grass valley

GV ORBIT

DYNAMIC SYSTEM ORCHESTRATOR VERSION 2.4.0

User Guide

13-03082-170 AH

2021-09-07

www.grassvalley.com

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Document History

See also the Release Notes for more information about this release. See Related Documentation, on page 19.

Publication Date Y-M-D	Document Version	Notes
2020-10-15	13-03082-170 AA	Formed from merging the *GV Orbit Client Quick Start Guide* and *GV Orbit Routing Panel User Guide*. This resulting *GV Orbit Client User Guide* supersedes these two documents. Added sections covering: User management, MV Cluster and Room Editor, MV Cluster tally configuration, and Audio bars configuration. Added a glossary of terms.
2020-19-11	13-03082-170 AB	GV Orbit v1.6 items added. Includes: • IP routing IP Configuration spreadsheet import.
2020-12-22	13-03082-170 AC	GV Orbit v1.7 items added. Includes: • Clustered multiviewer UI improvements. • Dynamic destination mode.
2021-03-16	13-03082-170 AD	Merged-in the GV Orbit Control User Guide.
2021-04-15	13-03082-170 AE	Added the Audio Live Usage task.
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2021-08-05	13-03082-170 AG	Added Audio Live Redundancy Support, Panel Layouts, Northbound Control through Sony LSM (NS-BUS Router Matrix protocol).
2021-09-07	13-03082-170 AH	Added Rooms and Layouts under Kaleido devices, History and Management pages to the Channel Manager, automatic save of sources associated with multiviewer Room Layouts.

Table of Contents

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Introduction

Welcome to the GV Orbit Software User Guide

In this first chapter, there is a GV Orbit Product Introduction and GV Orbit Introduction. The next chapter contains Getting Started Steps and subsequent chapters provide additional information and feature descriptions.

See In This Document, on page 23, for a document overview.

The purpose of this guide is to provide a brief introduction to GV Orbit Client and GV Orbit Control and its features.

When you log in to GV Orbit Client you open the Stage.

The GV Orbit Client Stage presents a series of tiles, which are arranged in the order you would perform the tasks if you were to configure a GV Orbit system from start to finish. Each task builds on the last. It all begins by defining one or more areas. Once you have area, you can add logical levels. Then, you can create a topology.

These tasks are described in the chapters that follow.

Related Documentation

Use the following related documentation to configure GV Orbit and to better understand the available features. You can obtain the latest product documentation from the Documentation Library section of Grass Valley's website (www.grassvalley.com/docs/gvorbit).

Part Number	Document Title
GVB-2-0860A-EN-DS	GV Orbit Datasheet
13-03082-020	GV Orbit Welcome
13-03082-010	GV Orbit Release Notes
13-03082-090	GV Orbit Admin Guide
13-03082-110	GV Orbit MapView User Guide
13-03082-170	GV Orbit Client User Guide (this document)
Dell 09K9WX	Dell EMC PowerEdge XR2 Getting Started Guide
–	Dell EMC PowerEdge XR2 Installation and Service Manual

Latest Software

You can obtain the latest GV Orbit software from Grass Valley Technical Support. See Grass Valley Technical Support, on page 862.

GV Orbit Product Introduction

GV Orbit is a single, consolidated, overarching configuration, control and monitoring package specifically designed for the dynamic orchestration of broadcast media networks, whether they be SDI, hybrid or pure IP. The underlying client-server architecture is targeted at open standards-based IP systems with many features and functions specifically crafted to make IP easy.

'Dynamic Orchestration' is GV Orbit's core strength that differentiates it from competitive systems. The ability to build, configure and change systems on-the-fly is hugely powerful, whether it is the adding/removing of devices or simply changing a name. In today's cost-conscious world, fast and efficient deployment and re-purposing of systems for alternative scenarios or productions is a key requirement.

GV Orbit uses one or more GV Orbit Servers running the GV Orbit services and one or more client computers running GV Orbit Introduction application(s), which provide the user interface(s) to a GV Orbit system.

GV Orbit Products

The product is offered in the following basic forms:
- GV Orbit **Lite**
- GV Orbit **Professional**
- GV Orbit **Enterprise**

The GV Orbit **Professional** and **Enterprise** products require a GV Orbit Server (GVO-HW) and are shipped with various software license options preinstalled. The options purchased determine the overall functionality and feature set available in a GV Orbit deployment.

The GV Orbit **Lite** product is a free-of-charge download from the Grass Valley website; it operates without a GV Orbit Server and has basic functionality.

Options Codes

The following table outlines the GV Orbit option codes and the related feature availability.

Table 1-1: GV Orbit Products - Functionality and Options Codes

Functionality	Lite	Professional			Enterprise
	(Free of charge)	GVO-CFG-PRO	GVO-MON-PRO	GVO-CTL-PRO	GVO-CTL-ENT
Uses GV Orbit Client	●	●	●	●	●
Requires GV Orbit Control		●	●	●	●
Requires min. one GV Orbit Server [a]		●	●	●	●
Functionality:					
Device Configuration	●	●	●	●	●
Device Upgrade	●	●	●	●	●

Table 1-1: GV Orbit Products - Functionality and Options Codes (continued)

Functionality	Lite (Free of charge)	GVO-CFG-PRO	GVO-MON-PRO	GVO-CTL-PRO	GVO-CTL-ENT
	Lite	Professional			Enterprise
Design MV-8 Series Video Wall	●	●	●	●	●
Design MV Cluster Video Walls		●	●	●	●
Client Real-Time Video Wall [b]	●	●	●	●	●
1 Seat GV Orbit Client/GV Orbit Control		●	●	●	●
Advanced Configuration		●			
Bulk Upgrade		●			
Custom Screens			●		
Custom Screens in Web View			●		
Alarm Logging			●		
Routing Configuration				●	●
Hardware Panel Support				●	●
Simple Routing				●	●
Advanced Routing					●
Third-party Device Routing Control					●
Channel Manager		●			

a. For system redundancy, purchase two **Professional** or **Enterprise** systems.

b. Displays H.264 video streams from compatible multiviewers (for example, MV-8 series multiviewers).

Sections and/or sub-sections of this guide are marked accordingly as being applicable to **Lite**, and/or **Professional** (Pro), and/or **Enterprise** (Ent) users.

GV Orbit Introduction

GV Orbit comprises two client applications:

1 **GV Orbit Client**.
2 **GV Orbit Control**, launched from within the GV Orbit Client.

Both client applications are installable on PCs running Microsoft Windows™. All the steps required to download, install and get started are covered in this guide.

GV Orbit and Existing Orbit

GV Orbit Client may be installed on the same client PC as the older Orbit client application.

Legacy Orbit projects can be opened and run by GV Orbit Client. However, any new features offered by GV Orbit will not be available in legacy Orbit projects run in GV Orbit Client.

> **Note:** GV Orbit projects *cannot* be opened by a legacy Orbit client.

GV Orbit Project Types

GV Orbit uses a project-based workflow.

The Control and Monitoring project (C&M project) is the *main* GV Orbit project type and is used for control and monitoring, and for routing control applications in GV Orbit **Professional** and **Enterprise**.

Table 1-2: GV Orbit Project Types

Project Type	Product			Description	Supported Devices
	Lite	**Pro**	**Ent**		
Multiviewer Project	●	●	●	Defines a video wall targeted at MV-8 series multiviewers.	MV-8 Series multiviewer devices.
IQ Multiviewer Project	●	●	●	Defines a video wall targeted at IQ-MV multiviewers.	IQ-MV multiviewer devices, for example, IQUCP-MV.
Connected Multiviewer Project	●	●	●	Pulls a Multiviewer project from a multiviewer into GV Orbit Client for video wall editing.	MV-8 Series and IQ-MV multiviewers.
Clustered Multiviewer	-	●	●	Defines video walls that are served by a cluster of MV-8 series multiviewer devices.	MV-8 Series multiviewer devices.
Control and Monitoring Project (C&M project)	-	●	●	Main project type. Includes: • Design and deployment of custom graphical operator screens. • Device configuration, control and monitoring. • Device routing control. Uses services/applications running on GV Orbit Server(s).	Densité-protocol and RollCall-protocol devices. Routing control: • IP end-points (Grass Valley and NMOS). • Traditional/SDI (NP-0017 and SW-P-08 protocols).

Requirements

For a full list of requirements for running GV Orbit, refer to the *GV Orbit Release Notes*, see Related Documentation, on page 19.

Domain IDs and IP Ports

A GV Orbit system employs 'domains' to segregate internal communications. Domains are specified with a Domain ID number (1 to 252) and each Domain uses separate IP ports. (For further information about IP Ports and Domain IDs for the GV Orbit Client and GV Orbit Server, refer to the *GV Orbit Release Notes* see Related Documentation, on page 19.)

> **Note:**
> You can change the Domain ID numbers. When using changed Domain ID numbers, recalculate the IP port numbers; refer to the *GV Orbit Release Notes* in Related Documentation, on page 19.

GV Orbit Services Requirements

Lite:

There are no GV Orbit Servers in a GV Orbit **Lite** installation and, as a result, no GV Orbit services in a GV Orbit **Lite** system.

Professional **and** Enterprise:

GV Orbit requires at least one GV Orbit Server running configured GV Orbit Services. Refer to related GV Orbit documentation, see Related Documentation, on page 19. Specifically, for information on GV Orbit services, refer to the *GV Orbit Admin Guide*.

In This Document

This document describes some steps for getting started with GV Orbit Client and then proceeds to describe other features.

- Chapter 2, Getting Started Steps, on page 25.
- Chapter 3, Home Screen, on page 77.
- Chapter 4, Manage Users, on page 141.
- Chapter 5, Getting Started With GV Orbit Control, on page 169.
- Chapter 6, Configuration Tasks, on page 175
- Chapter 7, Special Device Configuration Tasks, on page 331
- Chapter 8, Monitoring Tasks, on page 449
- Chapter 9, Control Tasks, on page 465
- Chapter 10, Administration Tasks, on page 477
- Routing control panels:
    - Chapter 12, Routing Control - Bulk Routing Panel, on page 505.
    - Chapter 13, Routing Control - XY Routing Panel, on page 591.
- Clustered multiviewers (applications with multiple multiviewers):
    - Chapter 14, Multiviewer Cluster, on page 653.
    - Chapter 15, MV Cluster - Room Editor, on page 675.
    - Chapter 16, MV Cluster - TSL Tally Configuration, on page 757.
    - Chapter 17, Audio Bars Configuration, on page 783.
- IP configuration for IP routing:
    - Chapter 18, IP Configuration, on page 793.

At the end of the document there is a handy Glossary of Terms.

2 Getting Started Steps

Summary contents of this chapter:

The purpose of this chapter is to provide the minimum steps required to install, configure and get started with the GV Orbit Client application.

Step 1: Download, Install and Launch

Lite	Professional	Enterprise
●	●	●

This section describes how to download/install client installers and launch GV Orbit Client.

Step 1.1: Download Client Installers

Download Installer for GV Orbit **Lite**

On the client PC:

1 Go to https://community.grassvalley.com/support/s/productdownloads

The Grass Valley product downloads login web page is shown.

2 If you already have a Grass Valley support login user name and password, then click **Login** and login here.

3 If you require a Grass Valley support user name and password, then click **Request Portal Access**, fill in your details and click **Send Request** to request Grass Valley portal access.

Login information will subsequently be sent to you.

The GV Orbit **Lite** client installer has been downloaded.

Download Installers for GV Orbit **Professional** and **Enterprise**

GV Orbit **Professional** and **Enterprise** use one or more GV Orbit Servers which are the source of client installers in GV Orbit **Professional** and **Enterprise** systems.

> **Note:**
> Downloading of the **GV Orbit Client** installer is separate from the downloading of the **GV Orbit Control** installer.

Download both the **GV Orbit Client** and the **GV Orbit Control** installer from the GV Orbit Server's admin page. (Thus, client versions are kept compatible.)

For full download instructions, refer to the *GV Orbit Admin Guide*, see Related Documentation, on page 19.

On the client PC:

1 Enter the GV Orbit Server's IP address into a browser. (Chrome recommended.)

The GV Orbit Server **Admin Login** screen appears. (See Figure 2-1.)

2 Click on each of the client installer download links to download the installers.
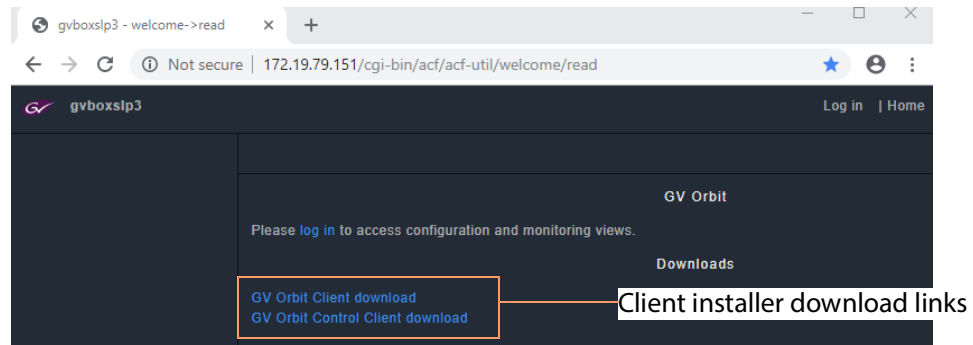
Fig. 2-1: GV Orbit Server Admin Login Screen

> **Note:**
> Client installers on the GV Orbit Server are updated with a server update.
> After a server update, download and reinstall the clients (recommended).

Step 1.2: Installation of GV Orbit Client

Lite	Professional	Enterprise
●	●	●

Installation of GV Orbit Client and of GV Orbit Control is done separately.
This section covers GV Orbit Client installation, including some information about any existing, legacy Orbit installs.
(For GV Orbit Control installation, see Step 1.3: Installation of GV Orbit Control, on page 30.)

Legacy Orbit Client Users

For users with the older, legacy 'Orbit' client already installed on the client PC, the following applies:

- GV Orbit Client may be installed on the same client PC as the legacy 'Orbit' client application.
- GV Orbit Client and the legacy 'Orbit' client must *not* be run together.
- At installation, GV Orbit Client inherits registry settings from any already-installed legacy 'Orbit' client (for example, multicast/unicast discovery setting, and 'recent projects' list).

Install GV Orbit Client

> **Note:** GV Orbit Client installs into client PC's 'Program Files' folder by default.

1 Run the downloaded installer file on the client PC.

Allow the installer to run by
responding to any Windows™ dialogs
accordingly.

The GV Orbit Client installer 'Setup GV
Orbit' screen is then shown.

2   Click **Next>** to begin the installation.
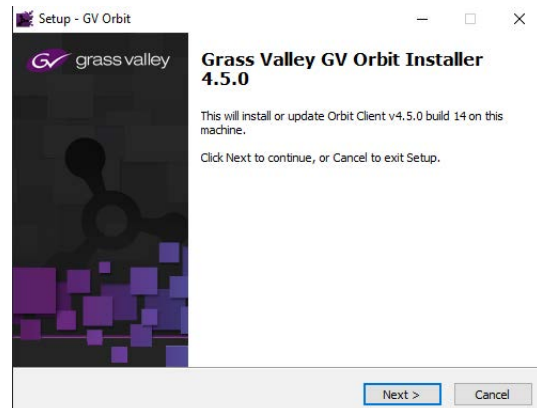
Fig. 2-2: GV Orbit Client's Setup Screen

3   Accept the License Agreement in the
    following dialog and click **Next>**.

    The installer will install into the folder
    of an existing installation of GV Orbit
    Client.
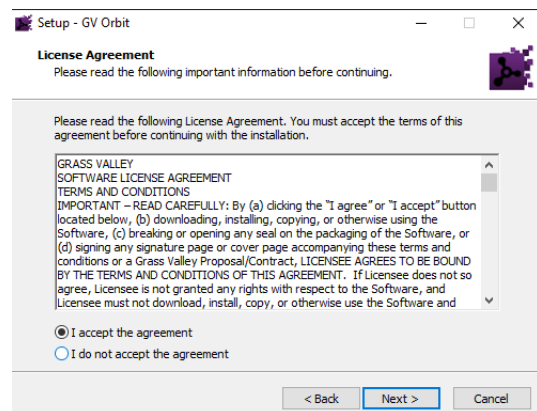
Fig. 2-3: GV Orbit Client's Setup Screen

4   If no previous GV Orbit Client is found, then an installation folder is prompted for.
    (Default folder location is `C:\Program Files\Grass Valley\GV Orbit`.)

5   Select a new folder, if required.
    Click **Next**.

6   At the next dialog, click **Install**.

    GV Orbit Client installation begins
    and a progress bar is shown.

7   When GV Orbit Client installation is
    complete, the GV Orbit Client setup
    'Completing' screen is shown.
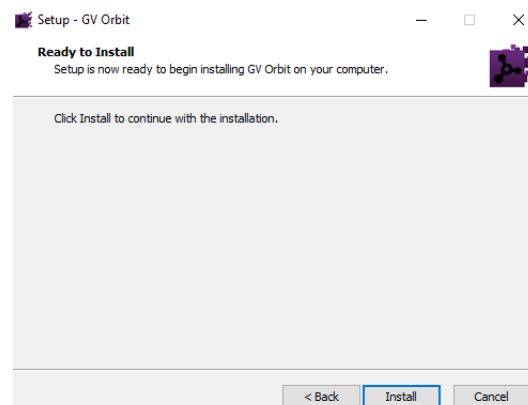
Fig. 2-4: GV Orbit Client Setup 'Completing' Screen

8 Click **Finish** and the GV Orbit Client application launches and shows its initial screen. See Figure 2-6.
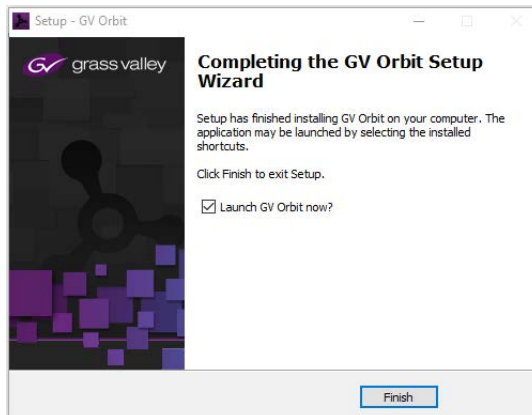
Fig. 2-5: GV Orbit Client Setup 'Completing' Screen

9 Close the GV Orbit Client application.GV Orbit Client is installed.

> **Note:**
> A shortcut is available from the Microsoft Windows™ Start menu: Start -> Grass Valley -> GV Orbit.
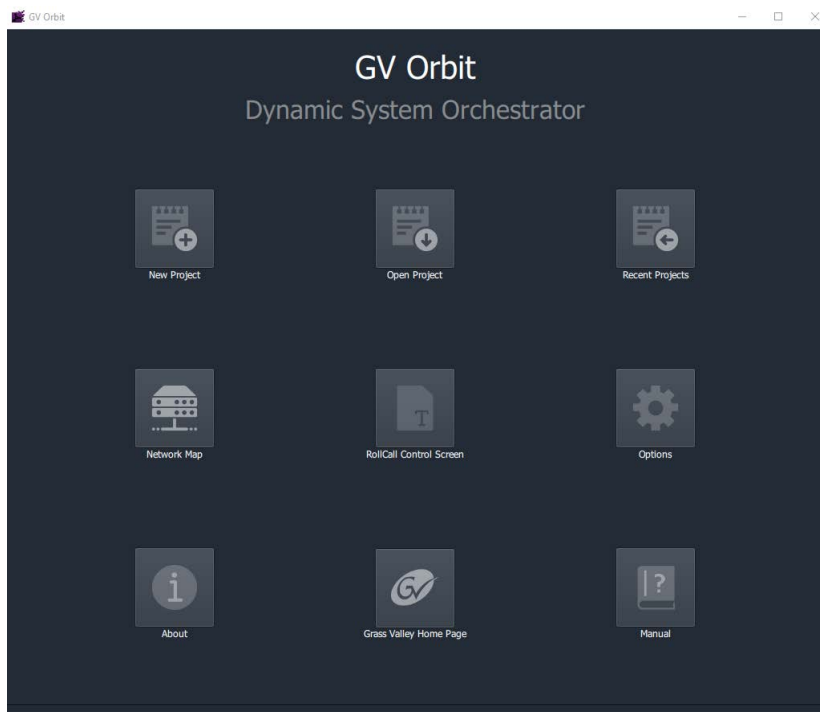
Fig. 2-6: GV Orbit Client Initial Screen

Firewall

1 Check that the GV Orbit Client application is not blocked by your client PC's firewall.

> **Note:** Firewall:
> 'orbit.exe' should be on a list of allowed apps (or programs) that can communicate through the client PC's firewall.
> These PC settings may be controlled by your network administrator.

Step 1.3: Installation of GV Orbit Control

Lite	Professional	Enterprise
	●	●

This sub-section is applicable to GV Orbit **Professional** and **Enterprise** product versions.

> **Note:**
> The GV Orbit Control installs into a *user* folder on the client PC. Thus it is normally only available to the person installing the software on that PC.

1 Log into the client PC under the username / password of the person who will be operating the GV Orbit clients.

2 Run the downloaded GV Orbit Control installer file.

Allow the file to run on the client PC by responding to any dialogs accordingly.

A splash screen is shown during installation:

3 When the installation is complete, the GV Orbit Control login screen appears.
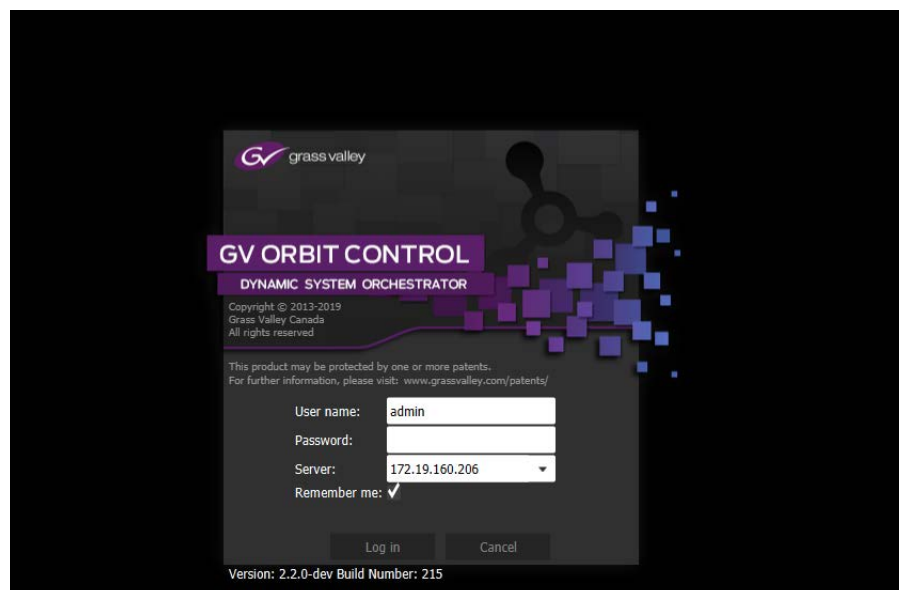
Fig. 2-7: GV Orbit Control Login Screen

4 Enter 'admin' for both the **User name** and the **Password**.

5 Enter the IP address of the GV Orbit Server in the **Server** text box.

6 Click **Log in**.

A blank **GV Orbit Control** screen appears.
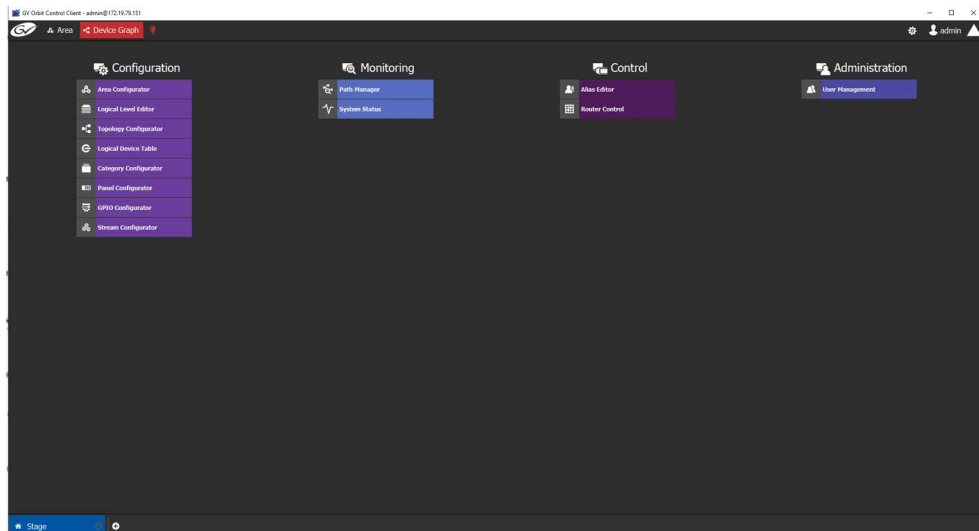
Fig. 2-8: GV Orbit Control Screen Example

7 Close GV Orbit Control.

GV Orbit Control installation is complete.

The installation folder is in the user folder, for example:

```
C:\Users\A_User\AppData\Roaming\JWrapper-GVOrbitControlClient\
```

> **Note:**
> The GV Orbit Control installs into a *user* folder on the client PC. Thus it is
> normally only available to the person installing the software on that PC.

> **Note:**
> You can launch GV Orbit Control manually from Microsoft Windows Start
> menu or through GV Orbit Client application.
> A shortcut is available on the client PC desktop and from the Windows™
> Start menu: Start -> Grass Valley -> GV Orbit Control.

Firewall

1 Check that the installed application is not blocked by your client PC's firewall.

> **Note:** **Firewall**:
> 'GVOrbitControlClient.exe' should be on a list of allowed apps (or
> programs) that can communicate through the client PC's firewall.
> These PC settings may be controlled by your network administrator.

Step 1.4: Launch GV Orbit Client

1 GV Orbit Client may be launched from the Windows™ 'Start' button. ("GV Orbit")

A splash screen is shown during start up:

And then the GV Orbit Client initial screen is shown. See Figure 2-9.

Create New Project

Open existing Project

Open a Project recently-opened by GV Orbit Client (Initially grayed-out)

Access a RollCall device control screen

Options

Open a Network Tree View

To GV Orbit documentation

Information about the GV Orbit Client

To Grass Valley web site
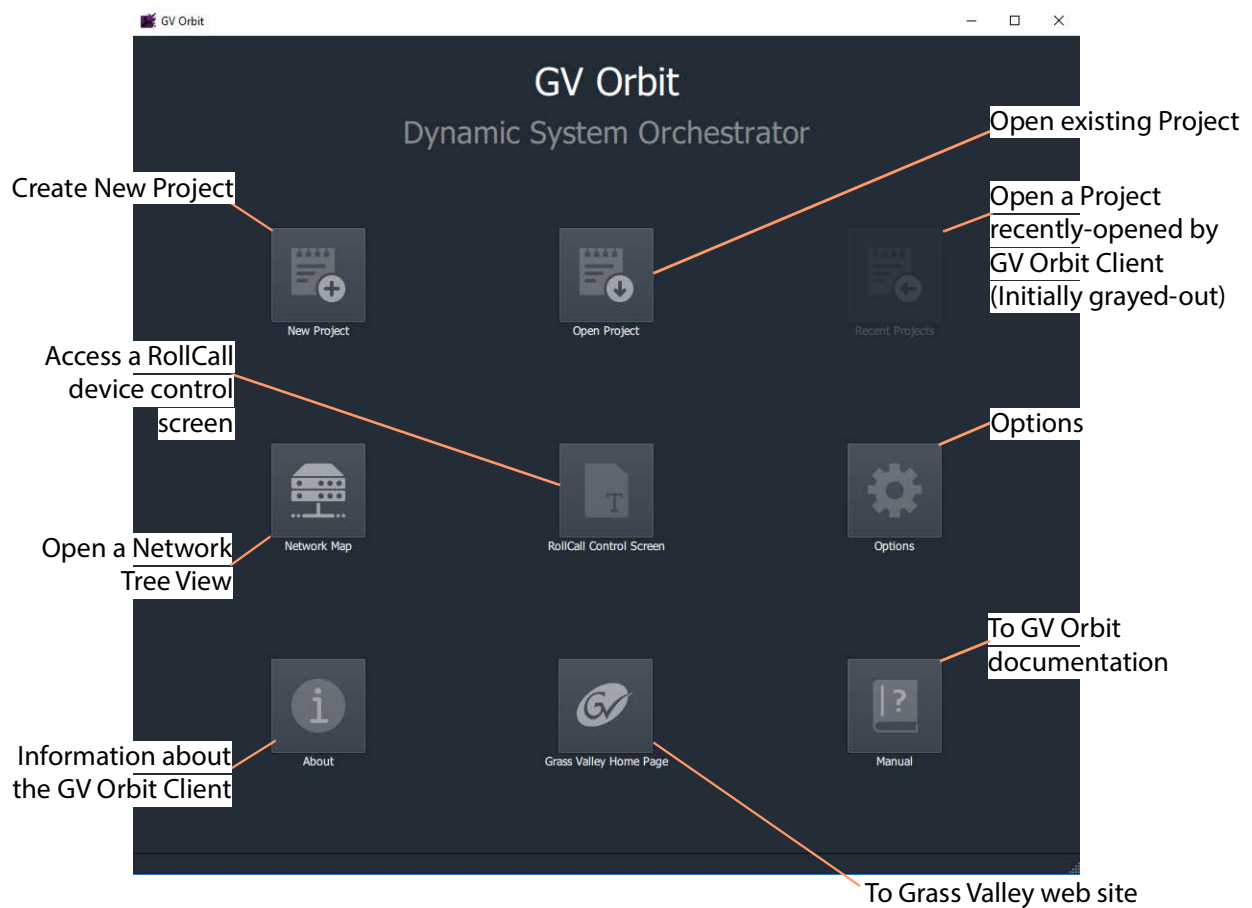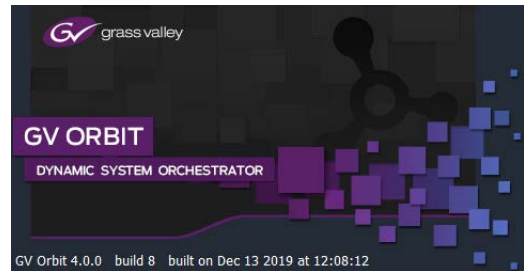
Fig. 2-9: GV Orbit Client Initial Screen

Step 2: GV Orbit Projects

Lite	Professional	Enterprise
●	●	●

Introduction

This section describes how to open a project. GV Orbit project types are listed in Table 1-2 on page 22. Once a project is created in GV Orbit Client, it can be saved locally on the client PC but it needs to be deployed for use by saving it (pushing it) to either:

- a multiviewer device (multiviewer projects; GV Orbit **Lite**, **Enterprise** and **Professional**); or to
- a GV Orbit Server (C&M projects; GV Orbit **Professional** and **Enterprise** only).

Multiviewer project types are used to define a compatible multiviewer's video wall. These are applicable to GV Orbit **Lite**, **Enterprise** and **Professional**.

The main project type for GV Orbit is a 'Control and Monitoring' project (C&M project) which is used for control and monitoring applications, and for routing control. This project type uses services running on a GV Orbit Server and is applicable to GV Orbit **Professional** and **Enterprise** only.

- Step 2.1: New Project, on page 33.
- Project Home Screens in GV Orbit Client, on page 38.
- Step 2.2: Save, Push, and Close a Project, on page 40.
- Open and Pull a Project, on page 41.

Step 2.1: New Project

To Open a Project from the Initial Screen

1 Click **New Project**.

The **New Project** dialog is shown.

2 Select a project type.

Entered project name.   Path to chosen folder.
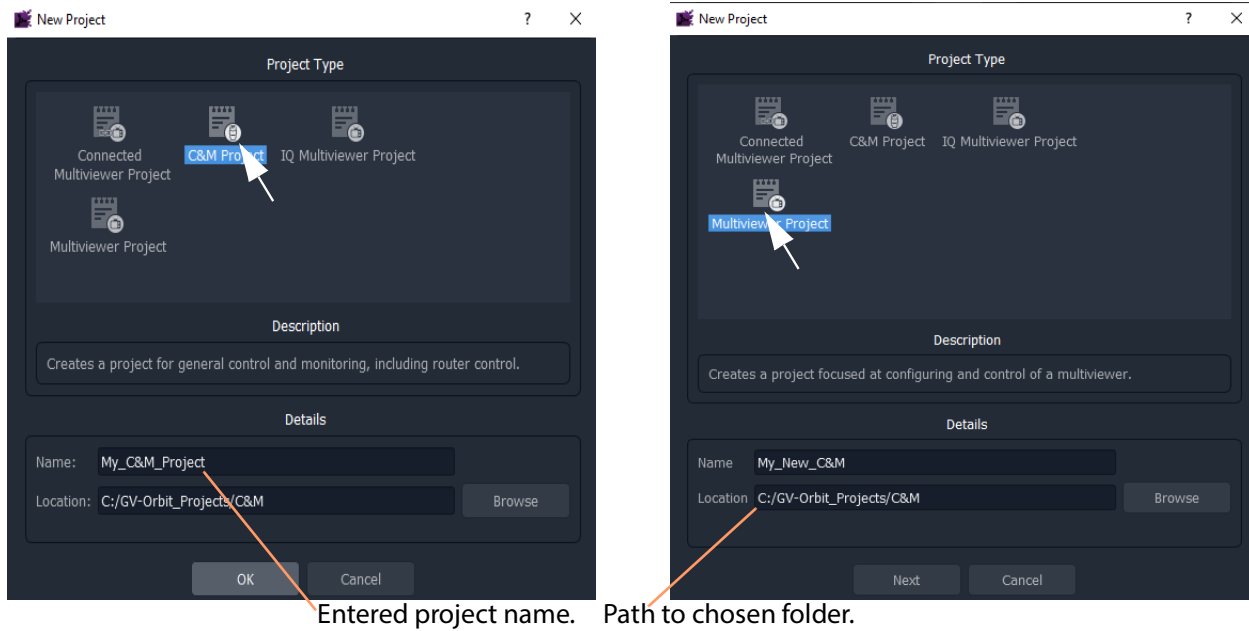
a) C&M project type selected   b) Multiviewer project type selected

Fig. 2-10: New Project Dialogs

3   Click **Browse** and browse to a local folder on the client PC (or to a network folder accessible from the client PC) where the new project files will be placed. Click **Choose**.

> **Note:**   The chosen folder is not on a GV Orbit Server.

4   Enter a name for the new project.

5   Click **OK** / **Next**.

A sub-folder is created with the name of the project. It contains the new project files.

6   If prompted, answer **Yes** to create a directory (sub-folder).

•   For a Multiviewer project, see
    For a Multiviewer Project (GV Orbit Lite, Enterprise and Professional), on page 34.

•   For a C&M project, see
    For a C&M Project (GV Orbit Enterprise and Professional), on page 35.

For a Multiviewer Project (GV Orbit **Lite**, **Enterprise** and **Professional**)

A dialog is shown for setting up the resolution of the multiviewer head display outputs.

1   Select the **Output Size** (1920x1080 or 1280x720).

2   Click **OK**.

The new multiviewer project is created and its GV Orbit Client project **Home Screen** is shown. See Project Home Screens in GV Orbit Client, on page 38.

For a C&M Project (GV Orbit **Enterprise** and **Professional**)

For a Control and Monitoring (C&M) project, a **Setup** dialog is shown.
(For more information about setting up a C&M project, see Step 7: Control and Monitoring Project Setup (Professional/Enterprise), on page 64.)
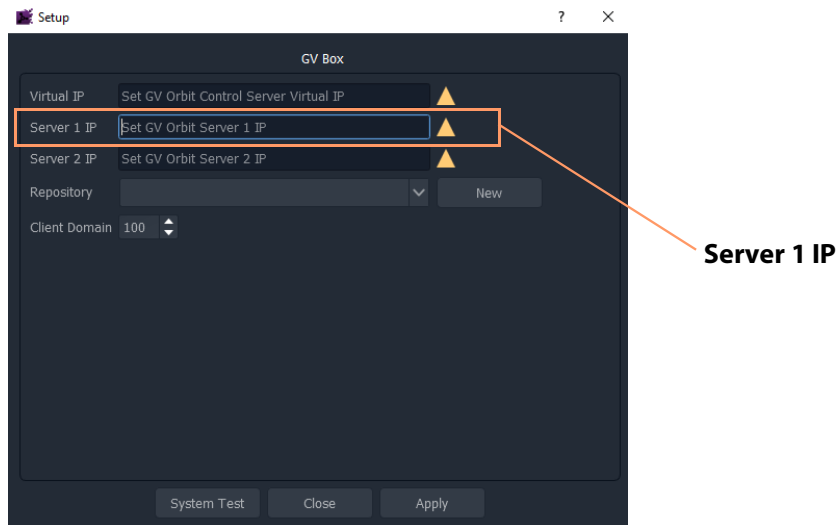
Fig. 2-11: C&M Project Setup Dialog

For the C&M project, in the Setup dialog:

1 Set **Server 1 IP** to the IP address of the GV Orbit Server. For a GV Orbit Server Cluster, still just enter the IP address of one server. The second server will be discovered automatically in the steps below.

After the IP address is entered, GV Orbit Client carries out some basic system tests; it uses the current **Setup** dialog settings. System connectivity is checked and some basic system information is discovered from the GV Orbit Server.

2 After these system tests are done, the results are listed in the dialog in a console pane. See Figure 2-12.

Green indicating GV Orbit Client's server connection is OK.

Server 1 IP

Repository setting

Results of basic system
tests in console pane.
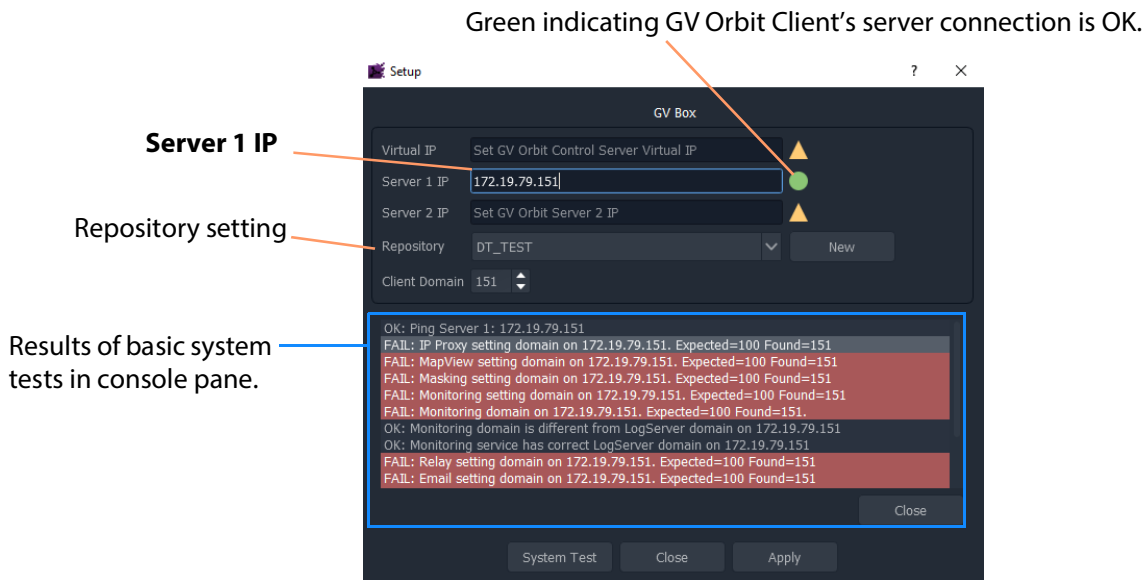
(For more information, see Step 7: Control and Monitoring Project Setup (Professional/Enterprise), on page 64.)

Fig. 2-12: Example Basic System Test Results (Single Server Shown)

Note:

Some system test console items may be shown in 'red', indicating where discovered information disagrees with settings in the **Setup** dialog. In this case, settings in the dialog are then filled out automatically to be consistent with discovered settings.

A subsequent system re-test (performed below) *will clear these red items.*

Repository in Setup Dialog

For deployment, a C&M project is saved to the GV Orbit Server in a **Repository**, one project per **Repository**. This setting selects which **Repository** is used by the project.

1 For the **Repository** setting, click **New**.

   The **Create Repository** dialog is shown:

2 Enter a name for the new repository and click **OK**.
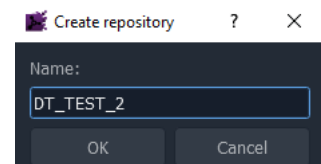
System Re-Test

A system re-test will now remove any red items in the console pane. In the **Setup** dialog:

1 Click **System Test**.

   This forces the GV Orbit Client to redo its basic system tests. The results are shown in the console. Any 'red' items from before should now be cleared.

Single GV Orbit Server   GV Orbit Server Cluster
and Virtual IP Address
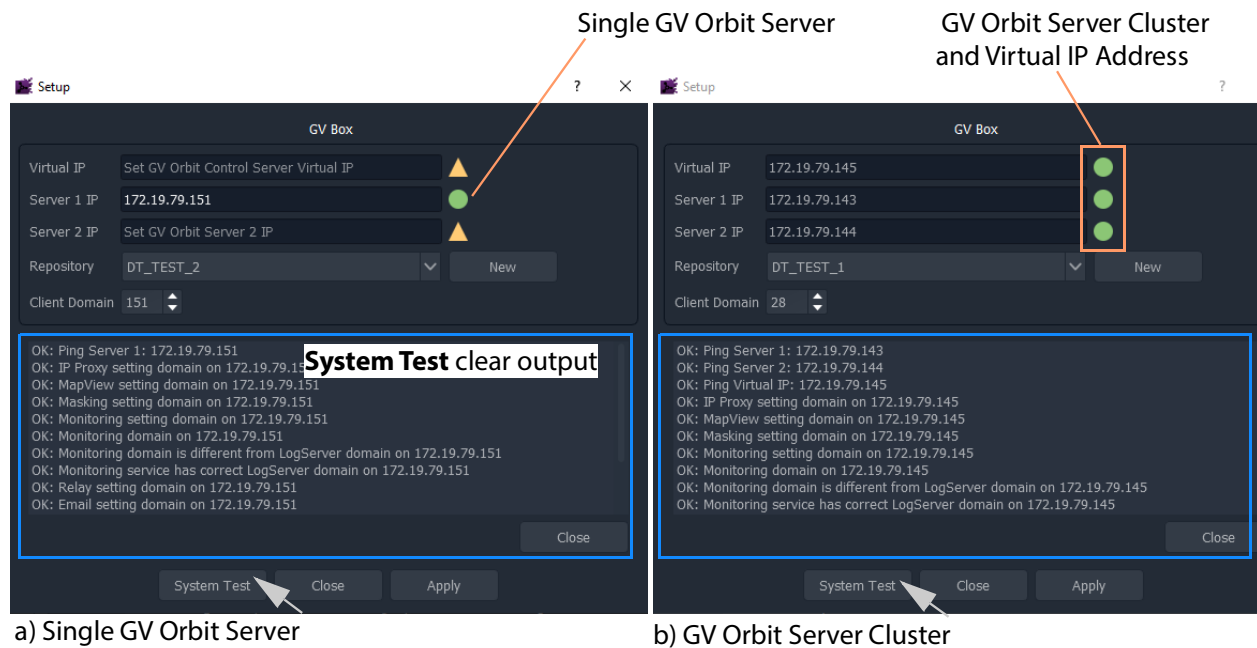
a) Single GV Orbit Server

b) GV Orbit Server Cluster

Fig. 2-13: System Test Console Output:
a) Single GV Orbit Server.
b) GV Orbit Server Cluster.

2   Click **Apply**.

The settings are
applied to the
project and a
progress bar appears in the dialog.
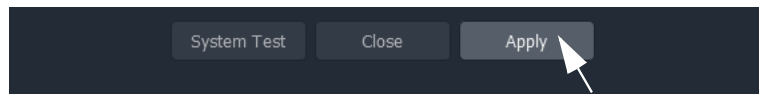
3   A pop-up dialog may appear, asking if the local
project should be updated from the chosen
repository.

- Click **Yes** to update the local project (and
  lose any local changes made).

- Click **No** to keep the local project changes
  (and not pull the project from the repository on the server).
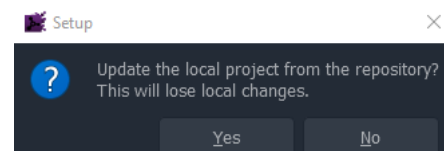
The applying of settings continues and progress is shown in the progress bar:
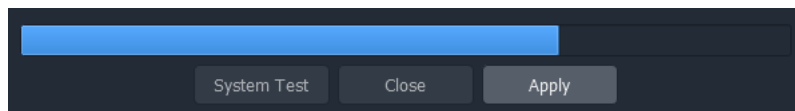
4   A pop-up dialog box confirms when the 'Applying' is all done.

Click **OK** in the pop-up to proceed.
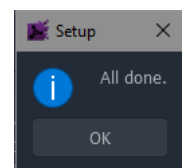
5 In the **Setup** dialog, click **Close**.
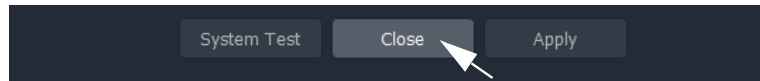
The new C&M project is created in GV Orbit Client and its **Home Screen** is shown. (See)

> **Note:**
> The **Setup** dialog can also be viewed when a C&M project is open by clicking **Connections -> GV Server** in the main menu of GV Orbit Client.

> **Note:**
> Setting up and applying the GV Orbit Server IP address for a project will automatically set up other comms settings for the project.

Project Home Screens in GV Orbit Client

The project's **Home Screen** is shown and a new GV Orbit project has been created.

> **Note:**
> The **Home Screen** appearance varies according to project type and which GV Orbit Client windows are enabled and being shown.

a) Example New Multiviewer Project Home Screen

Click icons to
hide/show windows
of project Home
Screen
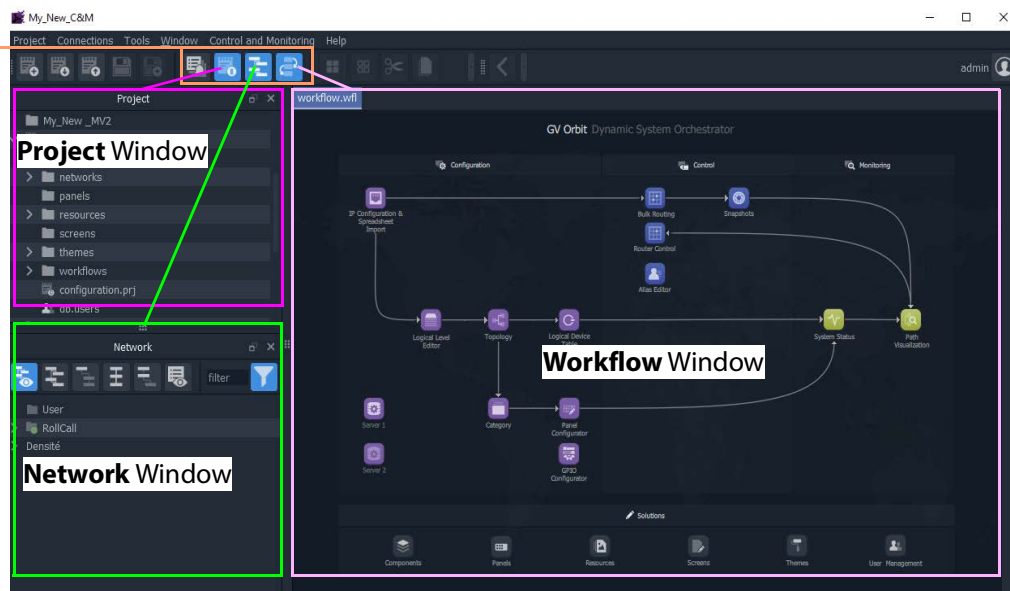
b) Example New C&M Project Home Screen (See Project Home Screen for Information)

Fig. 2-14: GV Orbit Client Home Screen Examples: a) Multiviewer Project; b) C&M Project.

Note: A GV Orbit 'Multiviewer' project type is typically for single-
multiviewer designs.
For video walls designs that are served by a cluster of multiviewers
(MV Cluster), then use the GV Orbit 'Clustered Multiviewer' project
type (described in Chapter 14, Multiviewer Cluster, on page 653).

Note: A C&M project type is for GV Orbit **Professional** and **Enterprise** only.
A C&M project can be created in GV Orbit **Lite**, but may not be used.

Step 2.2: Save, Push, and Close a Project

Step 2.2.1: Save a Project Locally

To locally save a project from GV Orbit Client:

1 Click **Project -> Save Project** in the main menu to save the project into the local folder on the client PC.

Step 2.2.2: Push Project (Save to Server)

To push an open project back into a repository (on the GV Orbit Server, or on a multiviewer device):

1 Click **Project -> Push** in the main menu.

A **Choose Projects** dialog is shown. Projects are listed that have been opened by the GV Orbit Client before. These appear in the **Project** window on the client.
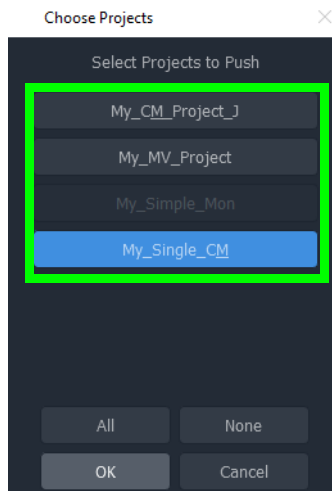
Fig. 2-15: Choose Projects Dialog

2 Select the project to be pushed. More than one may be selected. Click **OK**.

The project is pushed to the repository.

Once a project is in a repository, it is deployed for use:

- **Multiviewer project** - A project is pushed to a multiviewer which can then adopt the project's video wall design.
- **C&M project** - A project is pushed to the GV Orbit Server. Applications/services etc. on the server can then access the project. For example, the Web Renderer service can read the project and render its custom operator screens for viewing in a web browser.

Step 2.2.3: Close a Project

To close a project in GV Orbit Client:

- Click **Project -> Close Project** to close the project.

Open and Pull a Project

Open Existing Local Project

To open an existing local project from the GV Orbit **Initial Screen**:

1   Click the **Open Project** icon.

The **Open** dialog is shown:

2   Browse *into* the local project folder required and select the 'configuration.prj' file within it.

3   Click **Open**.

A login screen is shown.

4   For a new project, enter **User name** 'admin' and **Password** 'admin' and click **Login**.

The project's **Home Screen** is shown.
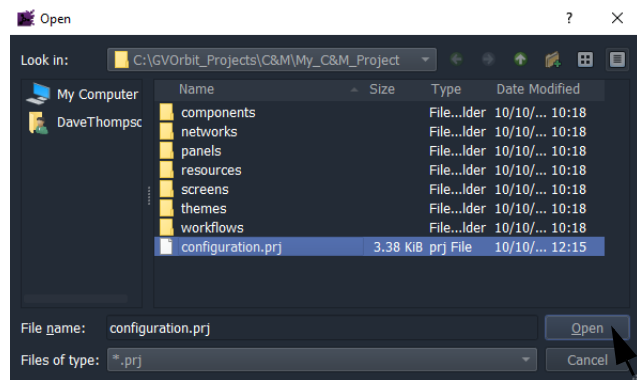
> **Note:**   New GV Orbit projects have **User name** 'admin' , **Password** 'admin.

Pull a Project (Load from Server)

To pull a project from a repository (on the GV Orbit Server, or on a compatible multiviewer):

1   Click **Project -> Pull** in the main menu.

A **Choose Projects** dialog is shown. (See Figure 2-15.)

2   Select the project to pull.

3   Click **OK**.

The project is pulled from the repository, stored locally on the client PC, and is opened by the GV Orbit Client.

> **Note: Pull** and **Push**:
> When connecting to a repository, you may be prompted to **Pull** a project from a **Repository**. **Pull** a project in order to either:
> •   edit the project locally (any local project is overwritten); or
> •   run the project locally (for example, to run operator screens).
>
> Do not **Pull**:
> •   if a local project has all been created or changed and which needs to be put into a **Repository**. (This requires a **Push**.)

Exit GV Orbit Client

Save the project locally and push it to be deployed, as required, before exiting GV Orbit Client.

To exit and close the GV Orbit Client application:

1   Click **Project -> Exit**.

The application shuts down and exits.

Step 3: Device Configuration

Lite	Professional	Enterprise
●	●	●

Introduction

This section describes how to access device control screens with GV Orbit Client. Devices can then be configured as required. RollCall- and Densité-protocol devices are covered.

- Step 3.1: Direct Configuration of RollCall-protocol Devices, on page 42.
- Step 3.2: Configuration of Densité and RollCall Devices, on page 43.

To configure a device (or unit), you must have the **Device control** permission assigned to your user profile otherwise you will not see this menu option. See Manage Users, on page 141.

Step 3.1: Direct Configuration of RollCall-protocol Devices

RollCall-protocol devices can be configured directly from GV Orbit Client with the device's IP address from the GV Orbit Client **Initial Screen**:

1 Click the **RollCall Control Screen** icon, (or, with a project open, in the main menu click **Connections -> RollCall -> RollCall Control Screen**).

   The **Open Template** dialog is shown:

2 Enter the IP address of the target device.

3 Click **OK**.

   The control screen is shown in a tab. Click on **x** on tab to close device control screen.
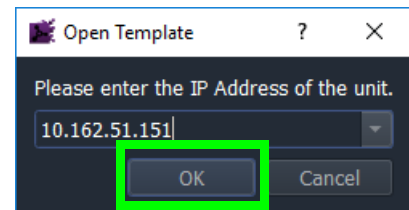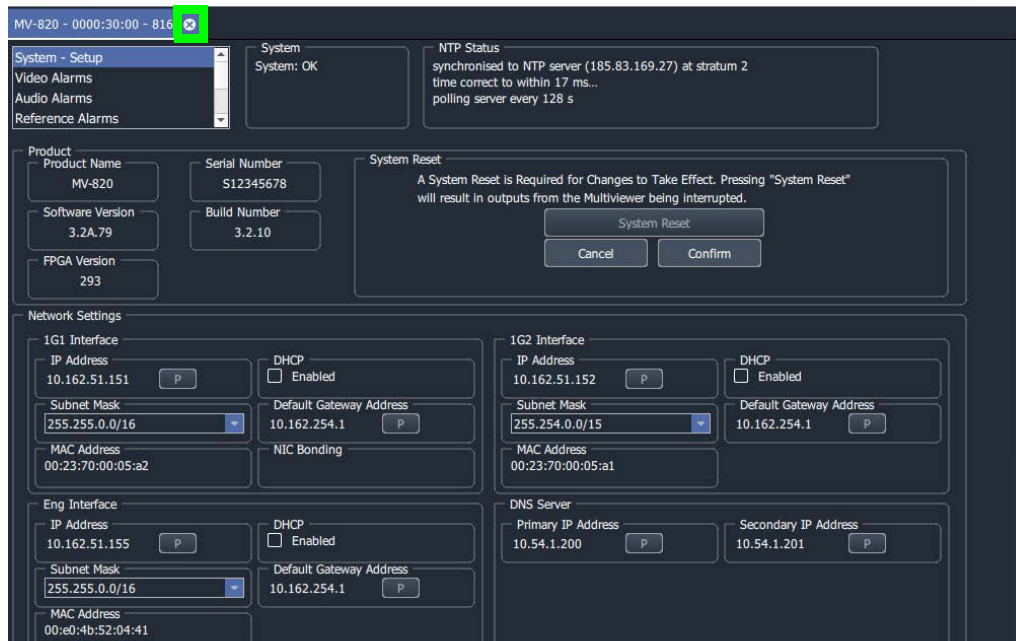
Fig. 2-16: Example Device Control Screen (RollCall-protocol Device shown)

4 When all device configuration changes are complete,
   close the control screen tab.

Step 3.2: Configuration of Densité and RollCall Devices

With a GV Orbit project open in GV Orbit Client, GV Orbit **Professional** and **Enterprise** can
show RollCall-protocol and Densité-protocol devices with full status indication listed in a
Network window.

However, GV Orbit **Lite** can only *list* RollCall-protocol device items in the **Network** window
and *without* any status indication.

Network Window Views

The **Network** window can show devices either in a tree-view or in a list-view. Toggle
between these views with the tool bar controls shown in Figure 2-17.
See Network Window, on page 84 for a description of the Network window.

Click to show List-View   Click to show Tree-View
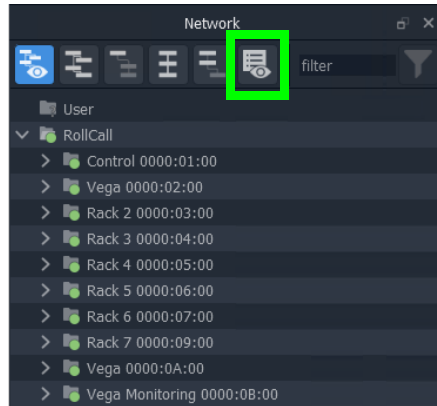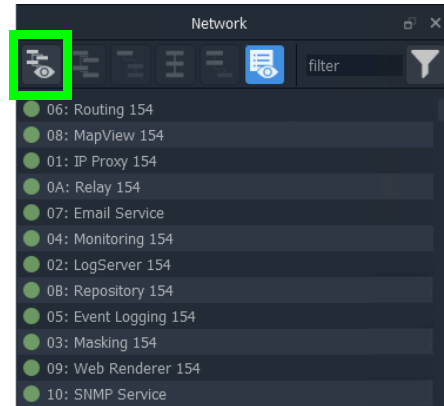
a) Tree-View   b) List-View

Fig. 2-17: Network Window Views

> **Note:** The **Network** window may already be showing system devices etc. for a C&M project open in GV Orbit Client if the GV Orbit services have been set up on the GV Orbit Server, so no set up may be required here.

Initial set up of the **Network** window can be done in a project; this is done differently for RollCall-protocol devices than for Densité-protocol devices and each is described below:

- Step 3.2.1: Network Window Setup For RollCall-protocol Devices
- Step 3.2.2: View a Device Control Screen - RollCall Devices
- Step 3.2.3: Network Window Setup For Densité Devices
- Step 3.2.4: View a Device Control Screen - Densité Devices

Step 3.2.1: Network Window Setup For RollCall-protocol Devices

RollCall device control screens can be viewed with GV Orbit Client via a GV Orbit Server (which runs a GV Orbit IP Proxy service).

To set up the **Network** window:

1. For GV Orbit:
   - **Lite** - From the GV Orbit Client **Initial Screen**, click the **Network Map** icon.
   - **Professional** and **Enterprise** and with a C&M project open - Click **Connections -> RollCall -> Network Map** in the main menu.

   An **Open Network** dialog is shown. (See Figure 2-18.)

a) **Open Network** Dialog

(after clicking on
Network Map in the GV Orbit
Client Initial Screen).

b) **Open Network** dialog
(after clicking on **RollCall -> Network Map** in GV Orbit Client's main menu).

c) Redundant server case.
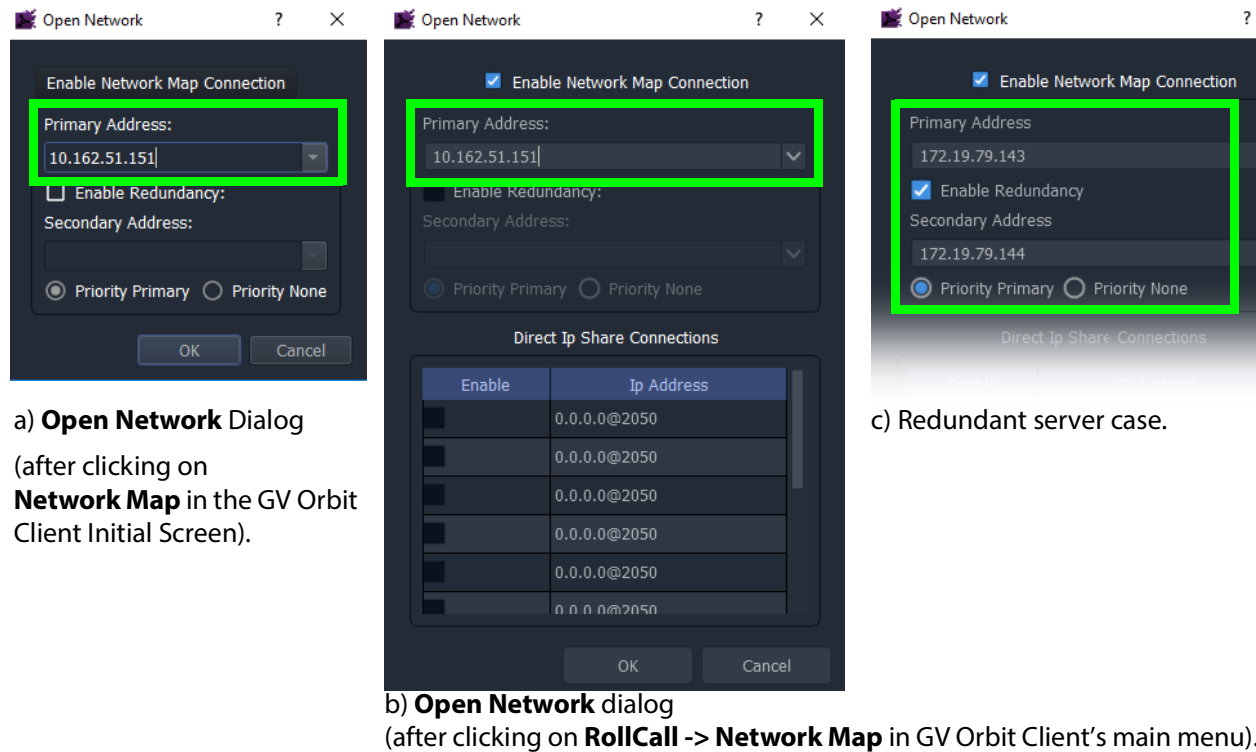
Fig. 2-18: Open Network Dialogs:
a) After clicking Network Map icon in GV Orbit Client Initial Screen.
b) After clicking RollCall -> Network Map in GV Orbit Client main menu.
c) Redundant server case.

2 Select **Enable Network Map Connection**, if available in the dialog.

3 Enter an IP address for the **Primary Address**:

- GV Orbit **Lite**:
  Enter the address of an IQ frame controller to be able to access all devices in the
  frame.

- GV Orbit **Professional** and **Enterprise:**
  Enter the IP address of a GV Orbit Server.

  This will connect to the IP Proxy service running on the server and allow access to
  all devices connected to the IP Proxy service.

  Note:
  The IP address entered in the **Open Network** dialog may be for either:
  - a GV Orbit Server, which runs a IP Proxy service; or for
  - a single device.

4 For redundant GV Orbit systems,
   select **Enable Redundancy** and enter the IP address of a second GV Orbit Server.

5 Click **OK**.

A **Network** window appears in the GV Orbit Client:

This can be re-sized. It can show an expandable tree-view of *all* devices attached to the IP Proxy service.
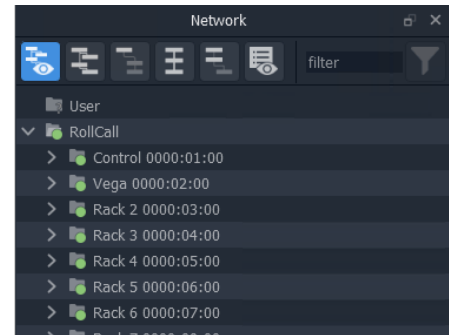
Step 3.2.2: View a Device Control Screen - RollCall Devices

To view a RollCall device control screen from the **Network** window:

1 Locate the target device in the **Network** window **(**tree-view or list-view).
   Right-click on the item and select 'Control'.

   The control screen and its sub-menus are loaded and are then shown in a tab.

Click to close the device control screen tab
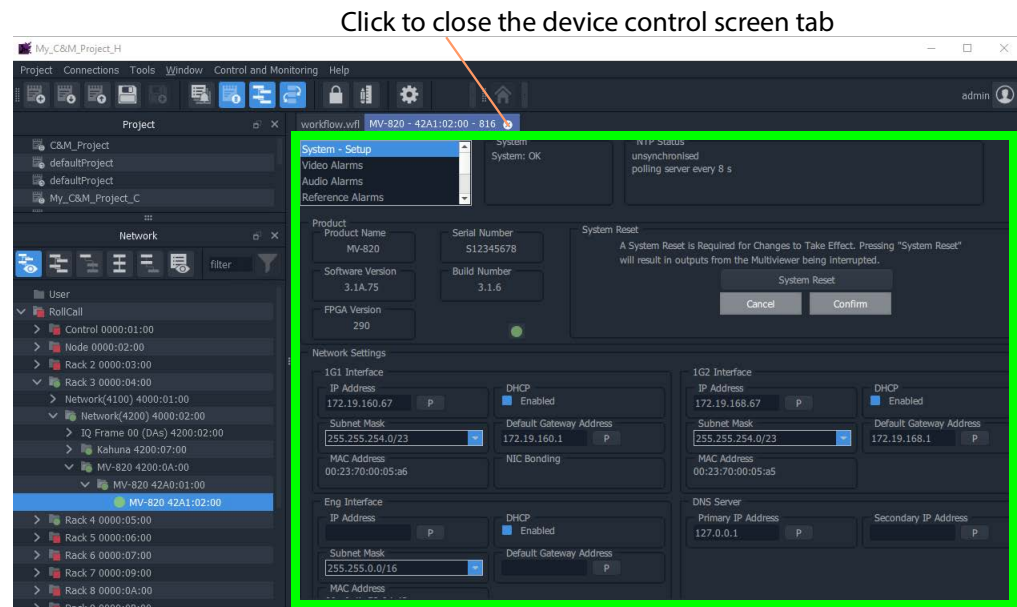
Fig. 2-19: Example Device Control Screen (RollCall-protocol Device Shown)

2 When all required user device configuration changes are done,
   close the control screen tab.

Right-click on any other device in the **Network** window to display/edit its control screen, as required.

Step 3.2.3: Network Window Setup For Densité Devices

Densité device control screens (card control panels) can be viewed with GV Orbit Client from the **Network** window via a GV Orbit Server (which runs a GV Orbit Densité service). GV Orbit Client must be configured to connect to the Densité server/service.

In a C&M project open in GV Orbit Client:

1 Click **Connections -> Densité** in the main menu.

   The **Densité Configuration** dialog is shown:

2 Enter the GV Orbit Server IP address.

3 Select:

   • 'Lookup Service'; and

   • 'Densité REST'.

4 Enter the **Username** and **Password** (if not already set up) to access the GV Orbit Server (and hence the Densité service).

   Note: These are *not* the same login credentials as those used when opening a GV Orbit project with GV Orbit Client.
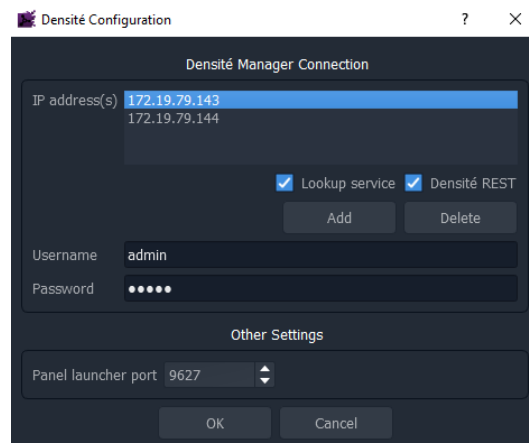
> **Note:** Densité service credentials are set up automatically if the **Setup** dialog (**Connections -> GV Server** in main menu) was used when creating the C&M project.

5 Click **OK**.

   GV Orbit Client connects to the Densité service on the GV Orbit Server.

6 Add all Densité frames to the Densité service. Refer to the **Densité Manager Service** in the GV Orbit *Admin Guide* in the Related Documentation, on page 19.

   Added Densité frames become visible in the **Network** window.

This has set up the **Network** window in GV Orbit Client to show Densité frames and to show fitted cards supported by the GV Orbit Server.

> **Note:** Densité cards can appear in the **Network** window if the card is:
> • present in a Densité frame that has been added into the GV Orbit Densité Manager service on the GV Orbit Server; and is
> • supported by the GV Orbit Server; and is
> • accessible by the GV Orbit Server over the network.

If a Densité card is still not shown in the window, support for it may need to be added to the GV Orbit Server. To add support for other Densité cards, if required, see Step 5: Adding Support for Further Densité Cards.

> **Note:** GV Orbit **Professional** and **Enterprise** ship with native support for some Densité cards. Refer to the GV Orbit release notes for a list of natively-supported Densité cards. See Related Documentation, on page 19.

Step 3.2.4: View a Device Control Screen - Densité Devices

You must have the **Device control** permission assigned to your user profile otherwise you will not see this option. See Manage Users, on page 141.

This step assumes that the Densité card is shown in the **Network** window (see Step 3.2.3: Network Window Setup For Densité Devices).

> **Note:** Densité cards can appear in the GV Orbit Client **Network** window if the card is:
> - present in a Densité frame that has been added into the GV Orbit Densité Manager service;
> - supported by the GV Orbit Server; and is
> - accessible by the GV Orbit Server over the network.
>
> To add support for a card, see Step 5: Adding Support for Further Densité Cards.

To access a Densité device control screen (device control panel) from the **Network** window:

1. Locate the target device in the **Network** window.
2. Right-click on the device and select 'Control'.

> **Note:** An informative message appears (bottom left of GV Orbit Client) while the control screen is being accessed.
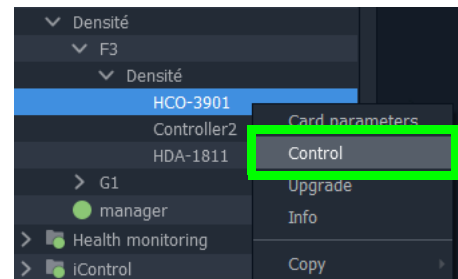
The Densité-protocol device's control screen opens in a separate window (that is, not in the GV Orbit Client's overall window) and may be obscured on your client PC's screen. Check that this window is not behind the GV Orbit Client window or other windows.
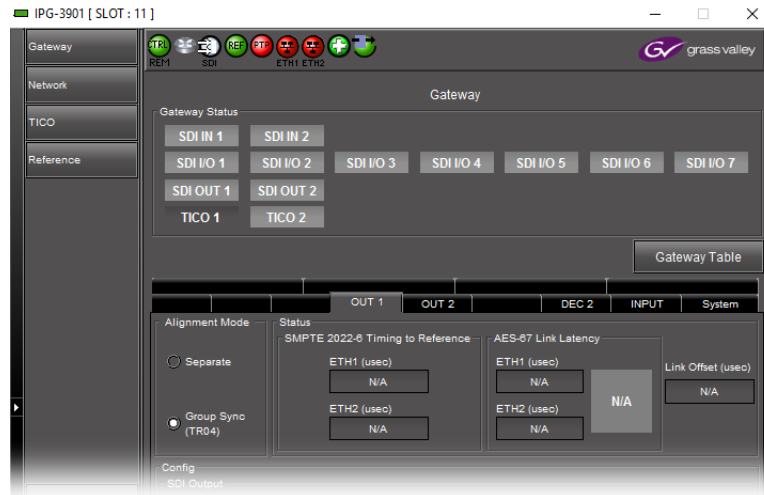
Fig. 2-20: Example Densité *Device Control Panel*

3   When all the required user device configuration is complete, close the control panel.

Right-click on any other device in the **Network** window to open its control screen, as required.

Step 3.3: Configuration of Other Devices

Devices in a GV Orbit system which may be configured via GV Orbit appear in the GV Orbit Client **Network** window and present a 'Control' drop-down menu option:

• Right-click on such a device and select 'Control' to open their web page in GV Orbit.
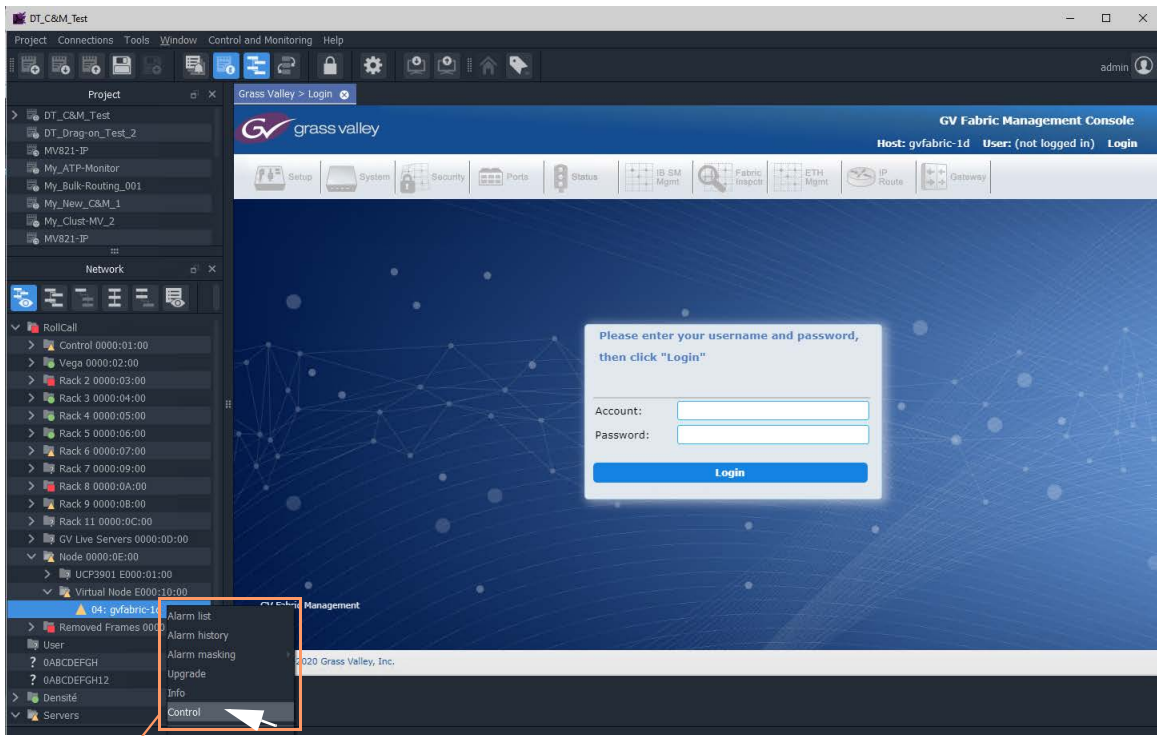
Right-click on device and select 'Control'

Fig. 2-21: Example GV Fabric Device Control Panel

Step 4: **Device Upgrade**

Lite	Professional	Enterprise
●	●	●

Introduction

This section describes how to upgrade software/firmware on a device using GV Orbit Client.

Upgrade packages for RollCall or Densité cards comprise a version of software and a version of firmware bundled together in a .zip file.

To upgrade a device (or unit):

- You must have the **Device upgrade** permission assigned to your user profile otherwise you will not see this menu option. See Manage Users, on page 141.
- The **Network** window must be open and showing the system device to be upgraded. (See Network Window Views, on page 43.)

> **Note:**
> Before starting, ensure that the upgrade package file is:
> • accessible;
> • for the correct RollCall or Densité card model; and is
> • the correct version required.
> Contact Grass Valley customer support for advice about upgrade packages.

Step 4.1: Upgrade RollCall-protocol Devices

• **Lite** - Simple device upgrade is possible directly from GV Orbit Client.
• **Professional** and **Enterprise** - Simple device upgrade and advanced device upgrades are possible with the GVO-CFG-PRO option.

Simple Upgrade

Check the Current Software/Firmware Version

1 Open the **Network** window.

2 Locate the device to be upgraded, right-click on it and select **Info**.

A **Details** window is shown for the unit, displaying unit information which includes the device's current version of software/firmware.
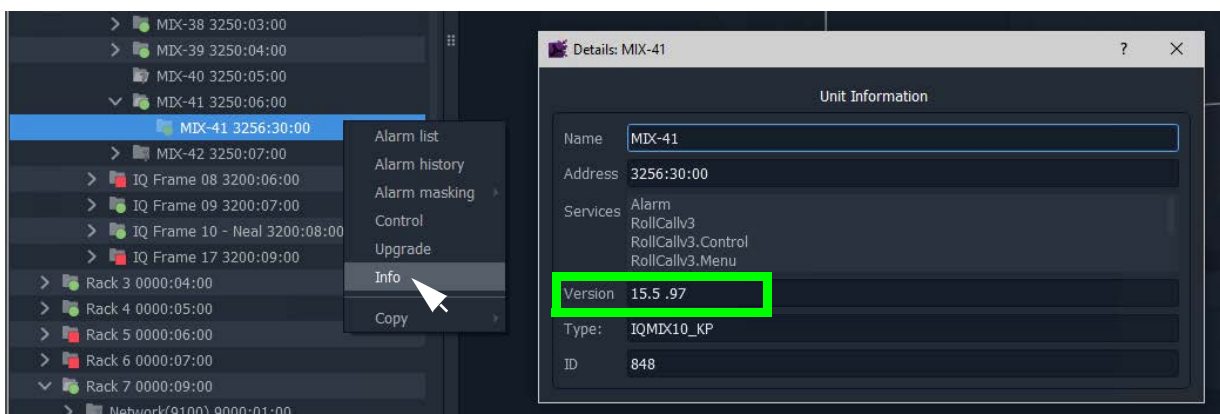
Fig. 2-22: Unit Information in Details Window

3 Close the **Details** window.

Import Upgrade Packages

4 Right-click on the tree-view device item and select 'Upgrade'.

The **RollCall Upgrade** window is shown. Any software/firmware upgrade packages

that have been previously uploaded to the GV Orbit Client are shown listed on the left hand side. For a fresh install of GV Orbit Client, no packages are listed.
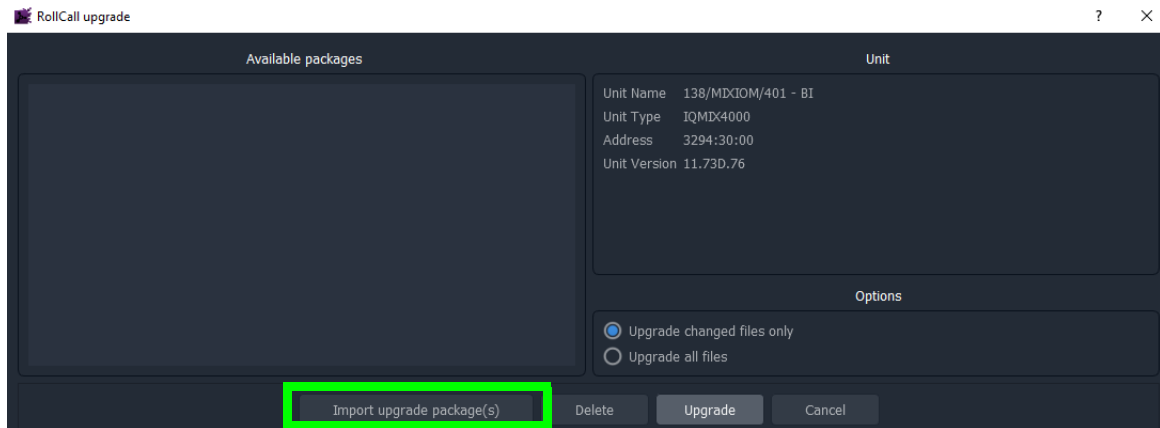
Fig. 2-23: RollCall Upgrade Window

5 Click **Import Upgrade Package(s)** and browse to the upgrade package to be uploaded. Select the package and click **Open**.

The package is imported into the GV Orbit Client.

After the package has been imported, it is listed under 'Available Packages' in the **RollCall Upgrade** window.

Upgrade the Device

6 Select a package in the 'Available Packages' list of the **RollCall Upgrade** window.

7 Select **Upgrade All Files** in the 'Options' pane to upgrade all files on the device, regardless of whether a file is the same on the device and in the upgrade package. (Deselect **Upgrade All Files** for a quicker upgrade.)
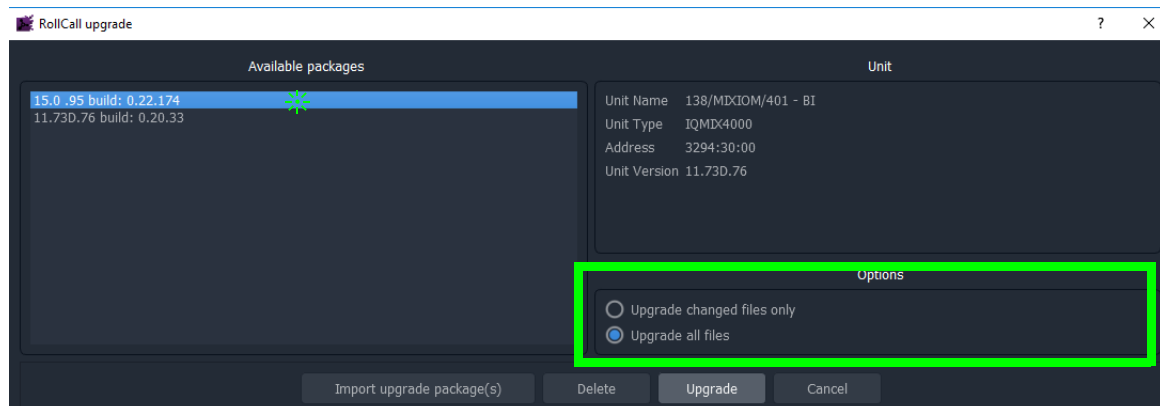
Fig. 2-24: RollCall Upgrade Window

8 Click the **Upgrade** button to start the upgrade of the device.

A message box appears informing you that the upgrade has started and will proceed in the background.
Click **OK**.
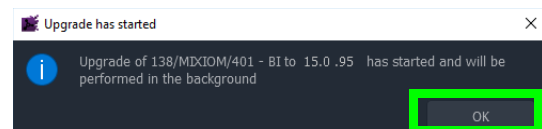
> **Note:**
> You can continue using the GV Orbit Client project while the upgrade proceeds.
> However, *only <u>one</u> RollCall upgrade can be running at any one time*.

The progress of the upgrade is reported bottom left in the GV Orbit Client window.

Bottom left

Messages
as
upgrade
progresses
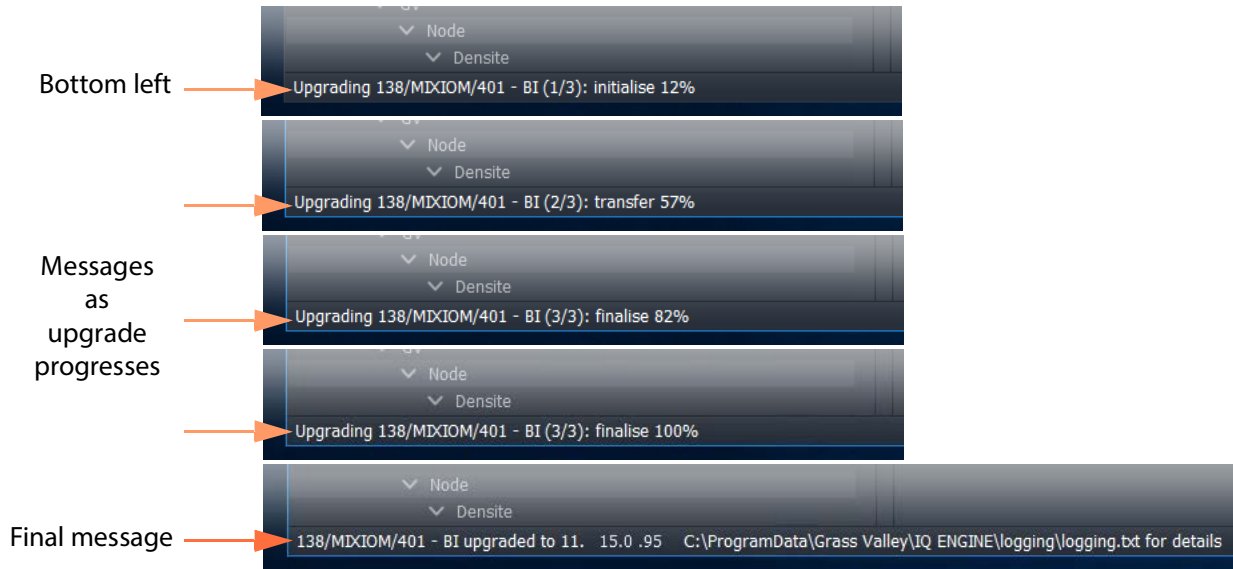
Final message

Fig. 2-25: Upgrade Progress Messages (Bottom left in GV Orbit Client *window)*

9 When the device has been upgraded, this is indicated by:
   • a final message at the bottom of the GV Orbit Client window; and also by
   • a pop-up notification message in the Windows^{TM} system tray.

Check the Upgraded Software/Firmware Version

1 Right-click on the **Network** window upgraded-device item and select **Info**.

   A **Details** window is shown displaying unit information.

2 Check that the device's current (upgraded) version of software/firmware is correct.

> **Note:**
> If the **Network** window is being presented through an IP Proxy then a GV Orbit Server fail-over (in a GV Orbit Server cluster system) during an upgrade will cause a failed upgrade.

Step 4.2: Upgrade Densité-protocol Devices

   • **Lite** - Simple device upgrade of Densité devices is not possible via the GV Orbit Client.

> **Note:**
> Densité modular devices may still be upgraded independently of GV Orbit Client using Grass Valley's iControl Solo product.

- **Professional** and **Enterprise** - Densité device upgrade is possible via GV Orbit Client with the GVO-CFG-PRO option, including upgrade of single and multiple Densité devices.

Device Upgrade (**GV Orbit Professional** and **Enterprise** only)

This sub-section assumes that the Densité card is shown in the **Network** window (see Step 3.2.3: Network Window Setup For Densité Devices).

> **Note:** Densité cards can appear in the GV Orbit Client **Network** window if the card is:
>
> - present in a Densité frame that has been added into the GV Orbit Densité Manager service;
> - supported by the GV Orbit Server; and is
> - accessible by the GV Orbit Server over the network.
>
> To add support for a card, see Step 5: Adding Support for Further Densité Cards to be able to see the card to upgrade.

Check Current Device Software/Firmware Version

1 Open the **Network** window and locate the device to be upgraded.

2 Right-click on the device item to be upgraded and select **Info**.

A **Details** window is shown for the unit, displaying unit information which includes the device's current version of software/firmware.
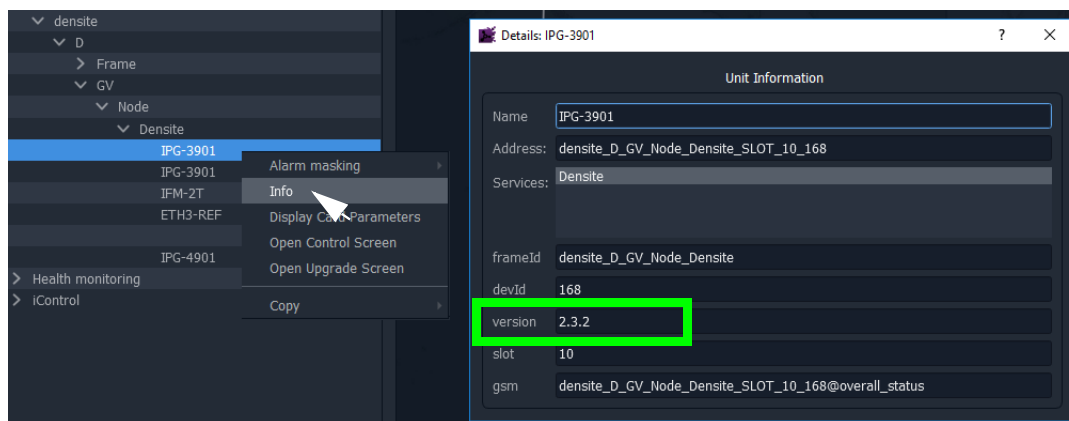
Fig. 2-26: Unit Information in Details Window

3 Close the **Details** window.

Import Upgrade Packages

4 Right-click on the tree-view device item and select 'Upgrade'.

The **Densité Upgrade Manager** window is shown.
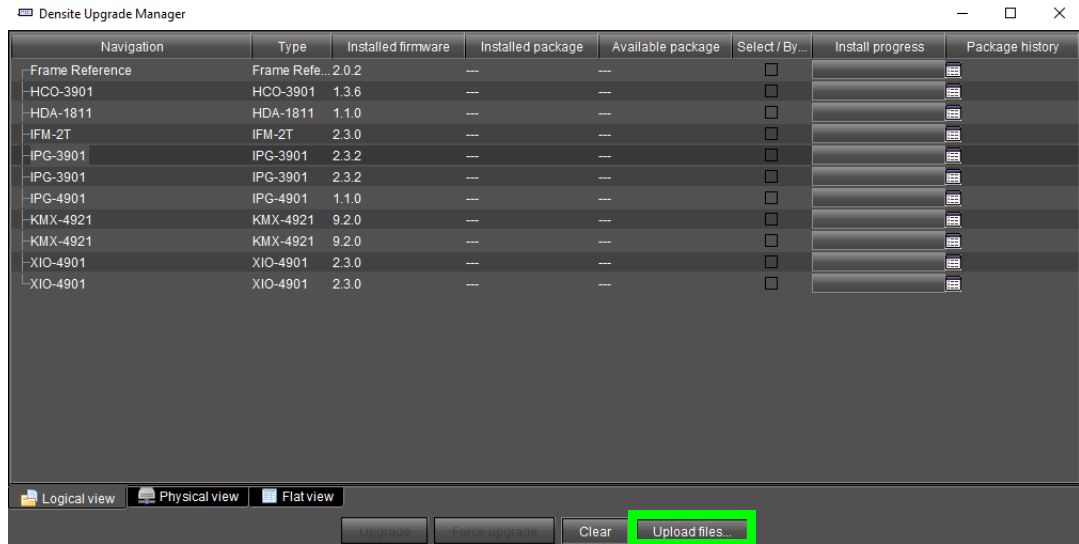
Fig. 2-27: Densité Upgrade Manager

5 Click **Upload Files...** and browse to the upgrade package to be uploaded.
   Select the package and click **Open**.

   A message window appears prompting you to start the upload.

6 Click **Upload** in the **Progress** window.

   Progress of the upload is
   shown in the window and the
   package is uploaded to the
   Densité Upgrade Manager.

7 When complete, the **Progress**
   window shows 100% done,
   'Operation finished':

   Click **Close**.

8 Verify the uploaded package
   is present in the **Densité**

Fig. 2-28: Progress Window - Upgrade Package 100%

   Upgrade Manager window by clicking in the 'Available package' column and looking
   in the drop-down list.

> **Note:** After an upgrade package has been uploaded, it is available in a drop-
> down box in the 'Available Package' column, in all rows for Densité
> devices compatible with the newly-uploaded package.
> For example, for an IPG-3901 package, check in any IPG-3901 device
> row.

Upgrade the Device

In the **Densité Upgrade Manager** window, in the row for the device to be upgraded:

9 Select an upgrade package in the 'Available Package' column's drop-down list.
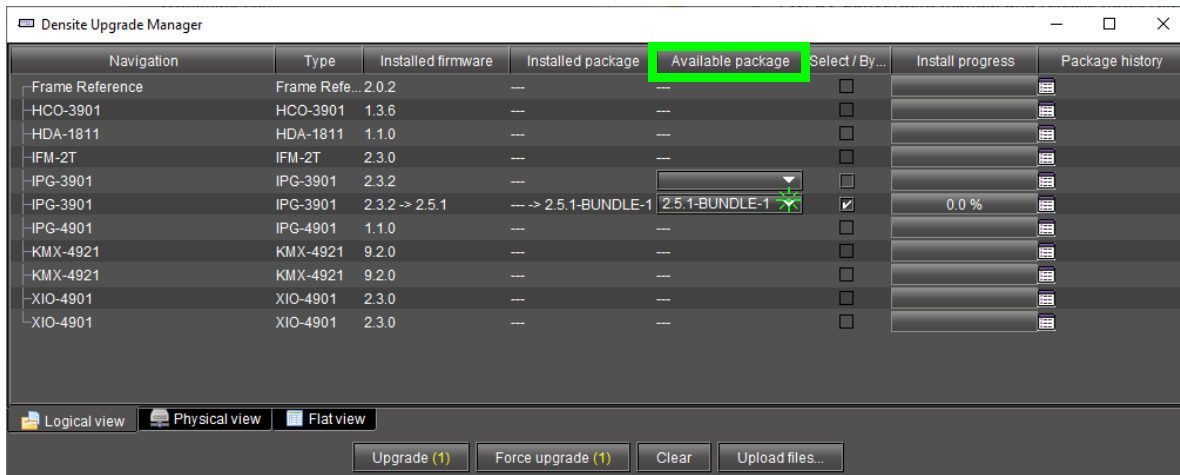
Fig. 2-29: Upgrade Window with Selected Upgrade Package

10 Click the **Upgrade** button to start the upgrade of the device.

An **Upgrade Confirmation** message box appears.

11 Click **Yes** to start the upgrade.
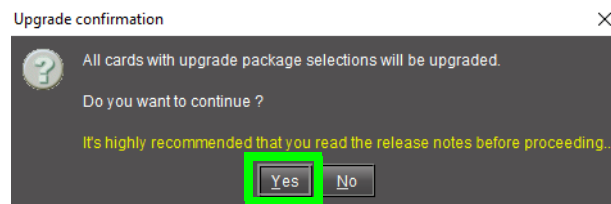
Progress is reported in the 'Install Progress' column as a progress bar and a percentage (%):
When done, a 'Finished 100%' message appears in the 'Install progress' column.
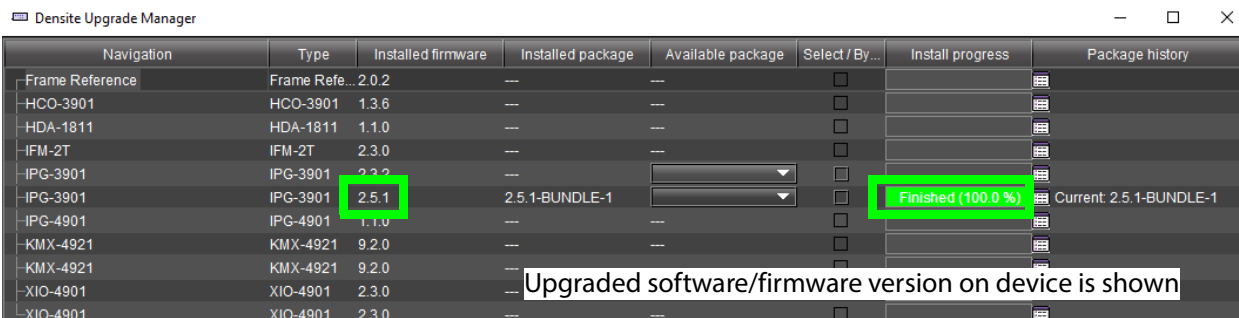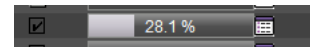
Fig. 2-30: Upgrade 'Finished 100%'

12 Close the **Densité Upgrade Manager** window.

Check Software/Firmware Version on Upgraded Device

13 In the **Network** window, right-click on the upgraded-device item and select **Info**.

A **Details** window is shown for the device/unit.

14 Check that the newly-upgraded device software/firmware version is correct.

> **Note:** The **Densité Upgrade Manager** can upgrade multiple devices.

Change Functionality of a 'Software-Defined Core' Card

Grass Valley offer a range of cards which have a software-defined core, enabling a user to change the functionality of a card with core packages and licenses. GV Orbit Client enables a user to change such a 'software-defined core' card's functionality.

> **Note:** Supported software-defined core cards include:
> - UCP-3901 and IQ-UCP cards, with various core packages, including Essence Processing (EP) cores and Multiviewer (MV) cores.
>
> See the documentation on the respective cards for further information and instructions on how to add licenses etc.

> **Note:** **License a card first** before loading a core package into the card. If a core package is loaded but a card is not licensed, then default, 'base' functionality results. See the documentation on the respective card for information.

To change a card's functionality, use the 'upgrade' mechanism in GV Orbit Client:

1 Locate the software-defined core card in the **Network** window.
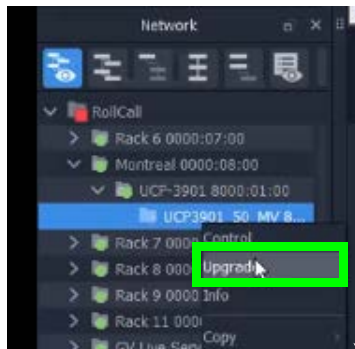
Fig. 2-31: Software-Defined Core Device in Network Window

2 Right-click on the card item in the tree-view and select 'Upgrade'.

The **RollCall Upgrade** window is shown for the card. The window shows:
- the core package currently in use by the card; and
- all available (imported) core packages.

See Figure 2-32.

Available core packages

Current software-defined core being used by the card.
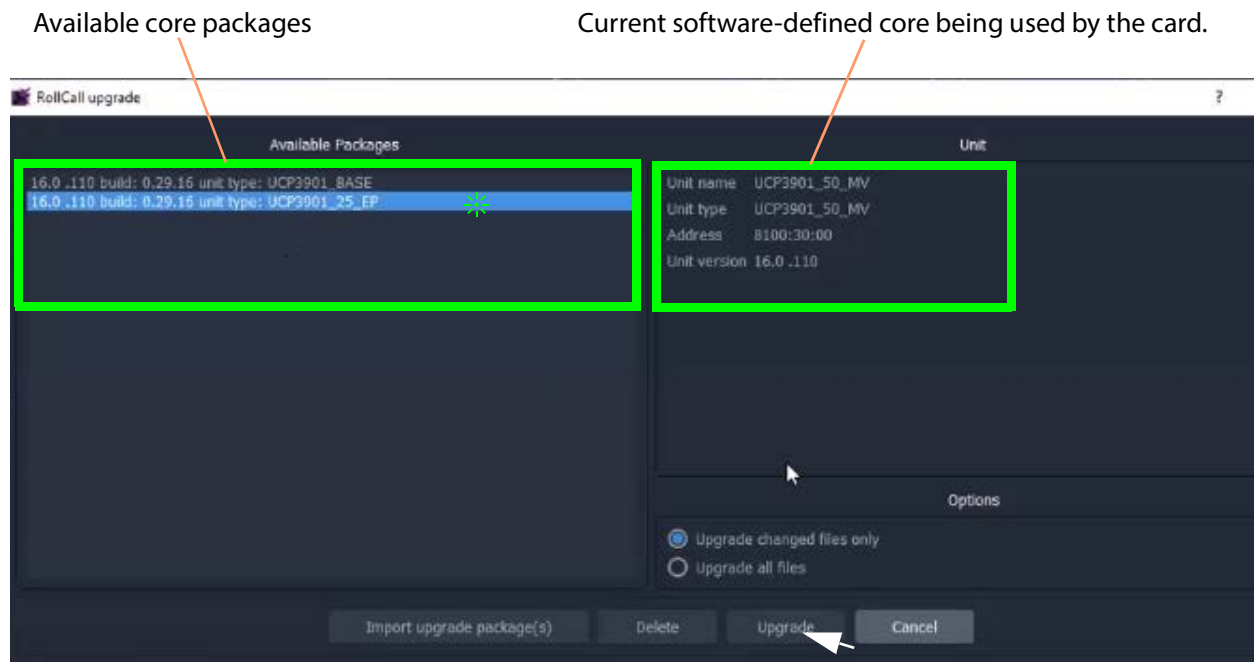
Fig. 2-32: RollCall Upgrade Window - Available Cores

To import further core packages:

3　Import the core package in a similar way to an upgrade package (see Step 4.1: Upgrade RollCall-protocol Devices, on page 51).

To load an available (already-imported) core package into the card and change card functionality:

4　Select an available core package and click **Upgrade**. The procedure is similar to upgrading a card (see Step 4.1: Upgrade RollCall-protocol Devices, on page 51).

The new core package is placed on the card; the card reboots and then adopts the functionality of the new core package if the card is licensed.

Step 5: Adding Support for Further Densité Cards

Lite	Professional	Enterprise
	●	●

Introduction

GV Orbit fully supports all Densité cards. GV Orbit **Professional** and **Enterprise** ship with native support for many Densité cards; for other cards, support needs to be added to your GV Orbit Server. This section describes how to add support for Densité cards to your GV Orbit Server.

Support is added by uploading the requisite Densité card software package. Once uploaded, the GV Orbit Server can recognize the cards and they may be integrated into the **Network** window.

Carry out this procedure to add or to update support of a Densité card.

Add or Update Densité Card Support

Many Densité cards are automatically recognized by GV Orbit. However, some Densité cards may not show in the **Network** window, even though they are physically installed in a Densité frame. For example, a frame's controller card may be shown but one or more cards in the same frame are not shown (in the tree-view nor list-view). To make such cards available, the corresponding card software packages must be uploaded through the Densité Upgrade Manager tool.

> **Note:** Refer to GV Orbit release notes documentation for a list of natively supported Densité cards. See Related Documentation, on page 19.

Prerequisite:
- All Densité frames are added to the Densité Manager service on the GV Orbit Server. Refer to the **Densité Manager service** in the *GV Orbit Admin Guide*. See Related Documentation, on page 19.)
- Software package are available for each Densité card type to be added/updated. (See each separate card documentation for how to obtain each software package.)

The procedure is similar to upgrading Densité cards (see Step 4.2: Upgrade Densité-protocol Devices):

1 Locate a Densité frame item in the **Network** window *tree-view* and expand it to show all available cards.

2 If one or more cards are not shown in the **Network** window tree-view, right-click on a fitted card item (for example, on the frame controller card item) and select 'Upgrade'.

   The Densité Upgrade Manager tool is opened showing all the cards in the Densité frame. Some cards may be grayed-out.

For each Densité card type for which support is to be added/updated:

3 Import the card's software package.
   (See Import Upgrade Packages for how to do this.)

4 Upgrade each card.
   (See Upgrade the Device for how to do this).

   After a card type has been upgraded, it should appear in the Densité Upgrade Manager tool and not be grayed-out.
   Support for the card has now been added to the GV Orbit Server.

When the support for all cards has been added:

5 Close the Densité Upgrade Manager window.

Support for the Densité cards has now been added to the GV Orbit Server and the cards are displayed in the GV Orbit Client's **Network** window.

Step 6: Multiviewer Project

Lite	Professional	Enterprise
●	●	●

Introduction

This section is applicable to GV Orbit Client and multiviewer applications with single multiviewers that use the GV Orbit 'Multiviewer' project type.

> **Note:** A GV Orbit 'Multiviewer' project type is typically for single-multiviewer designs.
> For video walls designs that are served by a cluster of multiviewers (MV Cluster), then use the GV Orbit 'Clustered Multiviewer' project type (described in Chapter 14, Multiviewer Cluster, on page 653 onwards).

This section describes a simple edit to a GV Orbit (single-multiviewer) 'Multiviewer' project pulled from a multiviewer (MV-8 series or IQ-MV series multiviewer). The simple edit changes the appearance of the video wall and the project is pushed back to the device.

> **Note:** GV Orbit 'Multiviewer' projects are pushed/pulled to/from a compatible (single) *multiviewer device* rather than to/from a GV Orbit Server.

Simple Multiviewer Project Editing Example

Pull Project and Open

1 Open GV Orbit Client at the initial screen and click **New Project**.

The **New Project** dialog is shown.

2 Select **Connected Multiviewer Project** type.

3 **Browse** into a new, empty folder (into which project information will be placed).

4 Click **Choose**.

5 Click **Next**.

A list of available multiviewers is shown.
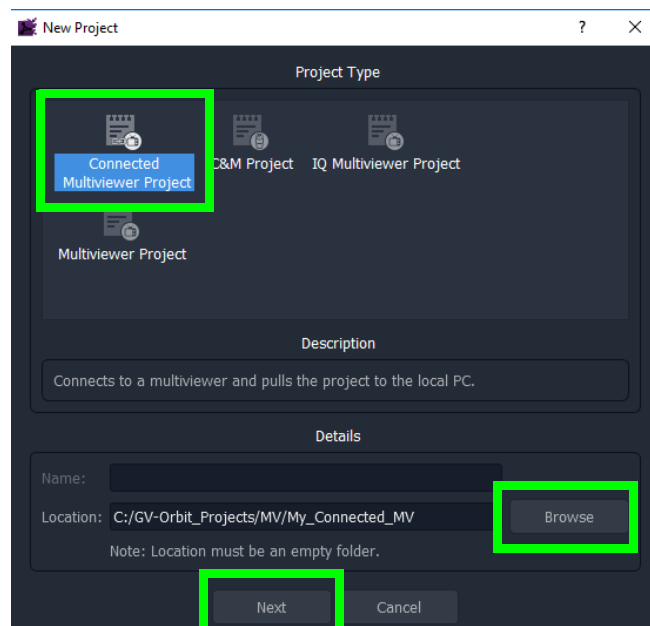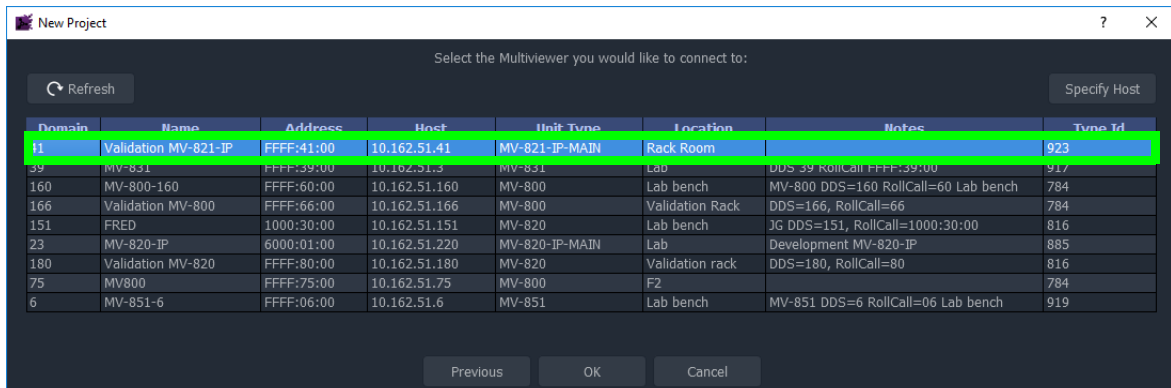
Fig. 2-33: Select Multiviewer to Connect To

> **Note:** The IP network used needs to support multicast for automatic discovery of devices to occur (for example, for listing available multiviewers).

6 Select the multiviewer to connect to and click **OK**.

GV Orbit Client connects to the multiviewer, pulls the GV Orbit project from it, attempts to open the project, and shows the login screen.

7 Enter the correct **User name** and **Password** for the accessing the GV Orbit project.

> **Note:** The default login for new projects is 'admin' 'admin'.

8 Click **Login**.

The project is opened and the multiviewer project **Home Screen** is shown.

Folder path where project is stored on the client PC.

Name of GV Orbit project (pulled from multiviewer)
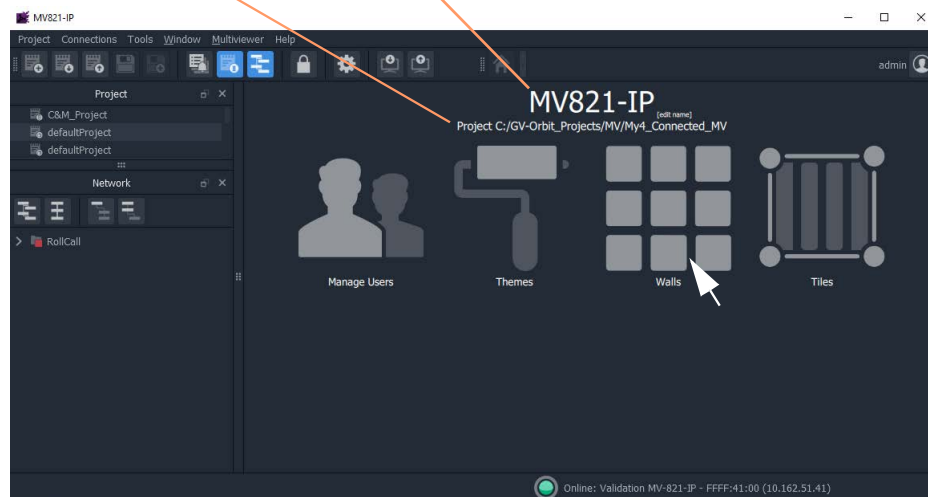
Fig. 2-34: Multiviewer Project Home Screen

The GV Orbit multiviewer project has been pulled from the target multiviewer device, locally stored on the client PC, and opened in GV Orbit Client.

The multiviewer video wall design may now be edited in GV Orbit Client.

Edit the Multiviewer Project

1 Click on the large **Walls** icon, and select one of the wall items that is shown listed.

The multiviewer video wall design is opened in a tab in the overall GV Orbit Client window. See Figure 2-35.
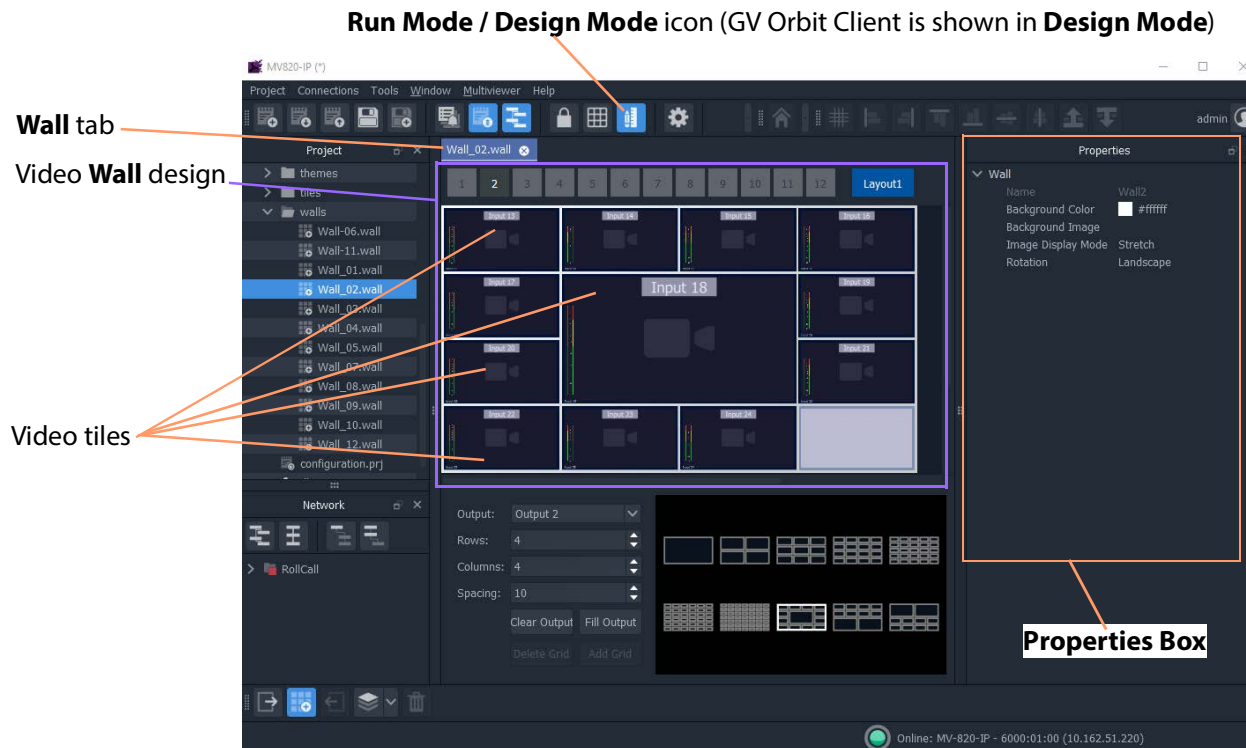
Fig. 2-35: Example Video Wall Tab in Wall Editor

The **Wall** tab is the stage on which a **Wall** is:

• designed and edited (in GV Orbit Client **Design** mode); and

• may be run and viewed (in GV Orbit Client **Run** mode).
Although a video wall is fully deployed when running on a compatible multiviewer device.

2 Click the **Run Mode / Design Mode** tool bar icon to select 'Design Mode'.

> **Note:**
> Clicking the **Run Mode / Design Mode** tool bar icon toggles between 'Run' and 'Design' modes of GV Orbit Client.

Click to exit Run Mode

a) Icon appearance when in **Run Mode**

Click to enter Run Mode

b) Icon appearance when in **Design Mode**

Fig. 2-36: Run Mode / Design Mode Tool Bar Icon

Note:

- In **Design Mode**, a project may be edited (for example, a video wall may be modified).
- In **Run Mode**, a project monitors log and alarm data and generates display screens in real-time.

This example edit will do a simple change to the video wall:

3 Click on one of the video tiles on the wall to select it. For example, the top-left video tile.

4 In the **Properties Box**, change the **Preferences -> Type** property value to 'Analogue Clock' via the drop-down menu.

The selected tile changes to a round-faced clock within the **Wall** tab.

Selected video tile   Round-faced, analogue clock tile   Analogue clock type
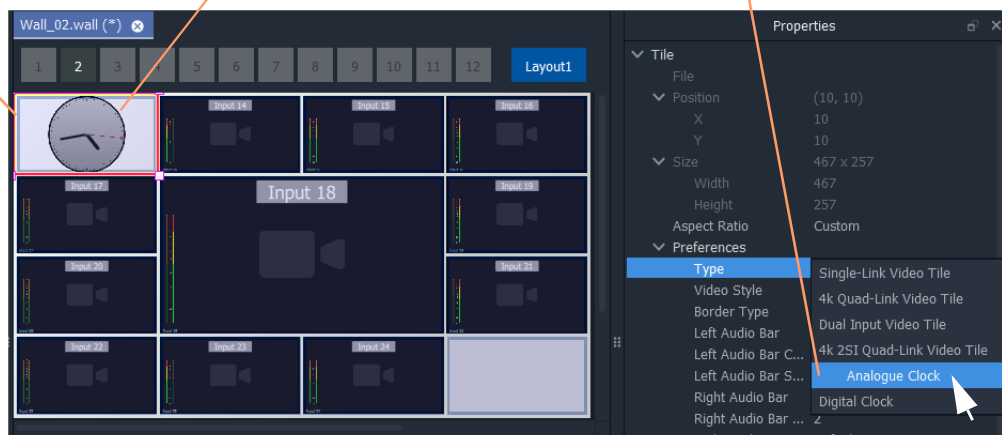
Fig. 2-37: Edited Wall Design

5 Click **Project -> Save Project** to save the whole project locally, including the video wall design.

Push Project Back to Multiviewer

1 Click **Project -> Push** in the main menu.

The **Choose Projects** dialog is shown.
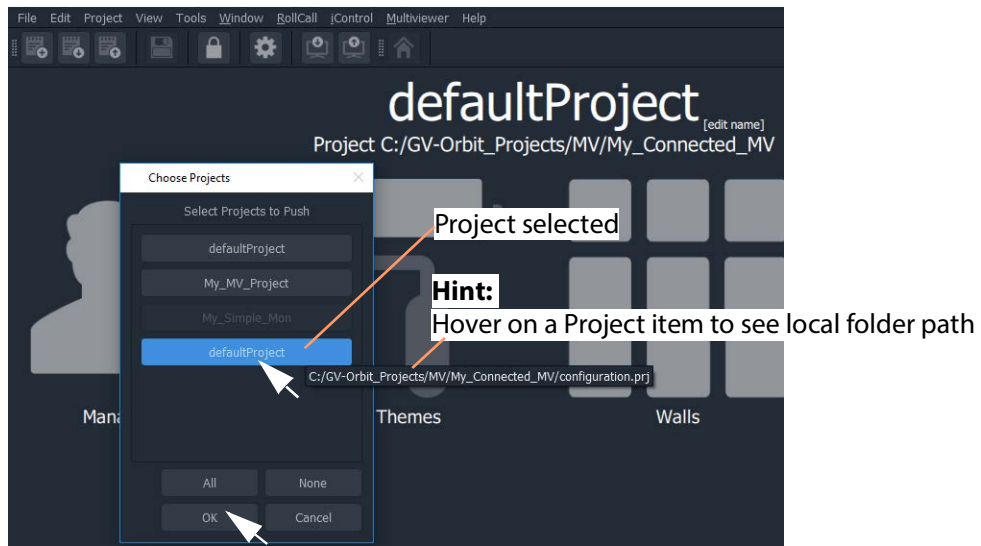
Fig. 2-38: Choose Projects Dialog

2 Select just the project to push to the multiviewer.

3 Click **OK**.

The selected project is pushed back to the multiviewer.
The edited video wall is then used and shown by the multiviewer device.

Step 7: **Control and Monitoring Project Setup** (Professional/Enterprise)

Lite	Professional	Enterprise
	●	●

Introduction

This section is applicable to GV Orbit **Professional** and **Enterprise** only. It describes setting up a new 'Control and Monitoring' project (C&M project), which is the main project type applicable to GV Orbit **Professional** and **Enterprise**. Following its setting up, a C&M project is ready for use. For example, custom graphical operator screens etc. can be designed, created and used.

All C&M projects are centrally stored in and used from repositories on the GV Orbit Server (one project per repository). The GV Orbit Client application needs to be configured to communicate with the GV Orbit Server(s) (see Step 7.2: C&M Setup Dialog, on page 65). A project is loaded by GV Orbit Client from a server repository and stored locally on the client PC.

> **Note:**
>
> GV Orbit Client requires network access to one or more GV Orbit Servers running configured GV Orbit services.

• Step 7.1: New C&M Project, on page 65.

Step 7.1: New C&M Project

From the GV Orbit Client **Initial Screen**:

1 Click **New Project.**

   The **New Project** dialog is shown.

2 Select the C&M project type.

3 Click **Browse** and browse to a folder where the project will be placed. Click **Choose**.

4 Enter a name for the new project.

5 Click **OK**.
   And, if prompted, answer **Yes** to create a directory.

   The **Setup** dialog is shown. See Step 7.2: C&M Setup Dialog, on page 65.
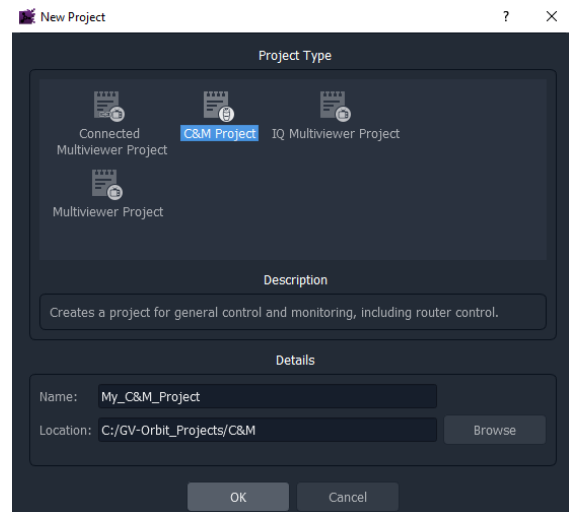
Step 7.2: C&M Setup Dialog
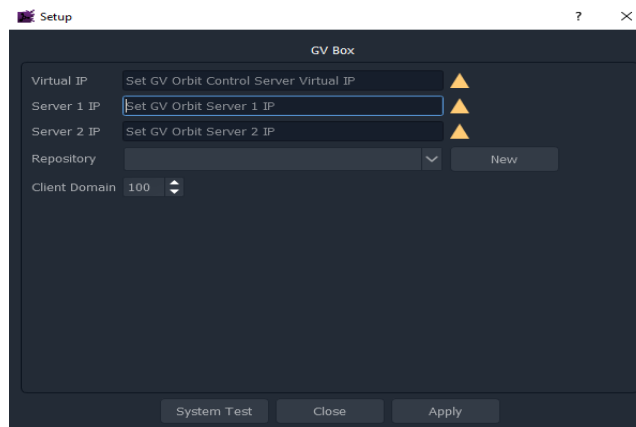
Fig. 2-39: C&M Project Setup Dialog

The C&M **Setup** dialog provides a quick way to enter key project parameters for a project.

The dialog is shown automatically when creating a new C&M project. And it can be accessed when an existing C&M project is open by clicking **Connections -> GV Server** in the main menu.

> **Note:**
>
> Some key project parameters are entered in the **Setup** dialog and used for the project settings. Some settings may be subsequently edited by you if required. Refer to Step 7.3.1: Project Variables (Project -> Edit Variables), on page 70.

Server IP Address(es)

1 Enter the IP address of the GV Orbit Server into the **Server 1 IP** text box.
   For a GV Orbit Server Cluster, enter the IP address of one server. The second server's address will be discovered automatically in the steps below.

   Check the address is correct.

   The GV Orbit Client attempts to connect to the server and performs some basic system tests.

> **Note: Basic System Tests**:
>
> 1. Connect to the GV Orbit Server.
>
>   A good connection status is shown with a green light indicator.
>
> 2. Find out other GV Orbit system information from the server.
>
> 3. Fill out settings in the **Setup** dialog.
>
>   For example:
>
>   - **Client Domain** number being used (default is 100).
>   - Available **Repositories** on the server.
>   - IP address of any second GV Orbit Server; and any IP address being commonly used by the servers ('Virtual IP').

The resulting connection status from the basic system tests is indicated in a console pane showing any system messages issued. See Figure 2-40a.

Green indicates
GV Orbit Client
successfully
connected to the
GV Orbit Server.

Console pane

System messages
from basic system
tests.

a) Single GV Orbit Server

IP addresses
automatically
added

Green indicates
GV Orbit Client
successfully
connected to the
GV Orbit Servers
and virtual IP
address detected.
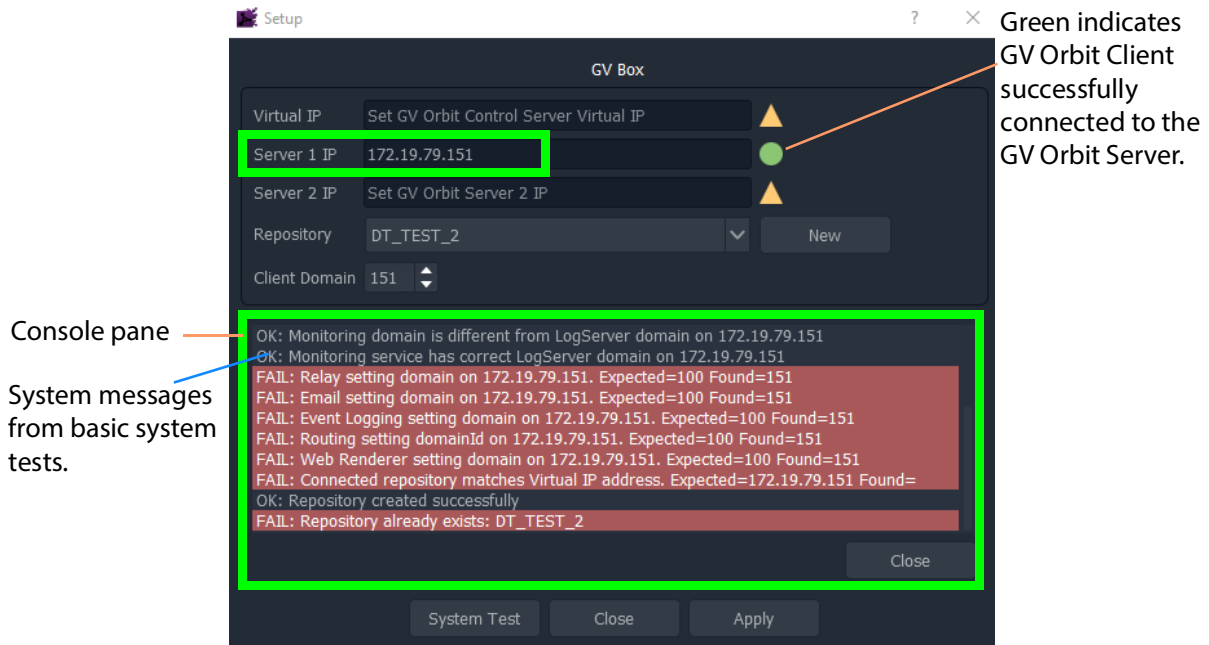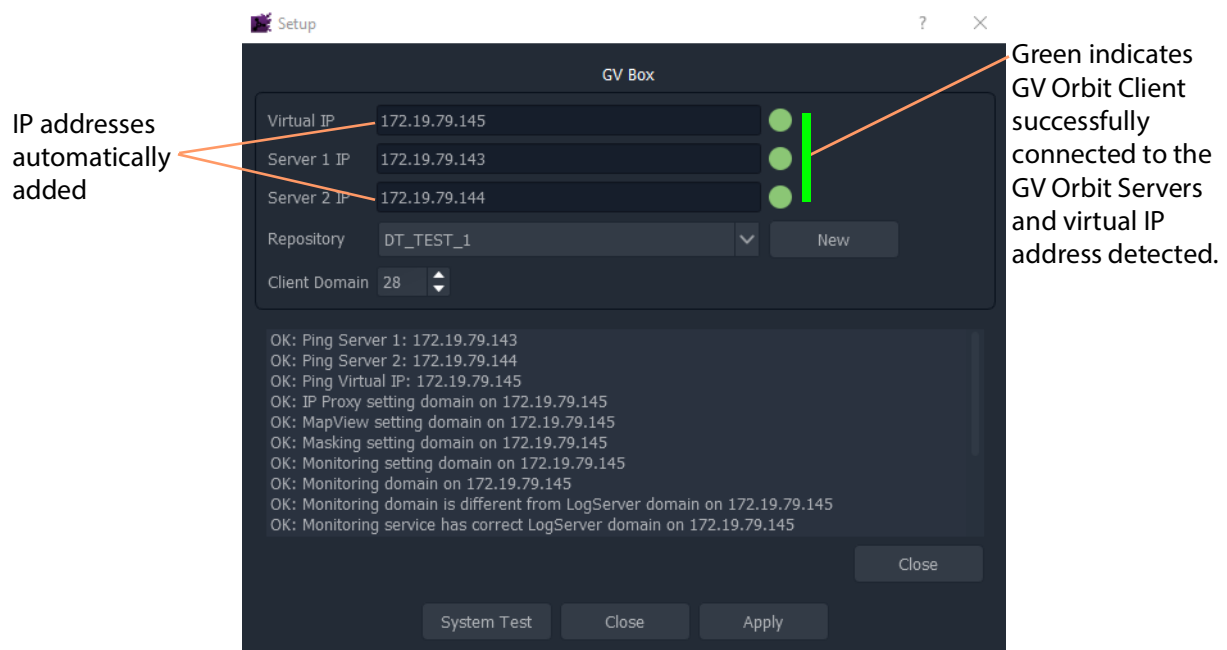
b) GV Orbit Server Cluster

Fig. 2-40: C&M Project Setup Dialog:
a) Single GV Orbit Server;
b) GV Orbit Server Cluster

Select a Repository

Note: Repository:	

Note: Repository:
Projects may be locally stored on the client PC but, for deployment, a C&M project must be saved to the GV Orbit Server (Pushed) into a **Repository**, one project per **Repository**. Multiple clients can access the same project.

Note:
The **Repository Manager** service, running on the GV Orbit Server, can be configured on the server and each repository may be set up from there.
Alternatively,
a **New** repository may be created from the C&M Project's **Setup** dialog.
Available **Repositories** are listed in a drop-down box in the **Setup** dialog.

Note:
Pull a project from a **Repository** to load the project from a server.
Push a project to a **Repository** to save it back to the GV Orbit Server.

1   In the **Setup** dialog, click **New**.

The **Create Repository** dialog is shown:

2   Enter a name for the new repository and click **OK**.

Alternatively, to select an existing repository:

3   Select a **Repository** in the 'Repository' drop-down list in the **Setup** dialog.

The C&M project will use the project from this **Repository**.
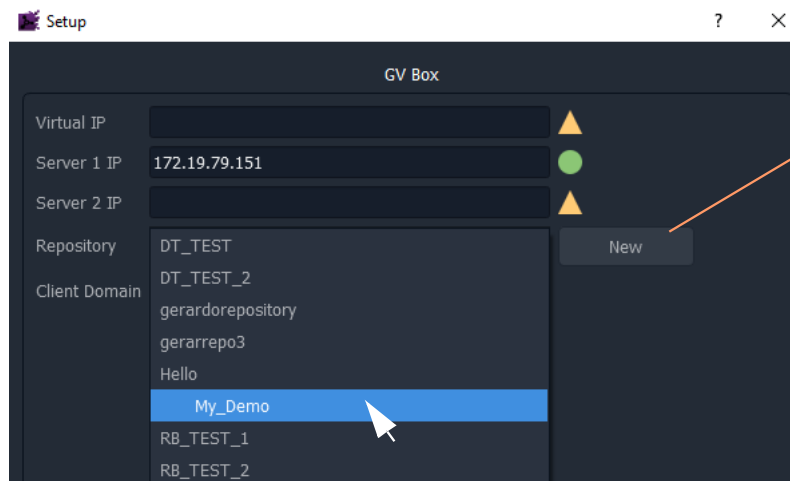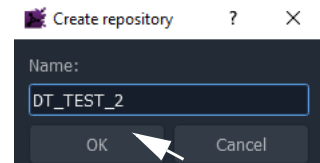
Fig. 2-41: Select a Repository in Setup Dialog

System Re-Test

1   Click **System Test** to redo the basic system tests.

For the basic system test, GV Orbit Client performs a:

- ping to each server;
- client-server communication check;
- services check on the server; and
- check of service Domain configurations (Monitoring and Log Server services).

The console pane in the **Setup** dialog may have shown some red messages which highlight differences between entered dialog settings and those of the GV Orbit system connected to. (For example, a Client Domain number difference.)
Re-do the basic system tests and the red messages should clear.
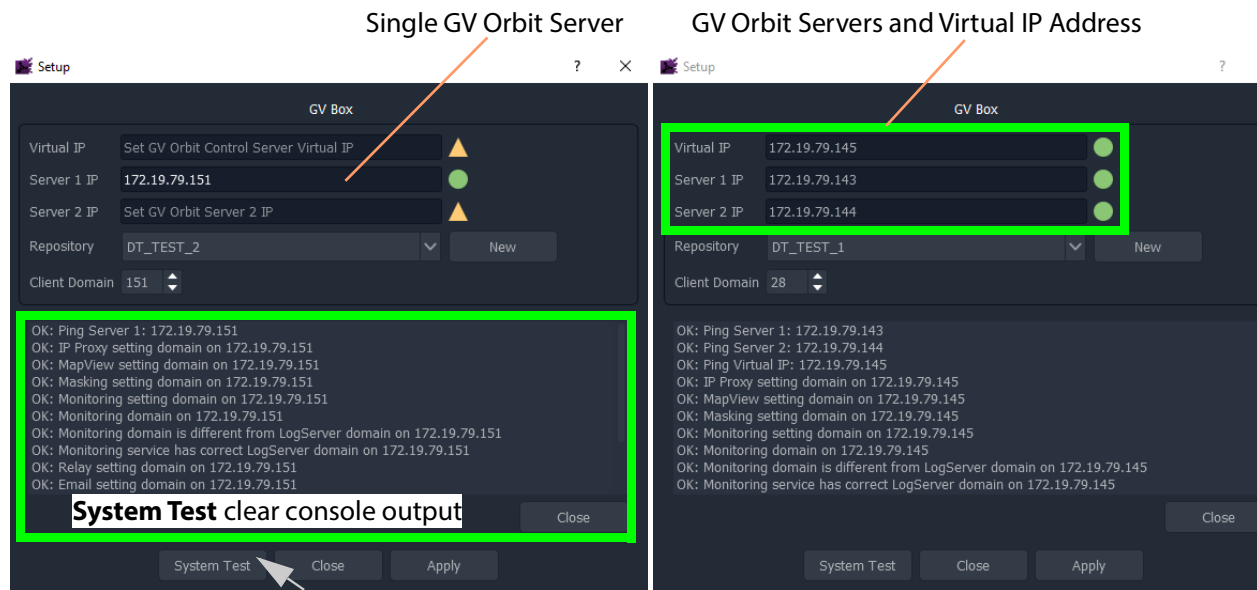
a) Single GV Orbit Server   b) GV Orbit Server Cluster

Fig. 2-42: System Test Re-done and Console Output OK:
a) Single GV Orbit Server.
b) GV Orbit Server Cluster.

Apply Settings

1   In the **Setup** dialog, click **Apply** to apply these settings to the project.

Click **OK** to any pop-up message.

2   Click **Close** to close the dialog.

The GV Orbit pulls the project etc. from the repository and shows the **Home Screen**.

> **Note:**
> When connecting to a **Repository**, you may be prompted to **Pull** a project from a **Repository**, so as to retrieve a project from the server.
> **Pull** a project in order to either:
>
> - edit the project locally (any existing local project is overwritten); or
> - run the project locally (for example, to run operator screens).
>
> Do not **Pull** if a local project has been created/changed and it needs to be put into a **Repository**. This requires a **Push** to a repository.

Step 7.3: Further Setup

Following initial set up, a C&M project is ready for use. Project settings and variables are set up from the settings in a C&M Project's **Setup** window.

This sub-section describes how to adjust the project settings (including project variables) further, if any parameters need changing for some reason.

Step 7.3.1: Project Variables (Project -> Edit Variables)

C&M projects have a set of project variables that are set up when using the C&M Project **Setup** window to establish connection to a GV Orbit Server. This done as part of creating a new C&M Project. (The **Setup** window is also accessed by selecting **Connections -> GV Server** in the main menu.)

The **Project Variables** enable GV Orbit Client workflows, and other user graphical screens, to communicate with GV Orbit services and Server(s).

> **Note:**
> Most **Project Variables** hold default values consistent with the default GV Orbit Server and GV Orbit services settings. Do not change the values of these variables unless the items have been changed from their default.

To access the project variables from the project **Home Screen**:

1 Click **Project -> Edit Variables...** in the main menu.

    A **Variables** window is shown for the C&M project.

Name	Type	Value
GVOC IP	String	10.37.81.65
GVOC Launcher	String	%APPDATA%\JWrapper-GVOrbitControlClient\GVOrbitControlClientWinLauncher.e...
IP Network	String	default.net
Routing Address	Address	F110:01:06
Server IP 1	String	10.37.81.65
Server IP 2	String	
Show External IDs	Boolean	true
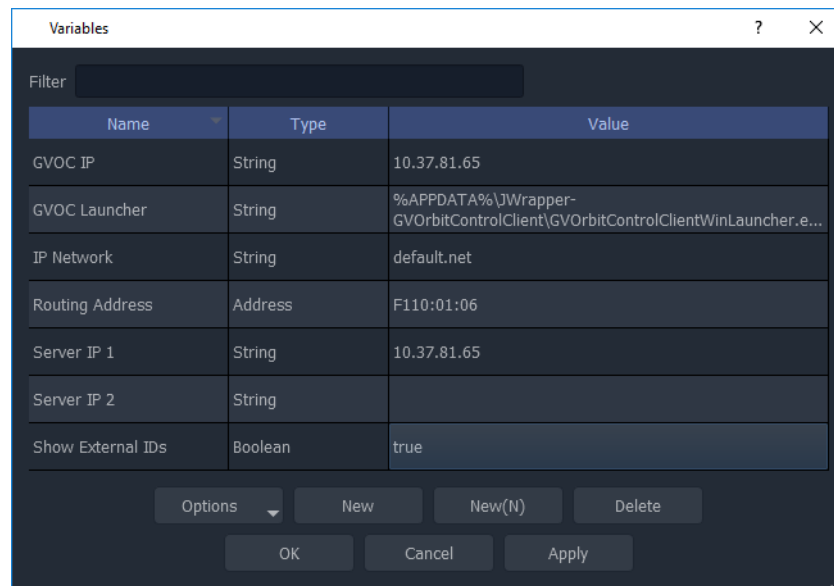
Fig. 2-43: C&M Project Variables Window

Parameter	Description
GVOC IP	Virtual IP address of the GV Orbit Server cluster.
GVOC Launcher	Path to launcher for GV Orbit Control Client.

Parameter	Description
IP Network	Network file name for IP endpoint configuration.
Routing Address	RollCall 'Control' address of Routing Service on GV Orbit Server(s).
Server IP 1	GV Orbit Server 1 IP address.
Server IP 2	GV Orbit Server 2 IP address.
Show External IDs	The GV Orbit Client uses the External IDs set in GV Orbit Control for router control. Certain control protocols require that the numbering of external IDs must be contiguous. **False:** GV Orbit Client remaps the External ID's used by GV Orbit Control into its own list of contiguous internal ID's. GV Orbit Client follows name changes to existing External ID's, however adding devices to GV Orbit or removing devices from GV Orbit may cause a shift in the internal ID numbering which can result in incorrect routing. When this occurs, the ID shown in GV Orbit Client Routing Behaviors will no longer match those used in GV Orbit Client as there are two separate ID lists which are no longer coherent. This is the default for a project migrated to GV Orbit version 2.0.0 and above, for backwards compatibility. **True:** GV Orbit Client uses the GV Orbit Control External ID's. You can insert or remove devices without any impact on existing IDs. The GV Orbit Client will follow name changes associated with External IDs. See also About External IDs and Northbound Control Interfaces, on page 467.
XEdit Launcher	When you have added one or more Kaleido multiviewers to GV Orbit, you can launch XEdit for those multiviewers from the Network Window, in order to configure them. In this variables window, you can specify which version of XEdit to open. **Auto:** GV Orbit auto selects an installed XEdit version. **[path]:** Define the path to the required version of XEdit to use that specific version. See also Step 7.3.3: Configure Network Window for Kaleido Multiviewers, on page 73.

> **Note:** For a multiviewer project there are fewer variables.

2 Click **OK** when project-variable value changes have been done.

3 Click **Project -> Save Project** in the main menu to save the project locally to disk.

4 Push the project to the repository when all changes are done.

Custom Project Variables

The **Variables** window also allows a user to create custom project variables for their own use. For example, the RollCall addresses of system devices, a company name, the TV channel/studio name, etc. These may each be set up as custom project variables and used in custom control and monitoring screens. Custom project variables can be created and deleted.

CAUTION
Do not delete any of the C&M project variables presented here.

Step 7.3.2: Client Domain Number (Connections -> GVOP)

To configure the **Client Domain** for the GV Orbit Client to use for the project:

1 Click **Connections -> GVOP** in the main menu.

The **GV Orchestration Protocol** dialog is shown.

Set the **Client Domain** number for the project to use. (Default is100.)

Select for multicast discovery of server IP addresses.
(Default is unicast discovery.)

Click to add a new IP address (for unicast discovery).

Select/deselect IP interfaces of the client PC to be used by GV Orbit Client.

Set multicast packet 'Time to Live' (TTL) - defines the number of "hops" that a network multicast message is allowed to do between IP network routers. The TTL value can limit the distance these messages travel within a network.

Fig. 2-44: GV Orchestration Protocol Dialog

2 Set the **Domain** number of the Client Domain that the C&M project will use. (Default is 100.)

3 Other project parameters can be changed in the dialog, see Figure 2-44.

4 Click **OK** to finish and close the dialog.

Step 7.3.3: Configure Network Window for Densité-protocol Devices

1 Click **Connections -> Densité** in the main menu.

The **iControl/Densité Configuration** dialog is shown.

IP address(es) of a server running a Densité Manager service, typically, a GV Orbit Server.

Click **Add** to add a new IP address.
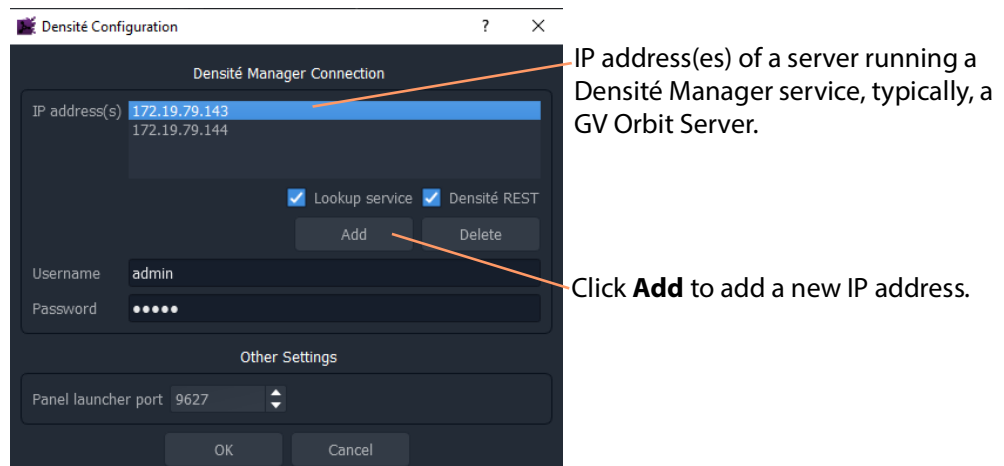
Fig. 2-45: iControl/Densité Configuration Dialog

2   Click **Add** and enter the IP address(es) of GV Orbit Server(s) (which run a Densité Manager service), or add the IP address of a server.

3   Select 'Lookup Service' and 'Densité REST'.

4   Enter the **Username** and **Password** to access the Densité Manager service.

5   Click **OK** to finish and close the dialog.

Finally:

6   Click **Project -> Save Project** in the main menu to save the project locally.

7   Push the project to the repository when all changes are done. See Step 7.4: Saving and Pushing a Project, on page 74.

Step 7.3.3: Configure Network Window for Kaleido Multiviewers

By adding one or more Kaleido multiviewers to GV Orbit, you can launch XEdit for those multiviewers, including their Rooms and Layouts, from the Network Window, in order to configure them. See also Network Window, on page 84.

You can specify which version of XEdit to open through the **Project** > **Edit variables** > **XEdit** Launcher. See Step 7.3.1: Project Variables (Project -> Edit Variables), on page 70

PREREQUISITE: XEdit needs to be pre-installed on the same PC as GV Orbit. Either use the online installer by connecting to a Kaleido multiviewer in a web browser or obtain an offline installer from Grass Valley Support.

1   Click **Connections -> Kaleido** in the main menu.

    The **Kaleido Configuration** dialog is shown.

2. Set the IP address(es) of one or more Kaleido Multiviewers.

1. Click **Add** to add a new IP address.
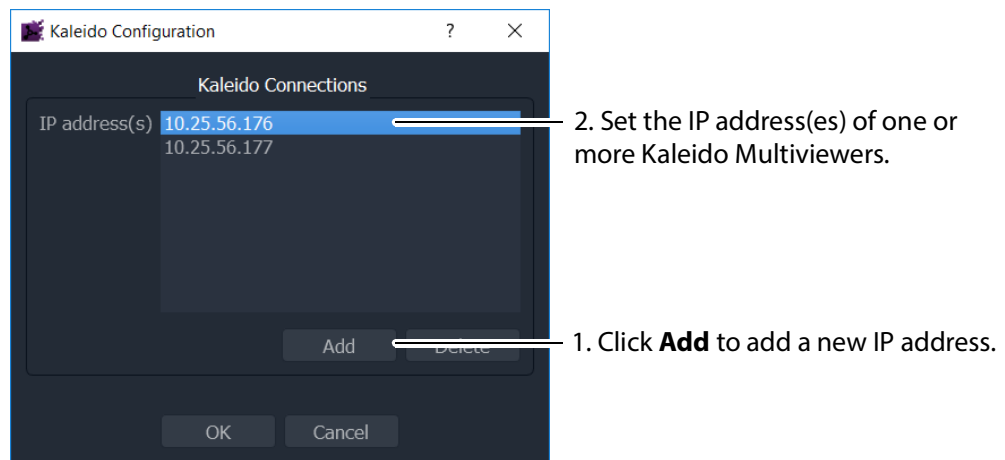
2   Click **Add** and enter the IP address(es) of one or more Kaleido Multiviewers.

3   Click **OK** to finish and close the dialog.

The Kaliedo Multiviewer(s) are added to the the Network Window from which you can launch XEdit for those multiviewers.

4   Click **Project -> Save Project** in the main menu to save the project locally.

5   Push the project to the repository when all changes are done. See Step 7.4: Saving and Pushing a Project, on page 74.

6   Right-click the multiviewer's IP address in the Network Window to launch XEdit for that multiviewer in order to configure it. Expand the IP to show the list of rooms, then expand a room to show the list of layouts for that room. You can right-click on any one of the Rooms or Layouts in order to configure it. See also Network Window, on page 84.

Expand the multiviewer to view and then right-click to edit the available Rooms and Layouts

Connecting to another Kaleido will switch the running instance of XEdit to the newly-requested Kaleido.

Step 7.4: Saving and Pushing a Project

Save Project (Locally)

To save a project locally to the folder on the client PC:

- Click **Project -> Save Project** in the main menu.

Push Project (Save to Server)

To push a project back into a repository (on the GV Orbit Server):

- Click **Project -> Push**. (See)
  In the **Choose Project** dialog, select the project to be pushed and click **OK**.

Pull Project (Load from Server)

To pull a project from a repository (on the GV Orbit Server):

- Click **Project -> Pull** in the main menu.

Close Project

To close a project that is open in GV Orbit Client:

- Click **Project -> Close Project** in the main menu.

IP Configuration of End Point Devices and Spreadsheet Import

Access the IP Routing endpoint configuration editing tool and a new, default GV Orbit C&M project (see Graphical Routing Workflow, on page 100 for more information).

1 In the Graphical Routing Workflow screen, click *IP Configuration and Spreadsheet Import*.

See Graphical Routing Workflow, on page 100 for more information.

2 Click the **Comms Setup** button:
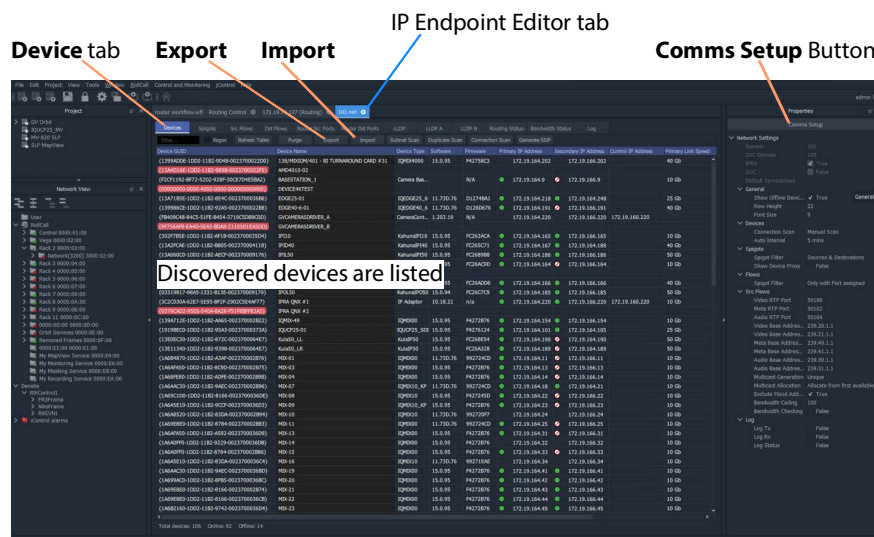
3 Select **Routing System** controller type to be 'GVOC'.
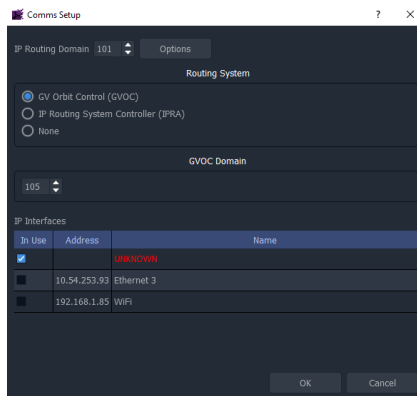
4   Leave the GVOC domain number at its default (105).

5   Select the client PC network **IP interfaces** to use.

6   Click OK.
    GV Orbit Client will discover IP End-points and list them.

7   Click on the **Devices** tab to see the listed devices.

8   Click **Export** to export the discovered IP end-point devices and their current settings. (A spreadsheet file, .xlsx file, is exported and this shows the spreadsheet file format. Settings include: device names, router port numbers, source/destination IP flows, and multi-cast IP addresses etc.)

9   Edit the spreadsheet file to change settings and/or add more IP end-point devices.

10   Click **Import** to import IP End-point device settings via a spreadsheet.

11   Select **Project -> Save Project** from the main menu. Close the IP Endpoint Editor tab.
Fig. 2-46: IP Endpoint Configuration Editor tab in GV Orbit Client (Device sub-tab shown)

This screen also allows:

- Manual configuration of end-points, if required.
- Review IP End-point settings, edit settings, validate settings, make engineering routes, if required.
- Monitor bandwidths at device interfaces, if required.

Note: SDI 'end-point' configuration etc. is set up via GV Orbit Control in the remaining controls on the routing workflow.

3

Home Screen

Summary contents of this chapter:

Home Screen

Project Home Screen

Lite	Professional	Enterprise
●	●	●

Home Screen Windows

The appearance of the GV Orbit Client project **Home Screen** varies according to project type and according to which GV Orbit Client windows are enabled and being shown. Use tool bar icons to show/hide windows.
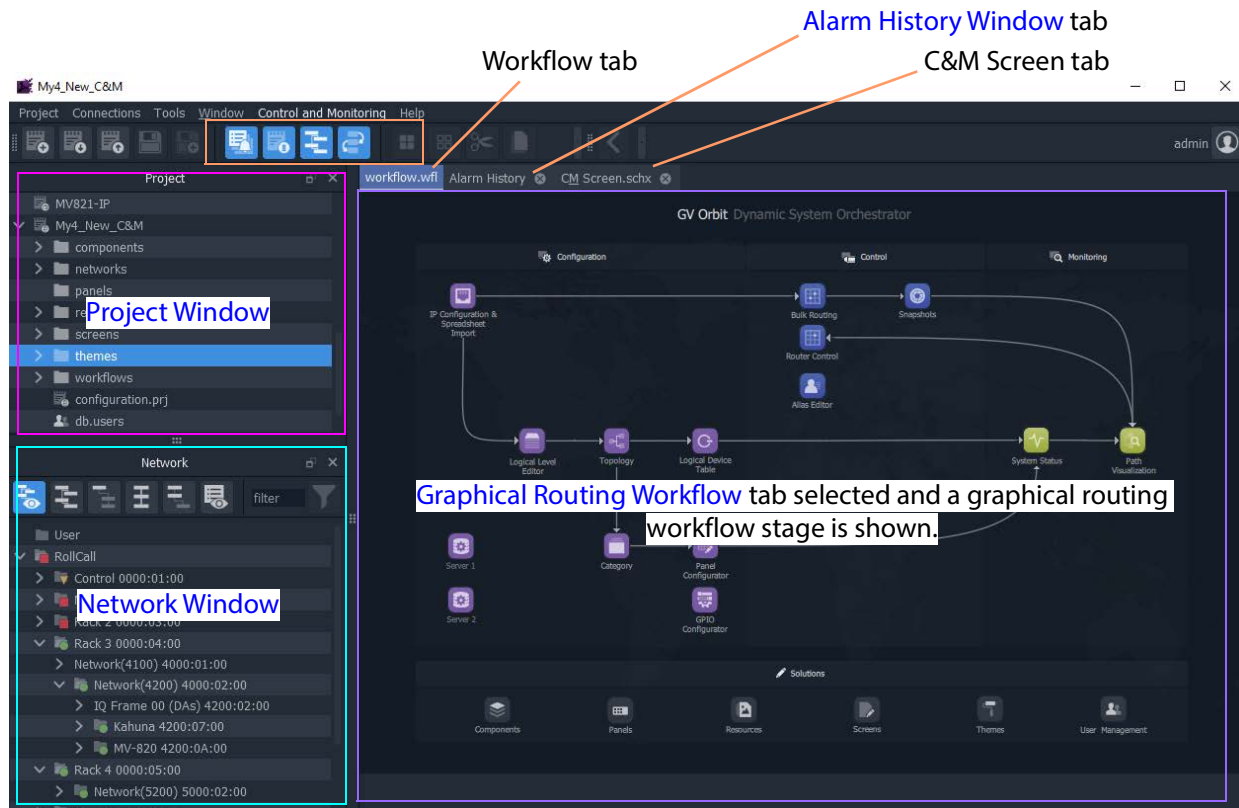
Fig. 3-1: GV Orbit Client *Project Home Screen Windows*

Table 3-1: Home Screen Windows

Window	Description	See
Project	A tree view of projects opened by the GV Orbit Client. Allows users to access aspects of the current project, or to load another project.	Project Window, on page 80.
Network	A view of devices/frames/services etc. in a GV Orbit system, presented in a tree-view or a list-view. A user can access device information and alarms.	Network Window, on page 84.
Alarm History	A list of alarms that have occurred across the system over time.	Alarm History Window, on page 99.
Properties	Shows the properties of the selected graphical widget when designing a graphical C&M project.	Properties Window, on page 81.
Workflow	A graphical presentation of all the tasks and functions available in GV Orbit. Click on an icon to access a task or a function.	Graphical Routing Workflow, on page 100.

Click the following tool bar icons to show/hide windows in the **Home Screen**:

Toolbar Icon	Description
	Alarm History window icon. See View Alarm History for System-wide Alarms, on page 100.
	Project window icon. See Project Window, on page 80.
	Network window. See Network Window, on page 84.
	Properties window (shown when a C&M screen tab is selected). See Properties Window, on page 81.
	Workflow window. See Workflow Window, on page 83.

Close All Windows

To close all windows and just see a default workflow:

- Click **Window -> Close All** in the main menu.

Project Window

The **Project** window lists the project currently open and any projects previously opened by the GV Orbit Client on the client PC.

The currently-open project is expandable in a tree view to show the various project items. You can access and manage different aspects/functions of the project from this tree view item.

Currently-open project

Project is expanded

Fig. 3-2: Project Window

Project Tree-Items

Project items seen when a project is expanded include:

- **Components** - Graphical custom components that appear on GV Orbit Client graphical control and monitoring screens.
- **Networks** - IP End-point configuration files, used in IP routing control set up.
- **Panels** - Soft XY Router control panels, created with a wizard and user-customizable.
- **Resources** - Imported resource items used in the project (for example, logo images etc.).
- **Screens** - C&M project user-defined graphical control/monitoring screens.
- **Themes** - The appearance of each graphical element on a GV Orbit custom graphical screen (multiviewer video wall screen, or C&M project control and monitoring screen) can have a style applied to it. A theme is a set of styles that can be applied to a project.
- **Workflows** - Workflow screen.
- **configuration.prj** - The GV Orbit project file. Select this file when opening an existing project in GV Orbit Client. Do not edit this file.
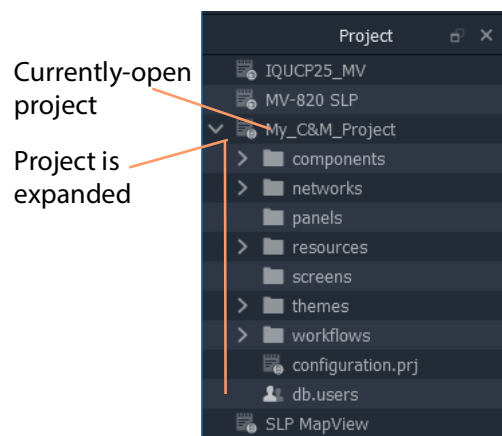
- **db.users** - Project users, user roles and their associated permissions can be managed. New user names and logins etc. can be set up.
- **Grids** - Imported tile-grid layouts for all multiviewer projects.
- **Tiles** - Video wall tile designs for all multiviewer projects.
- **Rooms** - Video wall designs for 'Clustered Multiviewer' projects.
- **Walls** - Video wall designs for 'Multiviewer' projects.

> **Note:**
> Some project items are also accessible via icons in the routing workflow window (see Graphical Routing Workflow, on page 100).

> **Note:**
> Some project items may be specific to certain project types.

Project Window Actions

Right-click on a **Project** window tree-view item to open, import, or create a new item.

For example, right click on:

- **Screens** - Select **New Screen** to create a new user screen in a C&M project.
- **Walls** - Select **New** to create a new video wall in a single-multiviewer project.
- **Resources** - Select **Import File(s)** to import an image file into a project.
- **db.users**
    - Select **Open** to open the User Management window in a tab to set up users and roles.
    - Select **Import user database** to import users from another project.
- **<Project Name>** - Select **Rename** project to rename the project.

Properties Window

Lite	Professional	Enterprise
●	●	●

The **Properties** window shows the properties of a selected graphical widget or on-screen item when designing/editing a C&M screen in GV Orbit Client in 'Design' mode. The window may be shown when a C&M screen tab, or a multiviewer video wall, or other graphical GV Orbit project item is selected.

Run/Design Mode icon indicates GV Orbit Client is in 'Design' mode for graphical editing and design.

Properties Window
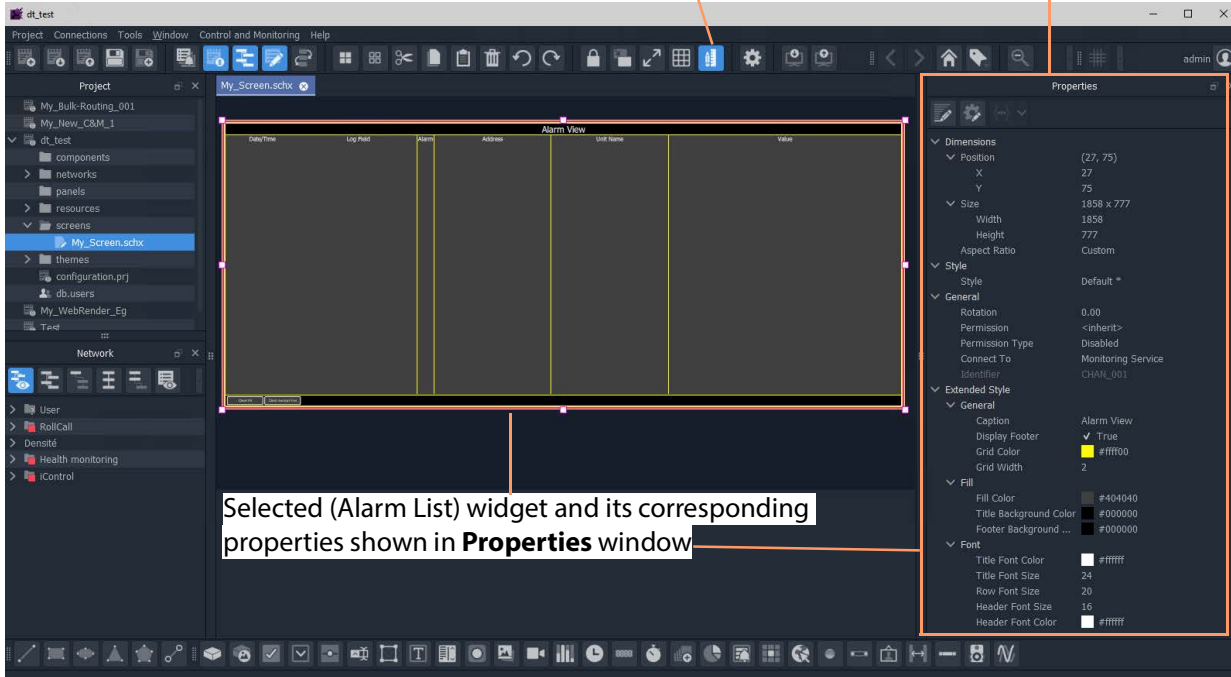
Selected (Alarm List) widget and its corresponding properties shown in **Properties** window

a) Example C&M Screen Running in 'Design' mode in GV Orbit Client

b) Example C&M Screen Running in GV Orbit Client

Alarm List widget showing live alarms in a system
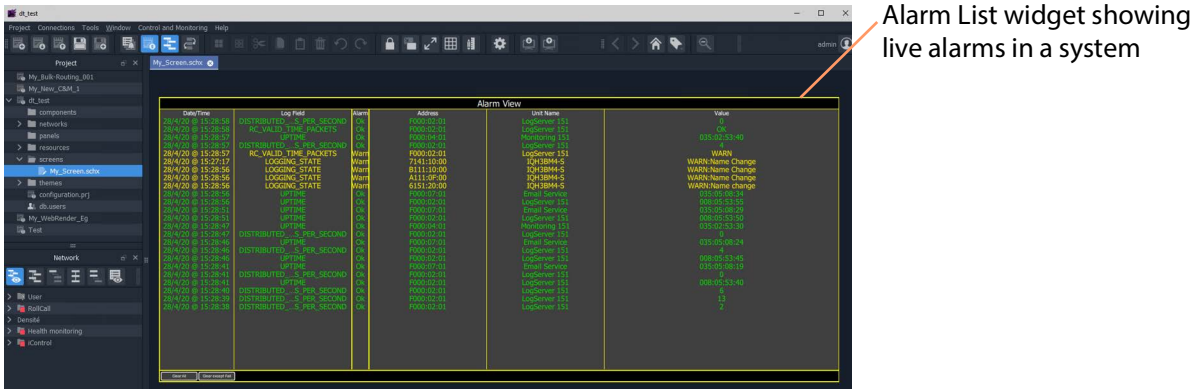
Fig. 3-3: Properties Window Example: a) In Design Mode;   b) In Run Mode.

Workflow Window

Lite	Professional	Enterprise
	●	●

> **Note:**
> A **Workflow** window may be visible in GV Orbit **Lite** but it is *not applicable* to the GV Orbit **Lite** product version.

A workflow window shows a graphical representation of all the tasks and functions available in GV Orbit **Professional** and **Enterprise** systems. The **Workflow** window is the stage which presents all the tasks and functions the system has to offer to the GV Orbit user. Click on a workflow icon for direct access to a task or a function.

View WorkFlow Stage

To view the **Workflow** stage:

1 Click the [icon] icon in the tool bar.

   Workflow stage is then shown in a tab.

2 Select the workflow tab (if it is not already selected) to view it.

   The workflow in Figure 3-4 is available to all new projects.
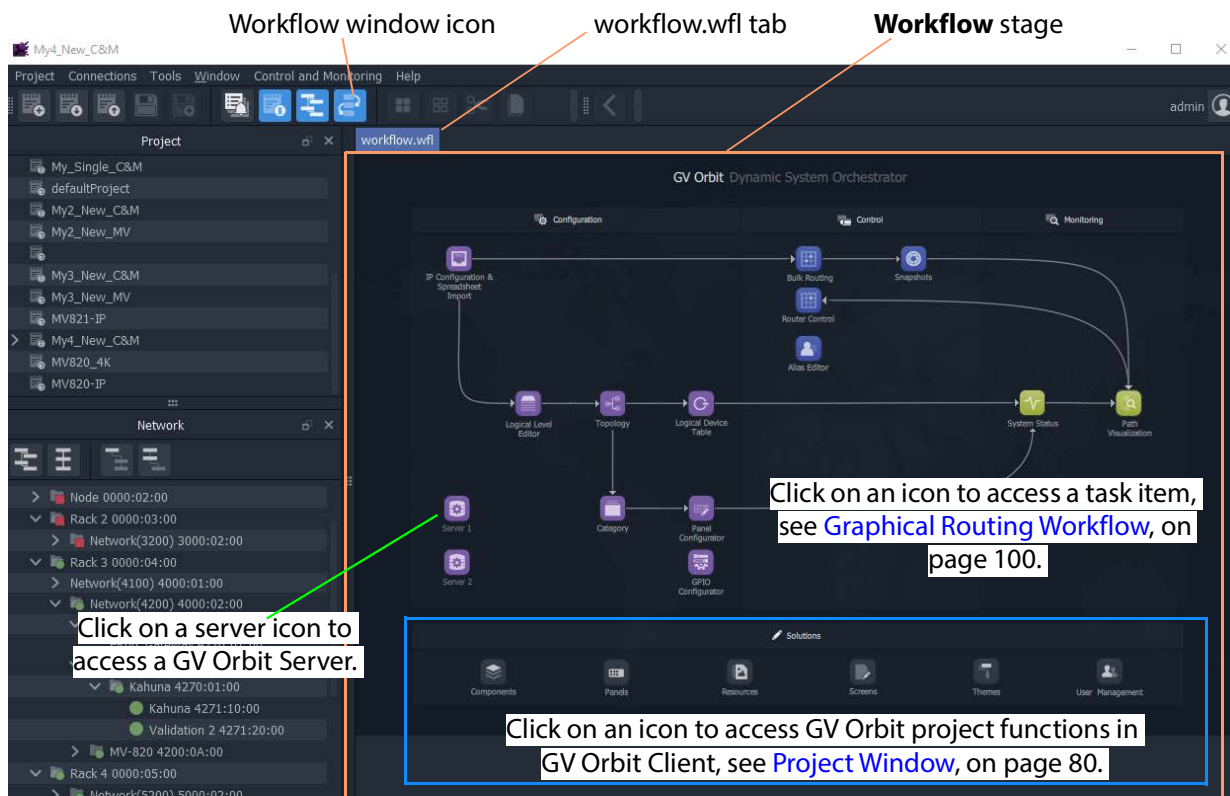
Fig. 3-4: Graphical Routing Workflow Stage

The graphical **Workflow** stage makes it easy to understand how tasks and functions are related and each icon provides direct access to the task/function it represents.

The workflow is optimized for carrying out the system configuration required:

- when re-purposing an existing routing infrastructure; or
- for the steps to set up a fresh, new routing environment.

Routing configuration and control is done through the GV Orbit Control application running on a GV Orbit Server, which supports Grass Valley NP0017 and SW-P-08 protocols. Both IP and SDI routing etc. may be controlled. The GV Orbit Control uses the GV Orbit Control service running on the GV Orbit Server.

Network Window

About the Network Window

The **Network** window shows a tree-view or a list-view of devices/frames/services etc. in a GV Orbit system. A user can access control screens, information and alarms about these items from the window.

> **Note:**
> To set up the **Network** window for a project, see Network Window Views, on page 43 onwards.
> See Step 3.2.1: Network Window Setup For RollCall-protocol Devices, on page 44; Step 3.2.2: View a Device Control Screen - RollCall Devices, on page 46; Step 3.2.3: Network Window Setup For Densité Devices, on page 47; and Step 3.2.4: View a Device Control Screen - Densité Devices, on page 48.

> **Note:** Automatically discovered devices:
> For devices that are automatically discoverable by a GV Orbit system, these are shown in the **Network** window. For example, GV Fabric IP switch.

Show/Hide Network Window

In the **Network** window's main tool bar, click [icon] to show / hide the **Network** window.

Tree-View and List-View

The **Network** window shows a tree-view or a list-view of devices/frames/services etc. in a GV Orbit system. A user can access control screens, information and alarms about these items from the window. For more information, see Network Window for more information.

> **Note:**
> To set up the **Network** window for a project, see Network Window Views, on page 43 onwards.

The tree-view and list-view forms of the **Network** window are shown in Figure 3-5.

The tree-view presents a hierarchical view of system devices/units/frames/services. See Figure 3-5a. The tree-view's expand/collapse controls are presented in Figure 3-5a.

The list-view is a flattened view, listing all system devices/units/frames/services. See Figure 3-5b. The list may be filtered, see Network Window List-View Filter for a description of the list-view filter controls.

Click to expand **all** of the tree-view.

Click to expand the **selected** part of the tree-view.

Click to collapse **all** of the tree-view.

Click to collapse the **selected** part of the tree-view.

Click to show List-View

Click to show Tree-View

List-view filter controls, see Network Window List-View Filter
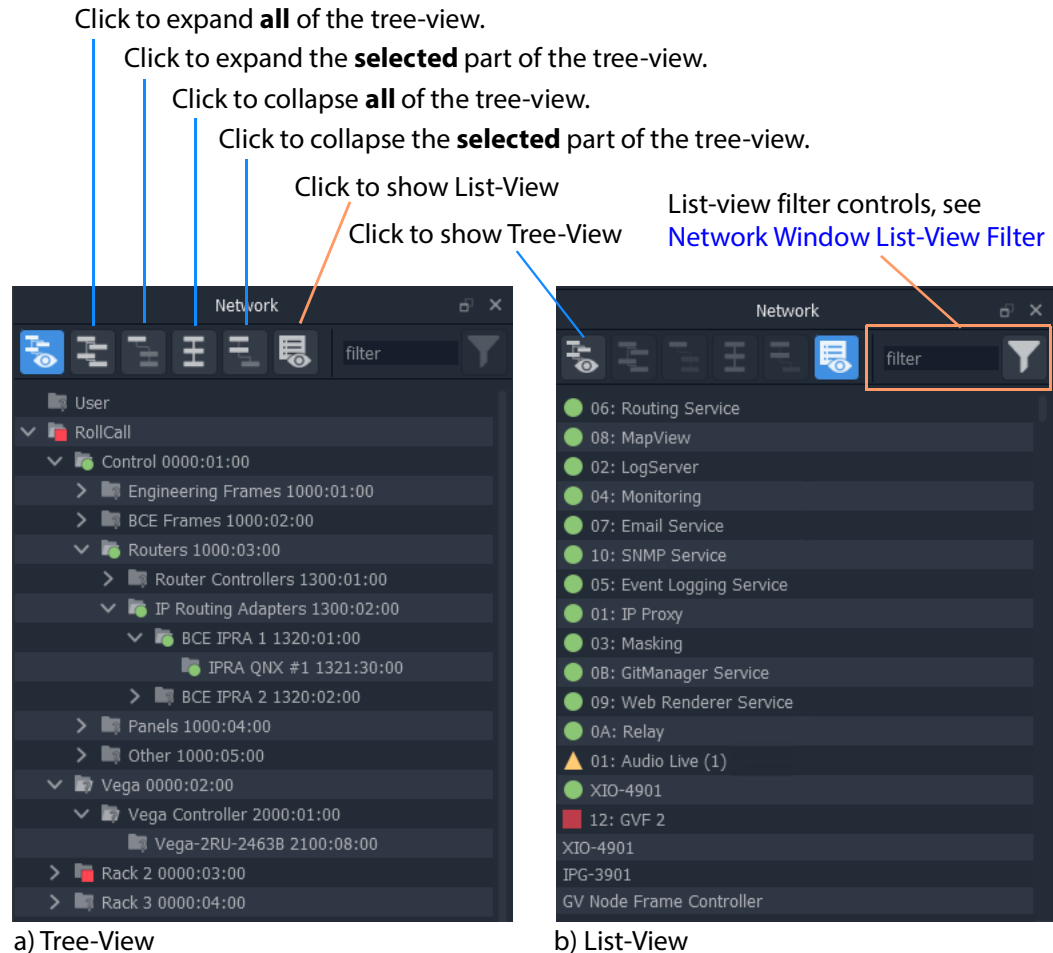
a) Tree-View   b) List-View

Fig. 3-5: Network Window: a) Tree-View;   b) List-View.

Network Window Actions

Locate a device in the **Network** window and right-click on the item. The following actions are possible in GV Orbit:

- **Lite**, **Professional** and **Enterprise**:
  - Device Information - View information about a device.
  - Card Parameters - View Densité-protocol device parameters.
  - Device Control - View and change device configuration settings. (**Lite**: RollCall devices only.)
  - Upgrade Device - Upgrade (or downgrade) device software/firmware.
- And for **Professional** and **Enterprise** only:
  - Alarm List - Live Alarms/Status - View a list of a device's live status and alarms.
  - Alarm History for a Device - View the alarm history of a device.

   • Alarm Masking (Professional and Enterprise) - Mask device alarms.

Network Window List-View Filter

In the **Network** window, the displaying of items in the list-view can be filtered. Filtering can be done:

   • with a text string; and/or
   • by card type; and/or
   • by alarm state.

The filter controls are shown in Figure 3-6.
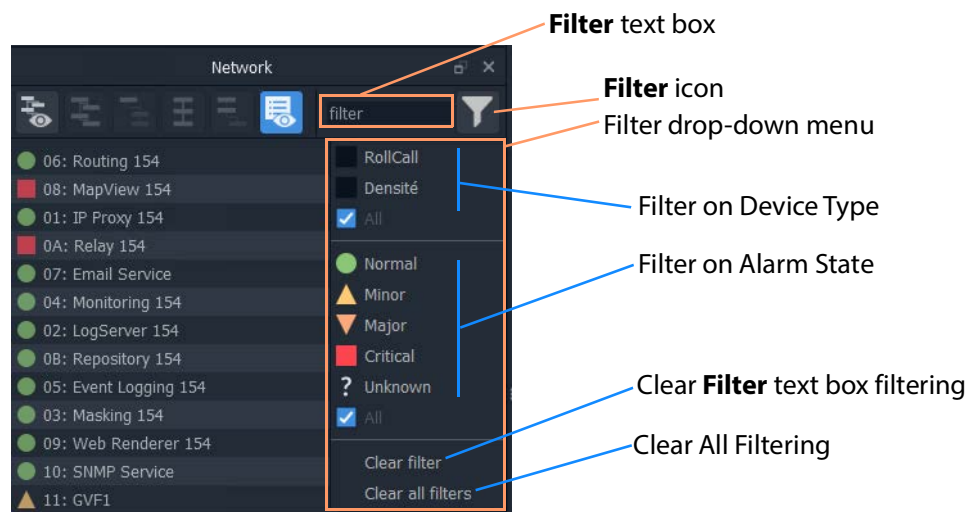
Fig. 3-6: List-View Filter Controls

Filter Example 1: Filter List Item Name

To filter the **Network** window list-view for a particular device by its name:

1 Enter a fragment of text in the **Filter** text box. For example, "UCP or "XIO".

   The displayed names are those containing the entered text. See Figure 3-7b or c.
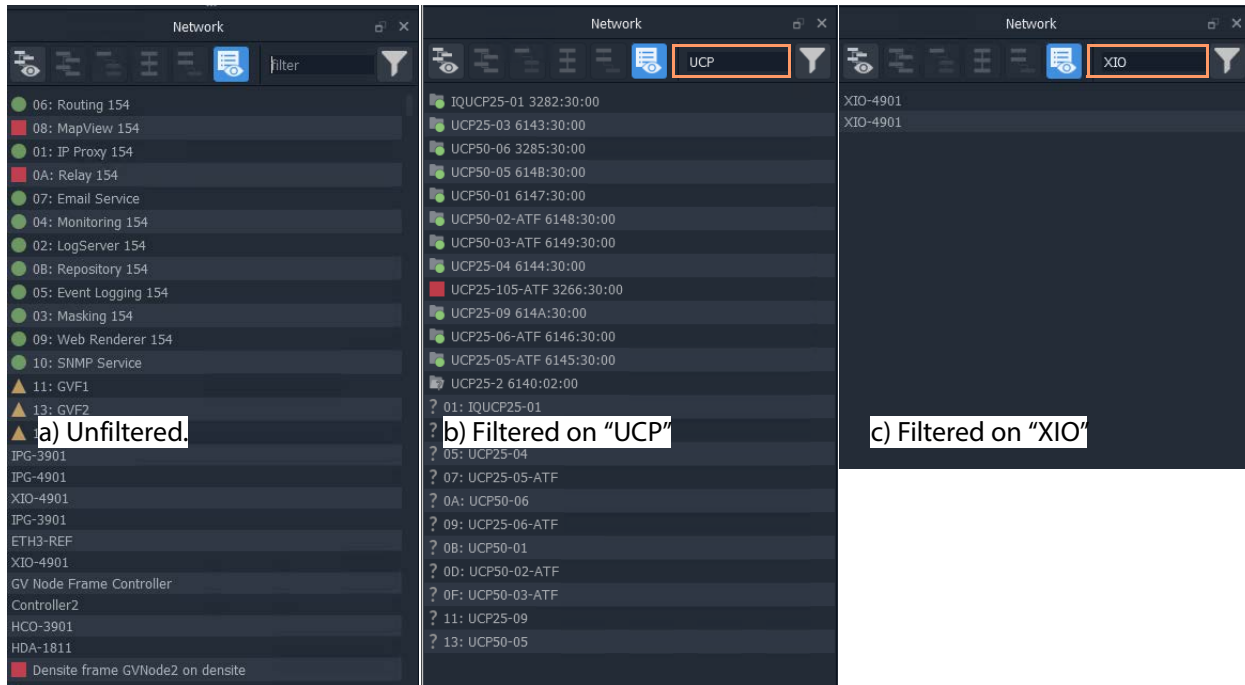
Fig. 3-7: List-View Filtered Names on Text

2 Click on the **Filter** icon and select 'Clear Filter'.

The text box is cleared and the text--box filtering is cleared.

Filter Example 2: Filter Device Type and then Alarm State

With all filters cleared, to filter on a device type and then their alarm states:

1 Click on the **Filter** icon and select 'RollCall'.

RollCall-protocol devices are shown. See Figure 3-8a.

2 Click on the **Filter** icon and select 'Minor.

'Minor Warning' RollCall-protocol devices are shown. See Figure 3-8c.

Filter icon indicates some filtering is active

a) Filter RollCall-protocol devices

b) Select to Show Minor Warning Alarm States

c) Minor Warning RollCall-protocol devices shown
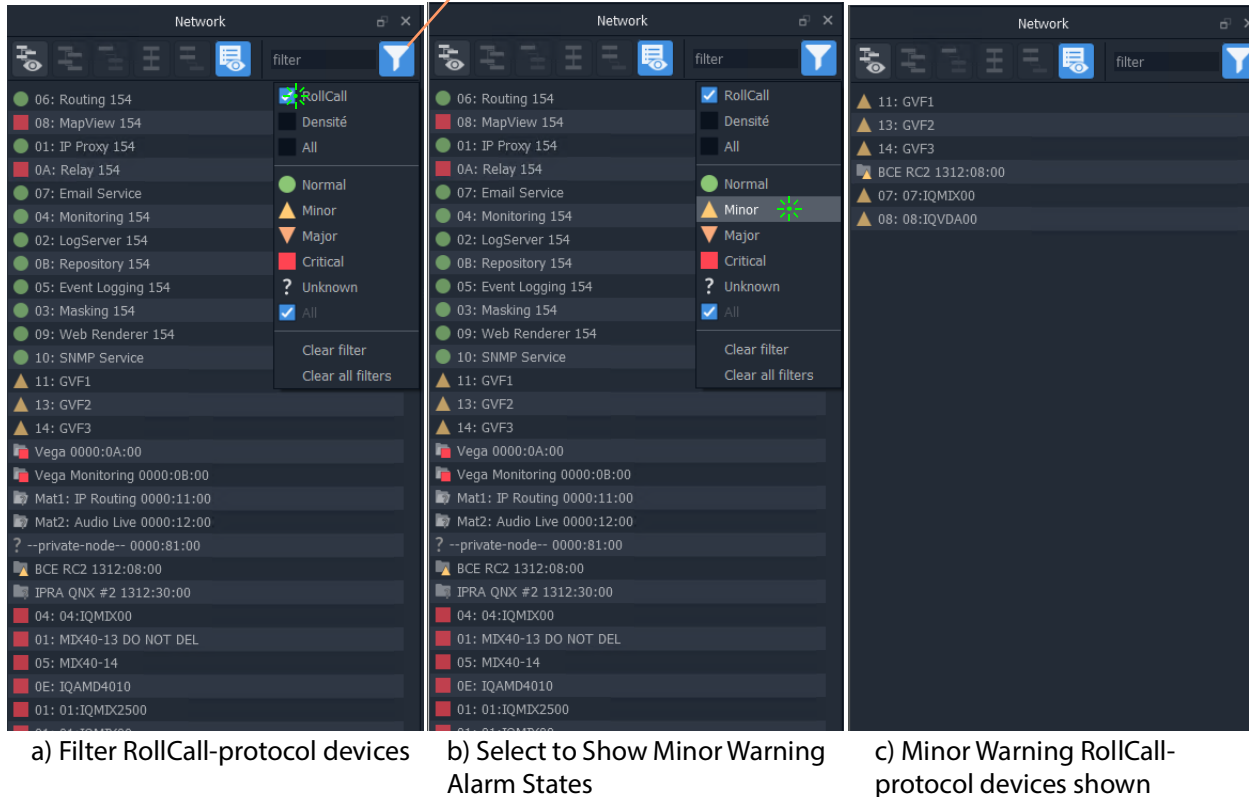
Fig. 3-8: Filter on Device Type and then Alarm State

To clear the alarms:

3   Click on the **Filter** icon and select 'Clear All Filters'.

All filters are cleared and all devices are shown.

Network Window Actions

Locate a device in the **Network** window and right-click on the item.

The following actions are possible in GV Orbit:

- **Lite**, **Professional** and **Enterprise**:
  - Device Information - View information about a device.
  - Card Parameters - View Densité-protocol device parameters.
  - Device Control - View and change device configuration settings. (**Lite**: RollCall devices only.)
  - Upgrade Device - Upgrade (or downgrade) device software/firmware.
- And for **Professional** and **Enterprise** only:
  - Alarm List - Live Alarms/Status - View a list of a devices' live status and alarms.

- Alarm History for a Device - View the alarm history of a device.
- Alarm Masking (Professional and Enterprise) - Mask device alarms.

Device Information

To inspect device information from the **Network** window (tree-view or list-view):

1 Right-click on a device and select 'Info'.

   Device information is shown in a **Details** pop-up window.
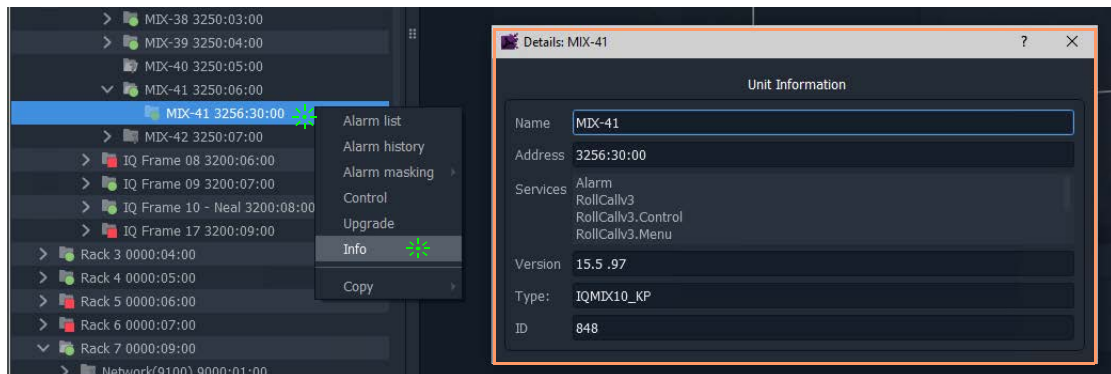
a) RollCall-protocol Device - Details window

b) Densité-protocol Device - Details window

Fig. 3-9: Device Info - Details Pop-up Windows

Card Parameters

To view a Densité-protocol device's parameter settings from the **Network** window:

1 Right-click on a Densité-protocol device and select 'Card Parameters'.

   A summary of the device's parameter settings is shown in a tab. See Figure 3-10.

Right-click and select 'Card Parameters',
a summary of card parameters is shown in a tab
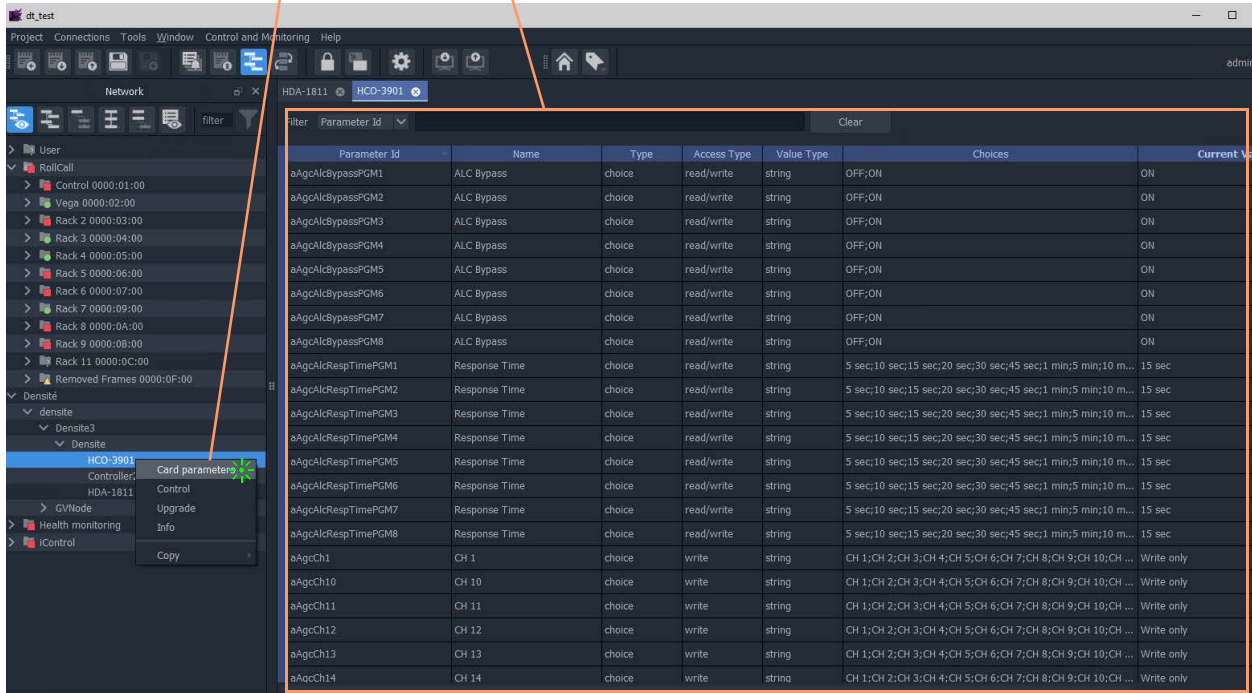
Fig. 3-10: Card Parameters Tab

2 Click on a column heading to sort the listed parameters on a column.

3 Use the filter controls to restrict the shown listed items. See Figure 3-11.

Example: Filtering on parameter name containing 'Resp'
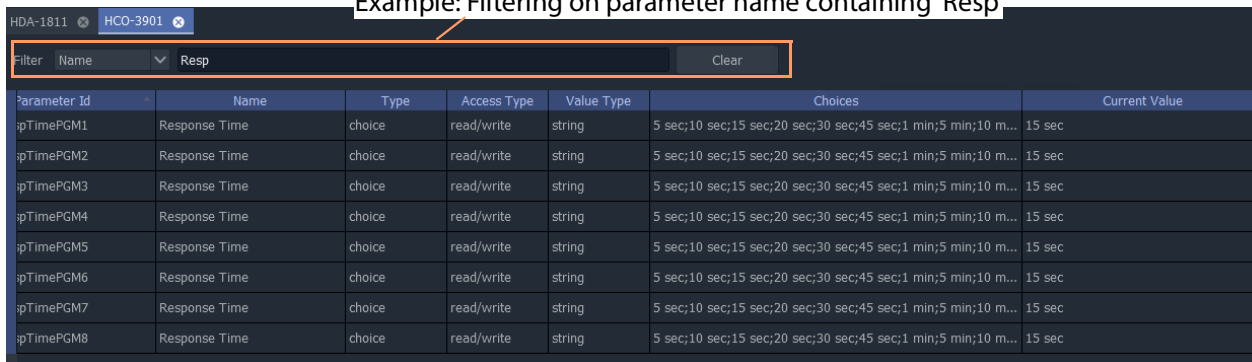
Fig. 3-11: Example Filtered Card Parameters

4 Read/Write card parameters can be entered via the 'Current Value' column.

Device Control

To inspect a device's configuration settings from the **Network** window:

1 Right-click on a device and select 'Control**'** to view the device's control screen. (See)

> **Note:** For GV Fabric IP Switch devices, the control screen that is opened in the GV Orbit Client window is the device's web page.

Upgrade Device

To upgrade a device from the **Network** window:

1 Right-click on a device and select 'Upgrade' to open the device's upgrade screen. (See Step 4: Device Upgrade, on page 50.)

Alarms

See Alarms section for more information.

Alarms

> **Note:** Alarms in GV Orbit v1.2 onwards:
>
> In GV Orbit systems, alarms are handled 'behind the scenes' with internal addresses. These addresses have changed for GV Orbit v1.2.0 onwards:
>
> - **v1.2.0 onwards**: Alarm-addresses for Densité-protocol devices are now aligned with the respective device/card address.
>
> - ***Earlier than* v1.2.0**: Densité-protocol device alarm-addresses are separate and are *not* aligned to device addresses.
>
> CAUTION
>
> As a result of this alarm addressing change, when upgrading to GV Orbit v1.2.0 onwards, addresses specified for alarms must be changed. This applies to custom operator panels of C&M projects and to Alarm Behaviours.

Alarm List - Live Alarms/Status

Professional and **Enterprise** only.

Alarm List Window

To inspect live alarms and status of a device/frame/service from the **Network** window:

1 Right-click on a device item in the **Network** window and select '**Alarm List'**.

The live status and alarms reported by the device/frame/service are listed in an **Alarm List** window. See examples shown in Figure 3-12a and b, and Figure 3-13a and b.

Sort by alarm name
Sort by value
Sort by status
Sort by mask
Sort by invert
Sort by recent

Click to select sorting of listed alarms from drop-down menu.

Clear filters on all columns.

Filter on a column (Name or Value or State).
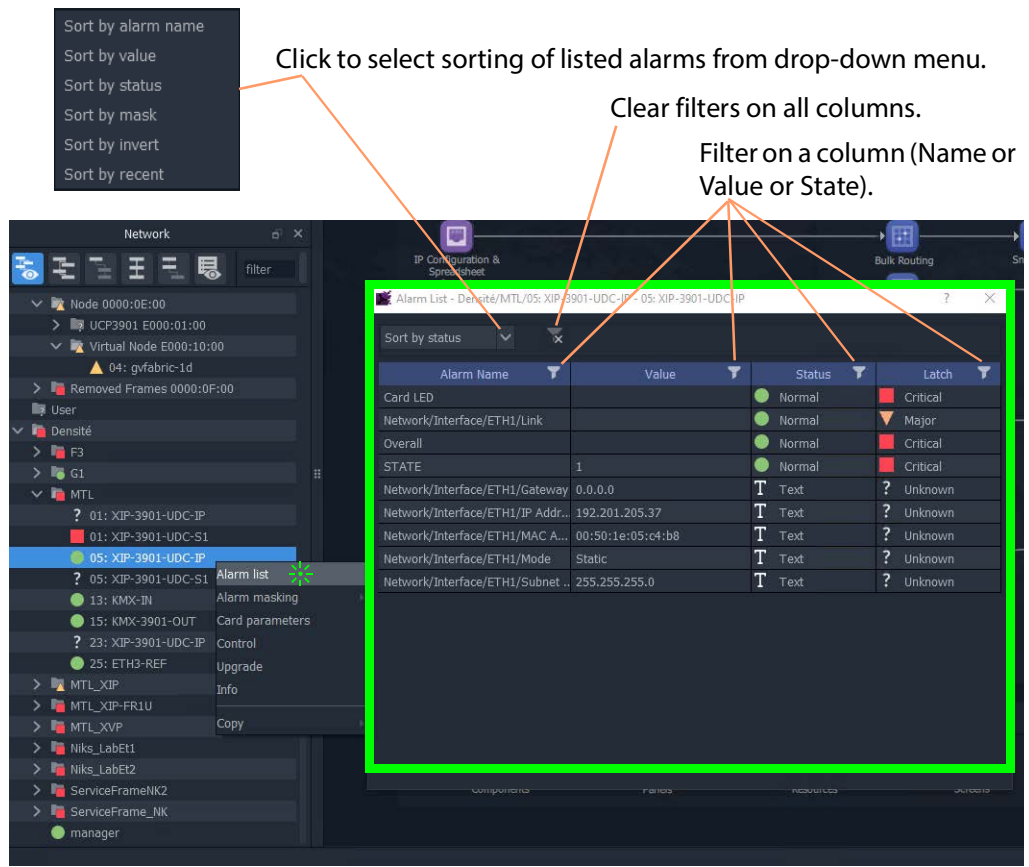
a) Alarm List example for a system device, XIP device
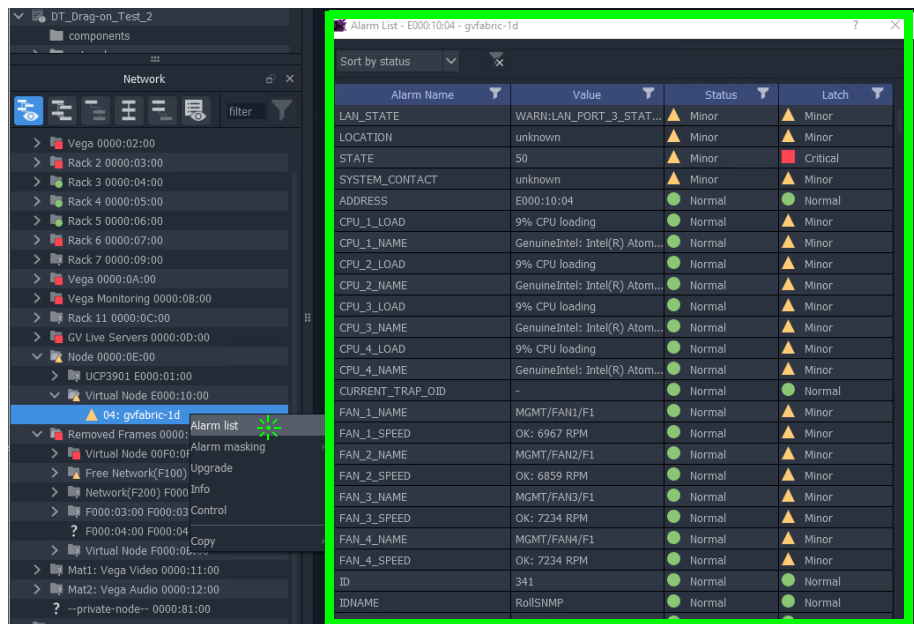
b) Alarm List for an Auto-discovered GV Fabric IP Switch

Fig. 3-12: Example Alarm List Windows for:
a) System Device (XIP shown); b) GV Fabric IP Switch.
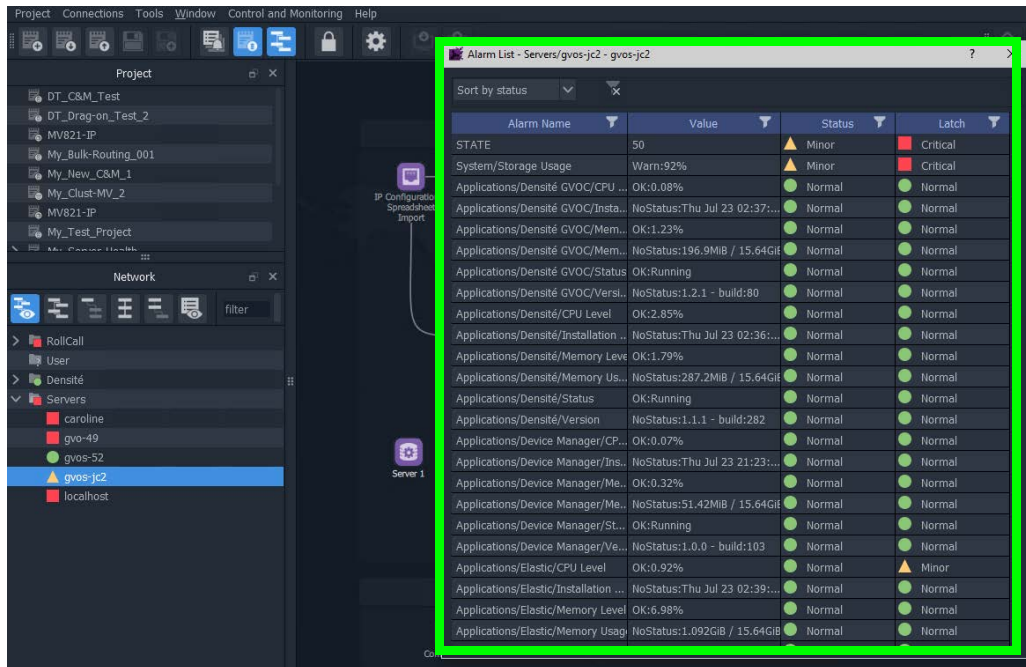
a) Alarm List for a GV Orbit Server
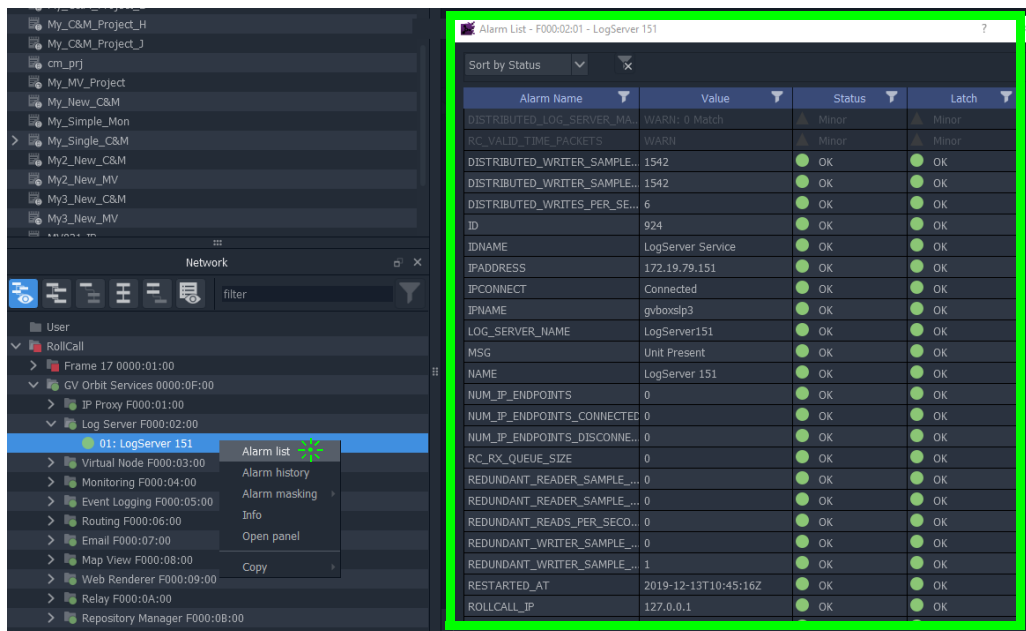
b) Alarm List for a GV Orbit Service

Fig. 3-13: Example Alarm List Windows for:
a) GV Orbit Server;
b) GV Orbit Service.

Alarm List Window Masking

In the **Alarm List** window, alarms can be masked:

- at a *device-level;* or
- individual alarms for a device can be masked (*alarm-level*).

Right-click on an item in the **Alarm List** window to see masking options. See Alarm Masking (Professional and Enterprise), on page 96 for further information on masking.

Right-click options
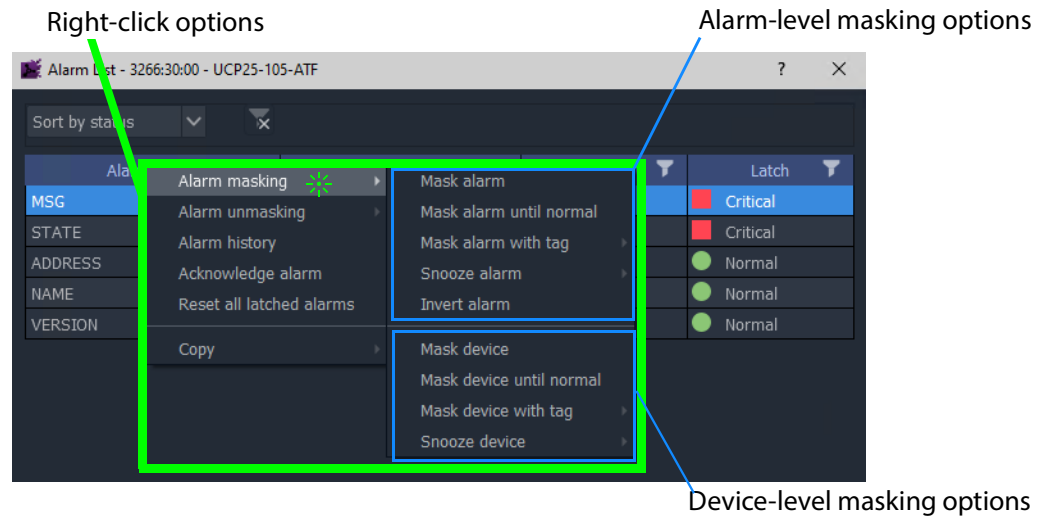
Fig. 3-14: Alarm List Window Right-Click Options

Alarm History for a Device

Professional and **Enterprise** only.

Note:
The **Alarm History** window uses the following GV Orbit services:
IP Proxy, Log Server, Monitoring, Event Logging, and Densité Manager.
These services are all required for **Alarm History**.

To inspect the history of device status and alarms from the **Network** window:

1 Right-click on a device in the **Network** window and select '**Alarm History**'.

The status messages and alarms etc. reported by the device are listed in a new **History** window tab. The address of the device is shown in the window tab. See Figure 3-15.

2 Click the search icon (🔍) in the **History** window.

The **Search Parameters** dialog is shown.

3 Select a **Log Data Source** from the drop-down menu.

> **Note:**
> The **Log Data Source** drop-down menu lists the **Event Logging** filters that are set up on the GV Orbit Server's **Event Logging** service.
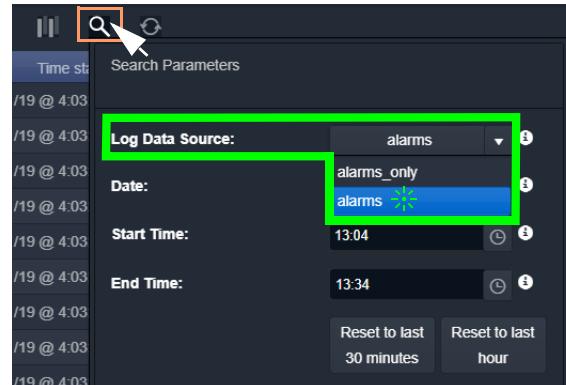
This selects an alarm data source to view in the window.

> **Note:**
> See Alarm History Window, on page 99 for further information on data sources and the controls in this tab window.

4 To close the **Search Parameters** dialog, (re-)click on the search icon (or click somewhere else in the **History** window).

The selected data source is shown in the **History** window.
(See Alarm History Window, on page 99 for further information.)

Address of device shown in tab   Click to filter on a column (Name or Value or State)
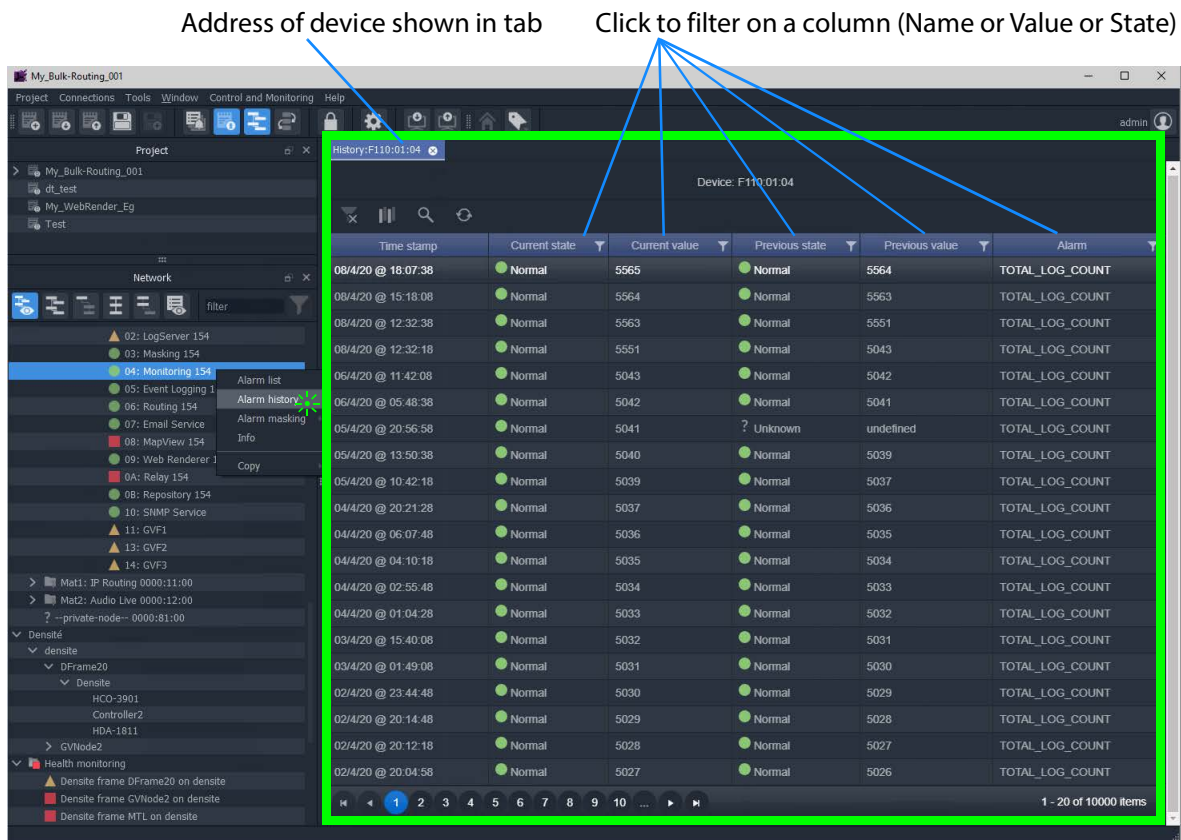
(See Alarm History Window, on page 99 for further information on the **History** window.)

Fig. 3-15: Example History Window

> **Note:** Masked alarms are shown "grayed-out" in the **History** window.

Alarm Masking (Professional and Enterprise)

Alarm masking may be done on a device (**device-level** masking), or it may be done on a an individual alarm from a device (**alarm-level** masking):

- **Device-level** masking/unmasking can be done from the **Network** window, or from the **Alarm List** window for a device.
- **Alarm-level** masking/unmasking may be done from a device's the **Alarm List** window.

Device-level masking is applied separately and additionally to any alarm-level masking. For example, if an alarm-level mask is applied to alarm A for a device and then a device-level mask is applied to the device, when the device-level mask is removed, the alarm-level-mask will still apply.

Apply a Device-Level Mask

To mask alarms associated with a device, from the **Network** window:

1 Right-click on a device, select 'Alarm Masking'. See Figure 3-19.

'Mask device until normal' is grayed-out for devices with OK status.
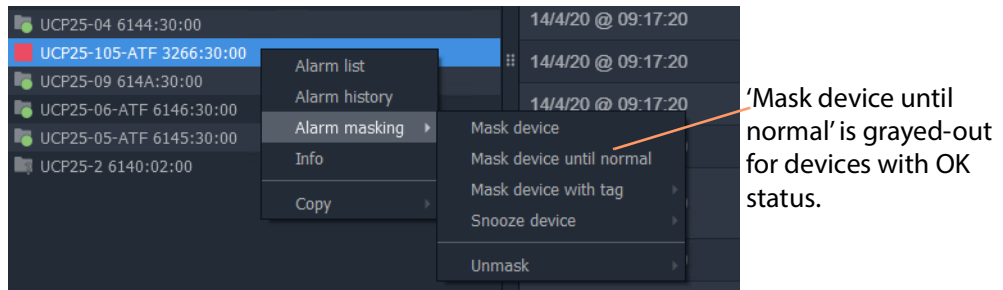
Fig. 3-16: 'Alarm Masking' Menu Options

2 Select one masking option from:

- **Mask Device** - Mask all alarms from a device/unit/frame/service.

- **Mask Device Until Normal** - Mask alarms from a device/unit until alarm state is OK ('green'). For example, mask a device/unit until any fault/error is corrected.
  Note: This menu item is grayed-out for devices with an OK Alarm state.

- **Mask Device with Tag** - Mask a device with a Masking Tag. See Alarm Masking Tags.

- **Snooze Device** - Mask alarms from a device/unit for a period of time. See Alarm Masking Snooze Times.

- **Unmask** - Unmask a device or a set of tagged devices.

> **Note:** Masking or unmasking menu options may be grayed-out in the menu.

Apply an Alarm-Level Mask

Mask an alarm from a device, from the device's **Alarm List** window. See Figure 3-14 on page 94.

Alarm Masking Tags

A set of device(s) can be masked with a **Masking Tag**.
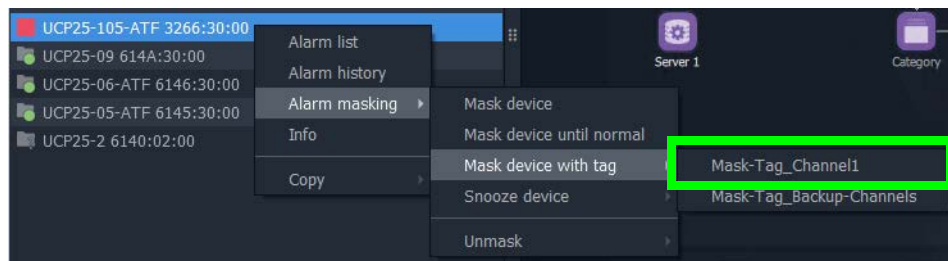
Fig. 3-17: Mask a Device with a Masking Tag

Masking Tags are created in the 'Tools > Options > Monitoring' dialog from the main menu and provide a flexible, multiple and layered masking facility.
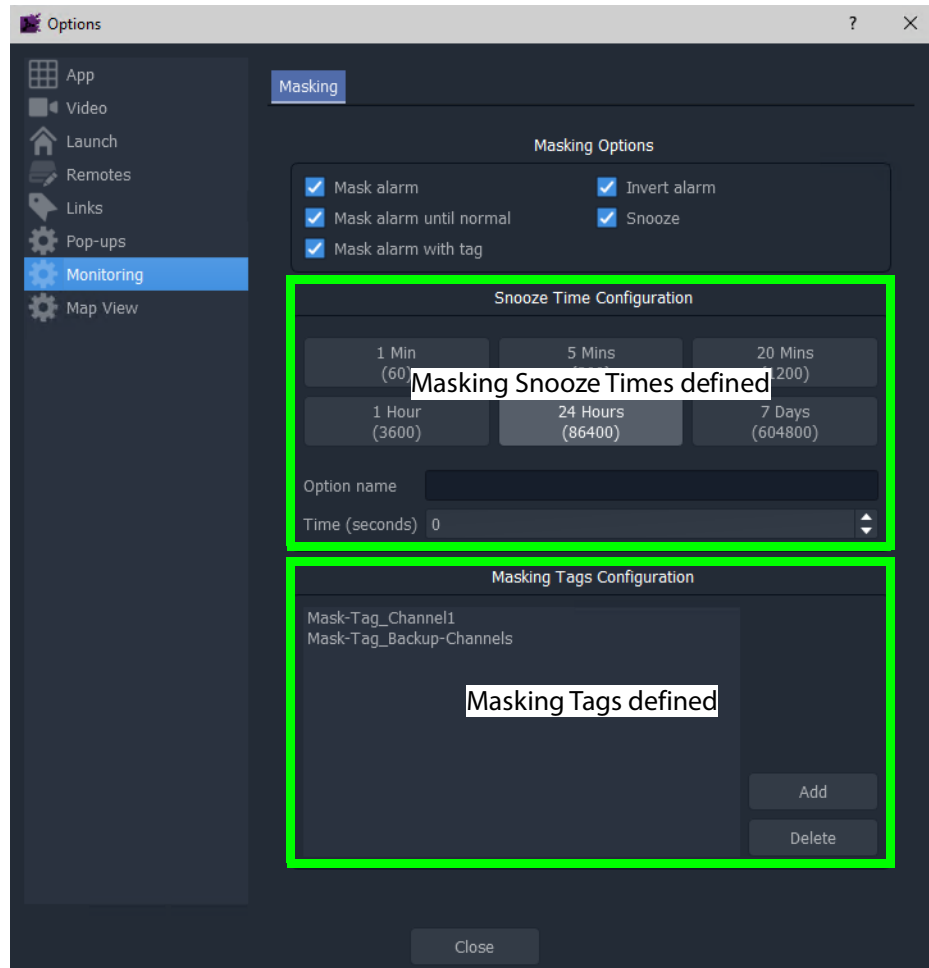
Fig. 3-18: Tools > Options > Monitoring Dialog

Alarm Masking Snooze Times

Alarms for a device/unit/frame/service may be masked for a period of time.
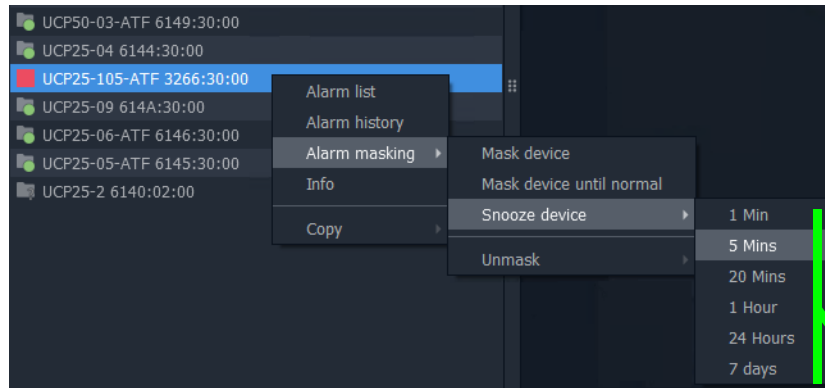
Masking 'Snooze' times

Fig. 3-19: Masking Snooze Times

The selectable masking snooze times are configurable, see 'Tools > Options > Monitoring'
in main menu in Figure 3-18 on page 98.

Alarm History Window

Lite	Professional	Enterprise
	●	●

Introduction

The GV Orbit Client **Alarm History** window can show the history of *system-wide* alarms and
status messages which are read from the **Event Logging** service on the GV Orbit Server.

> **Note:**
> The **History** window is similar to the window shown for Alarm History for
> a Device, on page 94.

> **Note:**
> By default, the **History** window sources event log data from the event log
> store which is set up as default in the **Event Logging** service. For example,
> the event log for which the **Default Index** setting is selected.
> A user can change the event log data source for an **History** window . For
> example, change **Log Data Source** in the **Search Parameter** dialog.

A GV Orbit **Professional** or **Enterprise** user can:

- Select an event log data-set to use from the event log store.
- Search for messages from a particular time period.

- Filter what is shown in the pages (for example, to just display minor alarms).

Note: Log Data Sources:

A **History** window sources log data from the GV Orbit system event log store. All events are logged by an **Event Logging** service running on the GV Orbit Server (see Simple Custom Monitoring Screen Example, on page 117). Depending on a log data-set's configuration, some and/or all events and alarms are logged. A store may be selected as the log data source for display in the **History** window.

View Alarm History for System-wide Alarms

To view the **Alarm History** for GV Orbit system-wide alarms:

1 Click the **Alarm History** icon in the main tool bar.

The **History** window appears in a tab. **Note:** The tab shows no specific device address when showing system-wide alarms.

Select the **History** tab to view it.
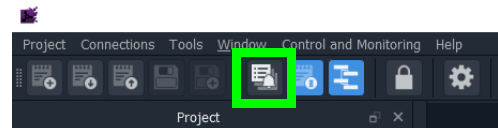
For further information about the Alarm History, refer to **Event Log Viewer (Alarm History)** in the *GV Orbit Admin Guide*. See Related Documentation, on page 19.

Graphical Routing Workflow

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	●	●

Introduction

The factory-set **Workflow** stage shows a graphical workflow for routing system configuration and control with clickable icons to access tools through GV Orbit Control.
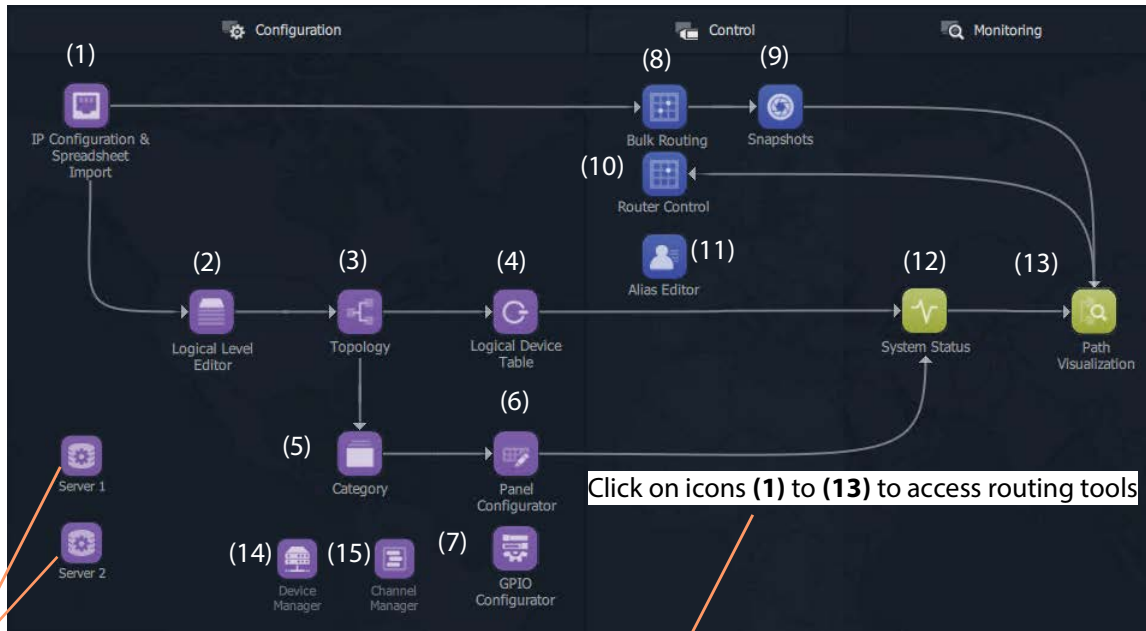
Click on server icons to access landing pages for each GV Orbit Server.

Each icon **(1)** to **(15)** is described in the Steps for Graphical Routing Workflow Stage Icons table, on page 101.

*Fig. 3-20: Graphical Routing Workflow Stage - with Icons **(1)** to **(13)***

Table 3-2: Steps for Graphical Routing Workflow Stage Icons

Steps relating to icons in Figure 3-20 **Graphical Routing Workflow Stage - with Icons (1) to (13)**, on page 101

(1) IP Configuration and Spreadsheet Import

Access the IP Routing endpoint configuration editing tool or create a new default GV Orbit C&M project. See IP Configuration of End Point Devices and Spreadsheet Import, on page 75 for more information. See also IP Configuration, on page 793.

Table 3-2: Steps for Graphical Routing Workflow Stage Icons (continued)

Steps relating to icons in Figure 3-20 **Graphical Routing Workflow Stage - with Icons (1) to (13), on page 101**

(2) Logical Level Editor

Access logical route editor tool in GV Orbit Control. For the target router:
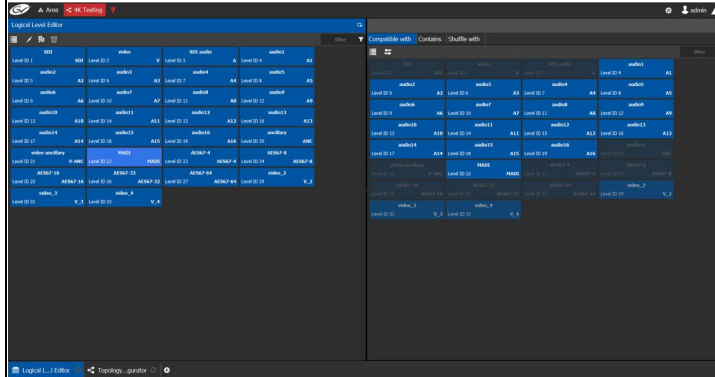
- Define, review, edit logical routing levels. For example, levels for audio channel(s), video channels, SDI video, ancillary data etc.

See Logical Level Editor Tasks, on page 190.

(3) Topology Configurator

Access router topology configurator tool in GV Orbit Control:
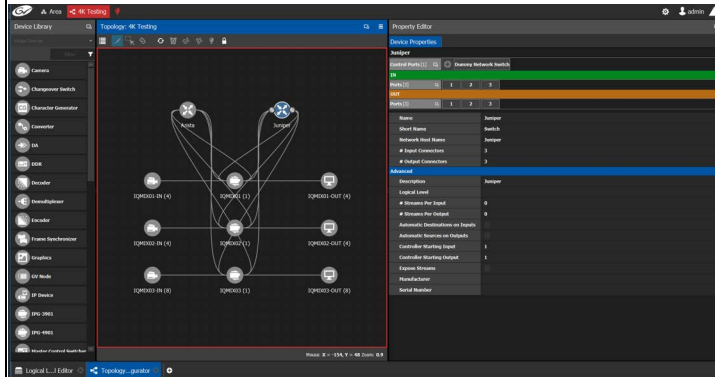
- Define router topology with the logical levels. For example, how physical and logical devices are arranged in the broadcast facility.
- Select topology to use.

See Topology Configurator Tasks, on page 199.

Table 3-2: Steps for Graphical Routing Workflow Stage Icons (continued)

Steps relating to icons in Figure 3-20 **Graphical Routing Workflow Stage - with Icons (1) to (13), on page 101**

(4) Logical Device Table

Access the logical devices editor tool in GV Orbit Control:
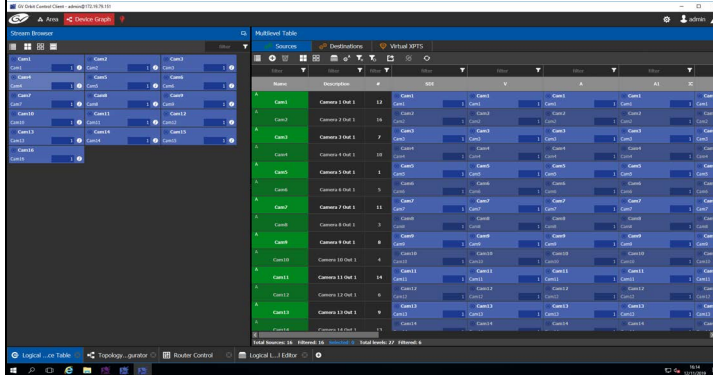
- Define logical devices in a table.
- Configure levels and IP streams.
- Configure audio shuffled streams and break-away streams.
- Create virtual crosspoints and logical destinations devices.

See Logical Device Table Tasks, on page 241.

(5) Category

Access the Category Configurator tool in GV Orbit Control:
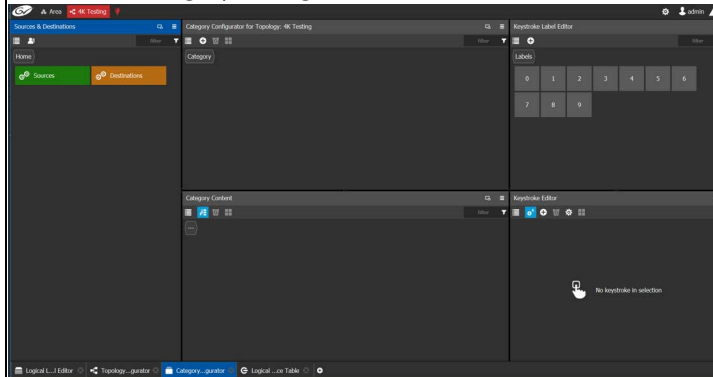
- Manage sources and destinations with groups (or categories) based on type or usage. This is useful when there are multiple resources. Categories allow sources/destinations to be accessed quickly on a routing control panel.

See Category Configurator Tasks, on page 268.

Table 3-2: Steps for Graphical Routing Workflow Stage Icons (continued)

Steps relating to icons in Figure 3-20 **Graphical Routing Workflow Stage - with Icons (1) to (13)**, on page 101

(6) Panel Configurator

Access the Panel Configurator tool in GV Orbit Control:
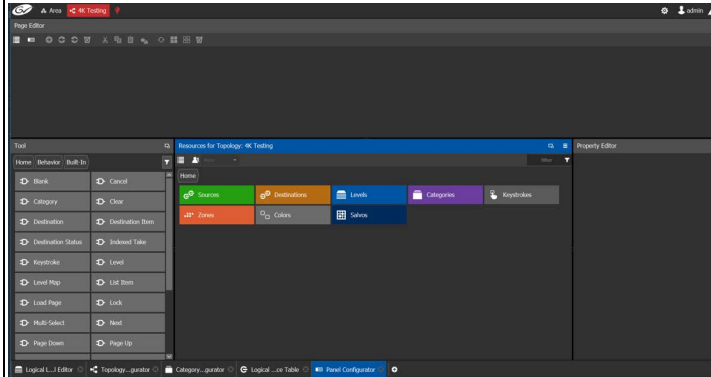
- Create soft router control panel designs.
- Add buttons and behaviors to a routing control panel.
- Push the design to soft or hard panels.

See Panel Configurator Tasks, on page 275.

(7) GPIO Configurator

Access the GPIO Configurator tool for GPIs and GPOs on supported panels (for example, GPI-1501) with GV Orbit Control:
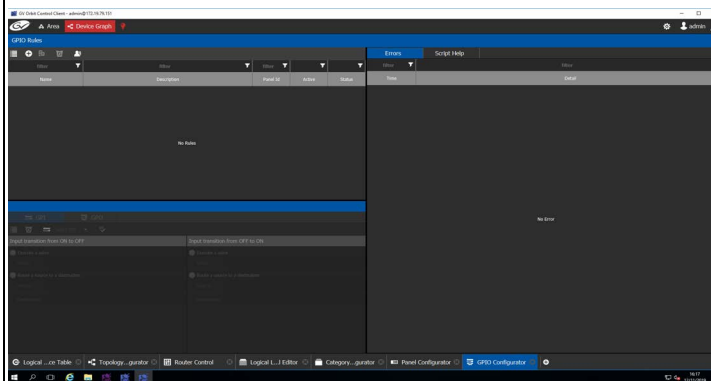
- Add rules for GPIs to trigger events such as a salvo or routing a source to a destination.
- Add rules for GPOs to activate on combinations of conditions.

See GPIO Configurator Tasks, on page 312.

Table 3-2: Steps for Graphical Routing Workflow Stage Icons (continued)

Steps relating to icons in Figure 3-20 **Graphical Routing Workflow Stage - with Icons (1) to (13)**, on page 101

(8) Bulk Routing

Access the Bulk Routing Control Panel tool in GV Orbit Control:
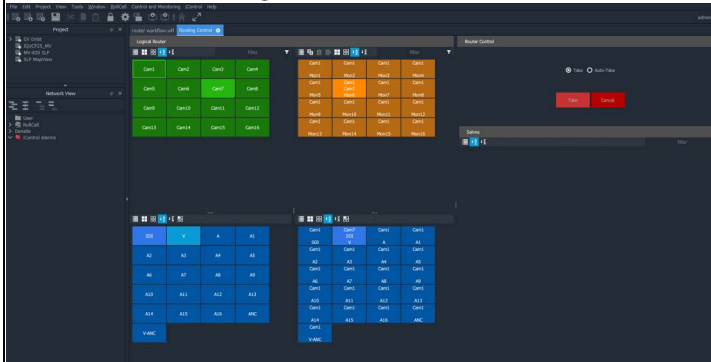
- Make routes between sources and destinations.
- Form break-away routes and shuffled routes.
- Execute salvos.

For an introduction to the Bulk Routing Control panel, see Bulk Routing Control Panel, on page 109.

(9) Snapshots

Access the Snapshots tab of the GV Orbit Routing Service that runs on the GV Orbit Server.
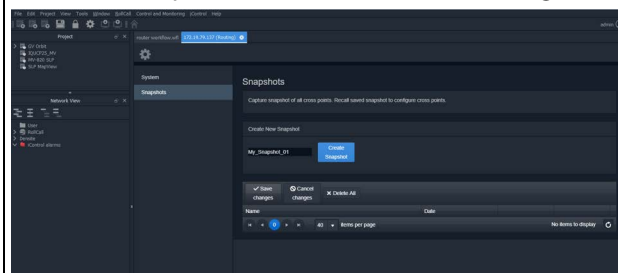
- Recall routing snapshots.
- Create and save new snapshots.

Refer to **Routing Service** in the *GV Orbit Admin Guide*, specifically the **Snapshots Screen**. See Related Documentation, on page 19.

Table 3-2: Steps for Graphical Routing Workflow Stage Icons (continued)

Steps relating to icons in Figure 3-20 **Graphical Routing Workflow Stage - with Icons (1) to (13)**, on page 101

(10) Router Control

Access the Router Control Panel tool in GV Orbit Control:
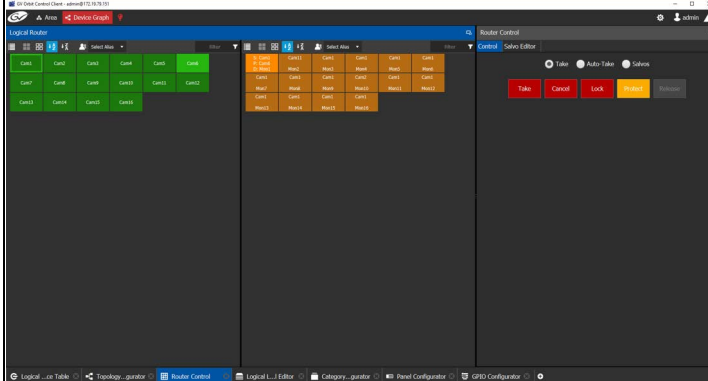
- Make routes between sources and destinations.
- Create and execute salvos.

See Router Control Tasks, on page 470.

(11) Alias Editor

Access the Alias editor tool in GV Orbit Control:
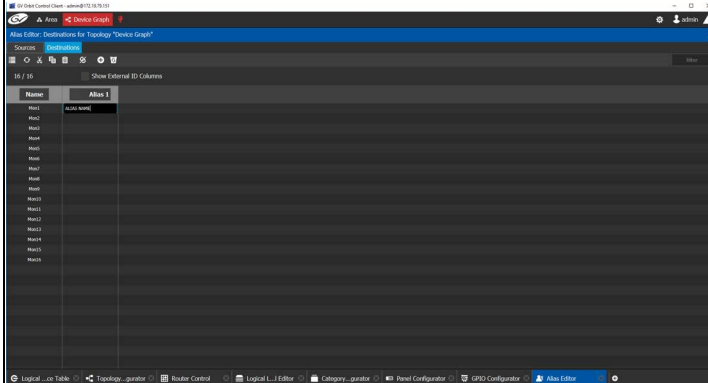
- Assign aliases to sources and destinations
  (to support shorter length names, other languages, or different production staff needs).

See Alias Editor Tasks, on page 466.

Table 3-2: Steps for Graphical Routing Workflow Stage Icons (continued)

Steps relating to icons in Figure 3-20 **Graphical Routing Workflow Stage - with Icons (1) to (13), on page 101**

(12) System Status

Access the System Status screen of the GV Orbit Control router controllers:
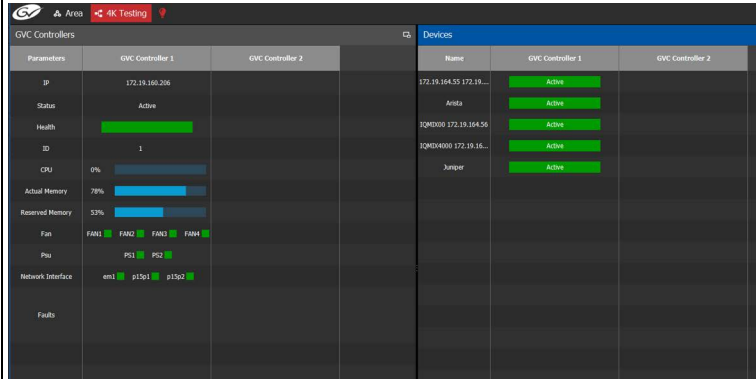
- Monitor the health of GV Orbit Control router controller(s).
- View device health for a selected topology.
- Manual fail-over, if required.

See System Status Task, on page 457.

(13) Path Manager

Access the Path Manager screen of GV Orbit Control:
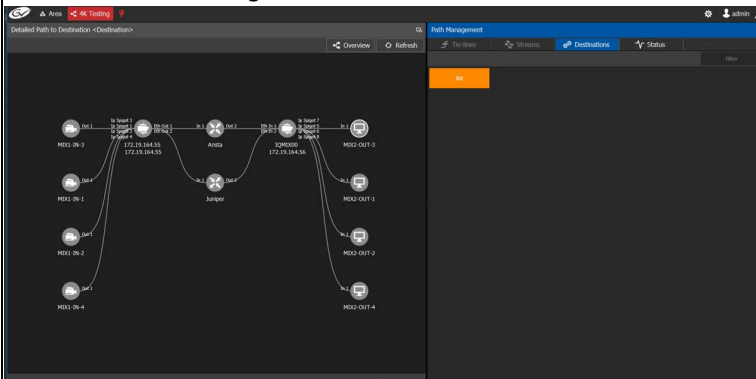
- View source-destination paths of routed streams.
- View Tie-Line usage information, including % bandwidth used.

See Path Manager Tasks, on page 450.

Table 3-2: Steps for Graphical Routing Workflow Stage Icons (continued)

Steps relating to icons in Figure 3-20 **Graphical Routing Workflow Stage - with Icons (1) to (13)**, on page 101

(14) Device Manager

The GV Orbit **Device Manager** service lists and manages the connections to supported devices from a GV Orbit system to provide device operating status and information for the purpose of device health monitoring.
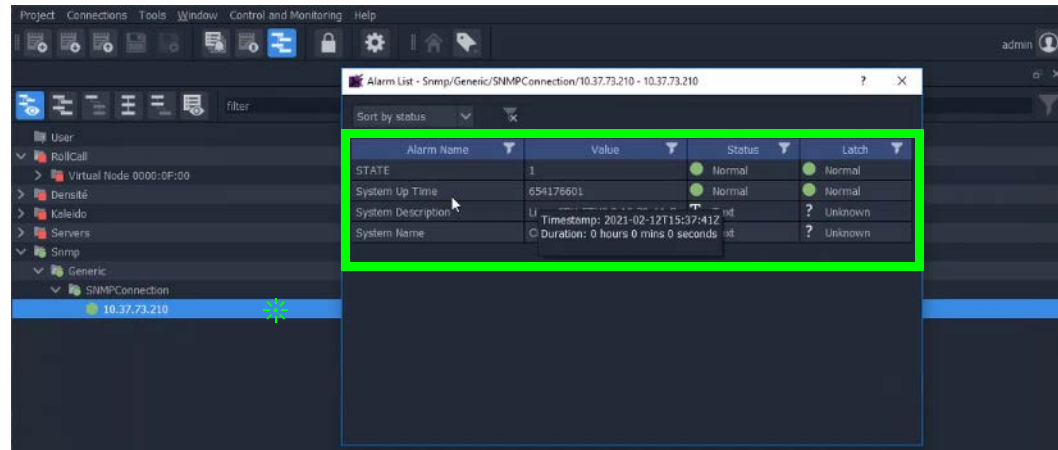
See **Device Manager** in the *GV Orbit Admin Guide*. See Related Documentation, on page 19.

(15) Channel Manager

The **Channel Manager** service supports Densité cards such as the XIP-3901-UDC-IF that have two independent processing channels. It allows you to easily visualize, manage, and operate XIP processing channels as individual devices without you having to know what physical device the channel is on.
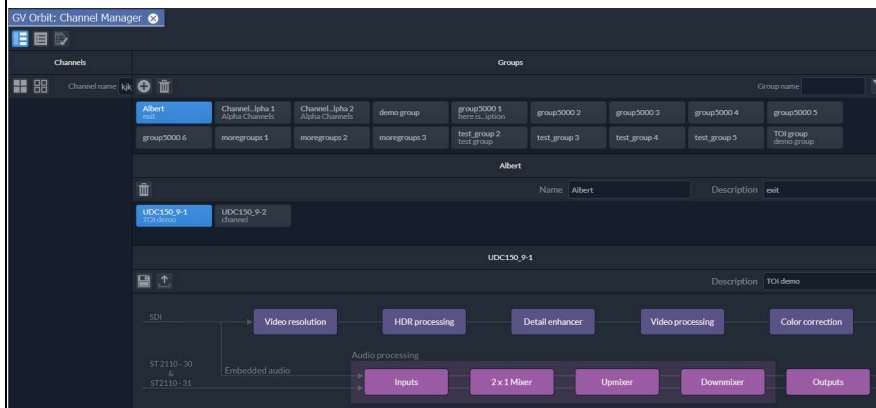
See Channel Manager, on page 491. The Channel Manager is available by default in projects created in GV Orbit Control version 2.2.0 and above. To add it to projects created before this, see Adding Channel Manager to Projects Created before GV Orbit Control Version 2.2.0, on page 503.

Bulk Routing Control Panel

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	●	●

Introduction

The Bulk Routing Control Panel is a built-in router control panel accessible from GV Orbit Client. It requires the GV Orbit **Routing** service to be running on GV Orbit Server(s). IP routing or traditional (for example, SDI) routing may be controlled.

More Information on Bulk Routing Panel

For more information, see Chapter 13, Routing Control - XY Routing Panel, on page 591.

Open Bulk Routing Panel

1 Open an existing C&M project and set the GV Orbit Client window size to 1920x1080.

2 Click on the **Bulk Routing** icon in the **Graphical Routing Workflow** stage.

    A **Bulk Routing Panel** is shown in a window tab in the GV Orbit Client. See Figure 3-21.

Filtering boxes to limit items shown, see Filtering, on page 547
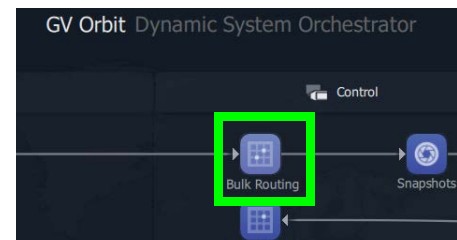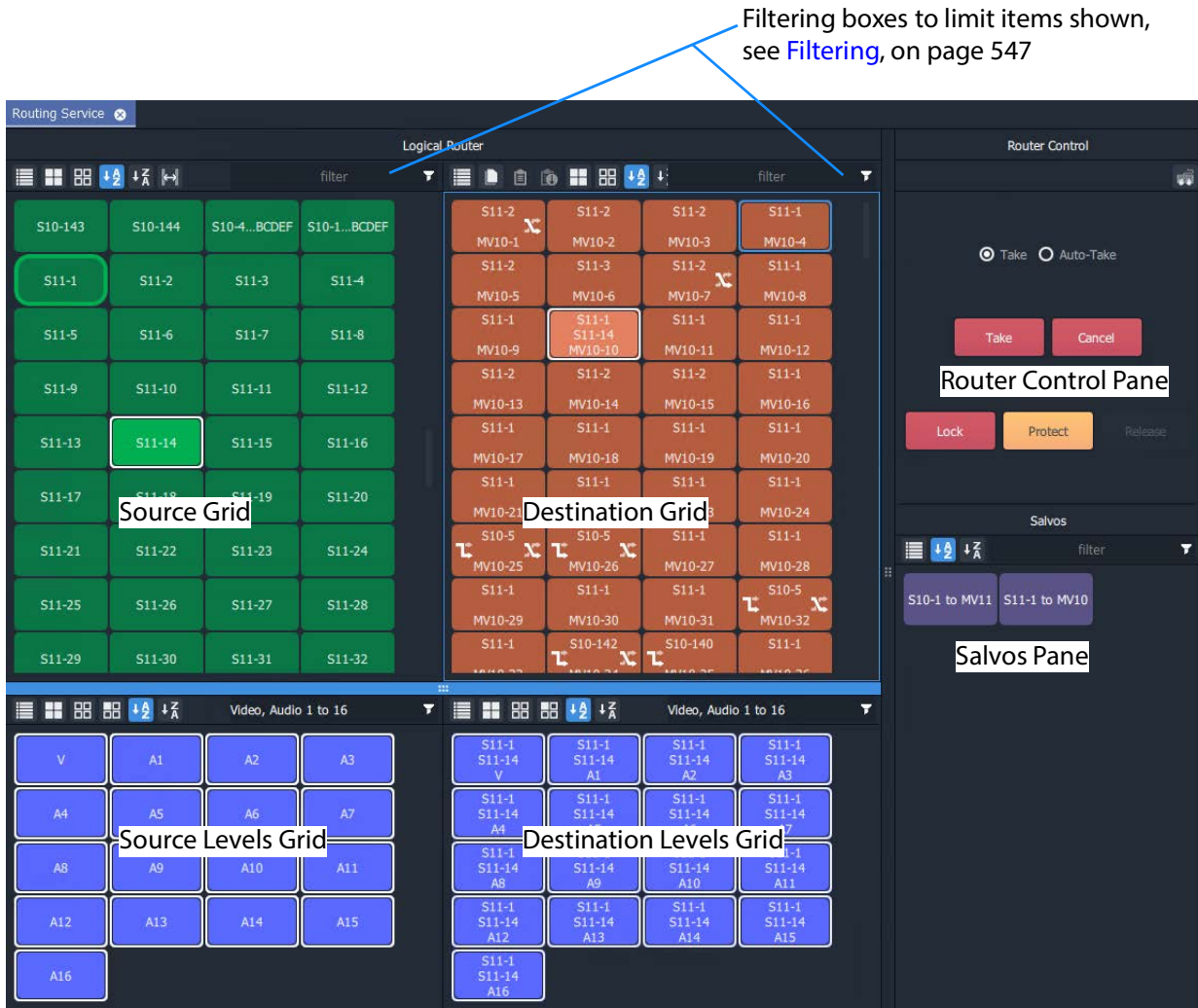
Fig. 3-21: Example Bulk Routing Panel

Troubleshooting

If problems are encountered when opening a Bulk Routing Panel, carry out the following checks:

1 Check that the project's **Client Domain** is set for the GV Orbit system.

   (Click **Connections -> GVOP** in the main menu.
   Set **Client Domain** to be the system's 'Client Domain' number.)

2 The project's **Routing Address** project variable (a RollCall address) should be set to the **Routing** service's **Logging Address**. To verify this:

   • To see the project variables, click **Project -> Edit Variables** in the main menu.

   • To see the **Routing** service's **Logging Address**:
     Log into the GV Orbit Server and access the **Routing** service's 'System' configuration screen. (See GV Orbit Server Login, on page 115, and Accessing Services Configuration Screens, on page 117.)

To save any changes made to the project settings:

3   Click **Project -> Save Project** in the main menu to save the project locally.

4   Click **Project -> Push** to push and save the project to the GV Orbit Server.

Alternative Open Bulk Routing Panel (Network Window)

The Bulk Routing Panel may also be opened from the **Network** window in GV Orbit Client:

1   Display the **Network** window tree-view (click
    in the main tool bar to toggle displaying
    the window) and expand the tree-view.

2   In the **Network** window,
    locate the '**Routing** service' item.
    (The item's name is the **Routing** service's
    "Logging Name".)

3   Right-click on the **Routing** service item and
    select **Open Panel**.

    A Bulk Routing Panel is shown in a window tab
    in the GV Orbit Client. See
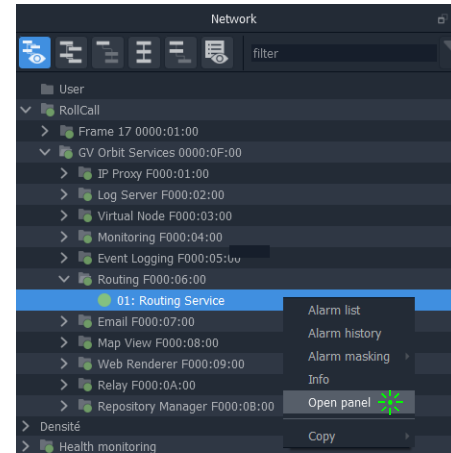
> **Note:**   A '**Routing** service' item appears in the GV Orbit **Network** window
>   when a **Routing** service is running on the connected GV Orbit Server
>   and is configured to talk to a router controller.
>
>   Bulk Routing Panel 'Source' and 'Destination' buttons are annotated
>   with router port names obtained through the **Routing** service.

Bulk Routing Panel - List View

List View is a level-centric view of a Bulk Routing Panel, allowing a user to focus on routing to Destination Levels. **List View** presents all of the destinations in a 'list' format; each list item is a Destination with all of its Levels.

To access **List View** mode:

1   Open the Bulk Routing Panel and set the GV Orbit Client window size to 1920x1080.

2   In the Destination Grid's tool bar, click on the **List View** icon.

This toggles between
the normal Bulk
Routing Panel view and
the **List View** mode.

The **List View** is shown.
See Figure 3-22.
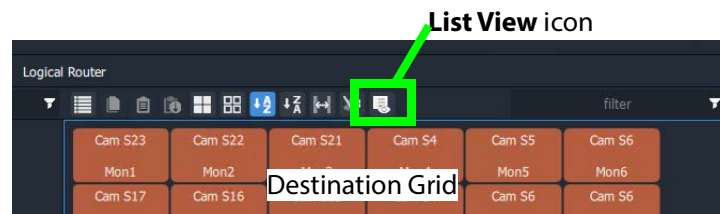
Click icon to toggle between **List View** and the normal view

Destinations

Destination Levels Grid

Scrollable list of destinations

Fig. 3-22: Bulk Routing Panel - List View

Bulk Routing Panel Information

For further Bulk Routing Panel information, including about **List View** and about general operation, refer to Chapter 13, Routing Control - XY Routing Panel, on page 591.

Routing Snapshots

Snapshots of all routes and crosspoints in a GV Orbit system can be taken and restored from the GV Orbit Client with the **Routing** service configuration screen.

Access Routing Service Screen

1   Go to the GV Orbit Client workflow.wfl **Workflow** window.

2   Click on the **Snapshots** icon.

The GV Orbit Server window is shown in a tab.
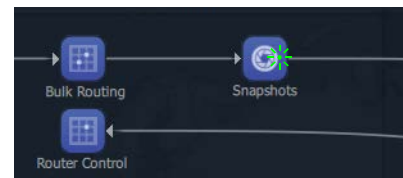
3 Scroll down the server window on the left
and locate the 'Services' section and select 'Routing'.

The **Routing** service configuration screen is shown.

4 Select the 'Snapshots' side-tab on the left.

The **Routing** service's **Snapshots** screen is shown. See Figure 3-23.
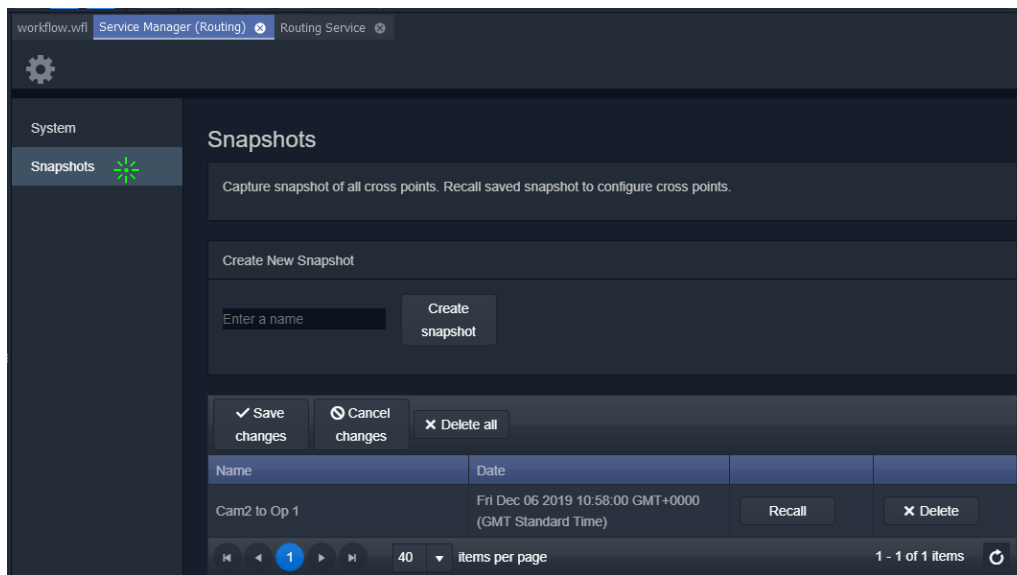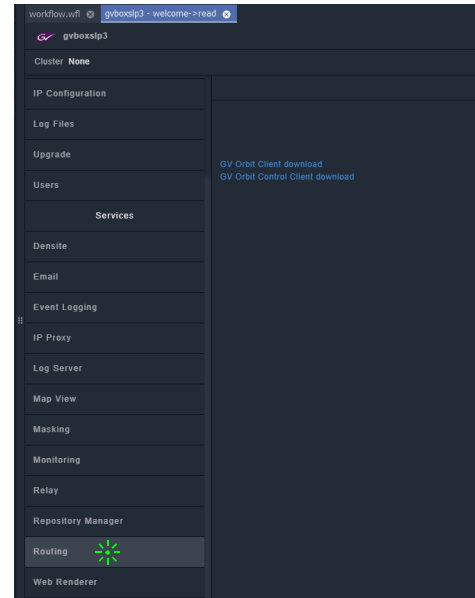
Fig. 3-23: Routing Service Snapshots Configuration Screen

To Take a Routing Snapshot

In the **Routing** service **Snapshots** screen:

1 Enter a name for the new snapshot.
2 Click **Create Snapshot**.
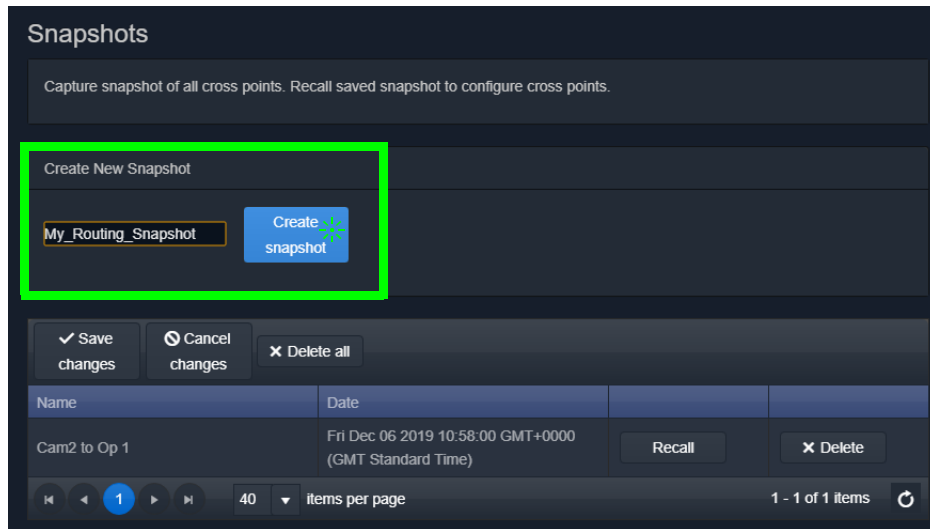
Fig. 3-24: Routing Service Snapshots Configuration Screen

A snapshot of all routes and crosspoints is taken. And the new snapshot appears in the list.
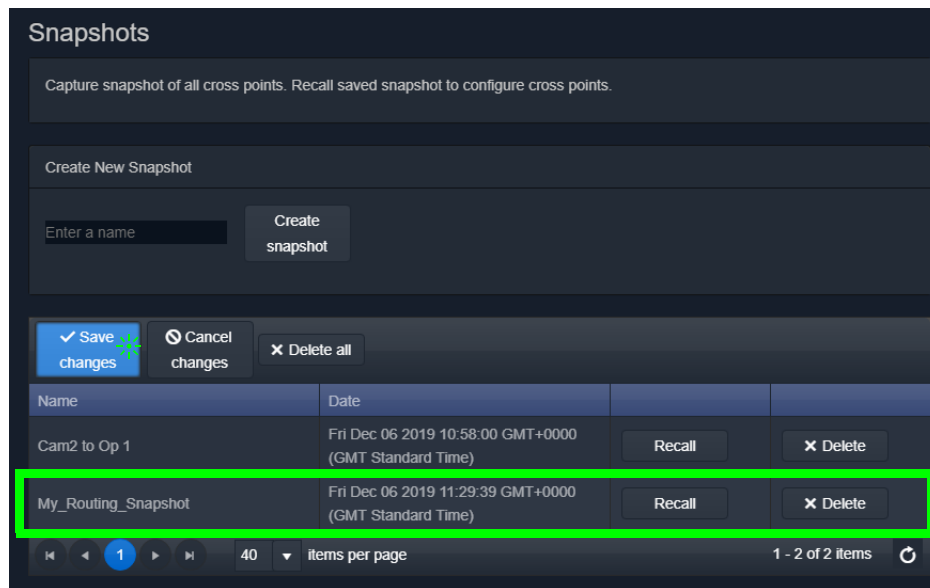
Fig. 3-25: New Snapshot Item in List

3 Click **Save Changes**.

To Recall a Snapshot

In the **Routing** service **Snapshots** screen:

1 Find a snapshot in the list and click **Recall**.

The signal routing and crosspoint settings present when the snapshot was taken are

restored.
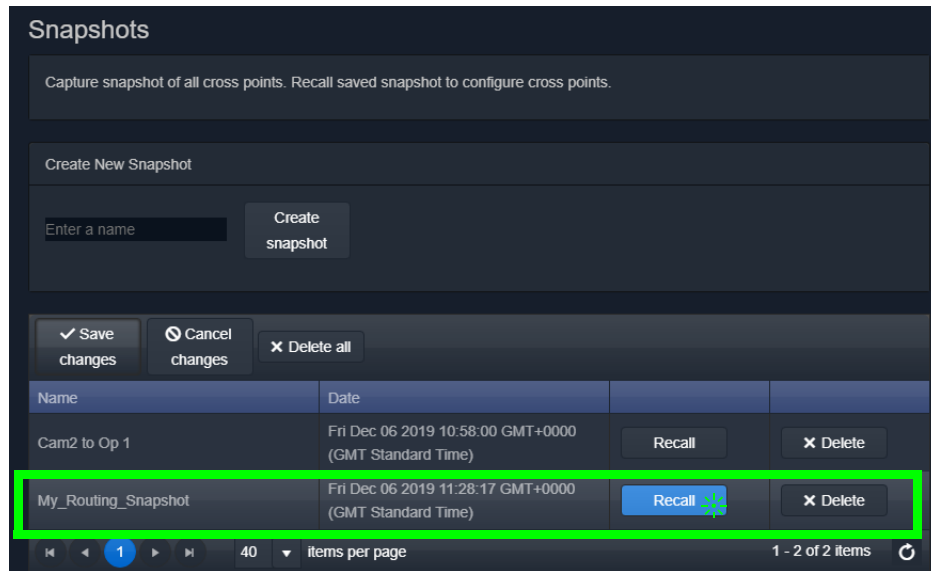
Fig. 3-26: Recall Snapshot

GV Orbit Server Login

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This section describes how to log into a GV Orbit Server from either the GV Orbit Client or with a web browser. When logged in, various configurations can be viewed, including settings for the GV Orbit services.

Refer to the **Launching and Logging in to GV Orbit Admin Interface** in the *GV Orbit Admin Guide*. See Related Documentation, on page 19.

Login From GV Orbit Client

With a GV Orbit C&M project open in GV Orbit Client, to open a GV Orbit Server's **Home** stage:

1 Either:

- click **Project -> URLs** in the main menu and select the GV Orbit Server item; or
- click on a server icon in the **Workflow** stage (for example, **Server 1**).

Fig. 3-27: Click on Server Icon in Workflow Stage

The GV Orbit Server **Admin Login** screen is then shown. See Figure 3-28 on page 116.

Login from a Browser

To log into a GV Orbit Server from a browser:

1 Enter the IP address of a GV Orbit Client into a web browser (Chrome recommended).

The GV Orbit Server **Admin Login** screen is shown. See Figure 3-28.

Server Admin Login Screen

For more details about the GV Orbit Server and logging in, refer to the *GV Orbit Admin Guide* in Related Documentation, on page 19.
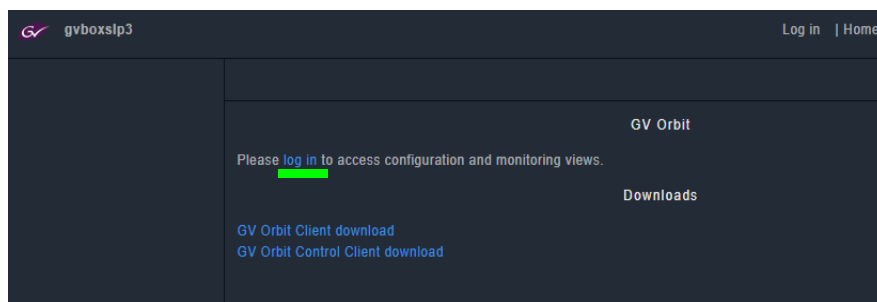
Fig. 3-28: GV Orbit Server Admin Login Screen

> **Note:**
> The GV Orbit Client and GV Orbit Control Client installers may also be downloaded from the GV Orbit Server **Admin Login** screen.

1 Click **Log in**.

   A login screen is shown.

2 Enter the **User ID** and **Password** (the default user ID is 'admin' with password 'admin'). Click **Login**.

   The GV Orbit Server **Home** stage is shown. See Figure 3-1 on page 79.

Accessing Services Configuration Screens

Services should be set up by the GV Orbit system administrator. Services running on the GV Orbit Server are configured via their configuration screens accessible from the GV Orbit Server **Home** stage.

For information about the server and services, refer to the *GV Orbit Admin Guide*. See Related Documentation, on page 19.

Logs

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	●	●

Introduction

Logs are kept for system device status/alarm messages (events) and also for applications/services running on the GV Orbit Server.

- Simple Custom Monitoring Screen Example - In an operating GV Orbit system, GV Orbit device/service status, alarm messages and events are logged by a GV Orbit service running on a GV Orbit Server. Events etc. are logged to an event log data set. This is set up when configuring the **Event Logging** service on the server.
- Server Application and Service Log Files - Each application/service running on the GV Orbit Server also has a set of log files.

For further information about the log files, refer to **Event Log Setup Screen** in the GV Orbit *Admin Guide*. See Related Documentation, on page 19.

Simple Custom Monitoring Screen Example

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Introduction

A simple custom graphical operator screen is presented here. The example describes a monitoring screen using a C&M project; device status is monitored by the screen.

This requires:

- a configured C&M project;
- a configured GV Orbit Server; and
- the following minimum GV Orbit services to be running:
  - IP Proxy
  - Log Server
  - Monitoring
  - Densité.

Steps:

Step 1: Create a New Monitoring Screen Schematic

1 Open the C&M Project and show the **Project** window and the **Workflow** window with the **Workflow** stage.

2 On the workflow stage, click on the **Screens** icon.

The **Screens** dialog is shown.
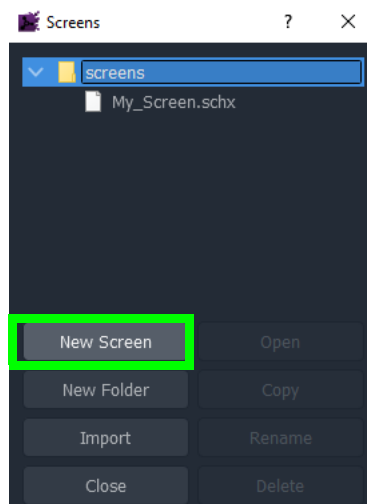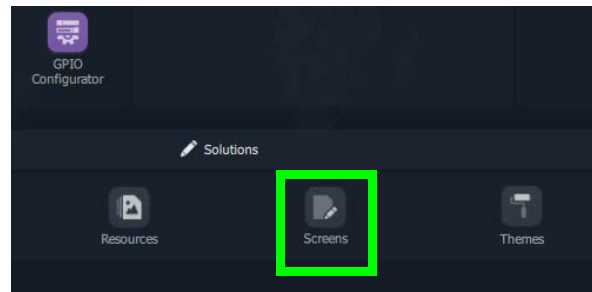
Fig. 3-29: Screens Dialog

3 Click **New Screen**.

The **New Screen** dialog is shown.

4 Enter a name for the new screen schematic and click **OK**.

A new, blank custom screen schematic is created. The new, blank schematic is shown in a window tab in GV Orbit Client. See Figure 3-30.

Note:
A custom screen schematic is shown in GV Orbit Client; this is the 'stage' on which the schematic is:

- designed when GV Orbit Client is in **Design Mode**; and
- run and operated when GV Orbit Client is in **Run Mode**.

Run Mode icon (Showing project is in **Design Mode**)

Note: Drag 'handle' to the right to reveal more tool bar icons

Schematic stage
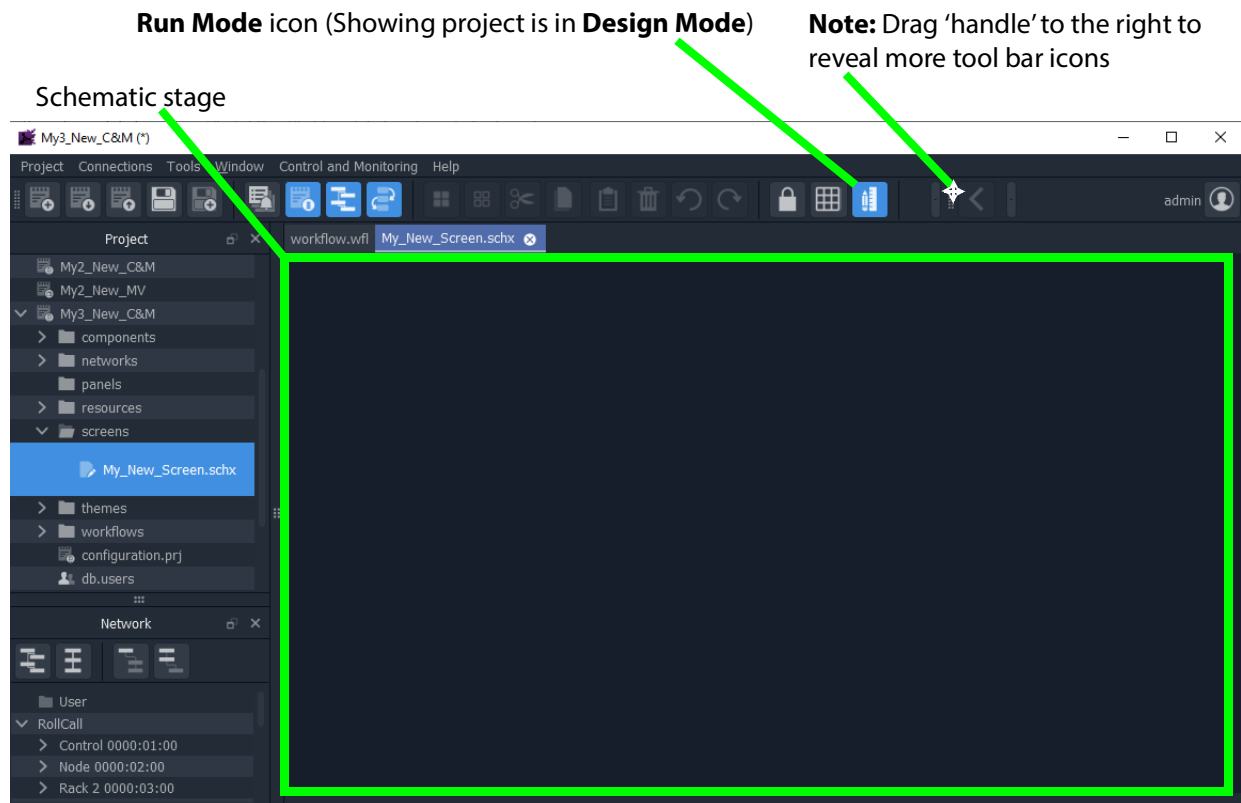
Fig. 3-30: New, Blank Custom Schematic

5 Click the **Run Mode** tool bar icon to select GV Orbit Client **Design Mode**. See Figure 3-31.

> **Note:** A project's 'mode' toggles between **Run Mode** and **Design Mode**.

Click to *exit* Run Mode

a) Icon appearance when in **Run Mode**

Click to *enter* Run Mode

b) Icon appearance when in **Design Mode**

Fig. 3-31: Run Mode / Design Mode Tool Bar Icon

Note:
In **Design Mode**, a project may be edited (for example, a video wall may be modified).
In **Run Mode**, a project monitors log and alarm data and displays updated custom operator screens in real-time.

Step 2: Add Monitoring

A control and monitoring (C&M) screen will monitor items in a system with individual or aggregate alarms for a device (or collection of devices), or an individual alarm (or collection of alarms). This is quick and easy to achieve with GV Orbit Client.

Items to be monitored can be dragged onto a C&M screen either from the **Network** window or from an **Alarm List** window. One or more devices or device alarms can be monitored.

Add Monitoring of Devices

For a C&M screen schematic open in GV Orbit Client in **Design Mode**:

1 Expand the **Network** window to find a RollCall- or Densité-protocol device to monitor.

2 Drag a device onto the C&M screen schematic, and release.

At release, GV Orbit Client pops up a list of options. These control what will be created from the drag. See Figure 3-32a.
(Figure 3-32b shows the resulting Run Mode screen appearance, see later steps.)

Project is in **Design Mode**

Pop-up Options

Selected device

Drag on-screen

a) Drag on Devices

Project is in **Run Mode**
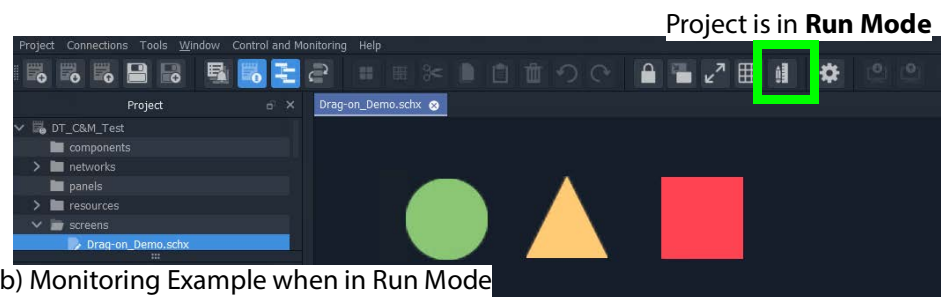
b) Monitoring Example when in Run Mode

Fig. 3-32: Drag Device Monitoring onto the Schematic:
a) Drag on Devices;   b) Monitoring Shown when in Run Mode

3   Click 'Create Single Tally' in the pop-up options list.

GV Orbit Client then infers a default, graphical Tally widget on the schematic which is automatically set up to graphically indicate the overall status of the device when in Run Mode.

4   Drag on more devices, as required.

(Figure 3-32b shows what the graphical items may look like in **Run Mode**.)

This has quickly added simple device alarm state monitoring to the C&M project.

> **Note:** Add Device:
> Dragging a device onto the schematic and releasing it on top of an *existing* monitoring Tally widget will *add* the device to the screen widget, thus creating an aggregate alarm.

Add Monitoring of Alarms

Device alarm monitoring can also be added:

1 Expand the **Network** window to find a device to monitor.
Then right-click on the device item and select 'Alarm List'.

The device's alarms are all shown in a pop-up **Alarm List** window.

2 Select one or more alarms in the **Alarm List** window and drag them onto the C&M
screen schematic, and release.
(To select more than one alarm item, click on an item to select it, and select more with
CTRL-click.)

At release, a list of options pops up which will control what will be created from the
drag. See Figure 3-33.

> **Note:** Pop-up Options:
> These pop-up options are described in 'Drag-On' Options, on page 123.
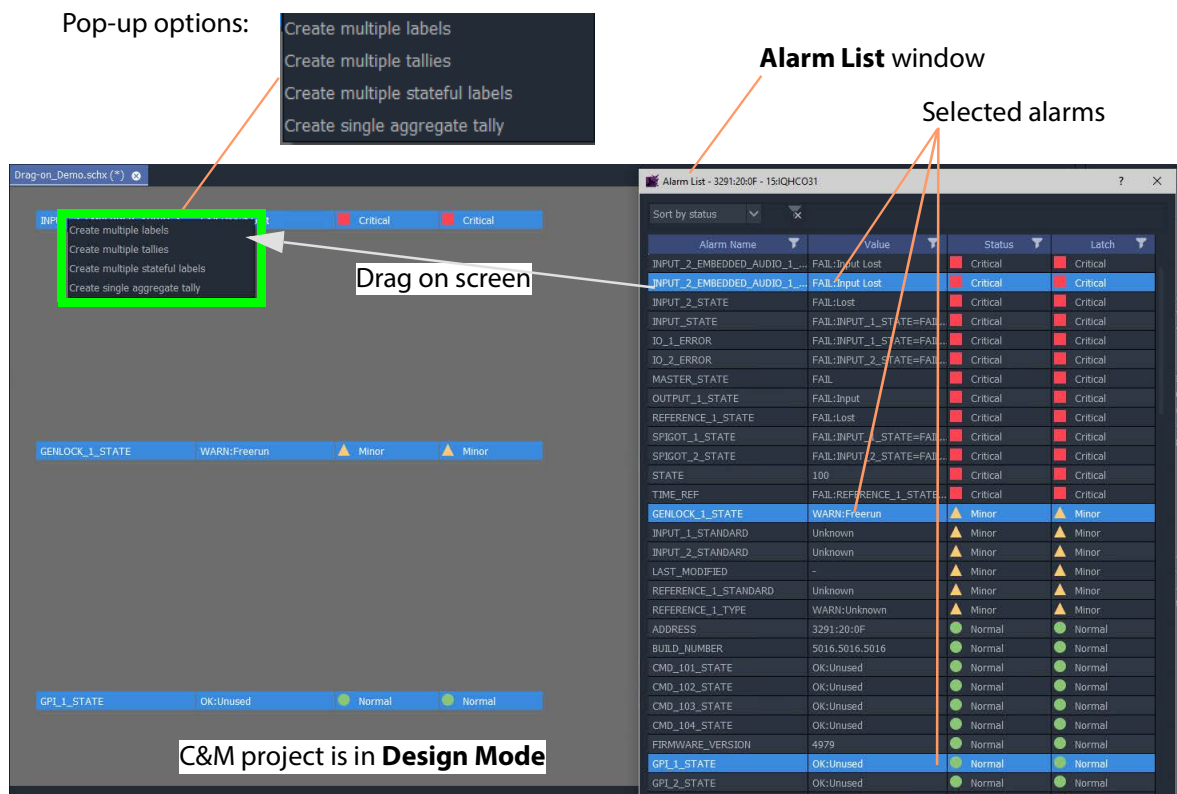
Fig. 3-33: Drag Alarm Monitoring onto the C&M Screen Schematic

3 Select the pop-up option required.

GV Orbit Client then infers graphical monitoring widget(s) on the schematic which are
automatically set up to indicate the alarm status.

This has quickly added simple device alarm monitoring to the C&M project.

> **Note:** Add an Alarm:
> Dragging an alarm (from the same or from a different device) onto an existing monitoring widget will add the alarm to the screen widget.

> **Note:** Right-click Drag:
> Right-click dragging will use the last pop-up option selected and will avoid you having to select the same pop-up option each time.

> **Note:** Label Style Change:
> A text label is difficult to see against a black background. In this case, change the label's appearance by selecting it and changing its 'Style' property value, see Text Label Style Change, on page 124.

When all monitoring widgets have been added, proceed to Step 3: Save and Push Project, on page 125.

'Drag-On' Options

The pop-up options for creating graphical, on-screen from the 'drag-on' item(s) are shown in Table 3-3. Figure 3-34b and Figure 3-34c show the result of each option **Design Mode** and in **Run Mode** respectively.

Table 3-3: 'Drag-On Options

	Option	Description
A)	Create multiple labels	Creates a text label per item.
B)	Create multiple tallies	Creates a graphical Tally widget per item, to show the individual alarm state of each item.
C)	Create multiple 'stateful' labels	Creates a colorful text label per item, where the text color indicates each individual alarm state.
D)	Create single aggregate tally	Creates one graphical Tally widget to show a combined, aggregate alarm state of all the dragged-on items.

These graphical items show alarm state.
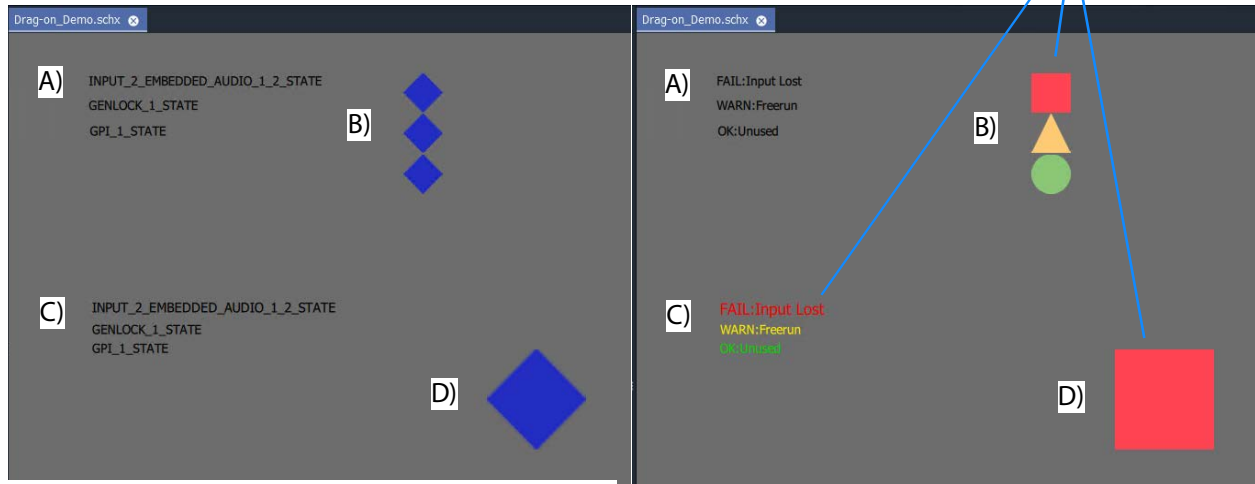
a) Result of options A), B), C), and D) in **Design Mode**   b) Result of options A), B), C), and D) in **Run Mode**

Fig. 3-34: Dragged-on Monitoring Options A), B), C), and D) in:
a) Design Mode;
b) Run Mode.

Text Label Style Change

When creating a text label with this 'drag-on' method, the resulting default label may be difficult to see (for example, if against a black background). In this case, change the appearance of the text label by changing its 'Style' property value, see Figure 3-35a and Figure 3-35b.

- Select the label(s) on the schematic.

  In the **Properties** box, click on the Style'-property's value (see Figure 3-35a).

  A drop-down menu is shown.

- Select a Style value from the drop-down menu, for example 'Solid Caption'.

- Click 'Yes' in the dialog that is shown.
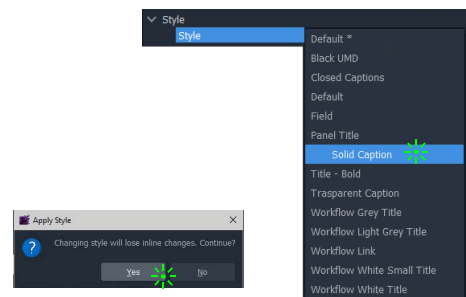
The label appearance has been changed (see Figure 3-35b).
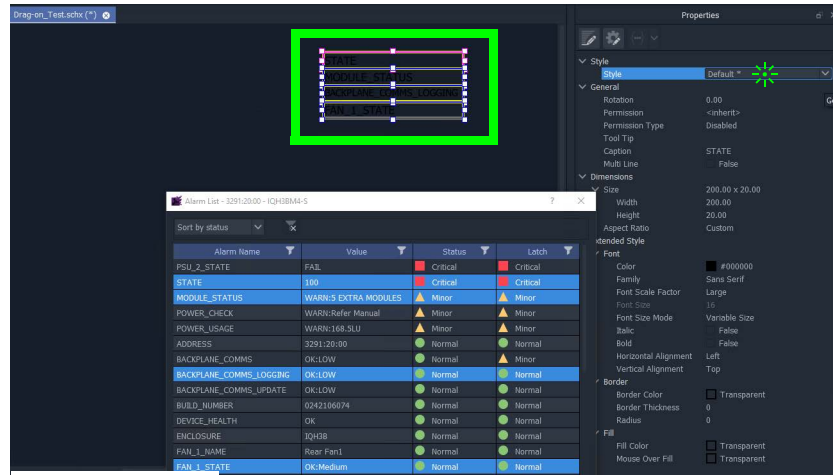
a) Selected Labels
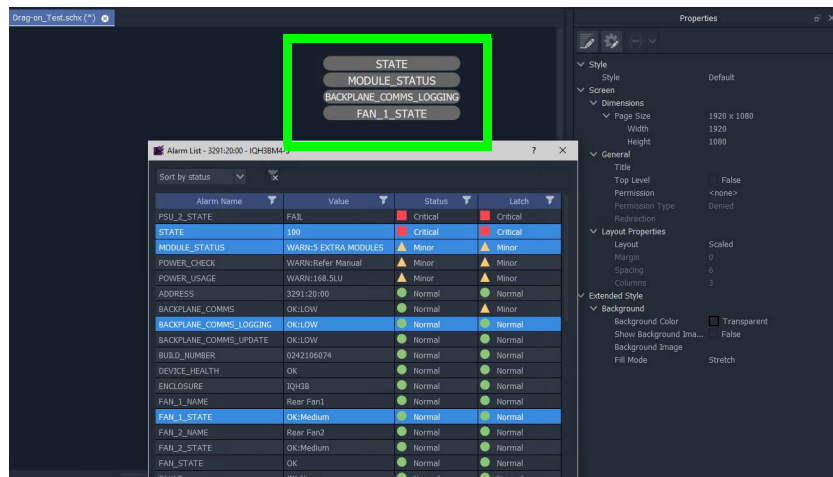
b) New Text Label Style

Fig. 3-35: Changing Text Label Style Property

Step 3: Save and Push Project

When all the required device/alarm monitoring is added to the C&M project screen:

1 Click **Project -> Save Project** in the main menu to save the project locally.

2 Click **Project -> Push** to push the project to the GV Orbit Server repository.

Step 4: Run Custom Monitoring Screen

1 Click the **Design/Run Mode** tool bar icon to take GV Orbit Client out of 'Design Mode' and into 'Run Mode':

GV Orbit Client runs the C&M project and gets device status information to display on the custom monitoring screen's **Lamp** widgets, which illuminate red/yellow/green to show device status. See Figure 3-36.

Icon when in **Run Mode**
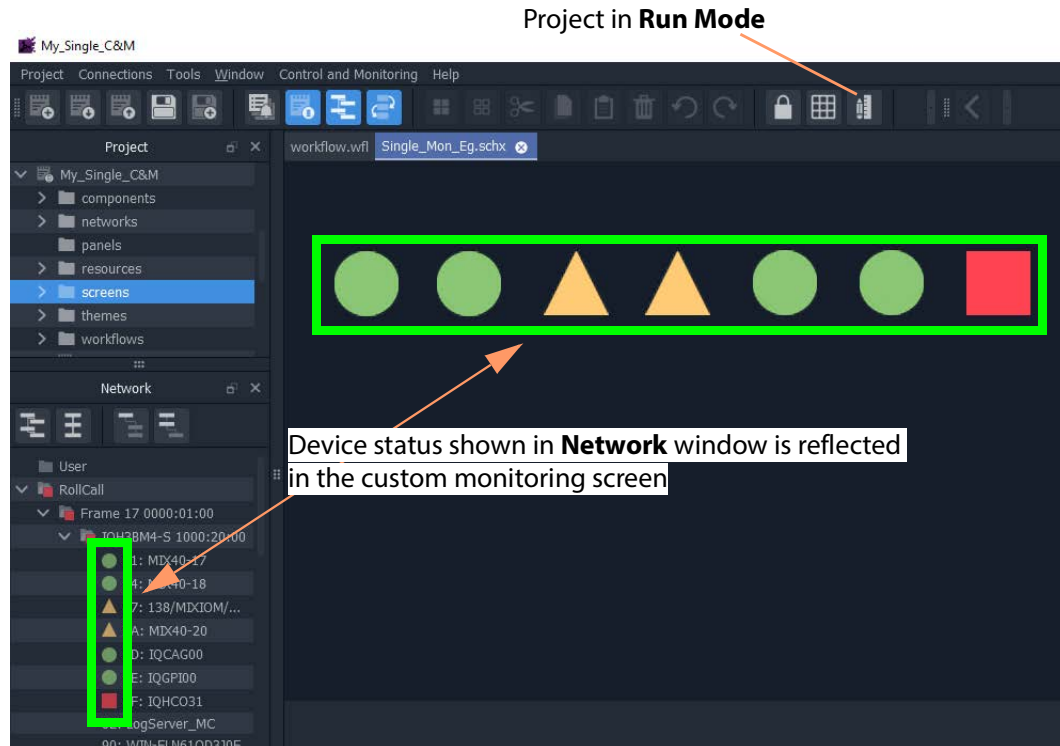
Fig. 3-36: Simple Custom Monitor Example Running in GV Orbit Client

Note: Tally Widget graphics:

The graphics shown by these Tally widgets are:

	Shape	Alarm Status
	Green circle	OK
	Yellow/amber triangle	Minor Warning
	Orange inverted triangle	Major Warning
	Red square	Failure/Error
	Blue diamond	Unknown

2   To go back to 'Design Mode', click the **Design/Run Mode** icon again.

3   To save the project locally,
    click **Project -> Save Project** from the main menu.

4   To push the project back to the GV Orbit Server:

    • click **Project -> Push** from the main menu;

    • select the project name in the list (it may already be selected/highlighted); and

    • click **OK**.

5   To close the project, click **Project -> Close Project**.

6   To close the GV Orbit Client application, click **Project -> Exit**.

Main Menu and Tool Bar Items

This section describes the **Home Screen**'s main menu items and main tool bar items:

• Main Menu Items

• Main Tool Bar Items

And:

• Common Operations in Graphic Editors

Main Menu Items
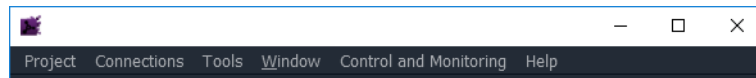
Note: The main menu items shown depend on the type of GV Orbit project open in GV Orbit Client.

Project Menu

Table 3-4: Project Menu Items

Menu Item	Description
New Project	Click to create a new project.
Open Project	Click to open an existing, locally-stored project.
Recent Projects	Click to see a list of recently opened projects.
Save Project	Click to locally save the current project with all recent changes.
Rename Project	Click to rename the open project.

Table 3-4: Project Menu Items (continued)

Menu Item	Description
Close Project	Click to close the open project.
Pull	Click to pull a project from a repository (on a GV Orbit Server).
Push	Click to push a project to a repository (on a GV Orbit Server).
Recent Files	Click to see a list of recently opened files.
Save File	Click to locally save the open file.
Save File As	Click to locally save the open file as a new file.
Close	Click to close the open file.
Set Home	Click to set the currently open schematic to be the home schematic.
Edit Variables	Click to see and edit project variables.
URLs	Click to see and access URLs defined in the project. These are hyperlinks to webpages that have been configured in the **Tools** -> **Options** -> **Links** popup. See Tools Menu, on page 129.
Exit	Click to close any project and exit GV Orbit Client.

Connections Menu

> **Note:** Setting up GV Orbit server IP address:
> When the GV Orbit server IP address is set up (either at the start of a project, or in the 'Connections > GV Server 'menu), then the 'RollCall-, 'Densité-, and 'GVOP-Connections' > menu item settings are automatically filled out and applied.

Table 3-5: Connections Menu Items

Menu Item	Description
GV Server	Click to set up project connection to GV Orbit Server. **Note:** Setting this up will automatically cause the other settings in the 'Connections' menu to be set up and applied.
Kaleido	Click to set up a connection to a Kaleido multiviewer by entering its IP Address and the multiviewer is then added to the Network View. See Step 7.3.3: Configure Network Window for Kaleido Multiviewers, on page 73.
RollCall	Click to set up RollCall connection settings and options. **Network Map:** See Step 3.2.1: Network Window Setup For RollCall-protocol Devices, on page 44. **Connect To:** See Step 3.1: Direct Configuration of RollCall-protocol Devices, on page 42. **RollCall Control Screen:** See Step 3.2.2: View a Device Control Screen - RollCall Devices, on page 46.

Table 3-5: Connections Menu Items (continued)

Menu Item	Description
Densité	Click to configure Densité connection settings. See Step 7.3.3: Configure Network Window for Densité-protocol Devices, on page 72.
GVOP	Click to set up GV Orchestration Protocol settings. See Step 7.3.2: Client Domain Number (Connections -> GVOP), on page 72.

Tools Menu

Table 3-6: Tools Menu Items

Menu Item	Description
Options	Click to set up options in GV Orbit Client, including: • **App**lication - Graphical grid settings and font settings. • **Video** - Real time video rendering options. • **Launch** - Project launch options. • **Remotes** - Remote access options. • **Links** - Set one or more URLs to be used in the project. These are webpages such as the pre-configured GV Orbit Server Admin interface. You can add other services that you want to be available to be shown in the project. These links then become available under the **URLs** button in the main toolbar or under the **Project** -> **URLs** menu. See Main Tool Bar Items, on page 132 and Project Menu, on page 127. • **Pop-ups** - Name, size and position of any pop-up windows in project. • **Monitoring** - Alarm Masking options. • **Map View** - Options for C&M project MapView screens, including built-in links and alarm state colors.
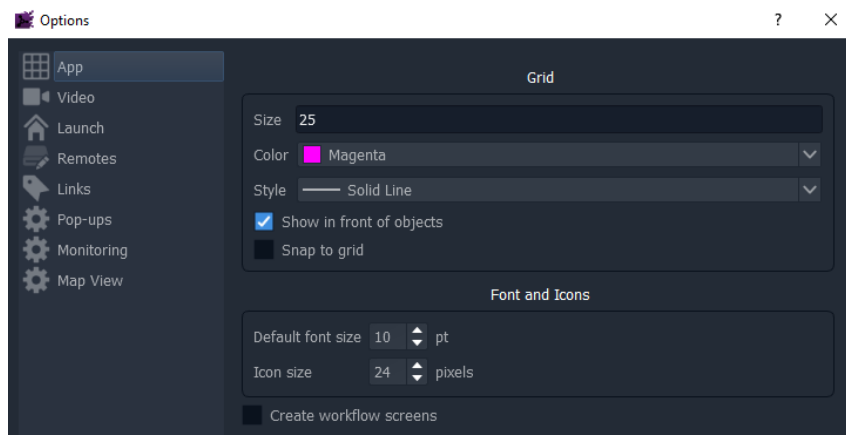
Fig. 3-37: Tools > Options Dialog from Main Menu

Window Menu

These menu items apply when more than one window (tab) is open in GV Orbit Client. Menu options may be grayed-out if they do not apply.

Table 3-7: Window Menu Items

Menu Item	Description
Next Tab	Click to go to the next open window tab. Alternatively, press CTRL-Tab.
Previous Tab	Click to go to the previous open window tab. Alternatively, press CTRL-SHIFT-Tab.
Close All	Click to close all window tabs.
List of open tabs	Radio-button list: Click on a list item to go to that windows tab.

Multiviewer Menu Items

Multiviewer Menu (Single-Multiviewer Project)

This menu appear for *non*-clustered, single multiviewer cases.

Table 3-8: Multiviewer Menu Items

Menu Item	Description
Properties	Click to see multiviewer device information.
Input Alarms	Click to enable and configure alarms on each multiviewer input. Alarms include video alarms and audio alarms.
Unit Alarms	Click to enable and configure specific alarms for the multiviewer device. For example, 'genlock state'.
Input Audio	Set up input audio related settings, including: 'audio metering type', digital audio reference level, audio loudness and phase engines. **Note:** The 'audio metering type' setting defines: • the ballistics of *all* audio metering data generated by the device; and • the default audio meter scale for graphical Audio Bars widgets on the multiviewer's video wall. CAUTION The audio metering data ballistics set up here applies globally for the multiviewer device. All audio metering data generated by the device will have the *same* ballistics. A GV Orbit multiviewer project may change an audio meter type locally on a video wall tile/schematic which locally changes the meter scale only; the audio metering data used will still have the *global* ballistics type.

Table 3-8: Multiviewer Menu Items (continued)

Menu Item	Description
Output Audio	Set up the audio sources for each of the audio channels in each of the multiviewer outputs. Up to eight stereo channels are embedded in each output.
Units	Select the units published by a Grass Valley Log Server that a multiviewer may view.
Download Logs	Obtain logs from a multiviewer unit.

> **Note:** The Alarm items are described in the user manual for the MV-8 Series multiviewer devices.
> See the *MV-8 Series Core Multiviewer User Manual*.

Multiviewer Menu (Clustered Multiviewer Project)

This menu appears for clustered multiviewer cases.

Table 3-9: Multiviewer Menu Items

Menu Item	Description
Multiviewer Cluster	Click to see multiviewer cluster information. See Chapter 14 Multiviewer Cluster, on page 653.

Help Menu

Table 3-10: Help Menu Items

Menu Item	Description
About GV Orbit Client	Click to see information about GV Orbit Client software.
Grass Valley Home Page	Click to go to the Grass Valley web page.
GV Orbit Manual	Click to go to the GV Orbit documentation web page.

Main Tool Bar Items

Tool bar icons implement some main menu functions.
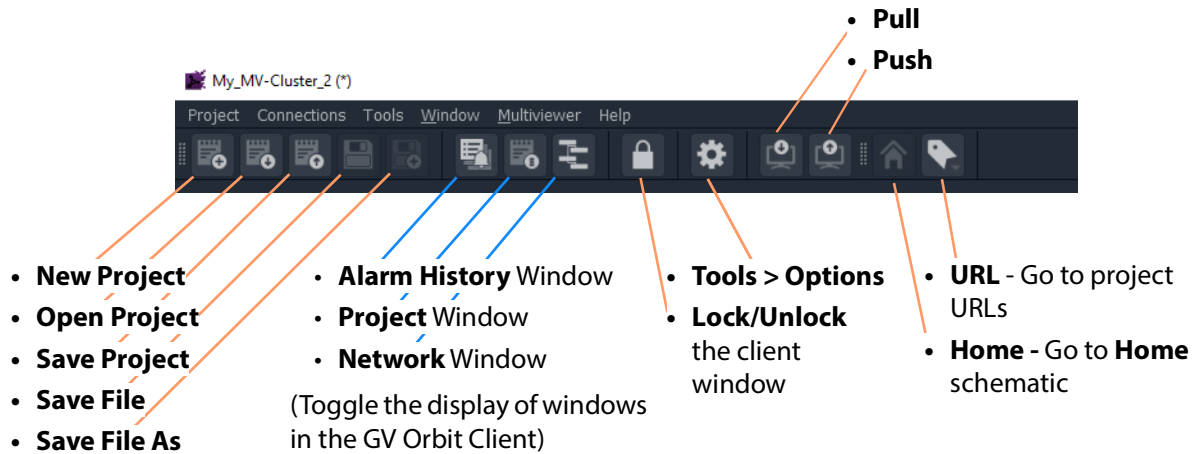
Fig. 3-38: Main Tool Bar Items

The tool icons shown depend on the type of project open in GV Orbit Client and on the editing function being carried out. For example, further Tool Bar items are shown when a multiviewer video wall is open. See Main Tool Bar with a Graphic Editor Open.

Main Tool Bar with a Graphic Editor Open

Additional tool bar icons are shown here. See Main Tool Bar Items for the other icons.
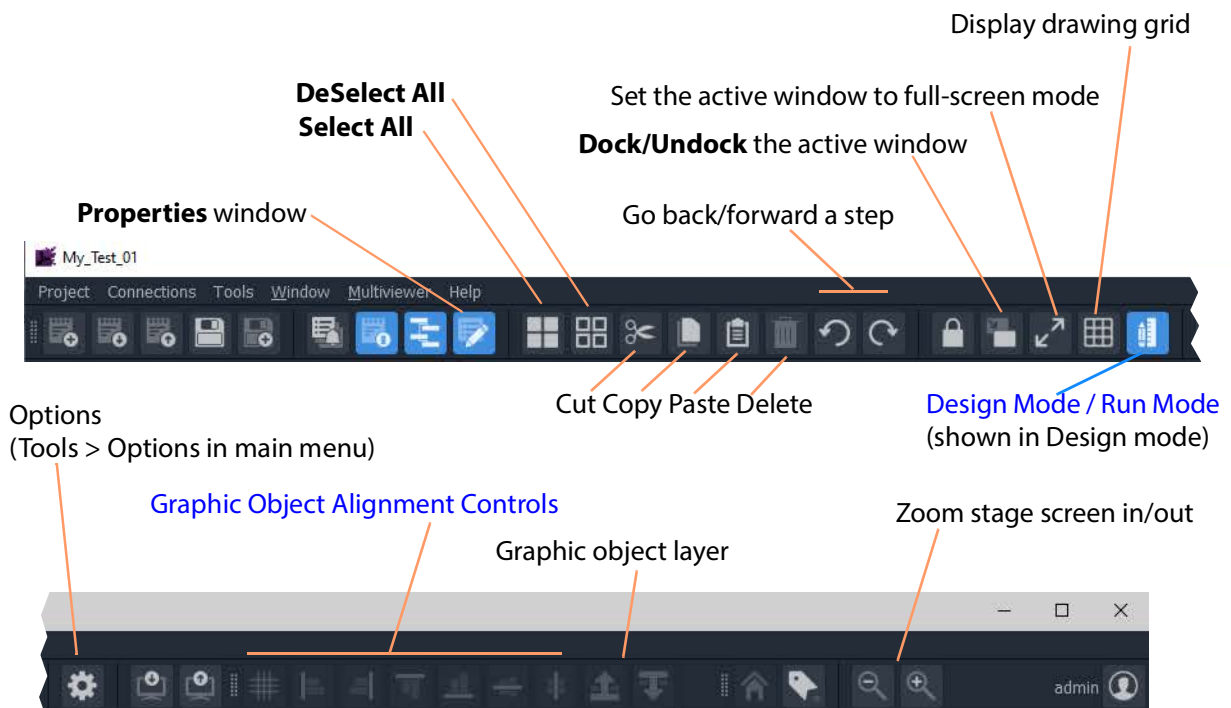
Fig. 3-39: Main Tool Bar with a Graphic Editor Screen Open

> **Note:** Object selection/deselection operations used in graphic editors in GV Orbit Client are described Selection/De-Selection of Objects in Graphic Editors, on page 137.

Design Mode / Run Mode

Clicking on the **Run Mode / Design Mode** tool bar icon toggles between 'Run' and 'Design' modes of GV Orbit Client.

Click to *exit* Run Mode

a) Icon appearance when *in* **Run Mode**

Click to *enter* Run Mode

b) Icon appearance when *in* **Design Mode**

Fig. 3-40: Run Mode / Design Mode Tool Bar Icon

Note:
- In **Design Mode**, a project may be edited (for example, a video wall may be modified).
- In **Run Mode**, a project monitors log and alarm data and generates display screens in real-time.

> **Note:** The **Design Mode / Run Mode** tool bar icon may not be shown if changing between these modes is not applicable in the screen mode of the GV Orbit project shown.

Full-Screen View

The graphical stage area can be viewed in full-screen mode. There are two ways to do this,

To Enter/Leave Full Screen Mode - Short Cut

To enter or to leave the full screen mode, when in a graphical screen:
- Press ALT-Enter.

  This toggles full-screen mode on/off.

To View Full-screen

1 Click the **Full Screen** button (　　　).

Set the active window to full-screen mode

Fig. 3-41: Main Tool Bar with a Graphic Editor Screen Open

To Exit Full-Screen Mode

1 Right-click on the (full) screen and select 'Full screen' in the pop-up menu to exit full screen mode.
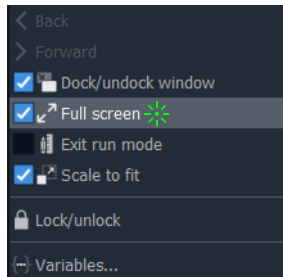
Fig. 3-42: Main Tool Bar with a Graphic Editor Screen Open

Graphic Object Alignment Controls

The graphic object controls are used in most graphical editing screens in GV Orbit Client. The controls are grayed out where they are not used.
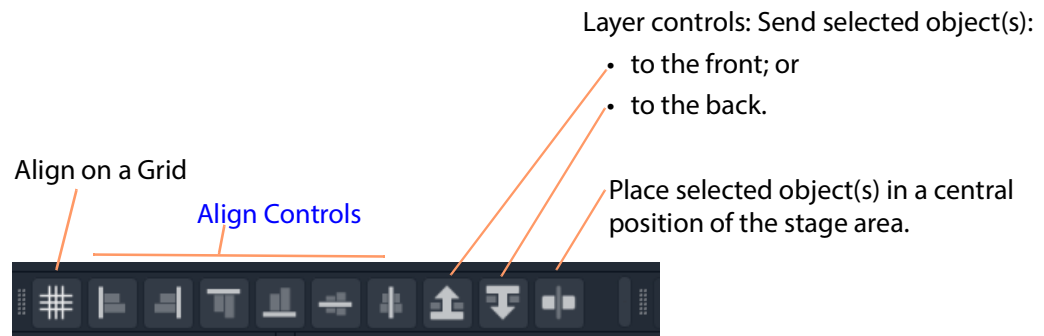
Fig. 3-43: Graphic Object Alignment Tool Bar Controls

Align Controls

> **Note:** Object selection/deselection operations used in graphic editors in GV Orbit Client are described Selection/De-Selection of Objects in Graphic Editors, on page 137.

To use an align control in one of the GV Orbit Client's graphical editor tools:

1 Select a graphical object. (See Figure 3-44a.)

This will be the object that will be aligned to.

2 SHIFT-select one or more further graphical objects. (See Figure 3-44b.)

3 Click on an align control in the main tool bar.

The alignment is done to the first object selected. (See Figure 3-44c.)

a) Select an object to align to.   b) SHIFT-Select further objects.   c) Objects aligned.
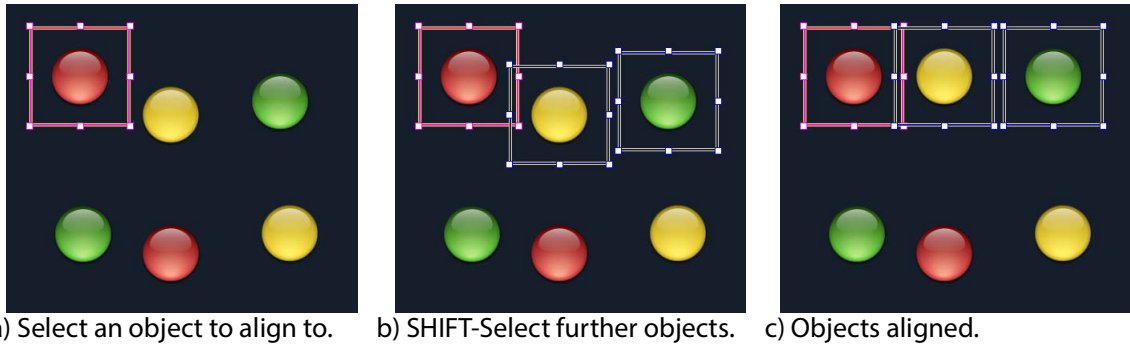
Fig. 3-44: Alignment Example

Align on a Grid

Use this control to arrange selected objects (see Figure 3-45a) in a grid arrangement.

In one of the GV Orbit Client's graphical editor tools:

1 Select all of the graphical objects to be arranged in a grid. (See Figure 3-45b.)

2 Click on the **Align to Grid** tool icon. (See Figure 3-45b.)

   'Align to Grid' controls are shown in the **Properties** box. (See Figure 3-45c.)

3 Set the following 'Align to Grid' control values:

   • **Num Rows** - number of rows required in the resulting grid of objects.
     (For example, = 3.)

   • **Row Spacing** - number of pixels between rows of the resulting grid.
     (For example, = 50.)

   • **Col Spacing** - number of pixels between columns of objects in the resulting grid.
     (For example, =20.)

4 Click **Apply**. (See Figure 3-45c.)

   The object alignment is done to the specified grid. (See Figure 3-44d and Figure 3-44e.)

a) Objects

Click Align to Grid

Selected objects

b) Select objects. Click Align to Grid icon.

c) Align to Grid settings in Properties box

d) Objects aligned to a grid.

e) Objects (deselected) aligned to a grid.
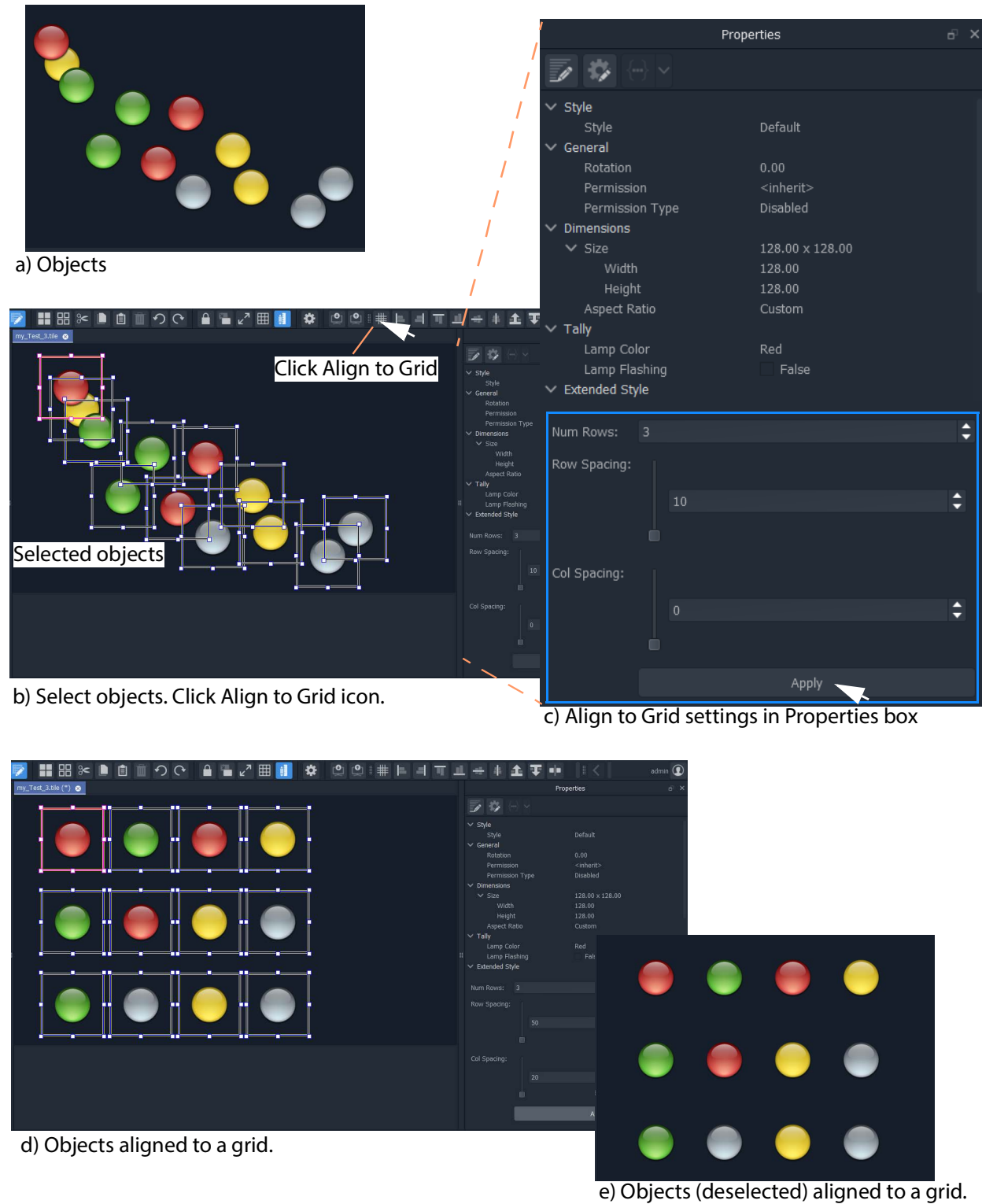
Fig. 3-45: Align to Grid Example

Common Operations in Graphic Editors

Selection/De-Selection of Objects in Graphic Editors

This section outlines actions to select and de-select objects in general in any of the graphic editors in GV Orbit Client. For example, in the Wall, Room, Tile, or Screen Editor tools.

Table 3-11: Object Selection / De-selection in a Graphic Editor

Action	Description
Click outside the schematic stage area.	Deselect All
ESC	
Click '**Deselect All**' in main tool bar.	
CTRL-A	Select All
Click '**Select All**' in the main tool bar	
Click on an item.	Select
ALT-Click on an item.	Select an alternative item from a layer-stack of items. Or: Select the group of objects that an item belongs to. (For information on groups of objects, see Selection Etc. in Groups of Objects, on page 138.)
SHIFT-Click on an item.	Add an item to the current selection. **Note:** When in a router control panel, SHIFT-click selects a contiguous range of sources are destination. For example, in the Routing Control - XY Routing Panel, in the Routing Control - XY Routing Panel, or in the XY Routing Sources screen of the MV Cluster - Room Editor.
CTRL-Click on an item.	Add an item to the current selection when in a **Room Editor** XY Routing Sources screen.
SHIFT-ALT-Click on an item.	Add another item to the current selection from a layer-stack of items.

Table 3-11: Object Selection / De-selection in a Graphic Editor

Action	Description
SHIFT-Click on an *already-selected* item.	Remove an item from the current selection
SHIFT-drag-cursor on screen to describe a rectangular area.	Select objects within a rectangular area. All objects wholly or partly within the area are selected.

Select All

Select All is accomplished via **CTRL-A** or by clicking a **Select All** button when in a graphic editor in GV Orbit Client.

General Select All

The **Select All** operation generally selects all objects on a wall or tile etc.

Select All in Some Screens of the Room Editor

However, in the **Room Editor** there is some flexibility built into **Select All** when in either the:

- **Design Layout** mode; or
- **X/Y Routing** mode.

In these **Room Editor** modes, then **Select All** is slightly modified:

- if nothing is selected, then
  Select All will select all multiviewer outputs of the video wall.
- if a video tile is selected in a multiviewer output, then
  Select All will select all tiles *just belonging to* that multiviewer output.

Selection Etc. in Groups of Objects

Grouping Objects Together

Graphical objects can be grouped together:

1 Select the objects. ('Select', and 'SHIFT-select' to add objects to selection.)
2 Right-click on the selected objects and select 'Group'. (See Figure 3-46a.)

   The objects are grouped together. (See Figure 3-46b.)

Selected objects   Right-click and select 'Group'
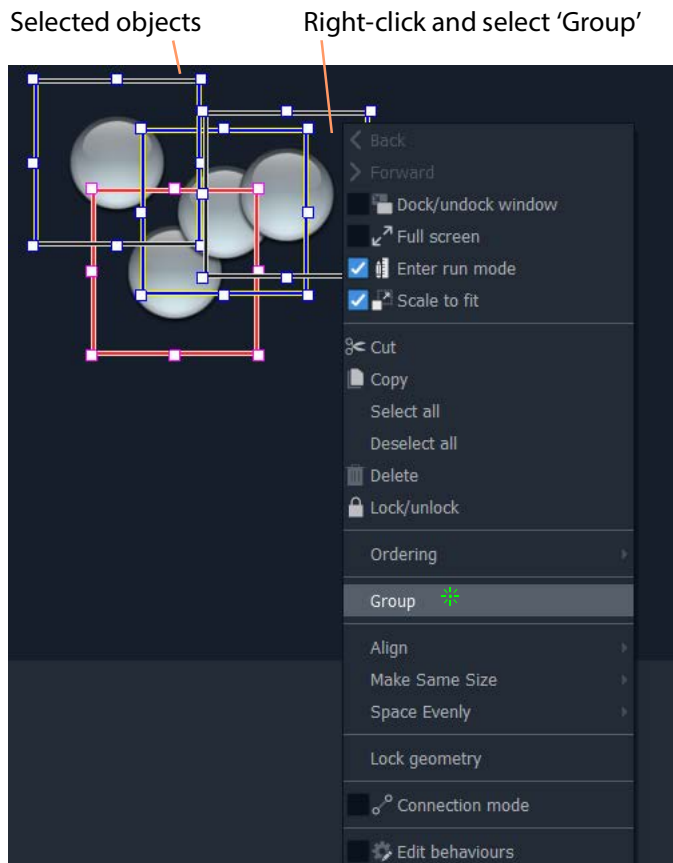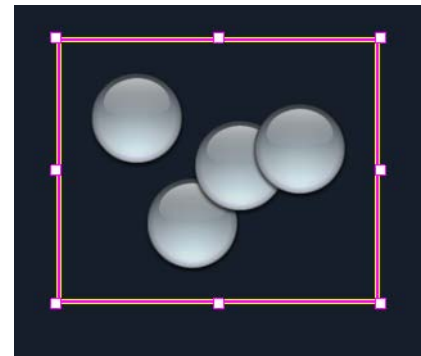
a) Selected objects   b) Grouped objects

Fig. 3-46: Grouping Objects

Un-Grouping Objects

Graphical objects can be un-grouped:

   1 Select the group of objects.
   2 Right-click and select 'Un-Group'.

Operations on Groups

Table 3-12: Operations on Groups of Objects

Action	Description
Select an object. Hold down Left-click and start to drag, and then additionally hold down SHIFT to drag into a Group.	Add an object to a Group. (Drag into a group.)
ALT-click to select an object in a group, and then hold Left-click and drag out of group.	Remove an object from a group. (Drag out of a group.)

Manage Users

Introduction

GV Orbit Client provides user access control to GV Orbit projects. This controls who can open a GV Orbit project in GV Orbit Client and what editing or operational actions they may perform. Users of a project will require different access to aspects of a project depending on their role.

The GV Orbit Client **Manage Users** screen enables project user roles and levels of user access to be set up and managed.

When opening a project, a user is prompted for a user name and a password when accessing a GV Orbit project.

Default Admin Username and Password

By default, only an 'admin' user is initially configured in a new project. The 'admin' user has full permissions.

Default   username   =   admin

Default   password   =   admin

Note: The 'admin' user has administrator role permissions which enable all operations within GV Orbit Client to be carried out.
The default 'admin' user password should be changed as soon as you log in for the first time, How to Change a User Password, on page 158.

Note: Administrator user passwords should be recorded and kept secure.

Note: The 'Users' described here in this chapter are GV Orbit Client users. These are *not* users for the GV Orbit Control application in GV Orbit, which utilizes a separate users and user setup. See User Management Task, on page 477.

Accessing the Manage Users Tab

The **Manage Users** tab is accessible in several ways:
- From the Workflow Screen.
- From the Project Home Page.
- From the Project Window.

From the Workflow Screen

To access the **Manage Users** screen from the GV Orbit **Dynamic System Orchestrator** workflow screen:

1 Click on the 'User Management' icon. See Figure 4-1.

The **Manage Users** tab is opened. See

Click **User Management** icon

Fig. 4-1: Workflow User Management Icon

From the Project Home Page

The **Manage Users** tab is accessible from a GV Orbit **Project Home** screen (for example, in a multiviewer project):

1 Start the GV Orbit Client application.

2 Open a (multiviewer) project and log in as an 'admin' user.

The GV Orbit **Project Home** screen is displayed.

3 Click on the large **Manage Users** icon. See Figure 4-2.

The **Manage Users** tab is shown. See

Manage Users Icon

Fig. 4-2: Manage Users icon on Home Screen

From the Project Window

The **Manage Users** tab is accessible from the GV Orbit Client **Project** window:

1 Start the GV Orbit Client application.

2 Open a (multiviewer) project and log in as an 'admin' user.

3 Clicking on the icon in the main tool bar (   ) toggles showing the **Project** window.

In the **Project** window:

4 Locate the name of the current project and expand the item.

5 Right-click on the 'db.users' item and select 'Open'. See Figure 4-3.

The **Manage Users** tab is shown. See Figure 4-4 on page 144.

Click to expand/collapse current project item

Right-click on 'db.users' item and select 'Open'.

Project window icon selected.

Current project item, expanded in **Project** window.
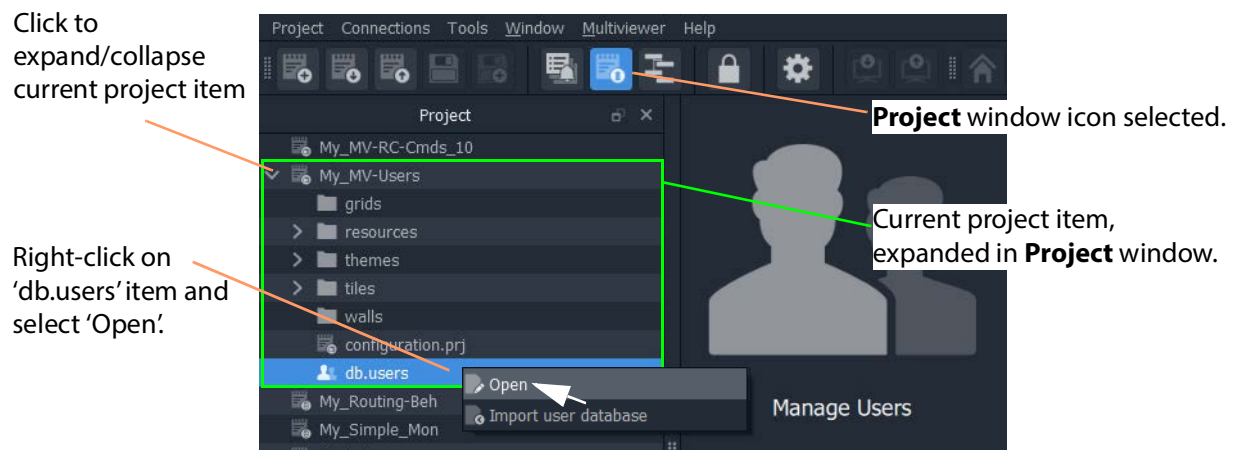
Fig. 4-3: Open Manage Users Tab from Project Window

Manage Users Tab

> **Note:** Managing users:
> Ensure that you are logged into the GV Orbit project with administrator permissions when managing users.

> **Note:** The logged-in User name is shown in the main tool bar of each GV Orbit Client screen.

Manage Users tab

db.users tab name,
click **x** to close tab

Click to log out of project and change user

User name shown
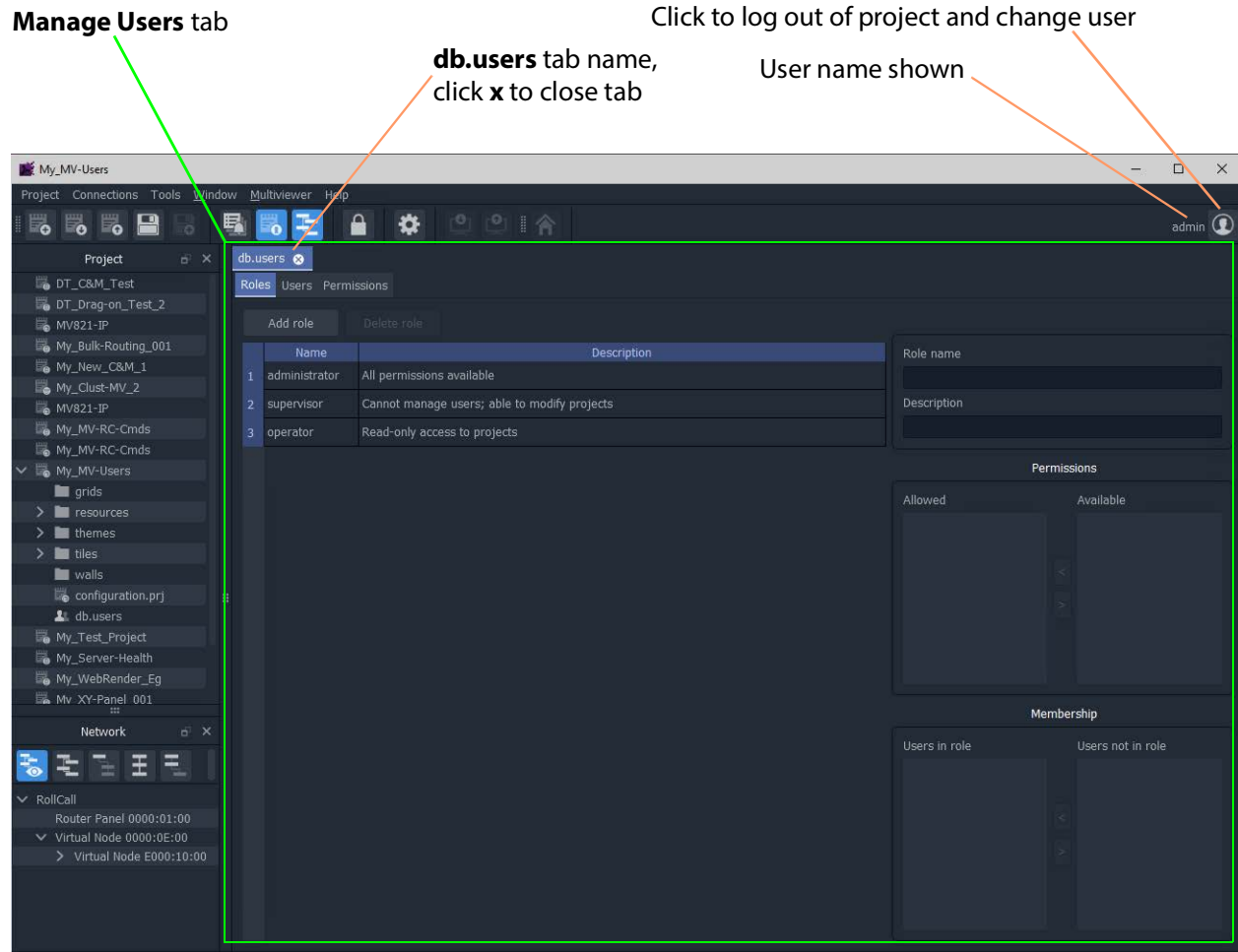
Fig. 4-4: Manage Users Tab ('Roles' Tab shown)

The **Manage Users** tab is labeled 'db.users' and contains the following 'sub-tabs':

- **Roles**.
- **Users**.
- **Permissions**.

A file with the name "db.users" appears in the **Project** window, see Figure 4-4.
This file contains encrypted project information, including user name and password details.

Changes to User Information

If a change has been made to settings in any of the **Manage Users** tabs,
an asterisk (*) is appended to the "**db.users**" label.

Save changes by:

1   Clicking the **Save File** icon in the GV Orbit Client main tool bar.

Change Logged-in User

When logged into a project as a user, it is possible to quickly log out and log back in as another user.

1 Start the GV Orbit Client application, open a project and log in.

The project opens in GV Orbit Client and the currently logged-in User name is shown in the main tool bar.

In the main tool bar:

2 Click the **Change User** icon ( ).

A **Change User** dialog is shown. See Figure 4-5.

3 Click **Yes** to log out and log in (as another user).

Click **Change User** icon to log out and change user

Current logged-in User name
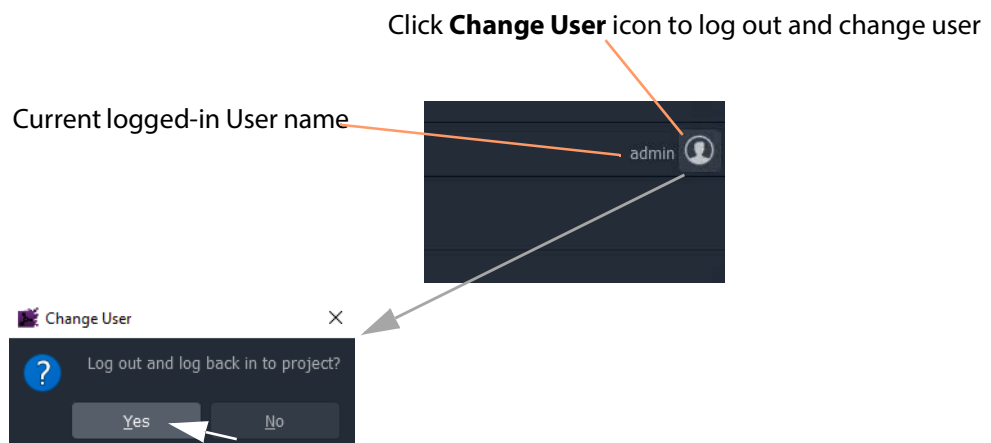
Fig. 4-5: User Name and Change Users Icon in Main Tool Bar

Roles Tab

To display the **Roles** tab in the **Manage Users** tab:

1 Click on the **Roles** tab.

The **Roles** tab lists the defined user roles for the GV Orbit project with a brief description of each, see Figure 4-6.

Select a listed **Role** for full role details.

List of defined User roles   Full details for selected **Role**
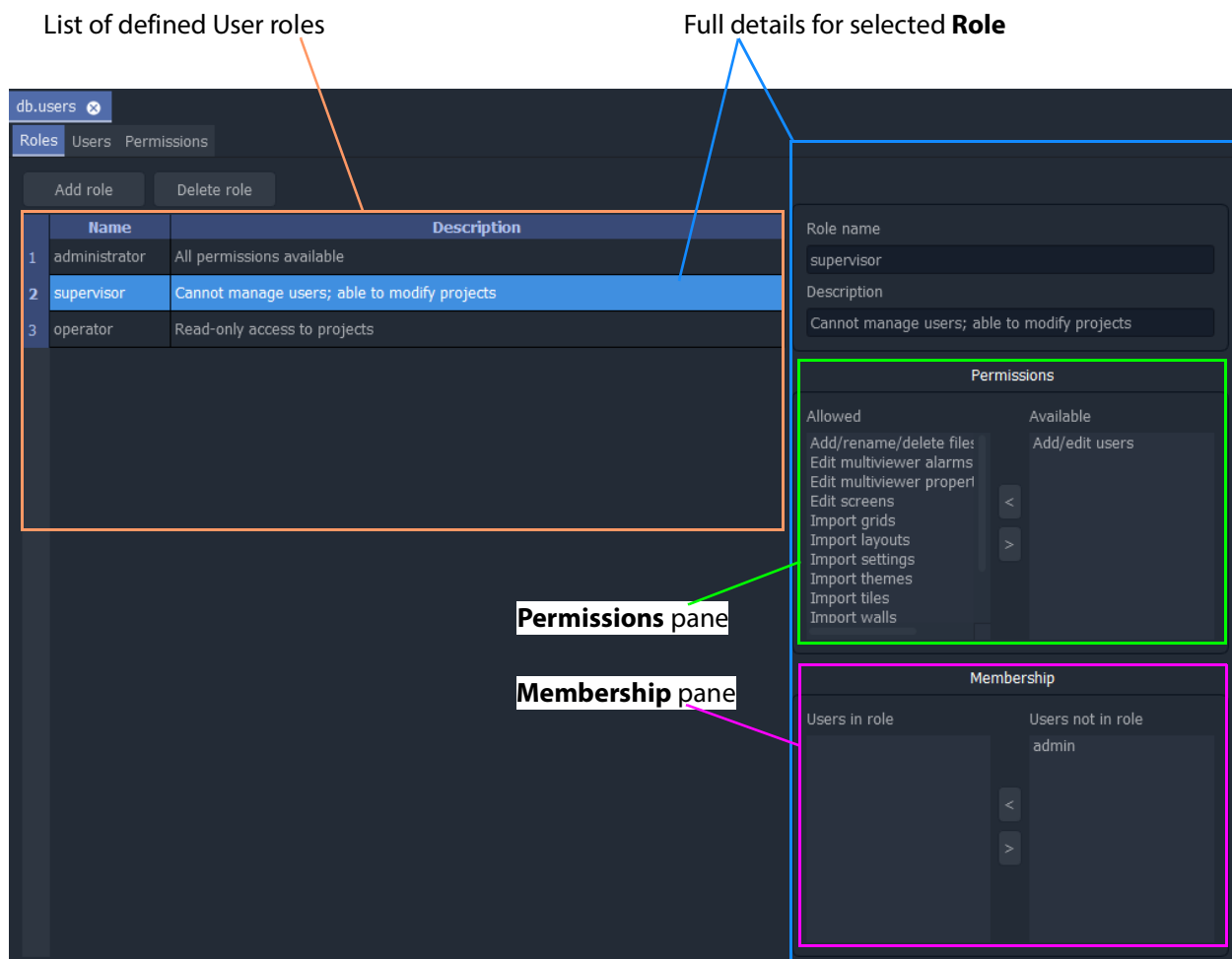
Fig. 4-6: Roles Tab

The **Roles** tab allows the roles to be viewed, created and edited; it is used to:

- Add and delete roles - New roles can be created and roles can also be deleted.
  See Roles Tab, on page 145.

- Edit permissions for each role - This defines which operations may be carried out in a role with the **Permissions** pane.
  See Edit Role Permissions, on page 151.

- Edit user roles - This assigns a role to each user name.
  See Roles Tab, on page 145.

Pre-defined User Roles

The following user **Roles** are configured by default in a new GV Orbit project:

- **Administrator** - role with all default permissions.
- **Supervisor** - role as administrator, but no user management role.
- **Operator** - role limited to read-only access to projects.

The permissions for each of these roles are listed in Figure 4-7.

a) Administrator

b) Supervisor
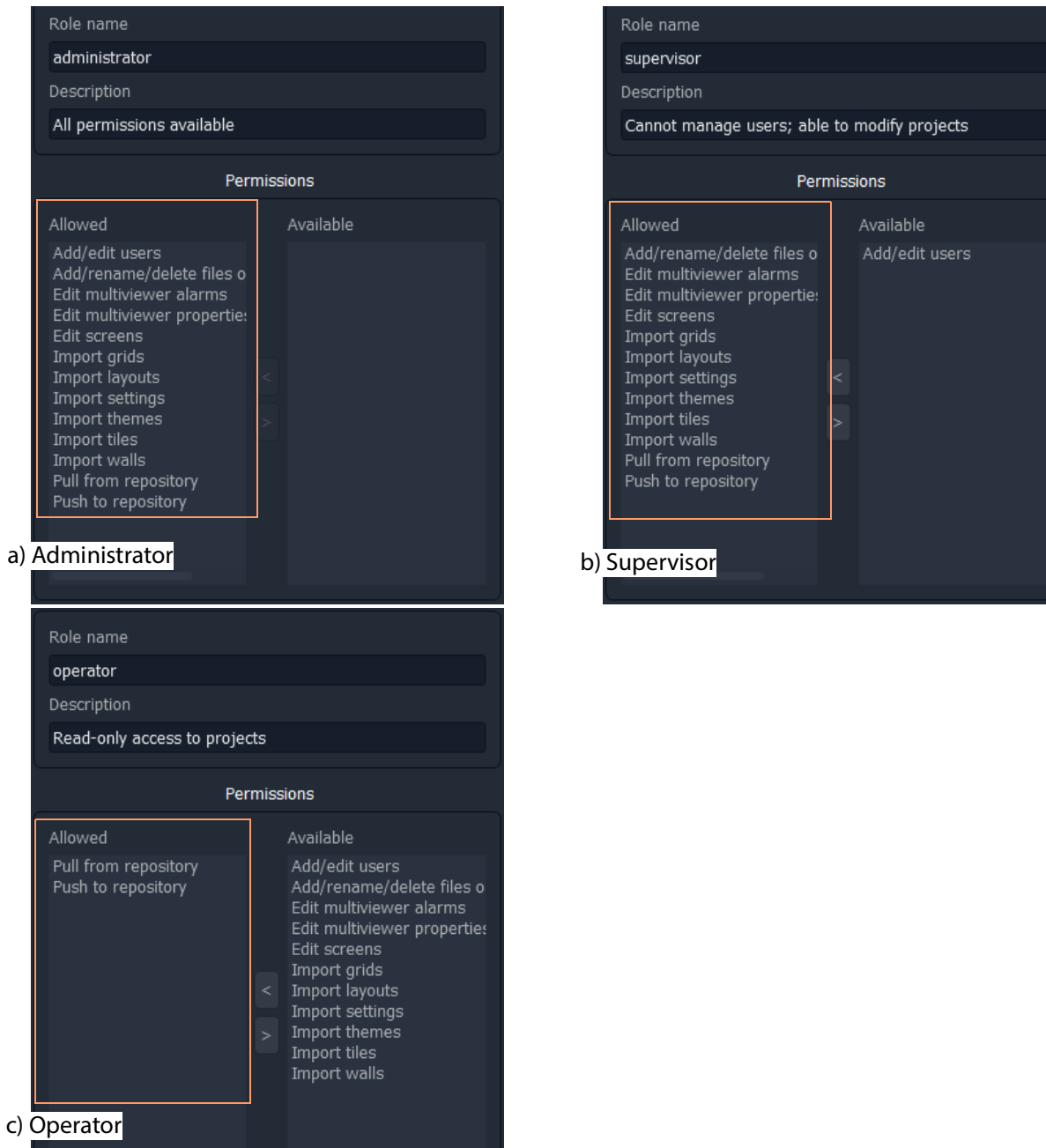
c) Operator

Fig. 4-7: Predefined User Role Permissions (Multiviewer project shown):
a) Administrator; b) Supervisor;   c) Operator.

Role Permissions (Permissions Pane)

A role's permissions are set up in the **Permissions** pane.

Permissions are operations that can be carried out on a GV Orbit project in the GV Orbit Client application. When applied to a user, they form the user's privileges, that is, what each user is allowed to do.

> **Note:** A default new project's 'administrator' role has permissions to
> add/edit users.

1 Select the **Role** in the list in the **Roles** tab.

Permissions information for the selected **Role** is shown in the **Permissions** pane.
Permissions that are 'allowed' for the role and others that are 'available' are listed in the
Permissions pane. See Figure 4-8.

> **Note:** The list of all permissions varies between GV Orbit project types.
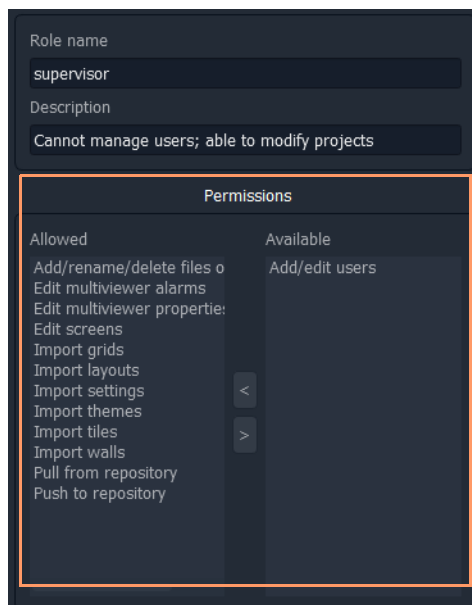
Fig. 4-8: Permissions (Supervisor Role in a Multiviewer Project Shown)

Table 4-1: Permissions - GV Orbit project types Multiviewer (MV)/ IP Routing (IP))

Permission	The ability to...	Project Type	
		MV	**IP**
Purge ALL	Purge all off-line devices.		IP
Change multicast options	Change automatic multicast assignment options.		IP
Export ALL	Export settings for all devices.		IP
Change flow options	Change the options used for automatic flow enabling.		IP
Assign device ports	Assign ports for a device.		IP
Assign ALL ports	Assign ports for all devices.		IP

Table 4-1: Permissions - GV Orbit project types Multiviewer (MV)/ IP Routing (IP))

Permission	The ability to...	Project Type	
		MV	IP
Edit source multicast	Edit individual multicast settings for a source flow.		IP
Enable flows for source device	Enable flows for a source device.		IP
Edit port number	Edit a port number for a spigot.		IP
Edit screens	Edit an X/Y Routing screen. Without this permission, when you open a MV Cluster Room File, you will be taken directly to the X/Y Routing Screen and GV Orbit Client will be put into full screen mode. You will only be able to switch Rooms, switch Room Layout and switch Monitor Layouts.	MV	
	Edit/create custom screens.		IP
Edit device name	Edit a device name.		IP
Import ALL	Import settings for all devices.		IP
Disable flows for source device	Disable flows for a source device.		IP
Edit port name	Edit a port name for a spigot.		IP
Enable source flow	Enable/disable individual source flows.		IP
Export device	Export settings for a device.		IP
Enable flows for all source devices	Enable flows for all source devices.		IP
Import device	Import settings for a device.		IP
Device control	Enable access to a device's configuration panel.		IP
Device upgrade	Enable access to upgrade a device's firmware.		IP
Clear multicast for source device	Clear multicast settings for a device.		IP
Clear multicast for all source devices	Clear multicast settings for all source devices.		IP
Assign multicast for source device	Assign multicast settings for a source device.		IP
Assign multicast for all dest devices	Set 1:1 or 1:All routes for all destination devices.		IP
Clear multicast for all dest devices	Clear multicast settings for all destination devices.		IP
Transfer device	Transfer settings from one device to another.		IP
Edit schematics	Modify video wall and tile designs.	MV	IP

Table 4-1: Permissions - GV Orbit project types Multiviewer (MV)/ IP Routing (IP))

Permission	The ability to...	Project Type	
		MV	IP
Import user database	Import a user database		IP
Clear device ports	Clear ports for a device.		IP
Disable flows for all source device	Disable flows for all source devices.		IP
Clear multicast for dest device	Clear multicast settings for a destination device.		IP
Edit destination multicast	Edit individual multicast settings for a destination flow.		IP
Assign multicast for dest device	Set 1:1 or 1:All routes for a destination device.		IP
Assign multicast for all source devices	Assign multicast settings for all source devices.		IP
Change comms settings	Change network domain and change IP interfaces.		IP
Purge device	Purge an off-line device.		IP
Pull from repository	Move a project from a product unit to GV Orbit Client. For example, pulling a project from a multiviewer.	MV	
Push to repository	Move a project from GV Orbit Client to a product unit. For example, pushing a project to a multiviewer.	MV	
Add/rename/delete files or folders	Manage project files and folders.	MV	
Edit multiviewer properties	Edit properties for video wall themes, tiles and walls.	MV	
Edit multiviewer alarms	Create and delete alarms.	MV	
Add/edit users	Manage users and roles.	MV	
Import themes	Import themes into a project from another GV Orbit Client project.	MV	
Import walls	Import walls into a project from another GV Orbit Client project.	MV	
Import layouts	Import wall layouts into a project from an GV Orbit Client project.	MV	
Import settings	Import project settings from another GV Orbit Client project.	MV	

Table 4-1: Permissions - GV Orbit project types Multiviewer (MV)/ IP Routing (IP))

Permission	The ability to...	Project Type	
		MV	IP
Import tiles	Import tiles into a project from another GV Orbit Client project.	MV	
Import grids	Import grids into a project from another GV Orbit Client project.	MV	

Edit Role Permissions

To edit the permissions for a **Role**:

1 Select a permission on the **Permissions** pane. See Figure 4-9.

2 Click **>** or **<** in the pane to move the selected Permission to/from the set of 'allowed'/'available' permissions for the role.

3 Add/remove permissions as required.

When done:

4 Click **Save File** icon in the main menu to save changes.
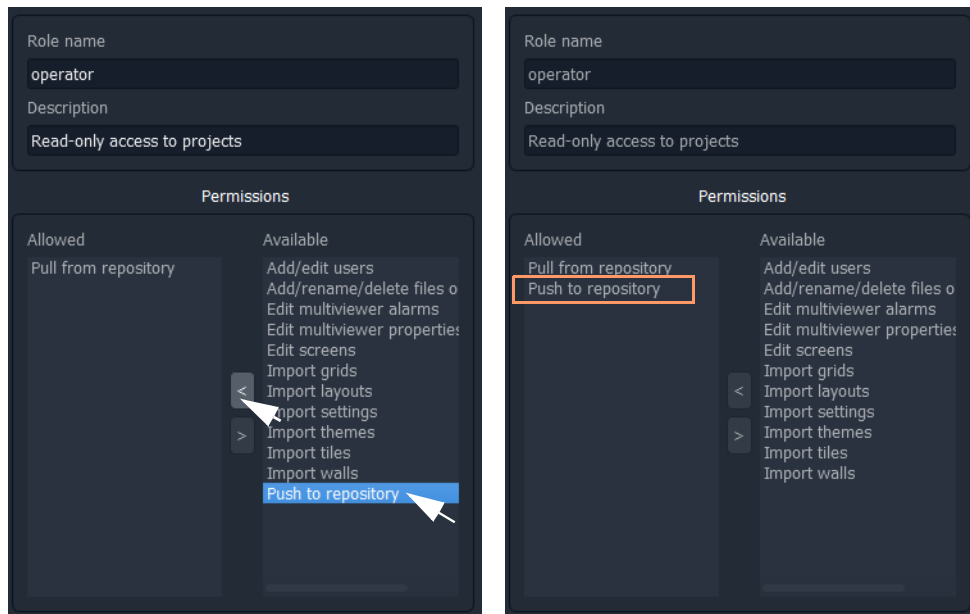
Fig. 4-9: Edit Role Permissions

Assign Users to Roles (Membership Pane)

The **Membership** pane displays the following for the selected **Role**:

• User names assigned in the role - These are listed in the "**Users in Role**" list.

- User names not assigned in the role - These are listed in the "**Users not in Role**" list.

To assign a role to a user, in the **Roles** tab,

1 Select a **Role** in the list.

This selects a role to be edited. (See Figure 4-10.)
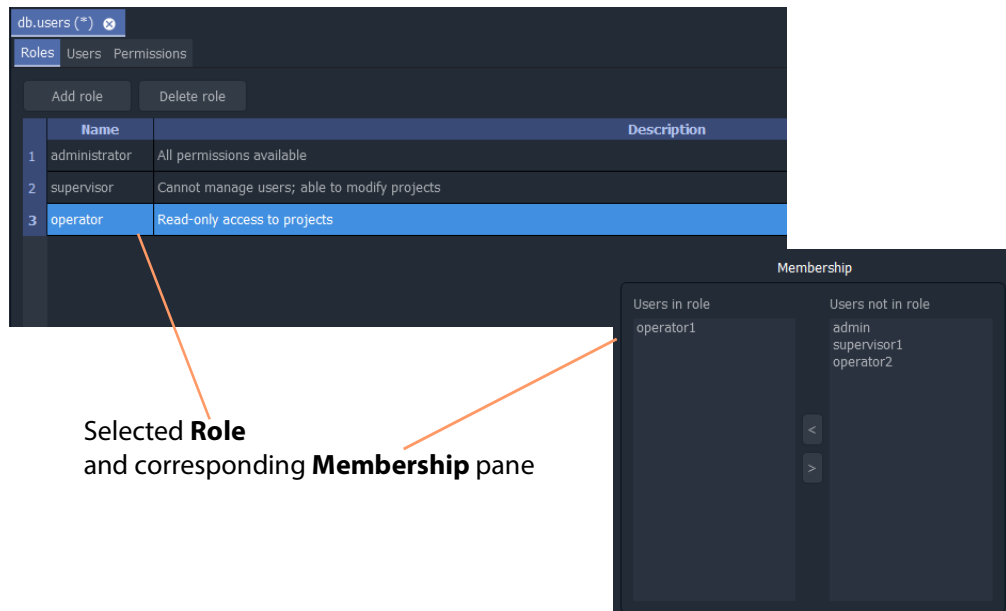
Selected **Role**
and corresponding **Membership** pane

Fig. 4-10: Selected Role and Membership Pane

To assign a user into a role:

2 Click on the user name item in the "**Users not in Role"** list to select an user.
(More than one user may be selected. To deselect an item, click on the selected item.)

3 Click on the **<** button to add the selected user name(s) to the "**Users in Role"** list.

The selected user(s) move from the "**Users not in Role"** list to the "**Users in Role"** list.

To remove a user from a role:

4 Select the user name item in the "**Users in Role"** list.

5 Click on the **>** button to remove it from the "**Users in Role"** list.

The selected user name moves to the "**Users not in Role"** list.

Lastly:

6 Save any changes by clicking on the **Save File** icon in the main menu.

How to Delete Roles

Note: A user will lose permissions if they are assigned to a role when the role is deleted. Ensure that no users are assigned in any role to be deleted.

To delete a **Role**, in the **Roles** tab:

1 Select the **Role** to be deleted.
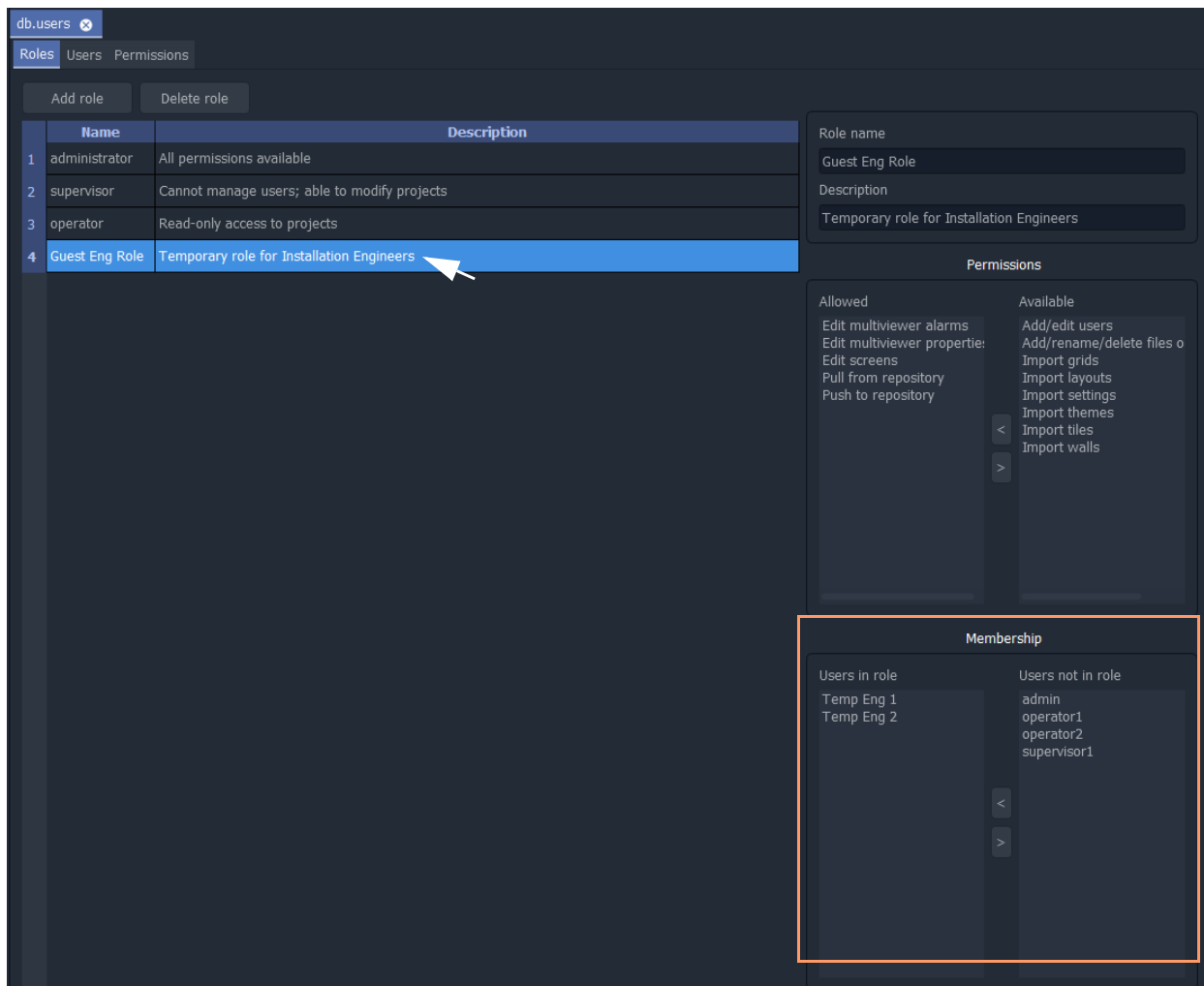
Fig. 4-11: Select a Role for Deletion

2 Review the **Role**'s user details in the **Membership Pane**.

Before deleting a **Role**, there should be no users assigned to that **Role**.

3 Remove any users from the role using the **Membership Pane**.
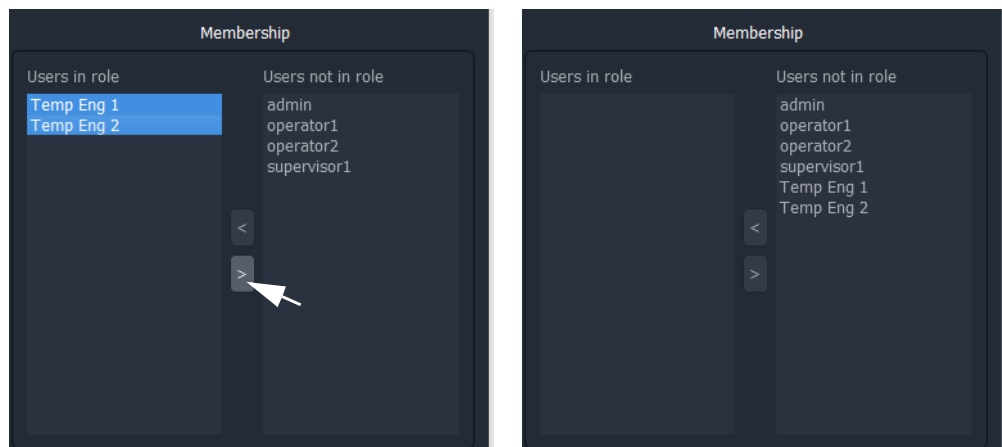
Fig. 4-12: Remove All Users from the Role

4 Click on the **Delete Role** button, see Figure 4-13.

A confirmation **Delete Role** dialog box will appear.
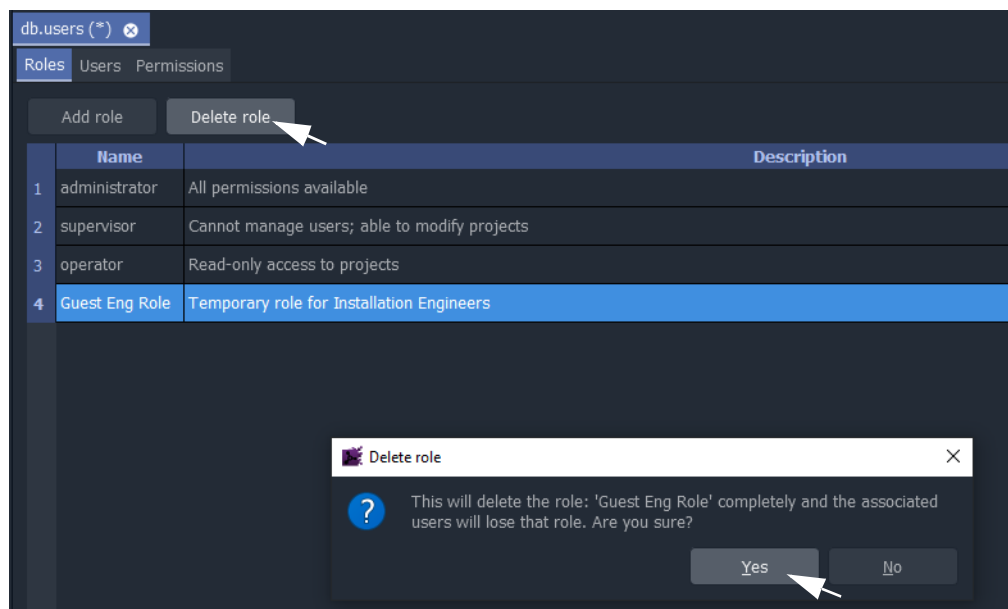
Fig. 4-13: Delete Role

5 Read the message in the dialog.
If you wish to proceed, click "**Yes**" to confirm that the role should be deleted, otherwise, click "**No**".

The **Role** is deleted from the **Roles** tab.
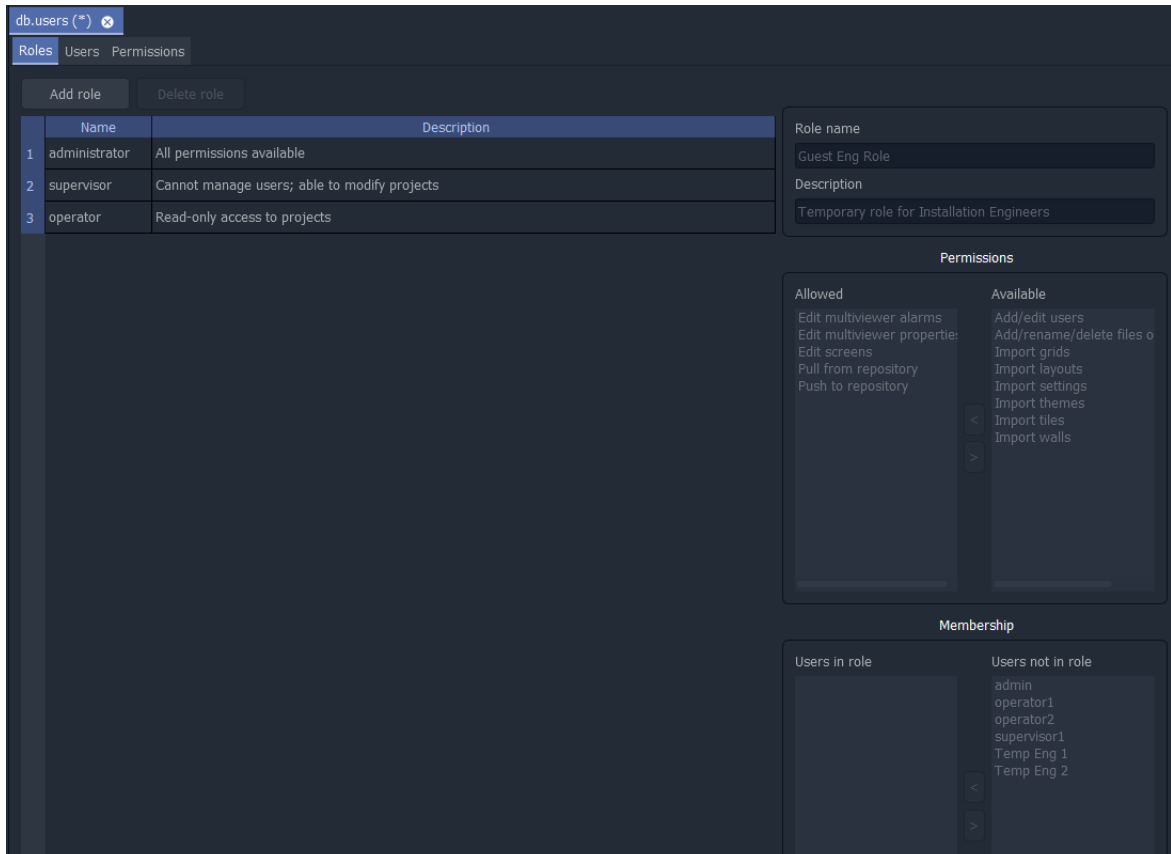
Fig. 4-14: Deleted Role

6   Save any changes by clicking **Save File** icon in the main tool bar.

How to Add a Role

New roles can be added. In the Roles tab:

1   Click **Add New Role**.

A new blank role item is added to the bottom of the roles list in the **Roles** tab.

New blank role item
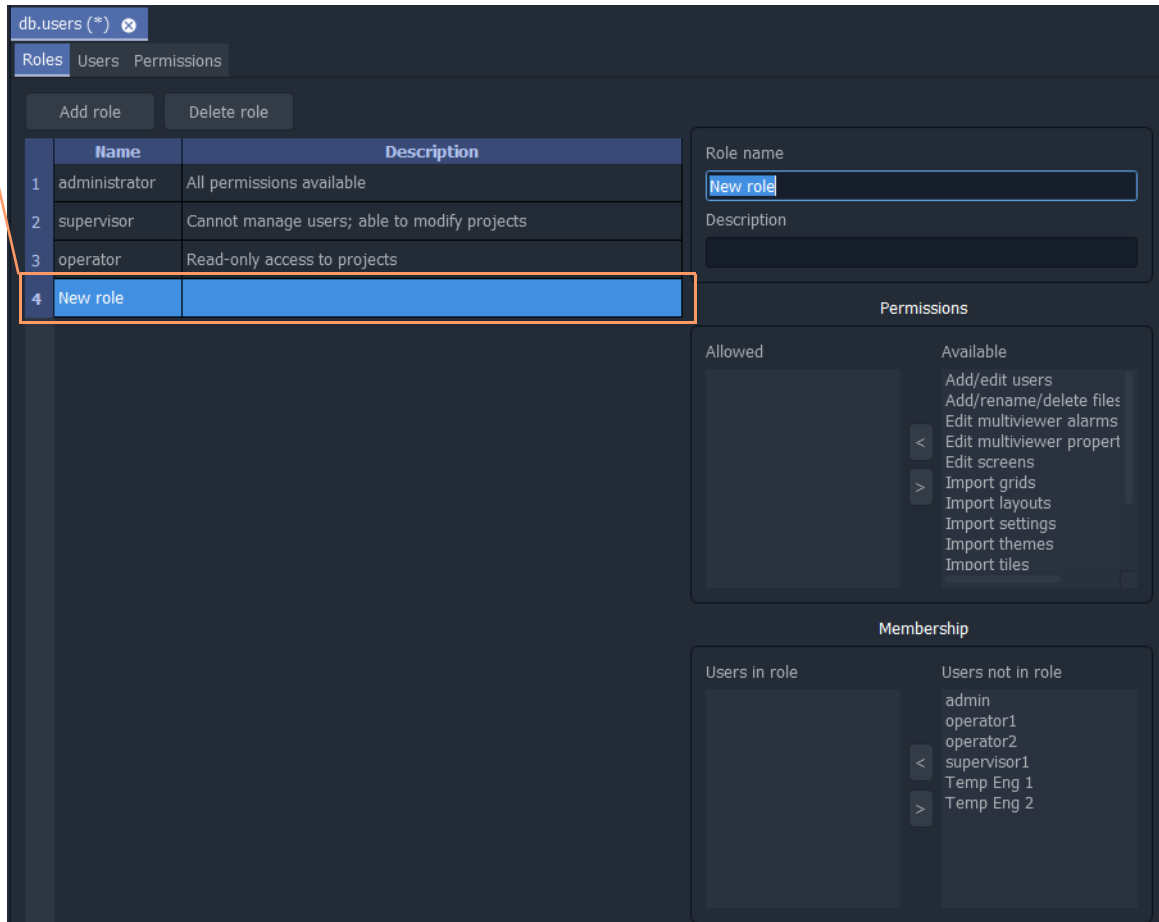
Fig. 4-15: Adding Role

On the right-hand side of the screen:

2 Enter a name for the new role in the **Role name** text box. Use a short, descriptive name. (Use characters 'a' to 'z', 'A' to 'Z', 'space' and '0' to '9'.)

3 Enter a brief description of the role in the **Description** text box.

The new role's name and description are shown in the list of roles.

4 With the new role highlighted, add the permissions required
- see Role Permissions (Permissions Pane), on page 147.

5 With the new role still highlighted, assign any users
- see Assign Users to Roles (Membership Pane), on page 151.

6 Save any changes by clicking **Save File** icon in the main tool bar.

A finished new role screen is shown in Figure 4-16.
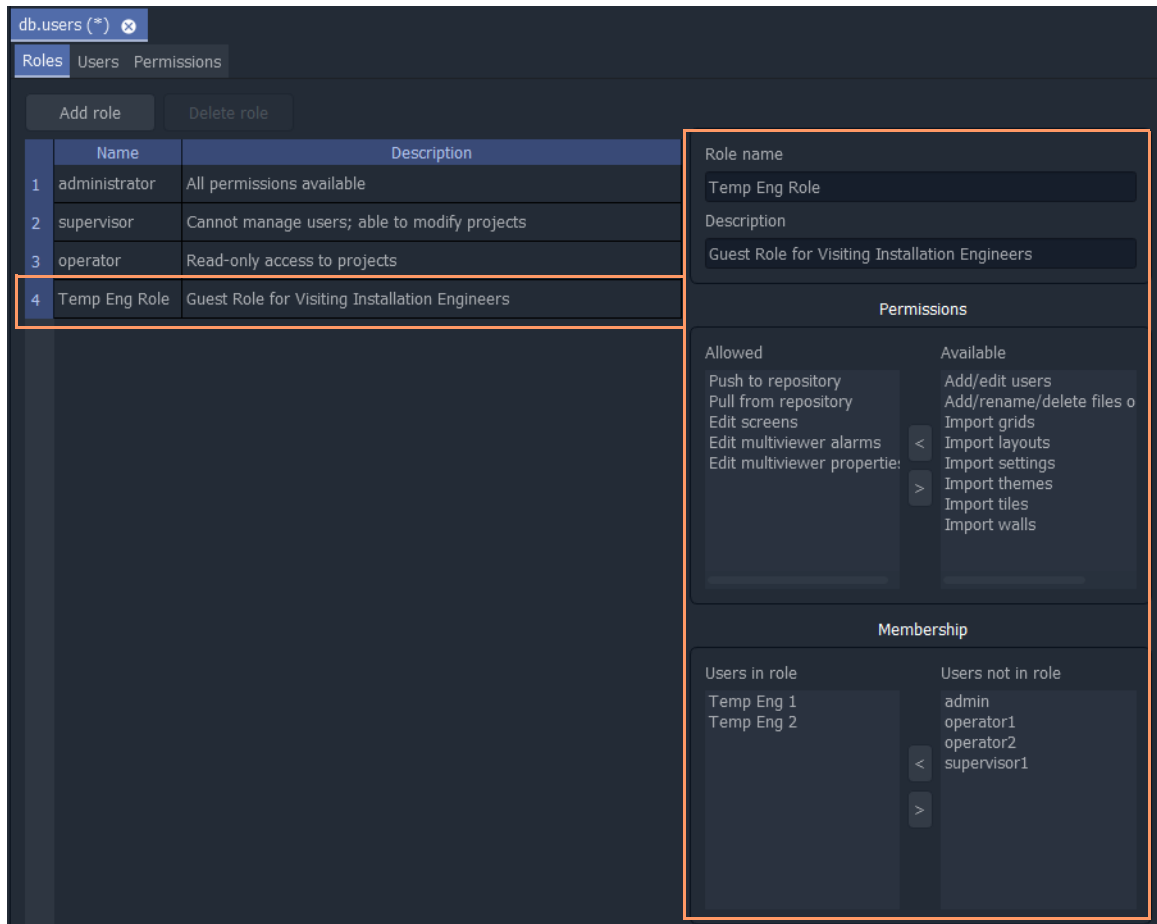
Fig. 4-16: New Role Added

Users Tab

Click on the **Users** tab at the top of the **Manager Users** tab to display the **Users Tab** tab, see Figure 4-17. The users of a GV Orbit project can be viewed, edited and created. Users are listed in the main screen area in a graphical **Users List** - a list of icons.

The **Users** tab is used to:

- Change the password of an existing user, see How to Change a User Password.
- Add a new user, see How to Add a User.
- Delete an existing user, see How to Delete a User.

Users tab   Users List (Icons)   User Name   Change Password button

User Roles list
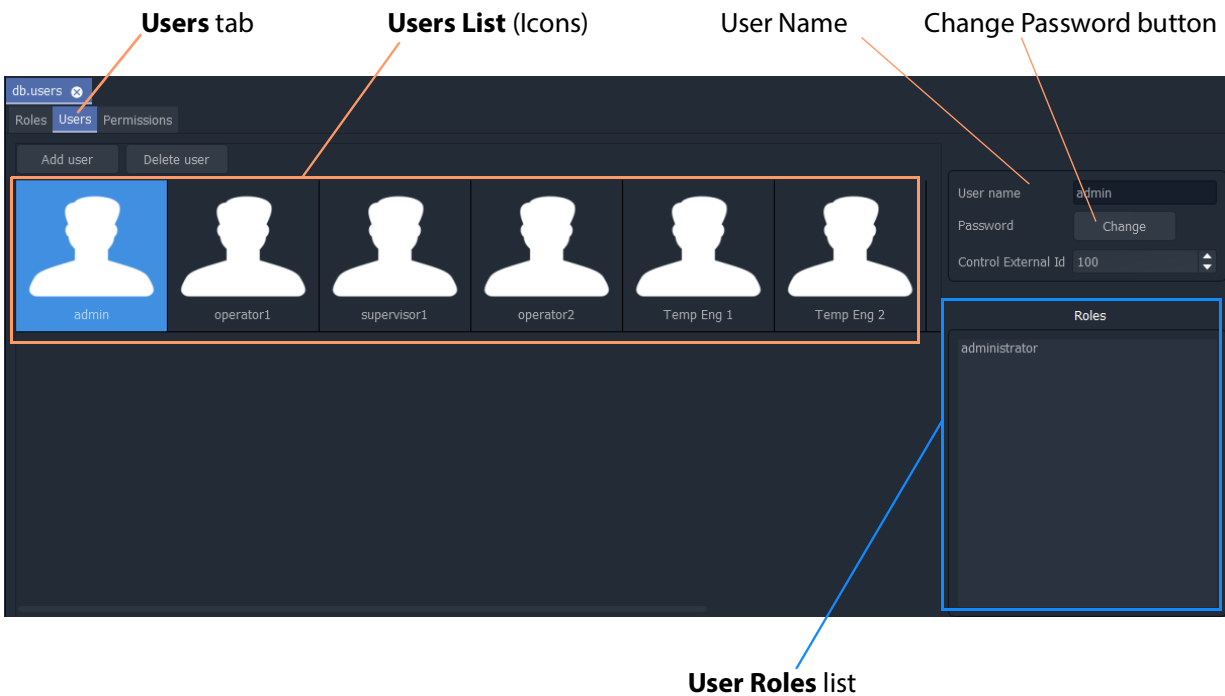
Fig. 4-17: Users Tab

Pre-defined Users

Initially, in a new GV Orbit project, a user named 'admin' is already defined with full administrator role permissions. This enables all operations within GV Orbit Client to be carried out.

Default username - admin

Default password - admin

The default password for user 'admin' should be changed as soon as you log into a new project, see section .

Record the user names and passwords somewhere safe and secure.

Note: Keep a record of the administrator user name and password used.

How to Change a User Password

In the **Users** tab:

1 Click on a user icon in the **Users List**.

This selects the user to be edited.

2 Click on the **Change** button, located below the **User name** text box.

The change password dialog is displayed. See Figure 4-18.
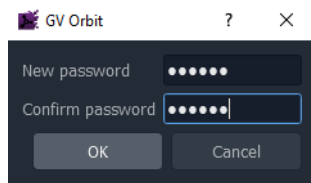
a) Add Password for a new user
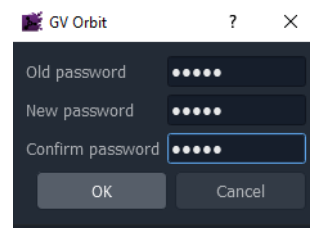
b) Change Password for a user

Fig. 4-18: Change Password Dialogs

3 Enter the original password in the **Old password** text box, if this is shown.
Enter the new password in both the **New password** text box
and also in the **Confirm password** text box.

4 Click **OK** to change the password or click **Cancel** to abandon the change.

If a new password has been set, a "Password changed successfully" message is
displayed; click **OK**. See Figure 4-19.
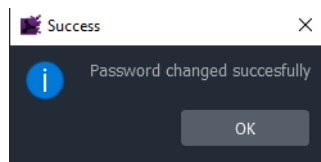
Fig. 4-19: Password Changed Successfully Message

5 Save any changes by clicking **Save File** icon in the main tool bar.

How to Add a User

In the **Users** tab:

1 Click **Add User**.
A new **User Icon** appears in the graphical **Users List**. See Figure 4-20.

User name text box

New **User Icon**

Set/change **password** button

Control External Id
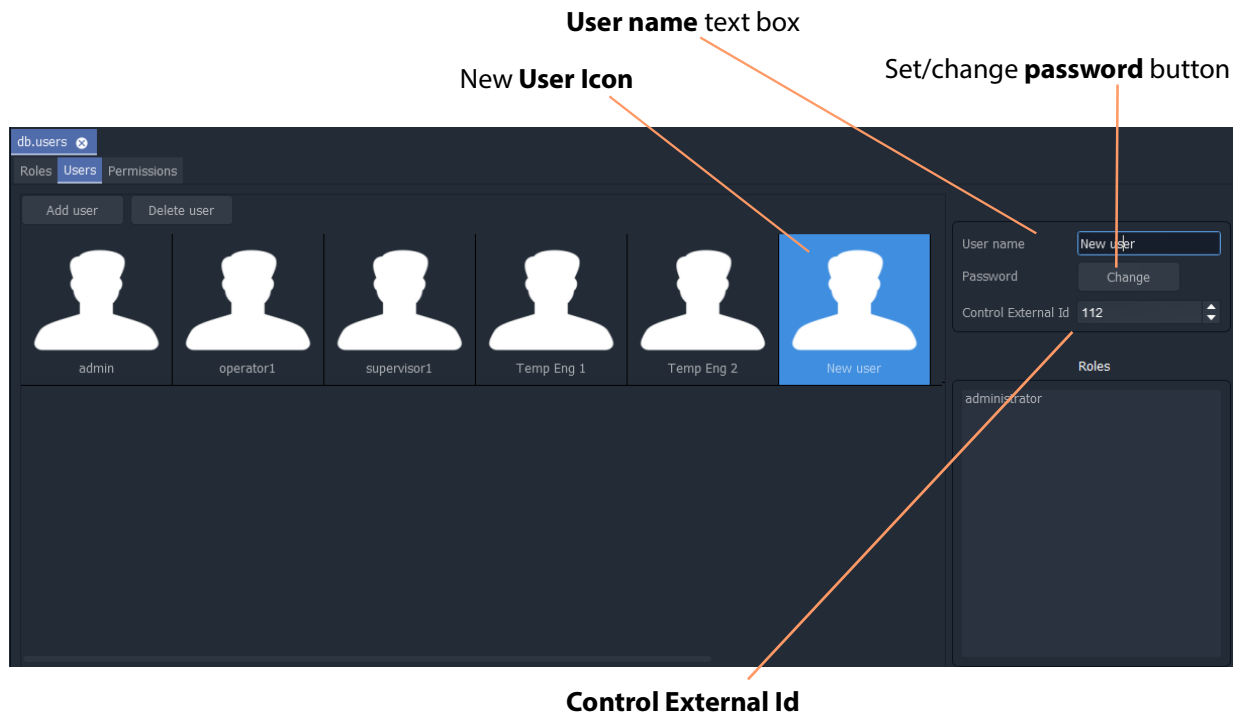
Fig. 4-20: Adding a New User

2 Enter a name for the new user in the **User name** text box.
(Use characters 'a' to 'z', 'A' to 'Z', 'space' and '0' to '9'.)

3 Click on the **Change** button below the **User name** text box.

The **Set New Password** dialog is displayed.

4 Enter a new password in the **New password** text box
and re-enter it in the **Confirm password** text box.

5 Click **OK** to set the password, or click **Cancel** to abandon the change.
If a new password has been set,
a "Password changed successfully" message is displayed; click **OK**.

6 Set the **Control External Id**:

- If this user is to have a User ID when using the GV Orbit Routing service, set the **Control External Id** that they are to use in their NP0017 router control protocol communications with GV Orbit Control.

- So that users with different **Control External Id**s cannot release a destination locked by another user or panel user; in GV Orbit Client, each user can be assigned a **Control External Id**. Users with a different **Control External Id** cannot release a destination locked by another with a different **Control External Id**. The admin user or a user with an **Control External Id** set to 0 can override locks set by any other user.

In all cases, you must ensure that the User IDs are coherent between GV Orbit Client and GV Orbit Control. To do this, see Setting a User ID for Lock, Protect, and Release with NDAC NP0016 / NP0017 Northbound Interfaces, on page 487.

7   Save any changes by clicking **Save File** icon in the main tool bar.

A new, empty user has been created.

To assign the user to **Role**(s), see Assign Users to Roles (Membership Pane), on page 151.

How to Delete a User

In the **Users** tab:

1   Click on a **User Icon** in the **Users List** to select the user to be deleted.

2   Click on the **Delete user** button.

A confirmation message dialog box appears.

3   Click **Yes** to confirm user deletion, or click **No** to abandon deleting the user.
   If the user is deleted, the corresponding user icon disappears from the **Users List**.

4   Save any changes by clicking **Save File** icon in the main tool bar.

Permissions Tab

The **Permissions** tab lists the available **Permissions** with a brief description of each.

Permission types:

- **Built-in** - By default, a project has built-in Permissions, which are project-type-dependent.
- **User** - Additionally, a user can create custom **Permissions** for use.

To see the Permissions tab:

1   Click on the **Permissions** tab in the **Manage Users** tab to display the **Permissions** tab.

Fig. 4-21: Permissions Tab

Custom User Permissions

Custom 'user' permissions can be created alongside the existing 'built-in' permissions and they can be assigned to roles. These allow user access/privileges to be tailored to operational needs.
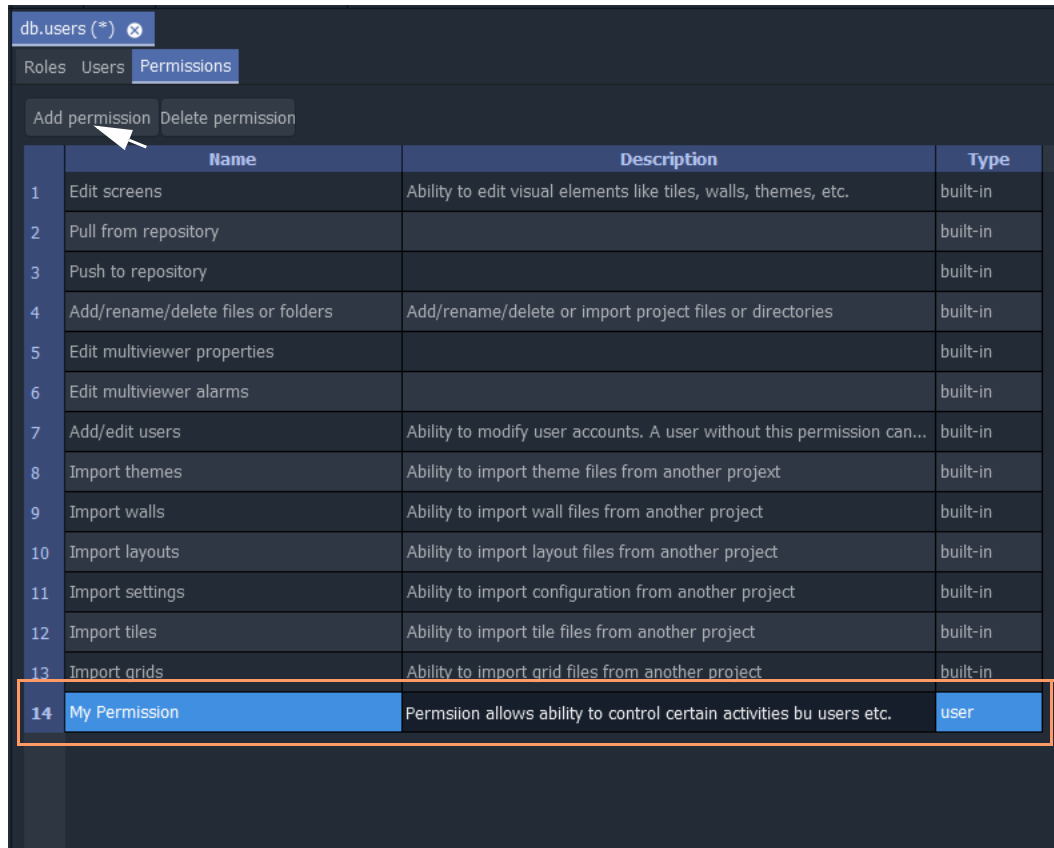
A custom user **Permission** is automatically given to the 'administrator' **Role**.

Access-control to GV Orbit Client project screens or to on-screen graphical widgets can be designed into an GV Orbit Client project using custom 'user' permissions.

Add Custom User Permission

In the **Permissions** tab:

1   Click **Add Permission**.

    A new item is added to the list.

2   Enter a name and enter a brief description for the new custom **Permission**. See Figure 4-22.

3   Save any changes by clicking **Save File** icon in the main tool bar.

Fig. 4-22: New Custom User Permission

See Using a Custom User Permission.

Using a Custom User Permission

Permission Properties

In a GV Orbit Client project, a GV Orbit control and monitoring screen can be designed to implement access control for:

- GV Orbit Client project screens; or for
- on-screen graphical widgets (for example, buttons).

This is accomplished by utilizing a screen's or a widget's 'Permission' properties. See Figure 4-23.
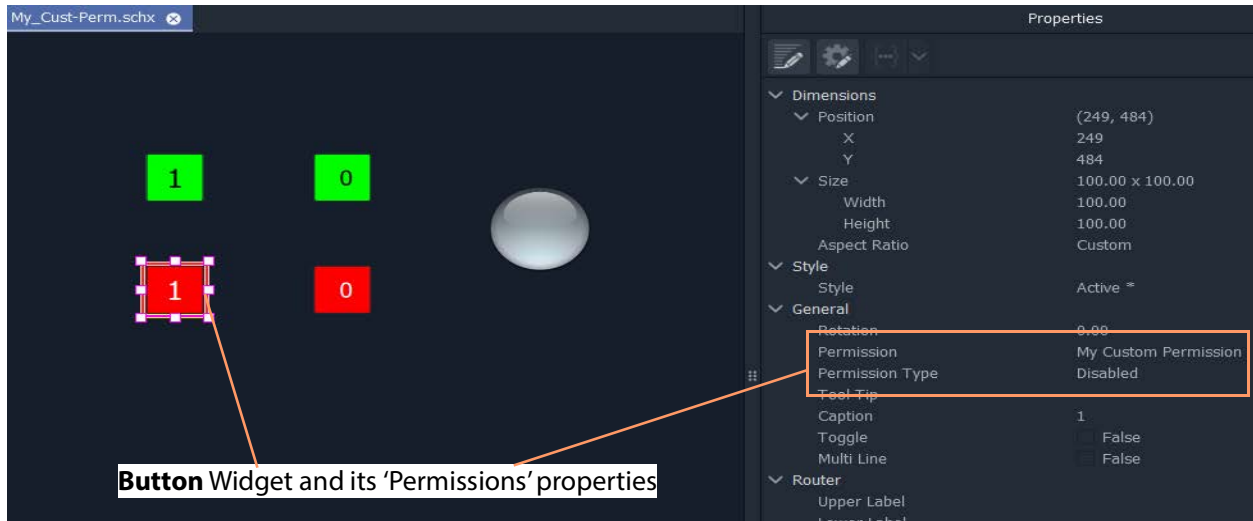
Fig. 4-23: Permission Properties (Widget shown)

Table 4-2: Widget Permissions Properties

Property	Description
General > Permission	Specify the **Permission** required by the widget user. Select from: • <none> - no **Permission** required. No access control. • <inherit> - use the **Permission** of the parent MapView screen/component/widget. • built-in permissions - list of all built-in **Permissions**. • user permissions - list of all custom user **Permissions**.
General > Permission Type	Set how the on-screen widget is affected if logged-in user does *not* have specified **Permission**: • **Disable** - Widget on-screen control is disabled. • **Hidden** - Widget is hidden from view.

A user's '**Role**', which will include or exclude various permissions, can determine whether a logged-in user:

• may use a widget or access screens in a running GV Orbit Client project; and
• how a widget appears on-screen (disabled or hidden).

This facility could, for example, control access to a MapView screen with certain operationally-sensitive controls and limit them to logged-in users whose role includes a certain (custom) permission.

Access Control Example - MapView C&M Screen

This is a simple, contrived example on a C&M 'MapView' screen to demonstrate controlled access to a **Button** widget.

In our example:

1 A custom 'user' **Permission** has been defined ('My Custom Permission').

2 Four **Button** widgets have been configured to turn a **Lamp** widget on/off (see Figure 4-24):

   • Two (green-colored) **Buttons** control the **Lamp** widget on/off green.

     The **Button** widgets do *not* have any specific **Permissions** properties set.

   • Two (red-colored) **Buttons** control the same **Lamp** widget on/off red.

     These **Button** widgets require a logged-in user to have a specific, 'user' **Permission** set up.

3 There are two **Users** set up for this example (see Figure 4-25):

   • User 'admin' has an administrator **Role**, which includes all **Permissions**, 'built-in' and 'user'.

   • User 'supervisor 1' has a supervisor **Role** which does not include a custom user **Permission.**

When this C&M project is run, the resulting on-screen behavior is shown in Figure 4-26. A user without the custom 'user' Permission only sees some grayed-out buttons and is unable to access them.
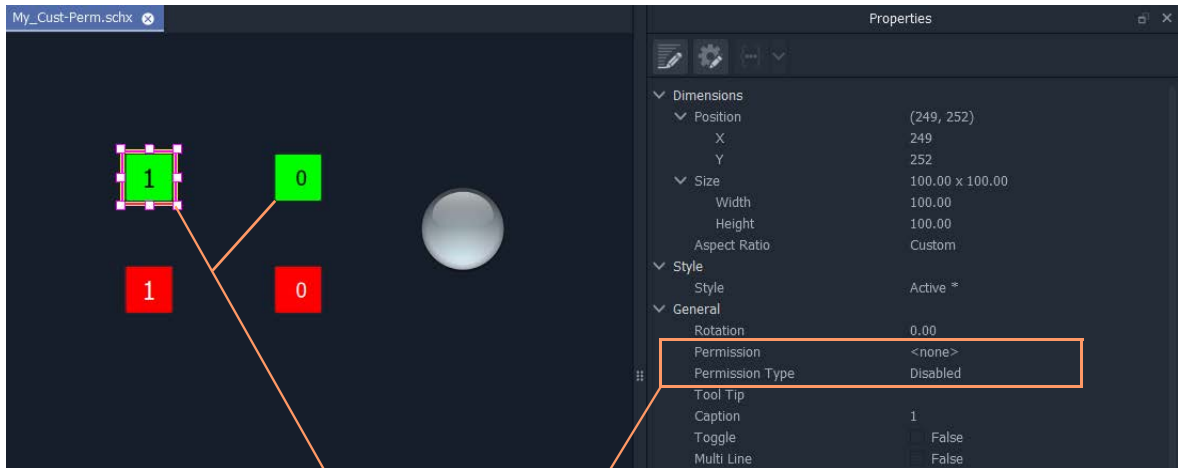
Button widgets *without* any specific Permission set.

Button widgets *with* a specific, custom 'user' Permission set up.
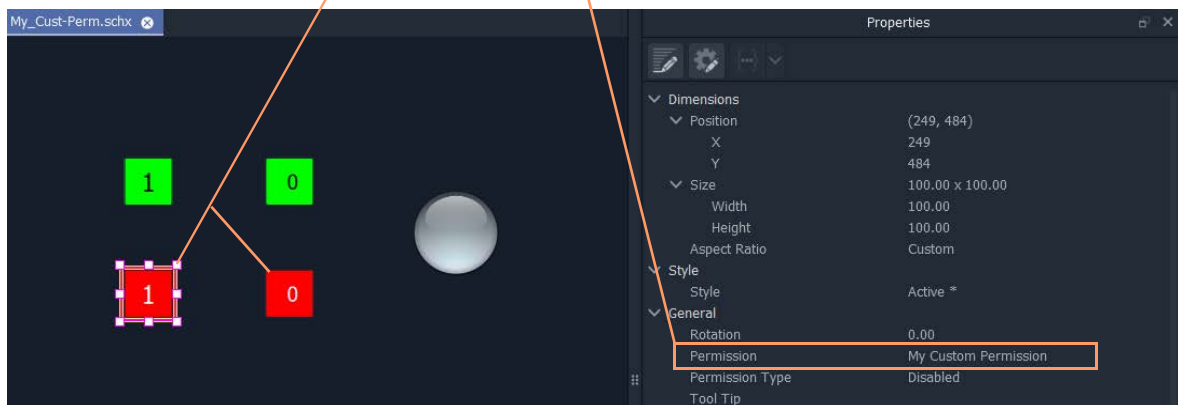
Fig. 4-24: C&M Screen Widget Access Control Example - Buttons
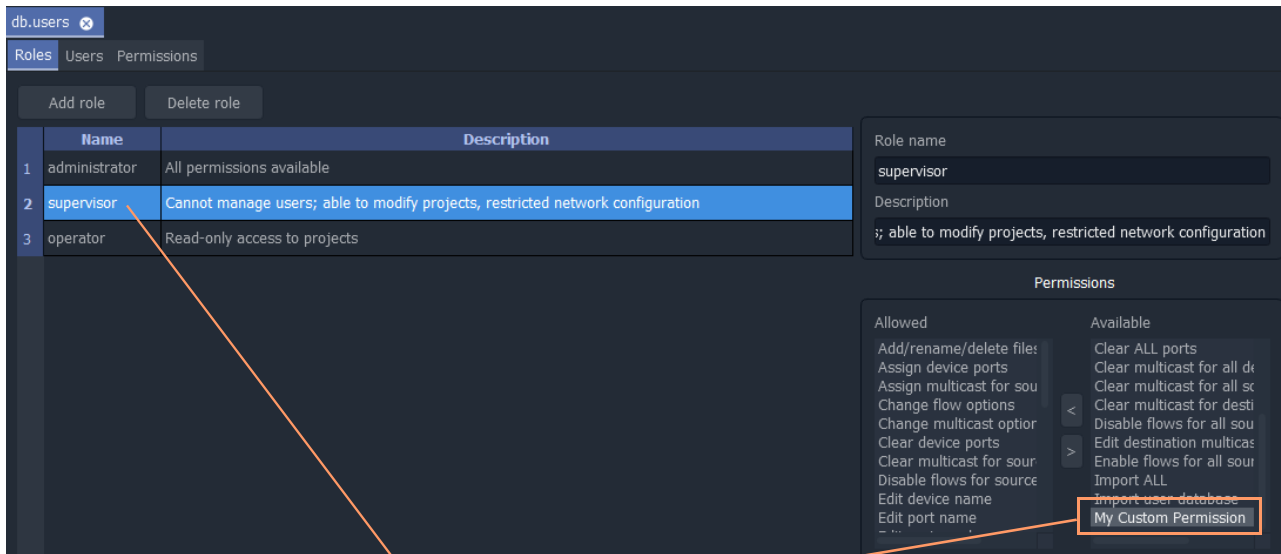
a) supervisor **Role**, *without* custom Permission

b) administrator **Role**, *with* custom 'user' Permission
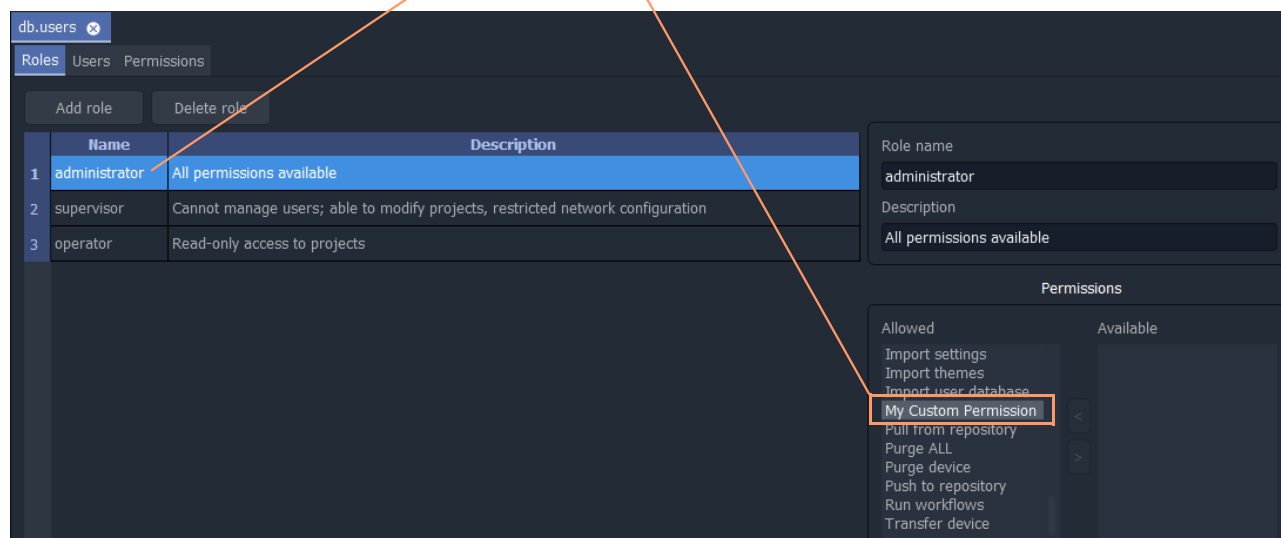
Fig. 4-25: C&M Screen Widget Access Control Example - Users:
a) Supervisor;
b) Administrator.
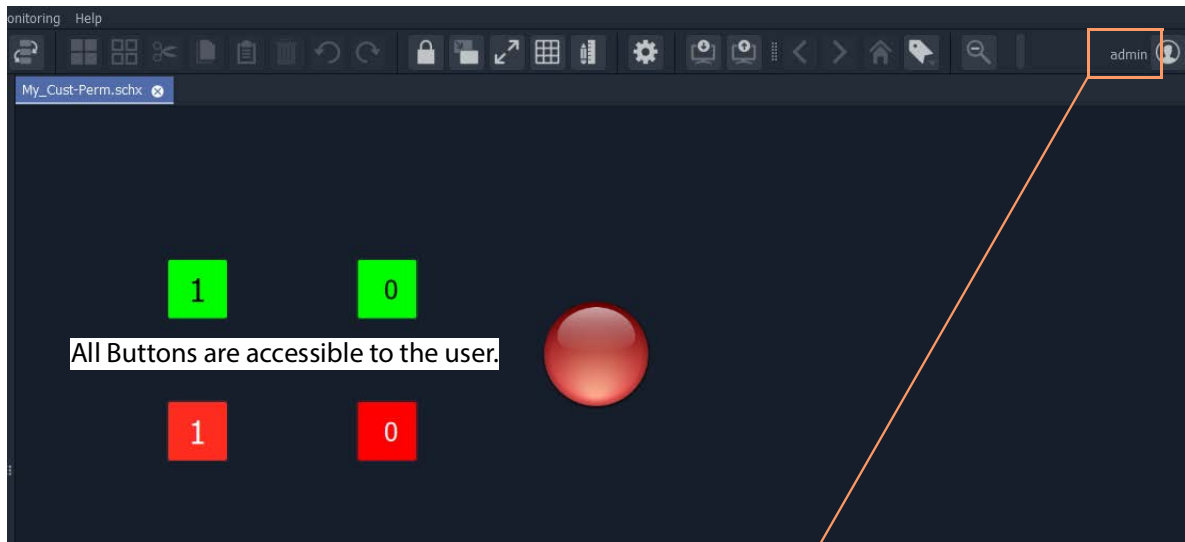
a) Project run when logged in with 'administrator' role

b) Project run when logged in with 'supervisor' role
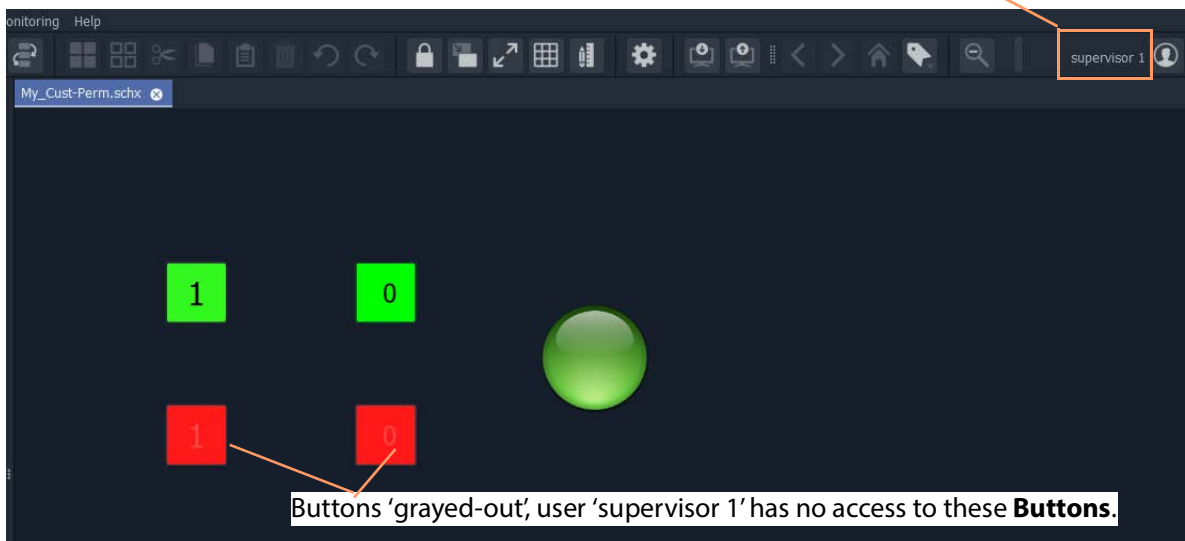
Fig. 4-26: C&M Screen Widget Access Control Example - Running:
a) Logged in as 'administrator' role;
b) logged in as 'supervisor' role.

Getting Started With GV Orbit Control

This chapter describes the following tasks:

Launching GV Orbit Control

Once GV Orbit Control is installed on your computer, the shortcut icon appears on your desktop.

For details on installing GV Orbit Control for the first time, refer to the *GV Orbit Admin Guide*. See Related Documentation, on page 7.

Logging in to GV Orbit Control

Tip: Before logging in to GV Orbit Control ensure that you have a valid **user name** and **password**, as well as the **Management IP address** of GV Orbit Admin.

To log in to GV Orbit Control

1 Click the GV Orbit Control icon on your PC.

The GV Orbit Control login screen appears.

2 Enter your user name and password in the **User name** and **password** text boxes.

3 Enter the Management IP address of the GV Orbit Admin in the **Server** text box.

4 Click **Log in**.

Client Server Version Check Warning

A warning is displayed if the GV Orbit Control's software version is different from the software version currently running on the connected server. In this case, it is strongly recommended that you download and reinstall the GV Orbit Control's software from the server so that the client and server software versions will match: for details on installing GV Orbit Control, refer to the *GV Orbit Admin Guide*.

If both client and server software versions are the same, no warning will be displayed and the GV Orbit Control opens normally.
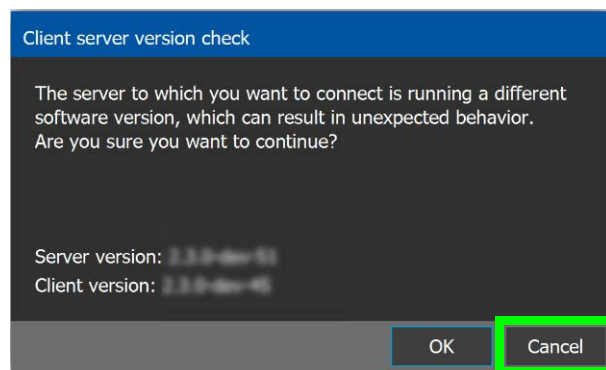
Click **OK** to continue to run the client application regardlessly: this can result in software crashes, database corruption, or other unexpected behavior. Running mismatched software versions is untested and unsupported. Click **Cancel** to go back to the login screen and then close and upgrade your GV Orbit Control.

Navigating Back to Stage

The Stage is the main entry point to configure GV Orbit Control. At any time, you can return to the Stage view.

To navigate back to Stage

1 Open GV Orbit Control to any task.

2 Do one of the following:

- Click the Stage tab at the bottom or the UI.
- Click the plus button at the bottom of the UI.

> **Tip:** The second option is useful, if you have a lot of tasks open.
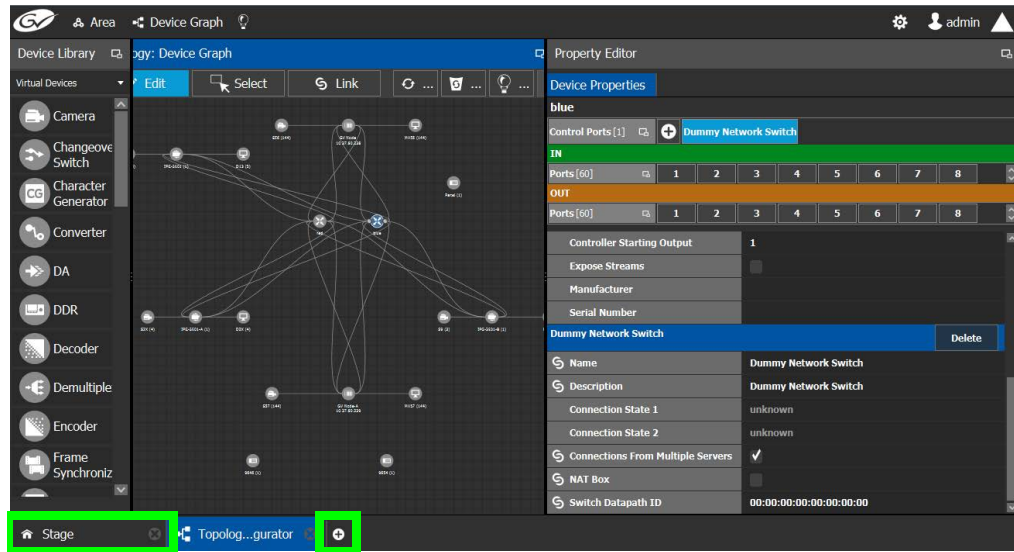
The home or **Stage** view appears.
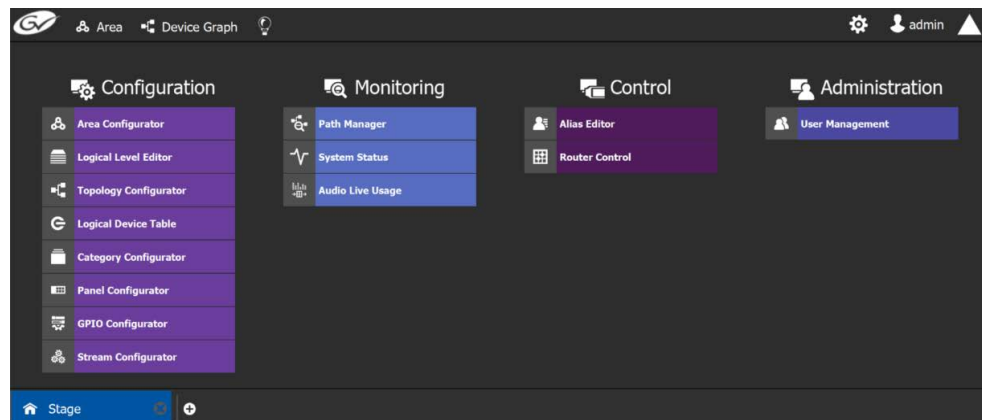
Switching User Profiles

From the Stage or any open task, you can change to another user profile.

> **Note:** Before switching to another user profile, ensure that you have the required user name, password, and Management IP address.

To switch to another user profile

1 Click on the user profile name at the top right of GV Orbit Control.
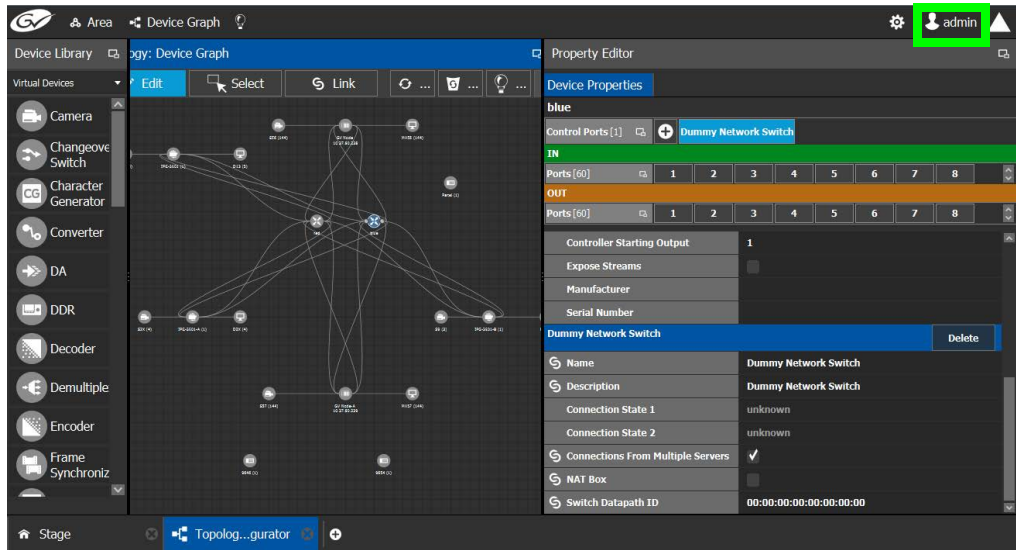
A confirmation message appears.

2   Click **Log out** to continue.

The Log in screen appears.

3 Enter your login credentials in the **User name** and **Password** text boxes.

4 Enter the Management IP address of the GV Orbit server you are connecting to in the **Server** field.

5 Click **Log in**.

GV Orbit Control opens to the view applicable to the user.
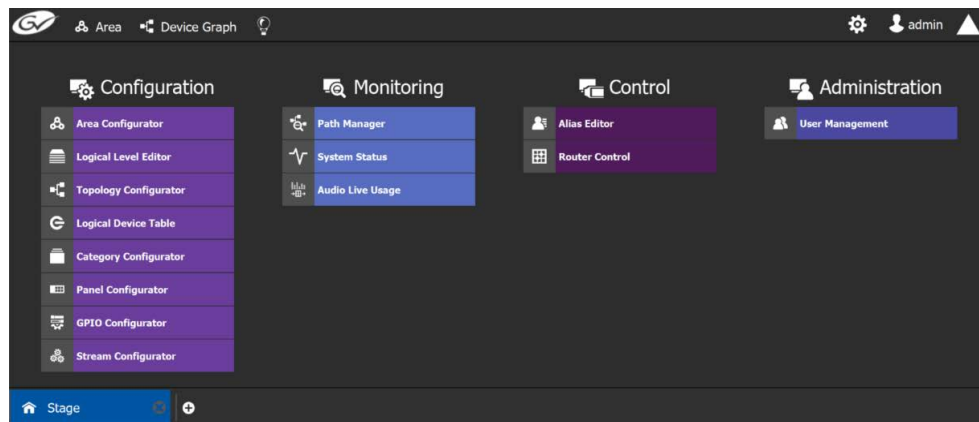
Note: Access permissions vary according to the permissions granted to the user's role. For further information, see Administration Tasks, on page 477.

Viewing Notifications

A notification is an indicator that an event has occurred.

To view your notifications

1 Log in to GV Orbit Control.
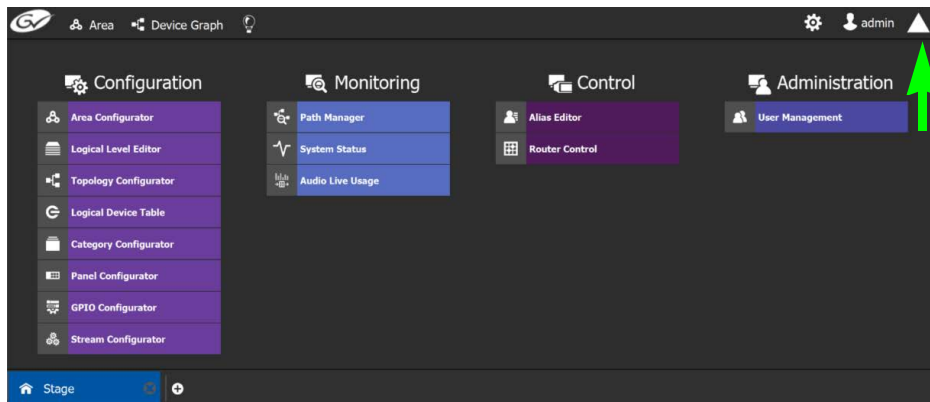
2 Click on the up arrow in the top right corner of the UI.

The Notification window appears.
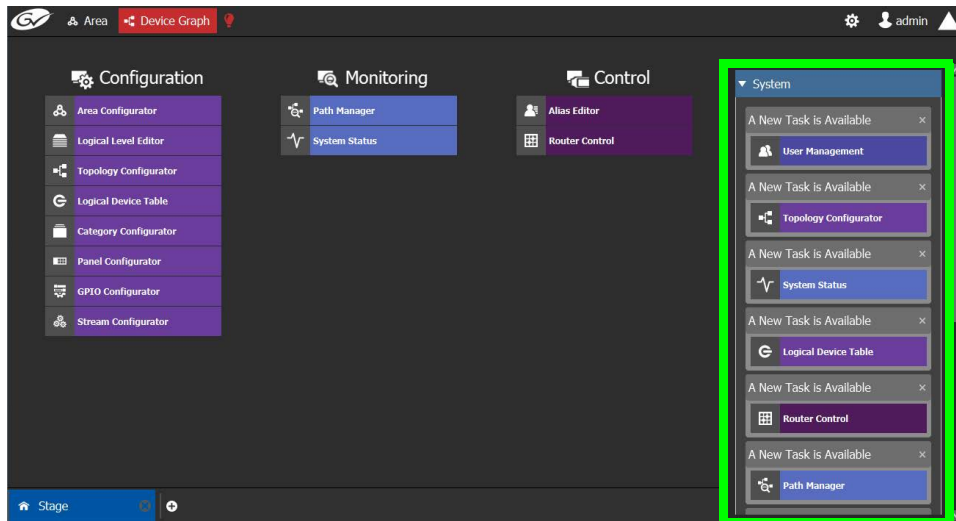
3 Expand the **System** list. The list of new events appears.

4 Click on a listed event on the right to view it in the UI.

6

Configuration Tasks

The Configuration tasks in GV Orbit Control are used for creating and maintaining areas, topologies, categories, and panels.
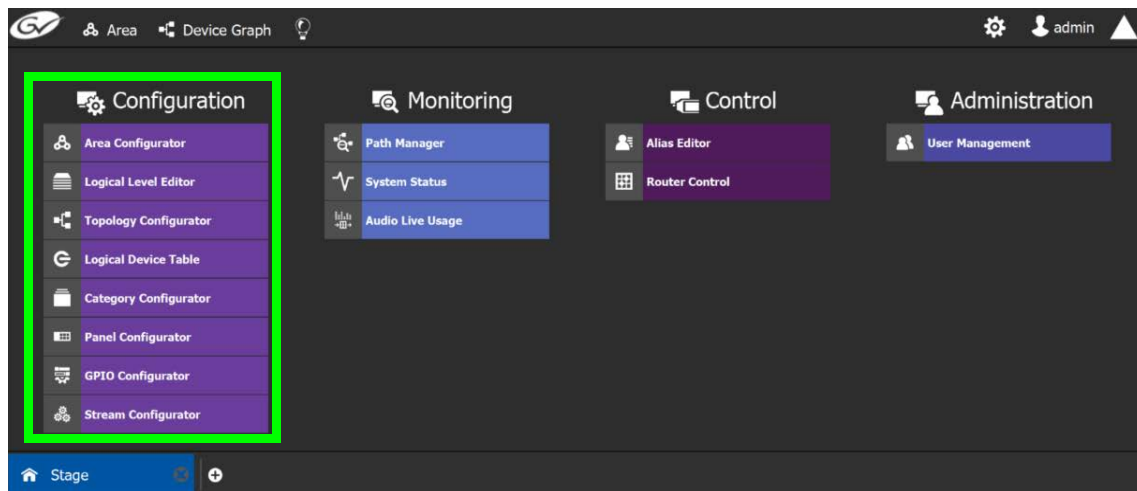
The Configuration Tasks are described under the following headings:

- Area Configurator Tasks, on page 177
- Logical Level Editor Tasks, on page 190
- Topology Configurator Tasks, on page 199
- Logical Device Table Tasks, on page 241
- Category Configurator Tasks, on page 268
- Panel Configurator Tasks, on page 275
- GPIO Configurator Tasks, on page 312
- Stream Configurator Tasks, on page 322

Required Permissions

Only users who are assigned to the Administrators role have View, Edit, and Delete permissions in the Area task. All other configuration tasks are accessible to users with either Administrator or Engineer rights only. For more information, see Viewing Permissions by Role, on page 484.

Area Configurator Tasks

The Area Configurator task is used for configuring the *Areas* and controllers in GV Orbit Control.

An *Area* is container that is used for grouping together a subset of resources within a system. Typically, these resources are closely related, by physical location, functionality, ownership, and/or logical organization. An area is managed by a single controller group, which is made up of:

- a single controller
- or optionally, two redundant controllers to provide 1:1 fail-over protection

This section describes the following:

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-
-
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Accessing Areas in the GV Orbit Control

All configuration in GV Orbit Control begins by creating one or more areas. Once you have the areas defined, you can add the logical levels, the topologies, and so on.

To configure the area in GV Orbit Control

1 Open GV Orbit Control Stage. See

2 Select **Configuration** > **Area Configurator**.
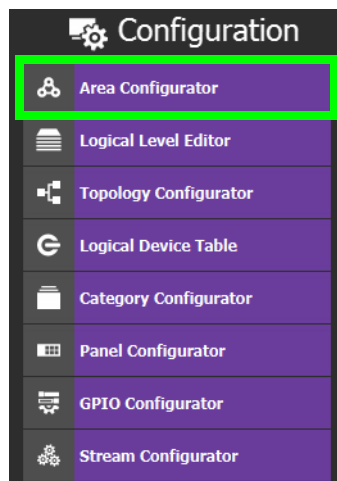
The Area Graph appears.
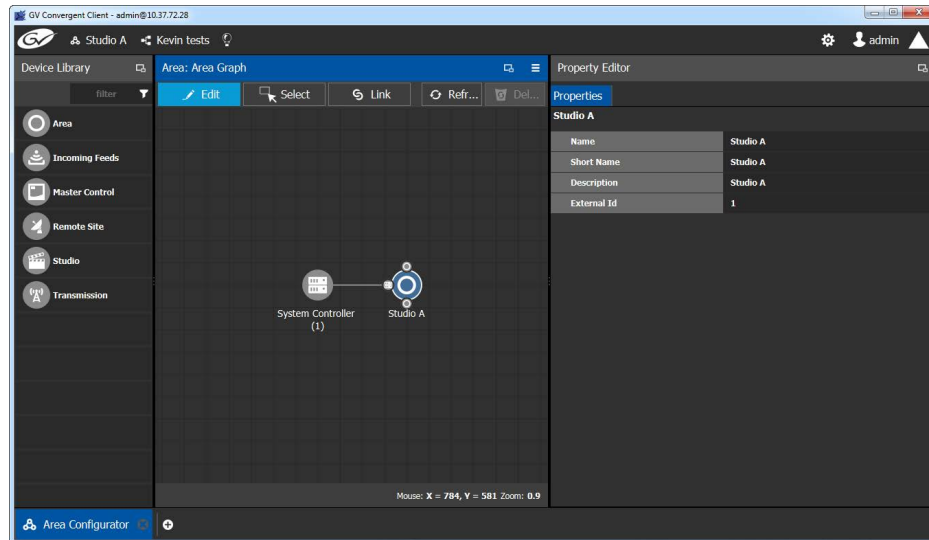
By default, there is one area, called Area. Use the **Property Editor** on the right to rename it and make it easy to identify within your system.

3 Select the Area to access the **Property Editor**.

You are automatically in Edit mode. **Edit** is highlighted in the bar at the top.

4 Enter the required information in the **Name**, **Short Name**, **Description**, and **External ID** fields to identify the area.

5 Repeat the procedure for each area in your system.

Adding an Area

You can create multiple areas for your system. This can facilitate configuration and control tasks. Smaller subsets are easier to bring into focus and manage.

To add an area

1 Open GV Orbit Control Stage. See Navigating Back to Stage, on page 170.

2 Select **Configuration** > **Area Configurator**. See Accessing Areas in the GV Orbit Control, on page 177.

This opens the Area Graph.
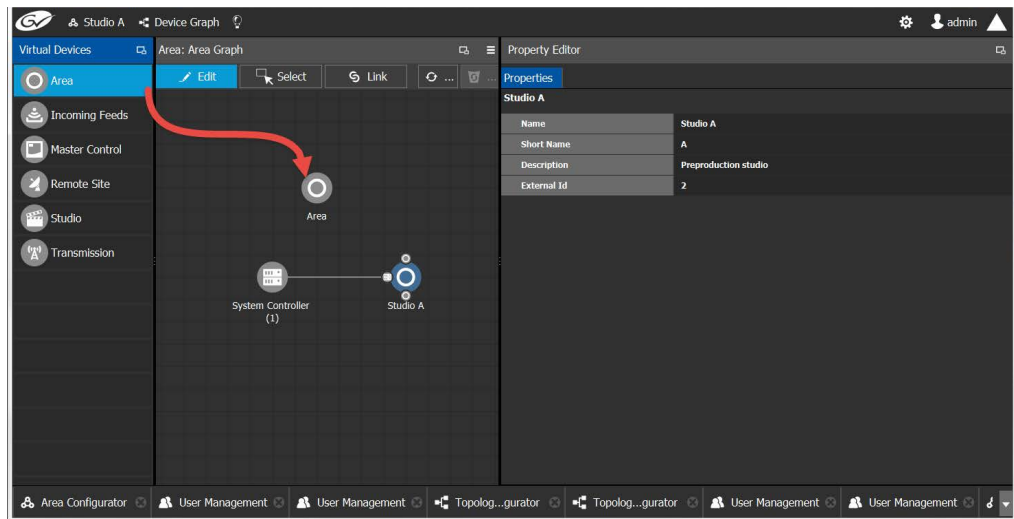
3 Select the area tile on the left.

4 Drag it to the Area Graph.

5 Repeat the procedure as many times as required to add all the areas you require.

Note: Currently, GV Orbit Control supports one Area. Area inter-connectivity and multiple areas (Incoming Feeds, Master Control, Remote Site, Studio, and Transmission) are not supported.

Configuring a Controller Group

By default, there is one area and one System Controller group on the Area Configurator Device Graph.

A controller group can have one or more areas. The controller is a physical or virtual server that runs the GV Orbit software.

A Controller group can be made up of either one or two controllers. You need two controllers to implement redundancy or failover protection. In the redundant configuration, one controller is active and the other is on standby. If there is a problem, such as a network connection loss, the standby controller becomes the active controller, automatically. In addition, you can force the standby controller to become the active controller by performing a manual failover operation, at any time.

To configure a controller group

1 Open GV Orbit Control Stage. See Navigating Back to Stage, on page 170.

2 Select **Configuration** > **Area Configurator**. See Accessing Areas in the GV Orbit Control, on page 177.

By default, there is one controller and one area on the graph.
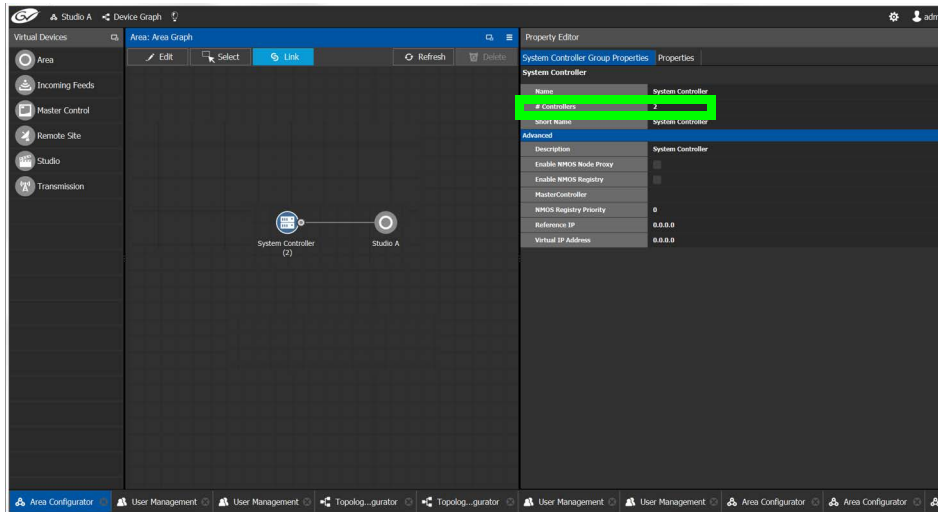
3 Select the bubble for the **System Controller** you are configuring.

4 Select the **System Controller Group Properties**.
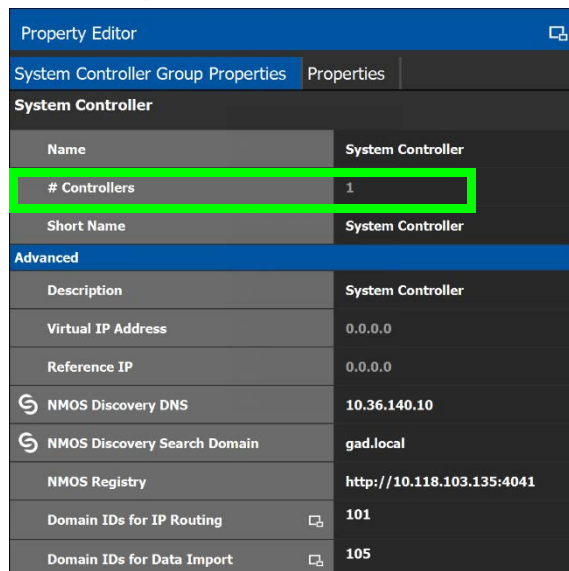
The following properties can be configured for the panel. See also Description of Common Device Properties, on page 332.

Parameter	Description
Name	The name or identifier for this system controller group.
# Controllers	Enter **2** in the field if you are setting up redundancy. Otherwise, enter **1**. You can only have one or two system controllers in a group.
Description	An optional description for this system controller group.

Parameter	Description
Virtual IP Address	This is the virtual IP address to communicate with the active server in a GV Orbit Server cluster (when a redundant configuration is used). If a GV Orbit Server cluster is not being used, use the GV Orbit Server administration IP address for devices instead of this IP Address. For example, in a cluster configuration, a soft panel can be configured to point to this virtual IP address. When a failover happens, control is maintained through the panel using this virtual IP address. See also System Status Task, on page 457 for more information about server clusters and failover.
Reference IP	Set the IP of a machine that is always on. After a failover the server that can connect first to this IP will become the master.
NMOS Discovery DNS NMOS Discovery Search Domain	GV Orbit Control can automatically discover an NMOS registry through DNS-SD when the **NMOS Discovery DNS** and **NMOS Discovery Search Domain** parameters are set. For more information about how to configure and use GV Orbit Control's NMOS registry, see To configure GV Orbit Control for use with NMOS, on page 377.
NMOS Registry	This shows the current NMOS Registry Query API URL (hostname / IP address and port number). For more information about how to configure and use GV Orbit Control's NMOS registry, see To configure GV Orbit Control for use with NMOS, on page 377.
Domain IDs for IP Routing	Only applications / devices that use the same Domain IDs can communicate with each other on the network. For a list of such devices, see GVOP Devices, on page 206. This is a comma separated list of domain IDs on which you want to discover devices and communicate with them. The default value for Grass Valley equipment is **101**. Valid range: **0** to **232**.
Domain IDs for Data Import	This is for future use.

5 Select the **Properties** tab.

6 Select **1** under **System Controller** to configure the first controller.
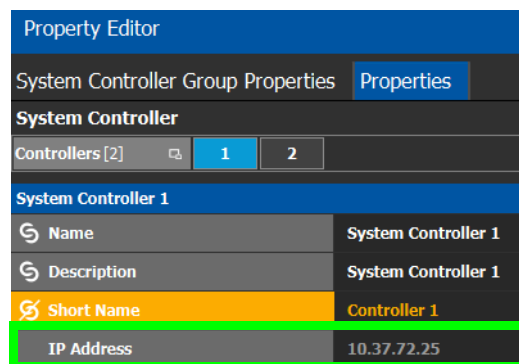
The following properties can be configured for the individual system controller that form the system controller group. See also Description of Common Device Properties, on page 332.

Parameter	Description
Name	The name or identifier for this system controller instance.
Description	An optional description for this system controller instance.
Short Name	A nickname used wherever the controller is specified. This name should be limited to 8 characters or less in length. This requirement is important if you are using NVISION panels as they use the Short Name to display device names and NVISION hardware can display a maximum of 8 characters for a device name. Otherwise, a longer nickname can be used.
IP Address	The network IP address for this system controller instance. This field for System Controller 1 is populated automatically with this system controller's Management IP address. This cannot be changed. When system controller redundancy is used (System Controller 2 is available), set the network IP address for System Controller 2.

7 Select tab **2** under **System Controller** to configure the second controller.
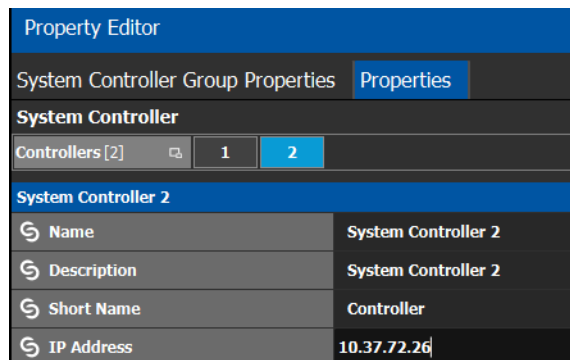
8 Update the identification fields for the second controller and set the network IP address for System Controller 2: see the table above.

A confirmation message is displayed:
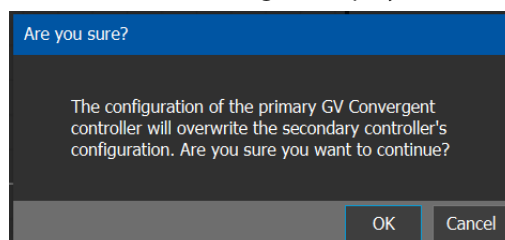
9 Click **OK** to continue.

Notes

When redundancy has been configured, System Controller 2 joins the Controller group automatically as the standby controller. It becomes the active controller in the event of an automatic or manual failover.
When you click OK, the database from Controller 1 is copied to Controller 2

You can view the health of both controllers on the System Status task. The System Status Task page will show the status of the controllers at all times, and the right hand section shows the health of devices specific to a topology. However, you must create your areas and topologies first. See System Status Task, on page 457.

Selecting an Area

You must select an area before you can create or maintain a topology within it. Only one area can be selected at a time.

To switch from one selected area to another

1 Open GV Orbit Control Stage. See Navigating Back to Stage, on page 170.

The currently selected Area is displayed at the top of the interface.
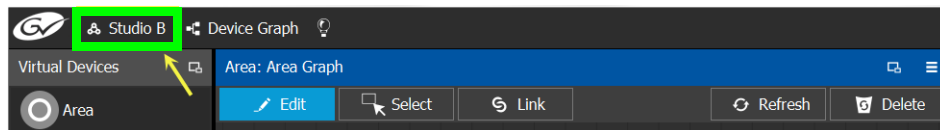
Note: You can perform this procedure from Stage or from any open task. You can always select an area.

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2 Click on this area.

A secondary window appears.
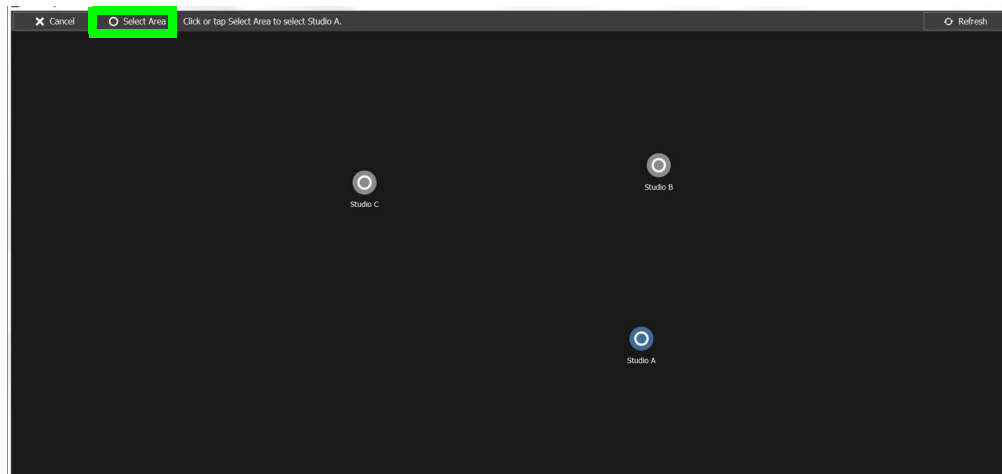
3 Click on the area that you to select.

In the screen shot above, this is Studio A.

4 Click **Select Area** at the top of the window.

Deleting an Area

> Note: You cannot delete the currently selected Area. If necessary, make another Area active first. See Selecting an Area, on page 183.

To delete an area

1 Select another Area other than the one you are going to delete. See Selecting an Area, on page 183.

2 Open GV Orbit Control Stage. See Navigating Back to Stage, on page 170.

3 Select **Configuration** > **Area Configurator**. See Accessing Areas in the GV Orbit Control, on page 177.

4 Click on the Area you want to delete.

5 Click **Delete** 🗑 at the top of the logical level editor.

6 A confirmation message appears. It lists the topologies created in the Area.
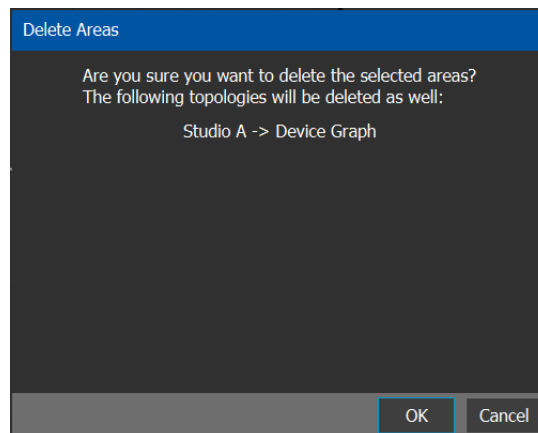
7 Click **OK** to continue.

Selecting a Graph

In the Area Configurator, you define the various Areas in your system. Within each Area, you can create multiple Graphs, and each Graph contains a *Topology*. Each topology shows a part of how the various physical and logical devices are arranged and interconnected within the broadcast facility.

To work on a topology, you first need to select the Graph in which the Topology is held. You can work on only one topology at a time.

To select a Graph

> Note: A Graph must be created in an area. Then, it is available only in the area where it was created.

1   Select the required Area. See Selecting an Area, on page 183.

2   Click the Graph icon [icon] that holds the currently active topology at the top left of GV Orbit Control.
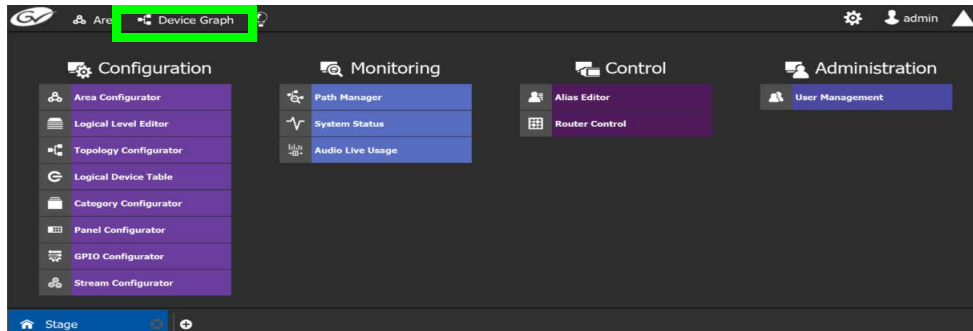
This opens the graphs window. It shows the currently-available graphs for the selected Area. Each Graph contains a Topology.

3   Double-click the Graph you want to update or select the Graph you want to update and then click **Load**.
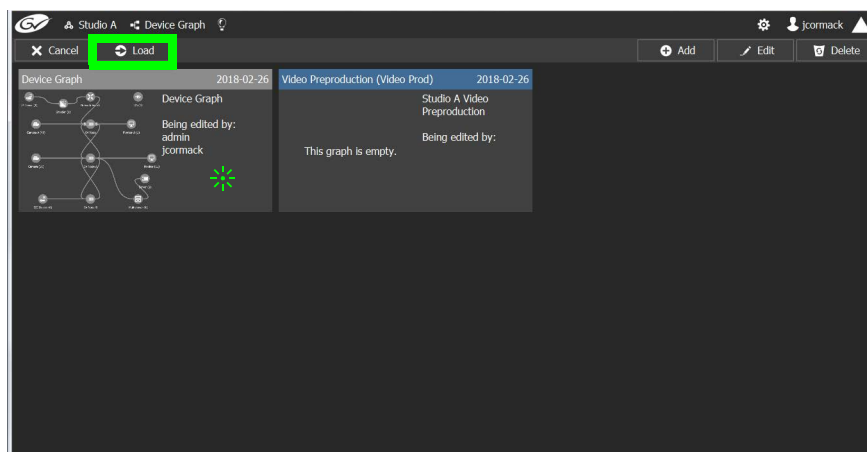
Now, any configuration work you carry out will be on this selected Graph.
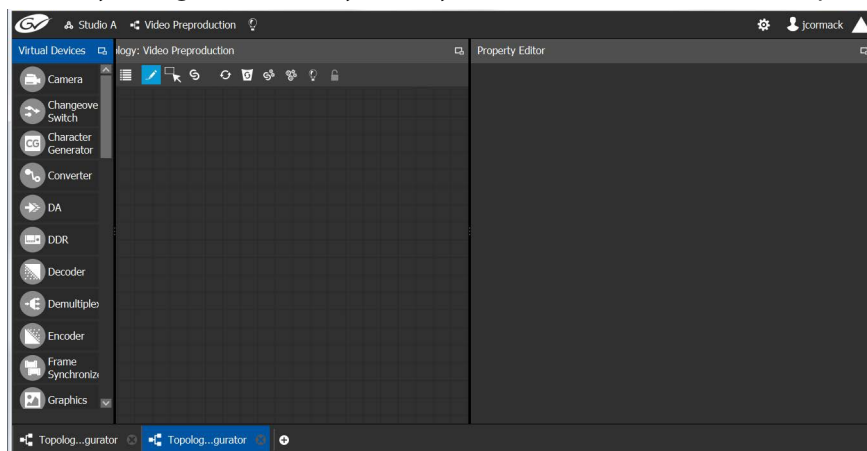
If the topology is new, the Graph is blank. The next step is to begin adding devices. See Adding Devices to a Topology, on page 204.

Creating a new Graph for a Topology

To create a new topology

1 Open GV Orbit Control Stage. See Navigating Back to Stage, on page 170.

2 Select the required Area. See Selecting an Area, on page 183.
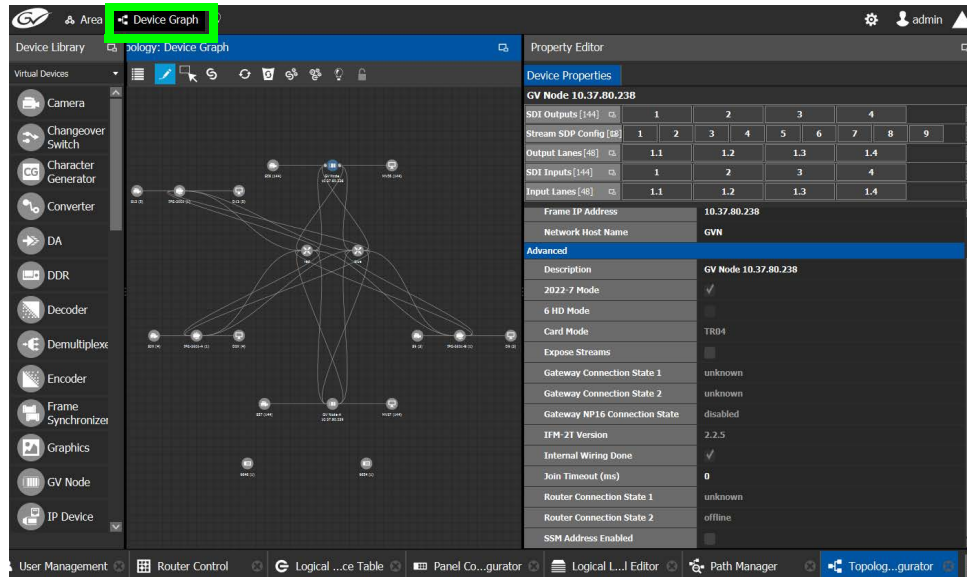
3 Click the Graph icon that holds the currently active topology at the top left of GV Orbit Control.

This opens a secondary window.
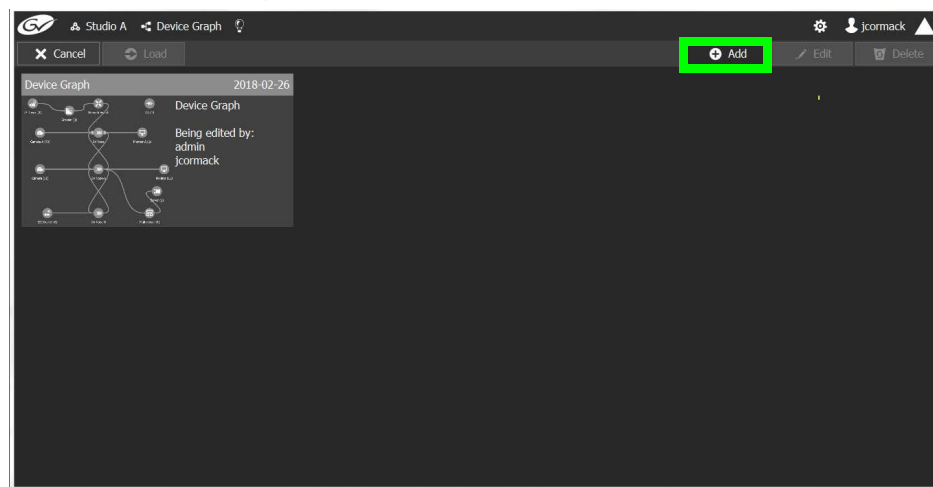
4 Click **Add** .

The Create New Graph window appears.
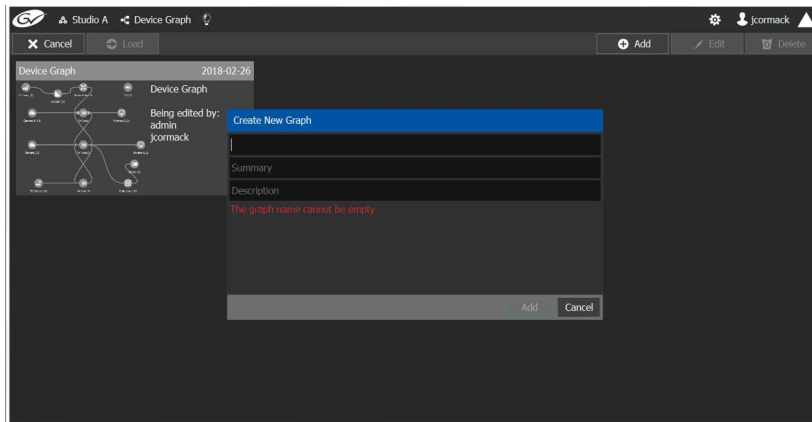
5 Enter a name for the new topology and enter meaningful text in the **Summary** and **Description** fields for easy identification.
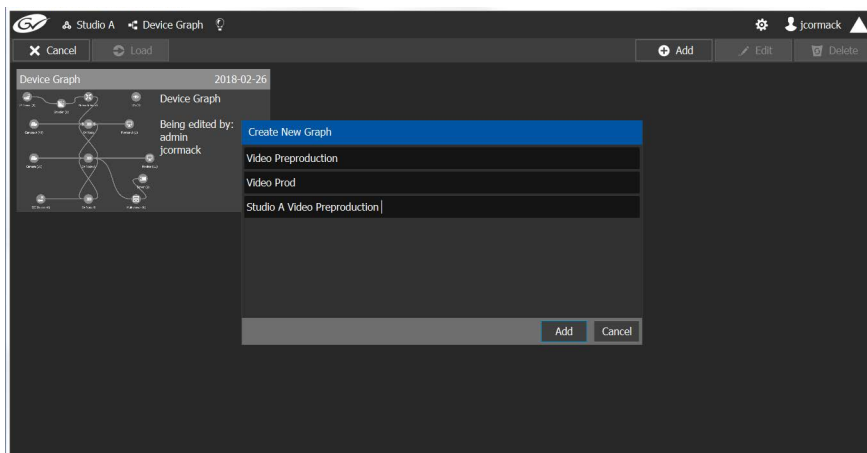
6 Click **Add** on the Create New Graph window.

The new topology appears in the list box with the existing topologies.
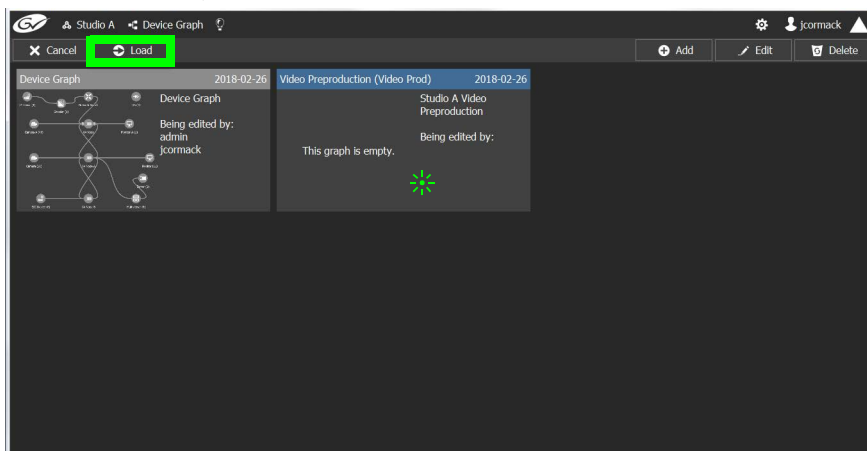
7 Select the new topology and click **Load**. Or double-click the topology.

The selected topology is opened.
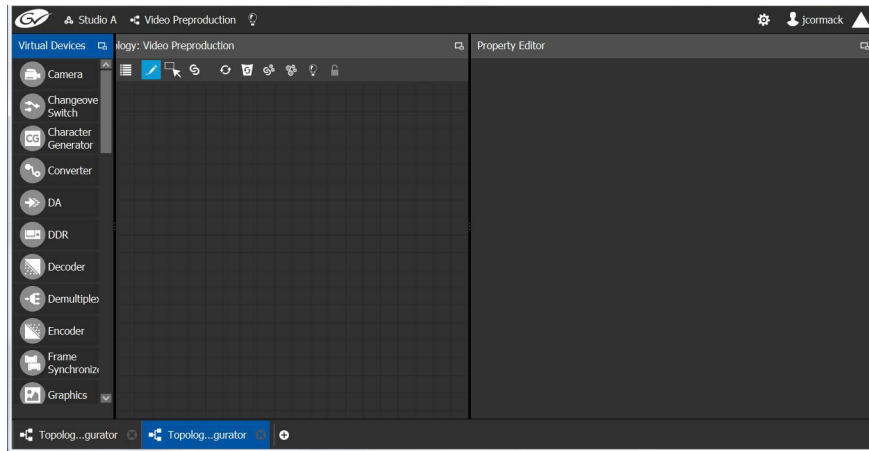
If the topology is new, the Topology is blank. The next step is to begin adding devices. See Adding Devices to a Topology, on page 204.

Deleting a Graph

Only inactive graphs / topologies can be deleted. See Making an Active Topology Inactive, on page 236. You cannot delete all graphs from GV Orbit Control; at least one graph must always be present.

To delete a Graph

1 Select the required Area. See Selecting an Area, on page 183.

2 If you are deleting the active topology, you must first make it inactive. See Making an Active Topology Inactive, on page 236.

3 Click the Graph icon that holds the currently active topology at the top left of GV Orbit Control.
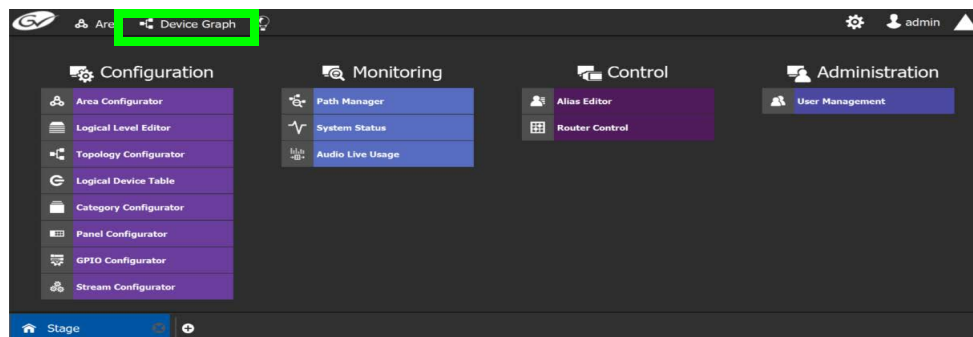
This opens the graphs window. It shows the currently-available graphs for the selected Area.

4 Select the Graph you want to delete and then click **Delete**.
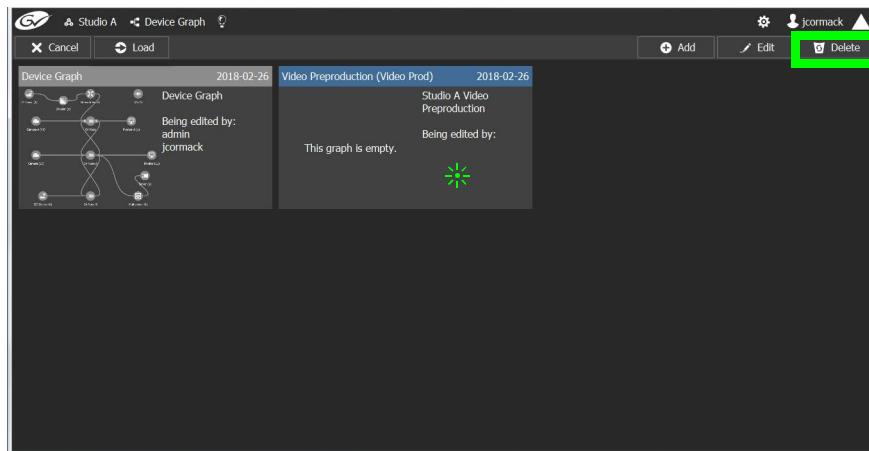
Deleting the last Graph

You cannot delete all graphs from GV Orbit Control; at least one graph must always be present. To delete the last graph, proceed as follows.

1 Create a new graph (see Creating a new Graph for a Topology, on page 186)

2 Make the new graph active (Activating a Topology, on page 235).

3 Delete the previous graph.

Logical Level Editor Tasks

Logical levels allow for the definition of compatibility and shuffling rules. This gives you complete control of the path definition to prevent routing of incompatible levels. For example, Logical levels are used to identify a stream's video resolution, the number of audio channels, ancillary data, and so on.

Every unique type of stream format in your facility should have a unique Logical Level. These levels are then assigned to sources and destinations (in the Logical Device Table; see Logical Device Table Tasks, on page 241). This allows GV Orbit Control's routing system to make takes between sources and destinations with signal types that are compatible with each other, and with the underlying hardware, so that takes can be successfully made in the real world.

This section describes the following:

- Accessing the Logical Level Editor, on page 190
- Viewing the Default Logical Levels, on page 192
- Duplicating a Logical Level, on page 193
- Editing a Logical Level, on page 195
- Deleting a Logical Level, on page 196
- Configuring a New Logical Level, on page 196
- Configuring the Logical Levels for the Devices in a Topology, on page 197

Accessing the Logical Level Editor

Use the Logical Level Editor to define new logical levels and to view the compatibility of the default levels.

To access the Logical Level Editor Task

1 Open GV Orbit Control Stage. See Navigating Back to Stage, on page 170.

2 Select an area.

3 Select **Configuration** > **Logical Level Editor**.
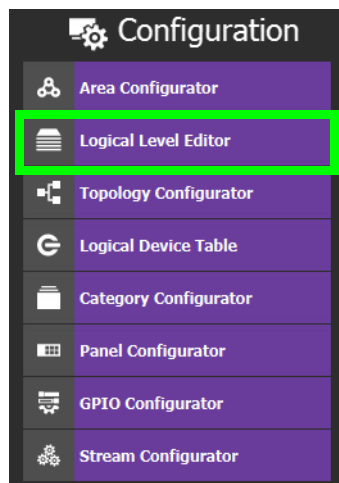
The Logical Level Editor appears.

> Note: Only users who are assigned to the Administrators or Engineers role in the selected area have View, Edit, and Delete permissions in the Logical Level Editor task. See Viewing Permissions by Role, on page 484.
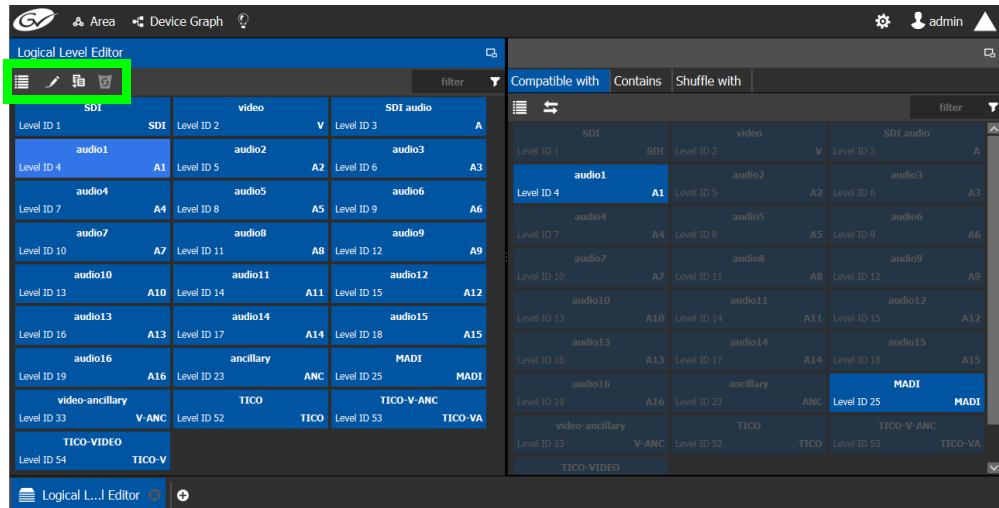
> Note: Before you can open the Logical Level Editor, you must open an Area and a Topology. Logical levels are defined specifically for each topology.

The Logical Level Editor has two columns:

- The first column contains tiles for all default logical levels along with the logical levels you have added.
- The second column has three tabs: *compatible with*, *contains* and *shuffle with*. The *shuffle with* allows a user to configure which audio levels can be shuffled with which. See Configuring Virtual Crosspoints (XPTs), on page 257.

Logical Level Editor Menu

The Logical Level Editor menu has the following menu options.

Icon	Description
Edit	Edit a logical level's properties. See Editing a Logical Level, on page 195.
Duplicate	Make a copy of the currently-selected logical level. See Duplicating a Logical Level, on page 193.
Delete	Remove the currently-selected logical level. See Deleting a Logical Level, on page 196.

Viewing the Default Logical Levels

The default logical levels are represented by the first tiles displayed in the **Logical Level Editor** column, beginning with video, then audio, ancillary, and finally AES67. When you create new logical levels, they are added after these ones.

You can change the Short Label and Level ID of a default Logical Level, but not the Name. Click ✏ Edit to do so. Also, you cannot delete a default level.

The Audio Live device uses AES67 audio levels. See AES Logical Levels that are used for IP Audio Streams, on page 436 for more information.

Verifying the Compatibility of the Default Logical Levels

Compatibility defines which Logical Levels are compatible when making a take. This is shown in the **Compatible with** tab shown below. When a source and destination use the same Logical Level, or the two Logical Levels are compatible with each other, then a take is possible between the source and destination.

Certain default Logical Levels are compatible with other Logical Levels. For example, **AES67-16** is compatible with **SDI audio**. That is to say, a take between an **AES67-16** source and an **SDI audio** destination is allowed by the router system. See also AES Logical Levels that are used for IP Audio Streams, on page 436.

When you create a Logical Level, you always modify the compatibility between these Logical Levels according to the required source / destination signal types.

To verify the compatibility of Logical Levels

1 Open GV Orbit Control Stage. See Navigating Back to Stage, on page 170.

2 Select **Configuration** > **Logical Level Editor**. See Accessing the Logical Level Editor, on page 190.

The Logical Level Editor appears.
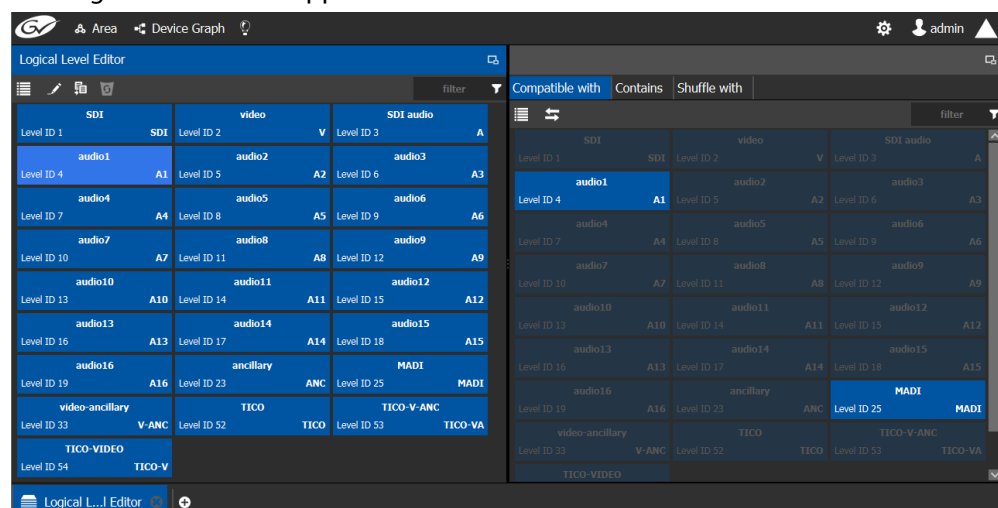
3 Select a logical level tile on the left.

The tiles for the logical levels it is compatible with are highlighted in the right column.

Note: A logical level is always compatible with itself.

Verifying the Component Signal Types of the Default Logical Levels

Like the compatibility, the signal types of the default logical levels is predefined and cannot be changed. When you create a Logical Level, you always modify the signal type components.

To verify the signal types of the default logical levels

1 Follow the procedure under Verifying the Component Signal Types of the Default Logical Levels, on page 193.

2 When you select a tile for a logical level in **Logical Level Editor**, the compatibility is highlighted in the **Contains** tab.

Duplicating a Logical Level

A pre-existing logical level can be copied to reuse that logical level's configuration properties and then you only need to modify the necessary logical level properties as required for the new application.

Notes

Logical levels are specific to topologies. In another topology, you won't see the logical levels you create in the currently selected topology.

Only SDI and TICO levels can be duplicated.

To duplicate a logical level

1 Open GV Orbit Control Stage. See Navigating Back to Stage, on page 170.

2 Select **Configuration** > **Logical Level Editor**. See Accessing the Logical Level Editor, on page 190.

3 Select a pre-existing level on the left-hand panel that you want to duplicate.
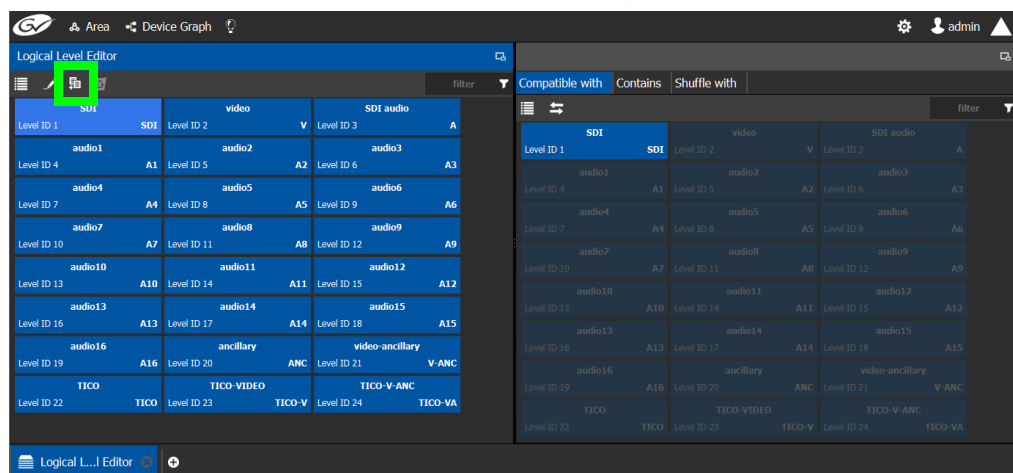
4 Click **Duplicate** 🔳 at the top of the interface.

The Logical Level configuration window opens.

Level To Duplicate	SDI
Name Prefix	
Name Suffix	HD
Short Label Prefix	
Short Label Suffix	HD
Starting Level ID	36

| Ok | Cancel |

5   Enter meaningful names to identify the level in the **Name Prefix**, **Name Suffix**, **Short Label Prefix**, and **Short Label Suffix** text boxes.

6   Enter a unique identifier in the **Starting Level ID** text box.

7   Click **OK**.

A tile for your new logical level is displayed in the left hand column.

Creating the Logical Levels for a UHD 4K Routing Setup

For an example of how to create the logical levels for UHD routing when a quad-link signal path is used, see:

- Configuring UHD 4K Two-Sample Interleave Division IP Streams for use with an IQMix, IQUCP, UCP-3901, or IPVU Device, on page 354.
- Configuring UHD 4K Quad-Link SDI Streams for use with an IQMix, IQUCP, UCP-3901, or IPVU Device, on page 359.

Editing a Logical Level

Use the following procedure to modify a logical level's identification information. The **Audio** setting marks that the level is an audio level.

To edit a logical level

1 Open GV Orbit Control Stage. See Navigating Back to Stage, on page 170.

2 Select **Configuration** > **Logical Level Editor**. See Accessing the Logical Level Editor, on page 190.

3 Select a level on the left-hand panel that you want to edit.

Note: For the default logical levels, you can modify the Short Label and Level ID. You cannot modify the Name.

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4 Click **Edit** at the top of the logical level editor.
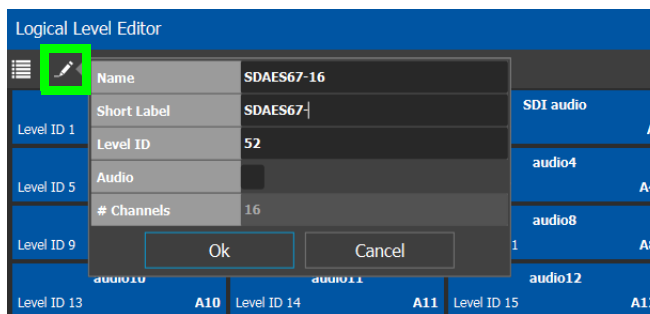
5 Modify the properties as required.

Parameter	Description
Name	The level's name.
Short Label	A shortened name for the level.
Level ID	A unique identifier for this level.
Audio	When set, this level will appear in the **Shuffle with** tab of the right pane for shuffling rules. See Configuring Virtual Crosspoints (XPTs), on page 257.
# Channels	When available, this shows the number of audio channels supported by this level. The Audio Live device uses a range of levels, each one supporting a different number of audio channels. See AES Logical Levels that are used for IP Audio Streams, on page 436 for more information. See also Configuring a Device that Supports Audio Breakaway/Shuffling such as Audio Live, on page 433.

6 Click **OK**.

Deleting a Logical Level

Use the following procedure to delete a logical level you have created that is no longer required in the selected topology.

> Note: You cannot delete the default logical levels. The Delete button is disabled when you click on these levels.

To delete a logical level

1   Open GV Orbit Control Stage. See Navigating Back to Stage, on page 170.

2   Select **Configuration** > **Logical Level Editor**. See Accessing the Logical Level Editor, on page 190.

3   Select the tile for the logical level you want to delete.
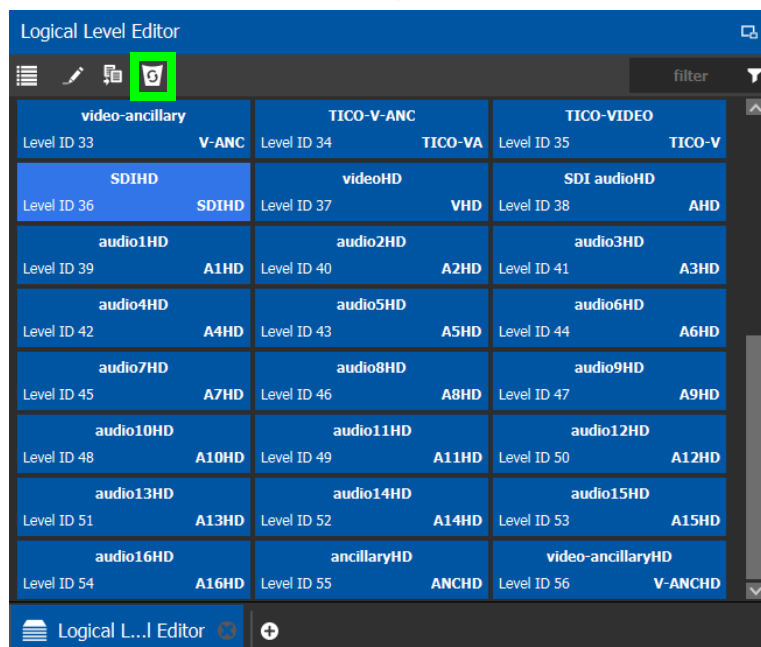
4   Click **Delete** at the top of the logical level editor.

> Note: There is no confirmation for the deletion.

Configuring a New Logical Level

Use the following procedure to configure a new logical level. This determines which signal types are compatible with this level.

To configure a new logical level

1   Open GV Orbit Control Stage. See Navigating Back to Stage, on page 170.

2   Select **Configuration** > **Logical Level Editor**. See Accessing the Logical Level Editor, on page 190.

3 Select the tile for the logical level you want to configure.
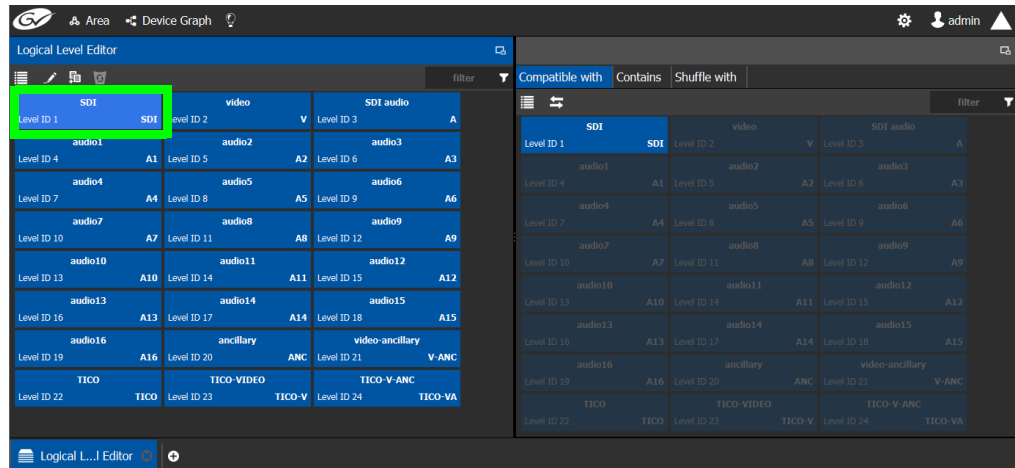
The tile for your new logical level is automatically highlighted in the right hand column.

4 Select the tiles for the signal types in the right hand column that are compatible. Click a tile a second time to deselect it.

Configuring the Logical Levels for the Devices in a Topology

Use the following procedure to set the logical levels for the device's sources and destinations in your topology. Logical levels can be used to define the type of signal carried on a physical connection between physical devices. If compatibility is not an issue, the default logical levels may be utilized.

To configuring an area in GV Orbit Control

1 Select the required topology in the area. See Accessing the Topology Configurator, on page 199.
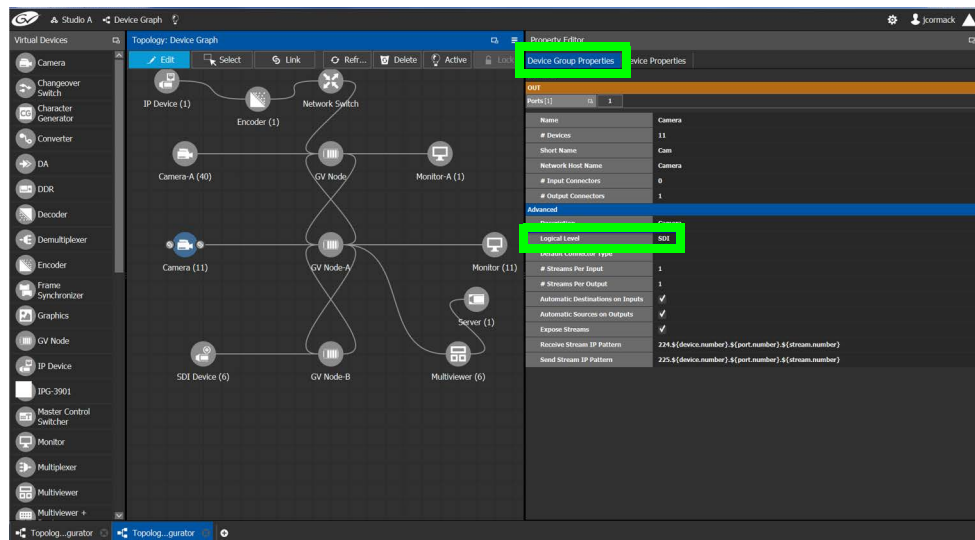
2 Select the device for which you want to configure its logical level.

In the above example, the camera bubble is selected. SDI is the default logical level for cameras.

3 Select Device Group Properties.

4 Select the **Logical Level** parameter in the **Property Editor**.

This opens the Logical Level list.
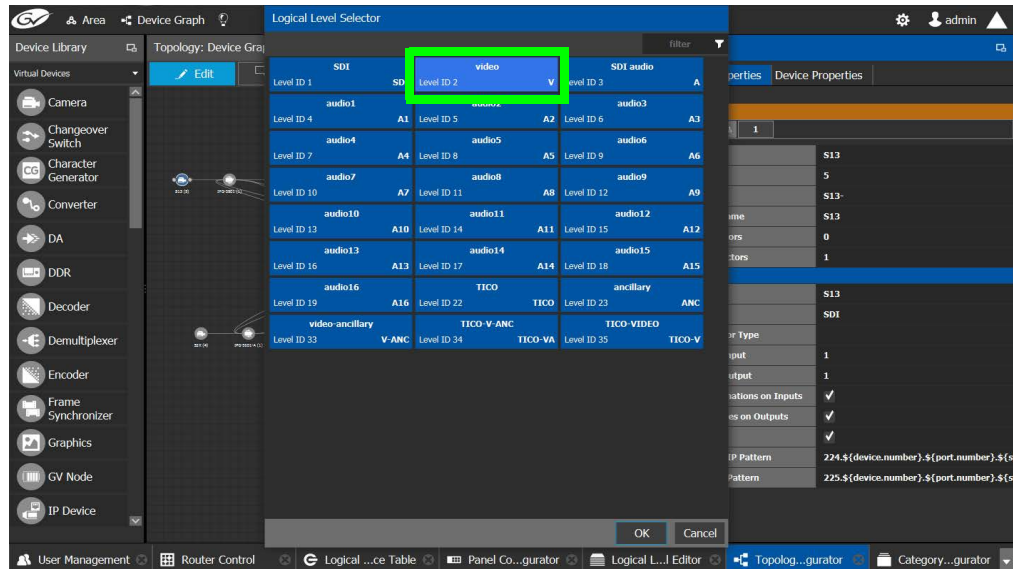
5 Select the required logical level for the device group.

Topology Configurator Tasks

In the Area Configurator, you define the various Areas in your system. Within each Area, you can create multiple Graphs, and each Graph contains a *Topology*. The topologies show how the various physical and logical devices are arranged and interconnected within the broadcasting facility. See Area Configurator Tasks, on page 177 and Selecting a Graph, on page 184.

These sections describes the following:

- Accessing the Topology Configurator, on page 199
- Selecting a Graph, on page 184
- Refreshing the Topology, on page 202
- Creating a new Graph for a Topology, on page 186
- Adding Devices to a Topology, on page 204
- Methods to Link Devices in a Topology, on page 222
- Defining Device Properties, on page 229
- Deleting a Device From a Topology, on page 234
- Activating a Topology, on page 235
- Making an Active Topology Inactive, on page 236
- Unlocking / Relocking a Topology, on page 238
- Locking an Unlocked Topology, on page 239

Certain devices require a detailed procedure to configure them; see Special Device Configuration Tasks, on page 331 for more information about these devices.

Accessing the Topology Configurator

You can access the Topology Configurator from Stage or from any open task. Access permissions are required. See also Selecting a Graph, on page 184.

To access the Topology Configurator from Stage

1 Open GV Orbit Control Stage. See Navigating Back to Stage, on page 170.

2 Select **Configuration** > **Topology Configurator**.
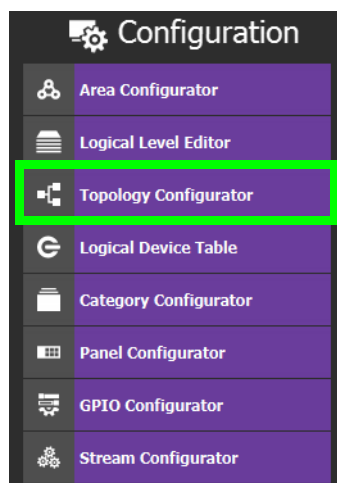
The Topology Configurator appears. The Topology Configurator comprises three sections. The left hand column has a list of bubbles, representing the device groups, such as cameras, routers, and monitors. You drag these onto to the Topology (middle column) and create connections between them. Then, you can configure the properties for the Device Groups in the **Property Editor** (right-hand column).
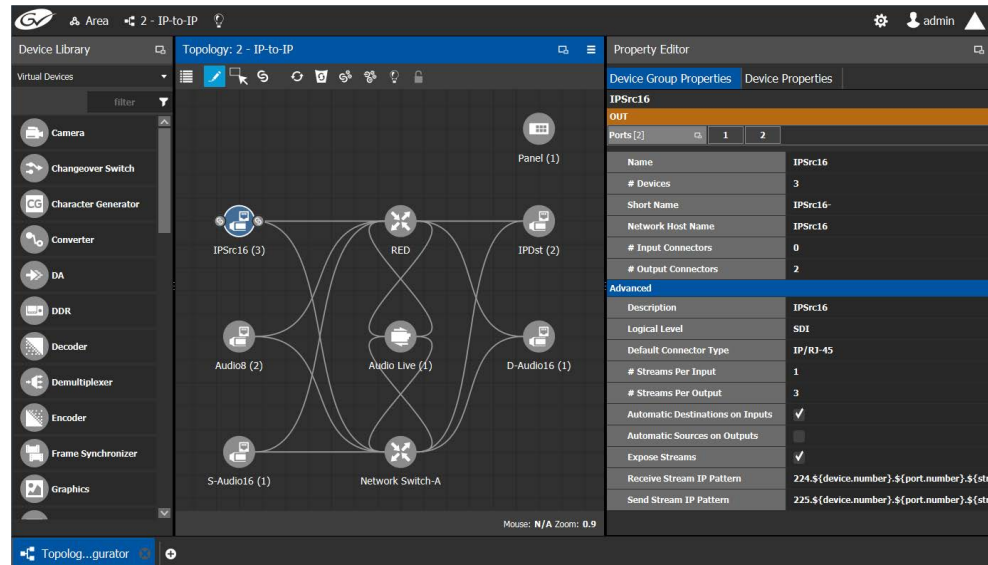
If an Area is open, the Topology Configurator opens in that area. You can switch areas from anywhere in GV Orbit Control. See Selecting an Area, on page 183.

Access Permissions

Access permissions to the Topology Configurator vary according to role. Only users who are assigned to the Administrators or Engineers role can View, Edit, and Delete topologies and device properties. Operators have the right to view topologies and device properties. Maintenance staff and Guests have no access. See Viewing Permissions by Role, on page 484.

Topology Configurator Menu

The Topology Configurator has the following menu options.

Icon	Description
Edit	Use this editing mode to select a device on the topology to edit its properties. See Defining Device Properties, on page 229.
Select	Use this editing mode to select one or more devices on the topology (by drawing a square with your mouse cursor) to move the selected devices around on the topology as a group, or to delete them. Press the <Ctrl> key to temporarily enable this option.

Icon	Description
ⓢ Link	Use this editing mode to connect a device's sources to the destinations of another device. See Methods to Link Devices in a Topology, on page 222.
	This editing mode is also used to break the connection between two devices. See Deleting the Connection Between Device Groups, on page 228.
↻ Refresh	Reloads the Topology's contents. See Refreshing the Topology, on page 202.
ⓖ Delete	Remove the currently-selected device from the topology. See Deleting a Device From a Topology, on page 234.
ⓢ Quick Connect	This automatically connects the unconnected ports of devices on the topology. See Methods to Link Devices in a Topology, on page 222 and Using Quick Connect to Link all Devices in a Topology, on page 222.
Quick Config	This sets the configuration of the selected devices on the topology. See Using Quick Config, on page 219.
Deactivate / Active	Activating a topology makes GV Orbit Control connect to and activate all drivers to devices in the topology. This is important for GV Orbit Control to learn a device's current configuration.
	See Activating a Topology, on page 235 and Making an Active Topology Inactive, on page 236.
🔒 Lock / Unlock	Lock a Topology to prevent you from inadvertently making edits on an active topology. See Unlocking / Relocking a Topology, on page 238 and Locking an Unlocked Topology, on page 239.

How to Identify if a Device Bubble is Selected or Not

A device bubble has the following selection states.

Description	Device Bubble State	Device properties are shown in the Property Editor
Gray, no white circle	Not selected	
Gray with white circle	Selected	
Blue with white circle	Selected	●

Refreshing the Topology

If you have added a lot of devices to a topology or made many modifications to it, you may need to refresh the Topology. You can refresh topology regardless of whether it is active or inactive.

To refresh the Topology

1   Open a topology in the Topology Configurator.
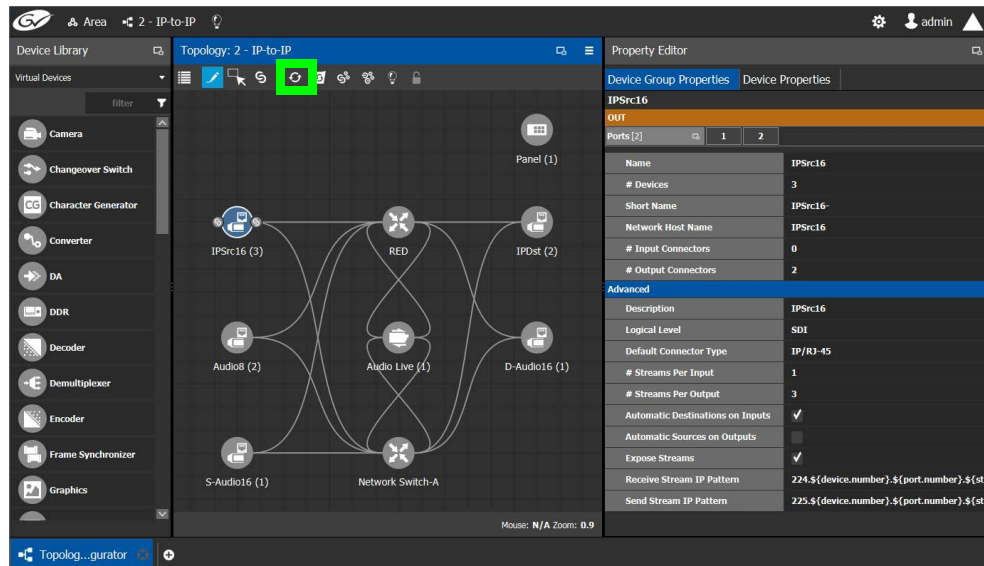
2   Click the Refresh button at the top of the interface.

The topology is inaccessible during the brief time it takes to refresh the window.

Viewing the Topology in Full Screen Mode

By default, the selected topology is displayed in the center of the Topology Configurator task. The devices are displayed on the left and the **Property Editor** is displayed on the right.

To view the topology in fullscreen mode

1   Open GV Orbit Control Stage. See Navigating Back to Stage, on page 170.
2   Select the required Area. See Selecting an Area, on page 183.

3 Select the required topology. See Selecting a Graph, on page 184.
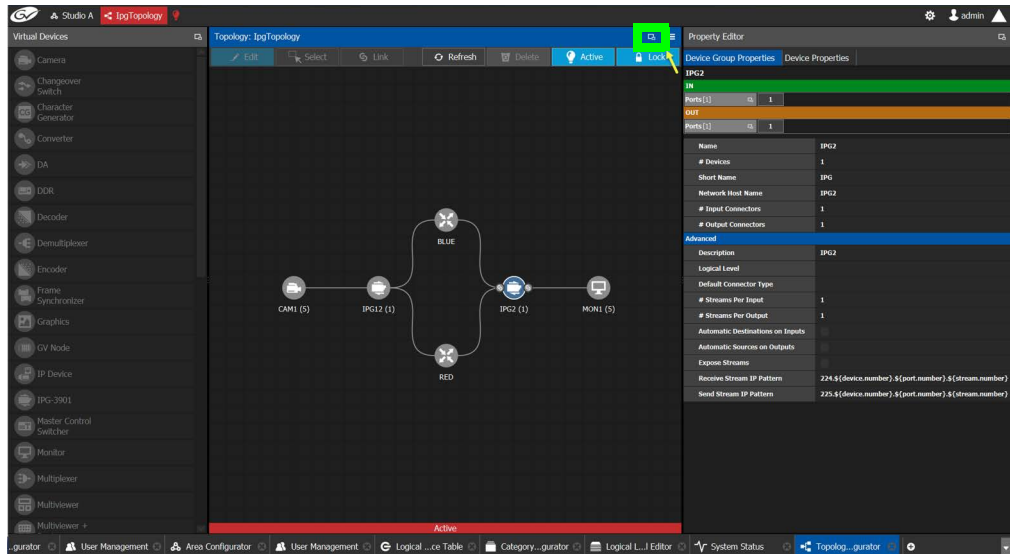
4 Click the Fullscreen toggle button at the top of the interface.

The Topology expands across all three columns in the Topology Configurator.
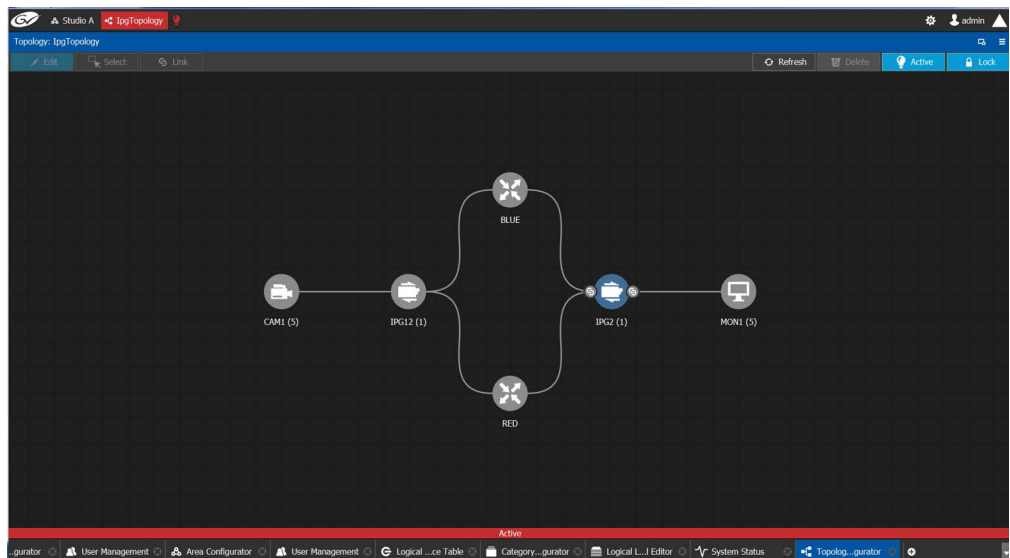
TIP

To zoom and center the topology view:
• click the Refresh button.
• double-click an empty space.

To return to default mode

1 When the Topology is in fullscreen mode, click Fullscreen to toggle the display back to the default mode.

Adding Devices to a Topology

By adding devices to a topology, you are making a representation in GV Orbit Control of the real world equipment you are using, and the physical interconnections made between this equipment.

There are two types of devices in GV Orbit Control.

- Virtual Devices: These are devices that GV Orbit Control does not need to know any of the device's configuration parameters in order to use the device. Therefore, the device can be offline when configuring it in GV Orbit Control. See Adding a Virtual Device to a topology, on page 204. Certain devices may require advanced configuration procedures; see Special Device Configuration Tasks, on page 331.
- Discovered: These are devices that GV Orbit Control needs to know the device's configuration parameters in order to know which of the device's spigots have been configured as sources or destinations, the levels, and so on. These devices must be online when configuring them in GV Orbit Control. For more information about discovered devices, see About Discovered Devices, on page 205.

Adding a Virtual Device to a topology

Certain Virtual Devices require advanced configuration procedures; see Special Device Configuration Tasks, on page 331 for more information about the specific device you are adding to the Graph, if necessary.

1 Select the required Area. See Selecting an Area, on page 183.

2 Select the required topology. See Selecting a Graph, on page 184.

3 The topology must be currently:
   - Activated (see Activating a Topology, on page 235).
   - Unlocked (see Unlocking / Relocking a Topology, on page 238).

4 From the **Device Library**, **Virtual Device** on the left, select **Virtual Devices** from the drop-down list.
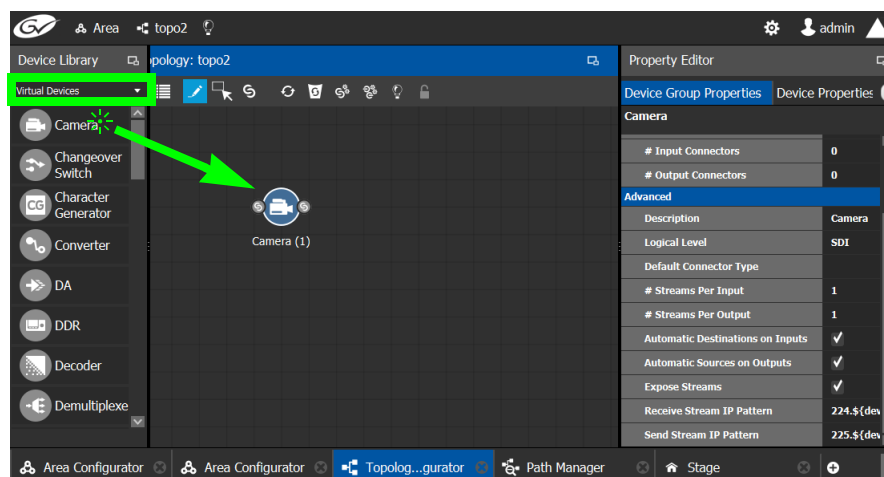
5 From the **Device Library**, **Virtual Device**, find the device that represents a piece of equipment you want to control: select the device bubble and drag it into position on the Topology and release the mouse button.

Initially, the device bubble represents a single device, such as a single camera. However, a bubble is a device group that can represent one or more devices. See To name a device and set the number of devices in the group, on page 205.

6 Repeat step 5 to and the following procedure (To name a device and set the number of devices in the group, on page 205) until you have added all the required devices to the topology.

To name a device and set the number of devices in the group

A device group is a collection of devices of the same type that can be configured together. All bubbles in a Topology are automatically device groups with the exception of the following devices: IPVU, IPG-3901, IPG-4901, IQMIX, IQUCP, UCP-3901, MV-820-IP, Kahuna-IP, NMOS devices, Audio Live, IQAMD, Network Switch, Router, and GV Node.

1 Click on the name of the device underneath the bubble to create a device group.

The Device Group configuration window appears.
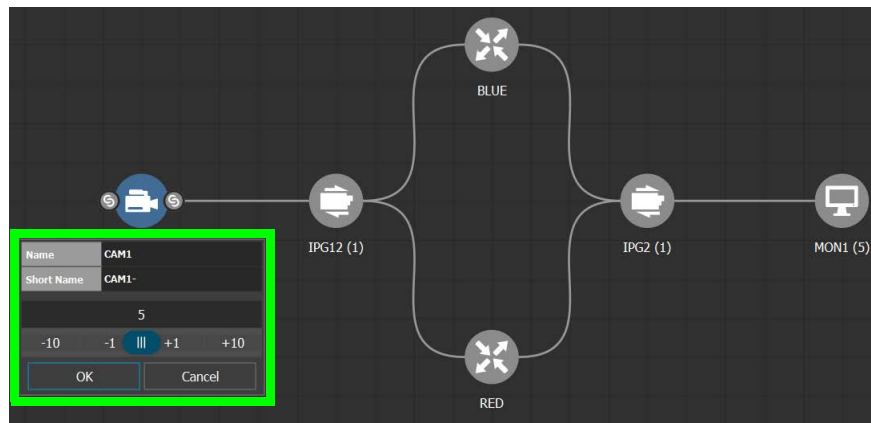
2 Enter meaningful names to identify the device group in the **Name** and **Short Name** fields.

In this case, the Camera device group is named CAM1 to identify the cameras controlled by Controller 1. These parameters can also be set in the **Property Editor**.

3 Use the plus and minus buttons to enter the number of device instances are in the device group.

4 Click **OK**.

Each device instance is shown and can be individually configured in the **Property Editor**, under **Devices**, by clicking an instance.

In the above example, five monitors, two IPGs, two network switches, and five cameras have been added to the Topology.

About Discovered Devices

There are two different types of discovered devices:

- NMOS devices discovered with IS-04, that can be senders, receivers or both. For more information, see Adding NMOS Devices to a Topology, on page 377.
- Grass Valley devices discovered with GVOP; see below for a list of these devices.

GVOP Devices

In order to use discovered GVOP devices in GV Orbit Control, the discovered devices must first be configured through the GV Orbit Client. GV Orbit Control needs to know the device's configuration parameters in order to know which of the device's spigots have been configured as sources or destinations, the levels, and so on. These devices must be online when configuring them in GV Orbit Control.

The following Devices Use GVOP to be discovered by GV Orbit Control.

Discovered Device Type	For more information, see
IPG-3901 / IPG-4901	Configuring an IPG-3901 / IPG-4901 Device, on page 343
IPVU	Configuring an IPVU Device, on page 349
IQMIX	Configuring an IQMix, IQUCP, or UCP-3901 Device, on page 352
IQUCP	
UCP-3901	
MV-820-IP	Configuring an MV-820-IP Multiviewer Device, on page 363
Kahuna-IP	Configuring a Kahuna IP Production Switcher Device, on page 367
Audio Live	Configuring a Device that Supports Audio Breakaway/Shuffling such as Audio Live, on page 433
IQAMD	Configuring an IQAMD40 Device, on page 446
Other devices that use GVOP for Configuration	These are devices that can be configured through GV Orbit Client.

When the **IP Friendly Name** service is running on the GV Orbit Server, and the device uses GVOP for Configuration:

•   In GV Orbit Control, GVOP device properties are automatically filled in from when the devices were configured through GV Orbit Client. Changes to those devices' properties in GV Orbit Client are updated in GV Orbit Control in real time. See Synchronization of Discovered GVOP Devices, Source, Destination, and Spigot Names made in GV Orbit Client, on page 211 for more information.

•   The device's current source and destination configuration is read in real time and is updated in the Logical Device Table's Multilevel Table when the **Automatic Sources and Destinations** parameter is set in the device's properties. See Logical Device Table Tasks, on page 241, About Automatic Sources or Destinations, on page 246, Device Properties Definitions, on page 232, and Synchronization of Discovered GVOP Devices, Source, Destination, and Spigot Names made in GV Orbit Client, on page 211.

•   There is no need to use Camera and Monitor devices to create the logical sources/destinations for these devices. Furthermore, Camera and Monitor devices are not created anymore when using the Quick Connect tool. See Using Quick Connect to Link all Devices in a Topology, on page 222.

•   Logical sources/destinations are created using the device spigot streams (Video, Audio, ANC). There is a logical source for each sender spigot and a logical destination for each receiver spigot.

Logical sources/destinations for GVOP devices are created using the audio channels from the spigot streams. The device's spigot configuration must have the **Num Audio Flows** configuration parameter that allow the use of 1, 2 or 4 audio streams.

The device's **Num Audio Flows** configuration parameter is configured on the device's Spigot page by connecting to the card's configuration with GV Orbit Client. See the device's documentation to see if this parameter is supported and how to set it.
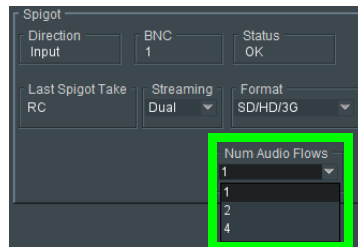
This spigot configuration allows the use of 1, 2 or 4 audio flows where the audio channels count in GV Orbit Control is accordingly adjusted. The 16 audio channels from the automatic logical sources / destinations are accordingly created using the multi audio streams / flows set in the card's configuration.

Num Audio Flows set in the GVOP card's Spigot	Effect in GV Orbit Control
1	There is 1 audio stream for the spigot with 16 audio channels which are represented in GV Orbit Control by the **AES67-16** logical level. In the GV Orbit Control GVOP device Properties, the following streams are available: **1:** SDI, SMPTE ST 2022. In the Logical Device Table, this is represented by the **SDI** column. **2:** Video, SMPTE ST 2110-20. In the Logical Device Table, this is represented by the **V** column. **3:** Audio AES67-16, SMPTE ST 2110-30. In the Logical Device Table, this is represented by the **A1** to **A16** columns. **7:** Ancillary, SMPTE ST 2110-40. In the Logical Device Table, this is represented by the **ANC** column.
2	There are 2 audio streams for the spigot; each stream has 8 audio channels which are represented in GV Orbit Control by the **AES67-8** logical level. In the GV Orbit Control GVOP device Properties, the following streams are available: **1:** SDI, SMPTE ST 2022. In the Logical Device Table, this is represented by the **SDI** column. **2:** Video, SMPTE ST 2110-20. In the Logical Device Table, this is represented by the **V** column. **3:** Audio AES67-8, SMPTE ST 2110-30. In the Logical Device Table, this is represented by the **A1** to **A8** columns. **4:** Audio AES67-8, SMPTE ST 2110-30. In the Logical Device Table, this is represented by the **A9** to **A16** columns. **7:** Ancillary, SMPTE ST 2110-40. In the Logical Device Table, this is represented by the **ANC** column.

Num Audio Flows set in the GVOP card's Spigot	Effect in GV Orbit Control
4	There are 4 audio streams for the spigot; each stream has 4 audio channels which are represented in GV Orbit Control by the **AES67-4** logical level. In the GV Orbit Control GVOP device Properties, the following streams are available:
	1: SDI, SMPTE ST 2022. In the Logical Device Table, this is represented by the **SDI** column.
	2: Video, SMPTE ST 2110-20. In the Logical Device Table, this is represented by the **V** column.
	3: Audio AES67-4, SMPTE ST 2110-30. In the Logical Device Table, this is represented by the **A1** to **A4** columns.
	4: Audio AES67-4, SMPTE ST 2110-30. In the Logical Device Table, this is represented by the **A5** to **A8** columns.
	5: Audio AES67-4, SMPTE ST 2110-30. In the Logical Device Table, this is represented by the **A9** to **A12** columns.
	6: Audio AES67-4, SMPTE ST 2110-30. In the Logical Device Table, this is represented by the **A13** to **A16** columns.
	7: Ancillary, SMPTE ST 2110-40. In the Logical Device Table, this is represented by the **ANC** column.

In the GV Orbit Control GVOP device Properties, the number, type of streams, and AES67 Logical Level are updated in real time according to the card's settings made in GV Orbit Client. For example, this screen shows the Properties for a card where the card's **Num Audion Flows** parameter configured to 1 and as a consequence, the level for the audio stream is shown as AES67-16.
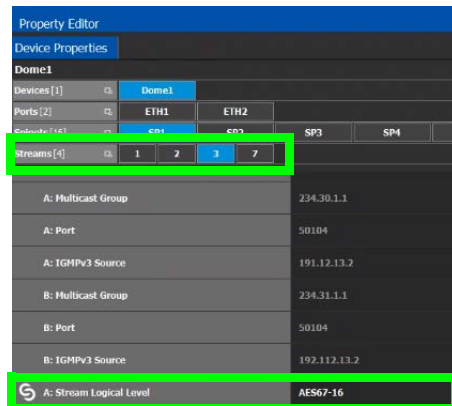
In the Logical Device Table, the GVOP device reflects the configuration settings, where there is only one audio stream.

To add a Discovered device to a Topology, see below. See also AES Logical Levels that are used for IP Audio Streams, on page 436.

To add a Discovered Device to a Topology

Discovered devices typically require advanced configuration procedures; see Special Device Configuration Tasks, on page 331 for more configuration information about the specific device you are adding to the Graph.

Adding a discovered device to a topology

1 Select the required Area. See Selecting an Area, on page 183.

2 Select the required topology. See Selecting a Graph, on page 184.

3 The topology must be currently:

- Activated (see Activating a Topology, on page 235).

- Unlocked (see Unlocking / Relocking a Topology, on page 238).

4 From the **Device Library**, on the left, select **Discovered** from the drop-down list. In the example below, an IQMix was discovered on the network.
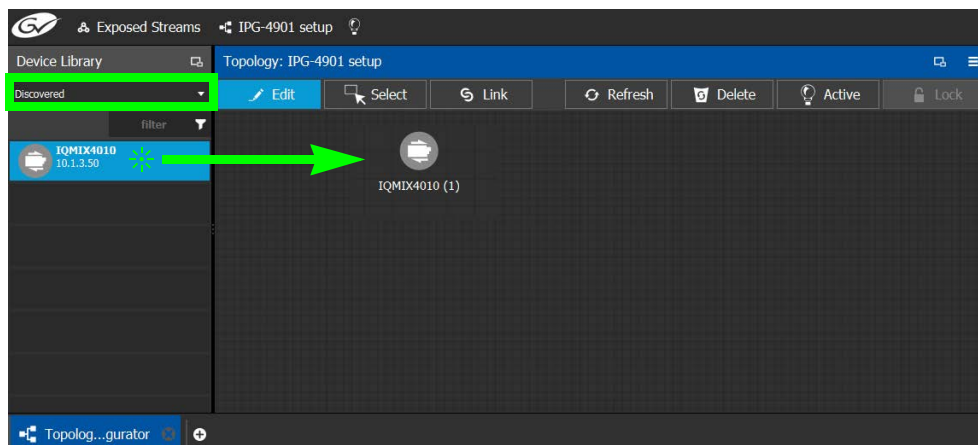
5 From the **Device Library**, **Discovered** find the device that you want to control: select the device bubble and drag it into position on the Topology and release the mouse button.

The device pulled from the **Device Library**, **Discovered** becomes grayed out and another instance of the same device instance cannot be added again to the Topology. However, multiple device instances found in the Device Library can be used to create a device group.

6 To create a device group:

   a From the **Device Library**, **Discovered**, find the device that you want to control: select the device bubble and drag it into position on the Topology and release the mouse button.

   b From the **Device Library**, **Discovered**, find another identical device that you want to control: select the device bubble and drag it on top of the first device instance already on the Topology and release the mouse button.
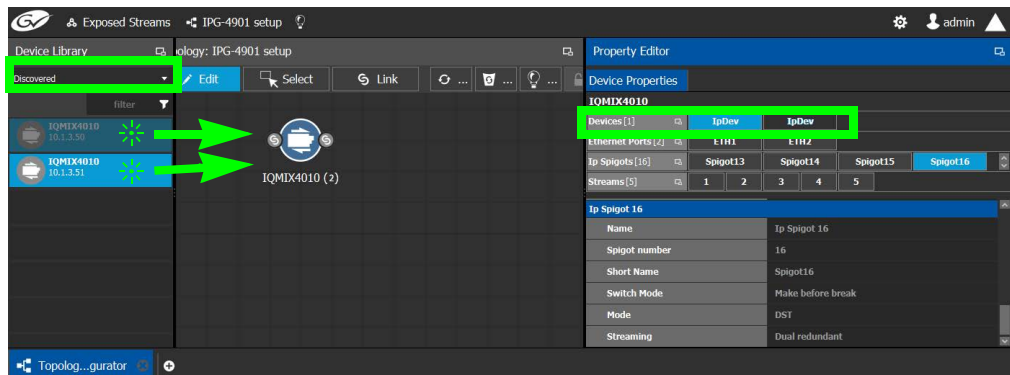
The two device instances are shown and can be individually configured in the **Property Editor**, under **Devices**, by clicking an instance.

7 Click on the name of the device underneath the bubble to name the device or device group.
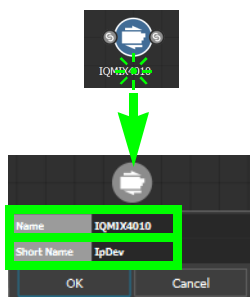
These parameters can also be set in the **Property Editor** when the device bubble is selected.
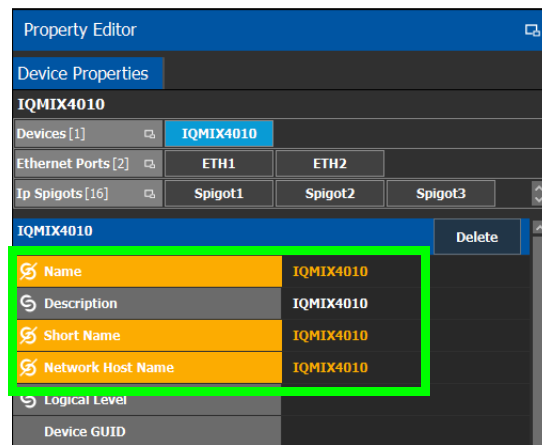
Using GVOP Devices

As of GV Orbit Control version 2.8.0 or higher, the way devices that use GVOP are configured has changed. To identify a device that uses GVOP, see GVOP Devices, on page 206. This brings new features such as:

- Tighter integration with GV Orbit Client to:
  - Automatically synchronize certain configuration parameters in GV Orbit Control.
  - Allow a spreadsheet import to set many GVOP device parameters in bulk in both GV Orbit Client and GV Orbit Control.

  See Synchronization of Discovered GVOP Devices, Source, Destination, and Spigot Names made in GV Orbit Client, on page 211.

- Devices that Use GVOP for Configuration no longer use the SDI camera/monitor bubble.

- Logical sources/destinations related to those GVOP devices will be automatically created using the spigot name (Port Name), once the configured device is added to the topology, even before making the appropriate connections. Those logical sources/destinations are created using the appropriate streams. For gateway devices, the SDI streams will be used and for IP devices, the IP streams will be used.

- The operating method of any GVOP device configured in GV Orbit Control version 2.7.X or earlier will remain unchanged after project migration to version 2.8.0 or higher. However, GVOP devices can be migrated to use this new function model of operation. See To migrate GVOP Devices for IP routing, on page 218.

Synchronization of Discovered GVOP Devices, Source, Destination, and Spigot Names made in GV Orbit Client

When the **IP Friendly Name** service is running on the GV Orbit Server, this service pushes certain configuration parameters made in GV Orbit Client to the same discovered GVOP device in GV Orbit Control. Changes to configuration parameters can result from having used the spreadsheet import feature in GV Orbit Client. See also GVOP Devices, on page 206.

This service uses a common device identifier, the device's GUID. A device's GUID is like a serial number that uniquely identifies individual GVOP devices. Through a device's GUID, the IP Friendly Name service:

- Provides persistence to the GV Orbit system for the naming of discovered GVOP devices. If the **IP Friendly Name** service is not running, Device and Spigot values from the configuration will not be available to GV Orbit Control and in such a case, GV Orbit Control will use the default values for device, spigot and logical source/destination labels. See Troubleshooting, on page 218.

- Updates made to GVOP devices in GV Orbit Client are dynamically reflected to those same devices in GV Orbit Control topology.

For example, by setting the device name in GV Orbit Client, the device name of the same GVOP device in GV Orbit Control will be updated in real time.

The intended workflow is to first configure the device in GV Orbit Client and then integrate the device for routing in GV Orbit Control.

When a discovered GVOP device is added to a Topology in GV Orbit Control, and the device's name is subsequently updated in GV Orbit Client, the device name and the Device Group name will also be automatically updated. However, once a second or more discovered devices have been added to this Device Group, then the name of the Device Group will no longer be updated due to changes made in GV Orbit Client to the name of any device found in the Device Group. The names of the individual devices, regardless of how many of them are in a device group, will always be updated.

Likewise, the device's current source and destination configuration is read in real time and is automatically updated in the Logical Device Table's Multilevel Table when the **Automatic Sources and Destinations** parameter is set in the device's properties. For more information, see About Automatic Sources or Destinations, on page 246 and Device Properties Definitions, on page 232.

Logical sources and destinations are created using the appropriate streams. For gateway devices, the SDI streams will be used and for IP devices, the IP streams will be used.

You can still manually create custom logical sources / destinations using the streams of your choice; see Configuring Streams for New Sources / Destinations, on page 249.

For gateway devices, the Stream Configurator allows you to expose any stream of your choice, including the device's IP streams. In such a case, the logical sources / destinations created using the SDI streams from the same spigot as the exposed IP streams will not be reachable anymore by GV Orbit Control's pathfinding, since the newly exposed IP streams become the device's edge. See Stream Configurator Tasks, on page 322. The following diagram shows that when IP streams are exposed, the SDI streams are no longer reachable.
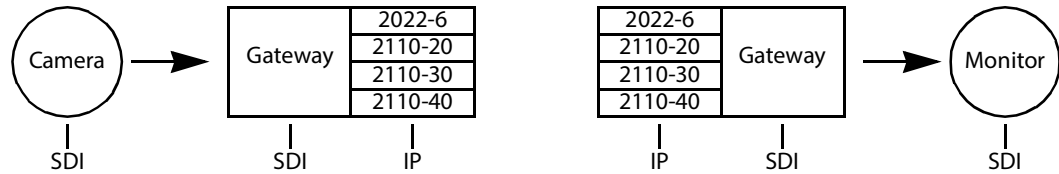
Note: When replacing a failed GVOP device, you will have to replace the device with the new one in the Topology of GV Orbit Control. The swapping of a GVOP device for a replacement one is not supported.

To Configure Device Information in GV Orbit Client

The following device parameter values are pushed from GV Orbit Client to GV Orbit Control. As a result, in GV Orbit Control, these parameters are read only. The IP Friendly Name service persists this data in the GV Orbit Server. For more information, see About Automatic Sources or Destinations, on page 246 and Device Properties Definitions, on page 232.

GV Orbit Control Device Property (read only)	GV Orbit Client Parameter	Comment	See
Name	Device Name	This is the device's *Friendly Name*. If no friendly name has been set, the device type (product's model number) is shown.	To Configure Device Information in GV Orbit Client, on page 213
Network Host Name	Host Name		
Description	Description	This is also the *Friendly Name* value. If the **Description** value is set in GV Orbit Client, then this value is used as the description in GV Orbit Control. Otherwise, if no friendly description has been set in GV Orbit Client, the device's product model number is shown.	

GV Orbit Control Device Property (read only)	GV Orbit Client Parameter	Comment	See
Short Name	Short Name	If a friendly short name is set in the GV Orbit Client, then this is the value set as the short name in GV Orbit Control. If no friendly short name is set, then the value for this GV Orbit Control will be derived from the Name parameter.	—
Source and Destination For example, found in the **Sources / Destinations** tab of the **Multilevel Table** in the **Logical Device Table**. See Logical Device Table Tasks, on page 241.	The Logical Source / Destination gets its name as follows: • The spigot port name (if this value has been set in GV Orbit Client), OR • The device's short name plus " . " plus spigot number.	When the **Automatic Sources and Destinations** property is set for a GVOP device (this is the default setting, see GVOP Devices, on page 206), the name of the spigot's source or destination set in GV Orbit Client is applied, when the topology is activated (see Activating a Topology, on page 235).	To Configure Source and Destination Information in GV Orbit Client, on page 215

Proceed as follows.

1 In GV Orbit Client, open the **Devices** tab. See also IP Configuration of End Point Devices and Spreadsheet Import, on page 75.
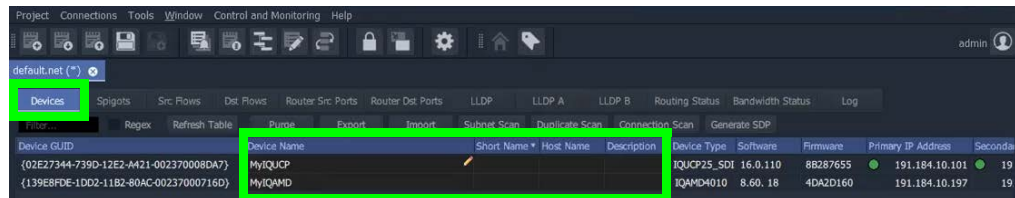
2 Identify the device you want to configure.

3 Set the **Device Name**, **Short Name**, **Host name**, and **Description** parameters for the device.

This information is immediately updated for the same device in GV Orbit Control.

To Configure Source and Destination Information in GV Orbit Client

The following source and destination spigot parameter values are pushed from GV Orbit Client to GV Orbit Control. As a result, in GV Orbit Control, these parameters are read only. The IP Friendly Name service persists this data in the GV Orbit Server. For more information, see About Automatic Sources or Destinations, on page 246 and Device Properties Definitions, on page 232.

GV Orbit Control Spigot Property (read only)	GV Orbit Client Parameter	Comment	See
Name	Port Name	The name or identifier for this input or output port. The Port Name in GV Orbit Client is used as the label to generate sources and destinations. If no value is specified in GV Orbit Client, GV Orbit Control will use a combination of device name plus spigot number for the sources and destinations.	
Short name	Short Name	This is the spigot name commonly used in the GV Orbit Control interface.	
Port Number	Port Number	Uniquely identifies any source or destination across all devices. A source and a destination can have the same port number. However, two sources / destinations cannot have the same port number.	

These values can be assigned automatically; see To Automatically Assign Port Numbers, Short Names, and Port names in GV Orbit Client, on page 216. Proceed as follows.

1 In GV Orbit Client, open the **Devices** tab. See also IP Configuration of End Point Devices and Spreadsheet Import, on page 75.

2 Select the device you want to configure.

3 Select the **Spigots** tab.
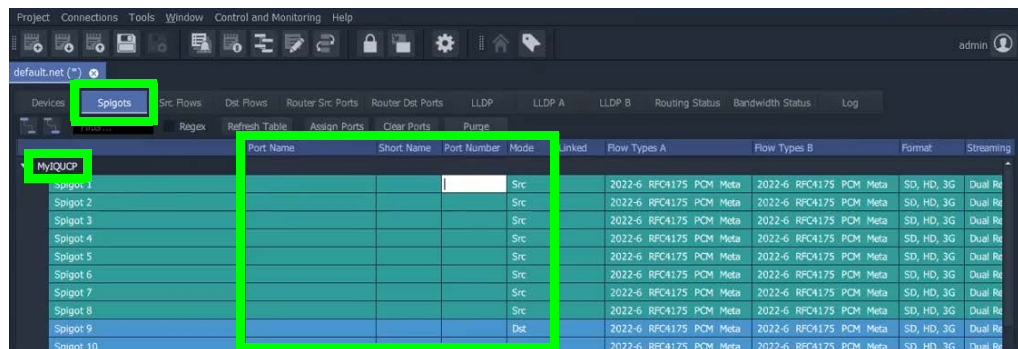
4 Identify the device's source (**Src**) and destination (**Dst**) spigots in **Mode**. This reflects the device's current configuration.

5 Set the **Port Number**, **Short Name**, and **Port Name** parameter for the spigot.

Enter the **Port Number** FIRST before entering other values. If you try to set a **Short Name** or **Port Name** parameter for a spigot that doesn't have a **Port Number**, then the value you enter is not saved.

This information is immediately updated for the same device in GV Orbit Control.

To Automatically Assign Port Numbers, Short Names, and Port names in GV Orbit Client

1 Select the **Spigots** tab.
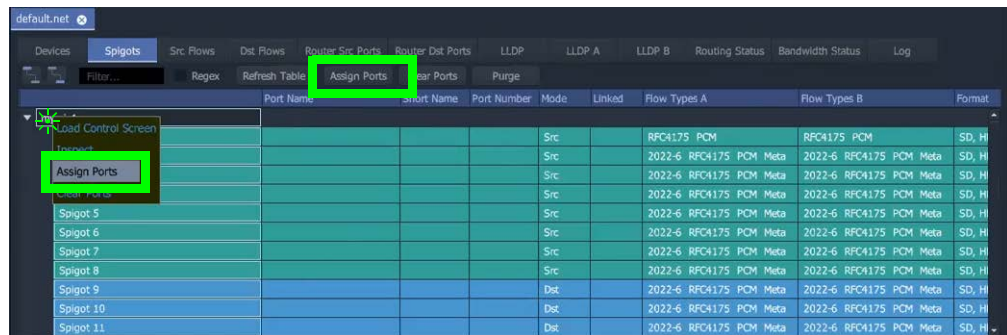
2 Right-click the device's name and select **Assign Ports**. Or click **Assign Ports** above the table to assign ports to all devices.

3 Set the following parameters in the **Assign Port Mappings** screen.

Parameter	Description
Spigot Selection	Select the scope of this screen. **Sources and Destinations:** Apply automatic assignment changes to both sources and destinations. **Sources:** Apply automatic assignment changes to sources only. **Destinations:** Apply automatic assignment changes to destinations only.
Source Ports / Base port number	This tool uses a counter to assign a number to a port. This setting allows you to individually set the starting number for the first source and destination port from which the count will start.
Destination Ports / Base port number	

Parameter	Description
Assignment Mode	Select the way port numbers are assigned: **Synchronize source and dest assignments in discrete blocks:** Assign port numbers such that the next highest available number is used to start numbering the first source and destination ports together in unison. **Ad hoc - use next free source or destination port:** Separately assign port numbers, individually to sources and destinations, in sequence such that the next available port number is always used.
Options	Automatically generate the parameter values for port and short names. **Create default port names:** Set to automatically generate the value in the **Port Name** column as follows: [device name] + [S = source, D = destination] + [Port Number] **Create default short names:** Set to automatically generate the value in the **Short Name** column as follows: [Port Number] + [S = source, D = destination] + [Port Number]

4 Click **OK**.

This information is immediately updated for the same device in GV Orbit Control.

To migrate GVOP Devices for IP routing

As of GV Orbit Control version 2.8.0 or higher:

- GVOP devices newly added to a Topology will no longer need to be connected to Camera and Monitor devices and the logical sources/destinations will be automatically created when: the device is added to the topology, the topology is activated, and the status of the device's control port is Online.

- The spigots of these devices can be re-named in GV Orbit Client. See Synchronization of Discovered GVOP Devices, Source, Destination, and Spigot Names made in GV Orbit Client, on page 211.

GVOP devices configured in GV Orbit Control version 2.7.X or earlier are not automatically updated to use this new routing method when a project is migrated to GV Orbit Control version 2.8.0 or higher. If you want to use the new behavior available to GV Orbit Control version 2.8.0 or higher, then you must manually migrate the devices.

To migrate GVOP for IP routing, choose one of the following methods.

- Delete The Camera and Monitor linked to the GVOP device and then set the **Automatic Sources and Destinations** parameter in the device's properties. See Device Properties Definitions, on page 232.

- Delete the GVOP device, the associated Camera and Monitor devices and then add only the GVOP device back to the Topology.

Troubleshooting

Verify that the IP Friendly Name service is running; if:

- A device's friendly name disappears from the GV Orbit Client.

- The device Name, Short Name and Network Host Name show the device's primary IP address.

Ensure the IP Friendly Name service is installed and running on the GV Orbit Server. Refer to Application Maintenance in the GV Orbit Admin Guide. See Related Documentation, on page 7.

Using Quick Config

Quick Config is used to make bulk configuration changes to the selected devices. See How to Identify if a Device Bubble is Selected or Not, on page 201. It can:

- Change a device's logical level.
- Expose or un-expose the device's streams.

Switches allow the changes to apply only to IP streams, SDI streams, inputs, or outputs. For example, Quick Config can be used multiple times: the first time to set the logical level for the device's inputs, and then a second time to set another logical level for the device's outputs.

To set the Quick Config options for the selected devices

1 Select the devices on the Topology you want to configure.
2 Click ⚙ in the Topology Configurator's toolbar.

3 Set the following options.

Parameter	Description
Logical level family	Select the logical level to assign to the device's source and destination streams. See also Duplicating a Logical Level, on page 193. **Keep current level**: leaves the device's currently-assigned source and destination logical levels untouched.
Expose streams un-expose streams	Only certain devices support this property. When Expose Stream is set, it displays the streams for this device in the Logical Device Table. See Logical Device Table Tasks, on page 241.
Set port redundancy	Certain third-party devices that support port redundancy are not automatically recognized by GV Orbit Control to support redundancy. When devices have been configured with two or more ports, set this option to make the ports redundant in GV Orbit Control. See Setting Port Redundancy for Many Devices at Once, on page 220.
Apply to IP streams	Set to apply the above settings to IP network connections between devices.
Apply to SDI	Set to apply the above settings to SDI connections between devices.

Parameter	Description
Apply to Inputs/Rx	Set to apply the above settings to device destinations.
Apply to Outputs/Tx	Set to apply the above settings to device sources.

4   Click **OK**.

Setting Port Redundancy for Many Devices at Once

Redundancy associates a port with another port to create a redundant network traffic flow path for failover protection. The associated port will not be available to carry other traffic. For example, this is a requirement of a SMPTE ST 2022-7 network topology. See also Configuring Network Switch Redundancy to Support SMPTE ST 2022-7, on page 399.

> Note: This feature is to only be used with third-party devices.

Certain third-party devices that support port redundancy are not automatically recognized by GV Orbit Control to support redundancy. For such devices, once they have been configured with two or more input / output connectors, use the **Set port redundancy** option in **Quick Config** (see Using Quick Config, on page 219) to make the ports redundant in GV Orbit Control. When completed, the **Redundancy Port** parameter in the **Device Properties** for *in / out 1* is *in / out 2* and the **Redundancy Port** parameter for *in / out 2* is *in / out 1*. If there are 4 ports, then the **Redundancy Port** parameter for *in / out 3* is *in / out 4* and the **Redundancy Port** parameter for *in / out 4* is in / out 3 and so on.

For more information about **Device Properties,** see Defining Device Properties, on page 229.

Use other **Quick Config** options to focus the redundancy on the required ports and port direction. For example, to make the selected device's output IP streams redundant, set the Quick Config as shown below.
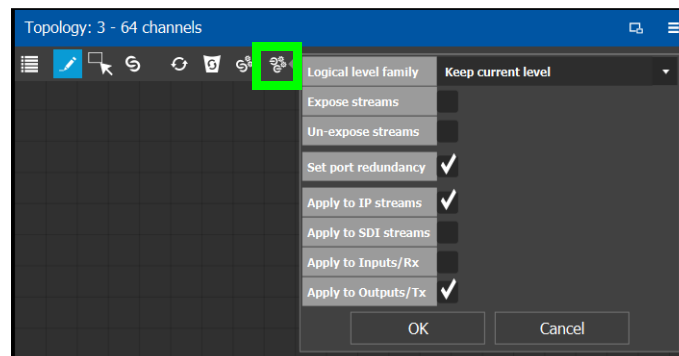
Once these devices have been configured, use the Stream Configurator to set the IP address for a large number of devices in an efficient way. See Stream Configurator Tasks, on page 322.

Example of how to set port redundancy for many devices at once

This procedure is an example for the following scenario:

- 100 IP analog-to-digital audio devices have been connected to the network switches with redundant connections.
- Each audio device supplies IP outputs for 16 channels of AES67 audio.

This example makes the IP output connections 1 and 2 redundant for each audio device in a device group of 100 generic IP Devices.

1 Open the Topology Configurator. See Accessing the Topology Configurator, on page 199.

2 From the Device Library, drag an **IP Device** onto the Topology Configurator. See Adding a Virtual Device to a topology, on page 204.

3 Select the **IP Device**. See How to Identify if a Device Bubble is Selected or Not, on page 201.

4 Set the device group's properties as follows (see Defining Device Properties, on page 229 and Device Properties Definitions, on page 232):

- Set the number of output connections in **# Output Connections** to **2**.
- Set the logical levels for the device in **Logical Level** to **AES67-16**.
- For a SMPTE ST 2110 device with three output streams, set the number of streams in **# Streams Per Output** to **3**.
  - Set the logical levels for each of these streams to video, audio, and ancillary found under the individual stream properties.
  - Set the IP address for each stream (video, audio, and ancillary) found under the individual stream properties.

5 Set the number of **IP Device** instances to 100 and set a name for the devices. See To name a device and set the number of devices in the group, on page 205.

6 Click [icon] in the Topology Configurator's toolbar while the device group is selected. See To set the Quick Config options for the selected devices, on page 219.

7 Set the following Quick Config options:

- Set port redundancy
- Apply to IP streams
- Apply to outputs / Tx

8 Click **OK**.

When complete, the **Redundancy Port** parameter in the **Device Properties** for *out 1* is *out 2* and the **Redundancy Port** parameter for *out 2* is *out 1* for all device instances. The IP address for these devices can be efficiently set with the Stream Configurator. See Stream Configurator Tasks, on page 322.

Methods to Link Devices in a Topology

Once two or more devices have been added to the Topology Configurator (see Adding Devices to a Topology, on page 204), devices can be linked together using the following methods. Using one method does not prevent you from using another method in the future.

Linking Method	Description	See Procedure
Quick Connect	Automatically connects all unconnected ports of devices currently in the Topology Configurator. Quick Connect options can limit automatic connections by stream, source, or destination type.	Using Quick Connect to Link all Devices in a Topology, on page 222.
Manual Linking	Create the links between devices manually. Manual linking allows precise control over link parameters. You must also set the link's physical connection parameters (sources and destinations) for each link.	1 Manually Linking the Devices in a Topology, on page 224. 2 Manually Setting the Link's Physical Connection Parameters (Sources and Destinations), on page 225.

Using Quick Connect to Link all Devices in a Topology

Quick Connect automatically connects all unconnected ports of:

- All devices currently in the Topology Configurator when no devices are selected.
- The currently selected devices in the Topology Configurator.

See How to Identify if a Device Bubble is Selected or Not, on page 201.

When necessary, it reads the device's configuration to learn:

- Which ports / spigots have been configured as sources or destinations.
- The available IP ports, including control and management ports.

If a NMOS node has been added to the topology and has been configured and is working (see Adding NMOS Devices to a Topology, on page 377), Quick Connect will connect the NMOS node's management ports.

Quick connect also automatically connects the link's physical connection parameters (sources and destinations) for each link.

Once more devices have been added to the topology, or if a link has been cut, Quick Connect can be run again to automatically connect those devices. Quick Connect will ignore pre-existing connections between devices.

Quick Connect has an option to automatically create sources and destinations for SDI inputs and outputs. SDI inputs are connected to Camera device groups, and outputs are connected to Monitor device groups. As a result, these SDI Camera and Monitor devices become available in the Logical Device Table as the device's inputs and outputs. See Logical Device Table Tasks, on page 241.

However, as of GV Orbit Control version 2.8.0 or higher, for devices that use GVOP (see GVOP Devices, on page 206), the sources and destinations of such a device newly added to a Topology will no longer be connected to Camera and Monitor devices by Quick Connect. The sources and destinations of the GVOP device become immediately available in the Logical Device Table when it is added to the Topology and the topology is activated. See Synchronization of Discovered GVOP Devices, Source, Destination, and Spigot Names made in GV Orbit Client, on page 211 for more information.

Quick Connect is found in the Topology Configurator's toolbar.
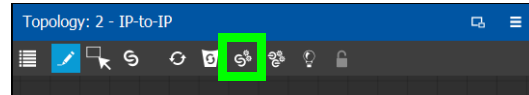
PREREQUISITES: The following must have been configured:

- If the system requires physical IP connections to be made, make sure you have at least one network switch device in your topology. If your network uses a second network switch to support redundancy (for example, to support SMPTE ST 2022-7), then you must have at least two network switch devices in your topology. See also Configuring Network Switch Redundancy to Support SMPTE ST 2022-7, on page 399.

- Ensure that core devices such as those listed in Special Device Configuration Tasks, on page 331 have been added to the topology using drag-and-drop from the Virtual or Discovered devices libraries and have been configured before using this tool. For example, GV Nodes, IPG-X901, IQMix, IQUCP, UCP-3901 cards, Audio Live, and Routers. See Special Device Configuration Tasks, on page 331 for specific configuration information about these devices.

- Add the remaining devices to the topology. See Adding Devices to a Topology, on page 204.

- The topology must be currently:
  - Activated (see Activating a Topology, on page 235).
  - Unlocked (see Unlocking / Relocking a Topology, on page 238).

- All devices must be currently online. That is, no device should be shown in red in the System Status. See System Status Task, on page 457.

- The required logical levels have been created. See Accessing the Logical Level Editor, on page 190.

Using Quick Connect

Set the Quick Connect options before using Quick Connect. See Using Quick Config, on page 219.

1   Click in the Topology Configurator's toolbar.

2 Set the following options.

Parameter	Description
Do IP connections	Set to automatically create IP network connections between devices.
Main network	Select the name of the primary switch in your network.
Backup network	If your network uses two network switches to support redundancy (for example, to support SMPTE ST 2022-7), then select the name of the secondary switch in your network. See also Configuring Network Switch Redundancy to Support SMPTE ST 2022-7, on page 399.
Do SDI connections	Set to automatically create SDI connections between devices. As of GV Orbit Control version 2.8.0 or higher, this option no longer applies to devices that use GVOP (see GVOP Devices, on page 206). See Synchronization of Discovered GVOP Devices, Source, Destination, and Spigot Names made in GV Orbit Client, on page 211 for more information. Topologies created in a previous GV Orbit Control version will not be changed to reflect this new behavior, unless the device is added again to the Topology.

3 Click **OK**.

Manually Linking the Devices in a Topology

Once the device groups are added to the Topology, the next step is to create links between them using the Link mode which allows you to link bubbles with a touch-based device. Otherwise, if you are using a mouse and keyboard interface, you can link devices together using the following procedure while in the Edit mode as well.

To link devices or device groups in a topology

Open the required topology.

1 Select the required Area. See Selecting an Area, on page 183.

2 Select the required topology. See Selecting a Graph, on page 184.
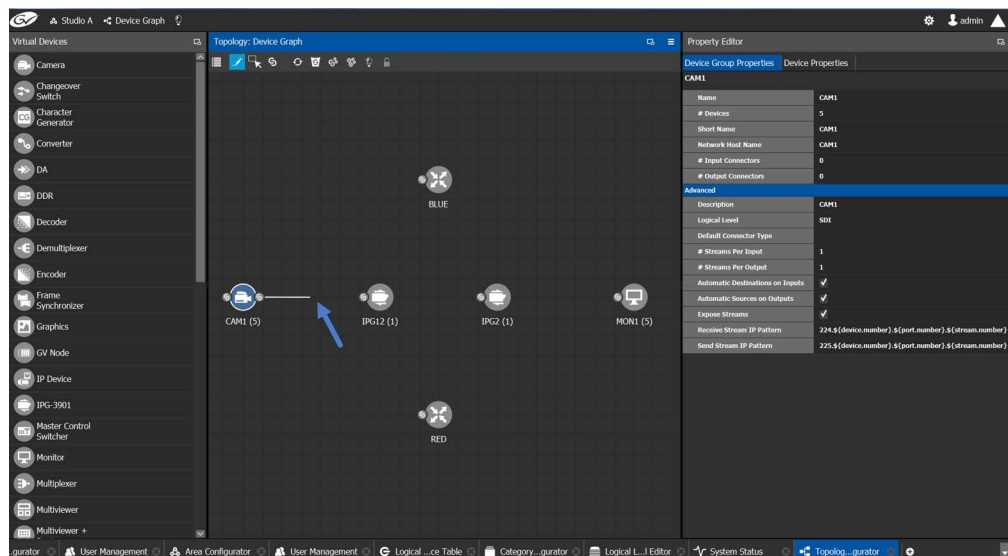
3 Click the **Link** button at the top of the interface.

4 Select the first bubble in the pair you want to connect.

   When the bubble is selected, the device is highlighted in blue and both the bubble's input and outputs ports become available. Input ports are on the left side of the bubble. Output ports are on the right side of the bubble.

5 Select an input or output port on the bubble.

   If the input port was selected, the output ports of all the available devices appear. If the output port was selected, the input ports of all the available devices appear.

6 Draw a line, with your mouse, between the ports of the two devices to make the connection between them. Or if you are using a touch-based device, the Link mode allows you to link bubbles together by dragging a bubble over others so that the connectors touch each other and then pull them apart to their final position.

Manually Setting the Link's Physical Connection Parameters (Sources and Destinations)

When a link is selected, the **Physical Connection Table** appears. It is in this table where you create the connections between device ports. When you add devices to a Topology and you then link two devices, you are indicating that the two devices in two groups are virtually connected.   Therefore, you need a place to specify how these devices are actually (physically) connected. This is achieved through the Physical Connections Table. It is in this table where you will actually specify that port1 of device1 that is part of group1 is connected physically with port1 of device1 of group2, for example.
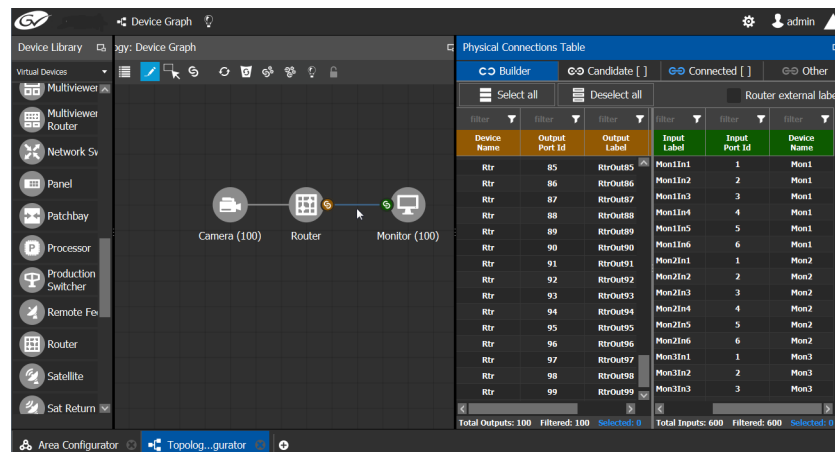
To make a connection, you must start in the Builder tab, and then complete the action in the Candidate tab.

The **Physical Connection Table** uses connection icons as follows.

Icon	State (status)	Action
	The stream is ready to be connected as it has been selected in the Builder tab.	—

Icon	State (status)	Action
	The stream is connected.	Connect: make the connection between the source and destination devices.
	—	Disconnect: break the connection between the source and destination devices.

The **Physical Connection Table** uses port type icons as follows. A source's output port type must be linked to the same input port type at the destination.

Port Type Icon	Description
	The connection type is SDI.
	The connection type is IP.
	The connection type is MADI.

In the **Physical Connection Table**, more than one table row can be selected at a time; to add to a selection, use *Shift* or *Ctrl* to select a range of table rows or to add another row to the selection.

Builder Tab

The Builder tab shows all the outputs and the inputs available for connections. The output streams are shown on the left and the inputs are shown on the right for the selected link. By selecting streams in the Builder tab makes them available in the Candidate tab where they are then linked. For extra information about an input or output, set **Router external labels**. The Router external labels are only available for router ports and not all device ports.
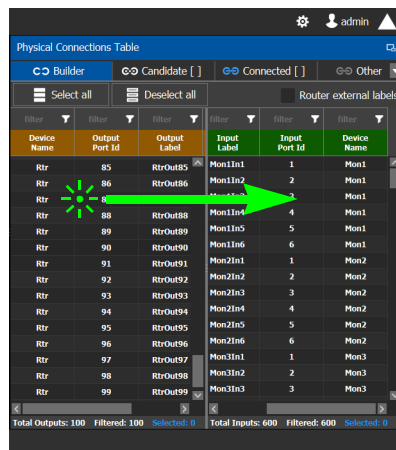
To associate a device's output stream to another device's input

1 Select one or more source output stream table rows that you want to link to destination's input.

2 Drag the source output stream table rows onto the destination input(s).

The selected items become available in the Candidate tab.

You can bypass the Candidate tab as follows: you select all your destination, and all your sources and then with your right mouse button held down you drag the destinations over the sources. With this method, the only way to review your connections is by going into the Connected tab and disconnecting the wrong/unwanted ones.

Candidate Tab

Once a device's output stream has been associated to another device's input in the Builder tab, you can review these associations to then select the ones you want to link together.
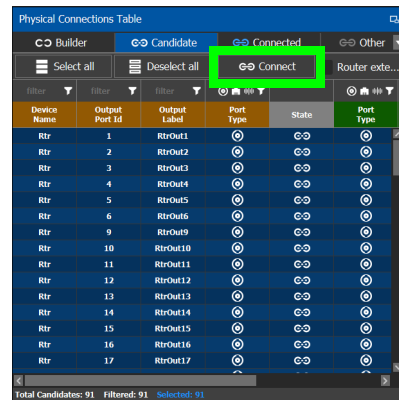
To link a device's output stream to another device's input

1 Select one or more table rows that you want to link the source's output stream to the destination's input.

2 When satisfied with your selection, click Connect at the top of the table.

Connected Tab

This tab shows the currently linked streams between the source's output and the destination's input. Links can be disconnected in this tab.
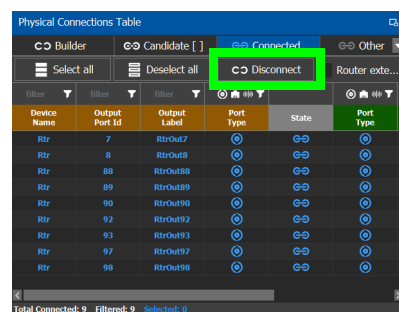
To disconnect a device's output stream from another device's input

1 Select one or more table rows that you want to disconnect the source's output stream to the destination's input.

2 When satisfied with your selection, click Disconnect at the top of the table.

Other Tab

This tab will show you all the other connections that a device's ports has on another links. For example, you have device1 with 20 ports, 10 are connected to device2 and 10 to device3. You select the first link and you connect the 10 ports. You select the second link on the Other tab you will see the first 10 ports that you connected.

Deleting the Connection Between Device Groups

To delete the connection between devices

Open the required topology.

1 Select the required Area. See Selecting an Area, on page 183.

2 Select the required topology. See Adding Devices to a Topology, on page 204.
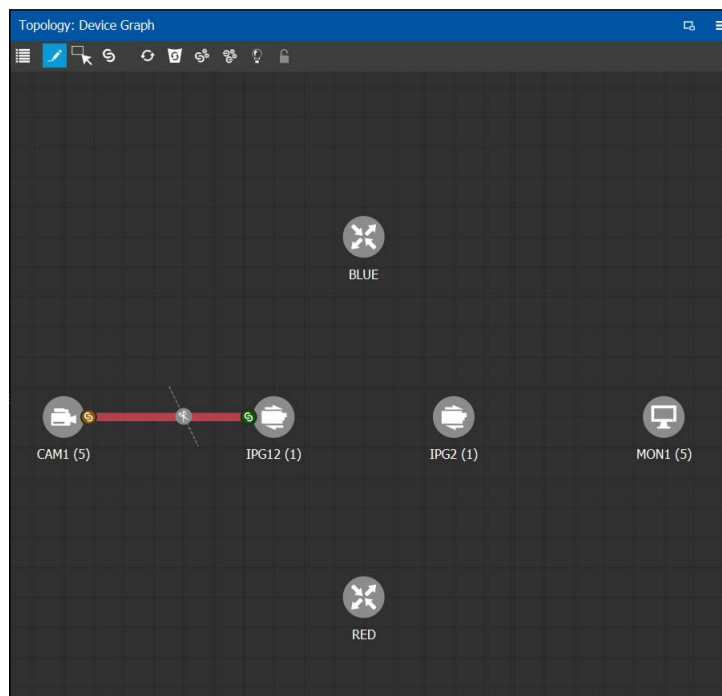
3 Select the **Link** button at the top of the interface.

4 Draw a line across the connection.

The scissor icon appears on the line and the link turns red.

5 Release the mouse.

The connection link is removed.

Defining Device Properties

You set the parameters for the selected device in the **Property Editor**.

- The configuration parameters for most devices is intuitive and no further explanation is required. See Device Properties Definitions, on page 232 for a primer.
- The configuration of certain devices requires advanced knowledge; see Special Device Configuration Tasks, on page 331 for more information about these devices.

Inheritance of Property Values from the Device Group Properties Tab

Certain parameter values in the **Device Properties** tab inherit their values from the corresponding parameter values in the **Device Group Properties** tab. This allows you to configure common parameters for a large number of devices at once with a default value.
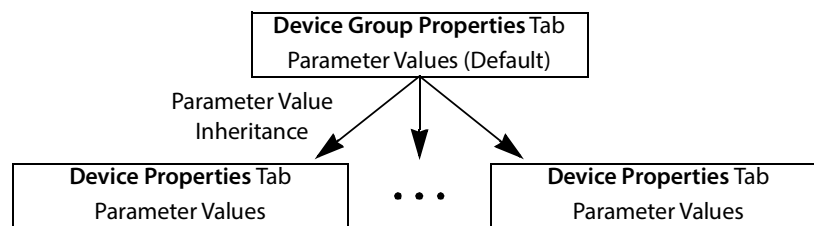
When you change the value of a parameter in the **Device Properties** tab such that it is now different from the corresponding value set in the **Device Group Properties** tab, the parameter will be displayed with an orange background. This is shown below.
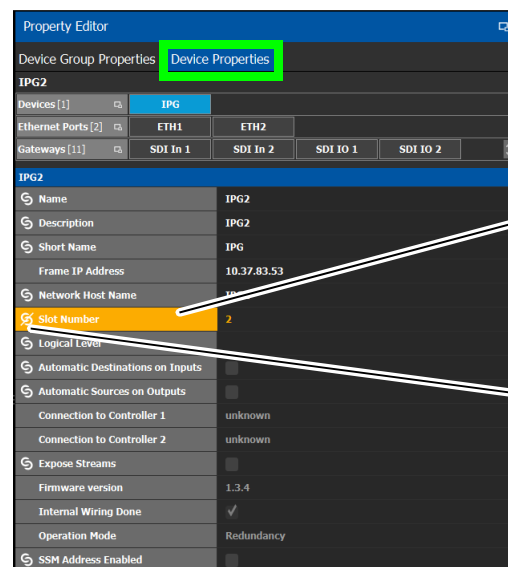
The parameter's value is a non-default value (indicated by the orange highlight)

Click to reset the parameter's value back to the default value set in the **Device Group Properties**

To define properties for a device

1 Open the required topology. See Selecting a Graph, on page 184.

2 Select the device you want to configure.

The **Property Editor** is displayed on the right.
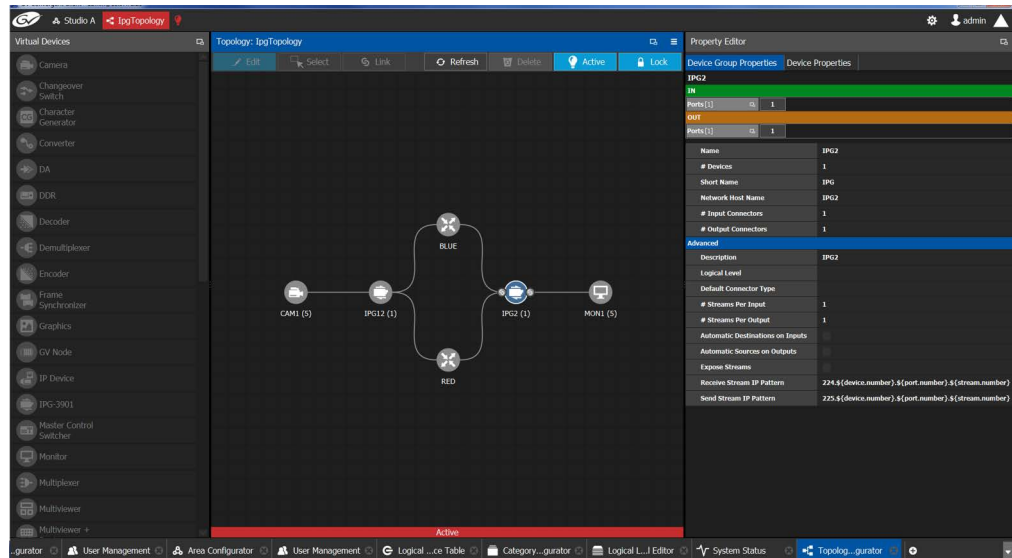
In this case, the IPG2 bubble is selected and the Device Group Properties tab is selected in the **Property Editor**.

3 Select the **Device Properties** tab to view the properties for the individual device. See also Description of Common Device Properties, on page 332.
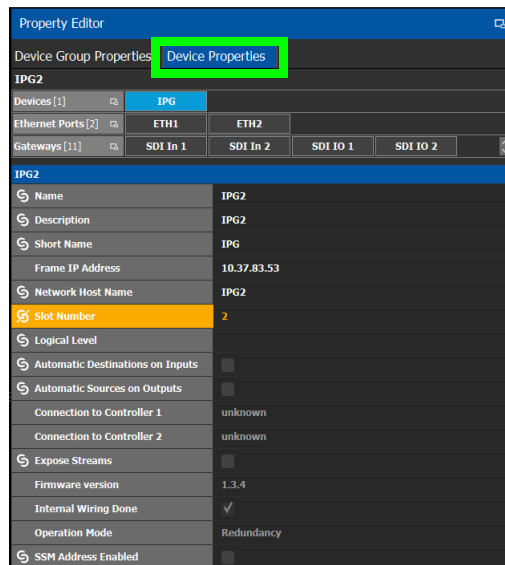
For example, for the Cameras, there is a **Device Group Properties** tab for the camera group and a **Device Properties** tab for each of the five cameras.

Camera Device Group Properties

The **Device Group Properties** tab sets the default parameter values to be passed down to each individual device in the **Device Properties** tab to save time. These default values can be overridden in the at the device level in the **Device Properties** tab.
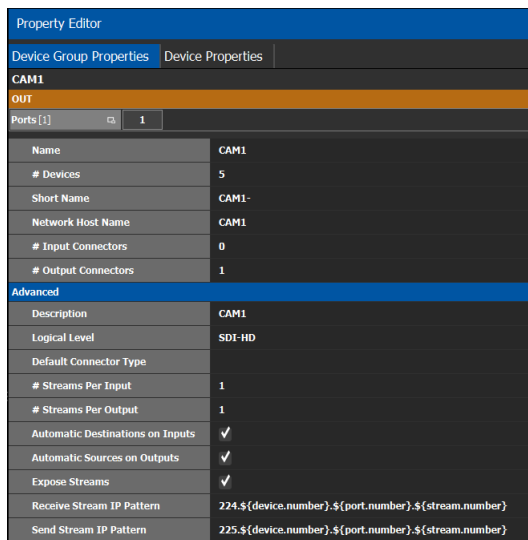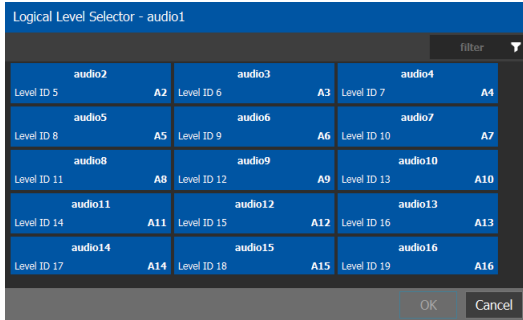
Camera Device Properties
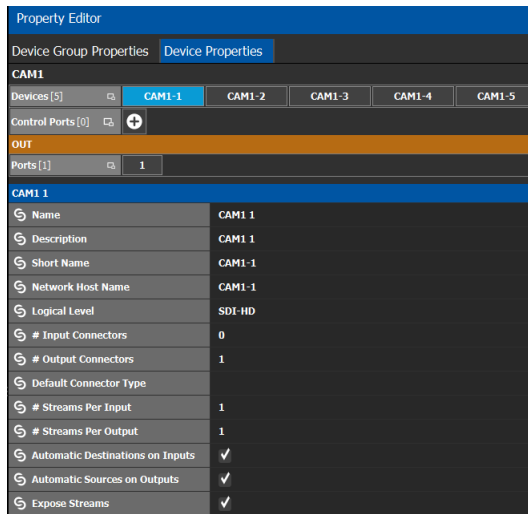
Note: All devices, device groups, and connections have properties.

Device Properties Definitions

This is a non-exhaustive overview of the device properties parameters.

Parameter	Description
Name[a]	The name or identifier for this device instance. The name or identifier for this input or output port. For devices that use GVOP to configure them, see Synchronization of Discovered GVOP Devices, Source, Destination, and Spigot Names made in GV Orbit Client, on page 211.
Description[a]	An optional description for the related input, output, or device. For devices that use GVOP to configure them, see Synchronization of Discovered GVOP Devices, Source, Destination, and Spigot Names made in GV Orbit Client, on page 211.
Short Name[a]	The nickname by which the input, output, or device is referred to everywhere in the system. For devices that use GVOP to configure them, see Synchronization of Discovered GVOP Devices, Source, Destination, and Spigot Names made in GV Orbit Client, on page 211.
# Devices	The number of device instances in this device group.
Network Host Name[a]	The hostname is the unique name by which the device is known on the network. For devices that use GVOP to configure them, see Synchronization of Discovered GVOP Devices, Source, Destination, and Spigot Names made in GV Orbit Client, on page 211.
Logical Level	The logical level for this input or output. Click to change the logical level through the Logical Level Selector. Select a logical level and click **OK** to change the level. For more information about logical levels, to create, or modify logical levels, see Logical Level Editor Tasks, on page 190.
# Input Connectors	The number of physical input port connections made to the device.
# Output Connectors	The number of physical output port connections made to the device.
# Streams Per Input	The typical number of streams available on each physical input connection.
# Streams Per Output	The typical number of streams available on each physical output connection.
# Streams	The actual number of streams available on the selected physical input / output connection.

Parameter	Description
Port Identifier	This is the generic identifier of the port within GV Orbit Control.
IP Address	The port's IP Address.
Automatic Sources and Destinations	This parameter is for GVOP devices (see GVOP Devices, on page 206) only: set to automatically use the names and the flow type configured for sources and destinations for this same device in GV Orbit Client in real time when the Topology is activated (see Activating a Topology, on page 235). This can be set for the device as a whole, or for individual spigots. When a GVOP device is newly added to the topology, this parameter is now set by default. For more information, see Synchronization of Discovered GVOP Devices, Source, Destination, and Spigot Names made in GV Orbit Client, on page 211 and About Automatic Sources or Destinations, on page 246. For topologies created prior to GV Orbit Control version 2.8.0 or higher, this parameter is deselected for all pre-existing GVOP devices. If you set this parameter, then connected camera / monitor groups will no longer work. See also To migrate GVOP Devices for IP routing, on page 218. When deselected, the streams will be unexposed for the device. You can create custom logical sources/destinations by exposing the required streams first, using the Stream Configurator. See Stream Configurator Tasks, on page 322.
Automatic Destination Automatic Destinations on Inputs Automatic Destinations on Outputs	Set to automatically create a destination by the system for the specified streams. See also About Automatic Sources or Destinations, on page 246.
Automatic Source Automatic Sources on Outputs Automatic Sources on Inputs	Set to automatically create a source by the system for the specified streams. See also About Automatic Sources or Destinations, on page 246.
Expose Streams	When set, it displays the streams for this device in the Logical Device Table. See Logical Device Table Tasks, on page 241. The following methosa are available to set or clear this parameter at once: • Quick Config; see Using Quick Config, on page 219. • The Stream Configurator; see Stream Configurator Tasks, on page 322
SSM Address Enabled	Shows if the source specific multicast address is enabled.

Parameter	Description
SDP	See Using SDP Parameters to Take a Stream from a non-NMOS Device to an NMOS Device, on page 385.
Redundancy Port	Associates a port with another port to create a redundant network traffic flow path for failover protection. The associated port will not be available to carry other traffic. This is usually a requirement of a SMPTE ST 2022-7 network topology. See also Configuring Network Switch Redundancy to Support SMPTE ST 2022-7, on page 399. See also Setting Port Redundancy for Many Devices at Once, on page 220.

a. When an asterisk (*) is shown, parameter cannot be edited in GV Orbit Control. To edit this value, it must be done in GV Orbit Client. For more information about this, see Synchronization of Discovered GVOP Devices, Source, Destination, and Spigot Names made in GV Orbit Client, on page 211.

Deleting a Device From a Topology

You must open a topology in the Topology Configurator before you can delete it.

To delete a topology

1 Select the Area. See Selecting an Area, on page 183.

2 Select the topology. See Selecting a Graph, on page 184.

3 Select the device you want to remove.

   The device is highlighted on the Topology.

4 Click **Delete**.
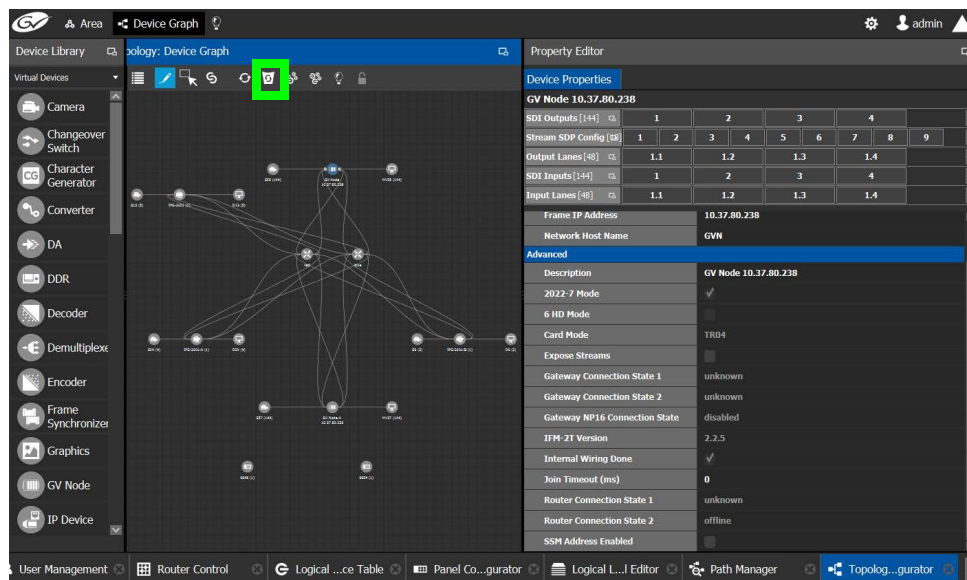
Activating a Topology

By activating a topology makes GV Orbit Control connect to and activate all drivers to devices in the topology. For example, for a GV Node it means initiating the Densité and NP0016 connections and being able to control them. By activating a topology, panels will become active and light up.

You must select a topology and open it in the Topology Configurator before you can make it active.

> Note: Only one topology can be active at a time for each area.

To make a topology active

1   Select the required Area. See Selecting an Area, on page 183.

2   Select the required topology. See Selecting a Graph, on page 184.
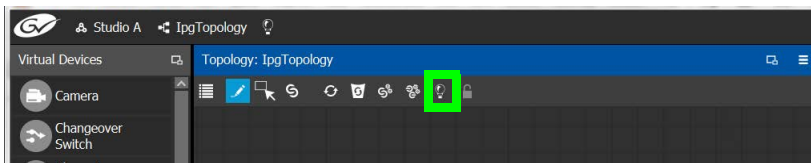
3   Click **Active** at the top of the Topology Configurator.

A confirmation message appears.
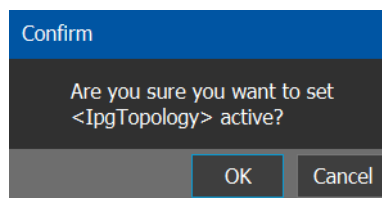
4   Click **OK** to continue.

The following changes occur.
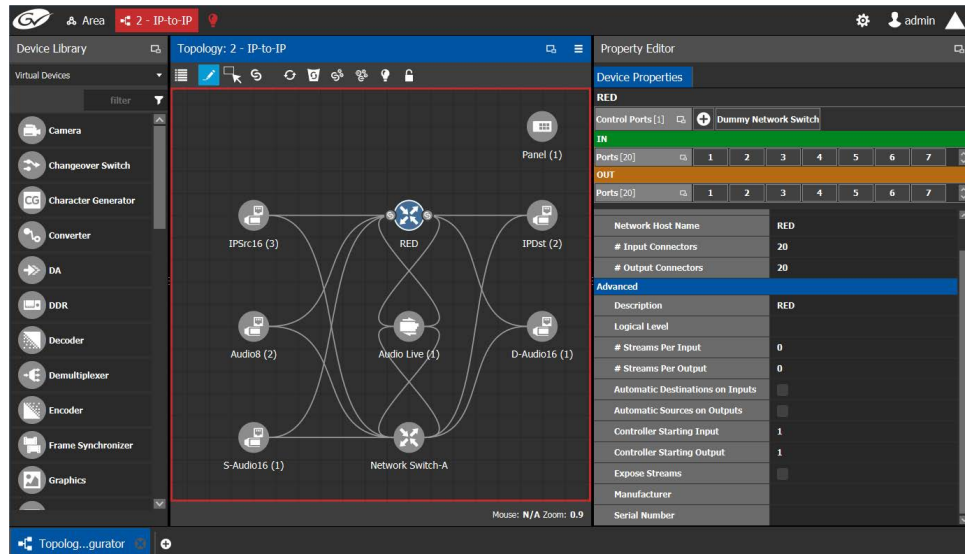
- The topology name is displayed in red at the top of the Topology Configurator.
- A red lightbulb is displayed beside the topology name.
- A red box appears around the topology.
- Active is written on the bar.
- The topology is locked.
- The red Active bar is displayed on the thumbnail for the active topology.
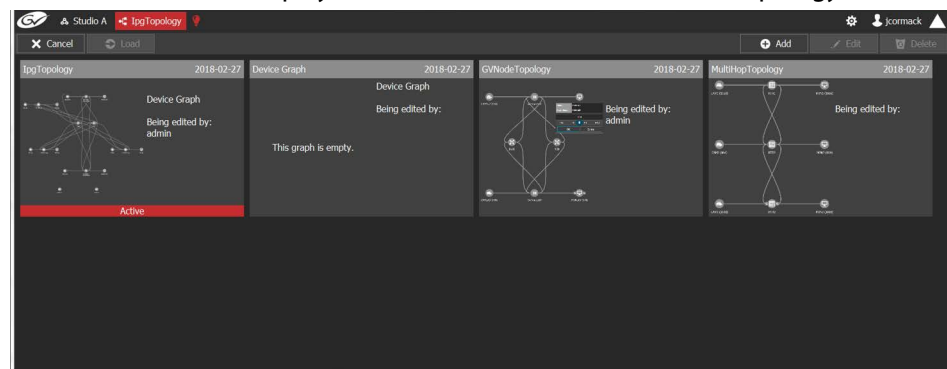
Making an Active Topology Inactive

Only one topology can be active at a time for each area. You must open the active topology in the Topology Configurator before you can make it inactive.

To make an active topology inactive

1 Select the required Area. See

2 Select the required topology. See Adding Devices to a Topology, on page 204.
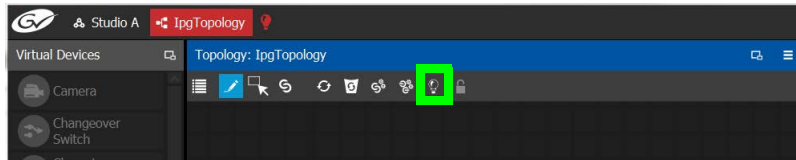
3 Click the **Active** button at the top of the Topology Configurator.

A confirmation message appears.
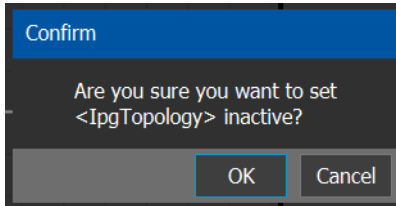
4 Click **OK** to continue.

The following changes occur.
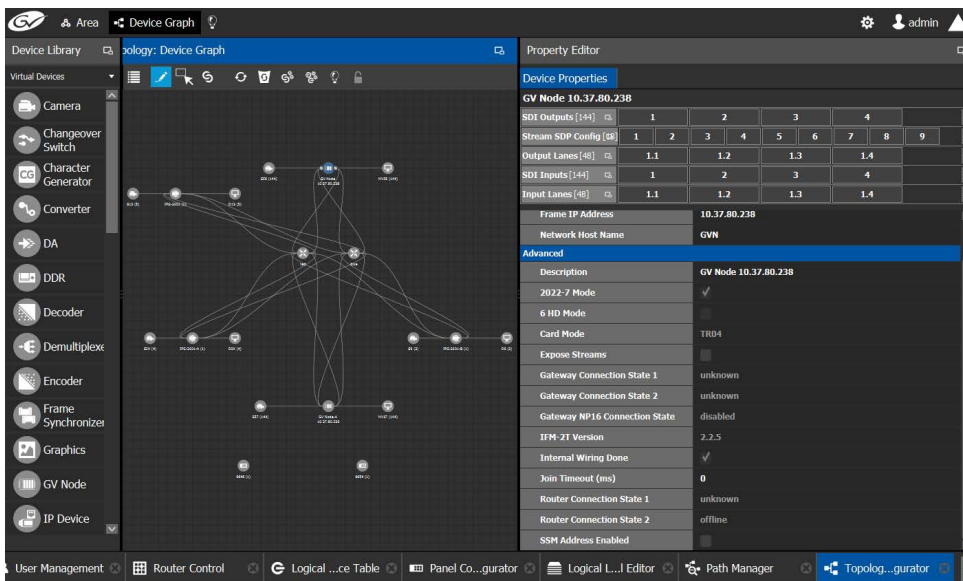
- The topology name no longer appears in red at the top of the Topology Configurator.

- The red bar no longer appears at the base of the Topology.

- The topology is unlocked.

- The red Active bar is no longer displayed on the thumbnail for the active topology in the secondary window.

Unlocking / Relocking a Topology

A topology is locked automatically when you make it active. The lock only affects the current GV Orbit Control application. If multiple users have the same topology open, then each user can lock/unlock their client to do edits; this setting is not global to all open clients.

To unlock an active topology

1 Select the required Area. See

2 Select the required topology. See

This opens the topology in the Topology Configurator.
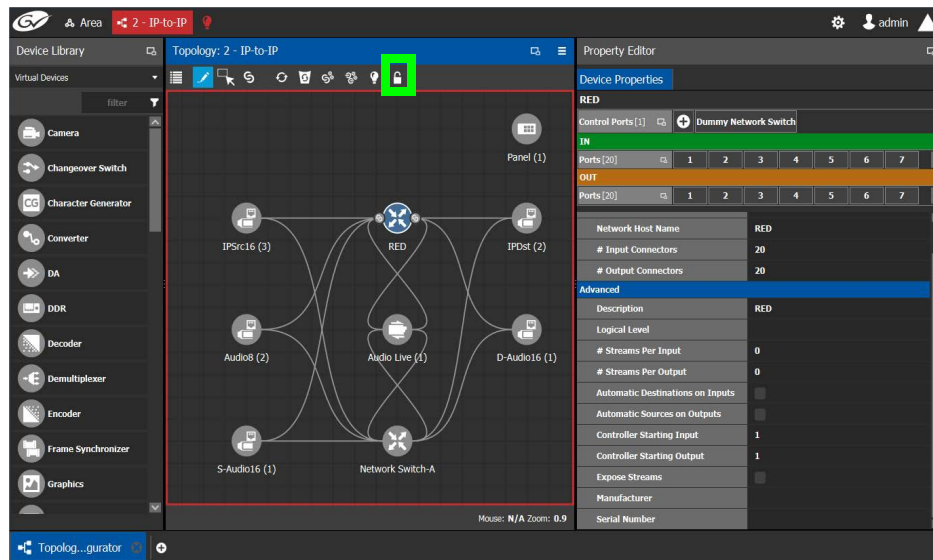
3 Click the **Lock** button.

A confirmation message appears.
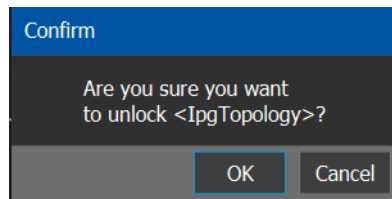
4   Click **OK** to continue.
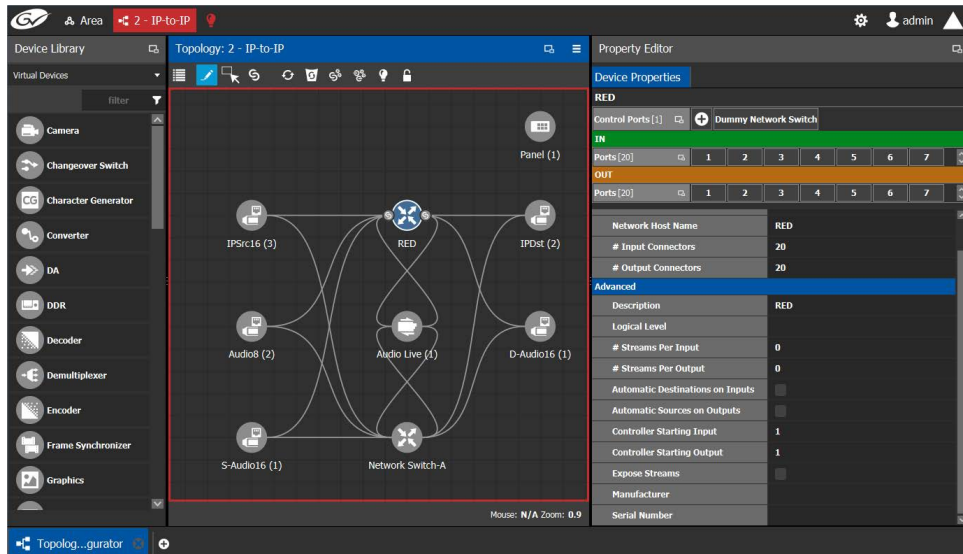
When a topology is unlocked

- The lock icon is unlocked.
- If you have Edit permissions to the Topology Configurator for the selected area, you can modify the active topology.

Locking an Unlocked Topology

It is recommended to relock an unlocked topology, when you have finished your edits. This prevents you from inadvertently making edits on an active topology, such as selecting an object and pressing delete by accident.

> Note: You can only lock an unlocked active topology. Inactive topologies cannot be locked or unlocked.

To lock a unlocked active topology

1   Select the required Area. See
2   Select the required topology. See

This opens the topology in the Topology Configurator.
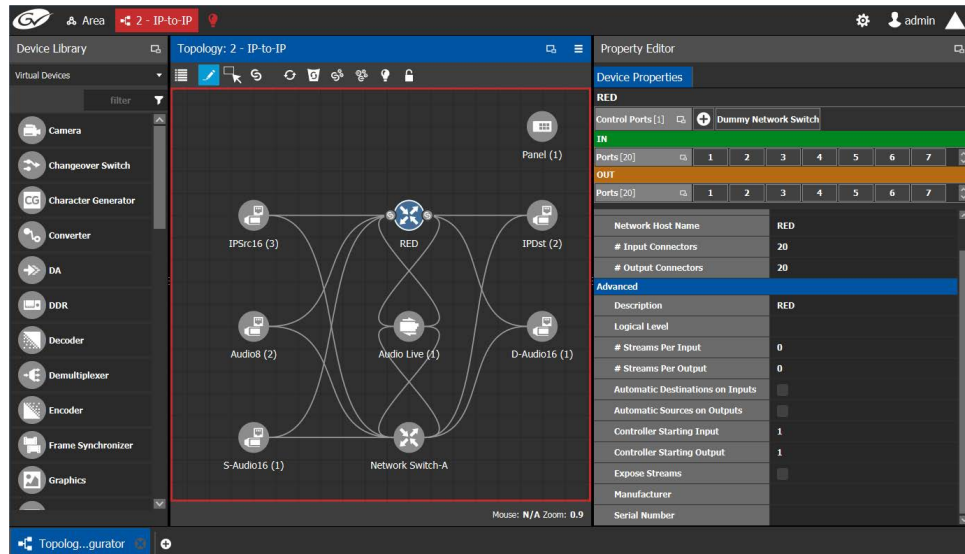
3   Click the unlocked Lock button at the top of the Topology Configurator.

No confirmation message appears.
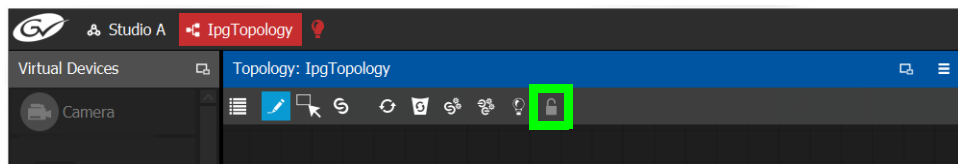
The **Lock** icon switches to the locked state.

No one can edit the topology.

Logical Device Table Tasks

Use the Logical Device Table task to view and configure the streams for the logical levels. Audio shuffling and breakaway can also be configured to create multiple streams with different audio channels (for example, for multi-language support).

The Logical Device Table task is also where you create virtual crosspoints (XPTs) and to configure logical destination devices that are related to these virtual XPTs. See Configuring Virtual Crosspoints (XPTs), on page 257.

Megasource is a logical source device that is defined with multiple streams, under multiple logical levels, that can be routed to a logical destination with at least one matching logical level. This allows the definition of a source device with multiple locations in the topology, where the destination devices' logical levels will determine which streams to route. For example, you may connect Bars to two different routers, the destination logical level will determine which of these two source streams are to be used. This is usually the source stream that is local to the destination. Megasource also allows for UHD quad-link sources to share a single stream of 16 channel audio and ancillary data with the 4 video streams. See Using Megasource, on page 254 for more information.

Accessing the Logical Device Table task

To access the Logical Device Table Task

1 Open GV Orbit Control Stage. See Navigating Back to Stage, on page 170.

2 Select an area. See Selecting an Area, on page 183.

3 Select a topology. See Selecting a Graph, on page 184.

4 Select **Configuration** > **Logical Device Table**.
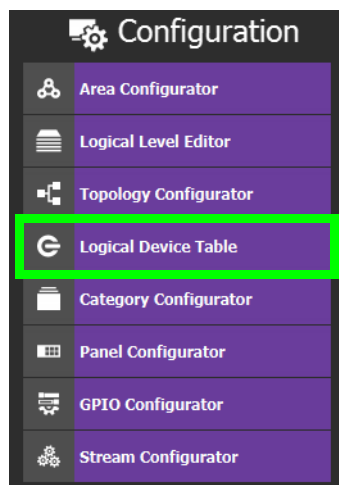
The Logical Device Table task appears.
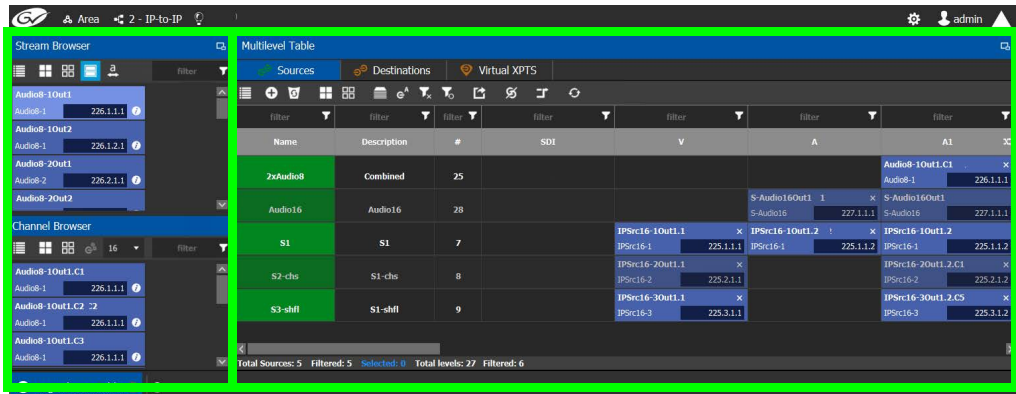
The default streams for your topology, are displayed in the left hand column under
Stream Browser.

The following tabs are found in the right hand column under **Multilevel Table**.

Tab	Description
Sources	Show the currently configured sources. Sources are the available outputs for all the devices on your topology. See Adding a Source or Destination to the Logical Level Table, on page 248.
Destinations	Show the currently configured destinations. Destinations are the available inputs for all the devices on your topology. See Adding and Configuring a Destination, on page 254.
Virtual XPTS	Show the currently configured virtual crosspoints. See Configuring Virtual Crosspoints (XPTs), on page 257.

Items in the **Multilevel Table** may be shown as grayed out and they cannot be edited.
These devices' configuration properties come from GV Orbit Client. See
Synchronization of Discovered GVOP Devices, Source, Destination, and Spigot Names
made in GV Orbit Client, on page 211.

5 Select the **Sources** tab to view the streams from the sources.

The Logical Level associated with the source are displayed. For information on the
logical levels, see Logical Level Editor Tasks, on page 190.

6 Scroll down in the **Sources** view to see all the levels for the selected source.

Stream Browser / Channel Browser

The Stream Browser shows all currently available steams. When a stream has two or more
channels, the Channel Browser gives you access to the individual audio channels in a
stream thereby allowing you to implement audio breakaway and audio shuffle for
independent audio routing. See Configuring Streams for New Sources / Destinations, on
page 249.

To make use of this feature, streams will need to pass through a device that supports audio breakaway/shuffling, such as a hybrid router, GV Node, or Audio Live. See Configuring a GV Node Device, on page 333 and Configuring a Device that Supports Audio Breakaway/Shuffling such as Audio Live, on page 433.

The selected stream

Shows detailed information about this stream

The Channel Browser shows the available audio channels for the selected stream

Each audio channel can be dragged onto a different level in the Multilevel table to shuffle the source's audio

Note: if more than one stream is selected in the Stream Browser, then the Channel Browser shows all channels derived from the selected streams

The Stream Browser and Channel Browser menu have the following menu options.

Icon	Description
Select All	Selects all items in the Stream Browser.
Clear All	Deselects all items in the Stream Browser.
Channel Browser	Shows the Channel Browser (found in the Stream Browser only).
Show Long Names	Toggles between the display of the long name or short name of the stream and device names in the Stream Browser, Channel Browser and the Multilevel Table.
Automated Sources Automated Destinations	Creates all the audio levels in the Multilevel Table for the selected streams. See also Configuring an IQAMD40 Device, on page 446 for an example of how to use this feature.
16 ▼ Channels per Device	Set how many channels are assigned per logical device when you have enabled the **Automated Sources** or **Automated Destinations** options. For example, if you select 64 streams in the channel browser, and you set **Channels per Device** to 16, and then you click the **Automatic Sources** option, it will automatically create 4 logical sources for you. The first 16 streams are assigned to A1-16 of the first source, the next 16 are assigned to A1-A16 of the second source, and so on. Likewise, if you select 64 streams in the channel browser, and you set **Channels per Device** to 8, and then you click the **Automated Sources** option, it will automatically create 8 logical sources for you. The first 8 streams assigned to A1-A8 of the first source, the next 8 assigned to A1-A8 of the second source, and so on. Similarly, if you select 64 streams, and set **Channels per Device** to 2, it will create 32 sources.

Icon	Description
filter ▼ Filter	Filters the list. Note that the filter operates on the currently shown list items according to the **Show Long Names** setting. See Filtering Lists, Table Columns, Sources, and Destinations, on page 266.
ⓘ Information	Shows detailed information about the stream / channel.

Multilevel Table Menu

The Multilevel Table menu has the following menu options.

Icon	Description
⊕ New	Creates a new Source / Destination / Virtual XPTS in the Logical Device Table. See Adding a Source or Destination to the Logical Level Table, on page 248, Adding and Configuring a Destination, on page 254, and Configuring Virtual Crosspoints (XPTs), on page 257.
🗑 Delete	Removes the currently-selected Source / Destination / Virtual XPTS in the Logical Device Table. See Deleting a Source, Destination, or Virtual XPTS, on page 256.
▦ Select All	Selects all rows in the Multilevel table.
▦ Clear All	Deselects all rows in the Multilevel table.
▤ Levels	Shows the Logical Level Selector. This allows you to set the logical levels that are to be shown in the Multilevel Table. See Setting the Logical Levels to be Displayed in the Multilevel Table, on page 247.
⊕ᴬ Hide automatic sources ⊖ᴬ Hide automatic destinations	Shows or hides automatic sources / destinations in the Logical Device Table.
⊙ Virtual Destinations	Shows the available destinations available from previously-configured virtual XPTS.
▼ₓ Reset all filters ▼₀ Reload all filters	The columns of the Logical Device Table have filters. These buttons clear all filters and restores the previous filters. See Filtering Lists, Table Columns, Sources, and Destinations, on page 266.
⬈ Export	Exports the Logical Device Table to a CSV file. See Exporting a Logical Device Table, on page 257 or Selecting all Devices in the Logical Device Table for Export, on page 257.
⟳ Restore default label	When a source or destination has been renamed, this resets the name to its original label.

Icon	Description
⬚ Show Redundant Streams	For each stream in the Multilevel Table: • When a source or destination has redundant IP streams (as may be the case with an SMPTE ST 2022-7 network for example), for each stream in the Multilevel Table, this toggles between the display of the IP address for the primary stream and the display of the IP address for the secondary stream. • When this option is selected, and the stream has a secondary IP address to be shown, the stream's secondary IP address is shown with a blue background to identify that the secondary stream's IP address is currently being shown. Streams that have no redundancy (no secondary IP address) are unaffected by this option.
⟳ Refresh	Reloads the Logical Device Table's contents.

About the Multilevel Table and GVOP Devices

When the following conditions are met, the device's configuration is read from the GVOP device in real time and GV Orbit Client automatically creates / updates sources and destinations for these GVOP devices in the Logical Device Table's Multilevel Table:

- The device uses GVOP (see GVOP Devices, on page 206), and the **Automatic Sources and Destinations** parameter is enabled in the device's properties (this is the default setting; see Device Properties Definitions, on page 232).
- The device is online.

For example, if the Flow Type for a video flow is assigned to SMPTE2022 in a GVOP device, then in the Multilevel Table, this flow appears as an SDI flow for this device and the SMPTE ST 2110-20, 2110-30, and 2110-40 flows are not used. Likewise, if an SMPTE ST 2110-30 audio flow is set to None, then in the Multilevel Table, this flow is no longer applied to the audio level for the given source or destination.

In addition, if the IP Friendly Name service is running on the GV Orbit Client Server, the custom naming configuration for the device and its spigots[1] is read in real time and it updates the names and descriptions of the sources and destinations in the Logical Device Table's Multilevel Table.

See also About Automatic Sources or Destinations, on page 246 and Synchronization of Discovered GVOP Devices, Source, Destination, and Spigot Names made in GV Orbit Client, on page 211.

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1. Custom naming for the device and its spigots is carried out in GV Orbit Client.

About Automatic Sources or Destinations

Certain sources and destinations are created automatically by GV Orbit Control, such as edge devices: cameras, monitors, and so on. Automatic sources or destinations are created when the following properties (as applicable) have been set in the device's property editor:

- Automatic Sources and Destinations
- Automatic Destination
- Automatic Destinations on Inputs
- Automatic Destinations on Outputs
- Automatic Source
- Automatic Sources on Outputs
- Automatic Sources on Inputs

See also Device Properties Definitions, on page 232.

The **A** icon is shown next to the name for the row in the Multilevel Table to indicate that the source or destination was automatically created by GV Orbit Control.

Source or destination was automatically created by GV Orbit Control

This yellow bar indicates that the name is no longer the automatically-generated name

Note: You cannot delete a default source from the Logical Level Table. However, you can modify the levels associated with the source. Also, you can modify or delete the sources that you create.

Automatically created sources' and destinations' name can be re-named by double-clicking the name field. A yellow bar indicates that the name of the source or destination is no longer the automatically-generated name. Click **Restore default label** to revert back to the automatically-generated name.

Such automatically generated sources and destinations have icons to represent the source or destination type when shown, for example, in the Panel Configurator, Category Configurator, or elsewhere. A key to a few source and destination icons is shown below. These icons are derived from the icon used to represent the device in the Device Library and on the Topology Configurator. See Adding Devices to a Topology, on page 204.

Icon	Description
	Camera source
	Logical device source
	Encoder source
	Monitor destination
	Default destination for a panel. See Creating a Single-Destination Work Flow Panel, on page 297.

If you try to delete an automatic source or destination from the Logical Device Table, the following message is displayed at the bottom of the task.

> The selected sources are automatically generated, and cannot be deleted. **OK**
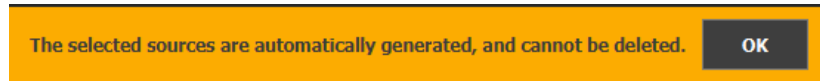
To remove an automatic source or destination, you must deselect the following properties (as applicable) in the device's Property Editor:

- Automatic Sources and Destinations
- Automatic Destination
- Automatic Destinations on Inputs
- Automatic Destinations on Outputs
- Automatic Source
- Automatic Sources on Outputs
- Automatic Sources on Inputs

Setting the Logical Levels to be Displayed in the Multilevel Table

You can show or hide the Logical Level shown in the Multilevel Table. For example, once you have created custom levels in the Logical Table Editor, you might want to show those levels while hiding others that are not of interest for the moment. Showing or hiding Logical Levels in the Multilevel Table is used to facilitate bulk assignment of sources and destinations in the Multilevel Table. See Bulk Assigning Logical Levels in the Multilevel Table, on page 253.

To modify the logical levels associated with a source / destination

1 Select a Source / destination in the Logical Device Table. See Accessing the Logical Device Table task, on page 241.

2 Click the Logical Levels icon ▤ at the top of the table.

A secondary window opens displaying the levels for the selected source / destination.
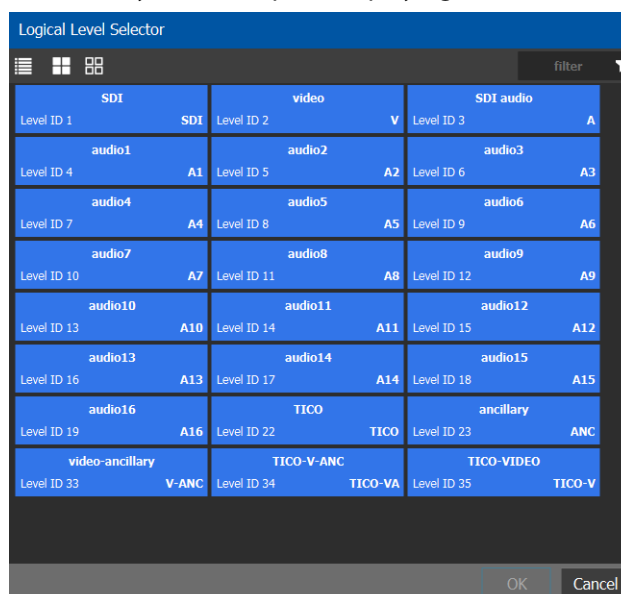
3 Select one or more levels you want to use for the selected source / destination.

4 Click **OK**.

The columns in the Multilevel Table adjust to show the ones you have selected.

Adding a Source or Destination to the Logical Level Table

By default, the logical device table displays the sources and destinations in the selected topology in the **Sources** and **Destinations** tabs. You can add a logical device to the table that is not on the topology. You would then have the option of switching to the new logical device in place of the existing device.

To add a source or destination to the logical level table

1 Open the logical level table for the required topology.
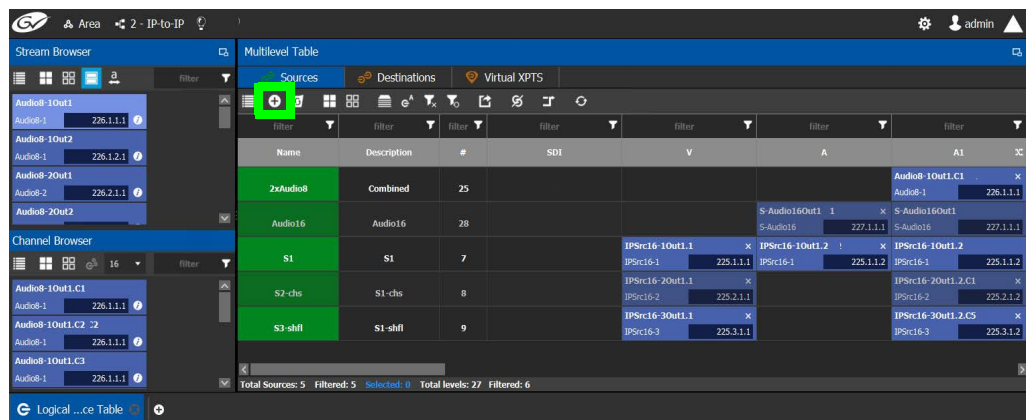
2 Select the **Sources** or **Destinations** tab.

3 Click **New** ⊕ at the top of the **Multilevel Table**.

A secondary window appears.

4 Enter the required information in the **Base Name**, **Start Index**, and **Count fields**.

5 Click **OK**.

New sources / destinations are created. The **Base Name** is displayed under the **Name** and **Description** fields. The number of new sources / destinations created corresponds to the number you enter in the **Count** field.

In the example, five new sources are created. The name for each device begins with the base name CAM100. A number is appended to the base name. This begins with the starting index and increases by one for every number in the count.

Configuring Streams for New Sources / Destinations

After creating new sources / destinations, the next step is to configure the streams for them. Different streams can be assigned to different levels, so that a source / destinations is composed of streams from different devices (to do an implicit breakaway).

For example, the column you drop a stream on in the Multilevel table selects the part of the stream to use to create the logical device. This is shown below for a stream from the Stream Browser.
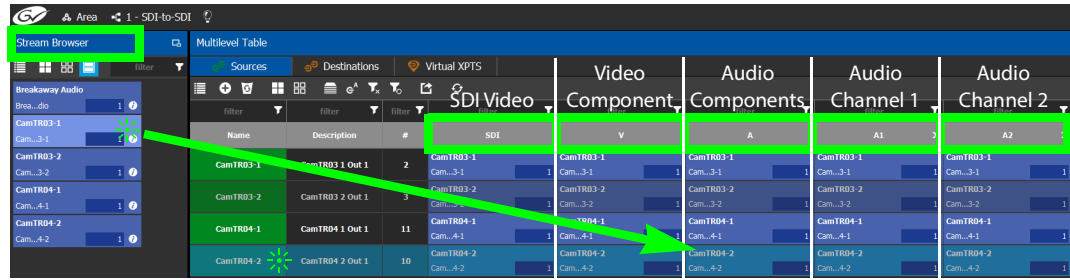
Select the row before dropping a source / destination onto it

Stream Drop onto Multilevel Table Column	Description
SDI	This fills all levels (video, 16 audio channels (A1 to A16), ANC, and V-ANC) with the equivalent levels from the SDI video stream.
V	This takes the video level only from the SDI stream.
A	This takes the audio levels only from the SDI or audio stream for all 16 audio channels (A1 to A16).
A1 to A16	This takes the first audio channel from the SDI or audio stream.
ANC	This takes the ANC level only from the SDI stream.
V-ANC	This takes the V-ANC level only from the SDI stream.

For instance, you could create a source with Video from a GV Node and the audio from an IPG-3901, or IPG-4901. You do this by assigning the GV Node stream under the **SDI** column, and the IPG-3901, or IPG-4901 stream under the Audio (**A**) column. If audio breakaway/shuffling is required to complete the path, GV Orbit Control will automatically choose a route through Audio Live for example.

Note that some levels are a composite of other levels, for example, dropping an SDI stream onto the SDI column will fill all levels as an SDI stream is composed of all levels. This logical levels hierarchy is shown below as it applies to each Multilevel Table column.

```
SDI                    SDI or SMPTE ST 2022-6

   V-ANC

         V             SMPTE ST 2110-20
         ANC           SMPTE ST 2110-40

   A                   SMPTE ST 2110-30

         A1 to A16
```
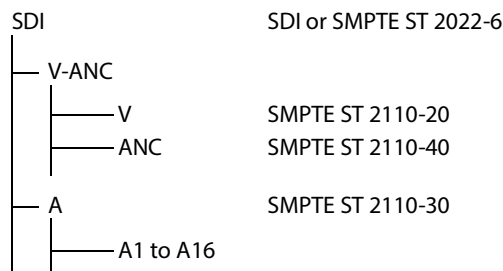
LIMITATIONS

- Any shuffling done internally in a card through iControl or RollCall is not taken into account by GV Orbit Control and is not controlled by GV Orbit Control. Such shuffling is local to the card and this can result in unexpected shuffling should the card's processing path be dynamically assigned by GV Orbit Control to another use or destination, where such internal shuffling would be detrimental.

- You cannot shuffle audio to the same destination more than once. For example, the same Destination channel is added to a destination from the Channel Browser three times. This will not work and must be avoided, as multiple sources cannot be routed to the same destination. A destination can only resolve to a single source.
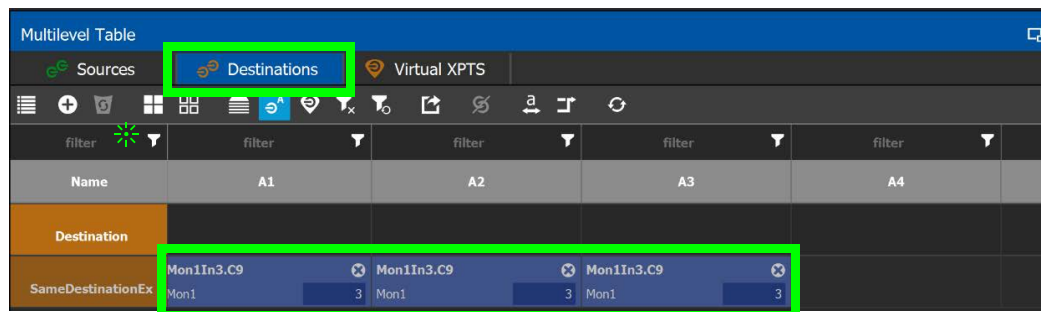
To configure streams for the new sources

1 Open the Logical Device Table for the required topology.

In the left hand column under **Stream Browser**, the default streams for your topology are displayed.

2 Add sources to the Logical Level Table. See Adding a Source or Destination to the Logical Level Table, on page 248.

3 Select a source's row to which you want to add a stream.
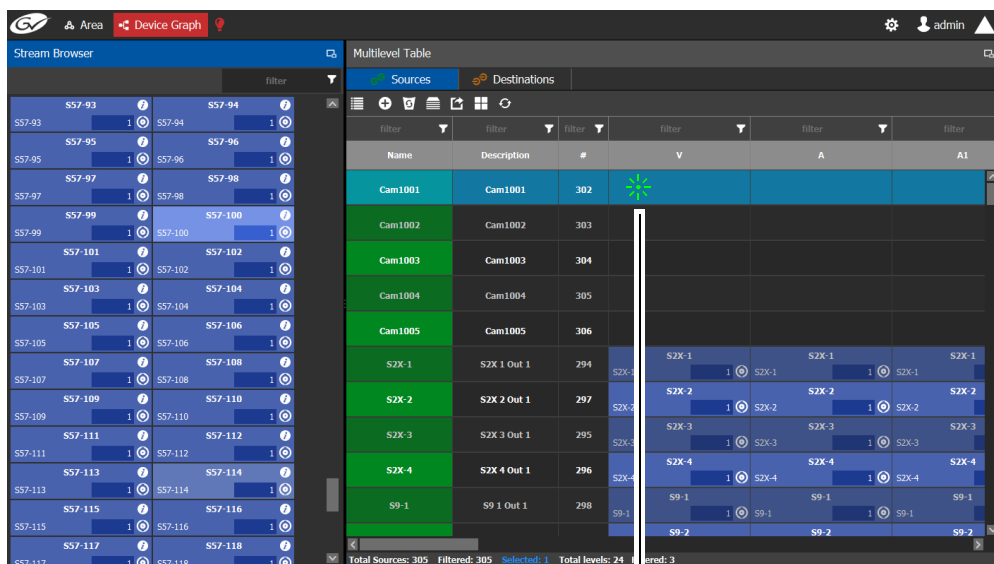
Select the row before dropping a source / destination onto it

4 Drag a stream onto the source.
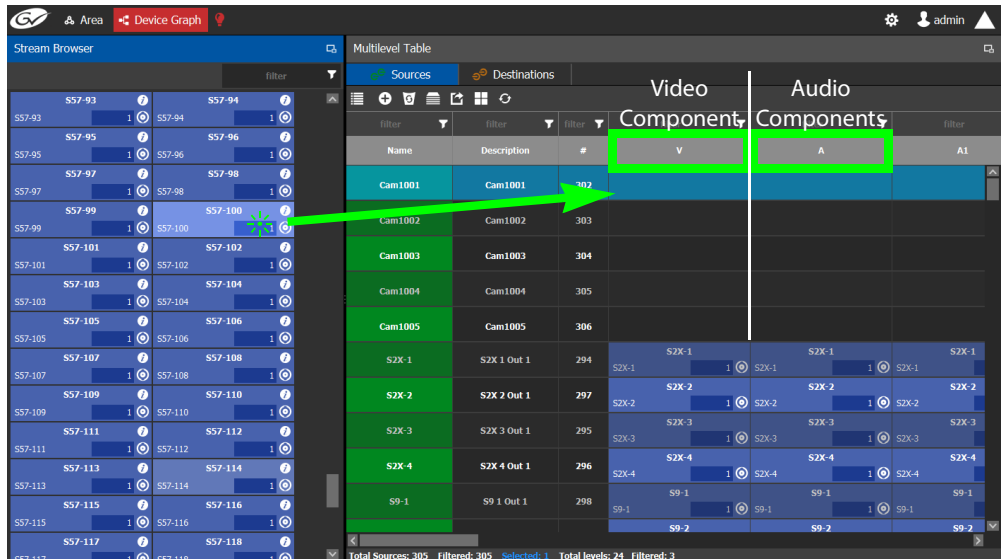
In the above image, a stream is added to a source for its video component. Optionally drag the same stream or another stream from the **Stream Browser** to a source to add its audio components.

5 To create an audio or video breakaway with this new source or destination, once the stream has been assigned to the **SDI** column, drag another stream from the Stream Browser onto the Video (**V**), Audio (**A**, **A1** to **A16**), or **ANC** column to use that specific flow component from that second stream.

To indicate that the source / destination is composed of streams from more than one device (this includes a video or audio breakaway), the following ⊤ symbol is shown with the name of the new source / destination.
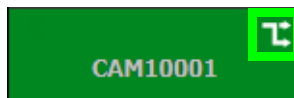
Configuring Streams for Audio Live Audio Channels

When using Audio Live in your topology or a similar device (see Configuring a Device that Supports Audio Breakaway/Shuffling such as Audio Live, on page 433), you can:

- From the Stream Browser, drop the main audio stream (never the redundant audio stream) onto the audio (**A**) column.

- From the Channel Browser, drop one or more audio channels from the stream onto the A1 to A16 column(s). To open the Channel Browser, click ▤. See also Stream Browser / Channel Browser, on page 242.
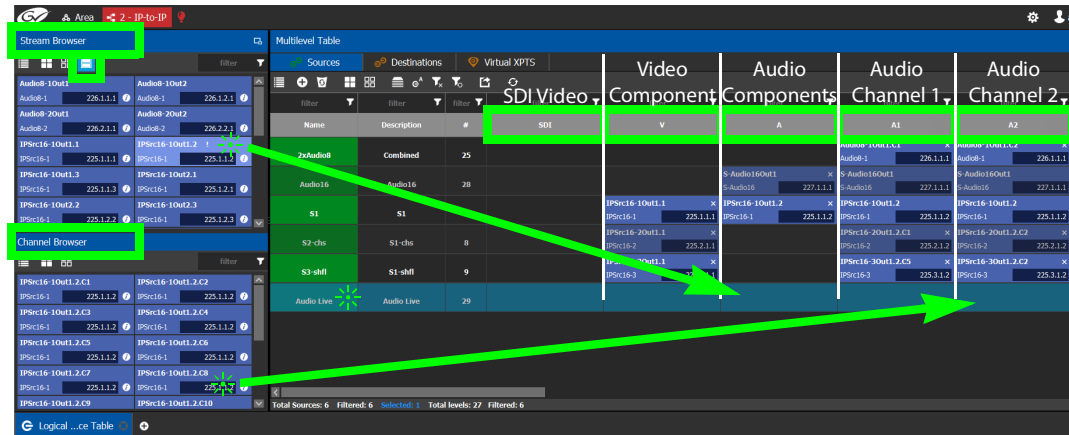
Bulk Assigning Logical Levels in the Multilevel Table

The Stream Browser and Channel Browser have filters that allow you to refine the stream selection shown. See Filtering Lists, Table Columns, Sources, and Destinations, on page 266. It is often possible that by using filtering, streams can be grouped together so that they can be dropped in bulk onto the Multilevel Table, on a row or a column.

- To bulk drop streams on to a row, select one row first and then select two or more streams to drop onto the row.

Select the row before dropping a destination onto it
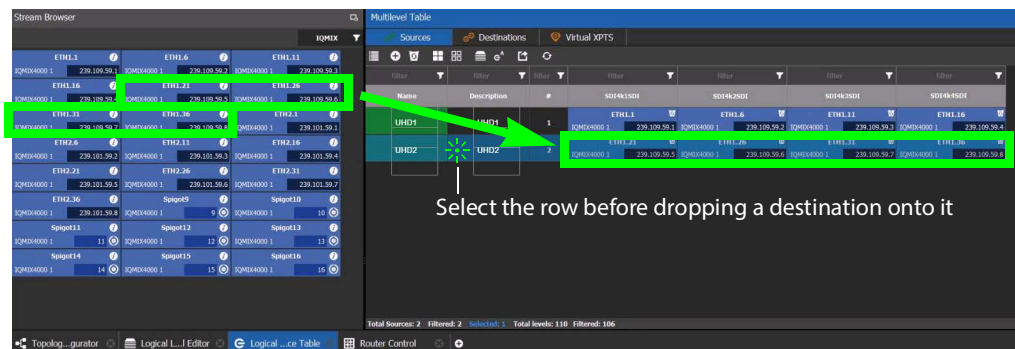
- To bulk drop streams on to a column, select two or more rows first and then select two or more streams to drop onto the column.

Adding and Configuring a Destination

The procedures for adding and configuring destinations are the same as for adding and configuring sources. For details, see Setting the Logical Levels to be Displayed in the Multilevel Table, on page 247, Adding a Source or Destination to the Logical Level Table, on page 248, Configuring Streams for New Sources / Destinations, on page 249, and Bulk Assigning Logical Levels in the Multilevel Table, on page 253.

Destinations have the **IP Clean Switch** option which enables the routing of an IP source to a local GV Node destination for a vertically accurate switch.

Using Megasource

Megasource changes GV Orbit Control's pathfinding rules to match exact logical levels before applying best match logic. This allows you to create logical sources where the same or different streams can be added to the logical level columns that share the different custom logical levels. Megasource only applies to sources with multiple stream/level pairings and the filtering happens when a normal destination is used in a route.

When doing a take, the GV Orbit Control's pathfinding algorithm will attempt to find an exact level match between the logical source and the logical destination. Failing to find an exact match, it attempts to find a compatible level match as it currently does. If there is more than one possible compatible match (ambiguous take), it will fail the take because we don't know which stream should be used on the logical destination.

Note that a UHD 4K take is a subset of this feature where there are four SDI levels per logical source and logical destination (one SDI level for each quad-link or two-sample interleave division substream component). See Creating the Logical Levels for a UHD 4K Routing Setup, on page 194 for more information.

For example, you have three SDI signals from the same source. One signal is full resolution 1080p video, the second signal is 720p video, and the third is 480p video. One destination is for the full resolution 1080p video, the second destination is for the 720p video, the second destination is for the 480p video, where the destination devices' logical levels will determine which streams to route.

The following is an example of how to do this.

Using Megasource

1   Create the following Topology to use for this example. See Adding Devices to a Topology, on page 204.
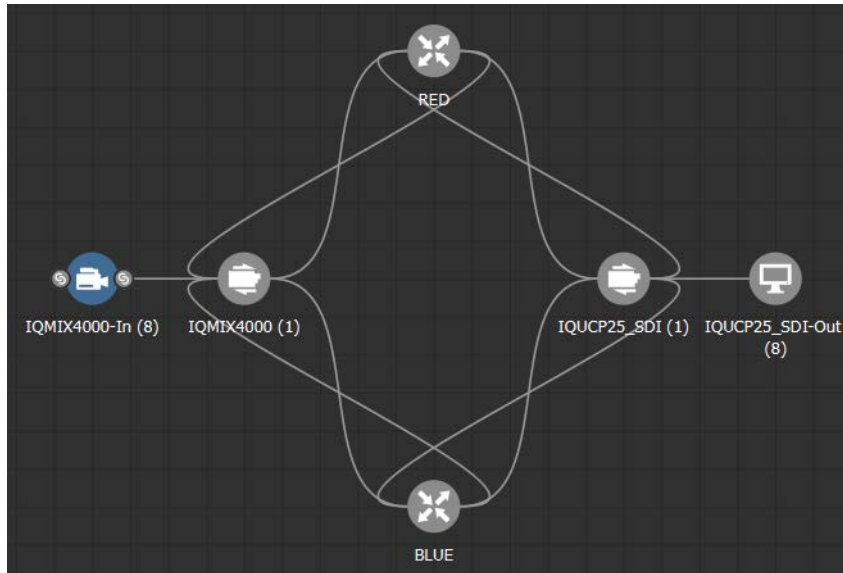
2   Create three copies of the **SDI** Logical Level called **SDI-A**, **SDI-B**, and **SDI-C** in the **Logical Level Editor**. See Duplicating a Logical Level, on page 193.

3   Click 🅶ᴬ in the **Multilevel Table**, **Sources** tab, of the **Logical Device Table** to hide the automatically-generated sources. See Multilevel Table Menu, on page 244.

4   Click ⊕ in the **Multilevel Table**, **Sources** tab, of the **Logical Device Table** to create a new source (shown in this example as *Megasource*). See Adding a Source or Destination to the Logical Level Table, on page 248.

5   In the Logical Device Table, select a source's row to which you want to add the streams. See To configure streams for the new sources, on page 251.

6   From the Stream Browser of the **Logical Device Table**, drag the three source streams onto the Multilevel Table. The first stream represents 1080p video, the second stream represents is 720p video, and the third stream represents 480p video.
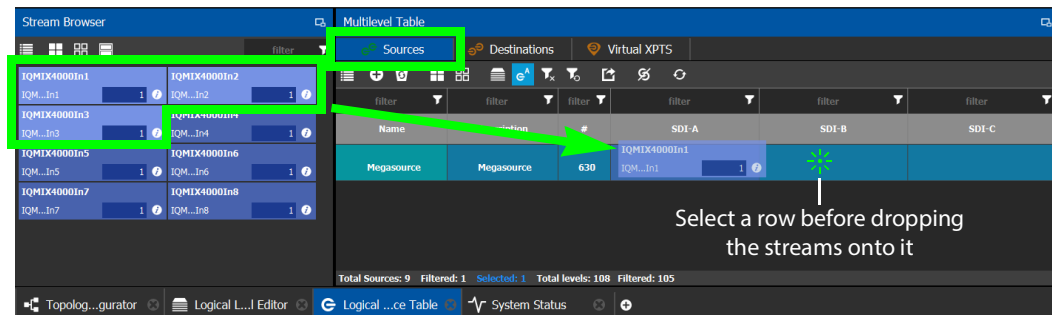
7   Click 🅶ᴬ in the **Multilevel Table**, **Destinations** tab, of the **Logical Device Table** to hide the automatically-generated destinations. See Multilevel Table Menu, on page 244.

8   Click ➕ in the **Multilevel Table**, **Destinations** tab, of the **Logical Device Table** to create new destinations, one for each level (1080p, 720p, and 480p video). See Adding a Source or Destination to the Logical Level Table, on page 248.

9   In the Logical Device Table, select the first source's row to which you want to add the streams.

10   From the Stream Browser of the **Logical Device Table**, drag the first destination stream onto the Multilevel Table.

11   In the Logical Device Table, select the second source's row to which you want to add the streams.

12   From the Stream Browser of the **Logical Device Table**, drag the second destination stream onto the Multilevel Table.

13   In the Logical Device Table, select the third source's row to which you want to add the streams.

14   From the Stream Browser of the **Logical Device Table**, drag the third destination stream onto the Multilevel Table.
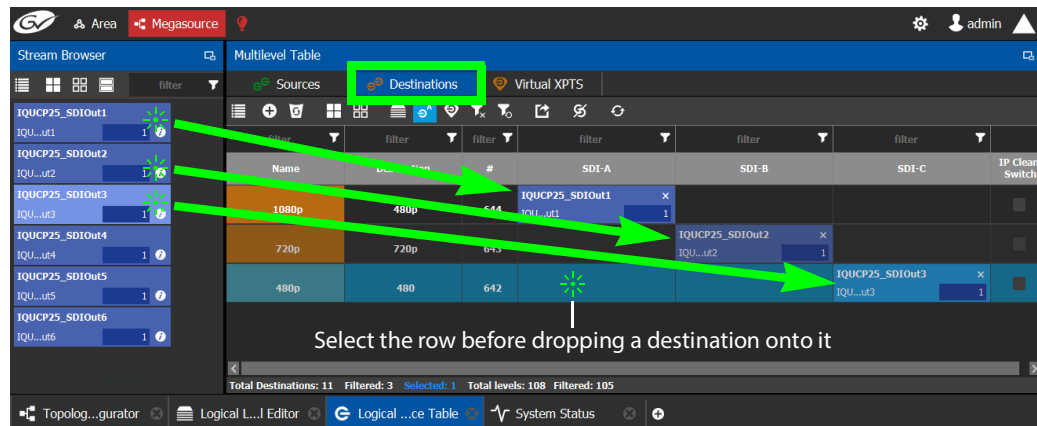
15   Test the configuration by making takes between a logical source and destination that use the *Megasource* source. See Performing a Take in Router Control, on page 471. See in Pathfinder that the correct source resolution is received by each destination. See Viewing Information about the Destinations, on page 454.

Deleting a Source, Destination, or Virtual XPTS

You can delete any source, destination, or virtual XPTS that you have created.

To delete a source, destination, or virtual XPTS

1   Open the Logical Device Table task for the required topology.

2   Select the Sources tab, the Destination tab, or virtual XPTS tab according to what you are deleting.

3   Select the sources, destinations, or virtual XPTS in the table.

> Note: You can delete one or more sources or destinations at the same time.

4   Click the **Delete** icon 🗑.

Exporting a Logical Device Table

You can export the data in your logical device table in a csv file.

To export a logical device table

1 Open the Logical Device Table task for the required topology.

2 Select the rows you want to export.

3 Click the **Export** icon ▣.

4 Navigate to the folder where you want to save the file.

5 Click **Save**.

Selecting all Devices in the Logical Device Table for Export

You can select all devices in the logical device table, for example, to export the Device Table's configuration data to a csv file.

To select all the devices and save their configuration data

1 Open the Logical Device Table task for the required topology.

2 Click the **Select All** icon ⊞.

3 Click the **Export** icon ▣.

4 Navigate to the folder where you want to save the file.

5 Click **Save**.

Configuring Virtual Crosspoints (XPTs)

Without virtual XPTs, only one route can be made for each task. Virtual XPTs are used when multiple outputs are required to be switched to the same source *in a single take*.
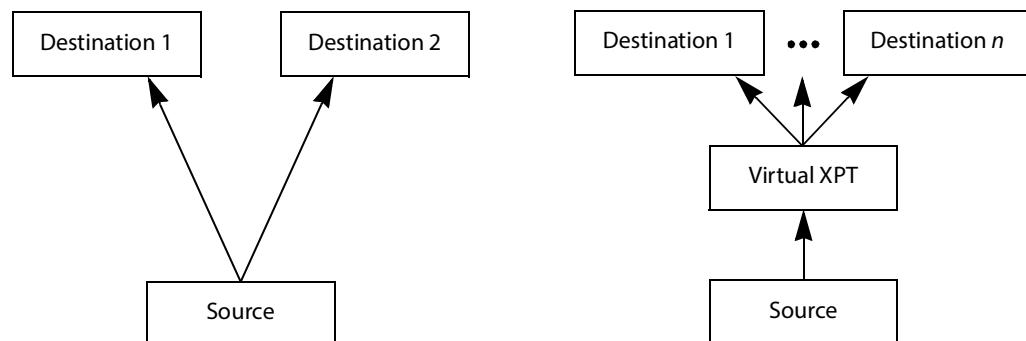
Virtual XPTs can be used to:

- Show user-friendly device names on the operators' control panels. For example, the name of the virtual XPT is shown on control panels when used.

- Hide implementation details from the operator(s). For example, in a transparent fashion, an output signal is also sent to a monitor.

Virtual XPTs are used for the following two primary applications:

- Monitoring: to follow the source routed to a given destination and to route that same source to other destinations as needed.
- Utility DA (distribution and amplifier): to allow for a configurable virtual destination/source that can be routed to other real destinations.

The following virtual XPT functional behaviors are by design:

- A take with a virtual XPT will fail if the path to the source does not exist and as a consequence the virtual source will fail. The status (Tally) will not reflect this.
- A take with a virtual XPT's destination will be ignored if the take fails.
- A logical destination can only be added to one virtual XPT destination at a time. Once a real destination has been added to a virtual XPT, it is no longer available to be used with other virtual destinations. A pop-up message is shown if you try to add a logical destination that has already been added to another virtual XPT. Click **OK** to remove the logical destination from the previous virtual XPT and add to it the new virtual XPT.
- You can only route virtual sources to unrelated virtual destinations that are not associated with the same virtual XPT. This allows you to increase the number of logical destinations devices that can be switched with a single route. Routing a logical source device to the virtual destination of another virtual XPT will route said source to all logical destination devices that the virtual source is routed to. Routing that virtual source to another virtual destination, will mean routing the original logical source device to all destination devices that the corresponding virtual source was routed to, as well.
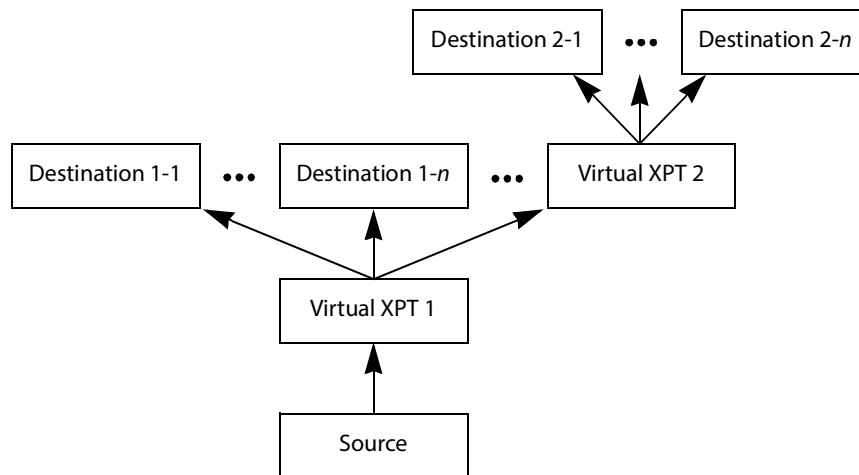
Routing a logical source device to the virtual destination of another virtual XPT

- A virtual XPT can have up to 100 real logical destinations.
- The status of a virtual XPT is shown in the Path Manager. See Accessing the Path Manager, on page 451.
- Adding a logical destination device to a virtual XPT changes the status of the destination to the virtual source - with the logical source device content being routed to the logical destination device(s). Removing the logical destination device from a virtual XPT, will change the status of that destination to the logical source device.

Virtual XPT Use Scenario 1

In this scenario, the physical level is set up so that any source routed to destination Z will be taken to the following destinations: R, S, and T.

| Virtual XPT Setup | Operator "takes" A to Z | Result: Operator still sees A as taken to Z |
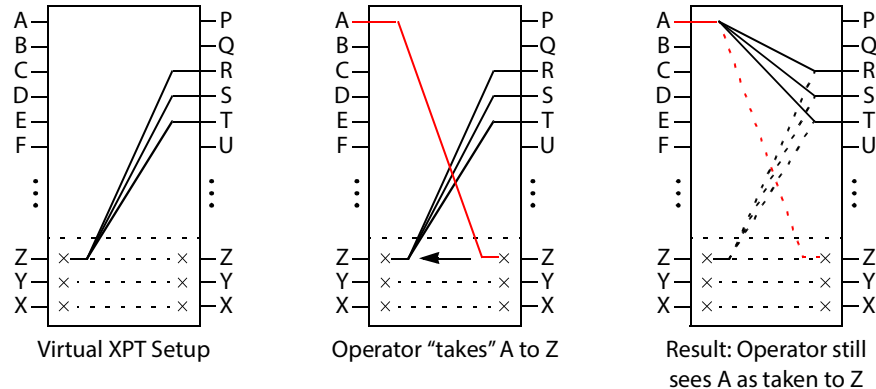
If the operator takes A to Z, the software "discovers" that source Z is virtually routed to R, S, and T. Therefore, it routes A to R, S, and T as real routes.

Here, a source was taken to multiple destinations with a single take, and that fact was concealed from the operator. The operator's control panel reports that A was taken to Z. The Path Manager can be used to know the actual path that was internally used by the router; see the Path Manager Tasks, on page 450.

Other inputs can be taken to Z with a similar result: that source will be taken to destinations R, S, and T.

Virtual XPT Use Scenario 2

In this scenario, the virtual XPT setup is the same as for scenario 2.

| Virtual XPT Setup | Operator "takes" A to Z | Result: Operator still sees A as taken to Z |
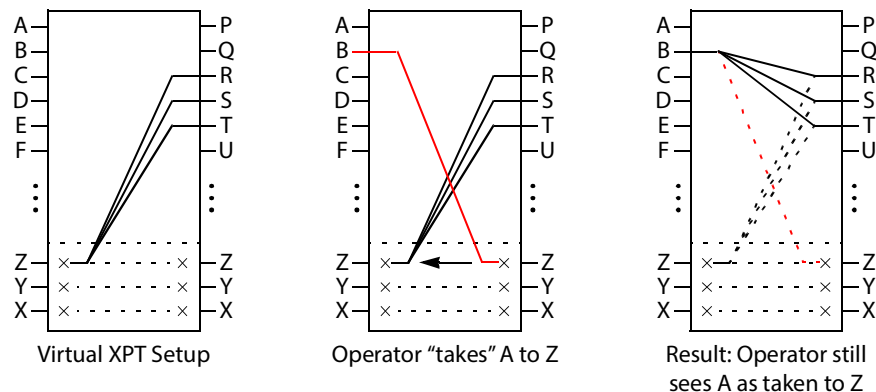
If the operator takes B to Z, the software "discovers" that source Z is virtually routed to R, S, and T. Therefore, it routes B to R, S, and T as real routes.

The operator's control panel reports that A was taken to Z. The operator executed a single take.

This scenario illustrates that any time an operator takes a source to virtual XPT destination *n*, the router actually takes the source to the real destinations "connected" to virtual XPT source *n*.

To create Virtual XPTs

Virtual XPTs are created in the Logical Device Table task.

1 In the Topology Configurator, activate the topology. See Activating a Topology, on page 235.

2 Open the Logical Device Table task. See Accessing the Logical Device Table task, on page 241.

3 Select the **Virtual XPTs** tab.
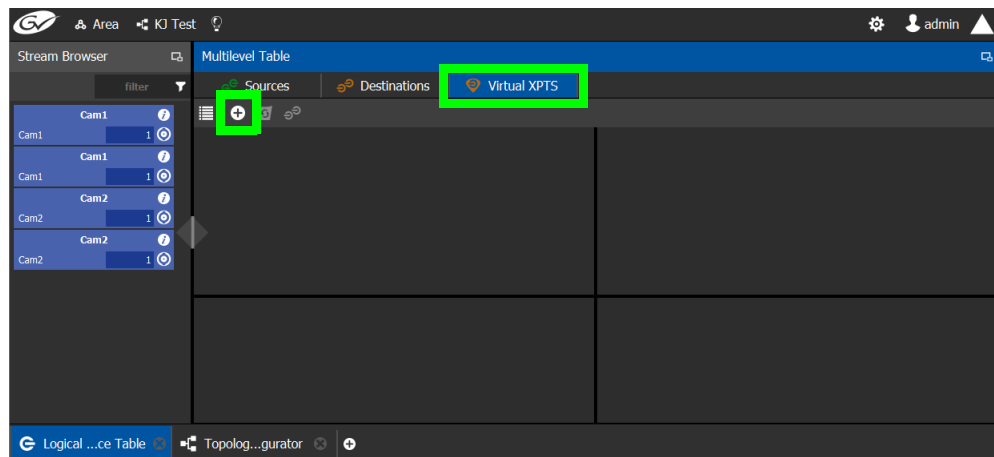
4 Click **New** ⊕
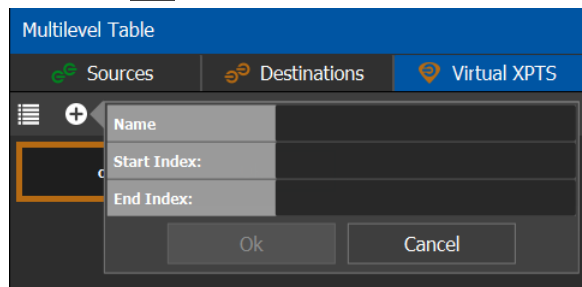
5 Enter a name for the new virtual XPT and click **OK**.

Optionally, a range of virtual XPTs can be created: The **Name** parameter is the prefix for the generated virtual XPTs. The **Start Index** is the index starting value, and the **End Index** is the last index value for the virtual XPT range.

The new virtual XPT is added to the **Multilevel Table** under the **Virtual XPTS** tab.
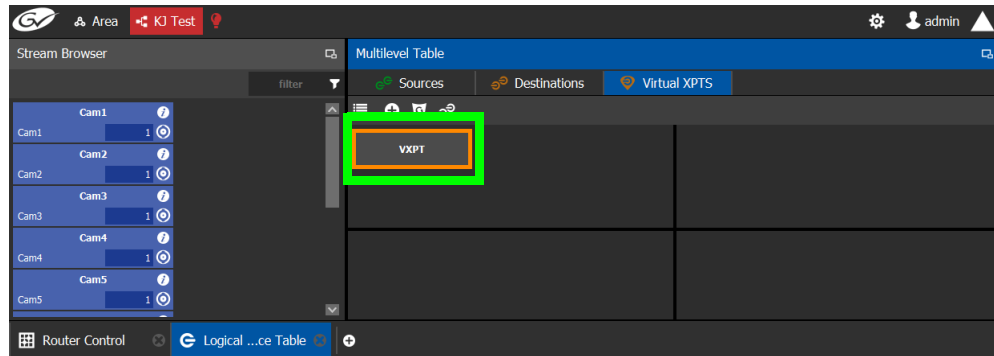
A new logical source and a new logical destination are created automatically in the system with the name of the virtual XPT.

Virtual source and destination filters are available for you to filter on virtual XPTs when configuring the panel, categories, and router control user interfaces. See Filtering Lists, Table Columns, Sources, and Destinations, on page 266

6 Add the default destinations for the virtual XPT. Select the virtual XPT and then click Destinations ⤴.
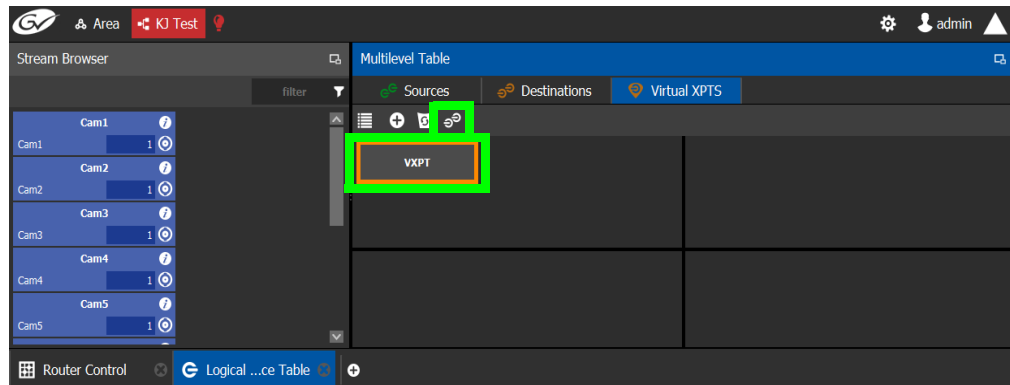
A list of all currently available destinations appears.

7 Select the default destinations the virtual XPT will use and click **OK**.
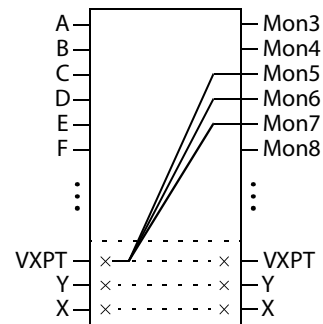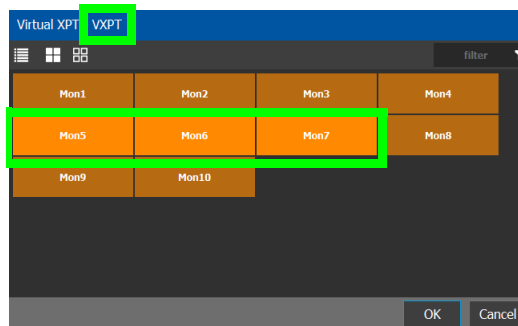
In this scenario, the physical level is set up so that any source routed to destination **VXPT** will be taken to the following destinations: **Mon5**, **Mon6**, and **Mon7**.

Once you have created one or more Virtual XPTs, you can start using them in Router Control.

To perform a take with a Virtual XPT

You must first create and activate the topology in the Topology Configurator. You perform takes with a Virtual XPT in Router Control. See also Performing a Take in Router Control, on page 471.

1 In the Topology Configurator, activate the topology. See Activating a Topology, on page 235.

2 Create a virtual XPT in the Logical Device Table task. See To create Virtual XPTs, on page 260. As an example, in this procedure, the name of the virtual XPT is **VXPT**.

3 Open Router Control. See Accessing the Router Control Task, on page 470.
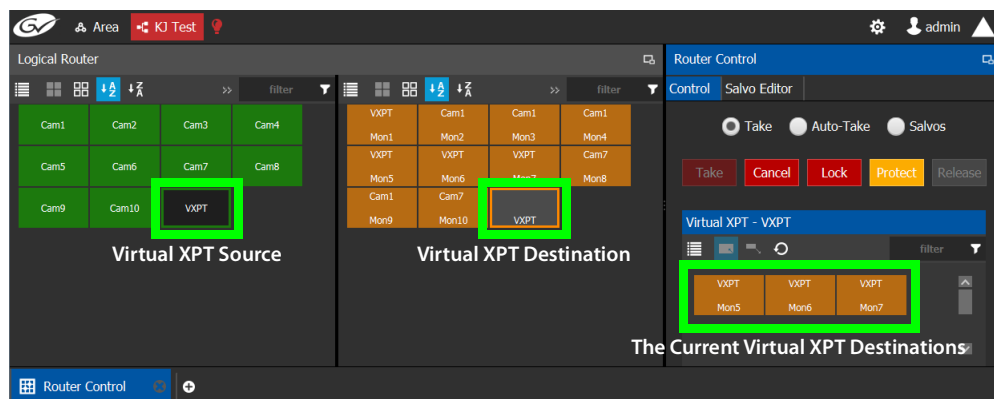
The default virtual XPT destinations that were configured in the Logical Device Table are shown by selecting the virtual XPT destination. See To create Virtual XPTs, on page 260.

4 To route Cam1 to Mon5, Mon6, and Mon7 using the virtual XPT **VXPT**, perform a take **Cam1** to destination **VXPT**.
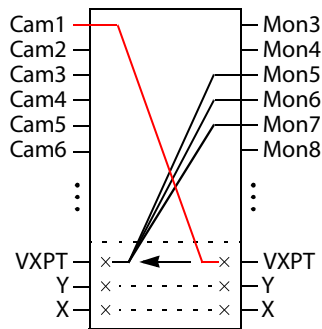
First click the destination virtual XPT **VXPT** and then click **Cam1** and finally click **Take**.
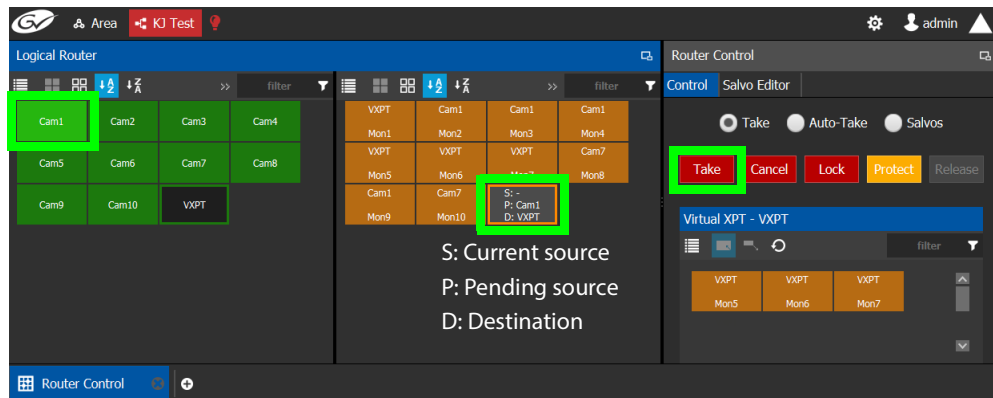
The destination virtual XPT **VXPT** button shows the current source.

Virtual XPT Source

The Path Manager can be used to know the actual path that was internally used by the router; see the Path Manager Tasks, on page 450.

To dynamically add a Virtual XPT destination

Destinations can dynamically be added to a virtual XPT. In this example, **Mon8**, and **Mon9** are added to the virtual XPT **VXPT**'s destination.

1 In the Topology Configurator, activate the topology. See Activating a Topology, on page 235.

2 First click the source virtual XPT and then click **Mon8** and finally click **Take**.

3 First click the source virtual XPT and then click **Mon9** and finally click **Take**.
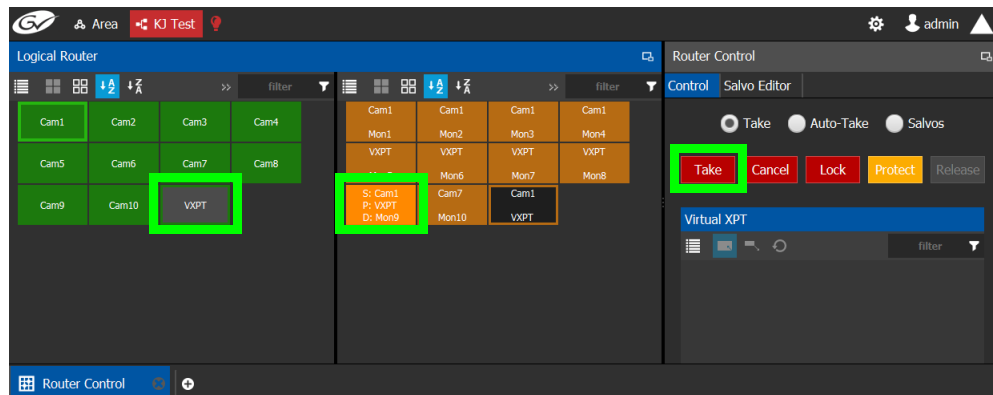
The current destinations for the selected virtual XPT are updated.
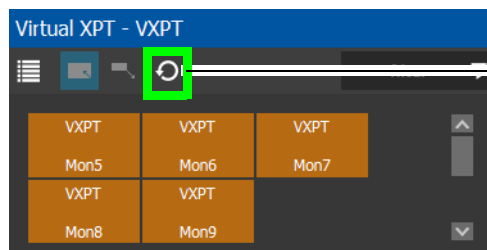
Click to revert to the default virtual XPT destinations configured in the Logical Device Table

See also Performing a Take in Router Control, on page 471 for more information about how to use the controls available in this window. The Path Manager can be used to know the actual path that was internally used by the router; see the Path Manager Tasks, on page 450.

To dynamically remove a Virtual XPT destination

Destinations can dynamically be removed from a virtual XPT. In this example, **Mon9** is removed from the virtual XPT **VXPT**'s destinations. This is done by assigning the destination to be removed to another source.

1 In the Topology Configurator, activate the topology. See Activating a Topology, on page 235.

2 First click the destination **Mon9** then click **Cam9** and finally click **Take**.
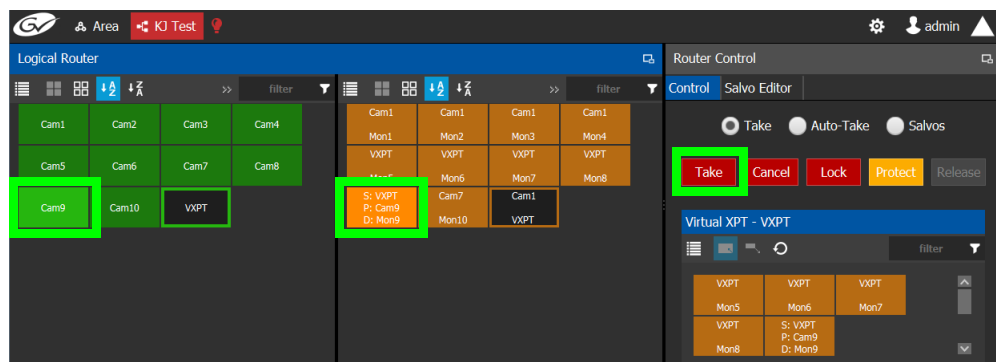
Minimize and Expand Virtual XPT Destinations

In the Router Control Task, when a virtual XPT is routed to another virtual XPT, the second virtual source is nested in the first virtual XPT. See Routing a logical source device to the virtual destination of another virtual XPT, on page 258.

As shown below, when **Minimize Virtual XPT** ▭ is selected, the VXPT2 virtual XPT is shown minimized.
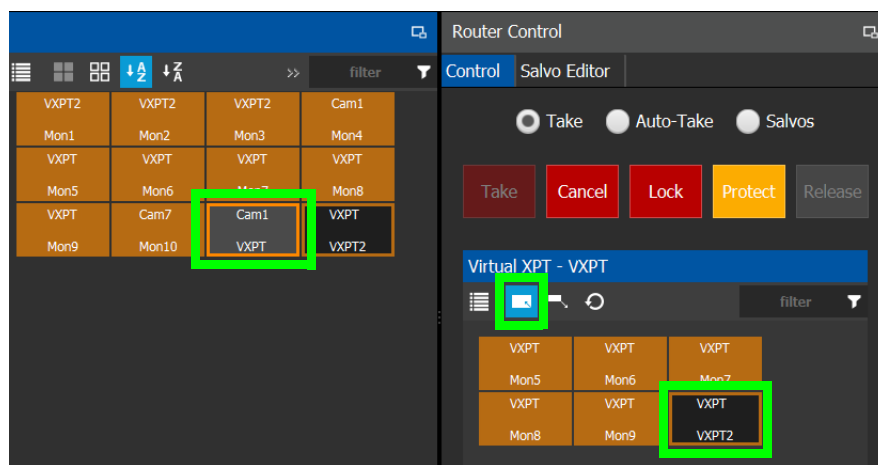
As shown below, when **Expand Virtual XPT** 🖳 is selected, all destinations are shown, including the nested destinations of all other virtual XPTs.
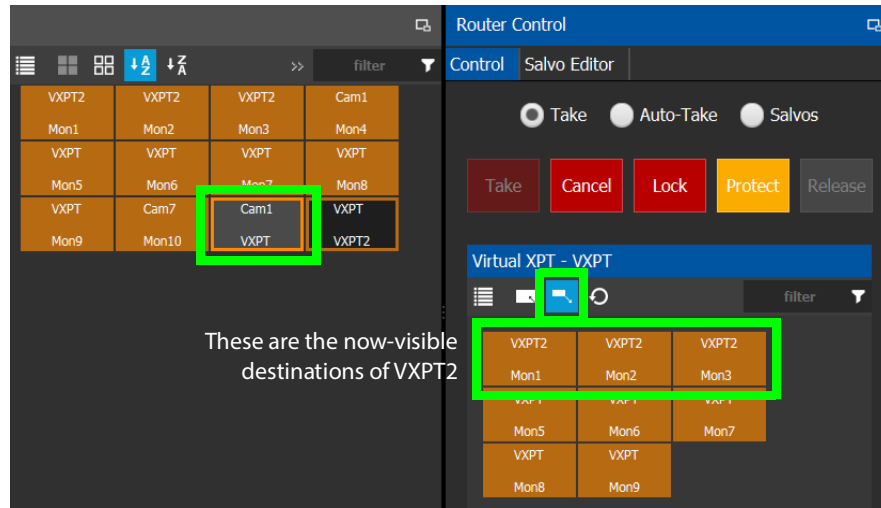
See also Performing a Take in Router Control, on page 471 for more information about how to use the other controls available in this window.

Filtering Lists, Table Columns, Sources, and Destinations

Virtual source and destination filters are available for you to filter on virtual XPTs when configuring the panel and category configurator user interfaces. To show virtual XPT sources or destinations only, enable the **Show virtual** setting in the filters dialog only.
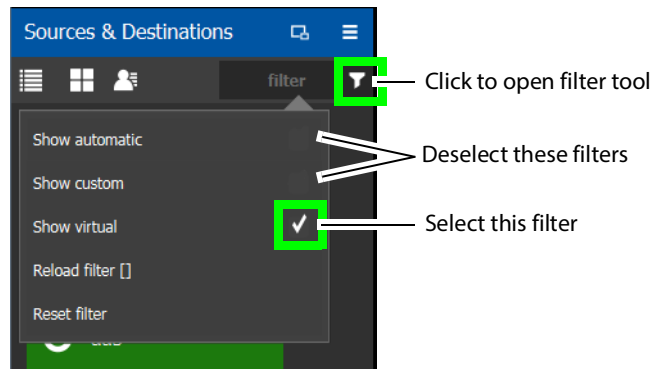
The functions available in a filter adapt to the screen in which the filter is found. For example, the Stream Browser has filters to allow you to filter streams that come from either input or output ports.
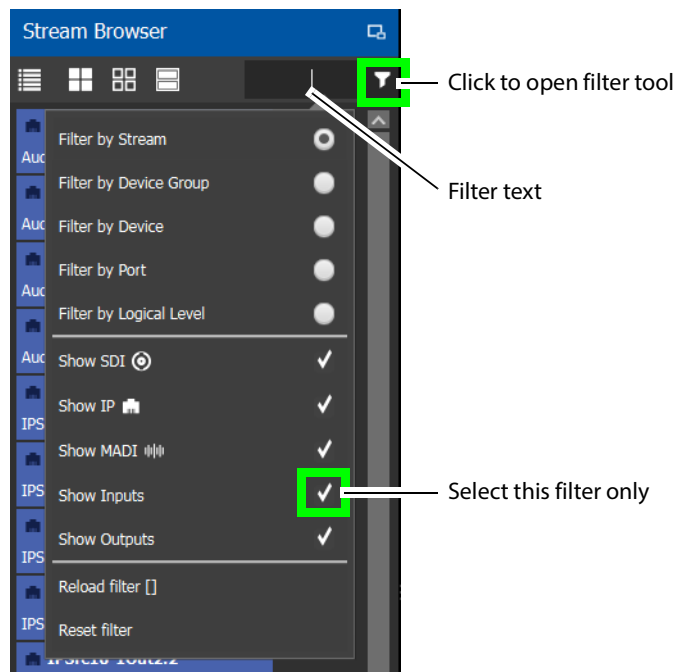
Filter Parameter	Description
Reload filter []	Reloads the previously-used filter.
Reset filter	Clears the text in the filter function.
Filter by Stream	Filter by the stream's name.
Filter by Device Group	Filter by the device group's name.
Filter by Device	Filter by the device's name.
Filter by Port	Filter by the port's name.

Filter Parameter	Description
Filter by Logical Level	Filter by the Logical Level's name.
Show SDI	Show results where the connection type is SDI.
Show IP	Show results where the connection type is IP.
Show MADI	Show results where the connection type is MADI.
Show Inputs	Show results where the connection direction is an input.
Show Outputs	Show results where the connection direction is an output.
Show automatic	Show automatically-created sources and destinations.
Show custom	Show user-created sources and destinations.
Show virtual	Show virtual XPTS.

Category Configurator Tasks

Use the Category Configurator to make it easier to manage the sources in your topologies. Creating groups of categories, based on type or use, is useful when you have multiple resources.

Categories are used to group sources and destinations together thereby allowing them to be accessed quickly on a panel, either by adding a category button or by using keyboard shortcuts. See also Panel Configuration Example Using Categories with Custom Navigation, on page 302.

Accessing the Category Configurator

To access the Category Configurator Task

1 Open GV Orbit Control Stage. See Navigating Back to Stage, on page 170.

2 Select an area. See Selecting an Area, on page 183.

3 Select a topology. See Selecting a Graph, on page 184.

4 Select **Configuration** > **Category Configurator**.
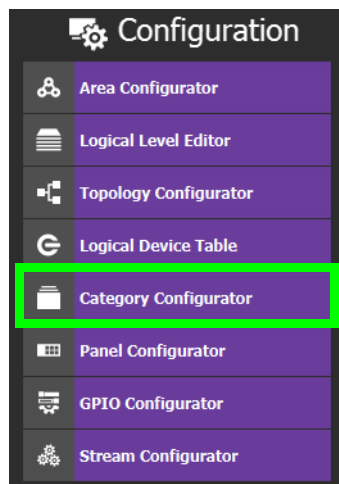
The Category Configurator task opens:
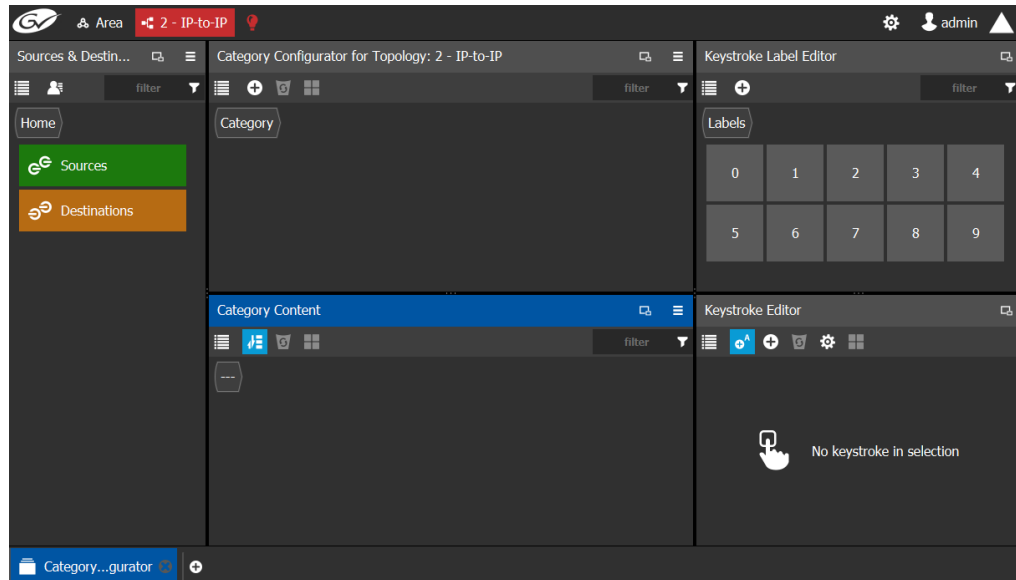
See the following Category Configurator procedures:

- Creating Categories for the Sources and Destinations in Your Topology, on page 270
- Assigning a Keystroke Label to a Source or Destination, on page 273
- Creating a Keystroke Label, on page 274

Sources & Destinations Menu

The Sources & Destinations menu has the following menu options.

Icon	Description
Select All	Select / deselect all source or destination items.
Select Alias	Select the Alias you want to use to identify Source and Destination streams in GV Orbit Control's interface. Aliases are created in the Alias Editor. See Adding Aliases, on page 467.

Creating Categories for the Sources and Destinations in Your Topology

When you first open the Category Configurator, the Home tab appears in the Sources and Destinations tab.

To create a category for your sources

1 Open the Category Configurator task for the required topology. See Accessing the Category Configurator, on page 268.

2 Click **Add** ⊕ .
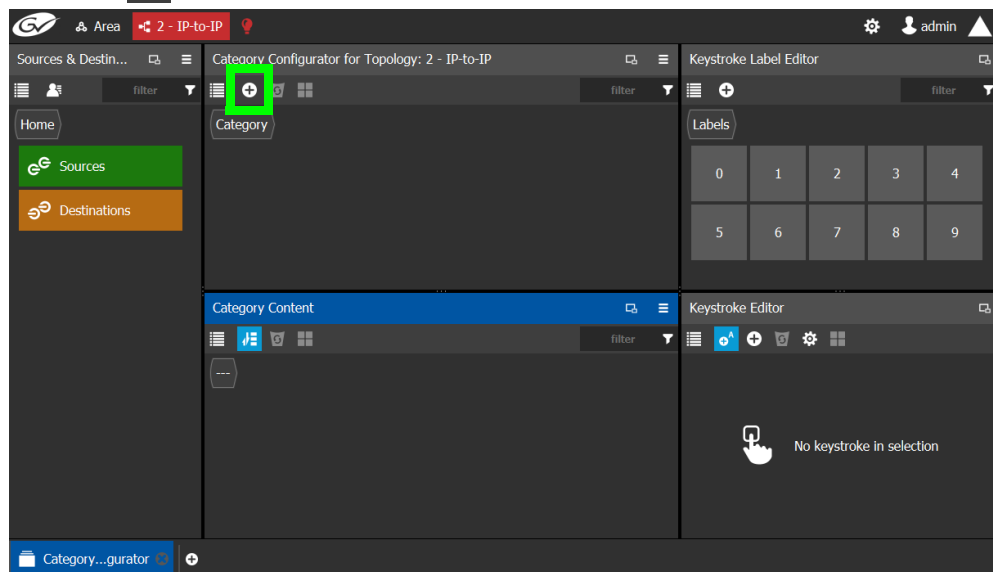
3 The **Enter a name for the new category** window appears:
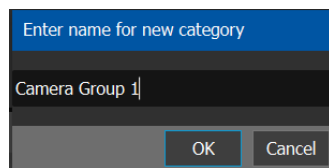
4 Enter a name for the new category and click **OK**.

The new category is added to the top of the **Category Configurator** column.

5 Click **Sources** or **Destinations** to view the available sources / destinations.

All the sources / destinations in the selected topology are displayed. This includes the logical sources you created in the Logical Device Table task. See Logical Device Table Tasks, on page 241.

6 Select the newly created category.
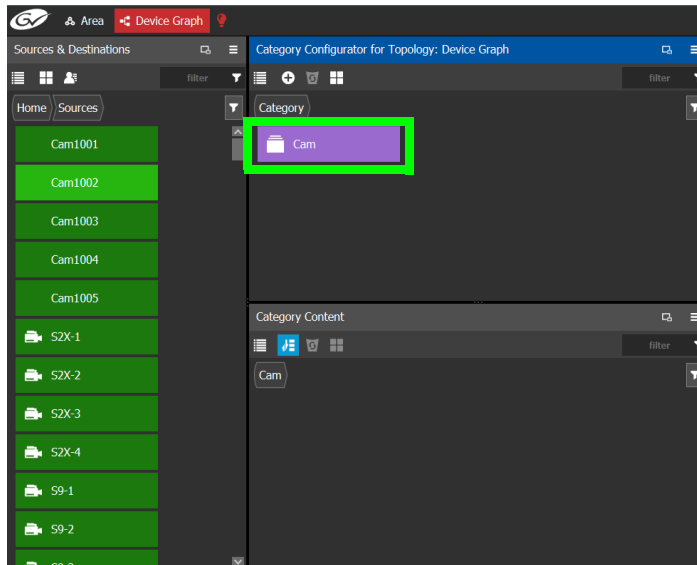
The category is added to the lower part of the center column under Category Content.

7 Drag the sources / destinations from the **Sources & Destinations** column to the Category Content area.
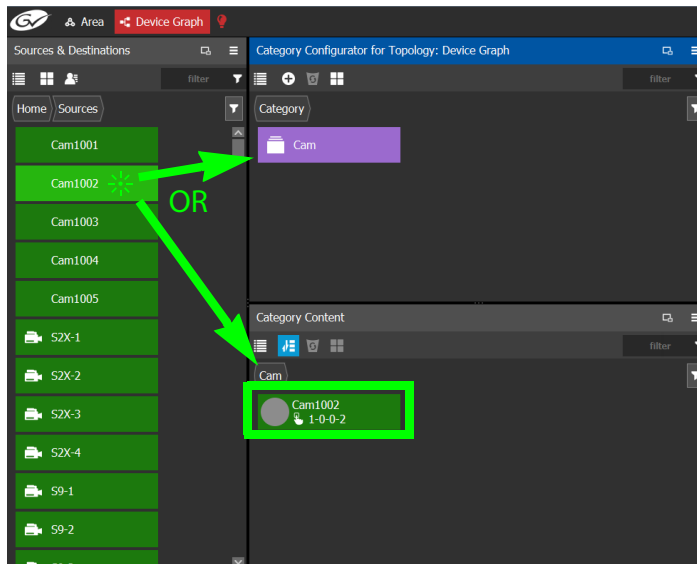
Alternatively, you can drag a source/destination to the created Category button.

When a Category contains only Sources or it contains only Destinations, the Category's symbol will change accordingly to show the type of content. For example, this allows

you to have two Categories with the same name where one only has Sources and the other Category only has Destinations and you can still distinguish them.

Table 1: Meaning of Category Icons

Icon	Description
	The category: • Is empty (contains no Sources or Destinations). • Contains a mix of Sources and Destinations.
	The category only contains Sources.
	The category only contains Destinations.

8 Click Home to toggle between **Sources** (Green) or **Destinations** (Orange) as necessary.
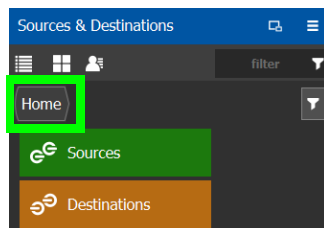
Re-ordering Category Content

The sequence of category content (Sources and Destinations) can be re-ordered so that when a category is used on a panel, the Sources and Destinations will be shown in the order that you want it to be.

1 Add Sources and Destinations to a Category. See Creating Categories for the Sources and Destinations in Your Topology, on page 270.

2 Re-order the Sources and Destinations in a Category: in the Category Content, drag the Source and Destination tiles into the oder you want them to be.
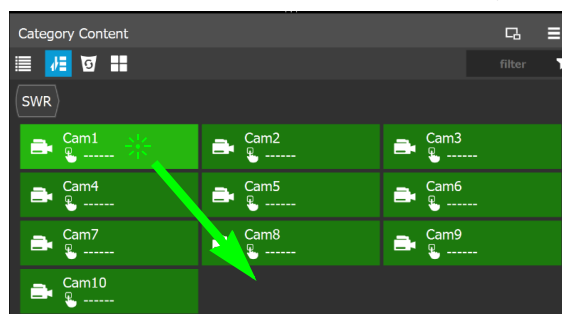
3 In the Panel Configurator, add a panel and configure it. See Panel Configurator Tasks, on page 275.

4 Add the Category to a panel button. See Adding Resources to the Panel, on page 287.

5 For each panel button you have added a Category to, select the panel button individually and set the **Sort Mode** property to **Manual** it in the button's Property Editor. See Setting the Properties for Panel Resources, on page 292.

Assigning a Keystroke Label to a Source or Destination

A keystroke label can be added to sources and destinations once they have been added to a category. Assigning a keystroke label to a source or destination allows a user to bring up categories by using a keypad on a panel. For example, if you have 100 categories in your system, a panel can bring up category 37 by pressing 3 then 7 instead of browsing through dozens of panel pages. This also applies to selecting sources or destinations. For instance, Cam17 can be directly accessed by pressing 1 then 7 on the panel instead of searching for the Cam17 button.

To add a keystroke label to a source or destination

1 Open the Category Configurator task for the required topology. See Accessing the Category Configurator, on page 268.

2 Click a **Category** to show sources and destinations that have been configured for that category, shown in **Category Content**.

3 From the Keystroke Label Editor drag one or more labels onto a source or destination to create a unique sequence for that source or destination.
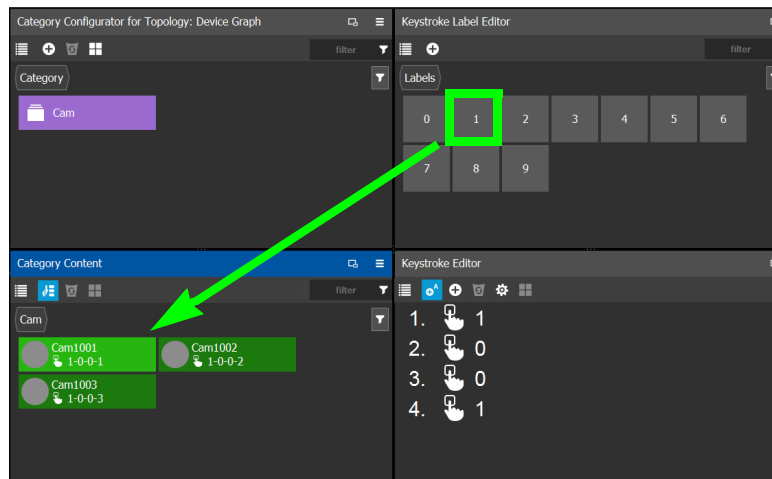
The **Keystroke Editor** shows the current keystroke label for the selected source or destination.

Edit a Source or Destination Keystroke Sequence

The **Keystroke Editor** allows you to change the selected source or destination's keystroke label. Setting for automatically assigning keystroke labels to a source or destination can also be set.

273
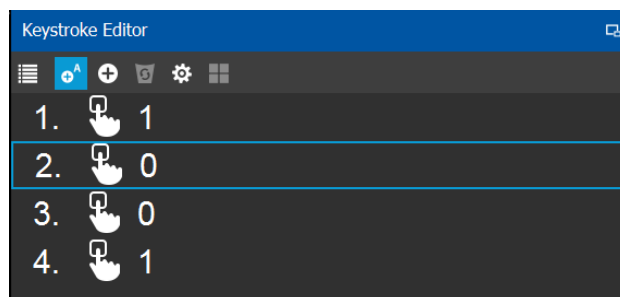
Set **Auto Add** to automatically assign a keystroke to a source or destination as it is added to a category. Click **Options** to configure this feature.

Proceed as follows to delete a keystroke.

1 Select a source or destination shown in **Category Content**.

2 Select a keystroke in the **Keystroke Editor** and click Delete.

Proceed as follows to delete all keystrokes.

1 Select a source or destination shown in **Category Content**.

2 Click **Clear All** in the **Keystroke Editor**.

Creating a Keystroke Label

You can assign custom keystrokes to a source or destination. Create a keystroke label to do so.

To creating a keystroke label

1 Open the Category Configurator task for the required topology. See .

2 In the Keystroke Label Editor, click **New** ⊕.

The Create a new keystroke label window opens.
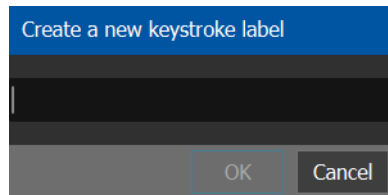
3 Set the keystroke label as required and click **OK**.

Panel Configurator Tasks

This allows you to add buttons and behaviors to a panel. Those buttons represent sources, destinations, levels, groups and various operations that can be saved under specific configurations and then pushed to a software or hardware panel.

For an example of how to setup and use a panel, see Panel Configuration Example Using Categories with Custom Navigation, on page 302.

Accessing the Panel Configurator

To access the Panel Configurator Task

1 Open GV Orbit Control Stage. See Navigating Back to Stage, on page 170.

2 Select an area. See Selecting an Area, on page 183.

3 Select a topology. See Selecting a Graph, on page 184.

4 Select **Configuration** > **Panel Configurator**.
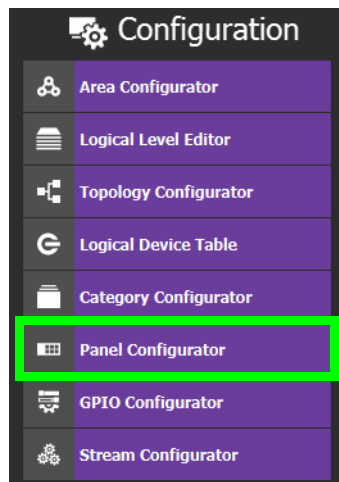
The Panel Configurator task appears:
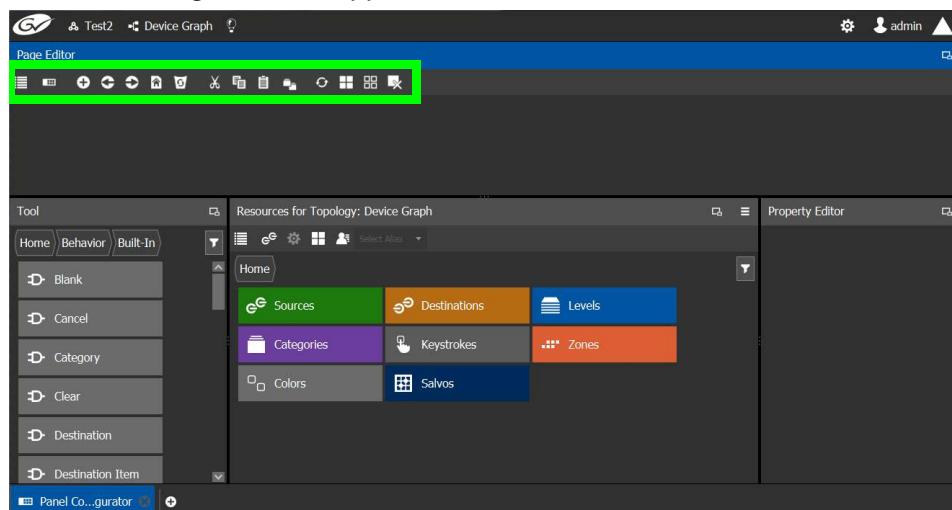
Page Editor Menu

The Page Editor menu has the following menu options.

Icon	Description
Manage	Creates multiple templates for hardware or software panels for various panel models. Then, you can add the template to a panel that you have added to the topology. A pre-existing panel can be duplicated; see Creating a New Panel, on page 277 or Viewing another Panel, on page 280. Using Layouts, panel layouts can be nested when used with the same panel model type. See *Layouts* in Adding Resources to the Panel, on page 287.
Add Page	Adds a page to the panel's layout. See Adding Panel Pages, on page 283.
Previous Page	Returns to the panel's previous page, when the panel configuration has two or more pages.
Next Page	Goes forward to the panel's next page, when the panel configuration has two or more pages.
Home Page	Make the currently shown page the panel's Home page. This is available when the panel's configuration has two or more pages and you currently are not on the Home page. To add panel pages, see Adding Panel Pages, on page 283. To set a page to be a panel's home page, see step 4 on page 283.
Delete Page	Removes the currently-selected page from the panel's configuration. This is unavailable for the panel page currently designated as the Home page.
Cut	Cuts the contents from the panel's currently selected button(s).
Copy	Copies the contents from the panel's currently selected button(s).
Paste	Pastes the clipboard contents to the panel's currently selected button. See About the Copy / Cut / Paste Buttons, on page 277.
Copy Category Properties	Copies the properties of another category to the panel's currently selected category. First configure a category's properties according to your needs, and then copy the properties to other categories using thislo feature as needed. See Copying the Properties from one Category to Another, on page 295.
Refresh	Reloads the Panel's contents.
Select All	Selects all the panel's contents.
Clear All	Deselects all the panel's contents.
Clear	Removes all the selected panel's contents.

About the Copy / Cut / Paste Buttons

Copy / cut / paste buttons can be used from one panel page to another and from one panel to another. Copy / cut / paste can be done using either the icons in the toolbar or through keyboard shortcuts: <ctrl>+X, <ctrl>+C, and <ctrl>+V.

You can multi-select using the <Shift> / <Ctrl> key:

- By holding the <Shift> key and selecting the first and the last button/cell on the panel, all buttons/cells in between are selected. If the first and the last selected buttons/cells are in different lines, the entirety of the lines will be selected between the two buttons/cells.
- By holding the <Ctrl> key, you can toggle the selection by clicking individual buttons/cells on the panel.

Creating a New Panel

You can create multiple templates for hardware or software panels of various models. Then, you can add the template to a panel that you have added to the topology. A pre-existing panel can be duplicated; see Viewing another Panel, on page 280.

To create a new panel

1. Open GV Orbit Control Stage. See Navigating Back to Stage, on page 170.
2. Select an area. See Selecting an Area, on page 183.
3. Select a topology. See Selecting a Graph, on page 184.
4. Select **Configuration** > **Panel Configurator**. See Accessing the Panel Configurator, on page 275.
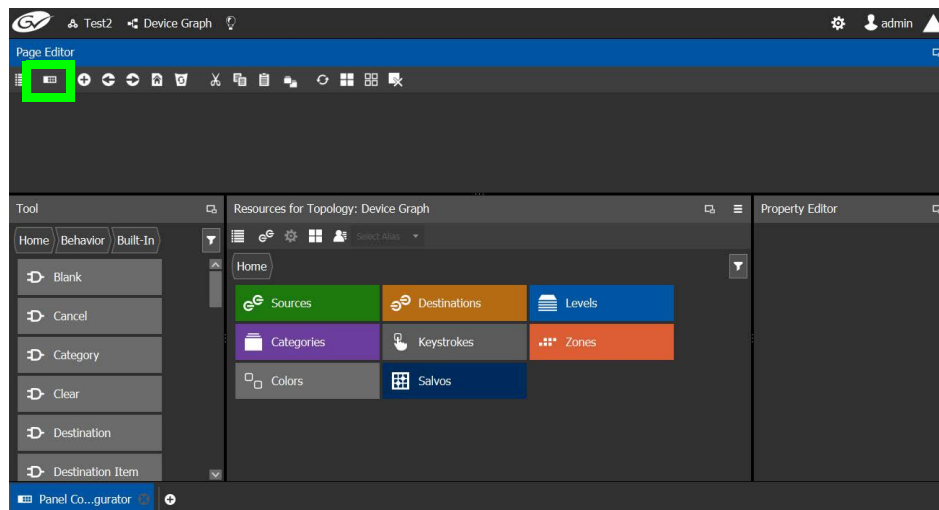
5. Click **Manage**.

A secondary window opens.
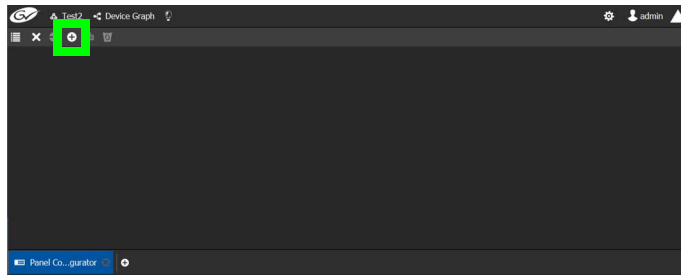
6 Click **New** ⊕.

The **New** window appears.
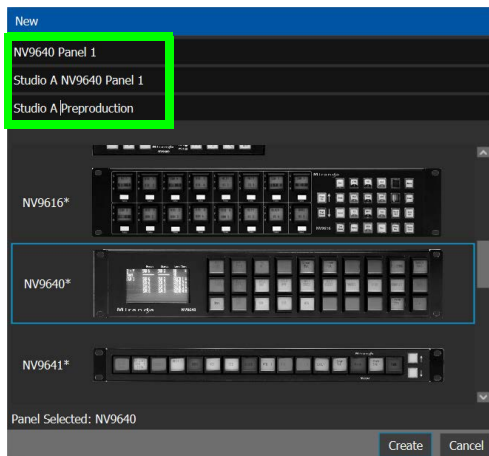
7 Enter meaningful text in the **Name**, **Summary**, and **Description** fields to identify the panel.

8 Select the required model from the list.

9 Click **Create**.

The new panel is added to GV Orbit Control.

Panels can have more than one page. When the panel is shown with a red outline, this indicates that the Home Page is being shown.
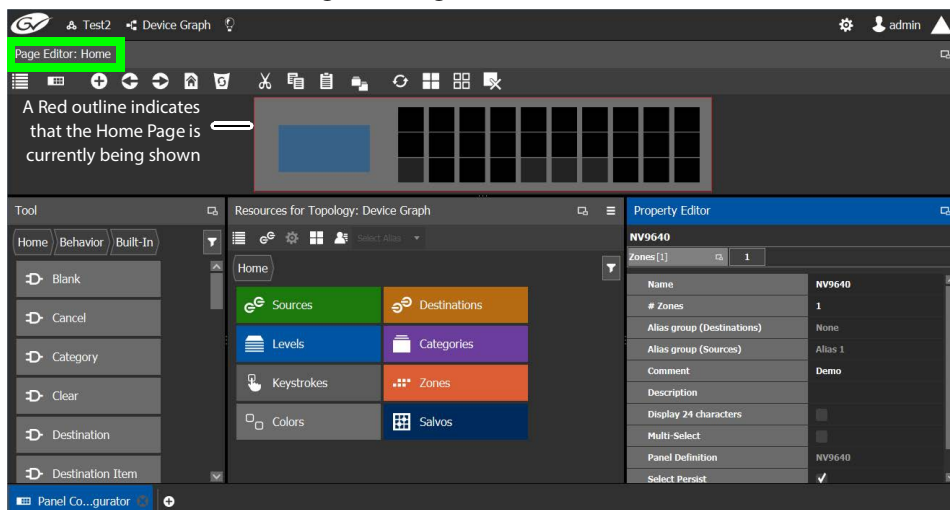
10 Configure the panel's properties; see Configuring a Panel's Properties, on page 281.

Duplicating a Pre-Existing Panel

A pre-existing panel can be copied to reuse that panel's configuration properties and then you only need to modify the necessary panel properties as required for the new application. The new panel configuration will have a new name and any changes to that configuration will not affect the original panel configuration that you chose to base its configuration on.

To duplicate a Pre-Existing Panel

1 Open GV Orbit Control Stage. See Navigating Back to Stage, on page 170.

2 Select an area. See Selecting an Area, on page 183.

3 Select a topology. See Selecting a Graph, on page 184.

4 Select **Configuration** > **Panel Configurator**. See Accessing the Panel Configurator, on page 275.
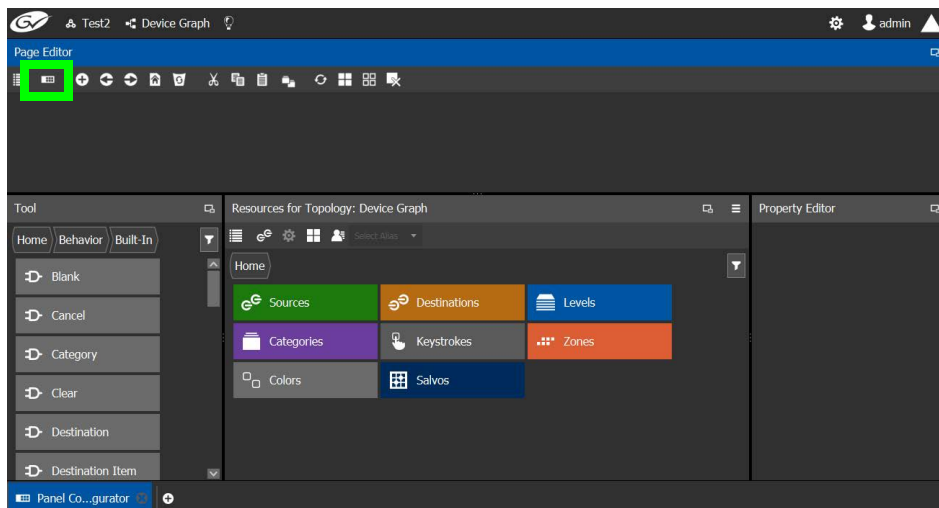
5 Click **Manage**.

A secondary window opens.
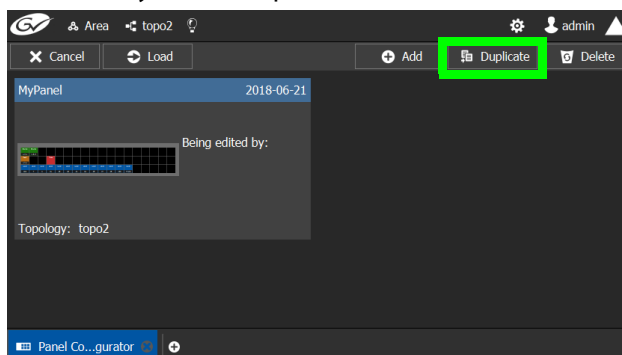
6 Click on a pre-existing panel that you want to duplicate and then click **Duplicate** .

The **New Name** window appears.
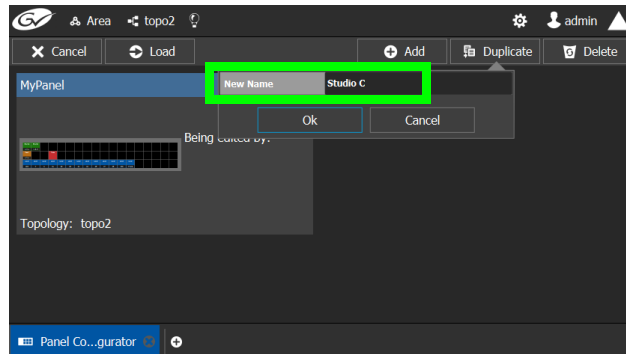
7   Enter a name to identify the panel.

8   Click **Ok**.

9   Configure the panel's properties; see Configuring a Panel's Properties, on page 281.

Viewing another Panel

When you have configured two or more panels, you can change between configuring them as follows.

To view a Pre-Existing Panel

1   Open GV Orbit Control Stage. See Navigating Back to Stage, on page 170.

2   Select an area. See Selecting an Area, on page 183.

3   Select a topology. See Selecting a Graph, on page 184.

4   Select **Configuration** > **Panel Configurator**. See Accessing the Panel Configurator, on page 275.
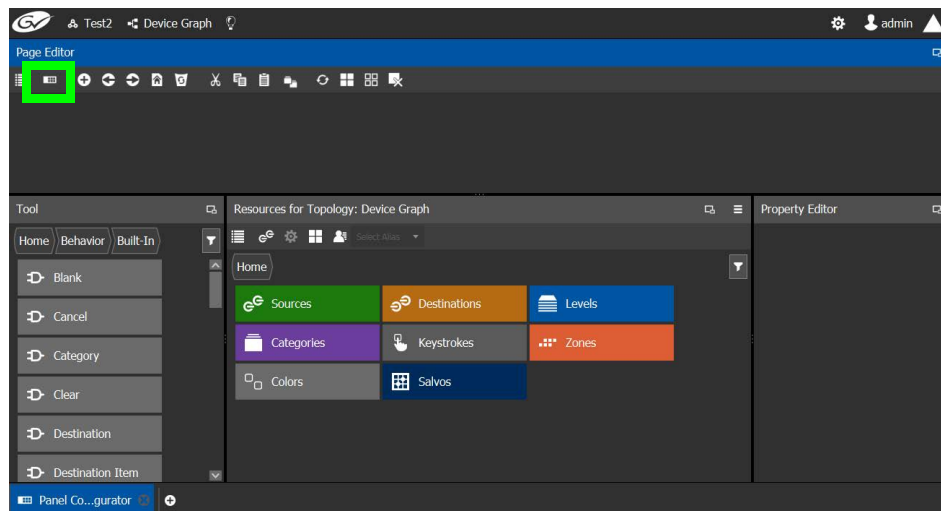
5   Click **Manage**.

A secondary window opens.
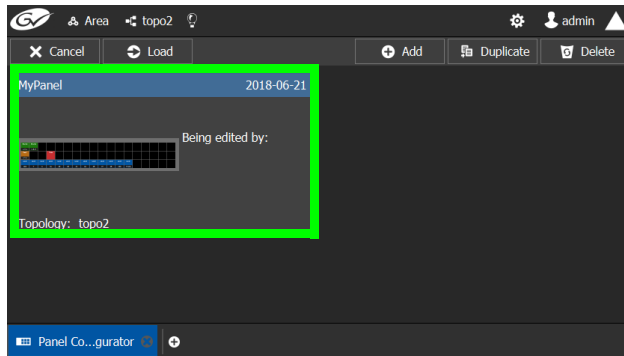
6 Click on a pre-existing panel that you want to view.

The configuration for the selected panel appears.

Configuring a Panel's Properties

Set the basic parameters to configure the panel.

To Configure a Panel's Properties
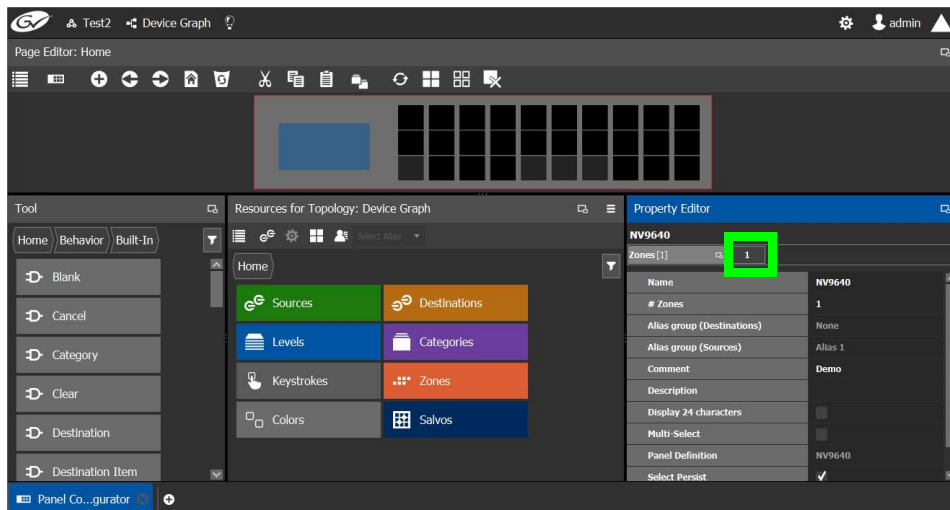
1 Click **1** next to **Zones [1]**.

The following properties can be configured for the panel. See also Description of Common Device Properties, on page 332.

Parameter	Description
Name	The name or identifier for this panel
# Zones	Sets the number of zones available for the selected panel. The default is 1, however you can add more as needed. Buttons can be assigned to any zone. Each zone can then act as an separate panel. For example, you can have two zones on a panel, and each zone has its own sources, destinations, and take button. Selection and take in one zone will not affect the other zone. Zones can be assigned to the button in the *Property Editor* when the button is selected in the *Resources for Topology*.
Alias group (Destinations) Alias group (Sources)	Shows the currently selected destination / source alias to use on the panel button's / interface to use in place of the short labels. See Using Source and Destination Aliases with a Panel, on page 291.
Comment	An optional comment about this panel.
Default Destination	Shows the currently selected default destination for this panel. See Creating a Single-Destination Work Flow Panel, on page 297.
Description	An optional description for this panel.
Display 24 characters	When deselected, panel button labels are limited to a maximum length of 8 characters. When selected, panel button labels are limited to a maximum length of 24 characters. This option is useful when using source / destination aliases that usually are longer than 8 characters. This will disable the destination status on the destination buttons. The display will only show the system names. The level buttons will only show the system names. To create source / destination aliases, see Alias Editor Tasks, on page 466. See also Using Source and Destination Aliases with a Panel, on page 291.
Multi-select	When deselected, the panel will allow multiple selection of destination buttons. This enables an operator to take a single source to multiple destinations at once. When selected, only one destination can be selected at a time.
Panel Model	The current panel's model number that was added in step 6 on page 278.
Select Persist	When deselected, the source and destination selections are cleared when a take is complete. When selected, the source and destination selections are maintained when a take is complete. This is parameter is selected by default. This parameter is not zone-specific.

See also Setting the Properties for Panel Resources, on page 292.

Adding Panel Pages

A panel can have one or more pages. Each page can be tailored to a function or purpose. Navigation buttons can be added to the page so the panel user can go page to page. There is more than one way for a panel user to navigate to another page; for example, see Panel Configuration Example Using Categories with Custom Navigation, on page 302.

To add a panel page

1 View a panel. See Viewing another Panel, on page 280.

2 Configure the panel. See Configuring a Panel's Properties, on page 281.

3 In **Tool**, navigate to **Home** > **Pages** and click **Add Page** ⊕.
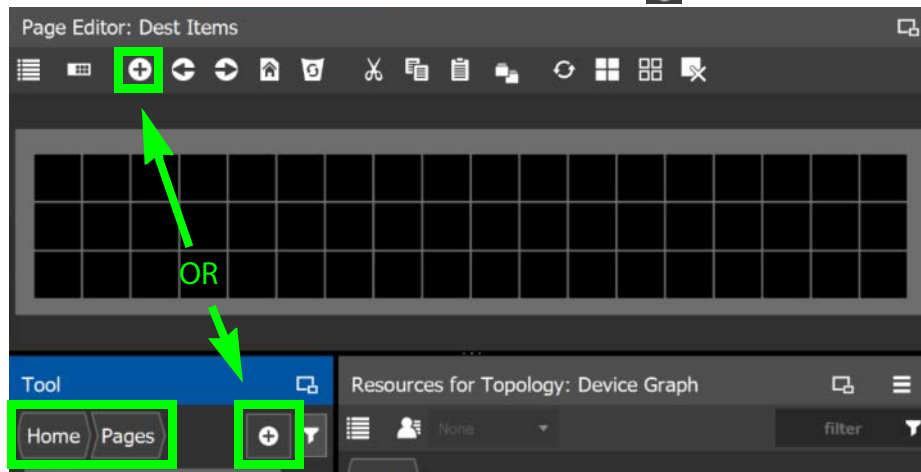
A new page is added to the **Pages** list in the **Tool** pane.

4 To make a panel page the Home page, select the page in **Tools** and click **Home** ⌂.
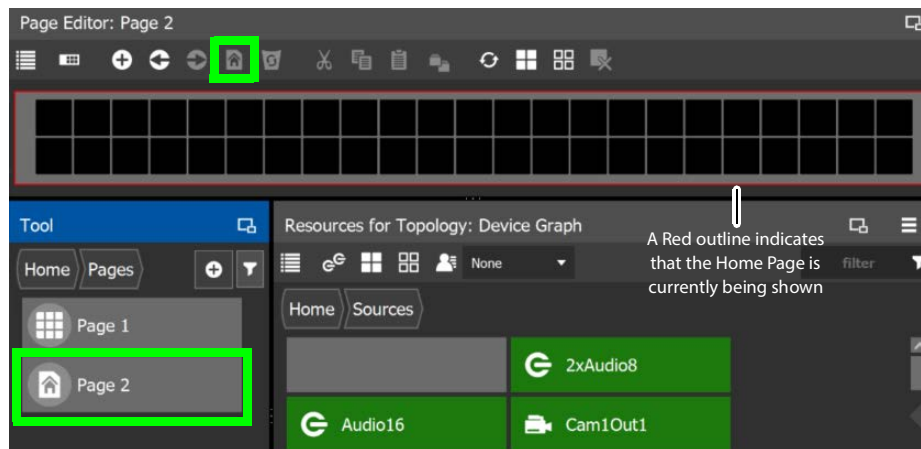
In the Tool list of panel pages, the Home icon is shown for current Home page. A red outline around the panel image indicates when the Home page is currently being shown.

Tool Page Icon	Description
	The panel page is currently not a home page.
	The panel page is currently a home page.

Adding Actions to a Panel

A panel can support a number of actions that must be added to it before the action becomes available to the panel user. For example, add a Take button to a panel as follows.

1 Open the Panel Configurator task for the required topology. See Creating a New Panel, on page 277.

2 Select the required Panel.

3 Drag the **Take** tool from the **Tools** column onto a panel button.
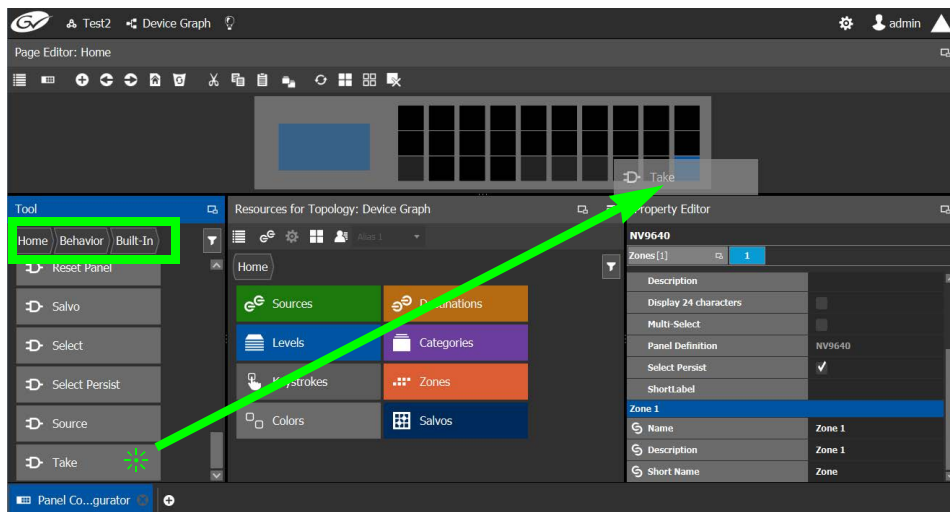
4 If the panel has a display, drag the **Page Up** and **Page Down** tools from the **Tools** column onto panel buttons (some panels have two dedicated buttons set apart for this purpose next to the display).

See the panel's documentation for more specific details about the behavior of panel buttons. The following table provides summary information.

Built-in Panel Actions	Description
Back	Allows the panel user to go back to a previously visited page. The Back button stacks all visited pages or layout pages and will be highlighted until the panel user reaches the first page visited where the button becomes low tally. The stack of visited pages: • Is persisted against restart, reboot and failover actions. • Is cleared when a panel user clicks a *Load home Page* button on the panel.
Blank	Some buttons can span multiple pages. This is used to force a button to appear on a higher-level page only.
Cancel	Cancels a Keystroke. Removes all keystrokes in the selection.
Category	This either (1) displays a category's device list or (2) displays a "suffix page." A category button is associated with either a source category or destination category. The button text is normally the category name and is short as space is limited.
Clear	Clears the Keystroke. Removes the last key stroke.
Default Destination	Provide the tally for the default destination when the **Show Tally** parameter is set in the button's property. Set a destination to which all takes made on a panel will be made. See Creating a Single-Destination Work Flow Panel, on page 297.
Destination	Select a destination.
Destination Item	This is used to do an indexed take. Use Multiple destination items to preset a multiple take. Each destination item will have a different index.
Destination Status	Provide the tally for the selected destination. See also Creating a Single-Destination Work Flow Panel, on page 297.
Indexed Take	Make a take on the Destination item.
Keystroke	Create a Keypad to select Source or Destination by their numbers.
Level	• Used to display the level of the destinations. • Used to display the preset of a selected level. • Used for audio Break away and audio shuffling.
Level Map	This cross-connects levels. The function is typically used to shuffle audio channels, for example, to connect AES1/2 to AES3/4.
List Item	Used in conjunction with the Category list button to create an area where the source or destination will be displayed in a list.
Load Home Page	Takes the panel user to the Home page. To set a page to be a panel's home page, see step 4 on page 283.
Load Layout	This is shown when a layout is dropped on a panel button. See *Layouts* in Adding Resources to the Panel, on page 287.
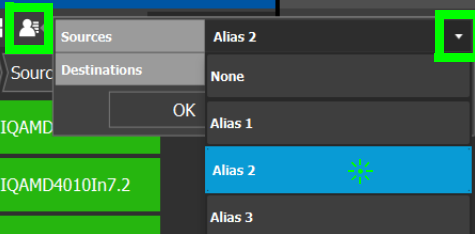
Built-in Panel Actions	Description
Load Page	Loads any panel page. To add a panel page, see Adding Panel Pages, on page 283
Lock	This prevents changes to the panel settings, especially router crosspoints. When the panel is locked, the button array becomes blank except for the **Panel Lock** button which becomes high-tally red. The button is a toggle: press the 'Lock' button to lock the panel. Press it again to unlock the panel.The button text is either "Lock" or "Unlock." See also About Lock, Protect, and Release, on page 472 for more information about the use and limitations of this feature.
Multi-Select	Allows the selection of multiple destinations.
Next	Continue forward to browse down a category list (this does not change the page). Normally you would not use this button directly but let the category list place it automatically, unless you need to map to a special button on a panel.
Next Page	When there are two or more pages that have been configured in the panel's layout, this cycles forward to the next panel page when available. When the panel user is at the last page, the button becomes low tally and the panel user can go no further.
Page Down	This scrolls the alphanumeric display down.
Page Up	This scrolls the alphanumeric display up.
Panel Lock	This locks the panel. When set, the panel button turns red and all other panel buttons are unavailable. Press the button again to release the lock.
Previous	Browse backwards to move up a category list (this does not change the page). Normally you would not use this button directly but let the category list place it automatically, unless you need to map to a special button on a panel.
Previous Page	When there are two or more pages that have been configured in the panel's layout, this cycles backwards to the previous panel page. When the panel user is at the first page, the button becomes low tally and the panel user can go no further.
Protect	This is a toggle that sets or clears a protect on the current destination device. The protect can be removed at the panel that originally set the protect, at any panel that has the same user ID, or by a forced release at any panel. • Note: a protect prevents others from routing to a destination; a lock prevents anyone—even the panel user who issued the lock—from routing to the destination. • You may lock a protected destination, but you cannot change a locked destination to a protected destination directly. You must first unlock it. The 'Destination Protect' button text is normally **Dest Protect** and when a selected MD destination is protected, the button legend becomes **Dest Unprotect**. See also About Lock, Protect, and Release, on page 472 for more information about the use and limitations of this feature.

Built-in Panel Actions	Description
Reset Panel	Reset the panel to its initial state and go to the home page.
Salvo	This executes a system salvo. A salvo is a pre-defined set of commands. The button text is the salvo's mnemonic. Pressing the salvo button puts the panel in "salvo" mode. To confirm that you want to execute the salvo, press a 'Take' button. When you press the take button, the salvo begins executing immediately. Salvos are typically short in duration. If you want to cancel the salvo before it executes, press the salvo button again. If you press an 'Information' button while the panel is in salvo mode, the panel presents the salvo commands on the display. You may scroll the display to view the entire salvo. See Creating Salvos, on page 474.
Select	After selecting Source or Destination from a Keypad, the panel user presses Select. This confirms the choice.
Select Persist	The destination stays selected after a Take.
Source Quick Source	This selects a source. Note that the quick source button selects a source and also performs an immediate take. Quick Source and Source buttons are similar, except that the Quick Source performs a take. Be aware of which buttons are quick sources so you do not perform an accidental take.
Take	In X-Y mode, a take button routes the preset source device(s) on selected levels to the selected destination device. In MD mode, a take button routes the preset source device(s) to the selected destination device(s) on all levels.

Adding Resources to the Panel

The Resources for Topology menu has the following menu options.
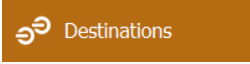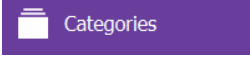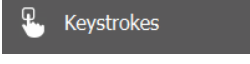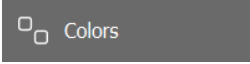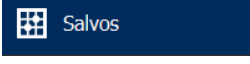
Icon	Description
Quick Source	This is shown only when *Sources* is selected. When enabled, the sources that are dragged onto the panel are quick sources, meaning the operator does not need to press the take button to do the take. The take is done as soon as the source is selected on the panel.
Default Destination	This is shown only when *Destinations* is selected. This makes the selected destination the default destination for the panel. When set: • The panel's properties shows the currently selected destination, found under **Default Destination**. • The icon on the destination changes to thus indicating its default destination status. To remove the Default Destination, select the destination set as the Default Destination and click . See Configuring a Panel's Properties, on page 281. See Creating a Single-Destination Work Flow Panel, on page 297.
Select All	Selects all the available resources.

Icon	Description
⊞ Clear All	Deselects all the available resources.
👤 Select Alias	Select the Alias you want to use to identify Source and Destination streams in GV Orbit Control's interface. Aliases are created in the Alias Editor. See Adding Aliases, on page 467.

In the Tool list of panel pages, the Home icon is shown for current Home page. A red outline around the panel image indicates when the Home page is currently being

shown. From the Resources for Topology, the following resources can be dropped onto panel buttons.

Tool Page Icon	Description
Sources	The currently configured sources. Sources are the available outputs for all the devices on your topology. See Adding a Source or Destination to the Logical Level Table, on page 248. Sources may be identified by an icon that represents the source type when it was automatically created as a virtual device. See About Automatic Sources or Destinations, on page 246 for more information.
Destinations	The currently configured destinations. Destinations are the available inputs for all the devices on your topology. See Adding and Configuring a Destination, on page 254. Destinations may be identified by an icon that represents the destination type when it was automatically created as a virtual device. See About Automatic Sources or Destinations, on page 246 for more information. When a destination has been set to be the default destination for a panel, it is designated by the Default Destination icon 🟧. See Creating a Single-Destination Work Flow Panel, on page 297.
Levels	Logical levels allow for the creation of shuffling and breakaways. For more information about logical levels, see Logical Level Editor Tasks, on page 190.
Categories	Shows the available categories. See: • Table Category Configurator Tasks on page 268. • Table 1 Meaning of Category Icons on page 272. • Panel Configuration Example Using Categories with Custom Navigation, on page 302
Keystrokes	A keystroke label can be added to sources and destinations once they have been added to a category. See Assigning a Keystroke Label to a Source or Destination, on page 273.
Zones	Click a zone to see which panel buttons are assigned to that specific zone. The number of zones is set in the **# Zones** parameter in the panel properties. See Configuring a Panel's Properties, on page 281.
Colors	Some panel buttons support the display of more than one color. For buttons that support colors, the button's color is used to show the current operating state. The color used for a button to represent any one of the given states can be changed. See Changing a Button's Color used to Represent a State, on page 295 and Changing a Button's Default Color used to Represent a State, on page 297.
Salvos	When a salvo is triggered, it executes a list of pre-configured actions. See Creating Salvos, on page 474.

Tool Page Icon	Description
▦ Layouts	Allows a panel to be used as a template to then be used in another panel. Making changes to the template panel will be seen everywhere the template is used. When:

1 You have created two or more panels with the same model type (for example, you have added three NV6954 panels in the Panel Configurator),

2 And you are viewing a panel with the same model type (for example, one of the three NV6954 panels in the Panel Configurator).

Then:

- These model types become available in this list (excluding the current panel). To create a panel, see Creating a New Panel, on page 277.

- A panel from Layouts can be dragged and dropped onto a button of the current panel layout to be reused. This creates a *Load Layout* button on the panel.

Select the *Load Layout* button to configure its properties in the *Property Editor*. See Setting the Properties for Panel Resources, on page 292.

To add panel resources

1 Open the Panel Configurator task for the required topology. See Creating a New Panel, on page 277.

2 Select the required Panel. See Viewing another Panel, on page 280.
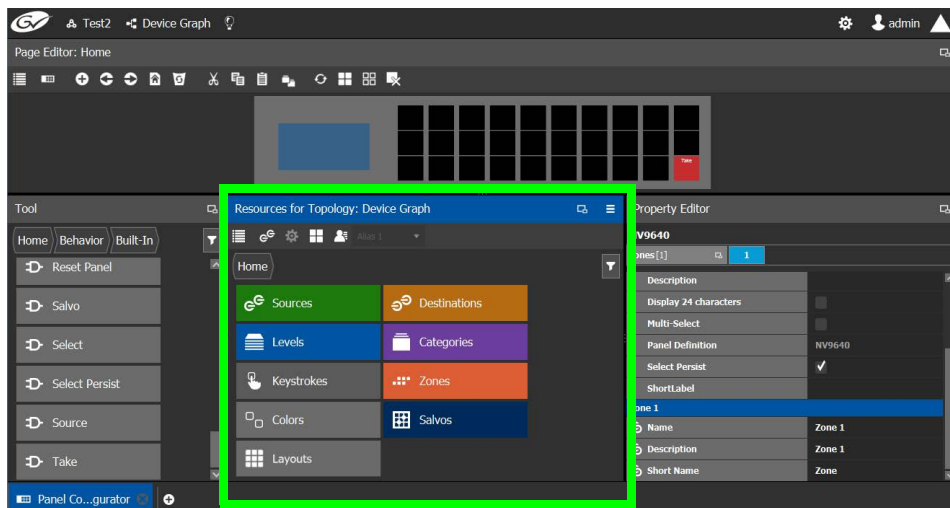
The resources that can be added to the panel are displayed in the lower section of the center column under **Resources for Topology**.

3 Click on resource type to begin adding individual resources to the panel such as **Sources**, **Destinations**, or **Levels**.

For example, click **Sources** to add cameras and other types of sources.
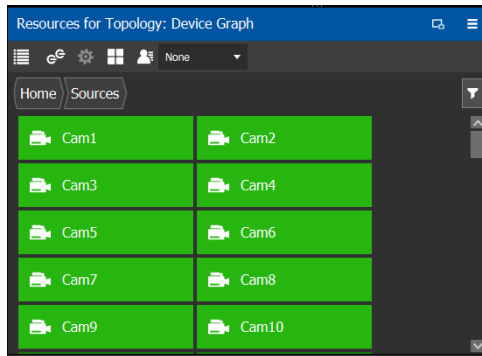
All the sources available in the topology are listed. This includes the logical sources you created in the Logical Device Table task. See Logical Device Table Tasks, on page 241.

4 Select a resource and drag it to one of the panel buttons at the top of the column. More than one resource can be added at a time; to add to a selection, use *Shift* or *Ctrl* to select a range of resources or to add another resource to the selection.
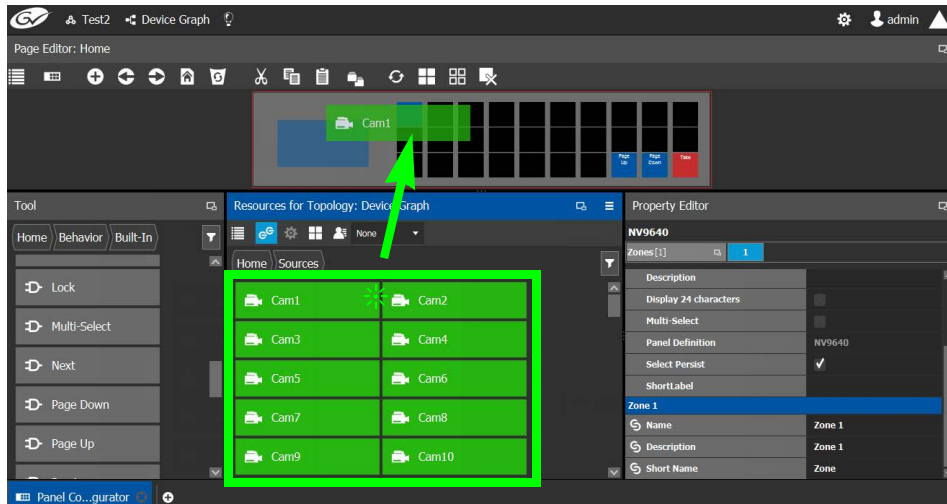
5 For each panel button you have added a resource to, select it individually and set the properties for it in the Property Editor. For a Category, see Setting the Properties for Panel Resources, on page 292.

6 Add resources from **Destinations**, **Levels**, and **Keystrokes** to the panel as required.

Note:

Only use the video+ancillary (V-ANC) logical level button unless you are routing in SMPTE ST 2110 mode. For SMPTE ST 2110 mode, you can individually use the Video or the Ancillary logical level buttons.

To directly control a GV Node's internal matrix, you must use the video + ancillary logical level button for video breakaway.

Using Source and Destination Aliases with a Panel

Aliases can be used for a panel to change the name of sources and destinations from short labels to the labels of the corresponding alias. First you must create one or more source and destination aliases; to create an alias, see Alias Editor Tasks, on page 466.

1   Under **Resources for Topology**, click **Sources** or **Destinations**.

2   Select from the **Select Alias** drop-down list the alias to use for this panel instance.
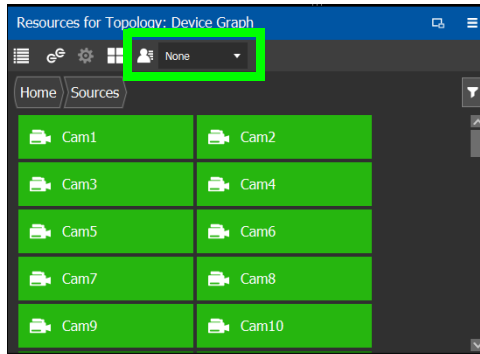
3   If the aliases are longer than 8 characters, consider setting the **Display 24 characters** option for the panel in the Panel's **Property Editor**. See Creating a New Panel, on page 277.

Setting the Properties for Panel Resources

When a resource has been added to a panel's button, you can select the button to then configure the properties for it.
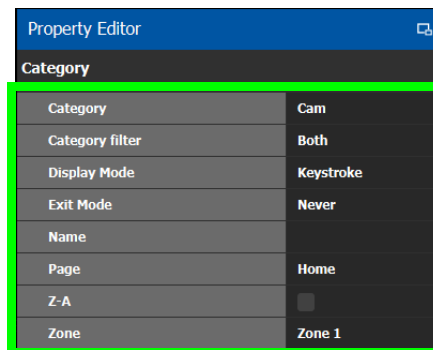
Parameter	Description
Category	Selects the category instance for the selected button. Typically this should be the category that was dragged onto the panel in Resources for Topology. It can be changed here for another category.
Category filter	A category can contain sources and/or destinations. Select the ones you want to be displayed. **Both**: display sources and destinations. **Destinations**: display destinations only. **Sources**: display sources only.
Display Mode	**Keystroke**: if the category item has keystrokes assigned to it, you can select this option. **List**: if not select List; this will list all sources/destinations in the category.

Parameter	Description
Exit Mode (for Load Layout, when a panel is used as a template)	Select how the panel user will be returned from a panel layout once they have made a category item selection or Take. The category item selection is displayed once the panel user has pressed the category selection button.
	Never: The panel user will remain in the same page where the category item selection is made. Other navigation buttons must be added to the page so that the panel user can navigate from the page (such as the **Back** button and / or the **Previous Page** and **Next Page** buttons).
	Preset: Once the panel user has made a selection in the category items, the panel user is immediately returned to the previous page (where the category selection button is located).
	Take: When the category items page has a Take button, the panel user is returned to the previous page (where the category selection button is located) once they select a category and then click Take.
	See Panel Configuration Example Using Categories with Custom Navigation, on page 302 for an example of how to use this parameter.
Exit Mode (for category item selection)	Select how the panel user will be returned once they have made a category item selection or Take. The category item selection is displayed once the panel user has pressed the category selection button.
	Never: The panel user will remain in the same page where the category item selection is made. Other navigation buttons must be added to the page so that the panel user can navigate from the page (such as the **Back** button). With this option, the **Exit Page** parameter below is not applicable.
	Preset: Once the panel user has made a selection in the category items, the panel user is immediately returned to the previous page (where the category selection button is located). This is the default. With this option, the **Exit Page** parameter can send the panel user to any other page (see below).
	Take: When the category items page has a Take button, the panel user is returned to the previous page (where the category selection button is located) once they select a category and then click Take. With this option, the **Exit Page** parameter can send the panel user to any other page (see below).
	See Panel Configuration Example Using Categories with Custom Navigation, on page 302 for an example of how to use this parameter.

Parameter	Description
Exit Page (for category item selection)	In conjunction with the **Exit Mode** parameter, this parameter changes the **Preset** and **Take** return navigation to any other panel page. This can be used to save the panel user from making extra panel presses to navigate back to the **Home** page, for example. In order to use this feature the **Exit Mode** must be set to **Preset** or **Take**. See above. When the value for this parameter is blank (empty), the **Exit Page** parameter has no effect. This is the default. When the value for this parameter is a panel's page, the panel behavior is to take the panel user to the selected panel page once they have pressed the category item selection or Take button. See Panel Configuration Example Using Categories with Custom Navigation, on page 302 for an example of how to use this parameter.
Layout	Set the panel to be associated to the **Load Layout** button.
Name	Set the name that will appear in the category button instead of the category name.
Page	Sets the page to display when the category button is pressed. It should typically contain either List Item buttons or Keystroke buttons.
Sort Mode	If the list display mode is selected, this will: **A-Z:** show the sources/destinations in alphabetical order. **Manual:** show the sources/destinations in the order you have set for the Category. see Re-ordering Category Content, on page 272. **Z-A:** show the sources/destinations in reverse alphabetical order.
Next	These options are present for the List Item buttons. If the list of sources/destinations in the category is greater than the number of list item buttons added to the page, some buttons will be used as next or previous buttons. This is determined automatically by GV Orbit Control, but you can override the default by specifying that a button can be used as a next or previous button if need be.
Previous	
Keystroke	This parameter is available with the Keystroke button. It specifies the keystroke associated with the button.
Zone	Select the zone for the category button. Buttons can be assigned to any zone. Each zone can then act as an separate panel. For example, you can have two zones on a panel, and each zone has its own sources, destinations, and take button. Selection and take in one zone will not affect the other zone. Zones can be assigned to the button in the *Property Editor* when the button is selected in the *Resources for Topology*.

Copying the Properties from one Category to Another

Copies the properties of the panel's currently selected category to one or more other categories used on the panel. The scope (the type of parameters) of the copy can be controlled.

To copy the Properties from one Category to Another

1 Add two or more categories to the panel. See Adding Resources to the Panel, on page 287.

2 Configure the properties of one of the categories according to your needs. See Setting the Properties for Panel Resources, on page 292.

3 Select the category from which you want to copy the properties from.

4 Click ▣ **Copy Category Properties** to copy the properties of the selected category to other categories.

Icon	Description
▦ Select All	Selects all the available categories.
▨ Clear All	Deselects all the available categories.
▣ Property to copy	Select from the dropdown list the property parameter field you want to copy. • **All Properties:** Copy all the following properties to the selected categories: **Display Mode**, **Exit Mode**, **Page**, **Category Filter**, **Zone**, and **Sort Mode**. • **Display Mode**, **Exit Mode**, **Page**, **Category Filter**, **Zone**, and **Sort Mode**: This allows you to copy only a specific property parameter while leaving the remaining property parameters for the categories untouched. For more information about these category property parameters, see Setting the Properties for Panel Resources, on page 292.

5 Select one or more categories to which you want to copy the properties to. Click **OK**.

Changing a Button's Color used to Represent a State

Some panel buttons support the display of more than one color. For buttons that support colors, the button's color is used to show the current operating state. The color used for a button to represent any one of the given states can be changed as follows.

1 Click a button that has a behavior previously associated to it (a blank button will not work). See Adding Actions to a Panel, on page 284 and Adding Resources to the Panel, on page 287.
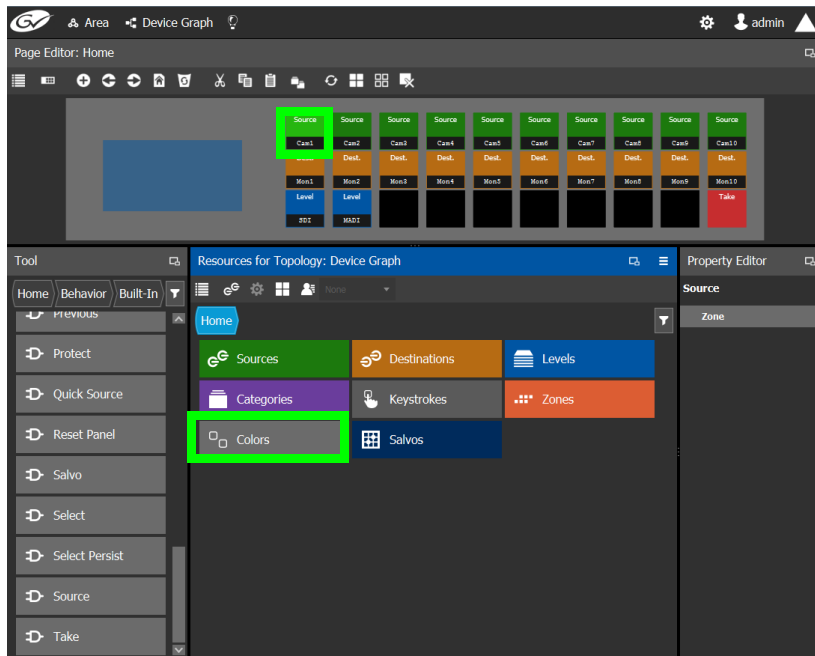
2 Click on the **Colors** resource type.
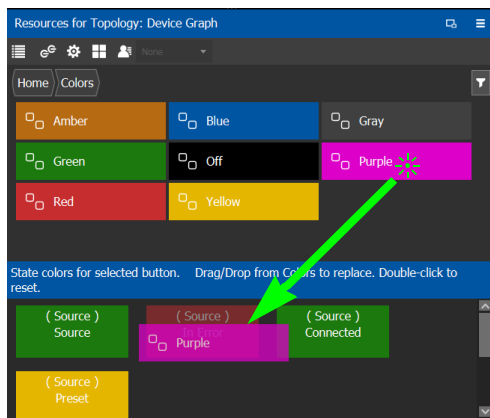
All available state colors for the selected button are shown on the lower half.

3 Drag a color from the color pallet (shown on the upper half) onto any one the state colors on the lower half.
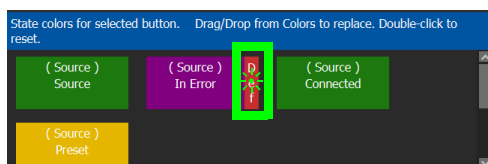
A *Def* bar appears on the state color which indicates the default color. Double-click the state color to revert to this default color.

Changing a Button's Default Color used to Represent a State

The default color used by all buttons for a behavior state can be changed when an across the system change is necessary.

1　Click the Custom Color Settings icon ⚙.

2　Click a behavior that you want to configure, for example, *Destination*.
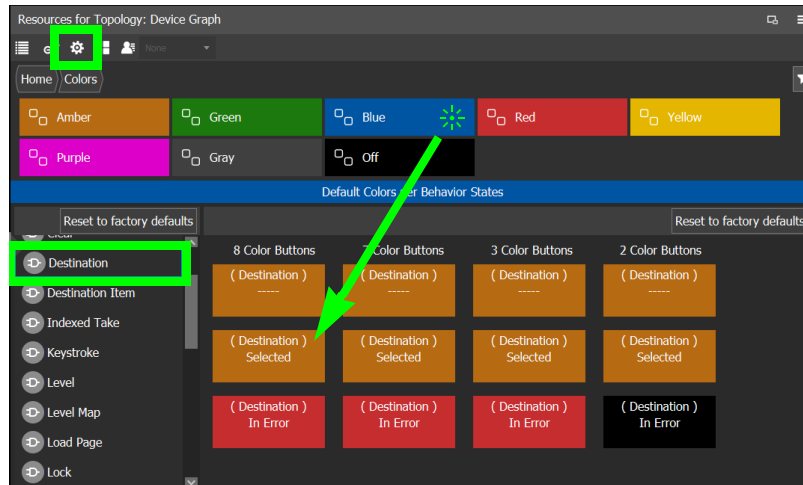
3　Drag a color from the color pallet (shown on the upper half) onto any one the state colors on the lower half.

Certain panel buttons support fewer colors. The 7, 3, and 2 Color Buttons columns will show how your color choice will be implemented for these reduced color-range buttons.

Creating a Single-Destination Work Flow Panel

A panel can be configured as an input selector: the panel shows a range of sources, from which the panel operator can choose from, and the selected source will always be routed to a single specific, pre-defined static destination for monitoring. Note that in this example, there are no destination buttons defined on the panel.

To create a single-destination work flow panel

This example shows how to create a single-destination work flow panel.

1　Create a new panel. See Creating a New Panel, on page 277.

2　Add the sources and a Lock and Take buttons to the panel. See Adding Resources to the Panel, on page 287 and Adding Actions to a Panel, on page 284.

3 Select the destination to which all sources will be routed for this panel: In **Resources for Topology**, **Destinations**, select a destination to which any selected source will be sent.
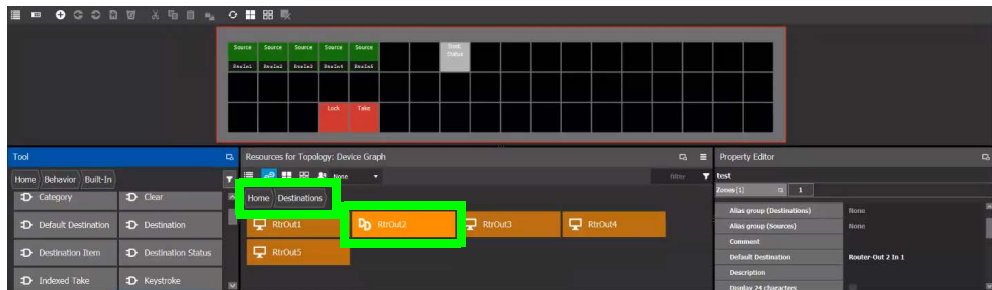
4 Set this destination as the default destination: click **Default Destination** ⊟⊃. The icon on the destination changes to 🗗.
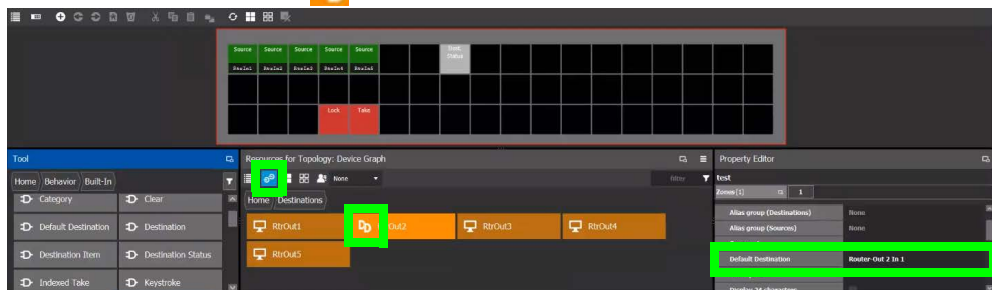
In the panel properties, the **Default Destination** parameter shows the selected destination as its value.

5 On the **Home** page, add a **Destination Status** from the **Built-In** Tool to a panel button. This panel button provides the tally of the default destination to the panel operator. See Adding Actions to a Panel, on page 284.
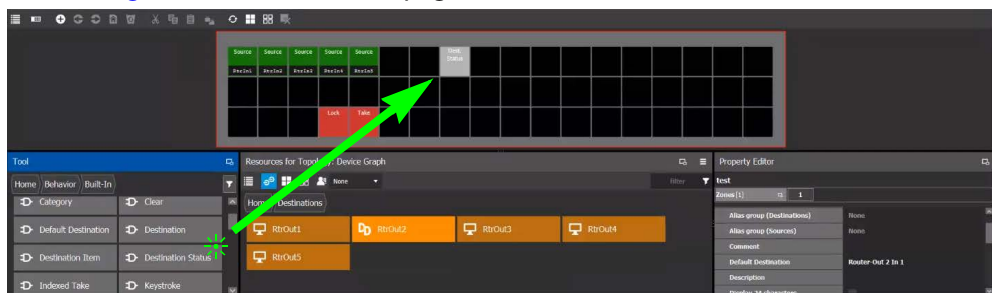
The panel operator can now select a source that will be routed to the **Router-Out 1 In 1** destination. The **Destination Status** button updates with the current tally for the destination.

Adding the New Panel to the Topology

After you have configured one or more templates for your software or hardware panels, you can add a panel to your topology.

To add a panel to the topology

1 Add the Panel to the Topology: from the **Device Library**, **Virtual Device**, find the Panel bubble. See Adding a Virtual Device to a topology, on page 204.
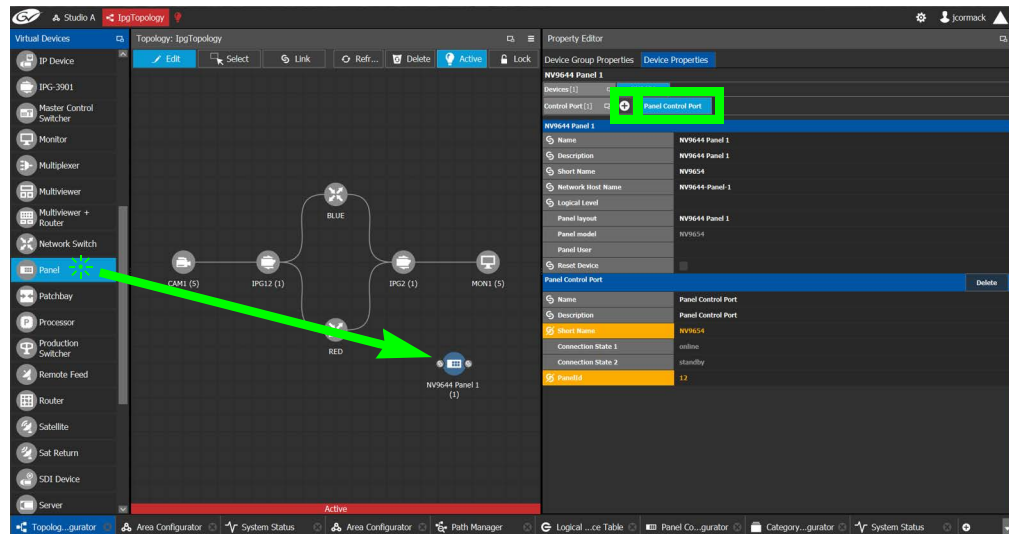
2 Select the bubble for the panel device to configure the panel's Device Group Properties in the **Property Editor**. See also Description of Common Device Properties, on page 332.

Parameter	Description
Name	The name or identifier for this panel instance.
# Devices	The number of panel instances in this device group.
Network Host Name	When one or more panels are managed by DCNM through the media network, set a unique network identifier for these panels so as to be able to push policies to them.
Advanced > Description	An optional description for this panel's control port.
Advanced > Logical Level	The logical level for this panel. See Logical Level Editor Tasks, on page 190.
Advanced > Default Connector Type	The panel's connector type.

3 Select **Device Properties** and click **New** ![icon] next to **Control Port** at the top of the **Property Editor** and select **NV96XX Panel Control** from the list.

The **Panel Control Port** tab appears. See also Description of Common Device Properties, on page 332.

Parameter	Required[a]	Description
Name		The name or identifier for this panel instance.
Description		An optional description for this panel instance.
Logical Level		The logical level for this panel. See Logical Level Editor Tasks, on page 190.
Panel Layout	•	Select the name of the panel you used when you created the panel (see Creating a New Panel, on page 277) from the drop-down list.
Panel Model		When you have selected the *Panel Layout* parameter, this is the panel's model number that was selected when you created the panel. It is read-only.
Panel User	•	Select the panel's user name from the drop-down list. For further information, see Administration Tasks, on page 477. A panel *Admin* or *Operator* user has the ability to release locks made by another user. Whereas non-Admin or non-Operator users can only release locks they made themselves. Destinations Lock/Protect is performed through the panel and if a destination is currently locked by another user, any take to this same destination will fail. If a specific router port is locked/protected but not linked to any destination within the Control System, the Lock/Protect status won't be exposed in the Control System and in fact is not releasable. See also About Lock, Protect, and Release, on page 472 for more information.
Reset Device		When the topology is inactive (see Making an Active Topology Inactive, on page 236), click to reset the device.

a. This parameter must be configured in order for the panel to become functional.

4 Select **Panel Control Port** tab to make the following properties visible. See also Description of Common Device Properties, on page 332.

Parameter	Required[a]	Description
Panel Control Port > Name		The panel's control port name.
Panel Control Port > Description		An optional description for this panel's control port.

Parameter	Required[a]	Description
Panel Control Port > Connection State 1 / 2		Connection State 1 shows the connection status of the panel with the primary server of a server group. Connection State 2 shows the connection status of the panel with the secondary server of a server group. See Configuring a Controller Group, on page 179. **unknown:** the topology is inactive (see Activating a Topology, on page 235) or the panel does not have network connectivity to the GV Orbit Server(s). **offline:** the panel does not have network connectivity to the GV Orbit Server(s). **online:** the panel is connected to the GV Orbit Server(s).
Panel Control Port > PanelID	•	Each control panel must have been configured with a unique Panel ID number. Enter the Panel ID that corresponds with the physical panel that is to be used with this panel instance.

a. This parameter must be configured in order for the panel to become functional.

5 In the hardware or software panel, ensure you have configured the Panel ID number and the Controller 1 IP address. For a software panel, set **Connect**.

When the panel is online, you can control GV Orbit Control from the panel.
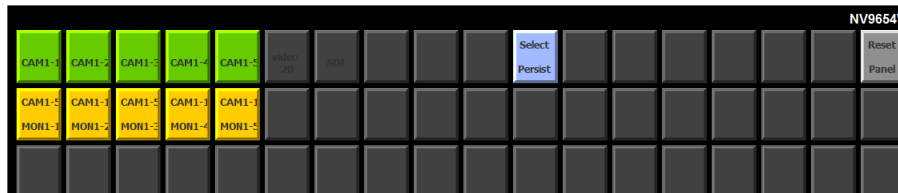
You can view the health of the panel in the System Status task. See System Status Task, on page 457.
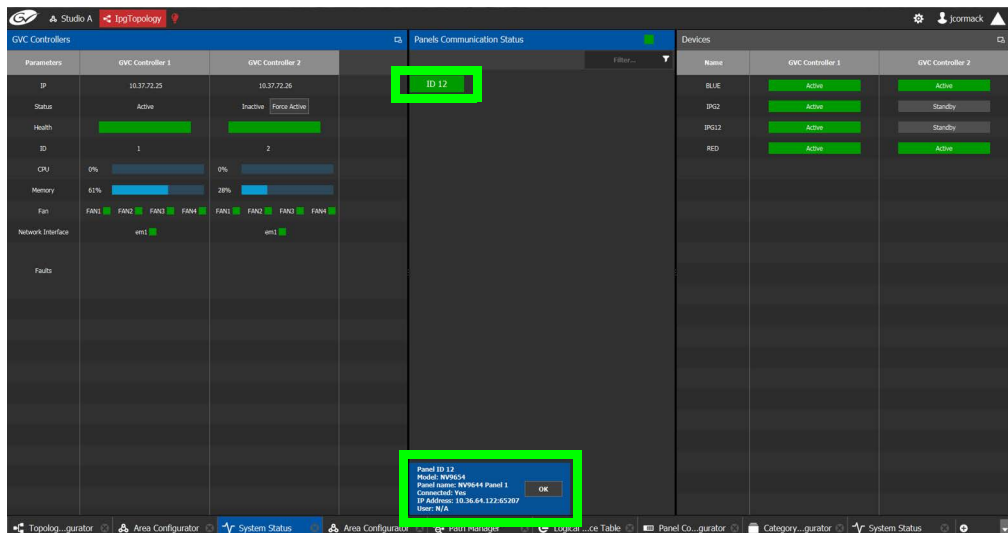
The green bar indicates the health of the panel is good.

6 Click the Panel ID at the top of Panel Communication Status column to view data on the panel. This appears at the bottom of the interface.

Panel Configuration Example Using Categories with Custom Navigation

This panel configuration example shows how to:

- Set panel navigation when using categories.
- Generally configure a panel.

For this example, the following panel page structure is used. The goal of this example is to teach you how to configure the panel so that the panel user has a work flow with the least number of panel navigation button presses (that is, the need to use *exit*, *return*, or *home* button presses has been minimized).
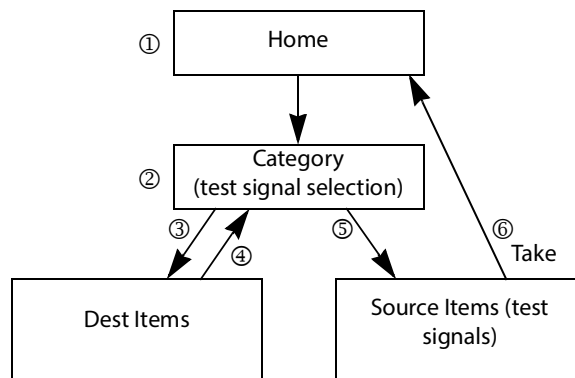
Panel Page Structure and Panel User Navigation Steps for this Example

The following steps outline panel navigation button presses used for this example. See the circled numbers in the above diagram.

Step	Panel User Button Press	Description
1	Category	On the panel's **Home** page is: • Is a range of sources and destinations, plus a Take button for normal routing activities. • A **Category** button (test signal selection) that allows the panel user to route a test signal to a destination using categories.
2	Dest Items	On the panel's **Category** page (test signal selection) are **Dest Items** and **Source Signals** buttons (test signals). The panel user presses **Dest Items**.
3	Select a destination	A selection of five destination category items are shown in the **Dest Items** page. The panel user presses a button to select a destination to which a test signal will be sent. The panel user is returned to the panel's **Category** page.
4	Source Items	On the panel's **Category** page (test signal selection) are **Dest Items** and **Source Signals** buttons (test signals). The panel user presses **Source Items**.
5	Select a source and then Take	A selection of five source category items (test signals) are shown in the **Source Items** page. The panel user presses a button to select a source (test signal)and then presses **TAKE**.
6	–	Once the Take is made in the **Source Items** page, the panel's configuration navigates the panel user to the **Home** page where the panel user is ready to continue with other operations.

About panel user navigation in this example

Note that no *up*, *home*, or *return* navigation buttons are used in this example. In practice, a panel's configuration should include navigation buttons as an answer to when a panel user changes their mind and no longer wants to commit to an action. In this example, a panel user must complete the action once started; there is no escape function to exit the above procedure part way through. This is solved by adding a *Load Page* action to a panel button and configuring the action to take the panel user to the **Home** Page for example. See Adding Actions to a Panel, on page 284.

To configure this example

Proceed as follows.

1 Create the following topology that is used for this example.
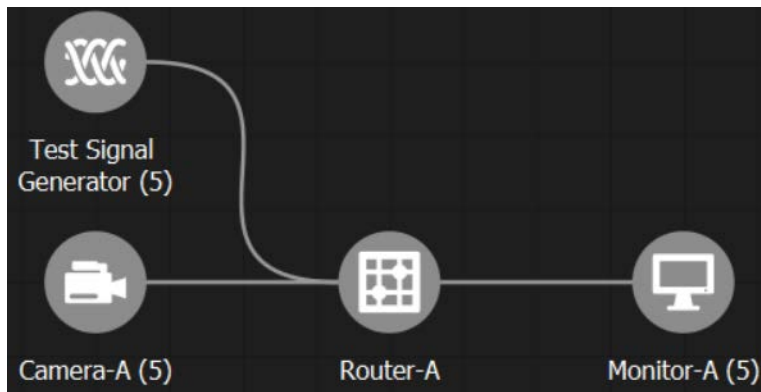
Add to the Topology Configurator the following device groups: 5 Test Signal Generators, 5 cameras, 5 monitors. Then add a router with 10 inputs and 5 outputs to the Topology Configurator. See Adding Devices to a Topology, on page 204 and To name a device and set the number of devices in the group, on page 205.

2 Click Quick Connect to link the devices together. See Using Quick Connect to Link all Devices in a Topology, on page 222.

3 In the Category Configurator, Create the categories you will use with the panel. See Creating Categories for the Sources and Destinations in Your Topology, on page 270.

For this example, five test signal sources have been added to the **Source** Category (shown) and five destinations have been added to the **Destination** Category (not shown).
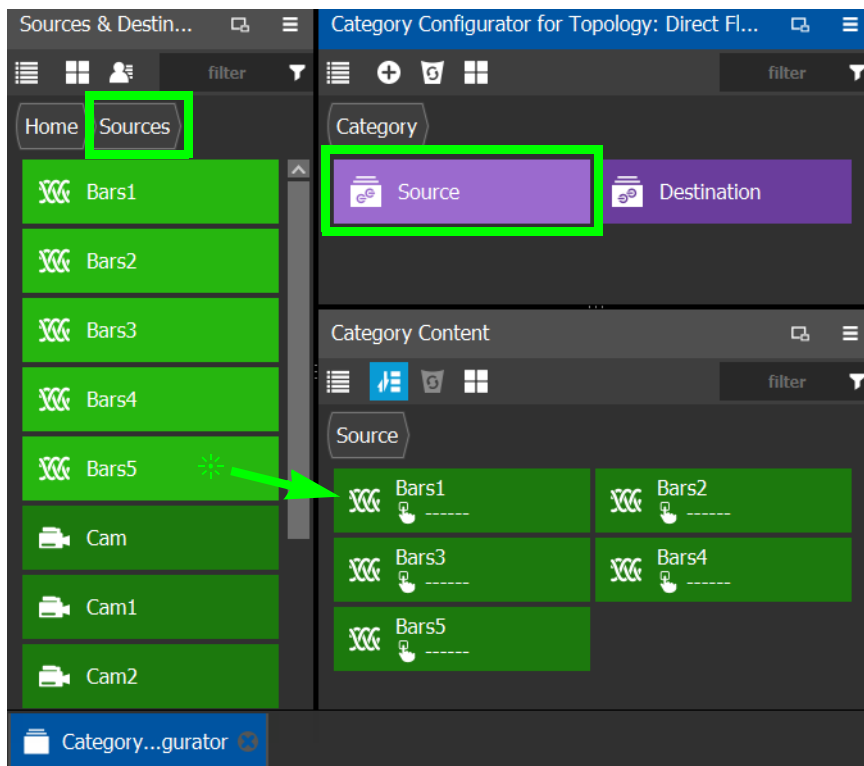
4 Create a panel if you have not already done so. See Creating a New Panel, on page 277.

5 Configure the panel's properties. See Configuring a Panel's Properties, on page 281.

6 Add the following pages to the panel: **Category**, **Source Items**, and **Dest Items**. See
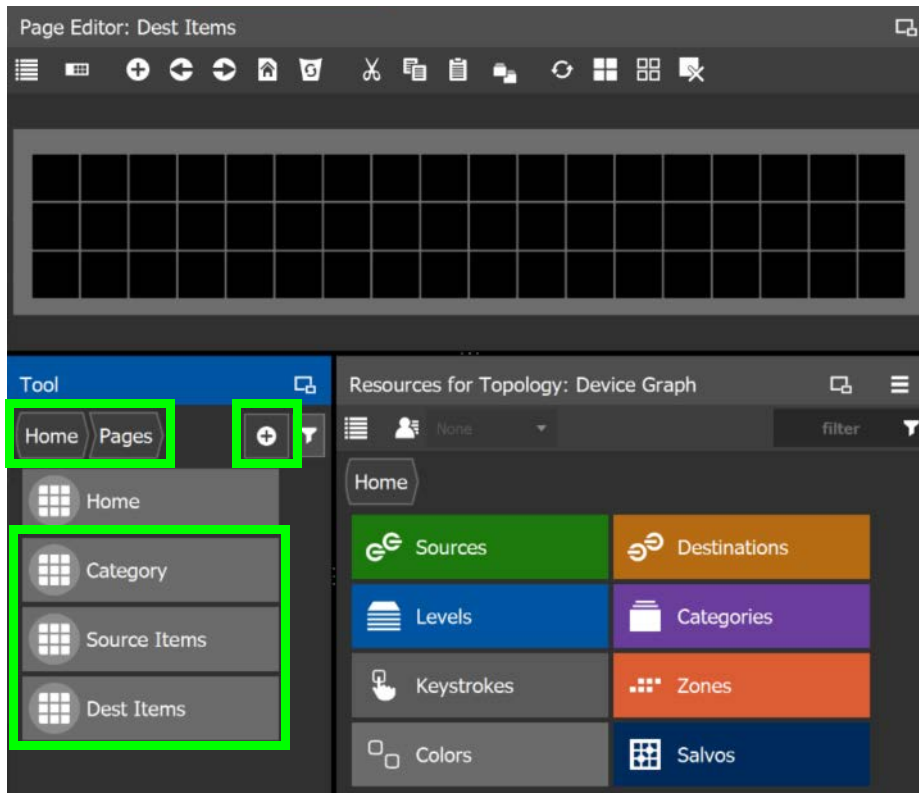
These are the pages between which the panel user will navigate according to the configuration parameters you set in the Panel's configuration, shown in later steps in this procedure.

7 On the **Home** page, add a **Load Page** from the **Built-In** Tool to a panel button. See
Adding Actions to a Panel, on page 284.
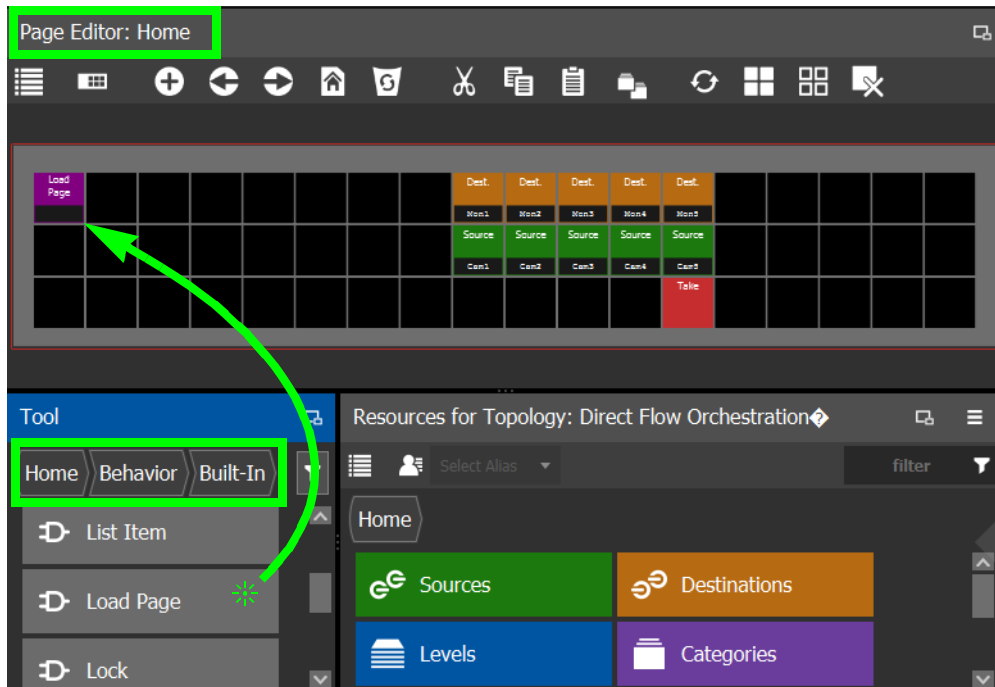
8 On the **Home** page, select the **Load Page** panel button and set the **Page** property
parameter to **Category**. With this setting, when the panel user presses this button, they
will be shown the **Category** page.
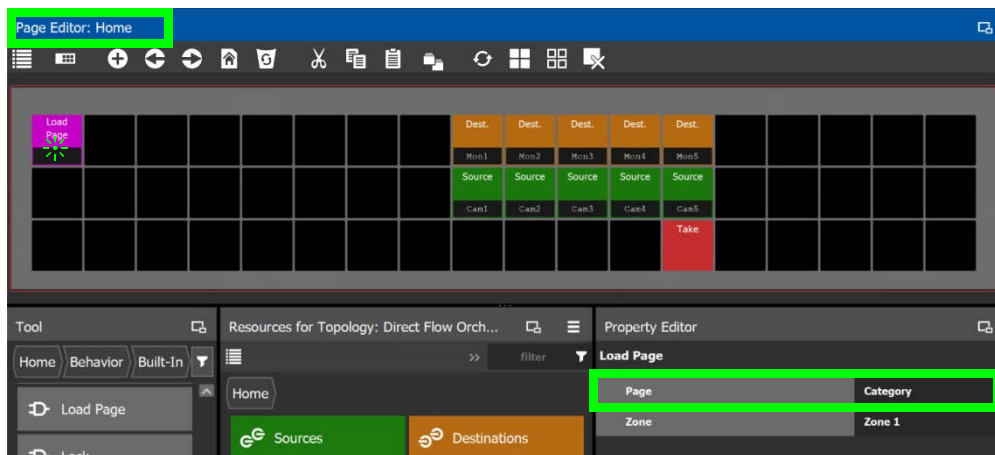
9   On the **Category** page, add the **Destination** Category to a panel button. See Adding Resources to the Panel, on page 287.
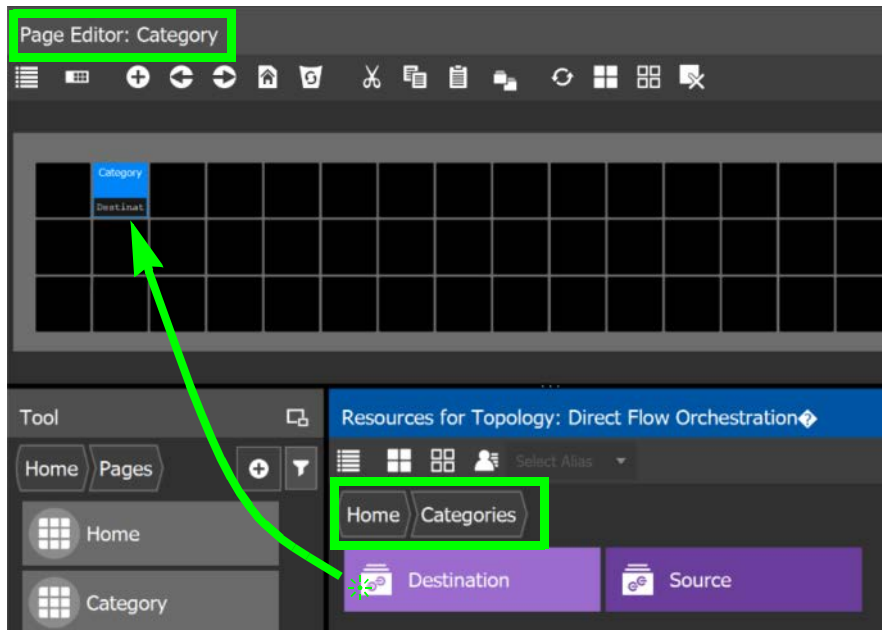
10   On the **Category** page, add the **Source** Category to a panel button. See Adding Resources to the Panel, on page 287.
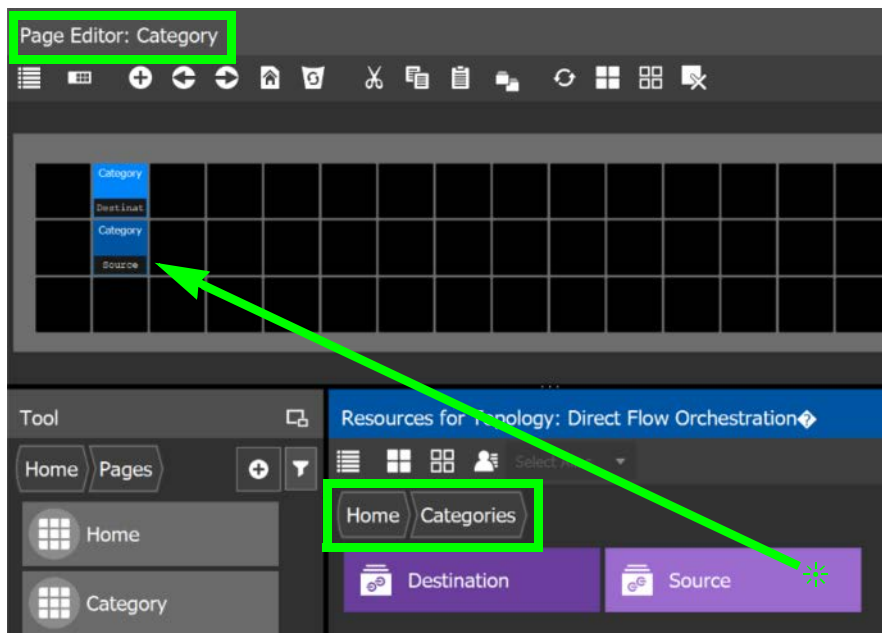
11 On the **Category** page, select the **Destination** Category panel button and set the **Exit Mode**, **Exit Page**, and **Page** property parameters.

The following configuration parameter explanation should be interpreted within the context of this example procedure.

Parameter	Description
Category	This should show **Destination** for this step.
Exit Mode	Select how the panel user will be returned once they have made a category item selection or Take. In this example, set this to **Preset**. With this option, the panel behavior is to take the panel user to the **Category** page immediately once they have pressed a destination category in the **Dest Items** page.
Exit Page	In this example, this is set to [blank]. The **Exit Page** feature is unused.
Page	For the **Destination** category, set to **Dest Items**. With this setting, when the panel user presses this panel button on the **Category** page, they will be shown the **Dest Items** page where the panel user is able to select a destination item.

See also Adding Resources to the Panel, on page 287 and Setting the Properties for Panel Resources, on page 292 for more information about the remaining properties.

12 On the **Category** page, select the **Source** Category panel button and set the **Exit Mode**, **Exit Page**, and **Page** property parameters.

The following configuration parameter explanation should be interpreted within the context of this example procedure.

Parameter	Description
Category	This should show **Source** for this step.
Exit Mode	Select how the panel user will be returned once they have made a category item selection or Take. In this example, set this to **Take**. With this option, the panel user has to select a source category and then press the Take button.
Exit Page	In conjunction with the **Exit Mode** parameter, this parameter changes the **Take** return navigation to any other panel page. In this example, set this to **Home**; the panel behavior is to take the panel user to the **Home** page immediately once they have pressed the category item selection and then the Take button in the **Source Items** page.
Page	For the **Source** category, set to **Source Items**. With this setting, when the panel user presses this panel button on the **Category** page, they will be shown the **Source Items** page where the panel user is then able to select a source item and then clicks Take.

13 On the **Dest Items** page, add five **List Item** from **Built-In** to five panel buttons. This corresponds to one **List Item** for each of the five sources.
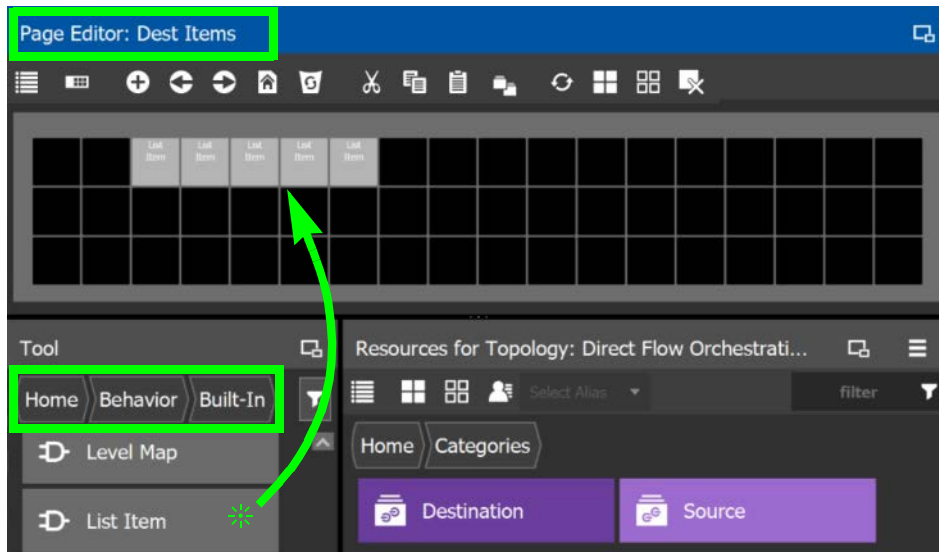
Note: You can use copy and paste a block of **List Item** on the panel to quickly create a large number of sources or destinations.

14 On the **Source Items** page, add five **List Item** from **Built-In** to five panel buttons. This corresponds to one **List Item** for each of the five sources. See Adding Resources to the Panel, on page 287.
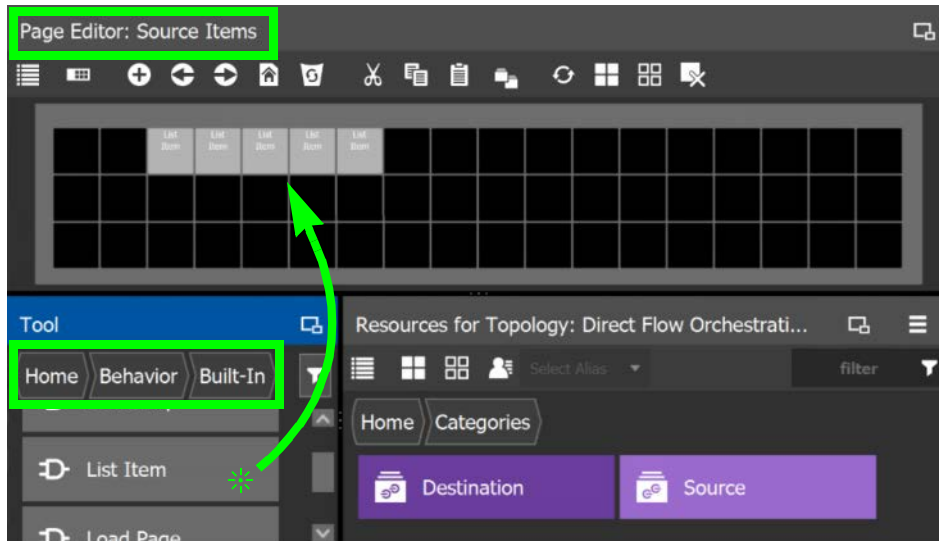
15 On the **Source Items** page, add a **Take** button.
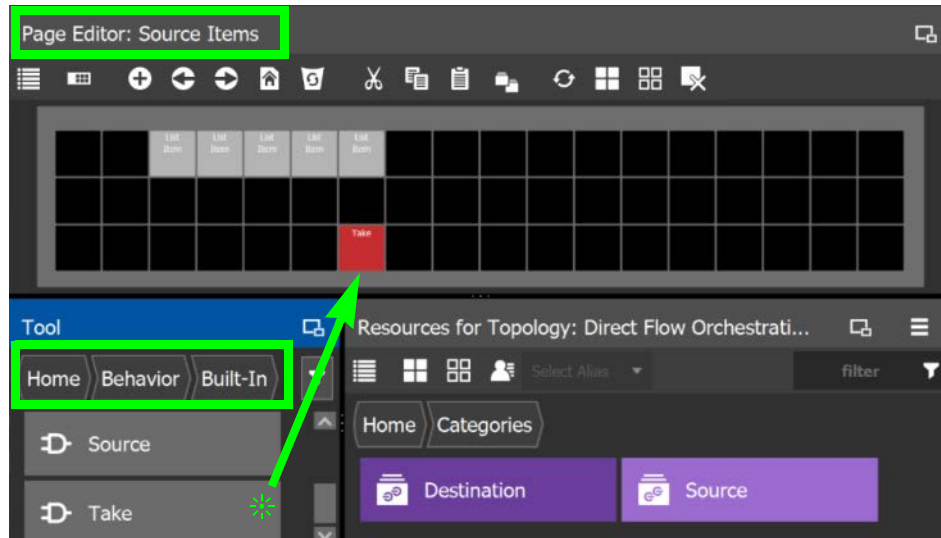
16 Add a panel device to the topology and configure the panel and its control port properties. See Adding the New Panel to the Topology, on page 299.

Note: The panel device bubble on the Topology Configurator does not need to be linked to any other bubble.

17 In the Topology Configurator, activate the topology. See Activating a Topology, on page 235.

18 Test the panel's behavior. Change the **Exit Page** and **Exit Mode** property parameters for the **Source** and **Destination** buttons on the **Category** page to see how the navigation behavior changes.

19 Add load page buttons that will allow the panel user to return to the Home page, to each of the following pages: **Category**, **Source Items**, and **Dest Items**. See also Adding Resources to the Panel, on page 287 and Setting the Properties for Panel Resources, on page 292 for more information.

This step is necessary because when the changing the **Exit Page** and **Exit Mode** property parameters for the **Source** and **Destination** buttons on the **Category** page, the panel user might wind up in a page without a way to exit out of it. Once testing is complete, and navigation is perfected, these buttons can be removed.

GPIO Configurator Tasks

Tally devices you connect to the panel's inputs can trigger events in the router control system such as a salvo or it can route a source to a destination.

In reaction to pressing a panel button, to a GPI input, or to a XPT status, the router control system can trigger events through the panel's relay outputs to switch your tally devices.

SUPPORTED PANELS: the following panels that support GPIO; NV9605, NV9606, NV9607, NV9609, NV9646, NV9649 (configured as a NV9609 panel model), NV9640, and NV9642.

Soft panels are available with GPIO controls that allow you to test and debug your GPIO configuration before putting a panel into production.
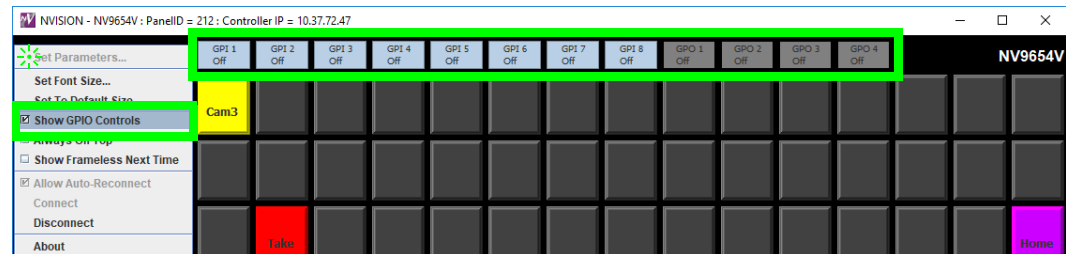
PREREQUISITES: The following must have been configured:

- a Topology (Topology Configurator Tasks, on page 199) including:
  - Panel Configuration: see Panel Configurator Tasks, on page 275
  - Sources and destinations: see Methods to Link Devices in a Topology, on page 222.
- a router: see Configuring Router Devices, on page 422

Accessing the GPIO Configurator

To access the GPIO Configurator Task

1 Open GV Orbit Control Stage. See Navigating Back to Stage, on page 170.

2 Select an area. See Selecting an Area, on page 183.

3 Select a topology. See Selecting a Graph, on page 184.

4 Create and configure a Panel. See Creating a New Panel, on page 277, Configuring a Panel's Properties, on page 281, Adding Actions to a Panel, on page 284, and Adding Resources to the Panel, on page 287.

5 If a salvo is to be triggered by a GPI, create one or more salvos. See Creating Salvos, on page 474.

6 If aliases are to be used, create them. See Adding Aliases, on page 467.

7 Add a panel to the topology. See Adding the New Panel to the Topology, on page 299.

8 Select **Configuration** > **GPIO Configurator**.
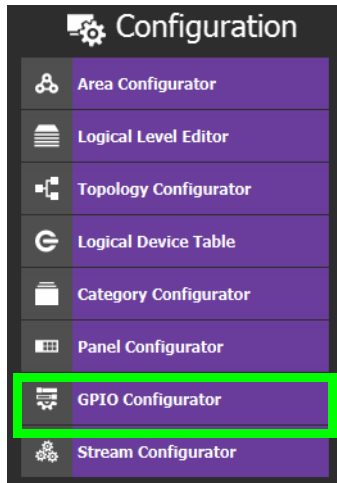
The GPIO Configurator task appears:
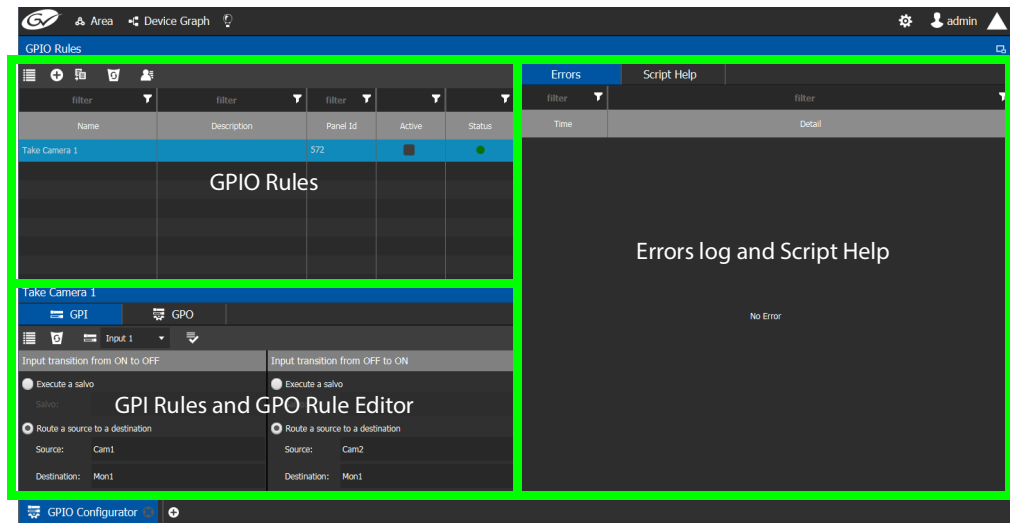
The GPIO Configurator has the following main sections shown above:

- GPIO Rules
- GPI Rules and GPO Rule Editor
- Errors log and Script Help

GPIO Rules Menu

The GPIO rules menu has the following menu options.

Icon	Description
New	Create a new rule in the rules list. See Adding a GPIO Rule, on page 314.
Duplicate	Make a copy of the currently-selected rule. See Duplicating a Rule, on page 320.

Icon	Description
Delete	Remove the currently-selected rule. See Deleting a Rule, on page 321.
Alias	Select the Alias to use for all rules. See Choosing an Alias for all Rules, on page 321.

GPI / GPO Rule Editor Menu

The GPIO rule editor has the following menu options.

Icon	Description
Delete	Remove the configuration for this rule.
Select GPI	Select the GPI input to be configured. See Configuring a GPI to Trigger an Event, on page 315.
Select GPO	Select the GPO output to be configured. See Configuring a Script to Trigger a GPO, on page 317.
Validate	Verifies if the rule is valid

Adding a GPIO Rule

Create one or more rules to control your tallies. Rules can be enabled and disabled as needed.

Note:

It is possible to create two or more rules can that act upon the same GPO, thereby creating a conflict. No error or warning will be flagged in this case. When two or more rules conflict, you must deactivate rule(s) such that only one rule controls a GPO at a time. See Activating / Deactivating a Rule, on page 320.

To add a rule

1 Click **New** ⊕.
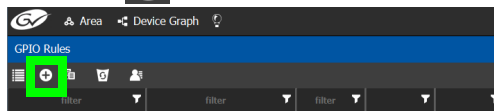
2 Enter meaningful text in the **Name** and **Description** fields to identify the rule.
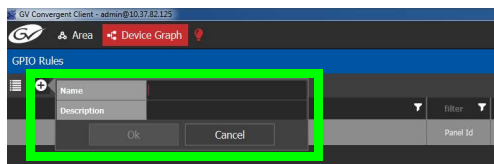
3 For the new row, click the cell for the Panel ID column.
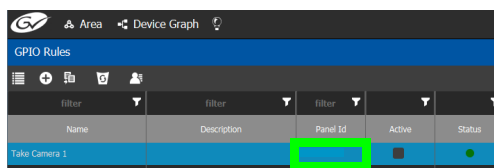
The **Panel Selector** window appears showing the panels that have been previously configured. See Panel Configurator Tasks, on page 275.

4 Select the panel which has GPIO connections made to it that you want to configure.
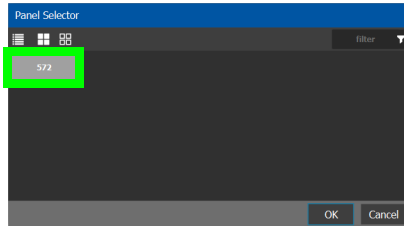
5 Click **OK**.

The Panel Id is shown for the GPIO rule and the Status is green.
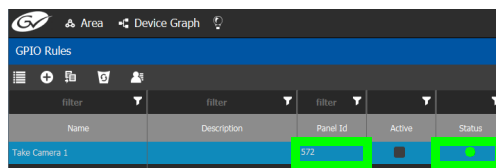
Configuring a GPI to Trigger an Event

Tally inputs (called GPIs) can be configured to trigger an event when the input transitions from OFF to ON and to trigger another event on a transition from ON to OFF. Events include:

- Execute a salvo. The salvo must have been previously created. See Creating Salvos, on page 474.
- Route a source to a destination. The source and destination must have been previously created. See Logical Device Table Tasks, on page 241.
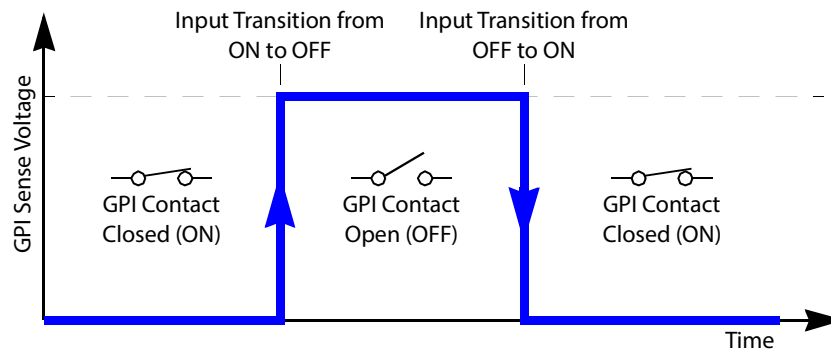
Separate actions are triggered depending on whether the transition is from ON to OFF or the transition is OFF to ON as shown above.
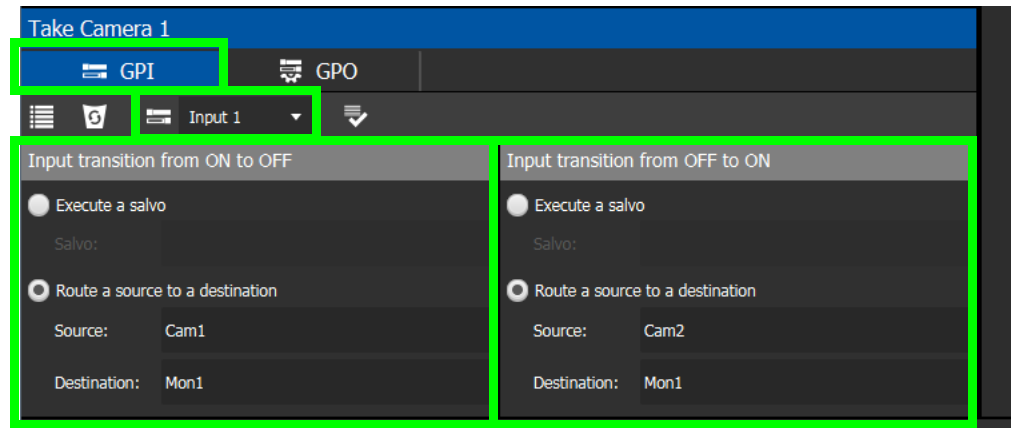
To configure a GPI state transition to route a source to a destination or trigger a salvo

1   Add a Rule if necessary. See To add a rule, on page 314. Select the rule you want to configure. Ensure the rule is de-activated.
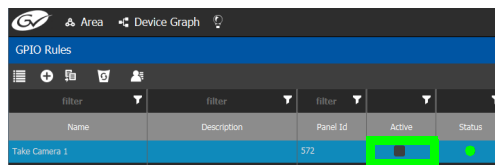
2   Click the GPI tab.

3   Select the panel's GPI input to be used as a trigger.

4   Select the action to execute when this input transitions from ON to OFF:

   • **Execute a salvo:** select the salvo to be executed from the list.

   • **Route a source to a destination:** select a source and a destination from the lists.

5   Select the action to execute when this input transitions from OFF to ON:

   • **Execute a salvo:** select the salvo to be executed from the list.

   • **Route a source to a destination:** select a source and a destination from the lists.

6   Repeat for the remaining GPI inputs to be used as a trigger for an action.

7   Click **Validate** to check the syntax and semantics with respect to the current configuration and it then saves the script.

8   Activate the rule. See To activate a rule, on page 320.

Configuring a Script to Trigger a GPO

Relay outputs can be configured to activate on a number of Boolean true or false conditions that form a script:

- One or more routes occurring on specific levels.
- Conditions involving output ports (destination, level).
- A transition on one or more of the panel's tally inputs.
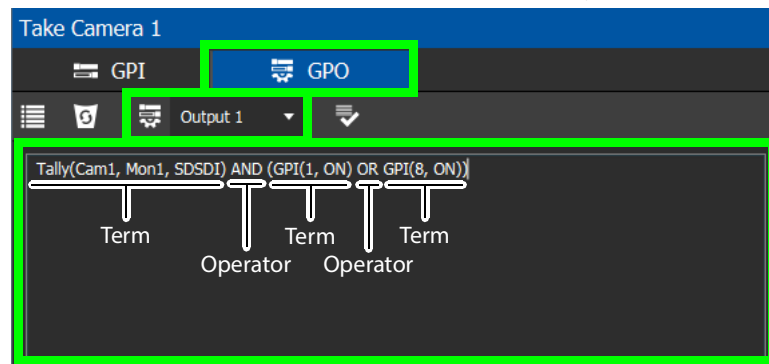
In this dialog, you create a Boolean script involving sources, destinations, port status, and GPI (input) status. When the conditions of the entire Boolean script evaluates as true, the relay output closes. When the conditions are not met, the relay output opens. Names of sources, destinations, levels and so on are case sensitive.

Boolean expressions comprise terms and operators. The operators include those shown under the **Script Help** tab. Expressions can be parenthesized to control the order of evaluation. Operator precedence is normally NOT > AND > OR. All parenthesized expressions are evaluated first; expressions in nested parentheses are evaluated before those in outer parentheses.

Function	Description
AND,OR, NOT,()	Logical AND, OR, NOT, and precedence. Note that && (AND), || (OR), ! (NOT) are also supported.
Tally(SRC,DST)	Returns true when the specified source is tallied on the specified destination for the SDI level.
Tally(SRC,DST,Level)	Returns true when the specified source is tallied on the specified destination for the specified level.
Tally(SRC,DST,Levels...)	Returns true when the specified source is tallied on the specified destination for the specified level shuffles. Level shuffle arguments are in pairs.
Locked(DST)	Returns true when the specified destination is locked.
LockReleased(DST)	Returns true when the specified destination is unlocked.
Protected(DST)	Returns true when the specified destination is protected.
ProtectReleased(DST)	Returns true when the specified destination is unprotected.
GPI(GPI#, STATUS)	Returns true when the GPI status is equal to the specified STATUS. STATUS value could be ON or OFF.

For example, the following script is true when Cam1 is tallied on Mon1 for the SDSDI level and GPI1 input is on or GPI8 input is on:

```
Tally(Cam1, Mon1, SDSDI) AND (GPI(1, ON) OR GPI(8, ON))
```

Click a function to see an example script of how to use the function under **Example**.

To configure a script to control GPOs

2   Click the **GPO** tab.

3   Select the panel's GPO output to be used as a trigger.

4 Create a script that when true will close the output relay's contact.

5 Click **Validate** to check the script's syntax.

Any errors are shown in the **Errors** tab. Correct the script as necessary. Click the **Script Help** tab for how to use script arguments.
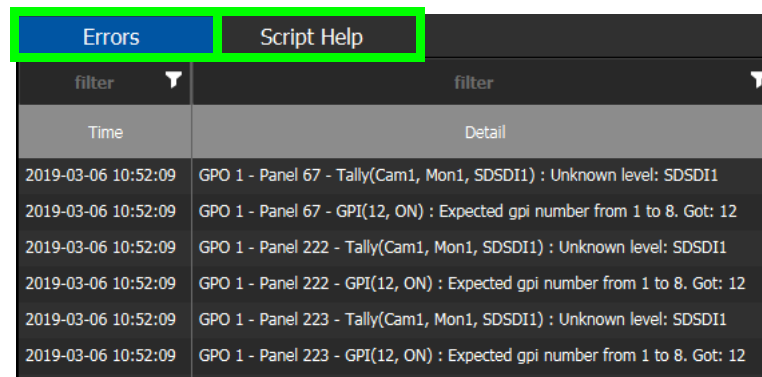
6 Activate the rule. See

Deleting a GPI or GPO Action Configuration

To delete a GPI or GPO action configuration

1 Click the GPI or GPO tab.
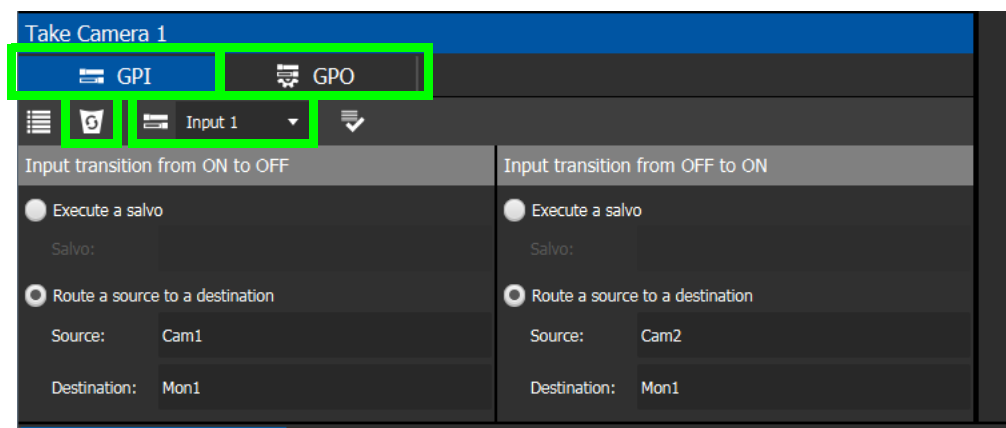
2 Select an **Input** or **Output** to be deleted.

3 Click **Delete**.

Activating / Deactivating a Rule

To activate a rule

1 Set **Active** in the rule's row.
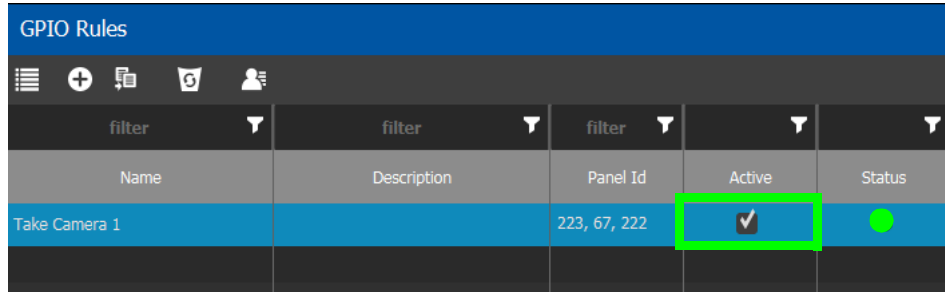
The rule's configuration becomes read only and cannot be modified. The rule's status becomes a green circle to indicate that the rule is valid.

To deactivate a rule

1 Deselect **Active** in the rule's row.

Duplicating a Rule

To duplicate a rule

1 Select the rule to be duplicated.

2 Click **Duplicate** .
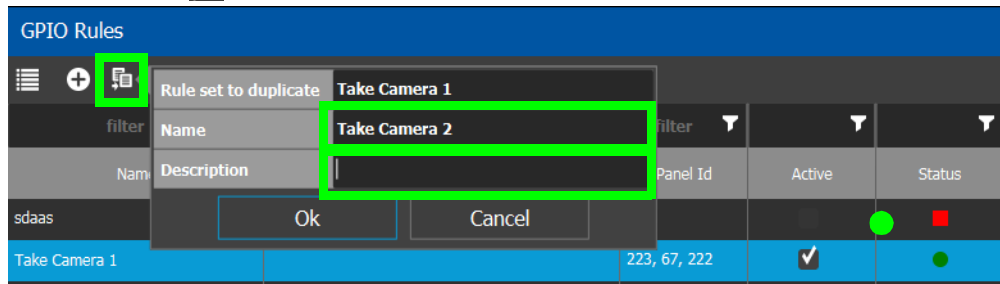
3 Set the name and description of the new rule.

4 Click **OK**.

Deleting a Rule

To delete a rule

1 Select the GPIO rule to be deleted.
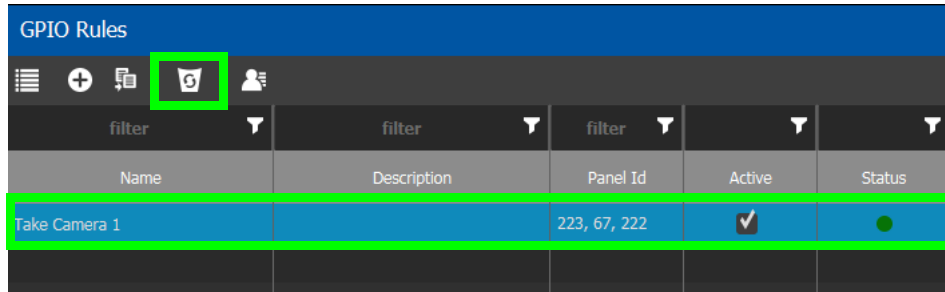
2 Click **Delete** ⟨icon⟩.

Choosing an Alias for all Rules

The source and destination aliases must have been previously created. See Adding Aliases, on page 467. The alias selection applies to all current rules.

To set an alias

1 Click **Alias** ⟨icon⟩.
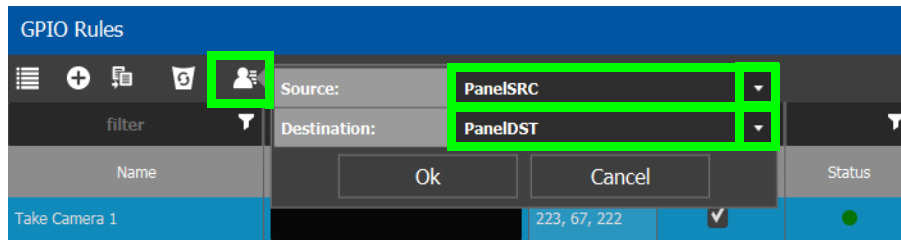
2 Set the **Source** and **Destination** aliases to use for all rules.

3 Click **OK**.

Stream Configurator Tasks

The Stream Configurator task displays all streams in the current topology and allows you to configure on a large scale the following stream parameters:

- Set the stream's Unicast and multicast IP addresses
- Change the stream's SDP template
- Change the stream's logical levels
- Expose or hide streams

This can be done in bulk by selecting multiple rows and using the paste functionality, to set the IP addresses of hundreds of streams in one action. Filters allow you to narrow down the list in order to only show the devices you want to change their IP addresses / port numbers. The list has multiple sort, so you can put the devices in the right order (from top to bottom), thereby allowing you to paste an incremental range of IP addresses. Content can be pasted from a vertical column of Microsoft Excel worksheet cells, or from a text editor where there is one IP address per line.

The Stream Configurator is also useful for troubleshooting: for example, you discover an unexpected IP address is being routed and you want to find the device associated with that IP address. Use the IP address in the filtering at the top of the **Unicast IP** or **Multicast IP** columns in the Stream Configurator to find the device.

PREREQUISITES: The following must have been configured:

- a Topology (Topology Configurator Tasks, on page 199).
- a number of devices on the topology such as a GV Node which has a variety of streams (see Adding Devices to a Topology, on page 204).

Setting the IP address in GV Orbit Control for third-party IP devices are an ideal application for the stream configurator; see Using Quick Config, on page 219 and the example in Setting Port Redundancy for Many Devices at Once, on page 220 to create such devices.

Accessing the Stream Configurator

To access the Stream Configurator Task

1 Open GV Orbit Control Stage. See Navigating Back to Stage, on page 170.

2 Select an area. See Selecting an Area, on page 183.

3 Select a topology. See Selecting a Graph, on page 184.

4 The topology must be currently:

- Activated (see Activating a Topology, on page 235).
- Unlocked (see Unlocking / Relocking a Topology, on page 238).

5 Select **Configuration** > **Stream Configurator**.
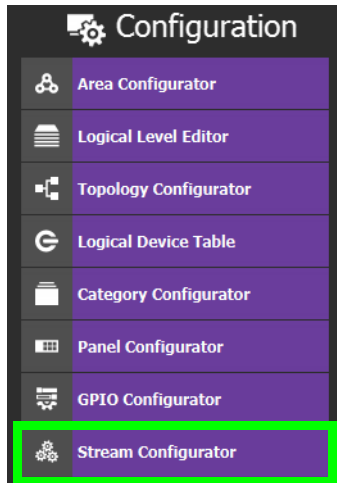
The Stream Configurator task appears:
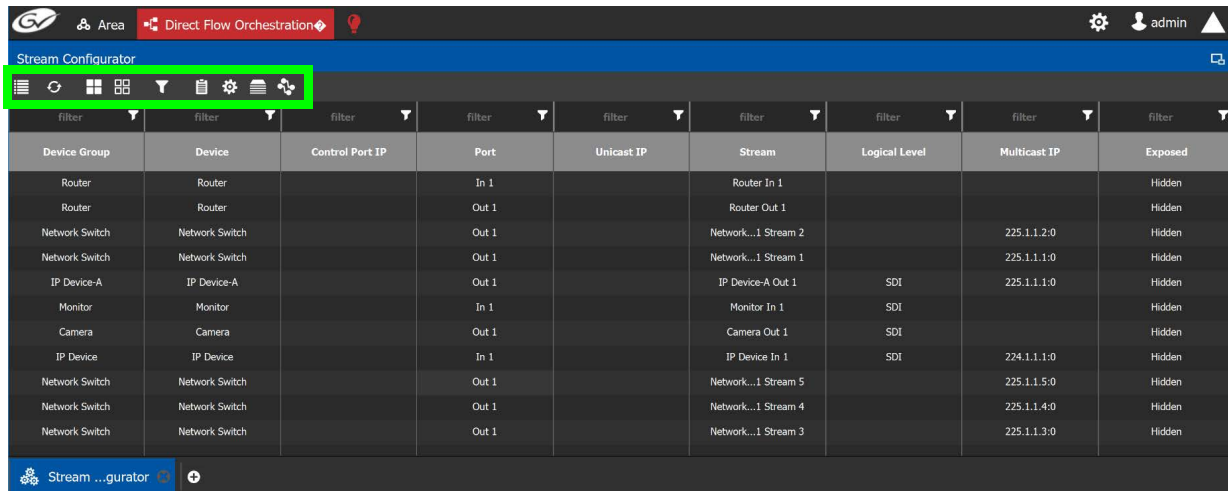
Stream Configurator Menu

The Stream Configurator menu has the following menu options.

Icon	Description
Refresh	Reloads the Stream Configurator's contents. The Stream Configurator's content is static. If you make a configuration change in another task, it will not automatically be reflected in the Stream Configurator.
Select All	Selects all rows in the Stream Configurator.
Clear All	Deselects all rows in the Stream Configurator.
Filters	Filters the list by signal type and direction. See Stream Configurator Filters Tool, on page 325.

Icon	Description
📄 Paste IP addresses	Pastes the clipboard contents to the selected Stream Configurator's column from a Microsoft Excel spreadsheet column or a text editor, where there is one IP address per line. See Pasting Unicast and Multicast IP Addresses from a Microsoft Excel Spreadsheet / Text Editor, on page 326. Certain IP addresses are reserved by GV Orbit Control and cannot be used. Refer to the Release Notes for more information. See Related Documentation, on page 7.
⚙️ Set stream SDP file	Set the SDP pattern for streams. See Setting SDP Templates for one or more Streams, on page 327.
▤ Set stream level	Sets the logical level of one or more selected streams. This shows the Logical Level Selector. Select a logical level and click **OK** to change the level of all selected streams to the new logical level. For more information about logical levels, see Logical Level Editor Tasks, on page 190.
🔀 Expose or hide streams	Sets to expose or hide streams of one or more selected streams. Only certain devices support this property. When Expose Stream is set, it displays the streams for this device in the Logical Device Table. See Logical Device Table Tasks, on page 241.
filter ▼ Filter	Row filters can be applied to each column by typing text in the filter boxes to filter the list according to a column's content. The combination of all applied filters means that a row must match all filter values in order to be displayed. See Filtering the Stream Configurator List, on page 325. See also Filtering Lists, Table Columns, Sources, and Destinations, on page 266.

Stream Configurator Filters Tool

A filter button is available in the toolbar for you to show or hide signal types (SDI, IP, MADI) or signal direction (Input/Rx and Output/Tx streams).
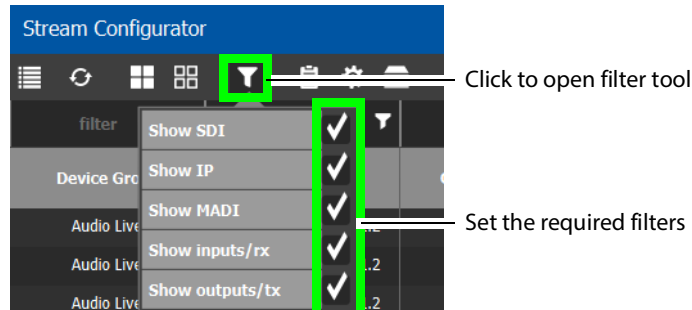
Icon	Description
Show SDI	Show results where the connection type is SDI.
Show IP	Show results where the connection type is IP.
Show MADI	Show results where the connection type is MADI.
Show inputs / rx	Show results where the connection direction is an input.
Show outputs / tx	Show results where the connection direction is an output.

Pasting IP addresses from a Microsoft Excel worksheet into the Stream Configurator

In order to paste a vertical column of worksheet cells of an ordered list of IP addresses you have created in Microsoft Excel, you must first prepare the Stream Configurator by:

1 Filtering the table to only show the devices, inputs / outputs, signal type, logical levels, for which you are going to update their IP addresses. Filters allow you to narrow down the Stream Configurator list in order to only show the devices of interest.

2 Sorting the filtered list such that the devices are in the same order as the vertical column of worksheet cells you have created in Microsoft Excel.

3 Paste a vertical column of worksheet cells you have created in Microsoft Excel into either the Unicast IP or Multicast IP columns of the Stream Configurator.

Certain IP addresses are reserved by GV Orbit Control and cannot be used. Refer to the Release Notes for more information. See Related Documentation, on page 7.

Filtering the Stream Configurator List

First, filter the Stream Configurator's contents to create a list of only the devices that are of interest; those devices you want to update their IP addresses.

Filtering can be done by combining the following methods:

- Use the Filters tool to show or hide signal types (SDI, IP, MADI) or signal direction (Input/Rx and Output/Tx streams). See Stream Configurator Filters Tool, on page 325.
- Enter text into the row filters found at the top of each column by typing text in the filter boxes to filter the list according to a column's content. The combination of all applied filters means that a row must match all filter values in order to be displayed. See Filtering Lists, Table Columns, Sources, and Destinations, on page 266.

filter	filter	filter	filter	filter	filter	filter	filter
Device Group	Device	Control Port IP	Port	Unicast IP	Stream	Logical Level	Multicast IP
Audio Live	Audio Live 191.13.11.2		Eth In 1	191.13.11.2	Audio Live...1 Stream 1	AES67-64	236.1.1.1:0
Audio Live	Audio Live 191.13.11.2		Eth In 1	191.13.11.2	Audio Live...1 Stream 2	AES67-64	225.2.1.1:0

Sorting the Stream Configurator List

Once the Stream Configurator's contents have been filtered, then sort the filtered list.

The list has multiple sort, so you can put the devices in the right order (from top to bottom), thereby allowing you to paste an incremental range of IP addresses. Content can be pasted from a vertical column of Microsoft Excel worksheet cells, or from a text editor where there is one IP address per line.

Each column can be sorted by clicking the header text. Multiple sort can be applied by <Shift> + clicking the headers. Bullets and numbers will appear next to the sort arrow indicating the column's sort priority. An up arrow is ascending sort, and a down arrow is a descending sort.

filter	filter	filter	filter	filter	filter	filter	filter
Device Group	Device	Control Port IP	Port	Unicast IP	Stream	Logical Level	Multicast IP
Audio Live	Audio Live 191.13.11.2		Eth In 1	191.13.11.2	Audio Live...1 Stream 1	AES67-64	236.1.1.1:0
Audio Live	Audio Live 191.13.11.2		Eth In 1	191.13.11.2	Audio Live...1 Stream 2	AES67-64	225.2.1.1:0

First sort priority (one bullet)   Second sort priority (two bullets)   Third sort priority (three bullets)   Fourth sort priority   Fifth sort priority   • • •   Eighth sort priority

Pasting Unicast and Multicast IP Addresses from a Microsoft Excel Spreadsheet / Text Editor

Unicast and Multicast IP address values can be bulk pasted into the Stream Configurator from a Microsoft Excel spreadsheet column by using copy/paste.

- Multicast IPs are formed with the following semi-colon separated concatenated format: **[IPv4 Address]:[Port Number]**. For example, the text to be pasted for a multicast address should look like **231.102.30.13:5004**

  If you paste an IPv4 address without a port number into the **Multicast IP** column, only the IP address will be updated and the current port number will be left intact.
- Unicast IPs are a basic IP address without a port number.

To paste Unicast or Multicast IP Addresses

1 Select a column with IP addresses from a Microsoft Excel spreadsheet and copy them.

2 Select the rows in the Stream Configurator that contain the streams to be changed. See Selecting Stream Configurator Rows, on page 329.

3 Click the paste ▤ button in the Stream Configurator toolbar. Choose whether to apply the paste to Unicast or Multicast IP addresses. The paste is made starting from top-to-bottom of the selected rows.

> Note: All pasted IP addresses are validated and if any one address is invalid, the entire paste is canceled and nothing happens.
>
> Certain IP addresses are reserved by GV Orbit Control and cannot be used. Refer to the Release Notes for more information. See Related Documentation, on page 19.

Editing Unicast and Multicast IP Addresses

Cells in the Unicast IP column can be double-clicked in oder to edit their contents. These cells will only accept valid IPv4 addresses.

Cells in the Multicast IP column can also be double-clicked in oder to edit their contents. These cells only accept valid IPv4 addresses and a port number separated by a colon (:). For example **231.102.30.13:1080**.

Setting SDP Templates for one or more Streams

Not all devices are NMOS compliant, however with the use of SDP parameters, GV Orbit Control may be able to make a take of a stream from a non-NMOS Device to an NMOS Device. GV Orbit Control can intuit some SDP parameters while other parameters will have to be provided by you. For more information about how to form an SDP template, see Using SDP Parameters to Take a Stream from a non-NMOS Device to an NMOS Device, on page 385.

You can set the SDP templates for one or more streams as follows.

1 If necessary, filter and sort the Stream Configurator list to only show the devices, inputs / outputs, signal type, logical levels, for which you are going to update their SDP templates. Filters allow you to narrow down the Stream Configurator list in order to only show the devices of interest. See Filtering the Stream Configurator List, on page 325 and Sorting the Stream Configurator List, on page 326.

2 Select the rows in the Stream Configurator that contain the streams to be changed. See Selecting Stream Configurator Rows, on page 329.

3 Click the cogwheel ⚙ icon. The SDP template text for the last selected stream in the table is shown in a pop-up.

If the last selected stream type is SDI or a receiver, the SDP template text area will be blank.

4 Type in or paste the SDP template text into the pop-up text area and click **OK**. See Using SDP Parameters to Take a Stream from a non-NMOS Device to an NMOS Device, on page 385.

> Note: The SDP text you enter is not validated by GV Orbit Control. The SDP is directly applied to IP streams only. All other stream types are ignored.

All selected streams will be updated with the new SDP template.

GV Orbit Control SDP Variables that can be used with Third-Party Devices

The following table lists whether the GV Orbit Control SDP variables are supported when used with third-party devices. Any unsupported SDP variable must be replaced by a hard coded value that represents the third-party device's static property value.

GV Orbit Control SDP Variable	Supported with third-party-devices	Description
`${audioBits}`		The audio stream's bit depth.
`${channelCount}`		The number of (audio) channels.
`${clockSetting}`		The PTP master clock setting.
`${sequence}`		This SDP file's ID.
`${packetTime}`		The length of time in milliseconds represented by the (audio) media in a packet.
`${portIpAddress}`	•	The sending port's IP address. The source for this variable comes from the Port's **IP Address** parameter for this stream.
`${streamIpAddress}`	•	The transmit (sending) stream's multicast IP address. The source for this variable comes from the stream's **IP Address** parameter.
`${streamPortNumber}`	•	The transmit (sending) stream's IP port number. The source for this variable comes from the stream's **IP Port** parameter.
`${redundantIpAddress}`	•	The transmit (sending) stream's redundant multicast IP address. The source for this variable comes from the stream's **IP Address** parameter used for the redundancy port. See the **Redundancy Port** parameter to identify the current redundancy port.
`${redundantPortNumber}`	•	The transmit (sending) stream's redundant IP port number. The source for this variable comes from the stream's **IP Port** parameter used for the redundancy port. See the **Redundancy Port** parameter to identify the current redundancy port.

GV Orbit Control SDP Variable	Supported with third-party-devices	Description
`${redundantPortIpAddress}`	•	The transmit (sending) stream's redundant IP port number. The source for this variable comes from the stream's **IP Address** parameter used for the redundancy port. See the **Redundancy Port** parameter to identify the current redundancy port.
`${rtpPayloadType}`		The RTP payload type as defined by the SDP specification.
`${samplingRate}`		The audio stream's sampling rate.

Selecting Stream Configurator Rows

Stream Configurator rows can be selected as follows:

- All current rows can be selected by clicking **Select All** from the Stream Configurator's menu. See Stream Configurator Menu, on page 323.
- Select one or more streams in the Stream Browser using <Ctrl> + click.
- Select a range of streams in the Stream Browser by selecting the first stream and then <Shift> + click the last stream in the range.

Special Device Configuration Tasks

The configuration of certain features for a specific device require an in depth explanation which is provided here.

Special Devices

These special device are described under the following headings:

Description of Common Device Properties

The description for certain device properties are universal.

Parameter	Description
# Input Connectors	The number of physical input port connections made to the device. This shows the current status for information purposes.
# Output Connectors	The number of physical output port connections made to the device. This shows the current status for information purposes.
# Streams Per Input	The typical number of streams available on each physical input connection. This shows the current status for information purposes.
# Streams Per Output	The typical number of streams available on each physical output connection. This shows the current status for information purposes.
# Streams	The actual number of streams available on the selected physical input / output connection. This shows the current status for information purposes.
Automatic Destination Automatic Destinations on Inputs Automatic Destinations on Outputs	Set to automatically create a destination by the system for the specified streams. See also About Automatic Sources or Destinations, on page 246.
Automatic Source Automatic Sources on Outputs Automatic Sources on Inputs	Set to automatically create a source by the system for the specified streams. See also About Automatic Sources or Destinations, on page 246.
Description	An optional description for the related input, output, or device.
Enabled	This shows the current status for information purposes.
Expose Streams	When set, it displays the streams for this device in the Logical Device Table. See Logical Device Table Tasks, on page 241. Quick Config can be used to set or clear this parameter; see Using Quick Config, on page 219.
Logical Level	The logical level for this input or output. See Logical Level Editor Tasks, on page 190.
Name	The name or identifier for this device instance. The name or identifier for this input or output port.
Short Name	The nickname by which the input, output, or device is referred to everywhere in the system.
SSM Address Enabled	Shows if the source specific multicast address is enabled.
SDP	See Using SDP Parameters to Take a Stream from a non-NMOS Device to an NMOS Device, on page 385.

Configuring a GV Node Device

To configure a GV node Device

1 Add the **GV Node** device to the Topology: from the **Device Library**, **Virtual Device**, find the **GV Node** device bubble. See Adding a Virtual Device to a topology, on page 204.
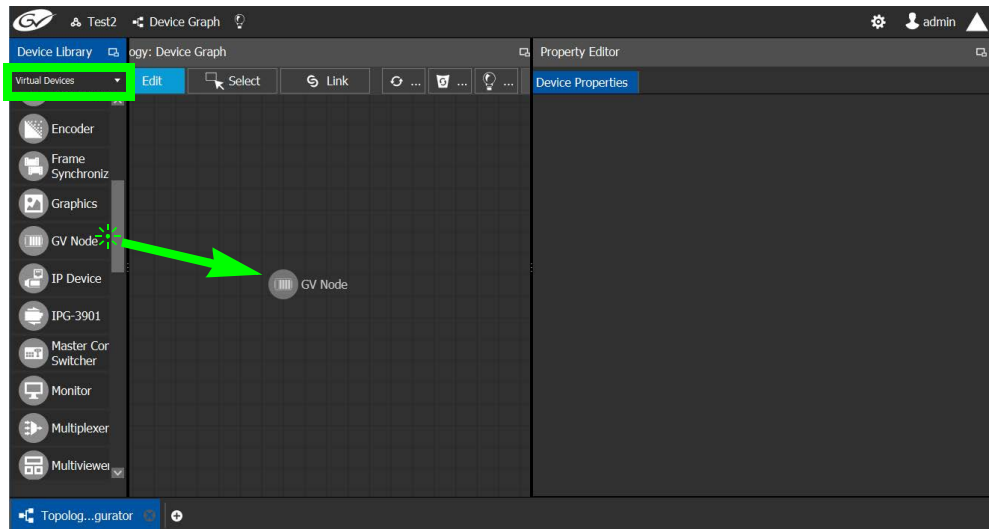
2 Select the **GV Node** bubble and configure the Device Properties in the **Property Editor**. See Defining Device Properties, on page 229 for more information.
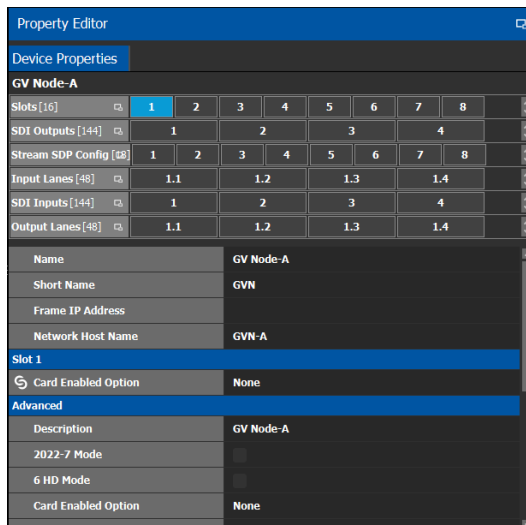
See also Description of Common Device Properties, on page 332.

Parameter	Description
Frame IP Address	The network IP address for the associated GV Node frame.
Network Host Name	The hostname is the unique name by which the associated GV Node CPU-ETH3 is known on the network.
Advanced > Description	An optional description for this GV Node's control port.

Parameter	Description
Advanced > 2022-7 Mode	When the IFM-2T-OPT-40G-6 option is active, you can choose to enable SMPTE ST 2022-7 Low Latency redundant, high-bit-rate streams on the aggregation ports, using the GV Node manager. If this option has been enabled in the GV Node Manager, then enable it here.
Advanced > 6 HD Mode	This no redundancy, low bitrate option reduces each channel from 3Gbps to 1.5Gbps, allowing all 144 channels to be sent on aggregation ports 1-6, and leaving aggregation ports 7-12 unused. If this option has been enabled in the GV Node Manager, then enable it here.
Advanced > Card Enabled Option	This option controls audio embedding / de-embedding. For example, the XIO-4901 3G/HD/SD SDI input/output card supports audio embedding/de-embedding, as a software option (MDX): **MDX:** The GV Node Manager allows you to enable or disable audio embedding/de-embedding on a card's SDI inputs and outputs. **None:** If your system is monitoring MADI signals (supported at the XIO-4901 card's inputs/outputs 8 and 9), then disabling the MDX option lets you select MADI at the inputs and outputs matching your physical configuration. See Configuring MADI support with a GV Node Device, on page 339 for more information.
Advanced > Card Mode	Set the signal type.
Advanced > Gateway Connection State 1 Advanced > Gateway Connection State 2	Gateway Connection State 1 shows the connection status of the GV Node frame with the primary server of a server group. Gateway Connection State 2 shows the connection status of the GV Node frame with the secondary server of a server group. See Configuring a Controller Group, on page 179. **unknown:** The topology is inactive (see Activating a Topology, on page 235) or the GV Node frame does not have network connectivity to the GV Orbit Server(s). **offline:** The GV Node frame does not have network connectivity to the GV Orbit Server(s). **online:** The GV Node frame is connected to the GV Orbit Server(s).
Advanced > Gateway NP16 Connection State	This shows the NP16 connection status of the GV Node frame with a server of a server group. **unknown:** The topology is inactive (see Activating a Topology, on page 235) or the GV Node frame does not have network connectivity to the GV Orbit Server(s). **offline:** The GV Node frame does not have network connectivity to the GV Orbit Server(s). **online:** The GV Node frame is connected to the GV Orbit Server(s).
Advanced > IFM-2T Version	The IFM-2T Fabric Module User Interface version number.
Advanced > Internal Wiring Done	Shows if the internal modeling of the GV Node is complete.

Parameter	Description
Advanced > Join Timeout (ms)	When GV Orbit Control is used with a GV Node version 1.3.0, to allow a clean switch that will not be reported as a fail, we recommend this parameter to be set to 2 ms.
Advanced > Router Connection State 1	Router Connection State 1 shows the connection status of the router with the primary server of a server group.
Advanced > Router Connection State 2	Router Connection State 2 shows the connection status of the router with the secondary server of a server group. See Configuring a Controller Group, on page 179. **unknown:** The topology is inactive (see Activating a Topology, on page 235) or the router does not have network connectivity to the GV Orbit Server(s). **offline:** The router does not have network connectivity to the GV Orbit Server(s). **online:** The router is connected to the GV Orbit Server(s).

3 Configure the card in each slot and configure the inputs and outputs for each card by making a selection at the top to make the related parameters become available below.
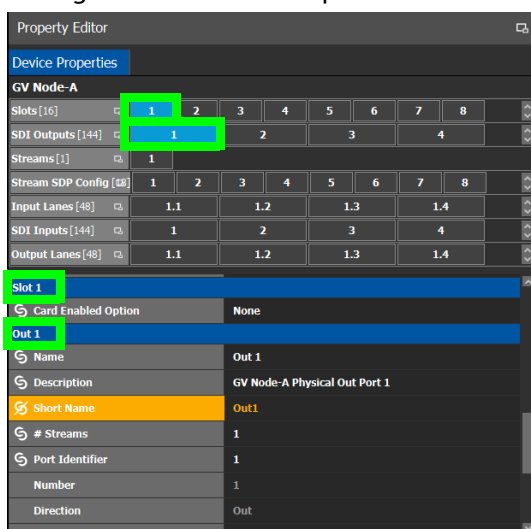
Select the	To configure the properties exposed below under
Card by its slot number in **Slots**	Slot #
Card's SDI output number in **SDI Outputs**. Then select the Card's SDI Output Stream Configuration number in **Streams**	Out # GV Node-[instance] Out #
Card's Stream SDP Configuration number in **Stream SDP Config**	IP Stream Prototype #
Card's Input Lanes number in **Input Lanes**. Then select the card's stream number in **Streams**.	Eth In #.# GV Node-[instance] Eth In#.# Stream #

Select the	To configure the properties exposed below under
Card's SDI Input number in **SDI Inputs**. Then select the card's stream number in **Streams**.	**In#** **GV Node-[instance] In#**
Card's Output Lanes number in **Output Lanes**. Then select the card's stream number in **Streams**.	**Eth Out #.#** **GV Node-[instance] Out#.# Stream #**

Configure the GV Node Card Properties in the **Property Editor**. See also Description of Common Device Properties, on page 332.

Parameter	Description
Slot #	
Card Enabled Option	This option controls audio embedding / de-embedding. For example, the XIO-4901 3G/HD/SD SDI input/output card supports audio embedding/de-embedding, as a software option (MDX): **MDX:** The GV Node Manager allows you to enable or disable audio embedding/de-embedding on a card's SDI inputs and outputs. **None:** If your system is monitoring MADI signals (supported at the card's inputs/outputs 8 and 9), then disabling the MDX option lets you select MADI at the inputs and outputs matching your physical configuration. See Configuring MADI support with a GV Node Device, on page 339 for more information.
Out #	
Name	The name or identifier for this SDI output.
# Sreams	The number of streams for this SDI output.
Port Identifier	An input lane is specified as QSPFport.lane which in turn corresponds to a physical port on the router. The number property specifies which physical port it is. The port identifier is how you name it so that you can refer to it.
Number	Set the port number on the router.
Direction	This shows the current status for information purposes.
Connector Type	
Capacity (bps)	The stream's data rate.
IP Address	The stream's network IP address.
Mods-Out to IFM	This option sets the expected output signal type: **SDI:** The output signal is a standard SDI video signal with embedded audio. **MADI:** The output signal is a MADI signal (supports 64 audio channels). See Configuring MADI support with a GV Node Device, on page 339 for more information.

Parameter	Description
Redundancy Port	Associate this port with another port to create a redundant network traffic flow path for failover protection. The associated port will not be available to carry other traffic.
GV Node-[instance] Out #	
Name	The name or identifier for this SDI output.
Automatic Source	Set to automatically create a source by the system using the specified stream.
Bandwidth (bps)	The stream's data rate.
IGMPv3 SSM Address	Source Specific Multicast address as per IGMPv3 (Internet Group Management Protocol) protocol.
IP Stream Prototype #	
Name	The name or identifier for this SDI output.
Flow Type	Set the content type for this stream: **Audio**, **Data**, or **Video**.
SDP	The Session Description Protocol is a format for describing streaming media communications parameters.
Eth In #.#	
Name	The name or identifier for this IP input.
# Sreams	The number of streams for this IP input.
Port Identifier	An input lane is specified as QSPFport.lane which in turn corresponds to a physical port on the router. The number property specifies which physical port it is. The port identifier is how you name it so that you can refer to it.
Number	Set the port number on the router.
Direction	This shows the current status for information purposes.
Connector Type	
Capacity (bps)	The stream's data rate.
GV Node-[instance] Eth In#.# Stream #	
Name	The name or identifier for this IP input.
Flow Type	Set the content type for this stream: **Audio**, **Data**, or **Video**.
Automatic Source	Set to automatically create a source by the system using the specified stream.
SDP	The Session Description Protocol is a format for describing streaming media communications parameters.
IGMPv3 SSM Address	Source Specific Multicast address as per IGMPv3 (Internet Group Management Protocol) protocol.
IP Address	The stream's network IP address.
IP Port	Port number for the stream.
In#	

Parameter	Description
Name	The name or identifier for this IP input.
# Sreams	The number of streams for this IP input.
Port Identifier	An input lane is specified as QSPFport.lane which in turn corresponds to a physical port on the router. The number property specifies which physical port it is. The port identifier is how you name it so that you can refer to it.
Number	Set the port number on the router.
Direction	This shows the current status for information purposes.
Connector Type	
Capacity (bps)	The stream's data rate.
Bandwidth Usage (bps)	The stream's data rate.
IP Address	The stream's network IP address.
Mods-In to IFM	This option sets the expected input signal type: **SDI:** The input signal is a standard SDI video signal with embedded audio. **MADI:** The input signal is a MADI signal (supports 64 audio channels). See Configuring MADI support with a GV Node Device, on page 339 for more information.
Redundancy Port	Associate this port with another port to create a redundant network traffic flow path for failover protection. The associated port will not be available to carry other traffic.
GV Node-[instance] In#	
Name	The name or identifier for this IP input.
Automatic Source	Set to automatically create a source by the system using the specified stream.
IGMPv3 SSM Address	Source Specific Multicast address as per IGMPv3 (Internet Group Management Protocol) protocol.
Eth Out #.#	
Name	The name or identifier for this IP input.
# Sreams	The number of streams for this IP input.
Port Identifier	An input lane is specified as QSPFport.lane which in turn corresponds to a physical port on the router. The number property specifies which physical port it is. The port identifier is how you name it so that you can refer to it.
Number	Set the port number on the router.
Direction	This shows the current status for information purposes.
Connector Type	
Capacity (bps)	The stream's data rate.

Parameter	Description
Bandwidth Usage (bps)	The stream's data rate.
IP Address	The stream's network IP address.
Redundancy Port	Associate this port with another port to create a redundant network traffic flow path for failover protection. The associated port will not be available to carry other traffic.
GV Node-[instance] Out#.# Stream #	
Name	The name or identifier for this IP input.
IP Address	The stream's network IP address.
IP Port	Port number for the stream.
Flow Type	Set the content type for this stream: **Audio**, **Data**, or **Video**.
Automatic Source	Set to automatically create a source by the system using the specified stream.
SDP	The Session Description Protocol is a format for describing streaming media communications parameters.
Bandwidth (bps)	The stream's data rate.
IGMPv3 SSM Address	Source Specific Multicast address as per IGMPv3 (Internet Group Management Protocol) protocol.

Configuring MADI support with a GV Node Device

To support a MADI input on a GV Node frame, this option must be configured both in GV Orbit Control and the MADI input must have been previously configured in iControl Navigator; locate the GV Node Manager associated with your GV Node and double-click its icon. For example, the following figure shows the 9th input XIO-4901 card in slot 16 is set to accept a MADI input. Within GV Orbit Control, the same setting must be made wherever a MADI input has been configured in iControl Navigator for a GV Node frame.

Fig. 7-1: A GV Node in iControl Navigator

The above iControl Navigator configuration is used as an example configuration for the following procedure.

To configure a GV node MADI input in GV Orbit Control

1 Select the required Area. See Selecting an Area, on page 183.

2 Select the required topology. See Selecting a Graph, on page 184.

3 Add and configure a GV Node device. See Configuring a GV Node Device, on page 333.

4 In the **Property Editor** for the GV Node device, make the same setting as in GV Node Manager for **Enabled Options** for the card: in the GV Node's properties, in **Slots**, select **16**, then set **None** in **Card Enabled Option**.
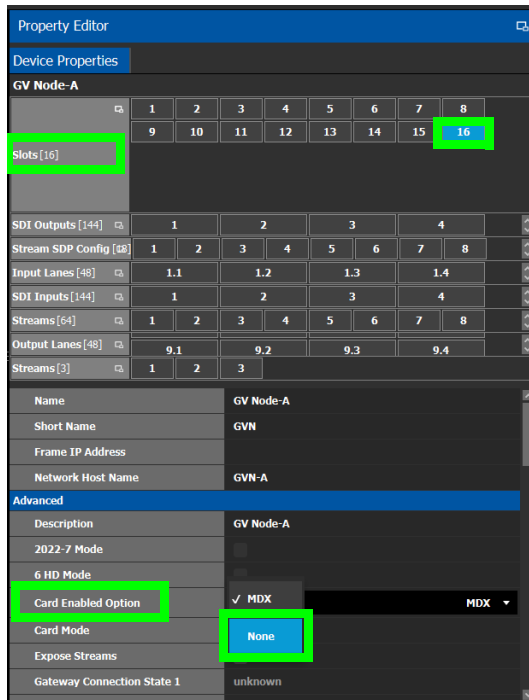
5 Use the following table to identify the SDI input number used by GV Orbit Control from the card's slot and input number for the next step. Only the eighth and ninth inputs of each slot support MADI input signals. For example, the ninth input of the card in slot 16 is **144**.

Matrix Input from Fabric Number for each GV Node Frame Slot

Card's Input from GV Node Fabric	GV Node Frame Slot Number															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
First Input	1	10	19	28	37	46	55	64	73	82	91	100	109	118	127	136
Second Input	2	11	20	29	38	47	56	65	74	83	92	101	110	119	128	137
Third Input	3	12	21	30	39	48	57	66	75	84	93	102	111	120	129	138
Fourth Input	4	13	22	31	40	49	58	67	76	85	94	103	112	121	130	139
Fifth Input	5	14	23	32	41	50	59	68	77	86	95	104	113	122	131	140
Sixth Input	6	15	24	33	42	51	60	69	78	87	96	105	114	123	132	141

Matrix Input from Fabric Number for each GV Node Frame Slot *(continued)*

Card's Input from GV Node Fabric	GV Node Frame Slot Number															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Seventh Input	7	16	25	34	43	52	61	70	79	88	97	106	115	124	133	142
Eighth Input	8	17	26	35	44	53	62	71	80	89	98	107	116	125	134	143
Ninth Input	9	18	27	36	45	54	63	72	81	90	99	108	117	126	135	144

6 In the **Property Editor** for the GV Node device, make the same setting as in GV Node Manager for the card's input: in the GV Node's properties, in **SDI Inputs**, select **144**, then set **MADI** in **Mods-In to IFM**.
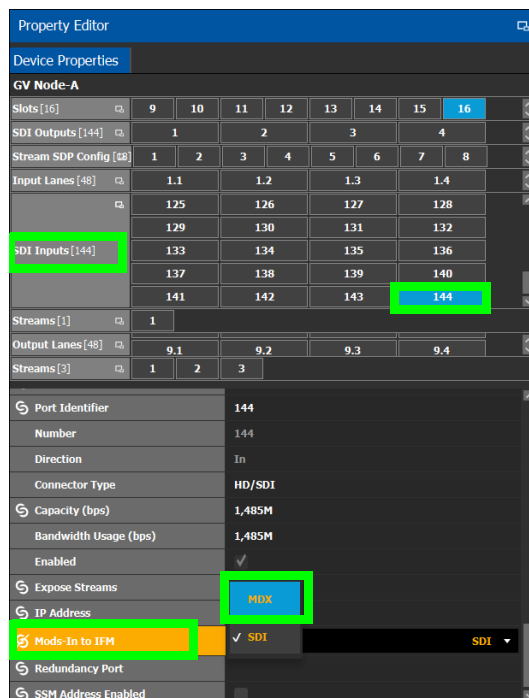
For each MADI input, 64 audio streams are shown in **Streams** and the logical level is MADI for each stream. These 64 streams are made available within the Logical Device Table for use on manually created logical devices. If you choose the Automatic source/destination option for the MADI, then 4 devices of 16 channels of audio are

created in the Logical Device Table on the appropriate tab. See Logical Device Table Tasks, on page 241.

Configuring an IPG-3901 / IPG-4901 Device

The Densité IP Gateway (IPG-3901) plug-and-play module is a 3 RU module for the Densité 3 frame, which provides bidirectional IP/SDI conversion. The Gateway operates with 10 GigE audio/video video-over-IP, supporting UHD/3G/HD/SD-SDI formats.

The GV Node IP Gateway (IPG-4901) plug-and-play module is a 3 RU single slot module for the GV Node frame, which provides bidirectional fiber IP connectivity to provide conversion to and from other equipment that cannot be handled directly by the GV Node aggregation ports (GV Node's receivers and transmitters). This card allows you to expand the receivers available on the GV Node, as well as it brings more flexibility to the allowed audio profiles that can be accepted through the IPG-4901

PREREQUISITES: All IPG-3901 and IPG-4901 devices must have been previously configured in iControl Navigator. GV Orbit Control reads this configuration information from iControl through the GV Node / Densité Manager.

To configure an IPG-3901 / IPG-4901 Device

1 Add the **IPG-3901** or **IPG-4901** device to the Topology: from the **Device Library**, **Virtual Device**, find the **IPG-3901** or **IPG-4901** device bubble. See Adding a Virtual Device to a topology, on page 204.
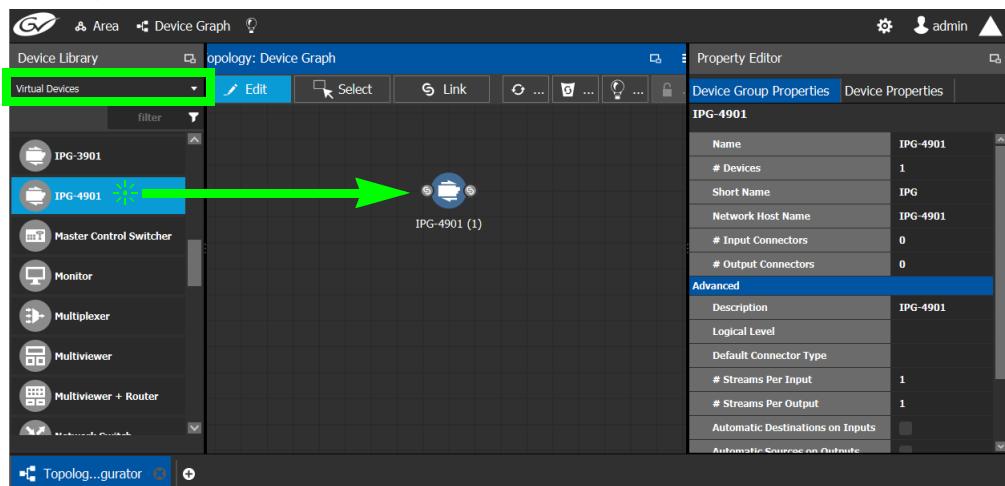
2 Select **Device Group Properties**. Configure the **GV Node IP Address** / **Frame IP Address** and **Slot Number** properties.

See also Description of Common Device Properties, on page 332.

Parameter	Description
# Devices	The number of panel instances in this device group.
Network Host Name	The hostname is the unique name by which the associated IPG-3901 or IPG-4901 is known on the network.
# Input Connections	The current status for information purposes, once the **GV Node IP Address** and **Slot Number** parameters are configured and the topology is activated. See Activating a Topology, on page 235.
# Output Connections	
Advanced > Default Connector Type	
Advanced > # Streams Per Input	
Advanced > # Streams Per Output	
Advanced > Receive Stream IP Pattern	
Advanced > Send Stream IP Pattern	

3 Activate the topology. See Activating a Topology, on page 235.

The card configuration is read from Densité Manager and applied to the device.

4 Select the **Device Properties** tab and then select **IPG** next to **Devices**. See also Description of Common Device Properties, on page 332.

Parameter	Applies to		Description
	IPG-3901	**IPG-4901**	
Network Host Name	•	•	The hostname is the unique name by which the associated IPG-3901 or IPG-4901 is known on the network.
GV Node IP Address		•	IP Address of the CPU-ETH3 for the GV Node frame into which the IPG-4901 card is installed.
Frame IP Address	•		IP Address of the CPU-ETH3 for the Densité frame into which the IPG-3901 card is installed.
Slot Number	•	•	The slot in which the IPG-3901 or IPG-4901 device is located in the GV Node frame.
Connection to Controller 1	•	•	Connection to Controller 1 shows the connection status of the IPG device with the primary server of a server group.
Connection to controller 2	•	•	Connection to Controller 2 shows the connection status of the IPG device with the secondary server of a server group. See Configuring a Controller Group, on page 179. **unknown:** The topology is inactive (see Activating a Topology, on page 235) or the IPG device does not have network connectivity to the GV Orbit Server(s). **offline:** The IPG device does not have network connectivity to the GV Orbit Server(s). **online:** The IPG device is connected to the GV Orbit Server(s).
Firmware Version	•	•	Shows the firmware version installed on the IPG-3901 or IPG-4901 card. This shows the current status for information purposes.
Internal Wiring Done	•	•	Shows if the internal modeling of the IPG-3901 or IPG-4901 is complete.
Operation Mode	•	•	Shows the operation mode of the ETH2 port of the IPG-3901 or IPG-4901 card for information purposes: **Redundancy:** ETH 2 is redundant to ETH 1. **Aggregation:** Both ETH 1 and ETH 2 are available simultaneously. **OFF:** ETH 2 is disabled.

5 Select **ETH#** next to **Ethernet Ports**. These are the network configuration parameters for the IPG-3901 or IPG-4901 card's Ethernet ports. See also Description of Common Device Properties, on page 332.

Parameter	Description
IP Address	The network IP address for this Ethernet port.
Gateway	The network gateway IP address.
Subnet Mask	The IP network's subnet mask.

6 Select one of the streams next to **Gateways** (by default labelled as **OUT#** or **IN#**). See also Description of Common Device Properties, on page 332.

Parameter	Description
Direction	This shows the current status for information purposes.
Logical Level on SDI Stream	To force a stream to use the IPG-3901 or IPG-4901 device, create a new level (see Duplicating a Logical Level, on page 193) that you will use to select these specific streams at the source and destination ports. Set the logical level that will be used for this here. For example, create a logical level called IPG-SDI from the SDI logical level. Now use this level to send and receive streams to and from this device.

7 Select **1** or **2** next to **Streams**. See also Description of Common Device Properties, on page 332.

Parameter	Description
Ethernet Port	The Ethernet port this gateway is assigned to (ETH 1 or ETH 2). This shows the current status for information purposes.
Format	The gateway format: SD, HD, or 3G for video streams, or AES67 profile for audio streams. This shows the current status for information purposes.
IGMPv3 Source	For a receiver gateway, this is the address of the joined stream's port when SSM Address is enabled on the device.
IP Address	The stream's network IP address.
Logical Level on ETH stream	The Logical level to apply on the ETH side of the gateway. By default for the video stream, this value is SDI and for the audio stream, this value is SDI audio.
Port	The stream's network port.
Redundant IGMPv3 Source	When the IPG-3901 or IPG-4901 card is in Redundancy mode: For a receiver gateway, this is the address of the joined stream's port when SSM Address is enabled on the device.

Parameter	Description
Redundant IP Address	When the IPG-3901 or IPG-4901 card is in Redundancy mode: The stream's network IP address.
Redundant Port	When the IPG-3901 or IPG-4901 card is in Redundancy mode: The stream's network port.

Connecting an IPG-4901 device

The IPG 4901 has 9 SDI input ports, 9 SDI output ports, and 2 bidirectional ETH ports. The SDI ports must be connected to the SDI ports of the GV Node in which the IPG-4901 is slotted in. This rule is not enforced in GV Orbit Control. GV Orbit Control allows you to use an IPG-4901 like an IPG-3901, however this is not a valid use case and will not work.

The 9 SDI input ports short labels are called OUT for OUT from fabric, and the 9 SDI output ports short labels are called IN for In to fabric to follow iControl's behavior.

Device properties

- It is possible to assign a logical level to SDI ports by changing the Logical Level of SDI stream at the Gateway level.
- It is possible to assign a logical level to IP streams by changing the Logical Level on ETH stream on Stream level, under the Gateway.
- It is possible to change the multicast address for SDI to IP gateways (called OUT) by changing the IP Address, Port, Redundant IP Address and Redundant Port properties on Stream level, under Gateway. These changes are propagated to iControl.
- In OFF or Redundancy mode, gateways OUT 6 to 9 and IN 6 to 9 are disabled and not visible in **Property Editor**. They become visible only if card is in Aggregation mode.

Example Topology Using an IPG-4901
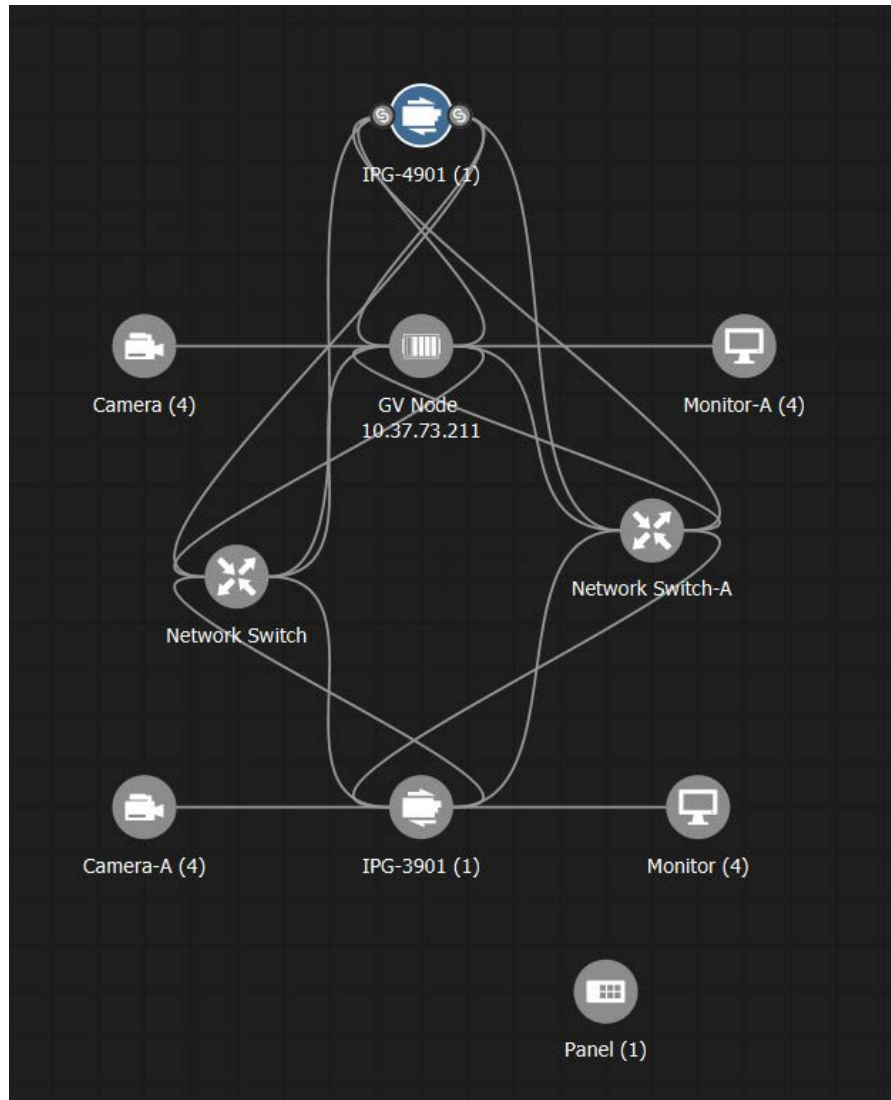
Configuring an IPVU Device

The IPVU is a compact dual-channel IP-to-HDMI converter that is perfect for displaying IP sources and a multiviewer's IP outputs on HD and UHD HDMI displays.

The inputs of an IPVU are called *spigots*. See also How to Know if a Spigot is an Input or an Output, on page 353.

WARNING
The IPVU's configuration is set through GV Orbit Client and then GV Orbit Control reads the configuration from the IPVU device. All spigots on an IPVU are inputs.

There is no offline configuration of the IPVU device. It must first be discovered on the network by GV Orbit Control.

The IPVU device must have been previously configured with GV Orbit Client before being integrated into GV Orbit Control as most configuration parameters shown in GV Orbit Control are for information purposes only (GV Orbit Control reads it from the IPVU devices). See the *IPVU Installation Guide* for more information.

PREREQUISITES: The Domain ID of the IPVU device(s) must be set in the System Controller Group Properties under **Domain Ids**. See Configuring a Controller Group, on page 179. These devices must be on the same subnet that the GV Orbit Server is connected to.

Related Topics

- How to Know if a Spigot is an Input or an Output, on page 353.
- Configuring UHD 4K Two-Sample Interleave Division IP Streams for use with an IQMix, IQUCP, UCP-3901, or IPVU Device, on page 354.
- Configuring UHD 4K Quad-Link SDI Streams for use with an IQMix, IQUCP, UCP-3901, or IPVU Device, on page 359.

Spigot Usage

An IPVU device has 8 input spigots. They are used according to the IPVU's output resolution.

Input Spigot Number	HD Output Description	UHD Output Description
Spigot1	Stream input for **Monitor Output 1** connection	SMPTE ST 424-5 Link 1 input stream for **Monitor Output 1** output connection
Spigot2	Not used	SMPTE ST 424-5 Link 2 input stream for **Monitor Output 1** output connection
Spigot3	Not used	SMPTE ST 424-5 Link 3 input stream for **Monitor Output 1** output connection
Spigot4	Not used	SMPTE ST 424-5 Link 4 input stream for **Monitor Output 1** output connection
Spigot5	Stream input for **Monitor Output 2** connection	SMPTE ST 424-5 Link 1 input stream for **Monitor Output 2** output connection
Spigot6	Not used	SMPTE ST 424-5 Link 2 input stream for **Monitor Output 2** output connection

Input Spigot Number	HD Output Description	UHD Output Description
Spigot7	Not used	SMPTE ST 424-5 Link 3 input stream for **Monitor Output 2** output connection
Spigot8	Not used	SMPTE ST 424-5 Link 4 input stream for **Monitor Output 2** output connection

To configure an IPVU Device

1 Add the IPVU device to the Topology: from the **Device Library**, **Discovered**, find an IPVU device bubble that you want to control. See To add a Discovered Device to a Topology, on page 209.
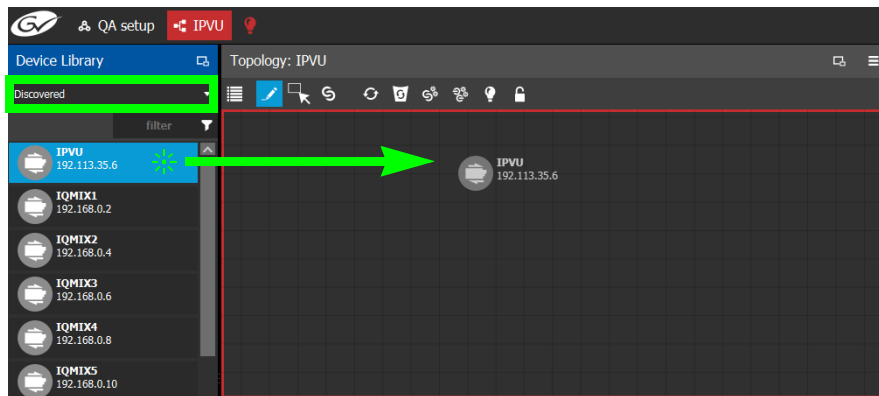
2 Configure the IPVU properties. See also Description of Common Device Properties, on page 332. The IPVU device should be first configured with GV Orbit Client before being integrated into GV Orbit Control as most configuration parameters shown in GV Orbit Control are shown for information purposes only.

Parameter	Description
Network Host Name	The hostname is the unique name by which the associated IPVU is known on the network.
Domain ID	Set the same Domain IDs on all IPVU devices that are to communicate with each other on the network. The default value for Grass Valley equipment is **101**. Valid range: 0 to 232. See also Configuring a Controller Group, on page 179.
Internal wiring	Shows if the internal modeling of the IPVU is complete.

3 Create and connect the core IP devices to the IPVU. See Methods to Link Devices in a Topology, on page 222.
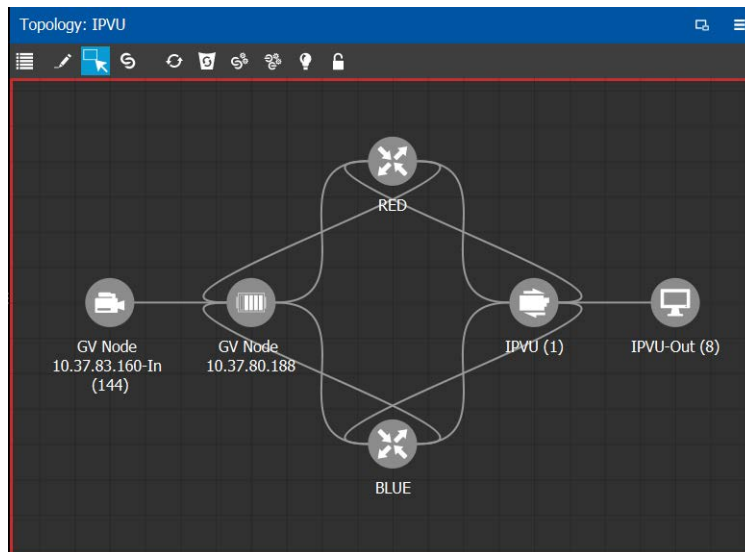
Configuring an IQMix, IQUCP, or UCP-3901 Device

The IQMIX / IQUCP / UCP-3901 series is a range of multi-channel video over IP transceiver modules developed for use within low latency, high bandwidth Ethernet IP networks, capable of encoding / decoding multiple SDI signals. They provide both compressed and uncompressed modes of operation.

The inputs and outputs of an IQMIX / IQUCP / UCP-3901 are called *spigots*. There are a variety of spigot configurations that are available; for example, 6 inputs / 6 outputs, 12 inputs / 0 outputs, 0 inputs / 12 outputs, 8 inputs / 0 outputs. See also How to Know if a Spigot is an Input or an Output, on page 353.

> **WARNING**
> The spigot configuration is set through GV Orbit Client and then GV Orbit Control reads it from the IQMIX / IQUCP / UCP-3901 card. For any given spigot, you must know which mode (input or output) has been configured to connect the spigots correctly in GV Orbit Control.

There is no offline configuration of the IQMIX / IQUCP / UCP-3901 device. It must first be discovered on the network by GV Orbit Control.

The IQMIX / IQUCP / UCP-3901 device must have been previously configured with GV Orbit Client before being integrated into GV Orbit Control as most configuration parameters shown in GV Orbit Control are for information purposes only (GV Orbit Control reads it from the IQMIX / IQUCP / UCP-3901 devices). See the IQMIX / IQUCP / UCP-3901 User Manual for more information.

PREREQUISITES: The Domain ID of the IQMIX / IQUCP / UCP-3901 device(s) must be set in the System Controller Group Properties under **Domain Ids**. See Configuring a Controller Group, on page 179. These devices must be on the same subnet that the GV Orbit Server is connected to.

> **Note:** An IQMix using VC2 video compression format is not currently supported by GV Orbit Control.

Related Topics

- How to Know if a Spigot is an Input or an Output, on page 353
- Configuring UHD 4K Two-Sample Interleave Division IP Streams for use with an IQMix, IQUCP, UCP-3901, or IPVU Device, on page 354.
- Configuring UHD 4K Quad-Link SDI Streams for use with an IQMix, IQUCP, UCP-3901, or IPVU Device, on page 359

To configure an IQMIX / IQUCP / UCP3901 Device

1 Add the IQMIX / IQUCP / UCP-3901 device to the Topology: from the **Device Library**, **Discovered**, find an IQMIX / IQUCP / UCP-3901 device bubble that you want to control. See To add a Discovered Device to a Topology, on page 209.
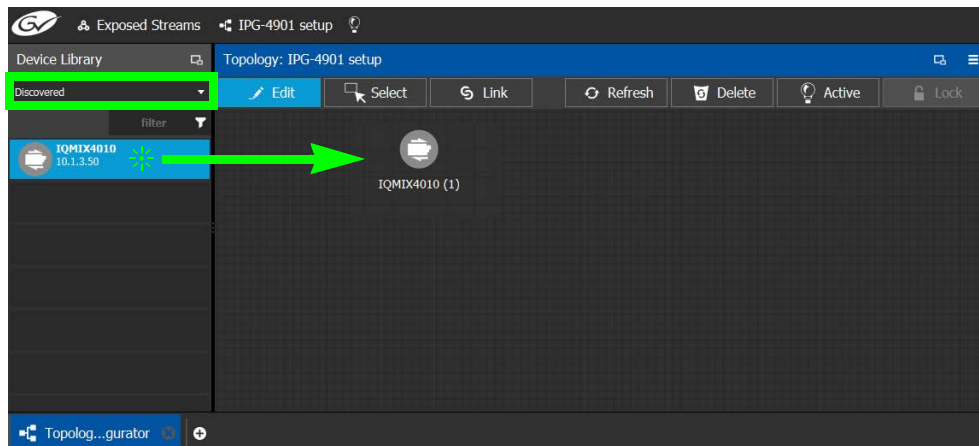
2 Configure the IQMIX / IQUCP / UCP-3901 properties. See also Description of Common Device Properties, on page 332. The IQMIX / IQUCP / UCP-3901 device should be first configured with GV Orbit Client before being integrated into GV Orbit Control as most configuration parameters shown in GV Orbit Control are shown for information purposes only.

Parameter	Description
Network Host Name	The hostname is the unique name by which the associated IQMIX / IQUCP / UCP-3901 is known on the network.
Domain ID	Set the same Domain IDs on all IQMIX / IQUCP / UCP-3901 devices that are to communicate with each other on the network. The default value for Grass Valley equipment is **101**. Valid range: 0 to 232. See also Configuring a Controller Group, on page 179.
Internal wiring	Shows if the internal modeling of the IQMIX / IQUCP / UCP-3901 is complete.

3 Create and connect the edge devices (SDI and IP devices) that are connected to the IQMIX / IQUCP / UCP-3901. See Methods to Link Devices in a Topology, on page 222.

How to Know if a Spigot is an Input or an Output

To know if a spigot In GV Orbit Control is an input or output, proceed as follows:

1 Select the device bubble on the Topology Configurator. See Selecting a Graph, on page 184.

2 Expand **Ip Spigots** in **Device Properties** and select a spigot from the list.

3 For each spigot, interpret the **Mode** property as follows:

  • SRC = Output
  • DST = Input

Configuring UHD 4K Two-Sample Interleave Division IP Streams for use with an IQMix, IQUCP, UCP-3901, or IPVU Device

To support UHD 4K streams, the image is mapped onto four SDI HD sub-images using a two-sample interleave division. This means each of the four sub-stream carries a quarter-resolution picture. These four sub-streams must:

- each be individually represented by four logical levels; one level for each sub-stream. For example, **SDI2SIuhd1**, **video2SIuhd2**, **video2SIuhd3** and **video2SIuhd4**.
  - The first logical level, **SDI2SIuhd1**, carries the full SDI stream for video, audio, and ancillary data.
  - The remaining logical levels will only use the video stream from the SDI levels, **video2SIuhd2**, **video2SIuhd3**, and **video2SIuhd4**.
- be logically linked together so that they are switched together at once ensuring that there is no switching delay between the four streams that would create visible glitches between the four quadrants.

The following shows the typical video stream composition of a two-sample interleave division display with the associated logical levels used in this procedure.
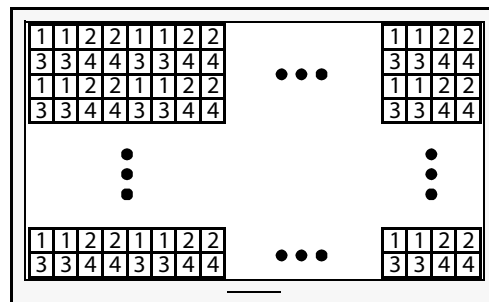
UHD Composite Image

1: SMPTE ST 424-5 Link 1 pixels carried by HD Logical Level **SDI2SIuhd1**

2: SMPTE ST 424-5 Link 2 pixels carried by HD Logical Level **Video2SIuhd2**

3: SMPTE ST 424-5 Link 3 pixels carried by HD Logical Level **Video2SIuhd3**

4: SMPTE ST 424-5 Link 4 pixels carried by HD Logical Level **Video2SIuhd4**

PREREQUISITES:

- For IQMix / IQUCP / UCP-3901 devices:
  - The IQMix / IQUCP / UCP-3901 device(s) must already be configured in GV Orbit Client. See Configuring an IQMix, IQUCP, or UCP-3901 Device, on page 352.
  - Configure the IQMix / IQUCP / UCP-3901 device spigots to be used for UHD in GV Orbit Client by enabling the **UHD Links** parameter in the **Link Control Page** for all quad-link signal spigots.
  - Set the corresponding spigots to use 2SI signals: Under **TPG**, clear (disable) the **SDQS** check boxes as required.
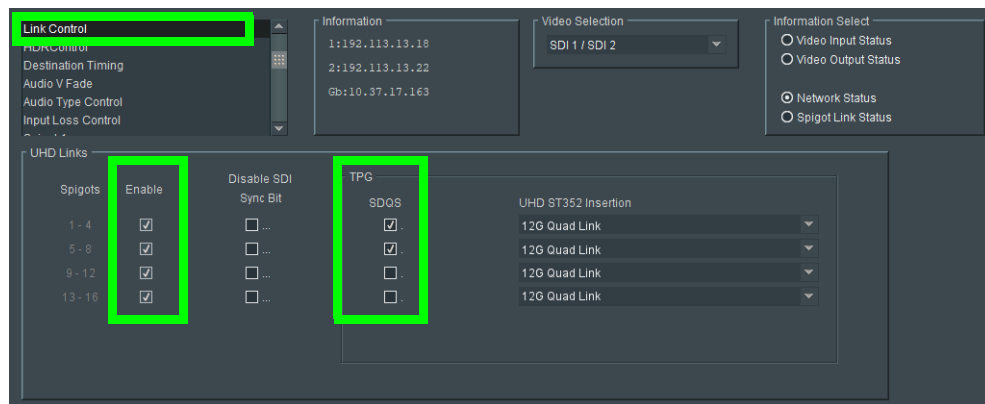
- The IPVU device(s) must already be configured in GV Orbit Client. See Configuring an IPVU Device, on page 349.
  - Configure the IPVU device spigots to be used for UHD in GV Orbit Client by:
    - Enabling the **Enable UHD** parameter in the **IPVU** configuration page for **Monitor Output 1** and **2** as necessary.
    - Set the **UHD Mode** to **2SI**.
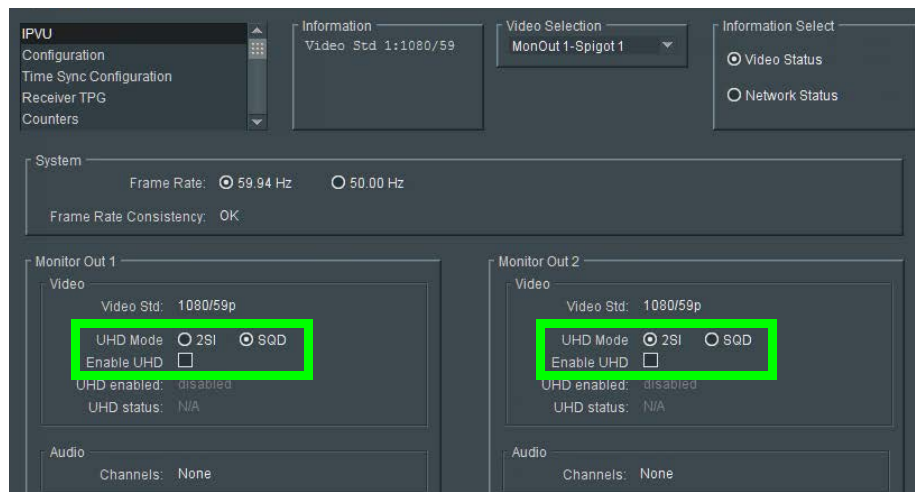
To configure UHD 2SI Streams with an IPVU Device

1. Add IPVU device(s) to the topology and configure them in GV Orbit Control. See Configuring an IPVU Device, on page 349.

Special Device Configuration Tasks

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Configuring UHD 4K Two-Sample Interleave Division IP Streams for use with an IQMix, IQUCP, UCP-3901, or IPVU Device   User

2 Link the IPVU device(s) to the logical sources and destinations in GV Orbit Control. See Methods to Link Devices in a Topology, on page 222.

The following topology will be used as an example, where the IPVU receives UHD stream sources from the GV Node.
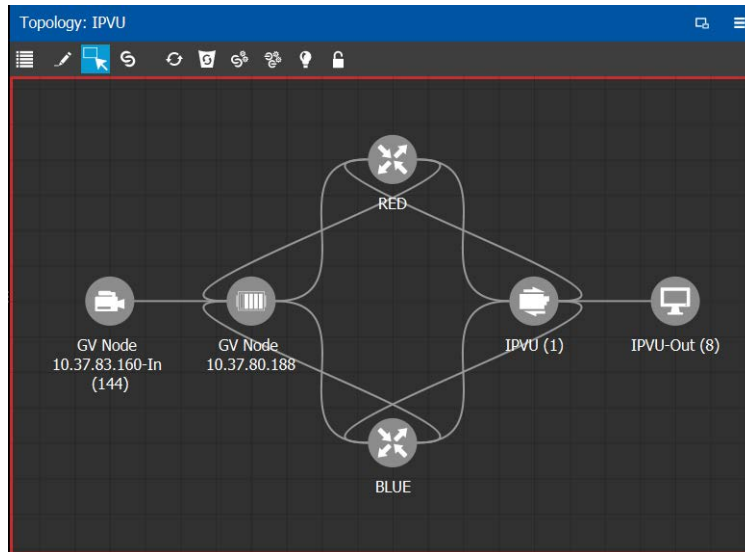
3 Create the logical levels necessary to support 2SI sources and destinations: Create the following UHD logical levels from the Logical Level Editor from the pre-existing **SDI** logical level: **SDI2SIuhd1**, **SDI2SIuhd2**, **SDI2SIuhd3**, and **SDI2SIuhd4**. See Duplicating a Logical Level, on page 193.
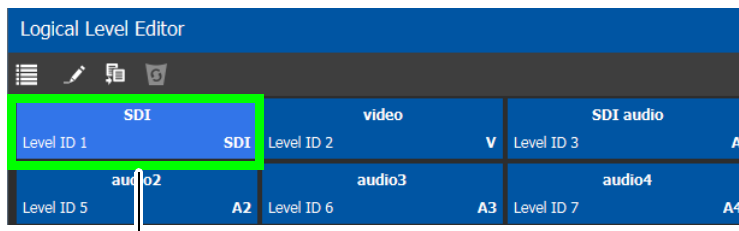
Duplicate the SDI Logical Level four times to create **SDI2SIuhd1**, **SDI2SIuhd2**, **SDI2SIuhd3**, and **SDI2SIuhd4**
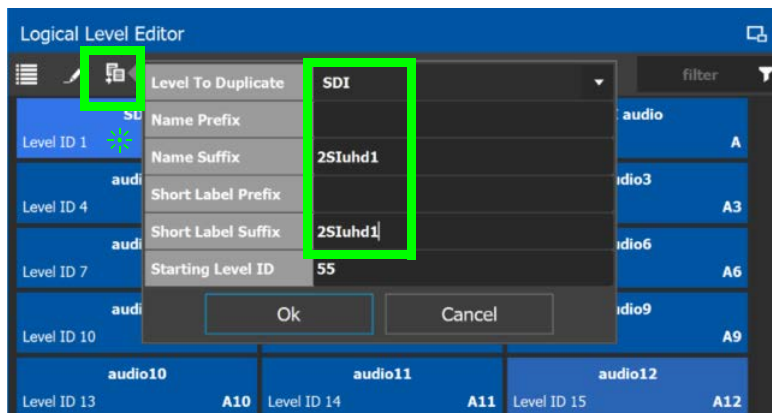
For this example, only the following "2SIuhd" levels will be used: **SDI2SIuhd1**, **Video2SIuhd2**, **Video2SIuhd3**, and **Video2SIuhd4**. It is optional to delete all other

"2SIuhd" logical levels for a cleaner presentation, if they are not used elsewhere. See Deleting a Logical Level, on page 196.

4   From the **Multilevel Table** of the **Logical Device Table**, under the **Sources** tab, click the Levels icon ≣. See Accessing the Logical Device Table task, on page 241.

5   Select the levels you want to display in the **Logical Device Table**. As shown below, the **2SIuhd** filter was applied and then you can select the 4 SIuhd levels (**SDI2SIuhd1**, **Video2SIuhd2**, **Video2SIuhd3**, and **Video2SIuhd4**), each representing one sub-stream of a of a 2SI signal. Click **OK**.

The columns of the Multilevel Table updates to only show the **SDI2SIuhd1**, **Video2SIuhd2**, **Video2SIuhd3**, and **Video2SIuhd4 columns**.

6   In the Logical Device Table, select a source's row to which you want to add the streams. See To configure streams for the new sources, on page 251.

7 In the Logical Device Table, map streams with levels: Configure the UHD sources and destinations by assigning quad-link IP streams to each level.

Select the row before dropping a destination onto it
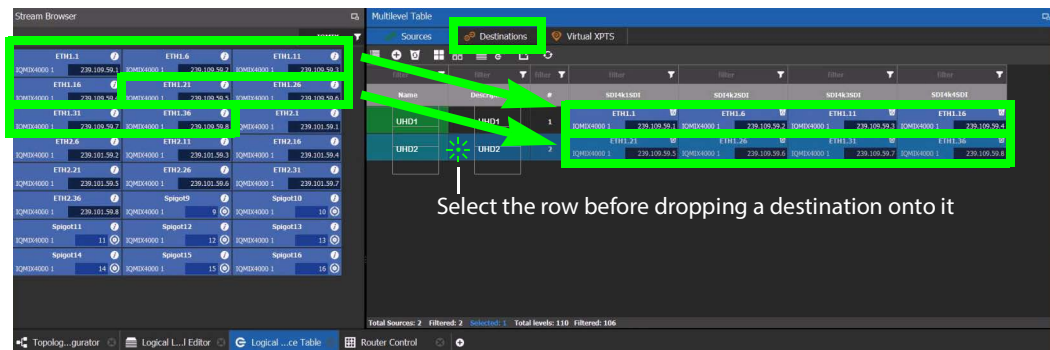
8 Select the levels you want to display in the **Logical Device Table**. Again, select the 4 SIuhd levels (**SDI2SIuhd1**, **Video2SIuhd2**, **Video2SIuhd3**, and **Video2SIuhd4**), each representing one sub-stream of a of a 2SI signal. Click **OK**.

The columns of the Multilevel Table updates to only show the **SDI2SIuhd1**, **Video2SIuhd2**, **Video2SIuhd3**, and **Video2SIuhd4 columns.**

9 From the **Multilevel Table** of the **Logical Device Table**, under the **Destinations** tab, click the Levels icon ▤. See Accessing the Logical Device Table task, on page 241.

10 Repeat step 6 for destinations.

11 Test the configuration by making takes between a logical source and destination that use the two-sample interleave division streams. See Performing a Take in Router Control, on page 471. See in Pathfinder that the correct source sub-streams are received by each destination. See Viewing Information about the Destinations, on page 454.

Configuring UHD 4K Quad-Link SDI Streams for use with an IQMix, IQUCP, UCP-3901, or IPVU Device

To support UHD 4K streams, a quad-link (square division) configuration is used. That is, the UHD image is divided into four SDI HD quadrants, and each quadrant is sent as four separate streams. These four streams must:

- each be individually represented by four logical levels; one level for each quadrant. For example, **SDI**, **SDIuhd2**, **SDIuhd3** and **SDIuhd4**.
    - The first logical level is the base **SDI** logical level. This logical level carries the video, audio, and ancillary data.
    - The **SDIuhd2**, **SDIuhd3** and **SDIuhd4** logical levels are video only.
- be logically linked together so that they are switched together at once ensuring that there is no switching delay between the four streams that would create visible glitches between the four quadrants.

The following shows the typical video stream composition of a UHD quad-link display with the associated logical levels used in this procedure.

UHD Composite Image

Special Device Configuration Tasks
Configuring UHD 4K Quad-Link SDI Streams for use with an IQMix, IQUCP, UCP-3901, or IPVU Device
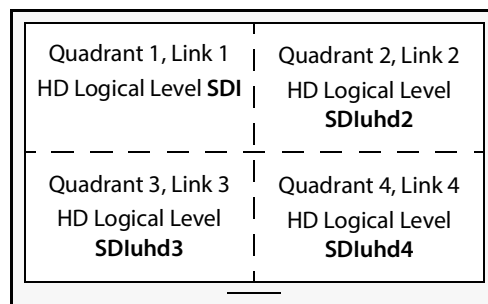
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User Guide

PREREQUISITES:

- For IQMix / IQUCP / UCP-3901 device(s):
  - The IQMix / IQUCP / UCP-3901 device(s) must already be configured in GV Orbit Client. See Configuring an IQMix, IQUCP, or UCP-3901 Device, on page 352.
  - Configure the IQMix / IQUCP / UCP-3901 device spigots to be used for UHD in GV Orbit Client by enabling the **UHD Links** parameter in the **Link Control Page** for all quad-link signal spigots.
  - Set the corresponding spigots to use Square Division signals: Under **TPG**, set (enable) the **SDQS** check boxes as required.
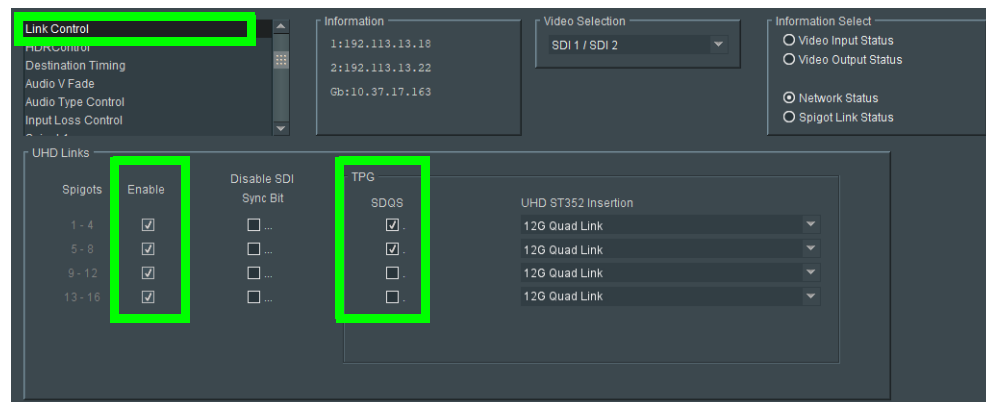
- For IPVU device(s):
  - The IPVU device(s) must already be configured in GV Orbit Client. See Configuring an IPVU Device, on page 349.
  - Configure the IPVU device spigots to be used for UHD in GV Orbit Client by:
    - Enabling the **Enable UHD** parameter in the **IPVU** configuration page for **Monitor Output 1** and **2** as necessary.
    - Set the **UHD Mode** to **SQD**.
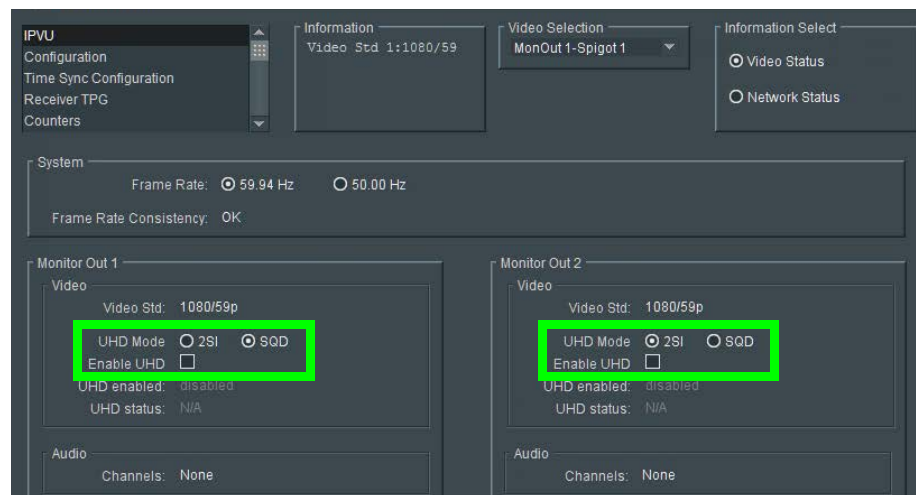
To configure UHD Quad-Link Streams

Create the logical levels necessary to support quad-link sources and destinations.

1 Create the following UHD logical levels from the Logical Level Editor from the pre-existing **SDI** logical level: **SDIuhd1**, **SDIuhd2**, **SDIuhd3** and **SDIuhd4**. See Duplicating a Logical Level, on page 193.
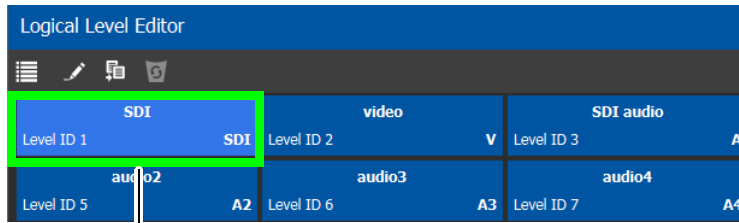
Duplicate the SDI Logical Level four times to create **SDIuhd1**, **SDIuhd2**, **SDIuhd3**, and **SDIuhd4**
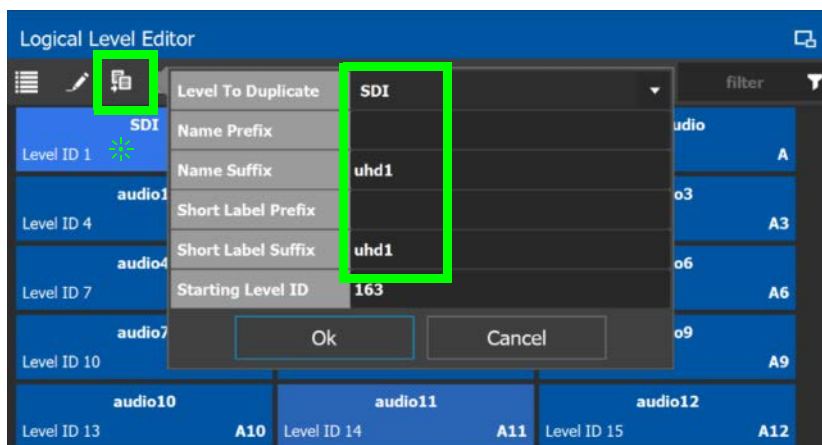
2 From the **Multilevel Table** of the **Logical Device Table**, click the Levels icon ▤. See Accessing the Logical Device Table task, on page 241.

3 Select the levels you want to display in the table. As shown below, a filter **SDIuhd** was applied and then you can select the 4 SDI UHD levels and click **OK**.

The logical device table will show 4 items (**SDIuhd1**, **SDIuhd2**, **SDIuhd3**, and **SDIuhd4**), each with a UHD level representing one quadrant of a of a quad-link signal.

4 Add IQMix / IQUCP / UCP-3901 device(s) to the topology and configure them in GV Orbit Control. See Configuring an IQMix, IQUCP, or UCP-3901 Device, on page 352.

5 Link the IQMix / IQUCP / UCP-3901 device(s) to the logical sources and destinations in GV Orbit Control. See Methods to Link Devices in a Topology, on page 222.

The following topology will be used as an example, where the IQMix is used as the UHD stream sources (called *uhd1* and *uhd2*) and the IQUCP is used as the UHD stream destination (called *DEST-uhd*).
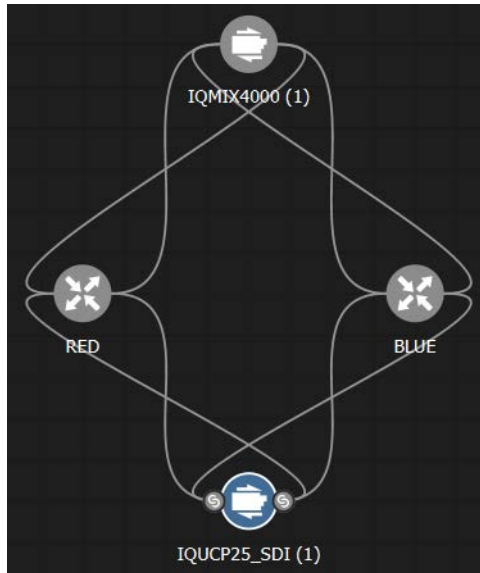
6 In the Logical Device Table, map streams with levels: Configure the UHD sources and destinations by assigning quad-link IP streams to each level.
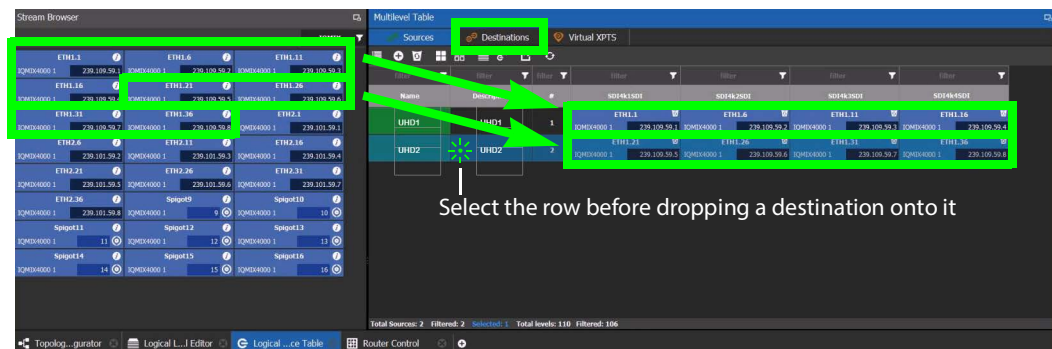
7 Repeat step 6 for destinations.

8 Test the configuration by making takes between a logical source and destination that use the quad-level link streams. See Performing a Take in Router Control, on page 471. See in Pathfinder that the correct quad-level link streams are received by each destination. See Viewing Information about the Destinations, on page 454.

Configuring an MV-820-IP Multiviewer Device

The MV-820-IP multiviewer has 48 IP inputs and 12 IP outputs in a 2 RU chassis, making it ideal for high-density IP monitoring applications. Internally, the MV-820-IP multiviewer is an MV-820 SDI multiviewer wrapped inside four IQMix cards to provide IP connectivity through a rear panel that supports the QSFP network interface adapters (refer to the MV-820 Multiviewer User Manual, where this is referred to as the *Video IP Circuitry*). These four IQMix cards are used to convert the IP network input streams to feed the 48 × SDI inputs of the MV-820 cards, and uses three of the four same IQMix cards to also convert the 12 × SDI mosaic outputs of the MV-820 cards into IP stream outputs. These IQMix cards are labeled as *MV-820-IP-REAR* in GV Orbit Client and GV Orbit Control. See Configuring an IQMix, IQUCP, or UCP-3901 Device, on page 352 for more information about how to configure an IQMix.

The inputs and outputs of an MV-820-IP are called spigots that, within GV Orbit Control, are provided by four MV-820-IP-REAR devices with the following spigot configuration: 48 input spigots across four MV-820-IP-REAR devices and 12 mosaic output spigots across three MV-820-IP-REAR devices. The third MV-820-IP-REAR device has no output spigots.
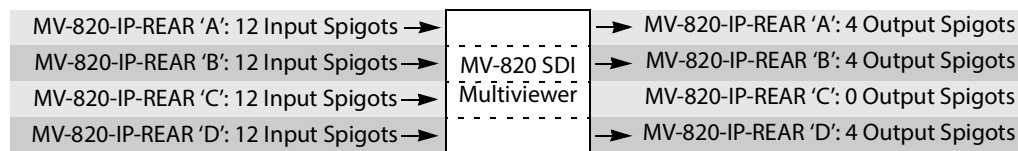
For each MV-820-IP-REAR device, the spigots are used as follows. The third MV-820-IP-REAR device has no output spigots. See also How to Know if a Spigot is an Input or an Output, on page 353.
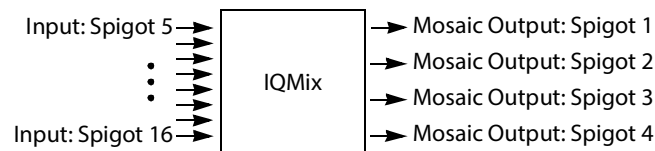
There is no offline configuration of the MV-820-IP device. It must first be discovered on the network by GV Orbit Control.

The MV-820-IP multiviewer must have been previously configured with GV Orbit Client before being integrated into GV Orbit Control as most configuration parameters shown in GV Orbit Control are for information purposes only (GV Orbit Control reads it from the MV-820-IP cards). See the MV-820-IP User Guide for more information.

For example, in GV Orbit Client 2.5 the MV-820-IP is shown as 4 × MV-820-IP-REAR.

PREREQUISITES: The Domain ID of the MV-820-IP devices must be set in the System Controller Group Properties under **Domain Ids**. See Configuring a Controller Group, on

page 179. These devices must be on the same subnet that the GV Orbit Server is connected to.

Note: An MV-820-IP using VC2 video compression format is not currently supported by GV Orbit Control.

To configure an MV-820-IP Multiviewer

1 Select the required Area. See Selecting an Area, on page 183.

2 Select the required topology. See Selecting a Graph, on page 184.

3 The topology must be currently:

   • Activated (see Activating a Topology, on page 235).

   • Unlocked (see Unlocking / Relocking a Topology, on page 238).

4 From the **Device Library**, on the left, select **Discovered**, from the drop-down list.
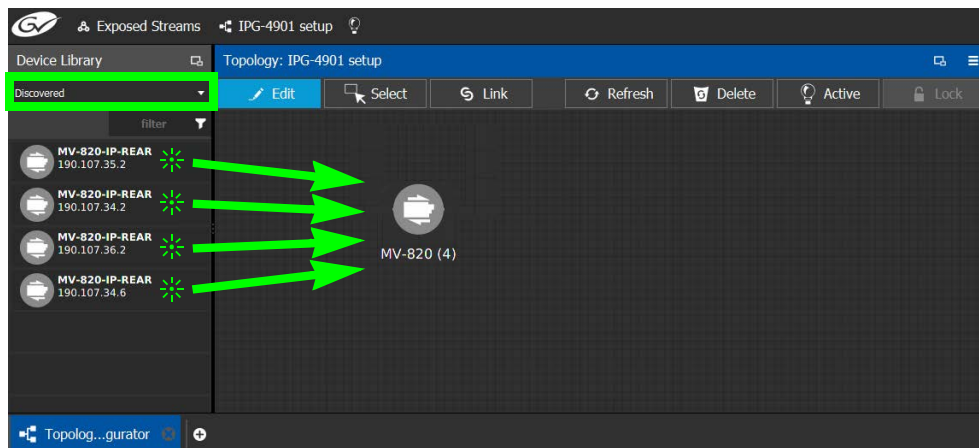
5 From the **Device Library**, **Discovered**, find the four **MV-820-IP-REAR** devices with the IP addresses that correspond with those for the MV-820-IP multiviewer on your network: select one of the MV-820-IP-REAR device bubbles and drag it into position on the Topology and release the mouse button.

   The device pulled from the **Device Library**, **Discovered** becomes greyed out and another instance of the same device instance cannot be added again to the Topology.

6 Now create a device group by adding the remaining three MV-820-IP-REAR device bubbles on top of the MV-820-IP-REAR already on the Topology:

   a Select another MV-820-IP-REAR device bubble from the **Device Library** and drag it on top of the first MV-820-IP-REAR device instance already on the Topology and release the mouse button.

   b Repeat this action for the third and fourth MV-820-IP-REAR device bubble in the **Device Library**.

   The four MV-820-IP-REAR device instances are shown as a single device on the Topology and can be individually configured in the **Property Editor**, under **Devices**, by clicking an instance. See Defining Device Properties, on page 229 for more information.

7 Click on the name of the device underneath the bubble to name the device or device group. See To name a device and set the number of devices in the group, on page 205.

8 Configure the MV-820-IP multiviewer's properties. See also Description of Common Device Properties, on page 332. The MV-820-IP device should be first configured with GV Orbit Client before being integrated into GV Orbit Control as most configuration parameters shown in GV Orbit Control are shown for information purposes only.

Parameter	Description
Network Host Name	The hostname is the unique name by which the associated MV-820-IP is known on the network.
Domain ID	Set the same Domain IDs on all MV-820-IP devices that are to communicate with each other on the network. The default value for Grass Valley equipment is **101**. Valid range: 0 to 232. See also Configuring a Controller Group, on page 179.
Internal wiring	Shows if the internal modeling of the MV-820-IP is complete.

9 Create the logical sources and destinations in GV Orbit Control for the MV-820-IP by adding SDI devices to the topology and then linking them. See Methods to Link Devices in a Topology, on page 222. An example is shown below.
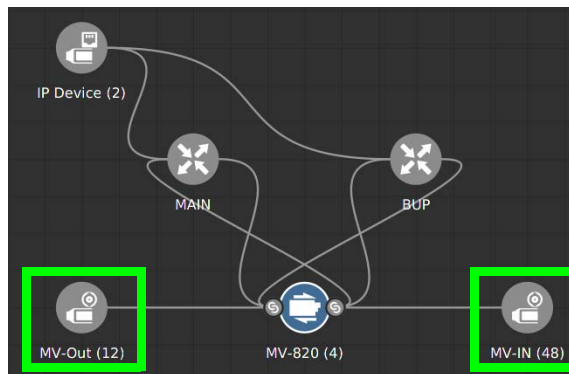
| Logical Sources Represent the Multiviewer's SDI Mosaic Outputs | Logical Destinations Represent the Multiviewer's SDI Inputs |

These logical sources and destinations represent the SDI inputs and outputs of the MV-820 multiviewer that will be used when making a take.

a From the **Device Library**, **Virtual Devices,** find the **SDI Device** bubble and drag it into position on the Topology and release the mouse button.
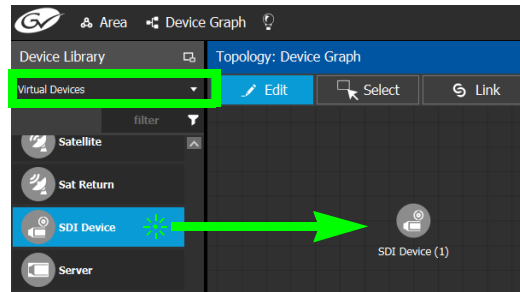
b Click on the name of the device underneath the bubble to name the device or device group. See To name a device and set the number of devices in the group, on page 205. For example, Enter *MV-Out* in both the **Name** and **Short Name** fields, then enter 12 for the number of device instances. These parameters can also be set in the **Property Editor**.

c From the **Device Library**, **Virtual Devices,** find the **SDI Device** bubble and drag it into position on the Topology and release the mouse button.

d Click on the name of the device underneath the bubble to name the device or device group. For example, Enter *MV-In* in both the **Name** and **Short Name** fields, then enter 48 for the number of device instances.

e Interconnect the SDI source and destination devices to the proper IQMix spigot SDI inputs and outputs as shown above.

If needed, contact support for more information as how to configure this device. See Grass Valley Technical Support, on page 862.

Configuring a Kahuna IP Production Switcher Device

The Kahuna IP is a production switcher. Internally, the Kahuna IP production switcher is an Kahuna SDI production switcher wrapped inside two IQMix cards to provide IP connectivity. These two IQMix cards are used to convert the IP network input streams to feed the 12 × SDI inputs of the Kahuna, and the other IQMix card to convert the 12 × SDI outputs of the Kahuna into IP stream outputs. These IQMix cards are labelled as *KahunaIPI10* and *KahunaIPO10* in GV Orbit Control. See Configuring an IQMix, IQUCP, or UCP-3901 Device, on page 352 for more information about how to configure an IQMix.

The inputs and outputs of a Kahuna IP are called *spigots*. There are 12 input and 12 output spigots. In the GV Orbit Control Device Library, the Kahuna IP switcher is discovered as two separate IP devices: the first represents the IP inputs (device type: KahunaIPI10) and the second represents the IP outputs (device type: KahunaIPO10).

KahunaIPI10: 12 Input Spigots → [Kahuna SDI Switcher] → KahunaIPO10: 12 Output Spigots
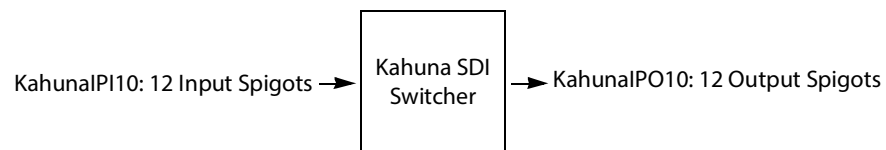
See also How to Know if a Spigot is an Input or an Output, on page 353.

There is no offline configuration of the Kahuna IP device. It must first be discovered on the network by GV Orbit Control.

The Kahuna IP device must have been previously configured with GV Orbit Client before being integrated into GV Orbit Control as most configuration parameters shown in GV Orbit Control are for information purposes only (GV Orbit Control reads it from the Kahuna IP device). See the Kahuna IP User Guide for more information.

PREREQUISITES: The Domain ID of the Kahuna IP device(s) must be set in the System Controller Group Properties under **Domain Ids**. See Configuring a Controller Group, on page 179. These devices must be on the same subnet that the GV Orbit Server is connected to.

To configure a Kahuna IP Device

1 Select the required Area. See Selecting an Area, on page 183.

2 Select the required topology. See Selecting a Graph, on page 184.

3 The topology must be currently:

   • Activated (see Activating a Topology, on page 235).

   • Unlocked (see Unlocking / Relocking a Topology, on page 238).

4 From the **Device Library**, on the left, select **Discovered** from the drop-down list.
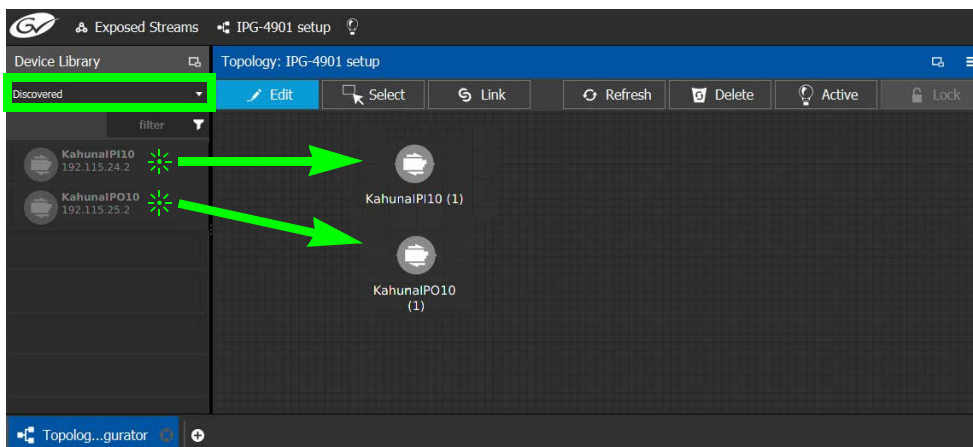
The Kahuna IP is discovered as two separate IP devices: the first represents the IP inputs (device type: KahunaIPI10) and the second represents the IP outputs (device type: KahunaIPO10).

5 From the **Device Library**, **Discovered**, find the Kahuna IP input device that you want to control: select the **KahunaIPI10** device bubble and drag it into position on the Topology and release the mouse button.

The device pulled from the **Device Library**, **Discovered** becomes greyed out and another instance of the same device instance cannot be added again to the Topology.

6 From the **Device Library**, **Discovered**, find the matching **KahunaIPO10** device bubble and drag it into position on the Topology and release the mouse button.

7 For each Kahuna IP device (IP inputs device type: **KahunaIPI10** and IP outputs device type: **KahunaIPO10**) Click on the name of the device underneath the bubble to name the device. See To name a device and set the number of devices in the group, on page 205.

8 Configure the Kahuna IP properties. See also Description of Common Device Properties, on page 332. The Kahuna IP device should be first configured with GV Orbit Client before being integrated into GV Orbit Control as most configuration parameters shown in GV Orbit Control are shown for information purposes only.

Parameter	Description
Network Host Name	The hostname is the unique name by which the associated Kahuna IP is known on the network.
Domain ID	Set the same Domain IDs on all Kahuna IP devices that are to communicate with each other on the network. The default value for Grass Valley equipment is **101**. Valid range: 0 to 232. See also Configuring a Controller Group, on page 179.
Internal wiring	Shows if the internal modeling of the Kahuna IP is complete.

9 Create and connect the edge devices (SDI and IP devices) that are connected to the Kahuna IP. See Methods to Link Devices in a Topology, on page 222. An example is shown below.

Logical Sources
Represent the
Switcher's SDI
Mosaic Outputs
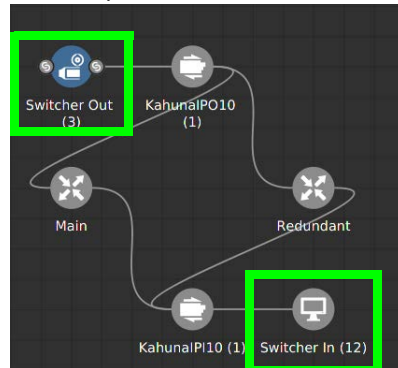
Logical Destinations
Represent the
Switcher's SDI Inputs

These logical sources and destinations represent the SDI inputs and outputs of the Kahuna switcher that will be used when making a take.

a From the **Device Library**, **Virtual Devices,** find the **SDI Device** bubble and drag it into position on the Topology and release the mouse button.
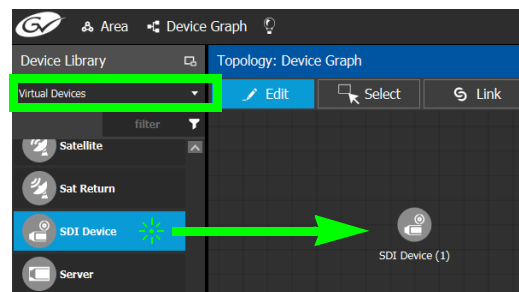
b Click on the name of the device underneath the bubble to name the device or device group. See To name a device and set the number of devices in the group, on page 205. For example, Enter *Switcher-Out* in both the **Name** and **Short Name** fields, then enter 3 for the number of device instances. These parameters can also be set in the **Property Editor**.

c From the **Device Library**, **Virtual Devices,** find the **Monitor Device** bubble and drag it into position on the Topology and release the mouse button.

d Click on the name of the device underneath the bubble to name the device or device group. For example, Enter *Switcher-In* in both the **Name** and **Short Name** fields, then enter 12 for the number of device instances.

e Interconnect the SDI source and destination devices to the proper IQMix spigot SDI inputs and outputs as shown above.

If needed, contact support for more information as how to configure this device. See Grass Valley Technical Support, on page 862.

Configuring a K-Frame Production Switcher

The K-Frame is a series of production switchers, and certain models support IP connectivity. The following frames are supported:

- K-Frame-V Production Switcher has 4 slots each providing 8 inputs and 4 outputs to the switcher, for a total of 32 inputs x 16 outputs.
- K-Frame-X Production Switcher has 14 slots. 10 slots each providing 16 inputs and 8 outputs to the switcher, followed by 4 slots each providing 8 inputs and 4 outputs of the switcher, for a total of 192 inputs x 96 outputs.

The following diagram shows a K-Frame-V / K-Frame-X Production Switchers populated with a typical assortment of I/O cards.
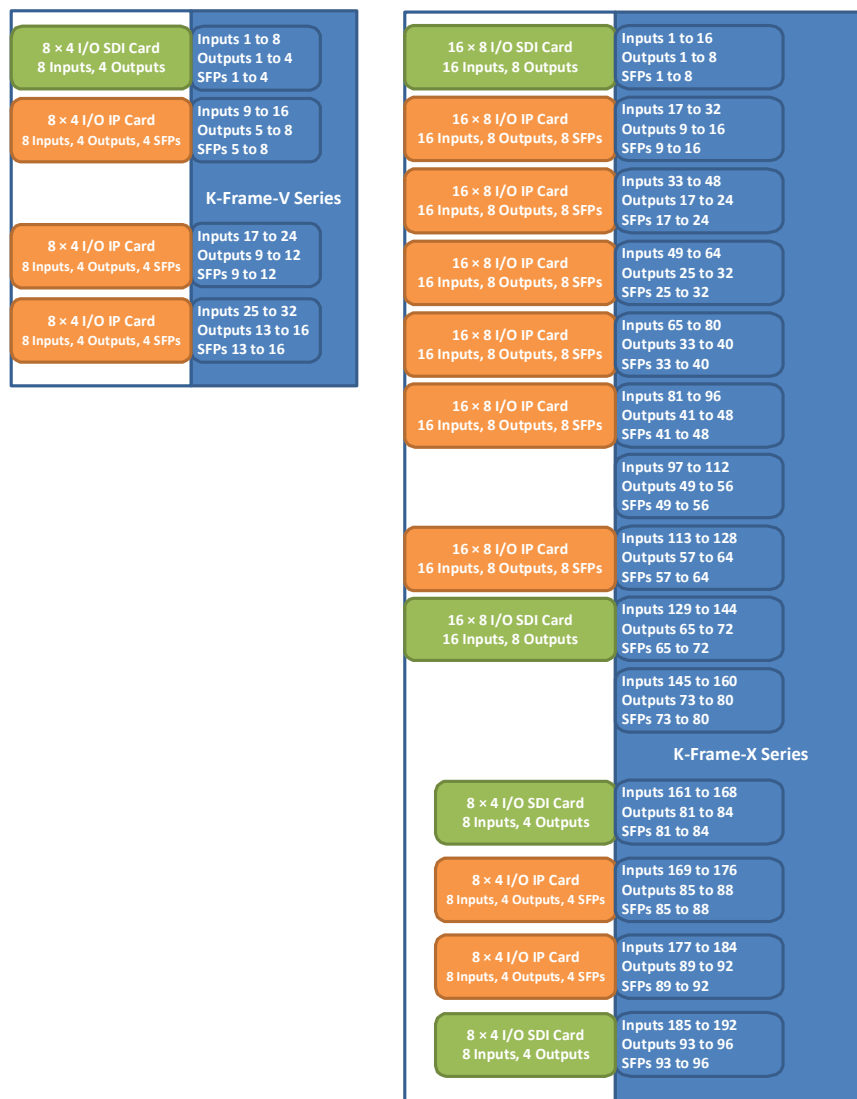
There are two types of modules which can be used in the K-Frame Production Switcher slots:

- SDI only card, equipped with BNC connectors.

- IP only card, equipped with SFP connectors.

Here are some details about IP cards you will need to know to model your K-Frame Production Switcher in GV Orbit Control:

- An SFP can receive two streams and transmit one. A stream is a group of the essence flows (a 2022-6 stream has a single flow, a TR-04 stream has two flows and a SMPTE 2110 stream has three flows)
- Each SFP stream maps directly to a switcher input or output of the slot. For example: the IP card in the second slot of the K-Frame-V Production Switcher has 4 SFP pairs (for redundancy) providing signals to inputs 9-16 of the switcher. The first SFP provides streams for inputs 9-10, the second SFP provides streams for inputs 11-12 and so on.
- IP cards support SMPTE 2022-6, SMPTE 2110, and TICO.
- Redundancy in SMPTE 2022 and SMPTE 2110 is supported.
- For SMPTE 2110-30, the following profiles are supported: L16/48K/125us, L16/48K/1ms, L24/48K/125us, L24/48K/1ms.

Note that GV Orbit Control only controls the K-Frame Production Switcher's IP receivers and transmitters. In consequence, The K-Frame Production Switcher must have been previously setup and configured before being integrated into GV Orbit Control. See the *K-Frame Installation & Service Manual* for more information.

PREREQUISITES: GV Orbit Control must have IP connectivity to the K-Frame Production Switcher:

- to automatically detect the K-Frame Production Switcher's model (K-Frame-V / K-Frame-X) and its current configuration parameters that are needed by GV Orbit Control.
- before making connections to the *Production Switcher* bubble in GV Orbit Control. See

K-Frame Production Switcher Nomenclature used in GV Orbit Control

The following diagram shows the nomenclature used in GV Orbit Control for the K-Frame-V Production Switcher signal flow. A K-Frame-X Production Switcher's signal flow uses a similar architecture, with more inputs and outputs.
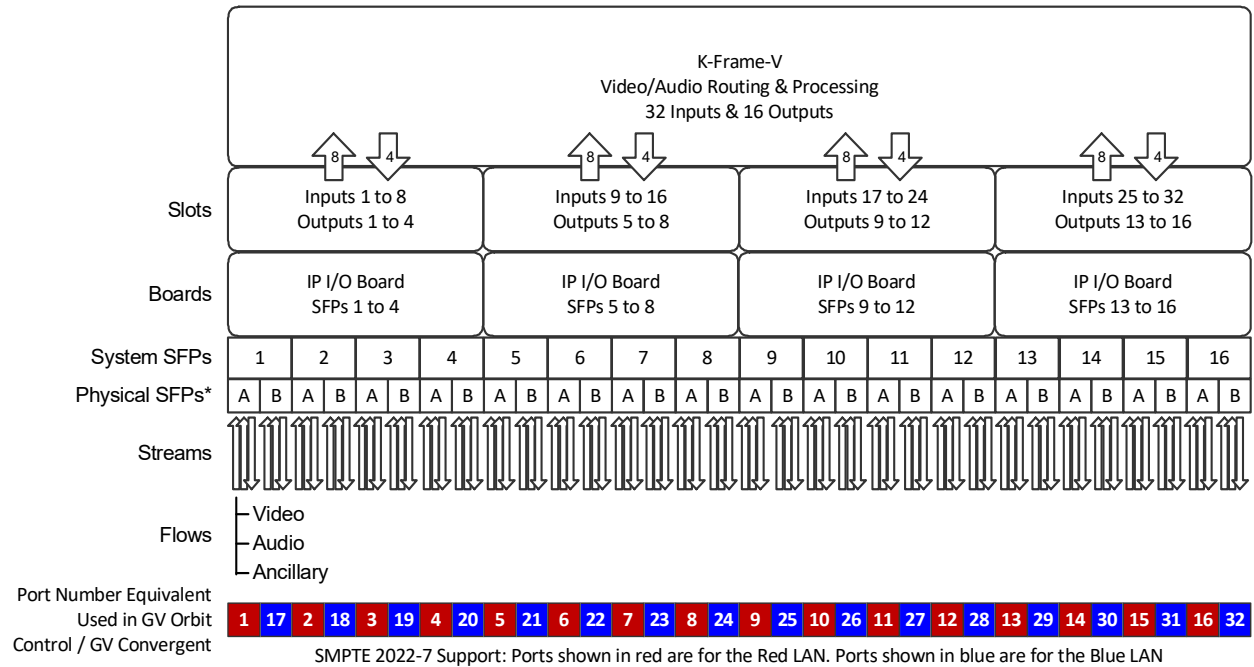
* This is shown in the Short Name property for a port. For example, SFP-1A is the first input port.

* Note that GV Orbit Control's **Short Name** property for a port is composed of a combination of the System SFP number and the Physical SFP letter in the following format: SFP-[System SFP number][Physical SFP letter]

For example, **SFP-1A** is the first input port. This port is shown below in the K-Frame Menu for reference.

When *Redundancy Mode* is *Enabled* in the K-Frame Menu, you must use a SMPTE ST 2022-7 network setup; see Configuring Network Switch Redundancy to Support SMPTE ST 2022-7, on page 399.

To configure a K-Frame Production Switcher

1 Add the Production Switcher device to the Topology: from the **Device Library**, **Virtual Device**, find the **Production Switcher** device bubble. See Adding a Virtual Device to a topology, on page 204.
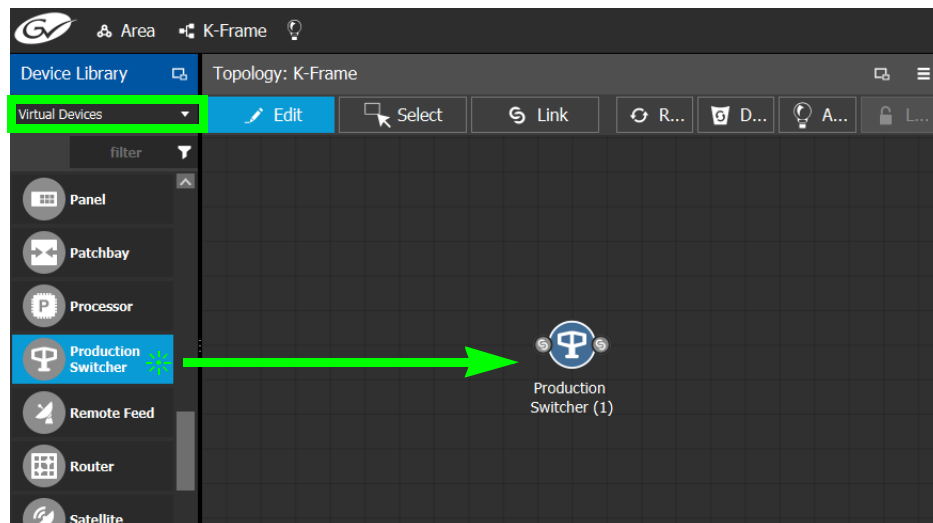
2 Click on the name of the device underneath the bubble to enter a meaningful name to identify this device in the **Name** field. See To name a device and set the number of devices in the group, on page 205.

These parameters can also be set in the **Property Editor**.

3 Click **New** ⊕ next to **Control Port** at the top of the **Property Editor** and select **K-Frame CPL TCP/IP** from the list. See also Defining Device Properties, on page 229 for more information.
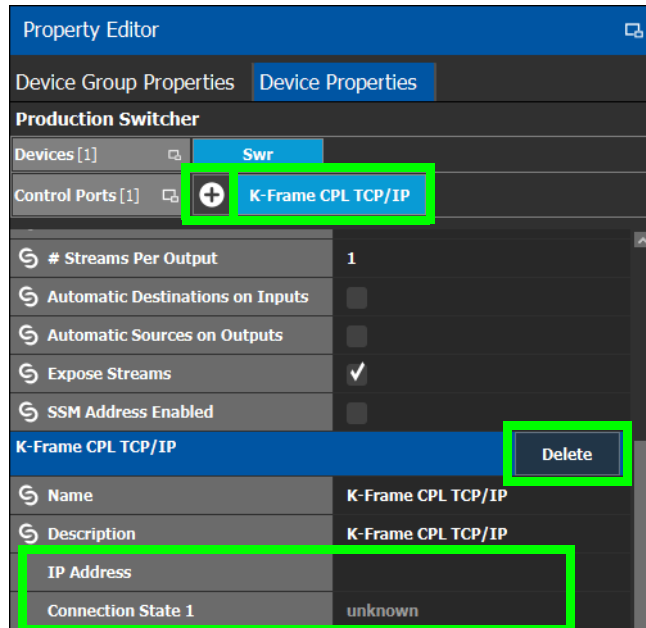
The **K-Frame CPL TCP/IP** tab appears. To remove the control port, click Delete.

4 Configure the K-Frame Production Switcher properties. See also Description of Common Device Properties, on page 332.

Parameter	Description
Network Host Name	The hostname is the unique name by which the associated K-Frame Production Switcher is known on the network.
IP Address	The IP address of the K-Frame Production Switcher to be controlled. Once connected, GV Orbit Control automatically detects the K-Frame Production Switcher's model (K-Frame-V / K-Frame-X) and K-Frame Production Switcher's configuration parameters that are needed by GV Orbit Control.

Parameter	Description
Connection State 1 Connection State 2	K-Frame Production Switcher Connection State 1 shows the connection status of the K-Frame Production Switcher with the primary server of a server group. K-Frame Production Switcher Connection State 2 shows the connection status of the K-Frame Production Switcher with the secondary server of a server group. See Configuring a Controller Group, on page 179. **unknown:** The topology is inactive (see Activating a Topology, on page 235) or the K-Frame Production Switcher does not have network connectivity to the GV Orbit Server(s). **Reconnecting:** The topology has been activated and GV Orbit Control is learning the K-Frame Production Switcher's current configuration. **offline:** The K-Frame Production Switcher does not have network connectivity to the GV Orbit Server(s). **online:** The K-Frame Production Switcher is connected to the GV Orbit Server(s).
Frame Model	Once the topology has been activated, this shows the frame model. This is shown for information purposes only.

5 Activate the topology. See Activating a Topology, on page 235.

The current K-Frame Production Switcher input and output ports are read into GV Orbit Control and become available to be connected within GV Orbit Control. According to the type of streams configured in K-Frame Production Switcher, the corresponding logical levels are created in the Logical Device Table. See Logical Device Table Tasks, on page 241 for more information.

When a port is selected, see the **Short Name** property to see the K-Frame Production Switcher's internal port reference. For more information, see K-Frame Production Switcher Nomenclature used in GV Orbit Control, on page 372.
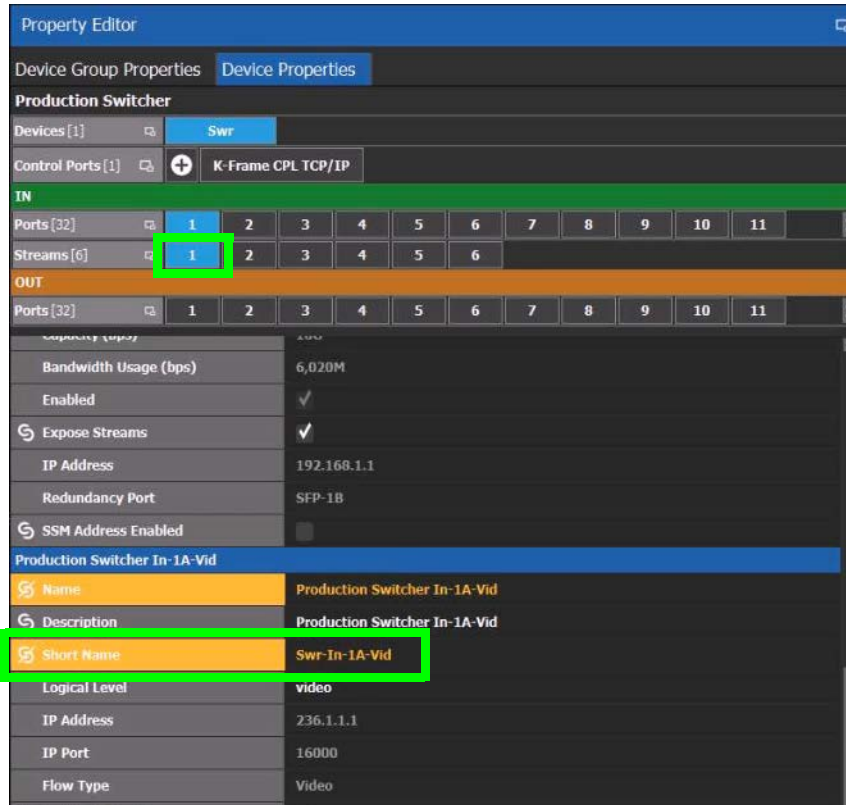
Each input port supports two sources. When a stream is selected, see the **Short Name** property to see the stream type currently configured in the K-Frame Production Switcher.

Streams	Description	Short Name
1	This is the video stream for the first source.	Swr-In-1A-Vid
2	This is the audio stream for the first source[a].	Swr-In-1A-Aud
3	This is the Ancillary stream for the first source[a].	Swr-In-1A-Anc
4	This is the video stream for the second source.	Swr-In-2A-Vid
5	This is the audio stream for the second source[a].	Swr-In-1A-Aud
6	This is the Ancillary stream for the second source[a].	Swr-In-1A-Anc

a. This stream is not shown if the selected port is configured as SMPTE 2022-6.

The K-Frame Production Switcher can now be used to make takes. See Router Control Tasks, on page 470 for more information.

Adding NMOS Devices to a Topology

GV Orbit Control supports Networked Media Open Specifications (NMOS) AMWA IS-04 for device discovery and registration and IS-05 for connection management[1]. Furthermore, it supports AMWA BCP-002-01 for the natural grouping of NMOS resources.

GV Orbit Control has a built-in NMOS registry (see below) that can be used to register NMOS devices. To be able to discover NMOS devices, you have one of the following options:

- Allow GV Orbit Control to automatically discover one or more NMOS registries through DNS-SD. DNS-SD can discover an NMOS registry that is available on the network and registered in your DNS server.
- Point GV Orbit Control to use its internal NMOS registry (when enabled), or to an external NMOS registry.

GV Orbit relies on the NMOS senders / receivers Group Hint Tag property to determine the available audio streams / flows to be used in order to extract the appropriate audio channels used for the creation of the automatic logical sources / destinations. You can still create custom logical sources / destinations using specific streams and specific audio channels.

PREREQUISITES:

- Entries for your NMOS registries have been added to the network DNS server. This enables automatic DNS-SD discovery. Contact your IT department to do so. Otherwise you can manually specify the registry to connect to.
- Routing between IP sources and IP destinations that have different flow configurations requires an Audio Live in order to convert audio flows into compatible ones. See Configuring a Device that Supports Audio Breakaway/Shuffling such as Audio Live, on page 433.

Notes

- GV Orbit Control listens for changes to any of the nodes in the registry. As it receives updates, it automatically updates any device that is dropped onto any topology that is associated with that node.
- If the registry is shut down, or the node is stopped and is removed from the registry, the devices will disappear from the list of discovered devices. The devices you already have dropped will remain on the topology, but will no longer receive updates.
- If the registry is restarted or the node is restarted, GV Orbit Control will continue to update the devices on the topology (assuming the devices have the same UUID).

To configure GV Orbit Control for use with NMOS

To use GV Orbit Control with NMOS devices, you first must configure it to use its internal NMOS registry, to use an external NMOS registry, or to automatically search for external NMOS registries.

1.GV Orbit Control supports IS-05 v1.1 API when available. This version is used before v1.0 when both versions are available.

1 Open the **System Controller Group Properties**. See Configuring a Controller Group, on page 179.

2 Set the following parameters.

Property Editor	
System Controller Group Properties	Properties
System Controller	
Name	System Controller
# Controllers	1
Short Name	System Controller
Advanced	
Description	System Controller
Virtual IP Address	0.0.0.0
Reference IP	0.0.0.0
NMOS Discovery DNS	10.36.140.10
NMOS Discovery Search Domain	gad.local
NMOS Registry	http://10.118.103.135:4041
Domain IDs for IP Routing	101
Domain IDs for Data Import	105

Parameter	Description
NMOS Discovery DNS NMOS Discovery Search Domain	GV Orbit Control can automatically discover an NMOS registry through DNS-SD when the **NMOS Discovery DNS** and **NMOS Discovery Search Domain** parameters are set. **NMOS Discovery DNS:** The IP address of the network DNS server that is also used to support networked NMOS devices. **NMOS Discovery Search Domain:** The network's domain name on which GV Orbit Control will search for NMOS devices and the NMOS registry. The **NMOS Discovery DNS** and **NMOS Discovery Search Domain** parameters are automatically retrieved from the GV Orbit's Server operating system when available (refer to **IP Configuration**, **DNS** tab in the *GV Orbit Admin Guide*; see Related Documentation, on page 7). The operating system values can be overridden by setting the appropriate values here. NOTE: If the DNS information is changed in the admin interface, GV Orbit Control must be restarted to retrieve the new values from the OS.

Parameter	Description
NMOS Registry	This shows the current NMOS Registry Query API URL (hostname / IP address and port number). Set a static NMOS registry URL when NMOS registry discovery is non-functional or when you want to override it to use a specific NMOS registry. If the *NMOS Registry* service is installed and running on the GV Orbit Server and you want to use GV Orbit Control's built-in NMOS registry, set this URL to the local host IP address for this service: **http://127.0.0.1:4041**. The NMOS registry is available to NMOS devices at the current system controller's IP address[a], on port **4041**. The priority of GV Orbit Control's NMOS registry is 0. If redundancy has been configured for GV Orbit Control, use the Virtual IP Address, on port **4041** to access the NMOS registry. Refer to **Application Upgrade** in the *GV Orbit Admin Guide* to install the *NMOS Registry* service and ensure that it is running. See Related Documentation, on page 7. To revert to automatic NMOS registry discovery, clear this field, press <Enter>, and wait 10 seconds for the above **NMOS Discovery DNS** and **NMOS Discovery Search Domain** parameters to take effect.

a. This is the same IP address as for GV Orbit Control's administration interface. This is shown as **IP Address** in step 6 on page 181.

3 To be able to discover NMOS devices in GV Orbit Control, you have one of the following options:

- Allow GV Orbit Control to automatically discover one or more NMOS registries through DNS-SD (set the **NMOS Discovery DNS** and **NMOS Discovery Search Domain** parameters). This is possible when the NMOS registries have been added to the network DNS server.

- Manually point GV Orbit Control to use the NMOS Registry service (when enabled), or to an external NMOS registry by setting a fixed URL for the registry (set the **NMOS Registry** parameter).

Update the server's Host file

In order for GV Orbit Control to communicate with the NMOS registry to retrieve a list of all its resources, retrieve update notifications, download SDP files and perform connection management, GV Orbit Control must be able to reach the host where the registry is running by its hostname. In order to do this, an entry for the NMOS host MUST be added to the server's hosts file.

The Host file is found here: `/etc/hosts`

Sample entry:
```
10.37.80.177    <registryHostName>
```

Once the server for the NMOS registry has been added to the hosts file, the GV Orbit Control service needs to be restarted. See *Reboot* found under *Upgrade Task* in the **GV Orbit Admin Guide**. See Related Documentation, on page 7.

Note that this applies even if you use the registry's IP address when specifying the URL of the NMOS Discovery Registry. Once the entry in the hosts file is added, the **NMOS Registry**

parameter can be either `http://10.37.80.177:4041` or `http://<registryHostName>:4041`

To update the server's Host file, contact Grass Valley Technical Support. See Grass Valley Technical Support, on page 862.

NMOS Node control port status in GV Orbit Control

GV Orbit Control pings the NMOS node to keep the connection active using the URL `http://XXX.XXX.XXX.XXX:4041/x-nmos/node/v1.2/self`. GV Orbit Control uses the success of the ping to determine the node's control port status (Online/Offline).

> **Note:** If the NMOS node's status is offline, check if the node's URL contains only a hostname (as opposed to a numeric IP address). If GV Orbit Control cannot resolve the hostname, then you need to add an entry into the server's hosts file and then restart GV Orbit Control. GV Orbit Control must be able to resolve the node's hostname in order to report the control port status as being online, download SDP files, and perform connection management. See Update the server's Host file, on page 379 and *Reboot* found under *Upgrade Task* in the **GV Orbit Admin Guide**. See Related Documentation, on page 7.

How to test the NMOS registry

Test the registry as follows: in a web browser, enter the following address into the browser's address bar: `http://XXX.XXX.XXX.XXX:4041/x-nmos/query/v1.2/`

Where `XXX.XXX.XXX.XXX` is the IP address of GV Orbit's NMOS registry. This can be either GV Orbit's Server IP address (for its internal NMOS registry), or the query API IP address of an external NMOS registry, if available. For external NMOS registries, see the NMOS registry's documentation as it may use a number of different IP addresses; one for the query API and another for the registration API for example.
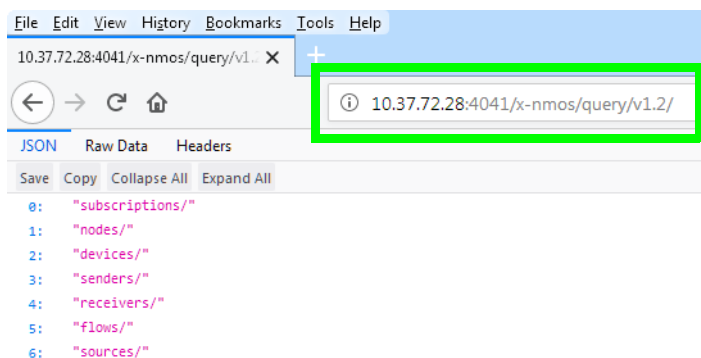
The following NMOS registry switches show the current NMOS registry's content:

```
subscriptions
nodes
devices
senders
receivers
flows
sources
```

This is accessible by, for example, entering the following address into the browser's address bar: `http://XXX.XXX.XXX.XXX:4041/x-nmos/query/v1.2/nodes`

As the NMOS registry has just been started, it is normal that it is empty of content. Wait for devices to discover the NMOS registry and to publish their resources to the registry.

> **Note:** If nodes are not published to the registry and are not listed under `http://XXX.XXX.XXX.XXX:4041/x-nmos/query/v1.2/nodes`, they will not be discovered by GV Orbit Control. Further device troubleshooting will be required to identify why a device is not publishing to the NMOS registry.

About the grouphint tag

AMWA BCP-002-01 makes use of the *grouphint* tags to identify senders and receivers. When a discovered device publishes grouphint tag information in senders / receivers to the NMOS registry, GV Orbit Control will automatically create the related logical sources and destinations for the device, once the NMOS device has been added to the topology. If a discovered device does not publish grouphint tags to the NMOS registry, then you will have to create the logical sources and destinations for the device manually in GV Orbit Control.

Logical sources / destinations are created using the audio channels from the grouphint tag information, when available. GV Orbit assesses if the audio flows use 1, 2 or 4 audio streams and then the 16 audio channels from the automatic logical sources / destinations are accordingly created using the multi audio streams / flows as required.

Number of Audio Flows as determined by the flow's *grouphint* tag	Effect in GV Orbit Control
1	There is 1 audio stream with 16 audio channels which are represented in GV Orbit Control by the **AES67-16** logical level. In the NMOS device's Properties, the following streams are available: **1:** SDI, SMPTE ST 2022. In the Logical Device Table, this is represented by the **SDI** column. **2:** Video, SMPTE ST 2110-20. In the Logical Device Table, this is represented by the **V** column. **3:** Audio AES67-16, SMPTE ST 2110-30. In the Logical Device Table, this is represented by the **A1** to **A16** columns. **7:** Ancillary, SMPTE ST 2110-40. In the Logical Device Table, this is represented by the **ANC** column.

Number of Audio Flows as determined by the flow's *grouphint* tag	Effect in GV Orbit Control
2	There are 2 audio streams; each stream has 8 audio channels which are represented in GV Orbit Control by the **AES67-8** logical level. In the NMOS device's Properties, the following streams are available: **1:** SDI, SMPTE ST 2022. In the Logical Device Table, this is represented by the **SDI** column. **2:** Video, SMPTE ST 2110-20. In the Logical Device Table, this is represented by the **V** column. **3:** Audio AES67-8, SMPTE ST 2110-30. In the Logical Device Table, this is represented by the **A1** to **A8** columns. **4:** Audio AES67-8, SMPTE ST 2110-30. In the Logical Device Table, this is represented by the **A9** to **A16** columns. **7:** Ancillary, SMPTE ST 2110-40. In the Logical Device Table, this is represented by the **ANC** column.
4	There are 4 audio streams; each stream has 4 audio channels which are represented in GV Orbit Control by the **AES67-4** logical level. In the NMOS device's Properties, the following streams are available: **1:** SDI, SMPTE ST 2022. In the Logical Device Table, this is represented by the **SDI** column. **2:** Video, SMPTE ST 2110-20. In the Logical Device Table, this is represented by the **V** column. **3:** Audio AES67-4, SMPTE ST 2110-30. In the Logical Device Table, this is represented by the **A1** to **A4** columns. **4:** Audio AES67-4, SMPTE ST 2110-30. In the Logical Device Table, this is represented by the **A5** to **A8** columns. **5:** Audio AES67-4, SMPTE ST 2110-30. In the Logical Device Table, this is represented by the **A9** to **A12** columns. **6:** Audio AES67-4, SMPTE ST 2110-30. In the Logical Device Table, this is represented by the **A13** to **A16** columns. **7:** Ancillary, SMPTE ST 2110-40. In the Logical Device Table, this is represented by the **ANC** column.

In the NMOS device Properties, the number, type of streams, and AES67 Logical Level are updated in real time according to the grouphint tag information. For example, this screen shows the Properties for an NMOS device where there is 1 audio stream, and as a consequence, the level for the audio stream is shown as AES67-16.
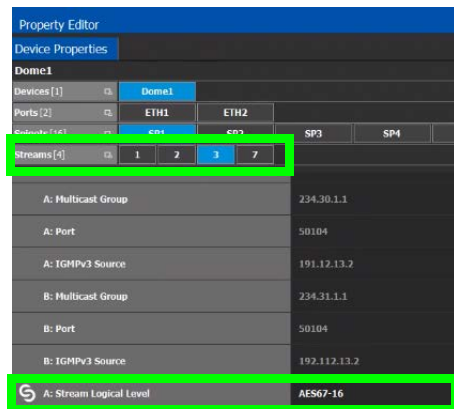
In the Logical Device Table, the NMOS device reflects the automatic.

To Add an NMOS Device to a Topology

PREREQUISITES:

- There is an operational NMOS registry on the network.
- GV Orbit Control has been configured to connect to the NMOS registry. See To configure GV Orbit Control for use with NMOS, on page 377.
- NMOS devices must be configured to publish their available resources to the NMOS registry.

Proceed as follows.

1 Add the NMOS device to the Topology: from the **Device Library**, **Discovered**, find an NMOS device bubble that you want to control. See To add a Discovered Device to a Topology, on page 209.
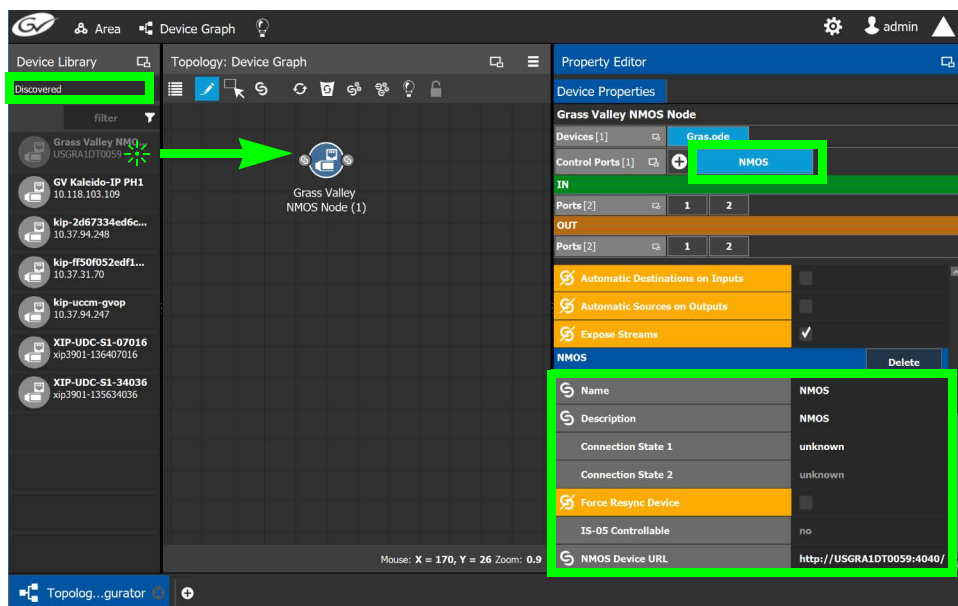
2 Click on the name of the device underneath the bubble to name the device or device group. See To name a device and set the number of devices in the group, on page 205.

3 The NMOS Control Port parameters are configured in the device's Property Editor, under the **Device Properties** tab. See Defining Device Properties, on page 229 for more information about this tab.

4 Select **NMOS** tab (next to **Control Port** at the top of the **Property Editor**) to configure the Device Properties in the **Property Editor**. See also Description of Common Device Properties, on page 332.

The NMOS control port properties appear.

Parameter	Description
Connection State 1 / 2	This shows the current connection state to the NMOS nodes. When a redundant configuration is used (two GV Orbit Servers form a cluster) **Connection State 1** and **Connection State 2** shows the connectivity of each server to the NMOS nodes. **unknown:** The topology is inactive (see Activating a Topology, on page 235) or the NMOS device does not have network connectivity to the GV Orbit Server(s). **reconnecting:** The GV Orbit Server is in the process of establishing communications with the NMOS device. **offline:** The NMOS device does not have network connectivity to the GV Orbit Server(s). **online:** The NMOS device is connected to the GV Orbit Server(s).
Force Resync Device	Set to make GV Orbit Control reload the NMOS device's parameters from the NMOS registry.
IS-05 Controllable	This status shows whether the corresponding node in the NMOS registry has devices that support being controlled through IS-05 (connection management). **Yes:** Routes to these devices should succeed. **No:** If you try to route to a device that is not IS-05 controllable, the route will fail. **Partial:** Some devices are controllable in this node, while others are not.
NMOS Device URL	This is the NMOS device's current URL and port number.

Ports and streams are automatically created using the values found in the registry, and they will automatically be updated whenever GV Orbit Control receives notifications of changes from the NMOS registry.

You can change the following NMOS device properties which will not be overwritten with values from the NMOS registry (the value you set for these properties will persist in GV Orbit Control): Labels, Short labels, Descriptions, Network label, and Logical levels. See Defining Device Properties, on page 229.

Using SDP Parameters to Take a Stream from a non-NMOS Device to an NMOS Device

In order to use IS-05 connection management, Session Description Protocol (SDP) information is required to be sent as part of the command. GV Orbit Control can create SDP type parameters that a receiving NMOS device requires in order to successfully complete a take made from devices that do not generate and publish their own information.

The SDP information is now generated by GV Orbit Control and is included in the connection management commands to allow discovered AMWA NMOS receivers to join non-discovered senders, or source devices created within the GV Orbit Control client. This SDP information is not currently published to the AMWA NMOS registry.

Within GV Orbit Control, a number of default SDP parameter templates are built-in and are selected according to the stream's **Logical Level** parameter. The SDP parameters can be tweaked if necessary as these SDP parameters must represent the current details and specifications of the source's stream.

The following device bubbles support SDP parameters:

- IP Device
- GV Node
- IQ-family type IP devices, for example, IQMix, IQUCP, UCP-3901, IQAMD, MV-820-IP, Kahuna IP, and so on
- Audio Live

Related Topics

- The Stream Configurator allows you to configure the SDP template for streams on a large scale. See

PREREQUISITES: To customize the SDP parameter, you must know how to form a valid SDP. This is beyond the scope of this document. For more information about SDP specific parameters, see RFC 4566. See also SDP.

The SDP parameters are configured in the device's Property Editor, under the **Device Group Properties** tab and in the **Device Properties** tab. See Defining Device Properties, on page 229 for more information about these tabs.
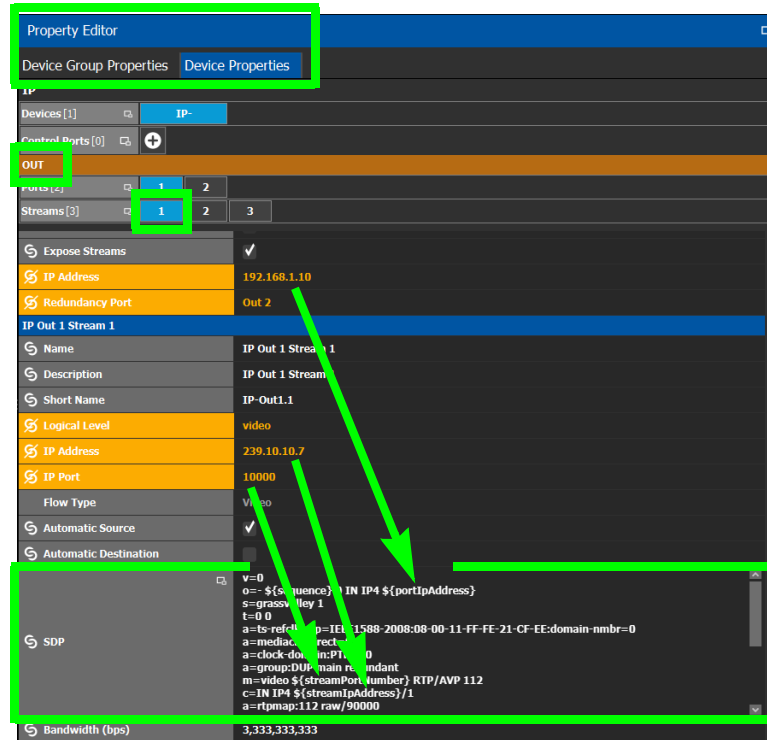
Certain SDP parameters have been enhanced with new GV Orbit Control variables which allows for better device control integration within GV Orbit Control. These variables are available for **SDP** parameters configured under the **Device Group Properties** and the **Device Properties** tab, output stream property. Variables always start with a dollar sign ($) and are enclosed in curly brackets {} as shown in the example below.

Once the topology is activated, the variables set in the SDP are replaced with the actual values GV Orbit Control has resolved for the device's stream. This can be helpful for troubleshooting.

See Defining Device Properties, on page 229 to know more about how parameter values in the **Device Properties** tab inherit their values from the corresponding parameter values in the **Device Group Properties** tab.

Example of SDP parameters used in GV Orbit Control

The following is a typical example of the SDP parameters used in GV Orbit Control.

```
v=0
o=- ${sequence} 0 IN IP4 ${portIpAddress}
s=grassvalley 1
t=0 0
a=recvonly
a=ts-refclk:ptp=IEEE1588-2008:08-00-11-FF-FE-22-04-00:127
a=mediaclk:direct
m=video ${streamPortNumber} RTP/AVP 98
```

```
c=IN IP4 ${streamIpAddress}/1
a=rtpmap:98 SMPTE2022-6/27000000
```

Special GV Orbit Control SDP Variables

The following table lists the supported special GV Orbit Control variables for use anywhere within the SDP parameter. These variables reference parameters that are configured elsewhere in GV Orbit Control, thereby automatically keeping stream information up-to-date.

GV Orbit Control SDP Variable	Description
`${audioBits}`	The audio stream's bit depth.
`${channelCount}`	The number of (audio) channels.
`${clockSetting}`	The PTP master clock setting.
`${sequence}`	This SDP file's ID
`${packetTime}`	The length of time in milliseconds represented by the (audio) media in a packet.
`${portIpAddress}`	The sending port's IP address. The source for this variable comes from the Port's **IP Address** parameter for this stream.
`${streamIpAddress}`	The transmit (sending) stream's multicast IP address. The source for this variable comes from the stream's **IP Address** parameter.
`${streamPortNumber}`	The transmit (sending) stream's IP port number. The source for this variable comes from the stream's **IP Port** parameter.
`${redundantIpAddress}`	The transmit (sending) stream's redundant multicast IP address. The source for this variable comes from the stream's **IP Address** parameter used for the redundancy port. See the **Redundancy Port** parameter to identify the current redundancy port.
`${redundantPortNumber}`	The transmit (sending) stream's redundant IP port number. The source for this variable comes from the stream's **IP Port** parameter used for the redundancy port. See the **Redundancy Port** parameter to identify the current redundancy port.
`${redundantPortIpAddress}`	The transmit (sending) stream's redundant IP port number. The source for this variable comes from the stream's **IP Address** parameter used for the redundancy port. See the **Redundancy Port** parameter to identify the current redundancy port.
`${rtpPayloadType}`	The RTP payload type as defined by the SDP specification.
`${samplingRate}`	The audio stream's sampling rate.

Editing SDP Parameters

Any of the above variables can be substituted with a fixed equivalent value so that it is hard coded. For example, the variable `${portIpAddress}` represents a multicast IP address and it can be replaced with an IP address such as *230.1.1.1*.

When you edit any SDP parameter:

- The SDP becomes fixed and will no longer automatically update when you make a change elsewhere in the Property Editor. For example, changing the logical level parameter will not update the SDP parameters with the logical level change. You will have to further edit the SDP to adapt it to any such change.
- The SDP becomes orange to indicate that its default value has been overridden. See Defining Device Properties, on page 229 to know more about how to reset a parameter to its default value.

Configuring Cisco DCNM Network Switch Devices

Networks that use Cisco Data Center Network Manager (DCNM) to manage LAN fabric can be controlled by GV Orbit Control.

PREREQUISITES:

- DCNM build 11.0(1) or higher
- Switch's firmware: NXOS 9.2(1) or higher for 9200, 9300-EX, and 9500-R switches.
- Switch's BIOS: version 07.64, compile time: 05/17/2018
- Configure the required DCNM network switch's flow policies. See below.

Note: As of DCNM v11.5(1), the DCNM application is now separate from the RabbitMQ application, with each application having its own independent user credential management. Thus, changing DCNM user credentials will not change existing RabbitMQ user credentials. Note that GV Orbit Control uses the user credentials from RabbitMQ and not from DCNM.

Configuring the Network Switch's Flow Policies

If you are using a network switch with DCNM control port, flow policies must be manually set in the DCNM web interface, before you configure GV Orbit Control to use the network switch.

Each flow policy sets the maximum bandwidth that can be allocated to a type of traffic flow. See the table below. **Only the flow policies for bandwidths you will use in your network need to be created.**

Each flow policy must have a multicast IP address range associated to it, according to your network addressing pattern, as GV Orbit Control uses a different multicast IP range for each type of traffic flow and bandwidth (audio, video 3G, Video HD, ANC / metadata, and so on). Class D IP addresses are multicast addresses. By default, IP address 239.255.0.1 may be reserved for use by certain Grass Valley equipment for DDS discovery and should not be allocated for any other purpose.

Review documentation for all equipment you are going to use on your network for any specific IP addressing and bandwidth requirements.

Establish the Customer Multicast IP Addressing Pattern

All network IP devices must be assigned an IP address, and each network traffic type is assigned to a IP address range according to its bandwidth requirement.

For example, the following table shows a typical multicast IP addressing pattern and the bandwidth allocation required by traffic flow type.

Traffic Flow Type	Flow Policy	Typical IP address range		Recommended Bandwidth Allocation
		From	To	
Video	SMPTE2022-6(3G)	230.1.1.1	230.255.255.255	3.2Gbps
	SMPTE2022-6(HD)	229.1.1.1	229.255.255.255	1.601Gbps
	SMPTE2022-6(SD)	228.1.1.1	228.255.255.255	0.27Gbps
	SMPTE2110-20(3G)	238.1.1.1	238.255.255.255	2.703Gbps
	SMPTE2110-20(HD)	237.1.1.1	237.255.255.255	1.401Gbps
	SMPTE2110-20(SD)	236.1.1.1	236.255.255.255	0.23Gbps
Audio	SMPTE2110-30(AES)	234.1.1.1	234.255.255.255	61Mbps
ANC (metadata)	SMPTE2110-40(ANC)	235.1.1.1	235.255.255.255	2Mbps
Default[a]		*		150Kbps

a. This allows any general network management data to pass through the network while guaranteeing that it will not take up any significant amount of total network bandwidth. When needed, this bandwidth allocation is also used for DDS discovery when such equipment uses a multicast address that is outside of any other pre-existing flow policy you have created (this must be the case).

Delete Pre-existing Flow Policies

If your switch has been previously configured, you may need to remove any pre-existing flow policies. These flow policies have the status **Create** under **Deployment Action**.
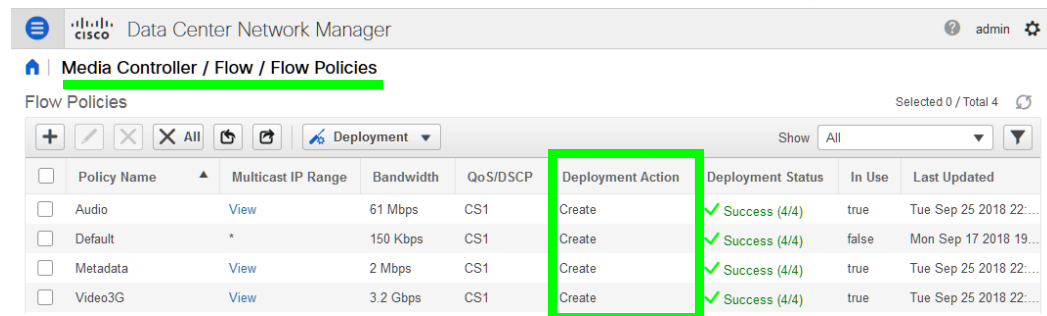
To delete pre-existing current flow policies

1 In the **Deployment** drop menu, select **Undeploy All Custom Policies**.
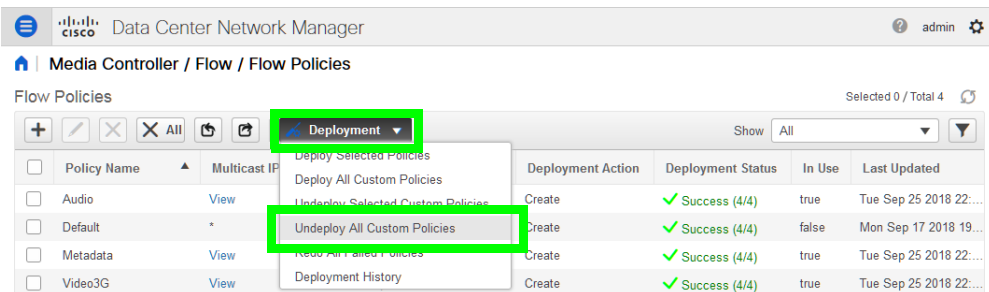
2 The **Deployment Action** column will show **Delete** instead of **Create**.

3 Select all flow policies from the list, but exclude the **Default** flow policy: do not remove the **Default** flow policy as it will be needed.

4 Use the delete (X) button to delete the selected flow policies.

Add New Flow Policies Using Your IP Addressing Pattern

According to the IP addressing pattern shown in the above table, create the new flow policies for each traffic flow type you are going to use.

To add new flow policies

1 Click New (+).

2 Set the parameters for the flow policy. The setting for **QoS/DSCP** is **CS1**.

3 Click Deploy.

4 Repeat to create all necessary flow policies.

5 In the **Deployment** drop menu, select **Deploy All Custom Policies**.

The status under **Deployment Action** becomes **Create** and the **Deployment Status** becomes **Success**.

Configuring a DCNM Network Switch Device

To configure a DCNM Network Switch Device

1 Add the Network Switch device to the Topology: from the **Device Library**, **Discovered,** find the Network Switch device bubble. See Adding a Virtual Device to a topology, on page 204.
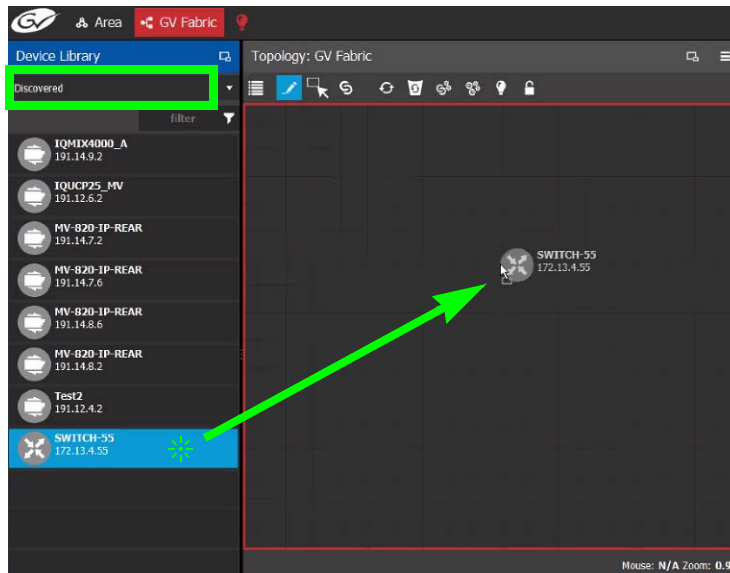
2 Click on the name of the device underneath the bubble to enter a meaningful name to identify this device in the **Name** field. See To name a device and set the number of devices in the group, on page 205.

These parameters can also be set in the **Property Editor**.

3 Set the number of physical input and output connectors being used on the network switch in **# Input Connectors** and **# Output Connectors**. See Defining Device Properties, on page 229 for more information.
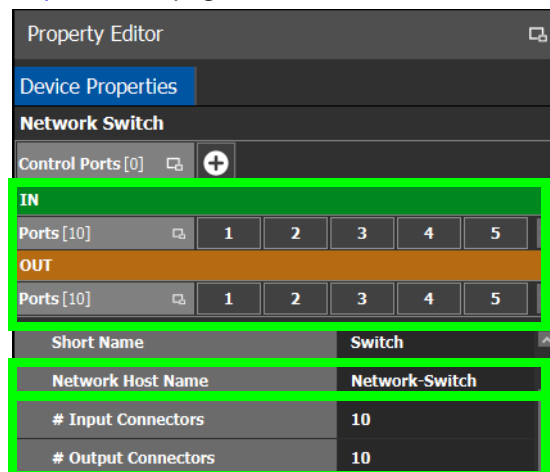
The configuration for these ports become available as **Ports** under **IN** and **OUT**.

4 Click **New** ⊕ next to **Control Ports** at the top of the **Property Editor** and select **Cisco DCNM** from the list. **Dummy Network Switch** should be used when the DCNM network

manager is not being used for the network switch. See Defining Device Properties, on page 229 for more information.
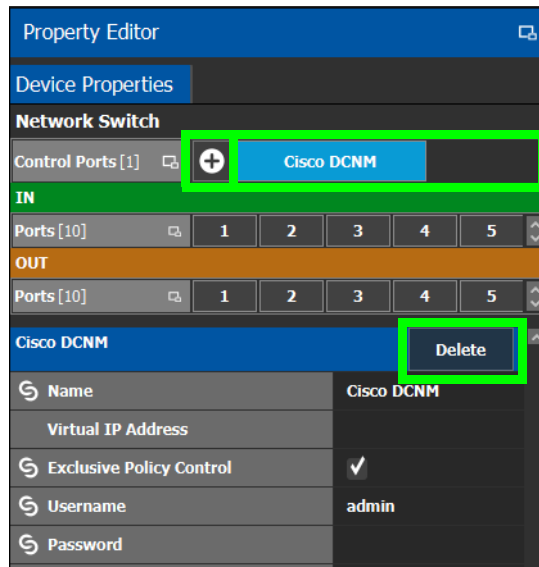
The **Cisco DCNM** tab appears. To remove the control port, click Delete.

5   Select **Cisco DCNM** tab (next to **Control Port** at the top of the **Property Editor**) to configure the Device Properties in the **Property Editor**. Only the properties shown below should be used. See also Description of Common Device Properties, on page 332.

Parameter	Description
Network Host Name	This is the unique name by which the Network Switch is identified within GV Orbit Control. This value is used to construct the input/output port labels.
Cisco DCNM Control Port parameters	
Virtual IP Address	This is the virtual IP address to communicate with DCNM cluster. This IP is used to address any active member of the two nodes that are operating in High Availability (HA) mode. If DCNM is not operating in HA mode, use the DCNM node IP address.
Exclusive Policy Control	When set, GV Orbit Control operates in exclusive mode: any change to the host aliases, host policies or flow policies (through DCNM web interface for example) will be overwritten and restored by GV Orbit Control. This is the supported mode to be used. Only deselect this parameter under the guidance of Grass Valley Technical Support.
Enabled	When set, GV Orbit Control controls the switch. When deselected, GV Orbit Control no longer controls the switch, thus allowing you to perform maintenance operations on the switch. When re-establishing control (set **Enabled**), GV Orbit Control will push the current policies to the switch.
Username	Set the administrator's username to access the DCNM network.
Password	Set the administrator's password to access the DCNM network.

Parameter	Description
Connection State 1 / 2	This shows the current connection state to the switch. When a redundant configuration is used (two GV Orbit Servers form a cluster) **Connection State 1** and **Connection State 2** shows the connectivity of each server to the switches. **Unknown:** The Virtual IP is not configured yet or the topology is inactive. **Online:** GV Orbit Control is connected to DCNM. **Offline:** The topology is active and GV Orbit Control is unable to communicate with DCNM. **Reconnecting:** GV Orbit Control is trying to reach DCNM.
Active Host Name Active IP Address Standby Host Name Standby IP Address	In a redundant High Availability network architecture, one node (in standby mode) provides failover protection to another node (currently active). **Host Name:** The hostname is the unique name by which the active / standby node is known on the network. **IP Address:** The network IP address for the active / standby node.

6 Do not configure any parameters found under Ports or Streams. These are shown for information purposes only.

7 Add IP devices to the topology and then connect them to the switch: Click Quick Connect to link the devices. See Using Quick Connect to Link all Devices in a Topology, on page 222. See also Methods to Link Devices in a Topology, on page 222.

To support network redundancy for use with SMPTE ST 2022-7 compatible equipment, see Configuring Network Switch Redundancy to Support SMPTE ST 2022-7, on page 399.

Use the Path Manager to view and troubleshoot the flow of streams through the switch fabric. See Path Manager Tasks, on page 450.

Direct Flow Orchestration: How To Create a Static Flow with a Cisco Network Switch

This topic describes the use case where a destination IP device does not have an API exposed that allows GV Orbit Control to direct the device's receivers to join send streams. Or you want to control what is to be sent to an IP destination. For this, GV Orbit Control can control the egress ports of a network switch to statically stitch flows feeding the IP device. It is also necessary to remove the network interface ports from the available resources for dynamically stitching flows via IGMP joins. Another way of stating this, it is necessary to remove these paths from the available tielines.

To create a static flow with GV Orbit Control you need to set some information on an output port of a network switch with a DCNM control port.

1   For this procedure the following topology will be used. See Adding Devices to a Topology, on page 204.

2   In the Network Switch's **Property Editor**, under **Control Ports**, select an output port on your network switch (for example, **Cisco DCNM**). This port should not be connected to anything. See Configuring Cisco DCNM Network Switch Devices, on page 389.

3   Set the number of streams you need in **#Output Connectors**.

4   With the **Cisco DCNM** control port selected, set **Expose Streams**.

5   Set the name and IP address of the network switch's control port (**Cisco DCNM**). You find this information through the Inventory page on the DCNM web UI. (*Inventory*, *Switches*, *Select a leaf*, *Interfaces* tab). You have to add 1 to the last number of the IP. For example: 192.102.45.0/31 becomes 192.102.45.1.

6   On the port's streams, set the **Logical Level**. See Configuring the Logical Levels for the Devices in a Topology, on page 197.

7   On the port's streams, set **Automatic Destination** if you do not want to create a logical destination yourself.

8   To create the static flow, you need to do a normal take from the streams (or logical destination if you created one) to the source you want.

9   To confirm if the flow is passing, you can check the flow status page on the DCNM UI (*Media Controller*, *Flow status*). Note: If the static flow was created but the source does not have a signal, there will be no feedback.

To delete a static flow, you need to do a take from the destination to a source with an IP of 0.0.0.0 on the streams.

Configuring a GV Fabric Network Switch Device

GV Fabric is an IP switch enabling format agnostic signal routing for small to enterprise-wide installations. GV Orbit Control automatically discovers and configures any GV Fabric switch found by the GV Orbit *Automatic Network Configurator* service. When this service finds a GV Fabric network switch on the network, or when you factory-reset an existing GV Fabric network switch, the service uses Zero Touch Provisioning (ZTP) to automatically configure the GV Fabric network switch to optimize its configuration to forward media traffic. Once the initial configuration of the GV Fabric switch is done, the GV Fabric switch becomes available as a discovered device in the **Device Library**.

GV Orbit Control also monitors the switch and updates the configuration as required. For example, the switch's media Ethernet interfaces are automatically assigned as members of the MEDIA_VLAN and configured for use.

PREREQUISTIES:

- The *Automatic Network Configurator* service must be licensed, installed, and running on the GV Orbit Server. See *Automatic Network Configurator Service* in the **GV Orbit Admin Guide**; see Related Documentation, on page 7.
- The GV Orbit Server must be configured to use DHCP. See *DHCP Task* and *Connecting the GV Fabric Network Switch* in the **GV Orbit Admin Guide**; see Related Documentation, on page 7.

LIMITATION: You must manually configure an interface breakout by using the GV Fabric Command Line Interface (CLI).

To configure a GV Fabric Network Switch Device

1 Add the GV Fabric Network Switch device to the Topology: from the **Device Library**, **Discovered**, find the GV Fabric Network Switch device bubble that you want to use. See To add a Discovered Device to a Topology, on page 209.
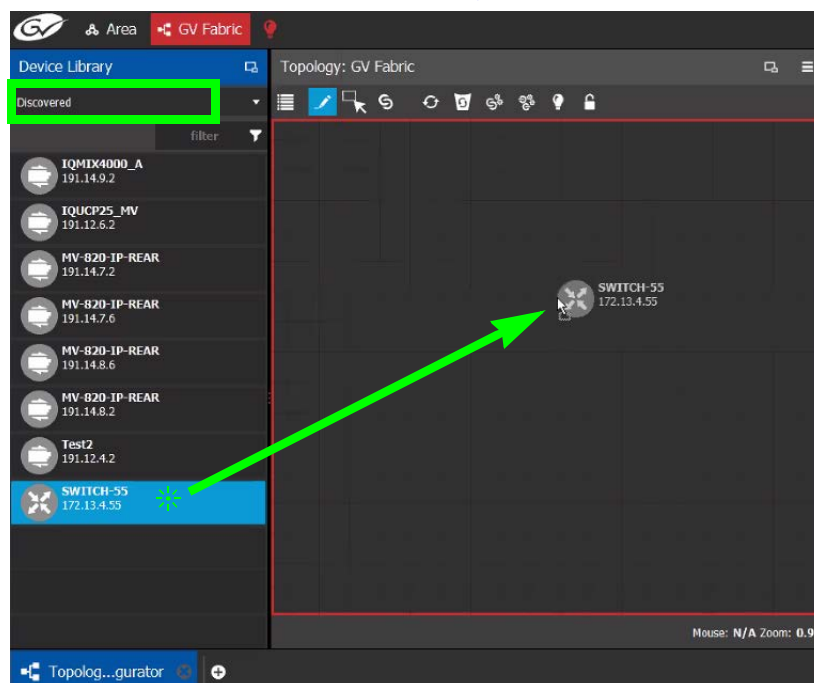
2 Select **Device Properties** and select **GV Fabric**. See Defining Device Properties, on page 229 for more information.

3 Select **GV Fabric** tab (next to **Control Port** at the top of the **Property Editor**) to configure the Device Properties in the **Property Editor**. Only the properties shown below should be used. See also Description of Common Device Properties, on page 332.

Parameter	Description
Network Host Name	This is the unique name by which the Network Switch is identified within GV Orbit Control. This value is used to construct the input/output port labels.
GV Fabric Control Port parameters	
Name	Once GV Orbit Control connects to the switch, the switch's name is read from the switch's configuration.
MGT0 / MGT1 IP Address	Once GV Orbit Control connects to the switch, the switch's management IP addresses are read from the switch's configuration.
Username	The Zero-Touch Provisioning (ZTP) process creates a *gvapi* user account in the switch. By default, GV Orbit Control uses the *gvapi* user account to access the switch. The username field can be customized to use another switch user account. Such a user account's capability must be *Monitor* or higher. See GV Fabric documentation to create a new user on the switch.

Parameter	Description
Password	Set the administrator's password for GV Orbit Control to access the GV Fabric switch's user account. When the GV Fabric device is added to the topology, the password for the *gvapi* user account is preset.
Connection State 1 / 2	This shows the current connection state to the switch. When a redundant configuration is used (two GV Orbit Servers form a cluster) **Connection State 1** and **Connection State 2** shows the connectivity of each server to the switches. **Unknown:** The Virtual IP is not configured yet or the topology is inactive. **Online:** GV Orbit Control is connected to DCNM. **Offline:** The topology is active and GV Orbit Control is unable to communicate with DCNM. **Reconnecting:** GV Orbit Control is trying to reach DCNM.

4 Do not configure any parameters found under Ports or Streams. These are shown for information purposes only.

5 Add IP devices to the topology and then connect them to the GV Fabric switch: Click Quick Connect to link the devices. See Using Quick Connect to Link all Devices in a Topology, on page 222. See also Methods to Link Devices in a Topology, on page 222.

To support network redundancy for use with SMPTE ST 2022-7 compatible equipment, see Configuring Network Switch Redundancy to Support SMPTE ST 2022-7, on page 399.

Use the Path Manager to view and troubleshoot the flow of streams through the switch fabric. See Path Manager Tasks, on page 450.

Configuring Network Switch Redundancy to Support SMPTE ST 2022-7

This topic describes the theory of how to implement network redundancy, and as such, information is provided as an example that can be used for any SMPTE ST 2022-7 compatible equipment.

To make streaming more reliable over an IP network, the implementation of SMPTE ST 2022-7 seamless protection switching depends on stream redundancy. This protection scheme transmits two identical packet streams over physically separate network routes (shown as Red LAN and Blue LAN in the figure below), so that if packets from one network are lost or delayed, the data can be reconstructed using packets from the second network stream. This process is seamless because switching between the streams is instantaneous and does not impact content.
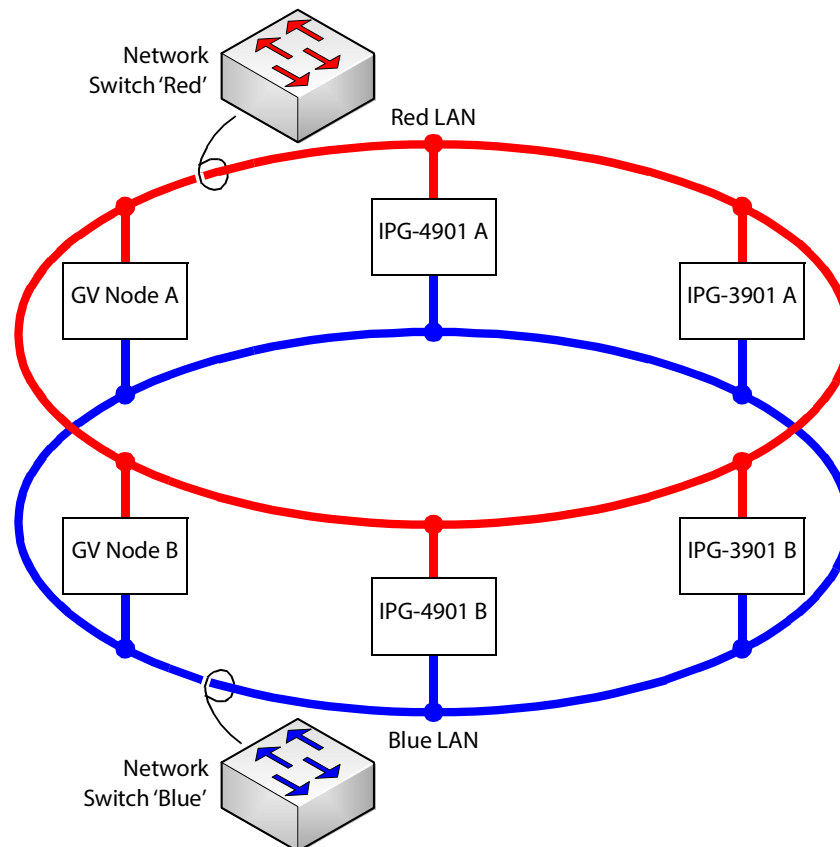
PREREQUISITES:

- At least two DCNM-compliant switches must be used for this application. Contact Grass Valley for more information about switch compatibility. See Grass Valley Technical Support, on page 862.

- For any GV Node frame:
    a In iControl's GV Node Manager, make sure to set **redundancy** to ON. See the GV Node User Manual for more information.
    b In GV Orbit Control, set **2022-7 Mode** and configure the **Redundancy Port** parameter. See Configuring a GV Node Device, on page 333.

- For any IPG-4901 / IPG-3901 card
    a In iControl's **Network panel**, **Settings** tab, for the **ETH 2 Port**, make sure to set the Operation Mode to **Redundancy**. See the IPG-4901 Guide to Installation and Operation for more information.
    b In GV Orbit Control, set the **Operation Mode** to **Redundancy**. See Configuring an IPG-3901 / IPG-4901 Device, on page 343.

- For certain third-party devices you may have to configure port redundancy manually. See Setting Port Redundancy for Many Devices at Once, on page 220.

To configure SMPTE ST 2022-7 example

1 Add the following devices to the Topology: from the **Device Library**, **Virtual Device**, add the following device bubbles to the Topology. See Adding a Virtual Device to a topology, on page 204.

Quantity	Device
2	Network Switch
2	IPG-3901
2 × 3 instances in a group	Camera
2 × 3 instances in a group	Monitor

Arrange the devices on the Topology as shown below.
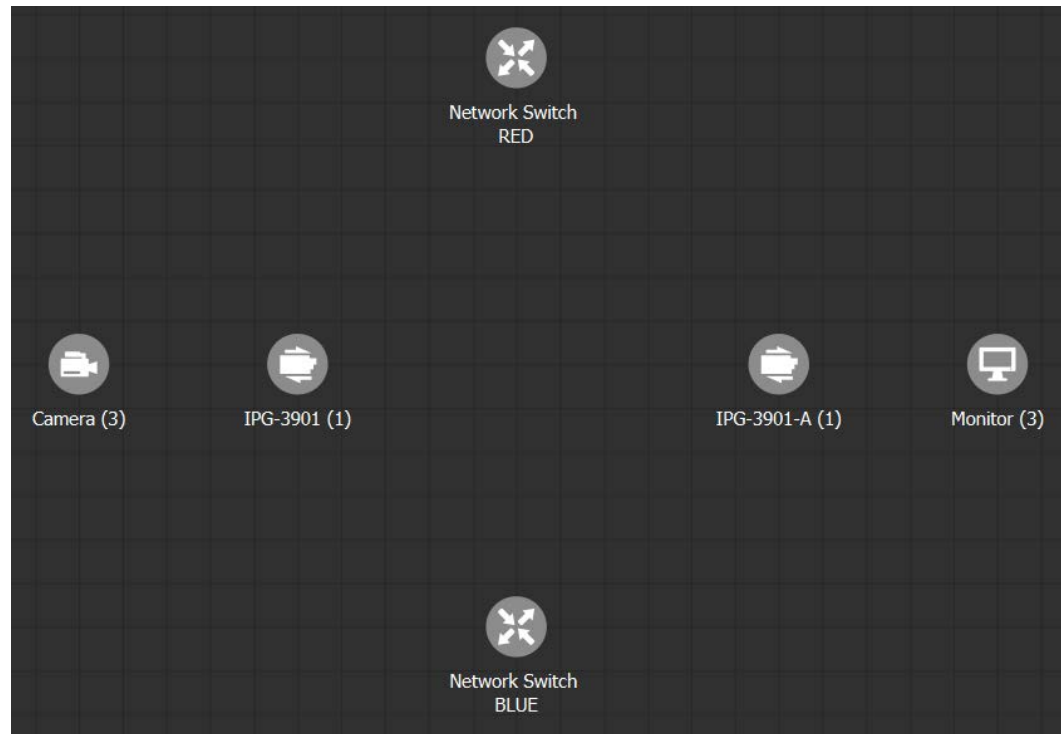
2 Activate the topology. See Activating a Topology, on page 235.

3 Configure the devices on the Topology. See Special Devices, on page 331. For any other device, see Adding Devices to a Topology, on page 204.

4 Click Quick Connect to link the devices as shown below. See Using Quick Connect to Link all Devices in a Topology, on page 222. See also Methods to Link Devices in a Topology, on page 222.
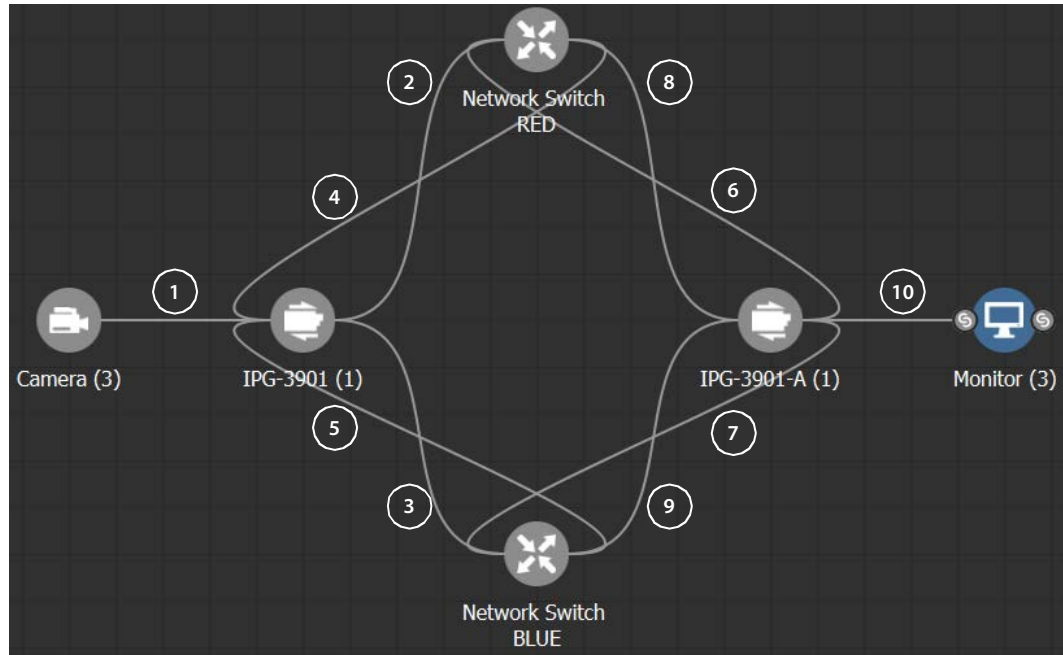
Much more elaborate systems can be configured. The objective is to connect all SMPTE ST 2022-7 IP devices (#2 to #9) to both network switches (RED and BLUE).

5 If you are manually making the connections between the devices, select the links between devices, one at a time, to make the connections between devices as shown below. See Manually Setting the Link's Physical Connection Parameters (Sources and Destinations), on page 225. If you use Quick Connect, this is not necessary.

Link			Make the following connections	
#	From	To	From	To
1	Camera	IPG-3901	Cam1 Cam2 Cam3	SDI to 1 (Input Port Id: 3) SDI to 2 (Input Port Id: 4) SDI to 3 (Input Port Id: 5)
2	IPG-3901	Network Switch RED	ETH1	SwitchIn1
3	IPG-3901	Network Switch BLUE	ETH2	SwitchIn1
4	Network Switch RED	IPG-3901	SwitchOut1	ETH1
5	Network Switch BLUE	IPG-3901	SwitchOut1	ETH2
6	IPG-3901-A	Network Switch RED	ETH1	SwitchIn2

Link			Make the following connections	
#	From	To	From	To
7	IPG-3901-A	Network Switch BLUE	ETH2	SwitchIn2
8	Network Switch RED	IPG-3901-A	SwitchOut2	ETH1
9	Network Switch BLUE	IPG-3901-A	SwitchOut2	ETH2
10	IPG-3901	Camera	SDI to 1 (Output Port Id: 3)	Mon1
			SDI to 2 (Output Port Id: 4)	Mon2
			SDI to 3 (Output Port Id: 5)	Mon3

Configuring an NVISION Hybrid Series Router

To control an NVISION Hybrid Series Router, GV Orbit Control uses the NP0016 router control protocol. The following NVISION Hybrid Routers are supported: NV8140, NV8144, NV8280, NV8576, or NV8576 Plus. Once the IP address(es) have been added to the Control Port(s) that connects to the NVISION Hybrid Series Router, the router's configuration is read into GV Orbit Control, and the router's card types and ports are automatically configured within GV Orbit Control.

PREREQUISITE: You must have a list of the card type for each slot in the router's frame. This information may be available in the router's MRC configuration software.

LIMITATIONS:

- The disembedder / embedder output card is currently not supported.
- The following topology use case is unsupported.
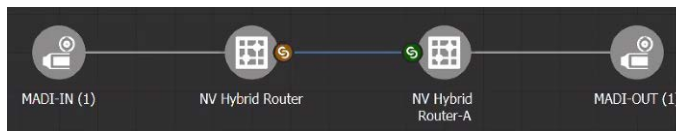
The tieline between two NVISION Hybrid Routers should not be MADI (for example, to link between a MADI source and a MADI destination). Taking a MADI source to a MADI destination will only work if both of them are directly connected to the same NVISION Hybrid Series Router.

- The following topology use case does not support lock and protect from a third-party control system on the NVISION Hybrid Router for a Logical Destination.
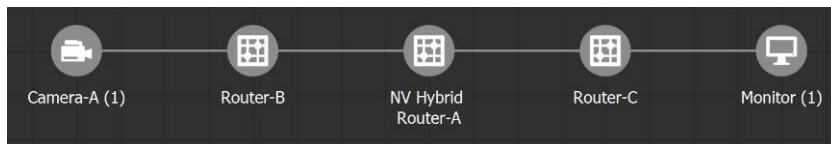
Any output of a NVISION Hybrid Router that is connected to another router cannot be locked in GV Orbit Control. GV Orbit Control will only update the lock/protect status of a destination which is directly connected to the NVISION Hybrid Router (that is, without any other devices in-between).

To configure an NVISION Hybrid Series Router Device

1 Add the **NV Hybrid Router** device to the Topology: from the **Device Library**, **Virtual Device**, find the **NV Hybrid Router** device bubble. See Adding a Virtual Device to a topology, on page 204.
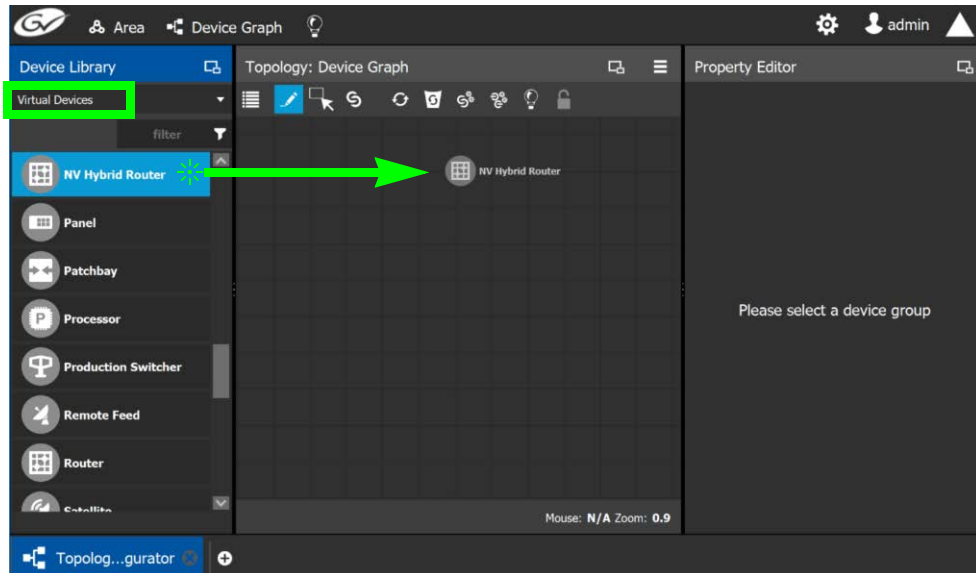
2 The control port(s) must be configured to allow communication with the router thereby permitting GV Orbit Control to control the router. NVISION Hybrid Series Routers are controlled through the NP0016 router control protocol.

Select the **NV Hybrid Router** bubble and click **New** ⊕ next to **Control Port** at the top of the **Property Editor** and select the router's control protocol from the list. **Dummy** can be used for testing purposes (or pre-deployment) when the actual router model is unknown. See also Defining Device Properties, on page 229 for more information.

A tab for the selected router model appears. Select this tab to configure the control port.

If the router has a second redundant network connection for controlling it, add a second control port and configure it the same way as the first one except for the IP address which must reflect that of the router's second network connection.

Specifically, you must set the router's control port **IP Address** and **IP Port** number parameters.

Router Control Protocol	See
NP0016 Compact Router	NP0016 Compact Router Control Port Configuration Parameters, on page 427
NP0016 Enterprise Router	NP0016 Enterprise Router Control Port Configuration Parameters, on page 427

To delete a control port, see To delete a router's control port, on page 426.

3 Activate the topology. See Activating a Topology, on page 235.

The **Connection State 1** / **2** status for the control port(s) becomes **Online** when is has successfully connected to the NVISION Hybrid router.

Once GV Orbit Control has connected to the NVISION Hybrid Router through the Control Port, it reads the router's configuration to then automatically configure the NVISION Hybrid Router device properties in GV Orbit Control accordingly. Should the NVISION Hybrid router's configuration change (for example, changes have been made to the type and slot location of the router's cards), the router's configuration can be re-loaded into GV Orbit Control; see To automatically refresh the NVISION Hybrid router's card information in GV Orbit Control, on page 409.

4   Deactivate the topology. See Making an Active Topology Inactive, on page 236.

5   Configure the NVISION Hybrid Series Router properties. See also Description of Common Device Properties, on page 332.

Parameter	Description
Network Host Name	The hostname is the unique name by which the associated NVISION Hybrid Series Router is known on the network.
Audio Physical Level ID	From the NVISION Hybrid Series Router's configuration, specify the level ID number that has been assigned to the router's audio matrix. Usually this is 2.
Video Physical Level ID	From the NVISION Hybrid Series Router's configuration, specify the level ID number that has been assigned to the router's video matrix. Usually this is 1.
NVision Hybrid Router Type	Shows the router's model type. This is automatically read from the router.
Advanced > Internal Wiring Done	Shows if the internal modeling of the NVISION Hybrid Router is complete.

6   This step is optional; setting the **Card Type** for each slot in the router's frame can automatically be done by GV Orbit Control: To automatically update GV Orbit Control's configuration when the type and slot location of the cards have been changed in the router, see To automatically refresh the NVISION Hybrid router's card information in GV Orbit Control, on page 409.
Manually set the router's card type for any of the router's input and output slots that need to be updated: select an **Input Slot** or **Output Slot** in the router's frame in the

Property Editor and then set the card type in the **Card Type** parameter. If the slot has no card installed in it, set the **Card Type** parameter to **NONE**.

7 Select each input or output port to configure them individually. These are the configuration parameters for each of the router's input/output ports. See also Description of Common Device Properties, on page 332.

Parameter	Description
Port Identifier	This is the generic identifier of the port within GV Orbit Control.
Number	This shows the current status for information purposes.
Direction	
Connector Type	
Capacity (bps)	The stream's data rate.
Bandwidth Usage (bps)	This shows the current status for information purposes.
Embedder bypassed	Shows the current embedder status for the selected output port according to the current path being routed. See also Path Manager Tasks, on page 450. When set, the output embedder is not being used. When deselected, the output embedder is being used.

8 Select each steam found under each input and output port to configure them
    individually. These are the configuration parameters for the individual streams carried
    on a network port. See also Description of Common Device Properties, on page 332.
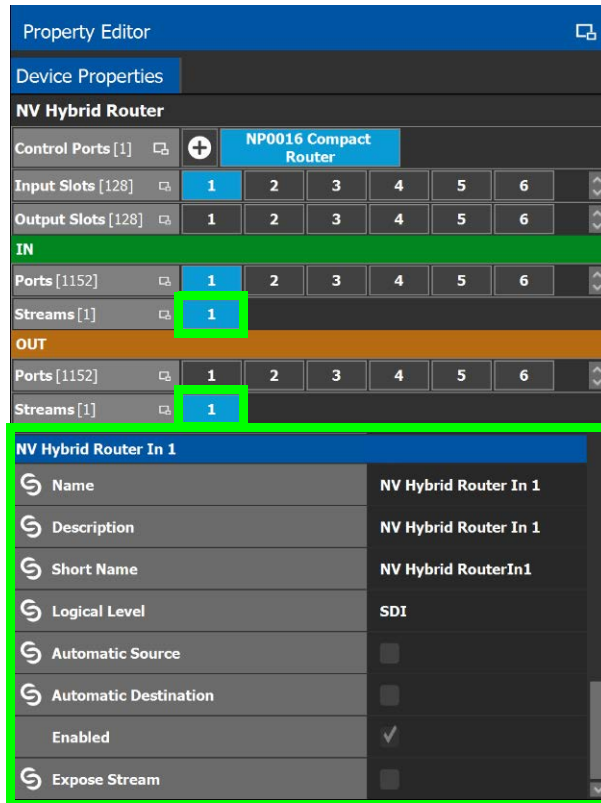
9 Link the NVISION Hybrid Router to other devices on the topology that the NVISION
    Hybrid Router is connected to in the real world. See Methods to Link Devices in a
    Topology, on page 222.

10 Test the configuration by making takes that use this router. See Performing a Take in
    Router Control, on page 471.

**To automatically refresh the NVISION Hybrid router's card information in GV Orbit
Control**

When the router has been reconfigured with new or different cards, GV Orbit Control can
read the router's configuration again to automatically configure the NVISION Hybrid Router
device properties in GV Orbit Control accordingly.

1 De-activate the topology if activated. See Making an Active Topology Inactive, on
    page 236.

2 Select one of the router's control ports.

3 Scroll-down the router's **Device Properties** list to the control port.

4 Click **Update Slotted Cards** and then click **OK**.

GV Orbit Control reads the router's configuration to then automatically configure the NVISION Hybrid Router device properties in GV Orbit Control accordingly.

5 Activate the topology. See Activating a Topology, on page 235.

Configuring a Sirius Series Router

A Sirius 800 series router device type can be added to the topology for more detailed control, including support for multiple controllers and different types of I/O cards. Note that the router must have been previously configured before adding it to the topology. See the router's documentation for this.

To control a Sirius Series Router, GV Orbit Control uses the SAM SW-P-08 TCP/IP router control protocol. The following Sirius Routers are supported: Sirius Dual S850, Sirius S830, Sirius S840, or Sirius S850. Once the IP address(es) have been added to the Control Port(s) that connects to the Sirius Series Router, the router's current cross-points are read into GV Orbit Control.

PREREQUISITE: You must have a list of the card type for each slot in the router's frame. This information may be available in the router's MCM configuration software.

LIMITATIONS:

- The following topology use case is unsupported.

MADI-IN (1)   Sirius Router-A   Sirius Router-B   MADI-OUT (1)
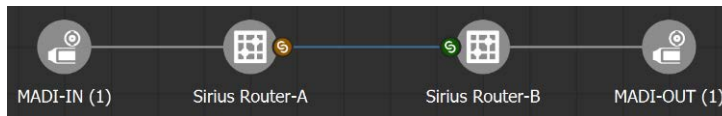
  The tieline between two Sirius Routers must not be MADI or AES (for example, to link between a MADI source and a MADI destination) unless both routers are equipped with AHP cards for this.

- The following topology use case does not support lock and protect from a third-party control system on the Sirius Router for a Logical Destination.

Camera-C (1)   Router-C   Sirius Router-C   Router-D   Monitor-C (1)
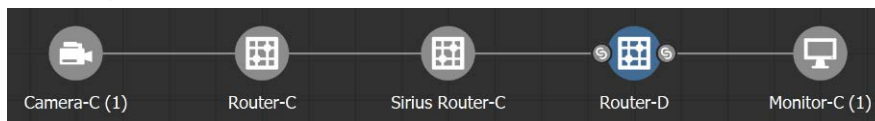
  Any output of a Sirius Router that is connected to another router cannot be locked in GV Orbit Control. GV Orbit Control will only update the lock/protect status of a destination which is directly connected to the Sirius Router (that is, without any other devices in-between).

  GV Orbit Control only handles lock/protect on destinations. If a router locks an output and GV Orbit Control doesn't have a corresponding Logical Destination, no lock will be seen in GV Orbit Control. Also note that SWP08 does not support the concept of a Protect; only LOCK is supported.

- GV Orbit Control only supports MV83X cards when they have been configured with **Redundancy** set to true with the Workbench router configuration software. The setting for **Main output follow** is ignored.

To configure a Sirius Series Router Device

1 Add the **NV Hybrid Router** device to the Topology: from the **Device Library**, **Virtual Device**, find the **Sirius Router** device bubble. See Adding a Virtual Device to a topology, on page 204.
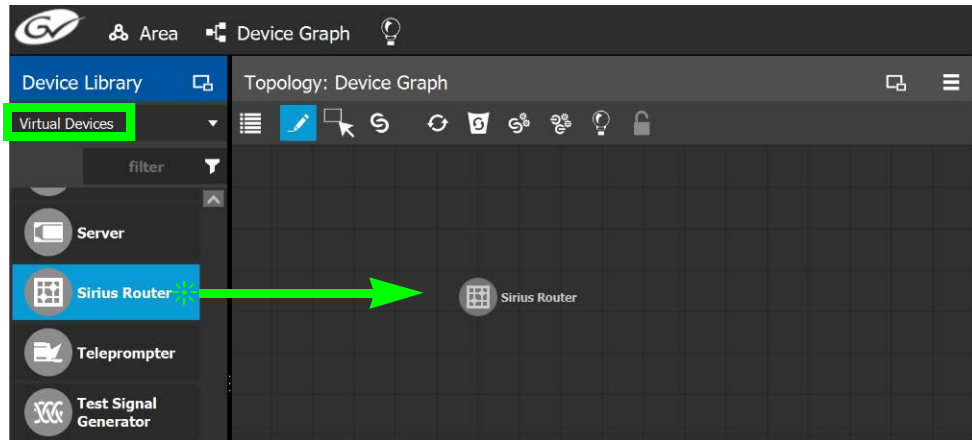
2 The control port(s) must be configured to allow communication with the router thereby permitting GV Orbit Control to control the router. Sirius Series Routers are controlled through the SAM SW-P-08 TCP/IP router control protocol.

Select the **NV Hybrid Router** bubble and click **New** next to **Control Port** at the top of the **Property Editor** and select the router's control protocol from the list. **Dummy** can be used for testing purposes (or pre-deployment) when the actual router model is unknown. See also Defining Device Properties, on page 229 for more information.

A tab for the selected router model appears. Select this tab to configure the control port.

If the router has a second redundant network connection for controlling it, add a second control port and configure it the same way as the first one except for the IP address which must reflect that of the router's second network connection.

Specifically, you must set the router's control port **IP Address** and **IP Port** number parameters. See SAM SW-P-08 TCP/IP Control Port Configuration Parameters, on page 431 to configure the control port(s) for the router.

To delete a control port, see To delete a router's control port, on page 426.

3 Activate the topology. See Activating a Topology, on page 235.

The **Connection State 1 / 2** status for the control port(s) becomes **Online** when is has successfully connected to the Sirius router.

4 Deactivate the topology. See Making an Active Topology Inactive, on page 236.

5   Configure the Sirius Series Router properties. See also Description of Common Device Properties, on page 332.

Parameter	Description
Network Host Name	The hostname is the unique name by which the associated Sirius Series Router is known on the network.
Audio Matrix ID	Specific to SWP08, it is similar to a level, but each Matrix could have multiple levels, but we only support one. Default is 2.
Audio Physical Level ID	From the Sirius Series Router's configuration, specify the level ID number that has been assigned to the router's audio matrix. Usually this is 1. For example, this is level 1 of matrix 2.
Video Matrix ID	From the Sirius Series Router's configuration, specify the level ID number that has been assigned to the router's video matrix. Usually this is 1.
Video Physical Level ID	From the Sirius Series Router's configuration, specify the level ID number that has been assigned to the router's video matrix. Usually this is 1.
Advanced > Sirius Router Type	Set the router's model type.
Advanced > Internal Wiring Done	Shows if the internal modeling of the Sirius Router is complete.

6   For each of the router's input, output, and multiviewer slots, set the **Card Type** for each slot in the router's frame in the **Property Editor** under **Input slots**, **Output slots**, and **MV slots**: Select an **Input slot**, **Output slot**, **MV slot** and then set the card type in the **Card Type** parameter. Do so for each and every input, output, and multiviewer card slot. If the slot has no card installed in it, set the **Card Type** parameter to **NONE**.Link the Sirius Router to other devices on the topology that the Sirius Router is connected to in the real world. See Methods to Link Devices in a Topology, on page 222.

For example, certain cards such as the MV830 use an input and output slot: If such a card is located in slot 1, then set the **Card type** for **Input slots 1** to **MV830** and set the **Card type** for **Output slots 1** to **MV830** also.

7 Select each input or output port to configure them individually. These are the configuration parameters for each of the router's input/output ports. See also Description of Common Device Properties, on page 332.

Parameter	Description
Port Identifier	This is the generic identifier of the port within GV Orbit Control.
Direction	This shows the current status for information purposes.
Connector Type	
Capacity (bps)	The stream's data rate.
Bandwidth Usage (bps)	This shows the current status for information purposes.

8 Select each steam found under each input and output port to configure them individually. These are the configuration parameters for the individual streams carried on a network port. See also Description of Common Device Properties, on page 332.
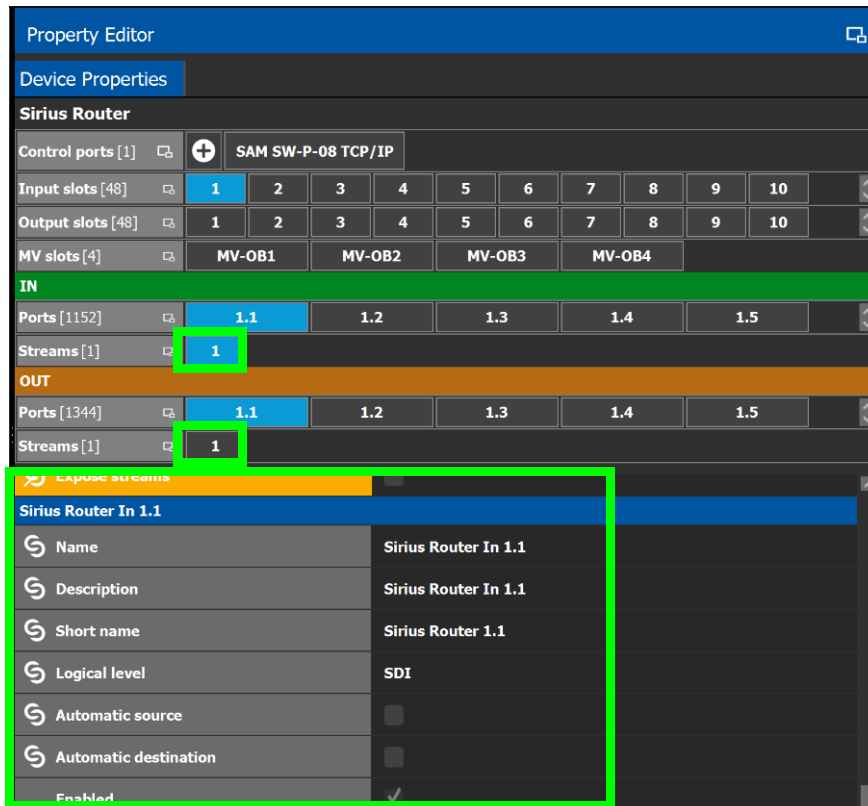
9 Link the Sirius Router to other devices on the topology that the Sirius Router is connected to in the real world. See Methods to Link Devices in a Topology, on page 222.

10 Test the configuration by making takes that use this router. See Performing a Take in Router Control, on page 471.

Logical Destinations for Multiviewer Cards

When the Sirius router is equipped with multiviewer cards, and the matching card configuration is made in GV Orbit Control, Logical Destinations are automatically created for these multiviewer destinations. See Router Control Tasks, on page 470.

This allows you to control the multiviewer inputs.

In Router Control, use *Sirius Router* as a filter to focus on these multiviewer destinations. See Filtering Lists, Table Columns, Sources, and Destinations, on page 266.

Typical Logical Destination naming	Description
Sirius Router MV-PTs.pp	PT: Pass through where s is the slot number and pp is the port number.
Sirius Router MV-OBs.pp	OB: On board where s is the slot number and pp is the port number.

Sirius Router Card Type and making Physical Connections

The Sirius Router has a number of cards that support different physical connection types.

Card Type	For more information, see
AES + MADI	Configuring an AES Source / Destination for use, on page 419
MADI	Configuring a MADI Source / Destination for use, on page 417
MV800	Methods to Link Devices in a Topology, on page 222
MV830	
MV831	
MV840	
MV850	
SDI	
SDI AHP	

Configuring a MADI Source / Destination for use

For a MADI source, proceed as follows.

1   Add a MADI source device to the topology and name it accordingly. Typically this is an **SDI** device. See Adding Devices to a Topology, on page 204.

2   Select the device bubble for the MADI source device and if necessary, set the **Default connector type** property in the MADI **Device Properties** to **MADI**. See Defining Device Properties, on page 229.

Under the MADI **Device Properties**, **OUT**, **Ports**, 64 MADI audio Streams become available and these streams also become available in the **Stream Browser** of the **Logical Device Table**.

3   Link the MADI source device to the Sirius Router. For example, in the Physical Connections Table, MADI connectors are identified by the ⊪⊪ symbol. See Manually Linking the Devices in a Topology, on page 224 and Manually Setting the Link's Physical Connection Parameters (Sources and Destinations), on page 225.
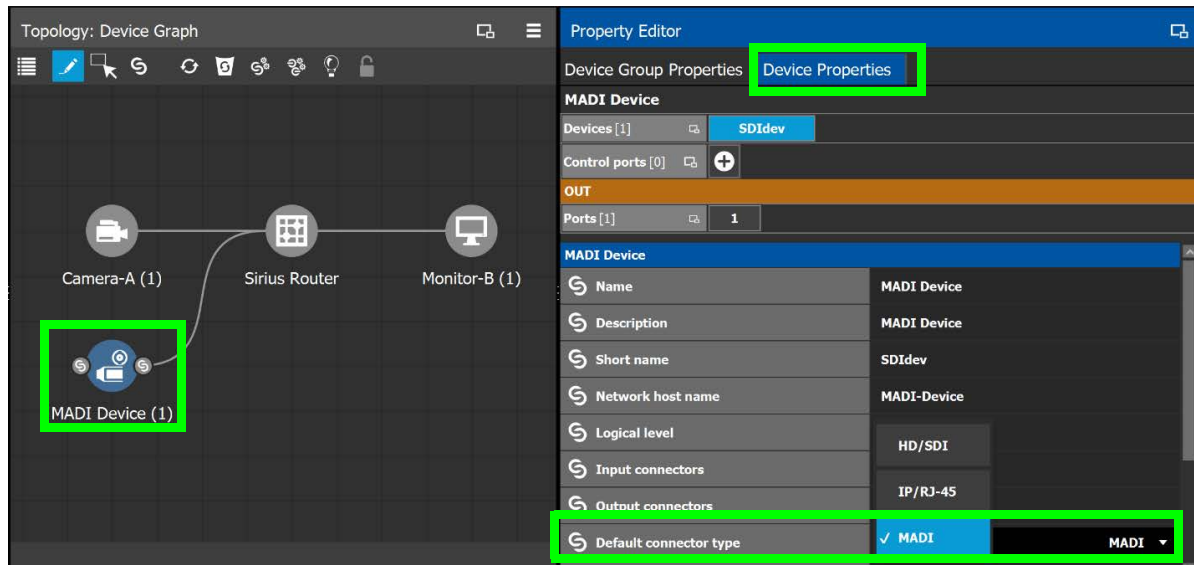
Normally, GV Orbit only routes 16 audio channels at a time. A MADI source has 64 audio channels, so a MADI source requires 4 sources to route all the audio channels. You must create these sources in the **Logical Device Table**.

4   Create 4 new sources in the **Logical Device Table**. See Adding a Source or Destination to the Logical Level Table, on page 248. For example, create the following sources: **Madi1**, **Madi2**, **Madi3**, and **Madi4**.
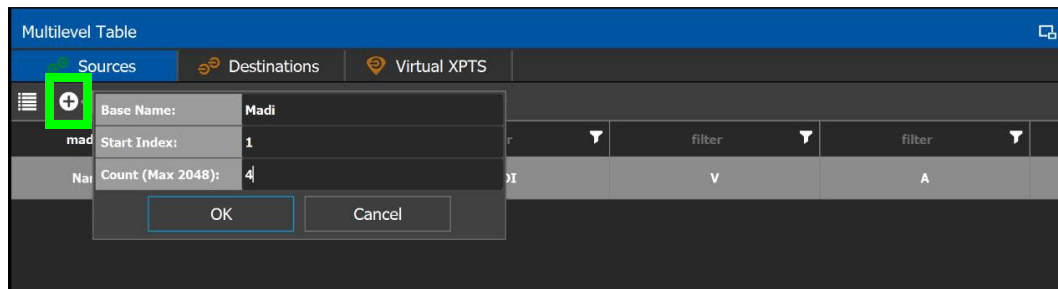
5 From the **Stream Browser**, assign the MADI streams to the audio channels in the sources. For example:

- Assign **MADI.1** to **MADI.16** in the **Stream Browser** to **Madi1 A1** to **A16** in the Multilevel Table (drop the streams on the **A1** column).

- Assign **MADI.17** to **MADI.32** in the **Stream Browser** to **Madi2 A1** to **A16** in the Multilevel Table.

- Assign **MADI.33** to **MADI.48** in the **Stream Browser** to **Madi3 A1** to **A16** in the Multilevel Table.

- Assign **MADI.49** to **MADI.64** in the **Stream Browser** to **Madi4 A1** to **A16** in the Multilevel Table.

Select the row before dropping the streams onto it
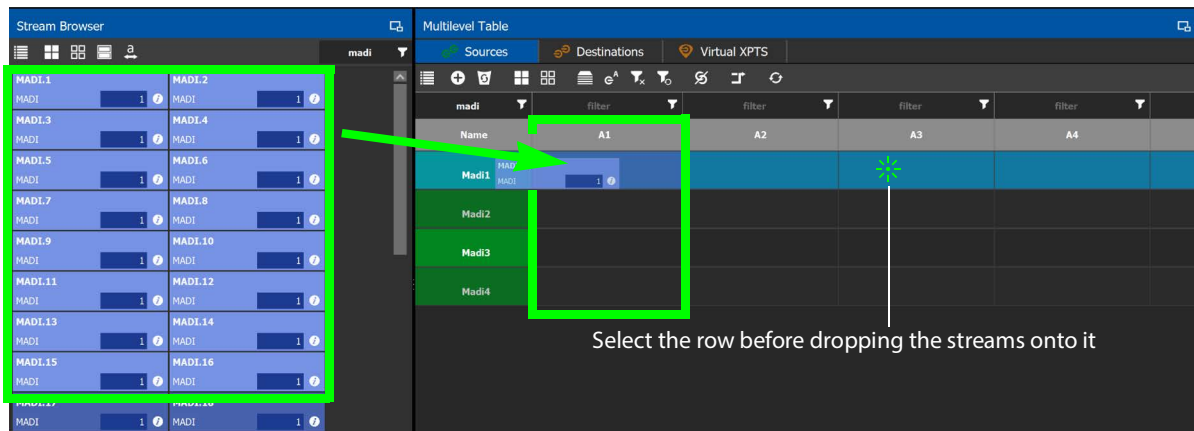
See also Bulk Assigning Logical Levels in the Multilevel Table, on page 253.

6 Create 4 new destinations in the **Logical Device Table**. See Adding a Source or Destination to the Logical Level Table, on page 248. For example, create the following destinations: **Madi1**, **Madi2**, **Madi3**, and **Madi4**.

7 From the **Stream Browser**, assign the MADI streams to the audio channels in the destinations. For example:

- Assign **MADI.1** to **MADI.16** in the **Stream Browser** to **Madi1 A1** to **A16** in the Multilevel Table (drop the streams on the **A1** column).

- Assign **MADI.17** to **MADI.32** in the **Stream Browser** to **Madi2 A1** to **A16** in the Multilevel Table.

- Assign **MADI.33** to **MADI.48** in the **Stream Browser** to **Madi3 A1** to **A16** in the Multilevel Table.

- Assign **MADI.49** to **MADI.64** in the **Stream Browser** to **Madi4 A1** to **A16** in the Multilevel Table.

Configuring an AES Source / Destination for use

For a AES source, proceed as follows.

1 Add an AES source device to the topology and name it accordingly. Typically this is an **SDI** device. See Adding Devices to a Topology, on page 204.

2 Link the AES source device to the Sirius Router. See Manually Linking the Devices in a Topology, on page 224 and Manually Setting the Link's Physical Connection Parameters (Sources and Destinations), on page 225.
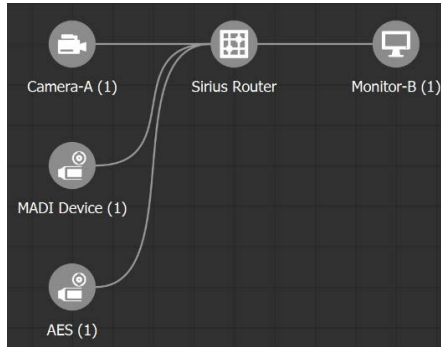
3 Select the device bubble for the AES source device and set the **Logical Level** property in the AES **Device Properties** to **AES**. See Defining Device Properties, on page 229.
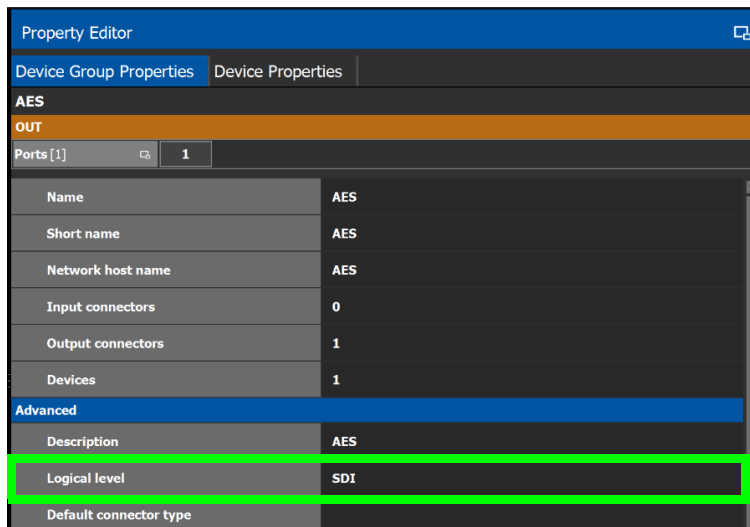
4   In the **Logical Level Selector**, select **AES** as the level and click **OK**.
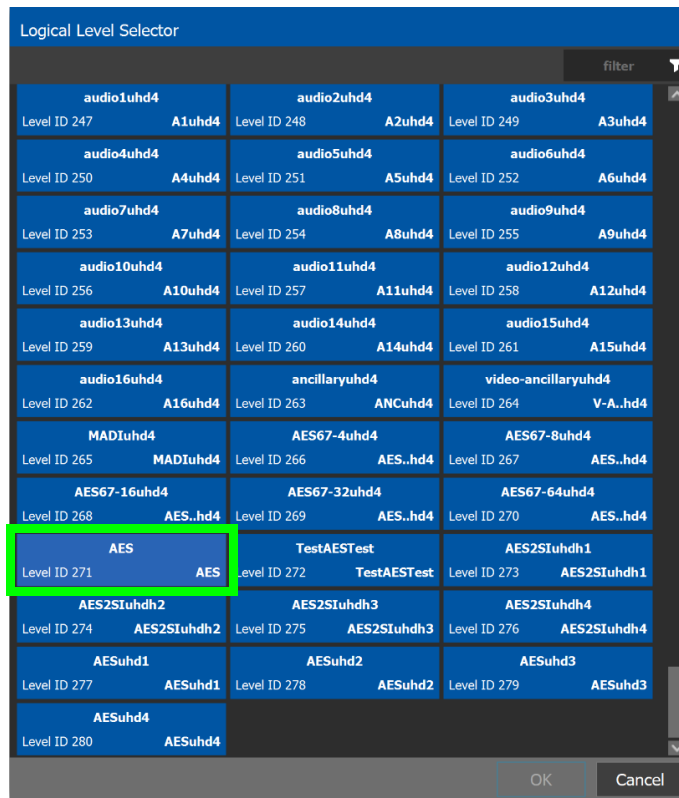
In the Logical Device Table, two AES channels become available in the **Channel Browser** of AES stream in the **Stream Browser**. See Logical Device Table Tasks, on page 241.
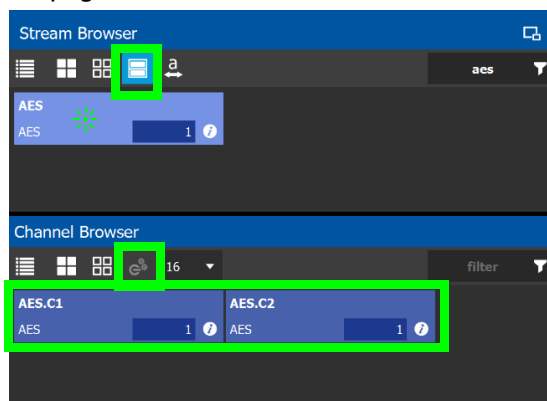
5   Select the AES channels in the channel browser.

6   Click Automated Sources [icon] in the channel browser to create the sources / destinations for the AES channels.

7   ???DONE TO HERE???

8

Configuring Router Devices

The following procedure configures a router device. Different models of routers use a range of control protocols that GV Orbit Control uses to control the router. Each router control protocol is individually covered in follow up procedures: see also Configuring a Router's Control Port, on page 425.

For more information about how GV Orbit Control manages a router's Lock, Protect, and Release, see also About Lock, Protect, and Release, on page 472.

To configure a Router Device

1 Add the Router device to the Topology: from the **Device Library**, **Virtual Devices**, find the **Router Device** bubble. See Adding a Virtual Device to a topology, on page 204.

2 Add and configure router control port(s) according to the router model you want to control. Control port(s) must be configured to allow communication with the router thereby permitting GV Orbit Control to control the router; see Configuring a Router's Control Port, on page 425.

3 Select the router's tab (next to **Control Port** at the top of the **Property Editor**) to configure the Device Properties in the **Property Editor**. See also Description of Common Device Properties, on page 332.

Parameter	Description
Network Host Name	The hostname is the unique name by which the associated router is known on the network.
Physical Level ID	Set the Physical Level ID value that has been configured for the corresponding router to be controlled by this device instance. To obtain this value, use the router's native configuration interface.
Advanced > Default Connector Type	The router's physical interface port connector: **HD/SDI**, **IP/RJ-45**, **MADI**.
Controller Starting Input	The starting input port number from which you want to control the router's physical level.
Controller Starting Output	The starting output port number from which you want to control the router's physical level.

4   Set the number of physical input and output connectors being used on the router in **#
   Input Connectors** and **# Output Connectors**.

The configuration for these ports become available as **Ports** under **IN** and **OUT**.

5 Select each input or output port to configure them individually. These are the configuration parameters for each of the router's input/output ports. See also Description of Common Device Properties, on page 332.

Parameter	Description
Port Identifier	This is the generic identifier of the port within GV Orbit Control.
Number	This shows the current status for information purposes.
Direction	
Connector Type	
Capacity (bps)	The stream's data rate.
Bandwidth Usage (bps)	This shows the current status for information purposes.
IP Address	This is the interface IP address of the selected port. This is currently not used in the router virtual device.
Redundancy Port	Associate this port with another port to create a redundant network traffic flow path for failover protection. The associated port will not be available to carry other traffic.

6 Select each steam found under each input and output port to configure them individually. These are the configuration parameters for the individual streams carried on a network port. See also Description of Common Device Properties, on page 332.
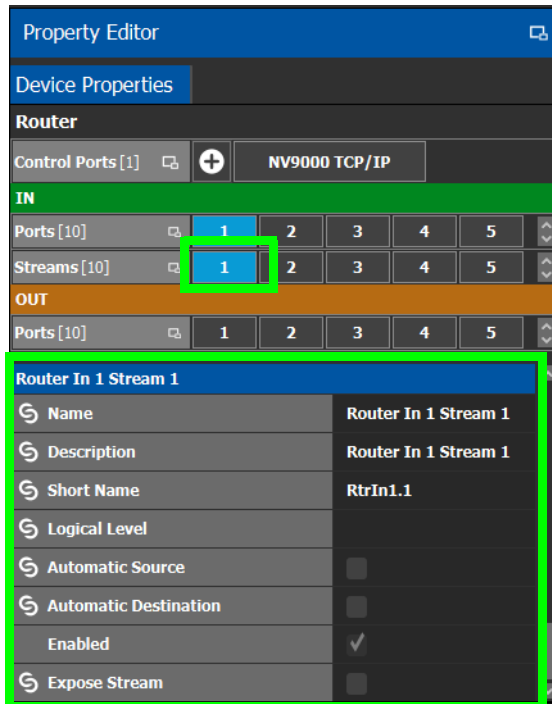
7 Link the router to other devices on the topology that the router is connected to in the real world. See Methods to Link Devices in a Topology, on page 222.

8 Test the configuration by making takes that use this router. See Performing a Take in Router Control, on page 471.

Configuring a Router's Control Port

Control port(s) must be configured to allow communication with the router thereby permitting GV Orbit Control to control the router. There are many types of control ports suited to the router's individual model or control protocol. First, you must add a control port to the router's configuration in GV Orbit Control and then configure it.

PREREQUISITE: Add a router device to the Topology Configurator. See To configure a Router Device, on page 422.

To add a router control port

1 Select the **Router** bubble on the Topology Configurator and then select **Device Properties** and click **New** [+] next to **Control Port** at the top of the **Property Editor** and select the router's model / control protocol from the list. **Dummy** can be used for testing purposes (or pre-deployment) when the actual router model is unknown. See also Defining Device Properties, on page 229 for more information.

A tab for the selected router model appears. Select this tab to configure the control port. The control port(s) must be configured to allow communication with the router thereby permitting GV Orbit Control to control the router.

If the router has a second redundant network connection for controlling it, add a second control port and configure it the same way as the first one except for the IP address which must reflect that of the router's second network connection.

2 Configure the control port. See below.

To delete a router's control port

Delete a router's control port as follows.

1 De-activate the topology if activated. See Making an Active Topology Inactive, on page 236.

2 Select one of the router's control ports.

3 Scroll-down the router's **Device Properties** list to the control port
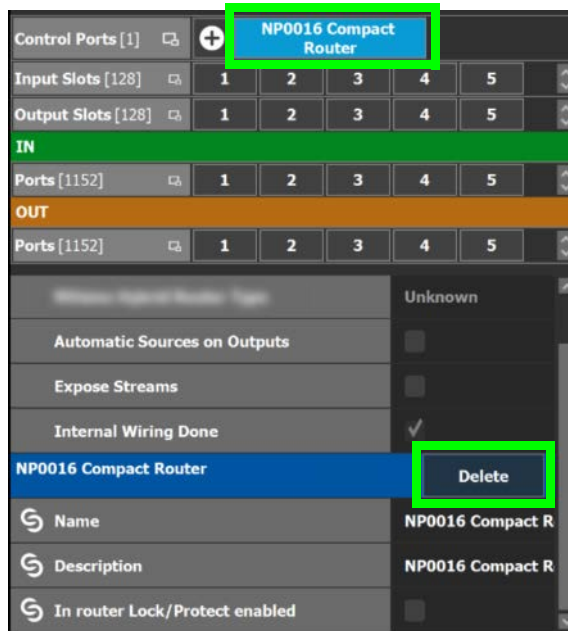
4 Click **Delete**.

Supported router control protocols

The following router control protocols are supported.

Router Control Protocol	See
NP0016 Compact Router	NP0016 Compact Router Control Port Configuration Parameters, on page 427
NP0016 Enterprise Router	NP0016 Enterprise Router Control Port Configuration Parameters, on page 427
NS-BUS	NS-BUS Control Port Configuration Parameters, on page 430
NV9000 TCP/IP (NP0017 device-based)	NV9000 TCP/IP Control Port Configuration Parameters, on page 430
SAM SW-P-08 TCP/IP	SAM SW-P-08 TCP/IP Control Port Configuration Parameters, on page 431

NP0016 Compact Router Control Port Configuration Parameters

See also Description of Common Device Properties, on page 332.

Parameter	Description
IP Address	The network IP address for the associated router's management or control port Ethernet address.
Connection State 1 Connection State 2	Connection State 1 shows the connection status of the router with the primary server of a server group. Connection State 2 shows the connection status of the router with the secondary server of a server group. See Configuring a Controller Group, on page 179. **unknown:** The topology is inactive (see Activating a Topology, on page 235) or the router does not have network connectivity to the GV Orbit Server(s). **offline:** The router does not have network connectivity to the GV Orbit Server(s). **online:** The router is connected to the GV Orbit Server(s).
Connections From Multiple Servers	Set this if the router supports multiple concurrent connections to it. When set, this allows GV Orbit Control main and backup servers to connect at the same time to the router, thereby increasing system availability.
IP Port	Port number for the control port stream used by the router. The default is 5194.
In router Lock/Protect enabled	Set to transfer the management of Locks/Protects from the GV Orbit Control control system to the Router for destinations that are directly connected to this router. Deselect to manage all Lock/Protect in GV Orbit Control exclusively. See About In router Lock/Protect enabled for a Router using NP0016 router control protocol, on page 429.

NP0016 Enterprise Router Control Port Configuration Parameters

The enterprise router control port supports the protocol's 'Coherent take' command when performing multiple crosspoint changes at the same time. See also Description of Common Device Properties, on page 332.

Parameter	Description
IP Address	The network IP address for the associated router's management or control port Ethernet address.

Parameter	Description
Connection State 1	Connection State 1 shows the connection status of the router with the primary server of a server group.
Connection State 2	Connection State 2 shows the connection status of the router with the secondary server of a server group. See Configuring a Controller Group, on page 179.
	unknown: The topology is inactive (see Activating a Topology, on page 235) or the router does not have network connectivity to the GV Orbit Server(s).
	offline: The router does not have network connectivity to the GV Orbit Server(s).
	online: The router is connected to the GV Orbit Server(s).
Connections From Multiple Servers	Set this if the router supports multiple concurrent connections to it. When set, this allows GV Orbit Control main and backup servers to connect at the same time to the router, thereby increasing system availability.
IP Port	Port number for the control port stream used by the router. The default is 5194.
In router Lock/Protect enabled	Set to transfer the management of Locks/Protects from the GV Orbit Control control system to the Router for destinations that are directly connected to this router.
	Deselect to manage all Lock/Protect in GV Orbit Control exclusively.
	See About In router Lock/Protect enabled for a Router using NP0016 router control protocol, on page 429.
Use Coherent Take Message	Set for GV Orbit Control to use the protocol's 'Coherent take' command when performing multiple crosspoint changes at the same time for this router.

About In router Lock/Protect enabled for a Router using NP0016 router control protocol

For a router using the NP0016 router control protocol, Lock, Protect, and Release have different behaviors depending on whether the **In router Lock/Protect enabled** parameter is set in the Router Control Port configuration.

In router Lock/Protect enabled parameter	Description
Set	For destinations that are directly attached to the router, this setting transfers the management of Locks/Protects from the GV Orbit Control control system to this router, thereby allowing better third-party router control integration with GV Orbit Control. This is called in router lock and protect.
	This setting keeps the router's Lock/Protect and GV Orbit Control's Lock/Protect in synchronization as follows:
	• If a Lock/Protect is updated in the router, it's also updated in GV Orbit Control.
	• If a Lock/Protect is updated in GV Orbit Control, it's also updated in the router.
	This option has the following effects and consequences: When locks / protections are created in the router through another control system, the user name used to create the locks / protections will be unknown to GV Orbit Control's user management mechanism. These unknown users are treated as *admin* users within GV Orbit Control. Note that *admin* users within GV Orbit Control can override the locks and protections of any other GV Orbit Control user. This means that any third-party control system will override locks / protections made in GV Orbit Control.
Deselected	GV Orbit Control stores the locks in its database and they are preserved after a restart/reboot. As such, destinations will remain locked/protected. GV Orbit Control system does not read a lock from a router and does not control a lock in the router. This is called in control system lock and protect. This is how all other types of routers are managed.
	Locks and protections are made in GV Orbit Control without consideration of any locks and protections that have been made through another control system (locks and protections are not synchronized between GV Orbit Control and the router). This can result in unexpected routing behavior such as a failed path that looks as though it should have been successful.

See also About Lock, Protect, and Release, on page 472.

NS-BUS Control Port Configuration Parameters

See also Description of Common Device Properties, on page 332.

Parameter	Description
Connection State 1	Connection State 1 shows the connection status of the router with the primary server of a server group.
Connection State 2	Connection State 2 shows the connection status of the router with the secondary server of a server group. See Configuring a Controller Group, on page 179.
	unknown: The topology is inactive (see Activating a Topology, on page 235) or the router does not have network connectivity to the GV Orbit Server(s).
	offline: The router does not have network connectivity to the GV Orbit Server(s).
	online: The router is connected to the GV Orbit Server(s).
IP Address	The network IP address for the associated router's management or control port Ethernet address.
IP Port	Port number for the control port stream used by the router. The default is 37800.
Multiple Connections Capable	Set this if the router supports multiple concurrent connections to it. When set, this allows GV Orbit Control main and backup servers to connect at the same time to the router, thereby increasing system availability.

NV9000 TCP/IP Control Port Configuration Parameters

This option uses the NP0017 device-based router control protocol to control an NV9000 router through Ethernet network link(s). If the router has two control ports, add a second control port, one for each control port on the router. See also Description of Common Device Properties, on page 332.

Parameter	Description
IP Address	The network IP address for the associated router's management or control port Ethernet address.
Connection State 1	Connection State 1 shows the connection status of the router with the primary server of a server group.
Connection State 2	Connection State 2 shows the connection status of the router with the secondary server of a server group. See Configuring a Controller Group, on page 179.
	unknown: The topology is inactive (see Activating a Topology, on page 235) or the router does not have network connectivity to the GV Orbit Server(s).
	offline: The router does not have network connectivity to the GV Orbit Server(s).
	online: The router is connected to the GV Orbit Server(s).

Parameter	Description
Connections From Multiple Servers	Set this if the router supports multiple concurrent connections to it. When set, this allows GV Orbit Control main and backup servers to connect at the same time to the router, thereby increasing system availability.
IP Port	Port number for the control port stream used by the router.
Protocol	The IP connection protocol. **TCP:** A point-to-point connection protocol. **UDP:** A stateless connection protocol that can also broadcast data to more than one device.

Lock, Protect, and Release with the NV9000 Control Port

GV Orbit Control stores the locks in its database and they are preserved after a restart/reboot. As such, destinations will remain locked/protected. The GV Orbit Control system does not read a lock from a router and does not control a lock in the router.

See also About Lock, Protect, and Release, on page 472.

SAM SW-P-08 TCP/IP Control Port Configuration Parameters

Grass Valley/Pro Bel devices including the Sirius router that use the Pro Bel SW-P-08 switcher protocol can be controlled by GV Orbit Control through an IP network. These routers use two control ports to control them.

LIMITATION: GV Orbit Control control of a Sirius router is limited to a maximum of 1152^2 crosspoints using single-level X-Y control.

To connect the GV Orbit Server to the router

1 Add two control ports in GV Orbit Control. See To add a router control port, on page 425.

2 Configure both control port configuration parameters. See also Description of Common Device Properties, on page 332.

Parameter	Description
IP Address	The network IP address for the associated router's management or control port Ethernet address.
Connection State 1	Connection State 1 shows the connection status of the router with the primary server of a server group.
Connection State 2	Connection State 2 shows the connection status of the router with the secondary server of a server group. See Configuring a Controller Group, on page 179. **unknown:** The topology is inactive (see Activating a Topology, on page 235) or the router does not have network connectivity to the GV Orbit Server(s). **offline:** The router does not have network connectivity to the GV Orbit Server(s). **online:** The router is connected to the GV Orbit Server(s).

Parameter	Description
Connections From Multiple Servers	Set this if the router supports multiple concurrent connections to it. When set, this allows GV Orbit Control main and backup servers to connect at the same time to the router, thereby increasing system availability.
IP Port	Port number for the control port stream used by the router. The default is 14000.
Matrix ID	A SW-P-08 device can have multiple matrices, each with multiple physical levels. Set the Matrix ID value that has been configured for the corresponding router to be controlled by this device instance. To obtain this value, use the router's native configuration interface. Refer to your router's documentation for more information about this parameter.
Polling	Set this to poll the crosspoint status at regular intervals.
Protocol	The IP connection protocol. **TCP:** A point-to-point connection protocol. **UDP:** A stateless connection protocol that can also broadcast data to more than one device.
Use Extended Mode	Set this for GV Orbit Control to try to use the *extended* command set of the SW-P-08 protocol with the router first. Extended commands allow routers larger than 1023 ×1023 to be controlled. If the router does not support extended commands, the GV Orbit Control will fallback to the standard command set and with it, the associated control limitations.

Configuring a Device that Supports Audio Breakaway/Shuffling such as Audio Live

Audio breakaway and shuffling can be done by Audio Live and by GV Node. Audio Live is designed specifically for audio processing.

About Audio Live

Audio Live is an IP-only device that manages audio feeds only. It accepts a number of AES67 streams as inputs. Internally, it demultiplexes these inputs to obtain a series of mono PCM audio channels which then go through an audio router. Outputs from the router get multiplexed in accordance with the required output configuration. This allows Audio Live to perform breakaway and/or shuffling of mono channel audio feeds, in addition to audio format conversion.
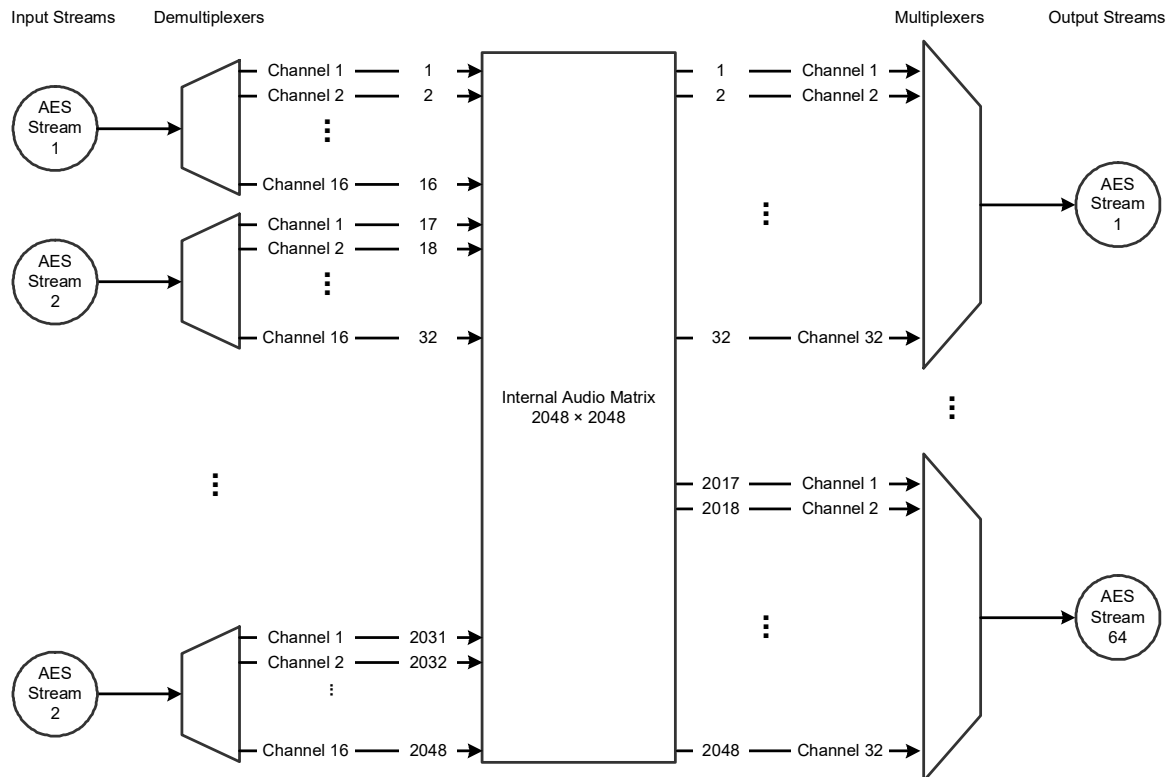
Example Audio Live configuration with 128 $\times$ 16 matrix for the input and 64 $\times$ 32 matrix for the output

The inputs and outputs of an Audio Live are called *spigots*. There are a variety of spigot configurations that are available. See also How to Know if a Spigot is an Input or an Output, on page 353.

GV Orbit Control is able to detect the number of channels in the input spigots and will assign one of the AES67 levels to the input stream for each spigot (for example, AES67-4, AES67-8, AES67-16, AES67-32 or AES67-64). This is conditional on having configured the input spigots in GV Orbit Client to not use the **Auto** setting for the number channels. This is shown in the procedure below (Required Audio Live Configuration in the GV Orbit Client Control Panel, on page 434).

GV Orbit Control will detect the number of channels in the output spigots and one of the AES67 logical levels will be automatically assigned to the output stream of each output spigot (for example, AES67-4, AES67-8, AES67-16, AES67-32 or AES67-64).

Audio Live can accept audio packets with any packet time on the input. Audio Live can convert audio packet times as well as the number of channels in the streams. For example, an input spigot accepts an AES67 stream with 8 channels and packet time of 1 millisecond, and route the signals to an output spigot with 16 channels and packet time of 250 microseconds. When using audio streams with different packet times however, extra configuration steps are required: see Required Configuration for Audio Streams with Different Packet Times, on page 437.

About the Routing Path of Audio Channels

If there are multiple devices on the topology that can perform audio shuffling, Audio Live will not necessarily always do the shuffle. For example, if the first device reached along the path (from destination to source) is a GV Node, then the GV Node may do the shuffle. It is GV Orbit Control that determines whether and when Audio Live is required for a given route. To know if an Audio Live or GV Node device is currently in use for a given route, use the Path Manager to see if there are tie-line connections to the Audio Live / GV Node device. See Path Manager Tasks, on page 450.

Prerequisites

Audio Live v1.5 or higher must be connected to the network, licensed, and has been previously configured with GV Orbit Client.

Required Audio Live Configuration in the GV Orbit Client Control Panel

In the *Audio Live User Guide*, see the following topics that must be configured according to your needs.

1 In GV Orbit Client, set the size of Audio Live's audio matrix (**Maximum Supported Channel Count**) and the number of channels per AES input and output streams. This setting is found under **Audio Live** > **Setup**> **System Configuration** > **Input Configuration** and **Output Configuration**.
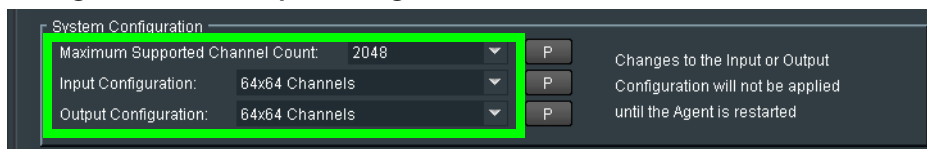
2 Stop the Audio Live server in **Agent Configuration**; under **Available Agents**, select **Audio Live** and click **Stop**.
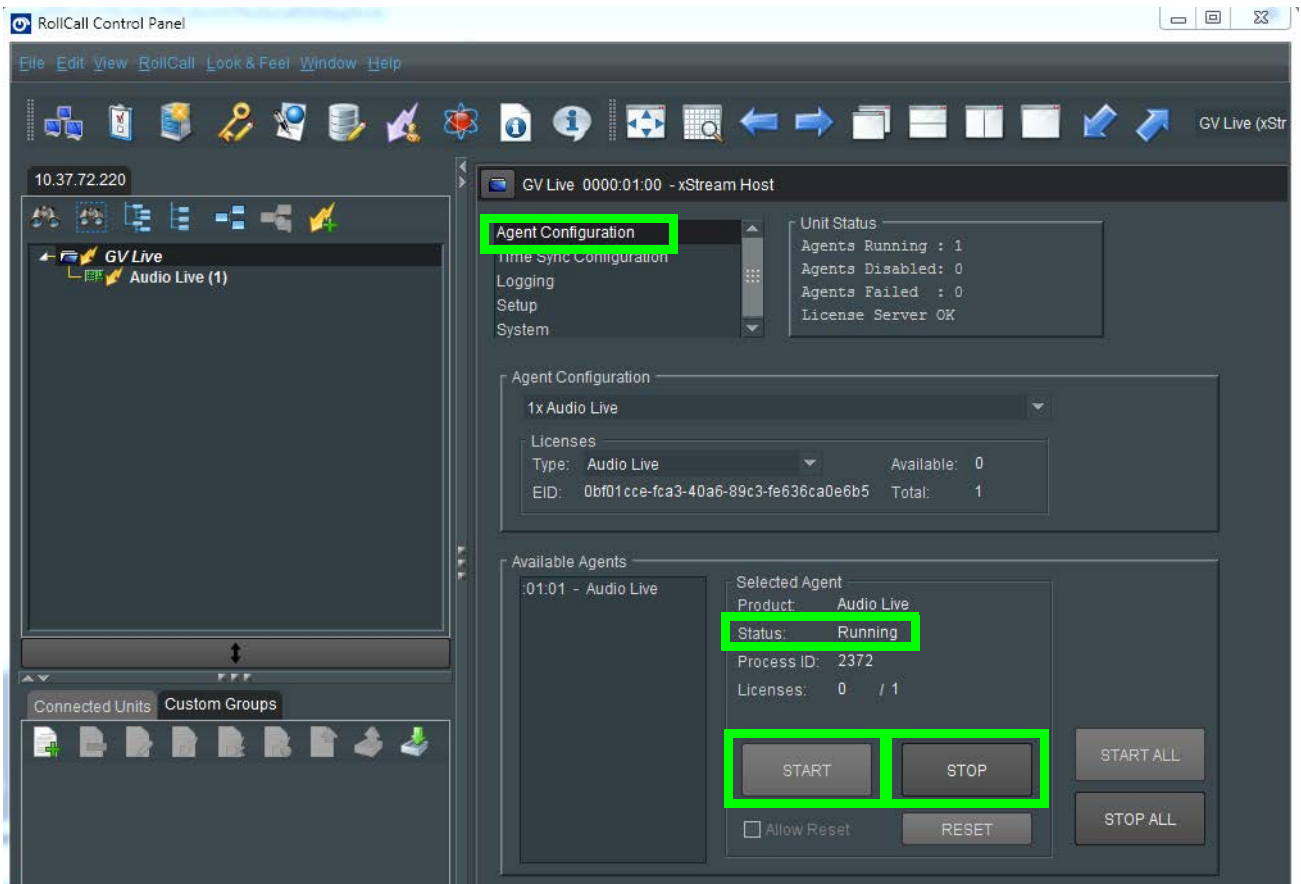
3 Once the **Status** under **Selected Agent** becomes **Stopped**, click **Start**.

4 In GV Orbit Client, set the **Channels** parameter to the maximum number of channels available for *each stream*. This setting is found under **Audio Live** > **Input**> **Source Flows** > **Channels**.
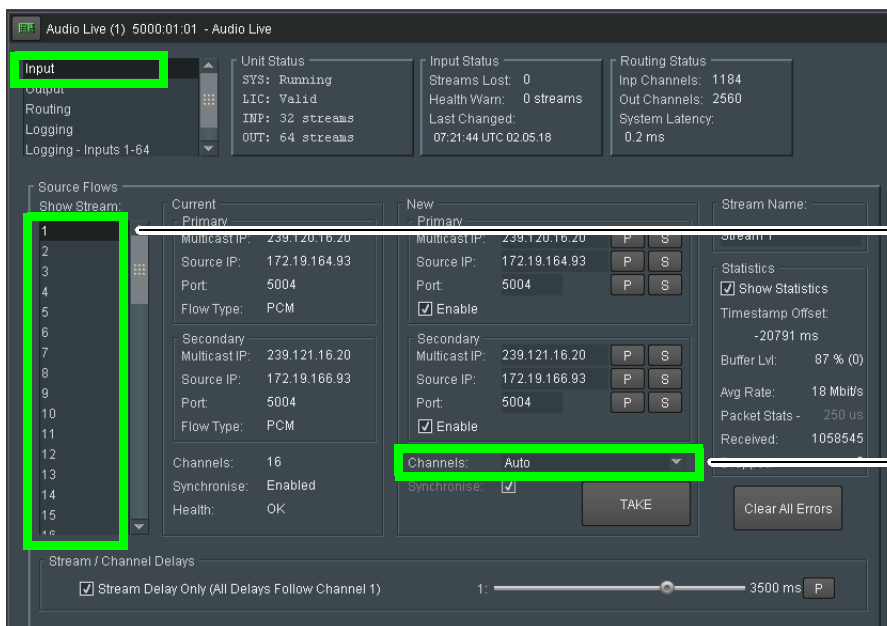
For each available stream, you must...

Set the number of channels to the maximum available in this dropdown. **Note:** the default **Auto** setting will not work.

Setting the maximum number of channels is necessary as GV Orbit Control expects that all channels be available for it to use at any time.

5   Click **Take**.

6   In GV Orbit Client under **Audio Live** > **Output**> **Dest Flows**:

   • Set the **Channels** parameter to the maximum number of channels available for *each stream*. This setting is found under **Audio Live** > **Output**> **Dest Flows**.

   • Set the **Packet Time** parameter according to the number of channels configured for *each stream*. See table below. This setting is found under **Audio Live** > **Output**> **Dest Flows**.

Packet Time	Maximum number of channels that the stream can carry
125us	up to 64 channels
250us	up to 32 channels
500us	up to 16 channels
1ms	up to 8 channels
4 ms	up to 2 channels

7   Click **Take**.

AES Logical Levels that are used for IP Audio Streams

To support a GVOP device's ability to support a range of audio channels per AES stream (for devices such as Audio Live; see GVOP Devices, on page 206), and on GVOP devices that support this feature, the following logical levels are used according to the number of

channels in the AES stream. See also Logical Level Editor Tasks, on page 190 and Setting the Logical Levels to be Displayed in the Multilevel Table, on page 247.

Logical Level	Description
AES67-4	4 mono audio channels
AES67-8	8 mono audio channels
AES67-16	16 mono audio channels This logical level is interchangeable with the **SDI audio** logical level.
AES67-32	32 mono audio channels
AES67-64	64 mono audio channels

To see the number of audio channels a given logical level supports, see Editing a Logical Level, on page 195.

Required Configuration for Audio Streams with Different Packet Times

If for a given topology, all audio streams have the same packet time, then the automatically assigned levels to the output spigots will work. If the topology has audio streams with different packet times, you will have to configure the packet times on Audio Live's output spigots. Currently GV Orbit Control is unaware of these settings in GV Orbit Client, so you must proceed as follows: duplicate the SDI audio level as many times as there are different packet times. To duplicate an SDI audio level, see Duplicating a Logical Level, on page 193.

For example, to accommodate a 1 microsecond audio packet time, you duplicate the SDI audio level with the **-1** suffix. To accommodate a 250 microseconds audio packet time, you again duplicate the SDI audio level with the **-250** suffix.

You also need to set the proper AES67 levels on the Audio Live output streams in GV Orbit Control. For example:

- If output spigot 1 has been configured with 16 channels at 250 microseconds, then the streams for output spigot 1 should be assigned the **AES67-16-250** level.
- If the output spigot has been configured with 8 channels at 1 ms, then the streams for that spigot should be assigned the **AES67-8-1** level.

Note: You will need to set the level on all output streams of the Audio Live configuration in GV Orbit Control if your topology uses more than one packet time value.

Configuring an Audio Live device in GV Orbit Control

To add an Audio Live device to a topology

1 Add the Audio Live device to the Topology: from the **Device Library**, **Discovered**, find an Audio Live device bubble that you want to control. See To add a Discovered Device to a Topology, on page 209.
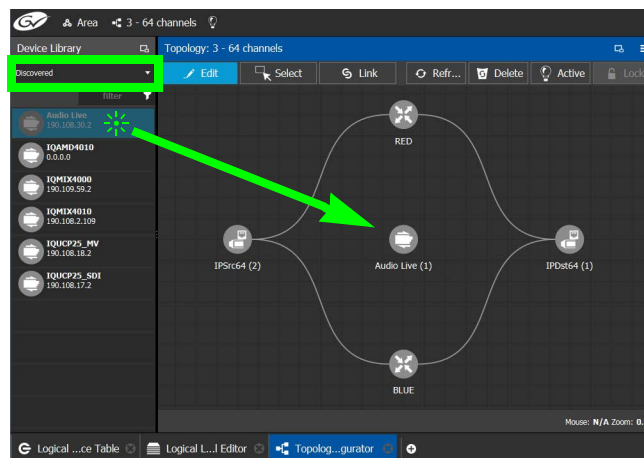
2 Click on the name of the device underneath the bubble to name the device or device group. See To name a device and set the number of devices in the group, on page 205.

3 On the topology, connect the Audio Live device to the network switches. See Methods to Link Devices in a Topology, on page 222.
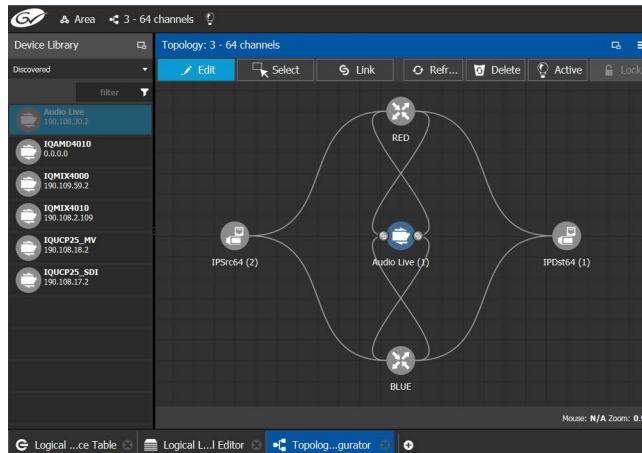
By default, the Audio Live device is created according to the configuration defined in GV Orbit Client. The streams are assigned the appropriate AES67 levels, based on the number of channels. The Audio Live can be used as is, without a need to modify the device properties in the Property Editor, unless you need to modify the streams to use custom levels.

4 Select the **Audio Live** bubble and configure the Device Properties in the **Property Editor**. See Defining Device Properties, on page 229 for more information.

See also Description of Common Device Properties, on page 332.

Parameter	Description
Name (of device bubble)	The name of the Audio Live device set in GV Orbit Client. When two Audio Live devices have been configured to be redundant, the name comes from the pricloudmary device.
Name (found under Node)	The name of the individual Audio Live device set in GV Orbit Client.
Nodes	When two Audio Live devices have been configured to be redundant: **Node 1:** The Audio Live that has been configured as *Redundant - Primary* in RollCall. **Node 2:** The Audio Live that has been configured as *Redundant - Secondary* in RollCall. See Audio Live Redundancy Support, on page 441.
Software	The firmware version running on the Audio Live device.
Primary IP Address Secondary IP Address	When two Audio Live devices have been configured to be redundant: **Primary IP Address:** The IP Address of the Audio Live that has been configured as *Redundant - Primary*. **Secondary IP Address:** The IP Address of the Audio Live that has been configured as *Redundant - Secondary*. See Audio Live Redundancy Support, on page 441.
Connection to Controller 1 Connection to controller 2	Connection to Controller 1 shows the connection status of the Audio Live device with the primary server of a server group. Connection to Controller 2 shows the connection status of the Audio Live device with the secondary server of a server group. See Configuring a Controller Group, on page 179. **unknown:** The topology is inactive (see Activating a Topology, on page 235) or the Audio Live device does not have network connectivity to the GV Orbit Server(s). **offline:** The Audio Live device does not have network connectivity to the GV Orbit Server(s). **online:** The Audio Live device is connected to the GV Orbit Server(s).
Primary spigot routing count Primary matrix routing count	These paramters come from the Audio Live's configuration made in RollCall.
Redundancy Mode	Shows the Audio Live's current configuration. **Independent:** This Audio Live bubble represents a single Audio Live device. **Redundant:** This Audio Live bubble represents a pair of Audio Live devices operating in a cluster for improved availability. See Audio Live Redundancy Support, on page 441.

5 Create the sources and destinations. See Automatically Creating AES67 Audio Channels for Sources and Destinations, on page 447.

6   Test the configuration by making takes between a logical source and destination that use the AES67 audio levels. See Performing a Take in Router Control, on page 471.

Known Audio Live limitations

- When choosing an Audio Live spigot to use for the take, GV Orbit Control will only use an output spigot that has the same number of channels as the destination, and only use an input spigot that has the same number of channels as the source. If no such spigot is available, the take will fail. It will not try to use multiple spigots (for example, if the source/destination is 16 channels, it will not try to use 2 spigots, each with 8 channels), and it will not try to use part of a spigot (for example, if the source/destination is 8 channels, it would not try to use the first 8 channels of a 16 channel spigot).

- In the Audio Live configuration, the channel count of an **Input Configuration** and **Output Configuration** cannot be set to **Auto** as GV Orbit Control does not support this setting. See Required Audio Live Configuration in the GV Orbit Client Control Panel, on page 434.

- The number of channels on the input stream must match the number of channels on the source stream, and the number of channels on the output stream must match the number of channels on the destination stream.

- For streams that have an AES67-X level, the logical source/destination that is automatically created is not usable. Instead, you must create custom logical sources and destinations, and place the streams in the SDI Audio or audio1 to audio16 level columns instead. See Required Configuration for Audio Streams with Different Packet Times, on page 437.

Audio Live Redundancy Support

Audio Live redundancy is supported in GV Orbit Control systems with Audio Live v1.5.3 firmware version or higher. With this Audio Live firmware, each Audio Live unit can be configured as *Independent*, *Redundant - Primary*, or *Redundant - Secondary*. These configuration parameters are available through the RollCall Unit Redundancy page, for each unit. When two Audio Live units are configured as follows, the units form a cluster for increased availability: Audio Live 1 is configured as *Redundant - Primary* and Audio Live 2 is configured as *Redundant - Secondary*.

Audio Live Network Connections

The Audio Live Primary and Secondary input and output ports from both units must be connected to RED and BLUE network switches and the corresponding spigots/streams must be properly configured.
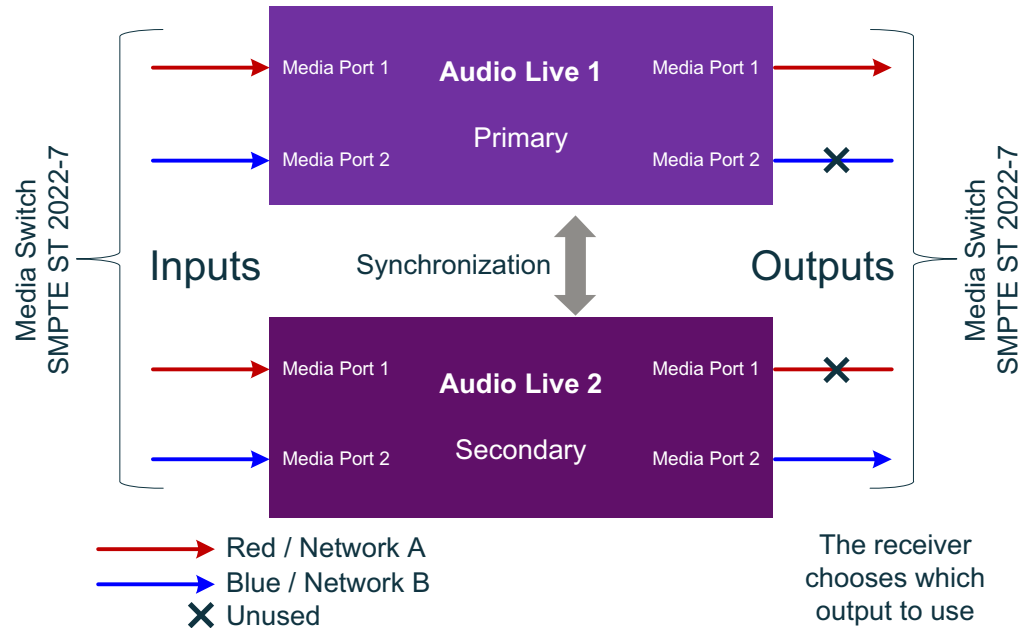
For more information about network connections, refer to **GV Orbit Server Cabling** chapter of the *GV Orbit Admin Guide*. See Related Documentation, on page 19.

Redundancy on Audio Live was designed to prevent signal loss or signal glitching in case of a hardware failure of one of the two units. In order to achieve this, the Audio Live cluster is using, on the sender side, the primary port from the Primary unit as the cluster primary output, whereas the secondary port of the secondary unit is used as the cluster secondary output.

The secondary output from the primary unit and the primary output from the secondary unit are not used by the GV Orbit Control systems.

On the receiver side, input ports from both Primary and Secondary units are used and join the same flows; primary input from the primary unit and the primary input from the secondary unit, as well as the secondary input from the primary unit and the secondary input from the secondary unit. The input and output ports currently being used are displayed through the Path Manager. See Path Manager Tasks, on page 450.

Required Audio Live Configuration in RollCall

Access the Audio Lives units, one at a time through RollCall and configure them as follows in their **Unit Redundancy** page. For redundancy support, both Audio Live units must be

configured in redundancy mode, one unit as *Redundant - Primary* and the other one as *Redundant - Secondary*.

Parameter	Description
Unit State	Shows this unit's state. **-:** Unknown status. **Initializing:** Unit is in the process of connecting and synchronizing with the partnered unit. **Running**: Unit has successfully paired with the partnered unit.
Partner State	Shows the partnered unit's state, when available. **-:** Unknown status. **Running**: Unit has successfully paired with this unit.
Redundancy Status	Shows the status of the paired Audio Live units. **Matched:** The two Audio Live units are operating with redundancy. **Error:** Configuration or communication issue.
Unit assignment	Set this unit's role. **Independent:** This unit is not associated with another Audio Live unit; there is no Audio Live redundancy currently enabled. **Redundant - Primary:** This unit is the primary unit to be associated to another Audio Live unit (the secondary unit) for redundancy through the **Partner IP Address** parameter. **Redundant - Secondary:** This unit is the secondary unit to be associated to another Audio Live unit (the primary unit) for redundancy through the **Partner IP Address** parameter.
Network interface	Set the Ethernet interface on which this Audio Live is to communicate with the other Audio Live. With redundancy, this must be set on both units such that both Audio Live units have network connectivity with each other.
Partner IP Address	With redundancy, set the IP Address of the other Audio Live device. If this is the primary unit, set the secondary unit's IP address. If this is the secondary unit, set the primary unit's IP address.

Both units must be identically configured with respect to any parameter that can affect the output audio. This is done in each Audio Live's RollCall configuration. This includes:

- Spigot routing (destinations and sources).

- Internal channel matrix routing.
- Input and output configurations. In GV Orbit Client, set the size of Audio Live's audio matrix (**Maximum Supported Channel Count**) and the number of channels per AES input and output streams. This setting is found under **Audio Live** > **Setup**> **System Configuration** > **Input Configuration** and **Output Configuration**.

- Input and output delays.
- Timestamp alignment settings.
- Input 2110-31/AES3 selections.
- Input synchronizer selections.
- Output channel counts and packet times.

Once the Audio Live configuration is complete, both units are synchronized in order to exchange flow data in order to handle redundancy.

Redundant Audio Live Configuration in GV Orbit Control

It is important to have both units up-and-running while configuring the Audio Live cluster in GV Orbit Control. Once the Audio Live cluster configuration is completed, the cluster will be discovered in GV Orbit Control systems, as a GVOP discovered device. If there is any configuration issue between the two Audio Live units, causing the cluster to be in a bad state (not synchronizing properly), then the discovered entity will not be discovered under the GV Orbit Control system and if the device is already on the topology, its status will change to offline.

A new icon is used to distinguish between Audio Live units using v1.5.3 firmware and units using an older firmware, regardless of the redundancy mode (Independent or Redundant).

Audio Live Icon	Audio Live Firmware Version	Description
	v1.5.2 or lower	Audio Live redundancy is unsupported.
	v1.5.3 or higher	Audio Live redundancy is supported.

The name of the discovered cluster and its related spigots will be using the ones from the primary Audio Live unit.

Once the cluster is added to the topology, the cluster group device will be listing two nodes corresponding to the two Audio Live units. Each node will provide the Audio Live unit properties (Unit name, hostname, Control IP address, GUID. and so on) and also the specific unit ports and spigots. See Configuring an Audio Live device in GV Orbit Control, on page 438.

The cluster device group lists the ports and the spigots from those units; the primary port is the one from the primary unit where the secondary port is the one from the secondary unit.

The cluster **Redundancy mode** property will reflect the current cluster status (Independent or Redundant).

The control port status (Online / Offline / Reconnecting) for the cluster is available on the cluster device group and also through the System Status page where the status for both units is also available. See System Status Task, on page 457.

Further notes:

- When replacing a failed unit, it's important to apply the same IP configuration to the new unit as was applied to the previous faulty unit, otherwise tally issues may occur.
- Independent Audio Live units from existing topologies, using an older Audio Live firmware, cannot be used for redundancy. Those units must be deleted from the topology, upgraded to v1.5.3 firmware (or higher), configured in a cluster mode and then they will be discovered by GV Orbit Control systems.
- No changes will be noticed if an independent Audio Live unit, using v1.5.3 Audio Live firmware (or higher) is added to the topology, except the new icon and the new unit Redundancy Mode, shown as **Independent**.
- Cisco DCNM host policies are only created for the streams corresponding to the ports that are actually used by GV Orbit Control systems.

Configuring an IQAMD40 Device

About IQAMD40

The IQAMD40 provides multichannel MADI-to-IP interfacing, and has been developed to allow high-density audio integration into Ethernet IP networks. Using industry standard AES67 encapsulation and an IP interface enables the IQAMD40 to interface directly with many common audio desks and systems.

PREREQUISITES: IQAMD40 must be connected to the network, licensed, and has been previously configured with GV Orbit Client.

IQAMD40 Integration in GV Orbit Control

GV Orbit Control supports the routing of audio signals through an IQAMD40 card.

To add an IQAMD device to a topology

1 Add the IQAMD device to the Topology: from the **Device Library**, **Discovered**, find an IQAMD device bubble that you want to control. See To add a Discovered Device to a Topology, on page 209.
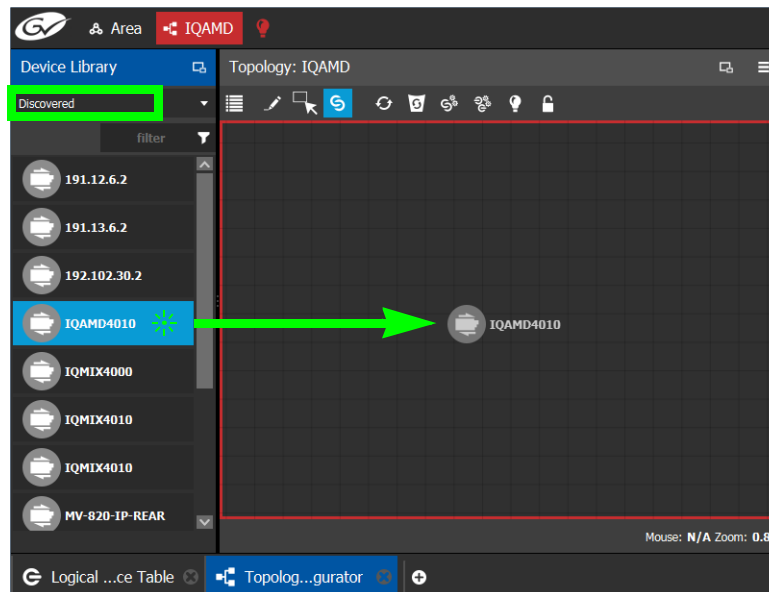
2 On the topology, connect the IQAMD device to the network switches. See Methods to Link Devices in a Topology, on page 222.
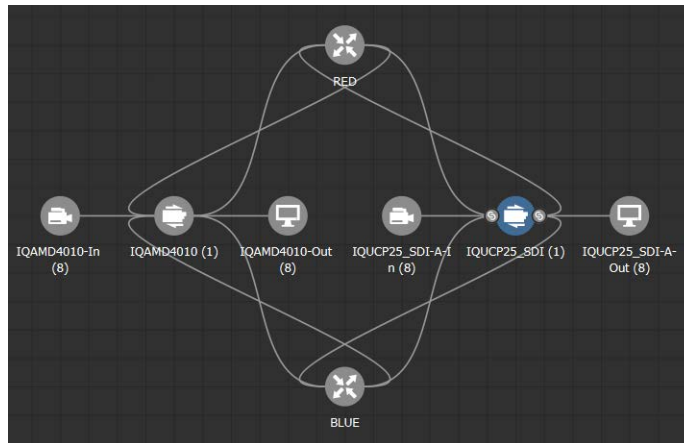
Automatically Creating AES67 Audio Channels for Sources and Destinations

GV Orbit Control routes multiples of 16 audio channels by default. As a result, if you want to send 64 audio channels to a destination, you create four destinations with 16 audio channels each.

An automation shown in the procedure below allows you to add the all the Stream's AES67 audio channels to the Multilevel Table in the Logical Device Table at once for AES67 sources and destinations.

To automatically create the AES67 audio channels for sources and destinations

1 In the Logical Device Table, Multilevel Table, select the **Sources** tab.

2 Select one or more streams in the Stream Browser (using <Ctrl> + click) for which you want to create all the source / destination audio channels.
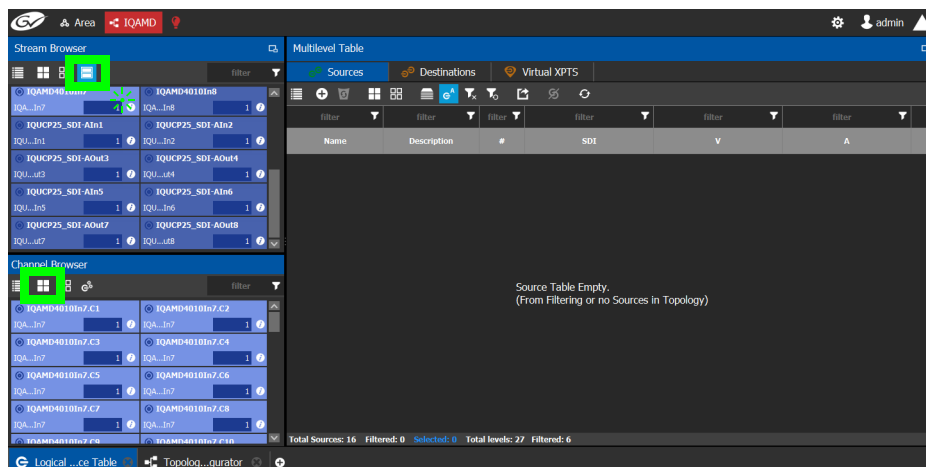
3 Click ⬜ to show the Channel Browser in the Stream Browser of the Logical Device Table. See Stream Browser / Channel Browser, on page 242.

4 Click ⬜ to select all in the Channel Browser.

5 Click ⚙ automated sources / destinations in the Channel Browser to create the selected streams in the multilevel Table.
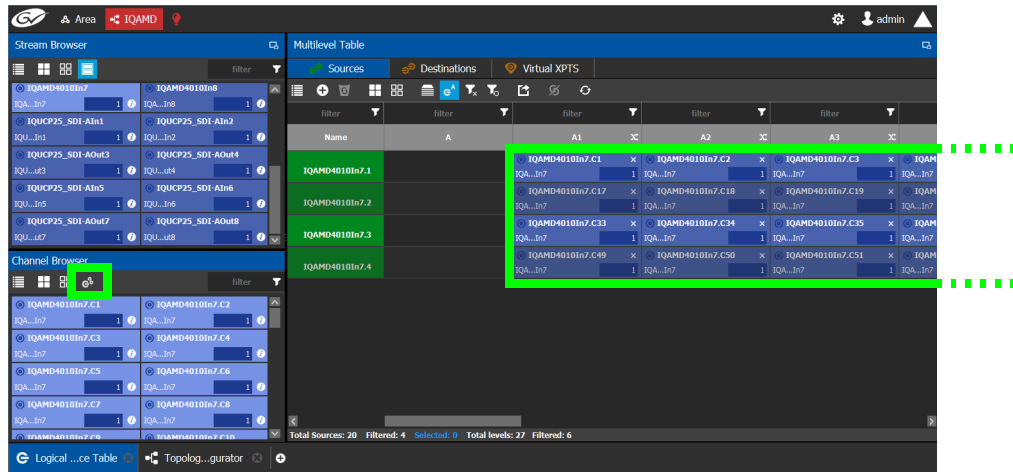
The 64 audio streams are created as four sources / destinations with 16 audio channels each.

6 Select the **Destinations** tab and repeat from step 2.

7 Test the configuration by making takes between a logical source and destination that use AES67 levels. See Performing a Take in Router Control, on page 471.

Monitoring Tasks

Overview

The Monitoring tasks in GV Orbit Control are used to view information about tie line use and the source to destination path of the streams and to monitor the health of the GV Orbit Servers and the devices in the selected topology.
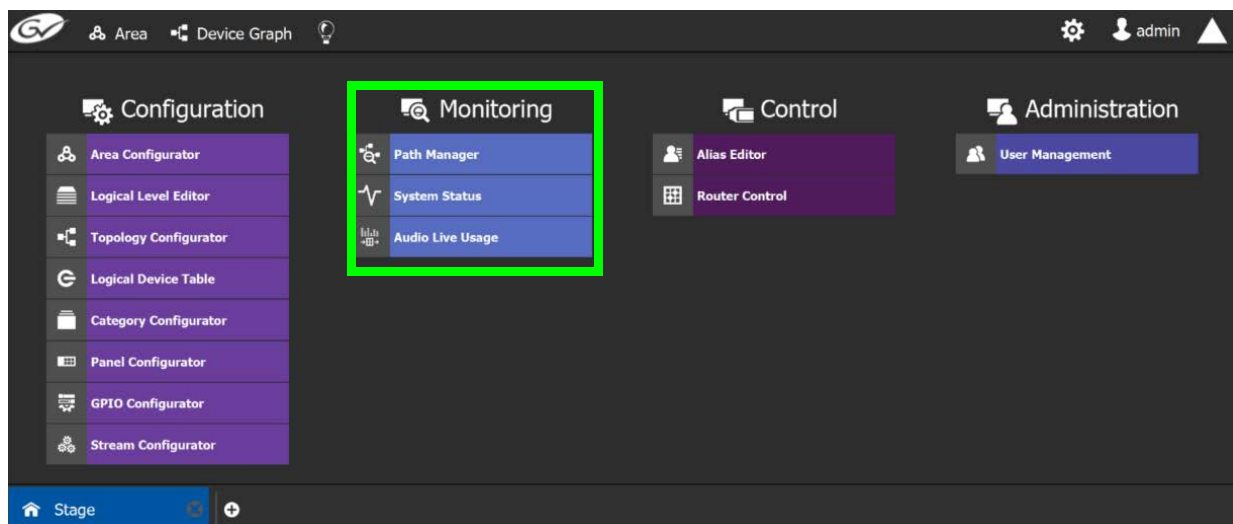
The GV Orbit Control Monitoring Tasks include:

- Path Manager Tasks, on page 450
- System Status Task, on page 457
- Audio Live Usage, on page 463

Path Manager Tasks

Use the Path Manager task to view information about the tie-line use and the source to destination path of the streams. Tie-lines also show the current percentage of bandwidth used.

When a topology includes a DCNM Network Switch, the Path Manager shows:

- Technical information that can be used to help diagnose network connectivity and path issues (no signal or wrong signal at the destination).
- The overall health status of each Network Switch device.
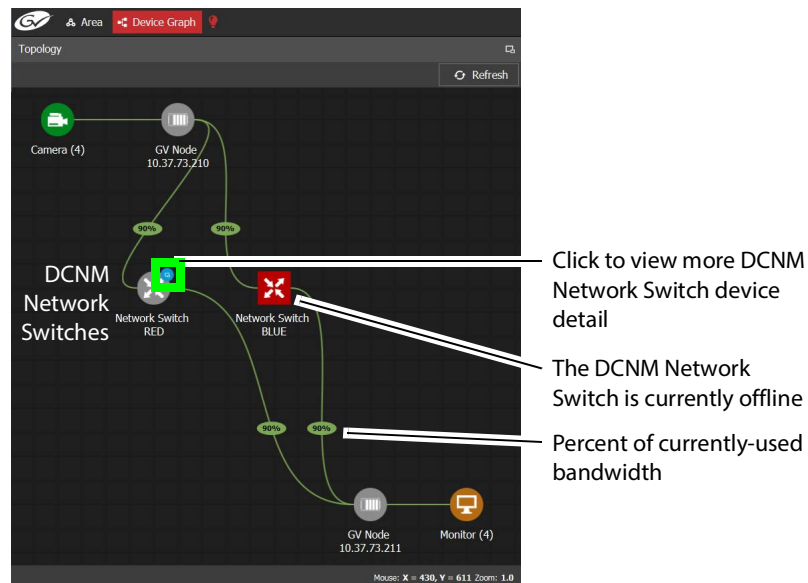
Network Switch devices have a blue bubble that when clicked provides more information about the internal status of the DCNM Network Switch that is shown in the Status tab.
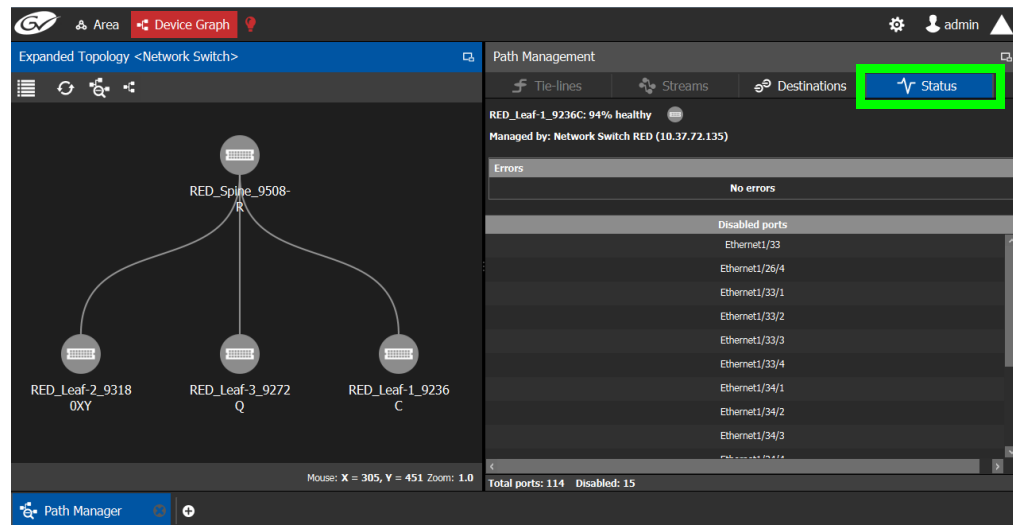
Interpreting DCNM Network Switch Symbols

The following DCNM network switch symbols are used to represent the Network Switch device's health.

Symbol	Description
	The DCNM network switch device is healthy.
	Connection to the DCNM network switch device is offline. To diagnose: Select this device and select the **Status** tab to view more technical information that can be used to troubleshoot the issue in the DCNM Web interface (by looking at the host policy / flow policy / flow status).

For a system-level health status, see System Status Task, on page 457.

Accessing the Path Manager

To access the Path Manager Task

1 Open GV Orbit Control Stage. See Navigating Back to Stage, on page 170.

2 Select the required Area. See Selecting an Area, on page 183.

3 Select the required topology. See Selecting a Graph, on page 184.

4 Make the topology active. See Activating a Topology, on page 235.

5 Select **Monitoring** > **Path Manager**.
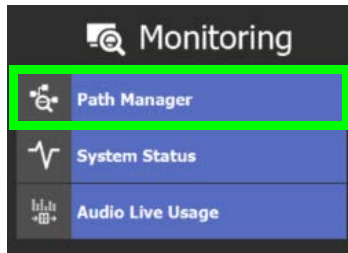
The Path Manager task opens:
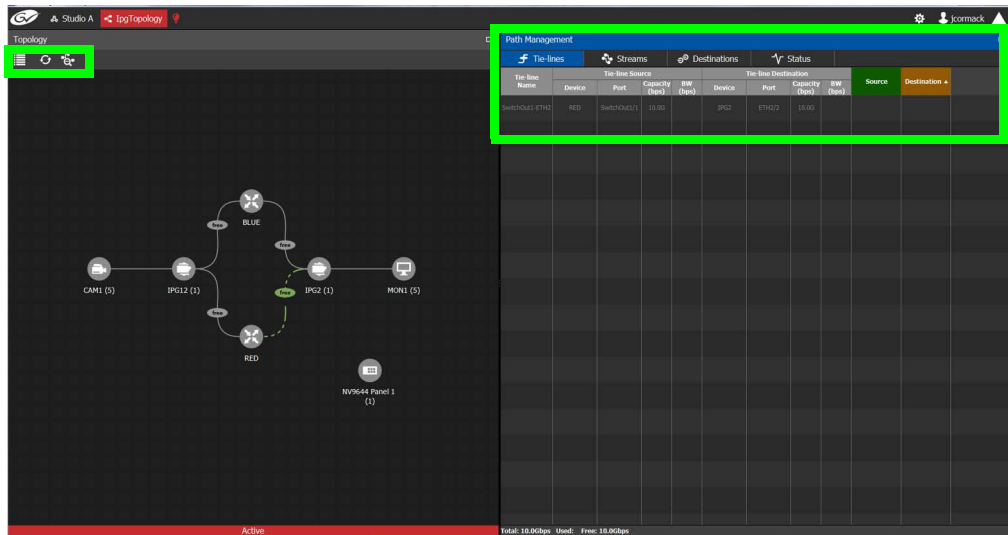
Under Path Management, click any of the following tabs for more information:

- Tie-lines
- Streams
- Destinations
- Status

Path Manager Topology Menu
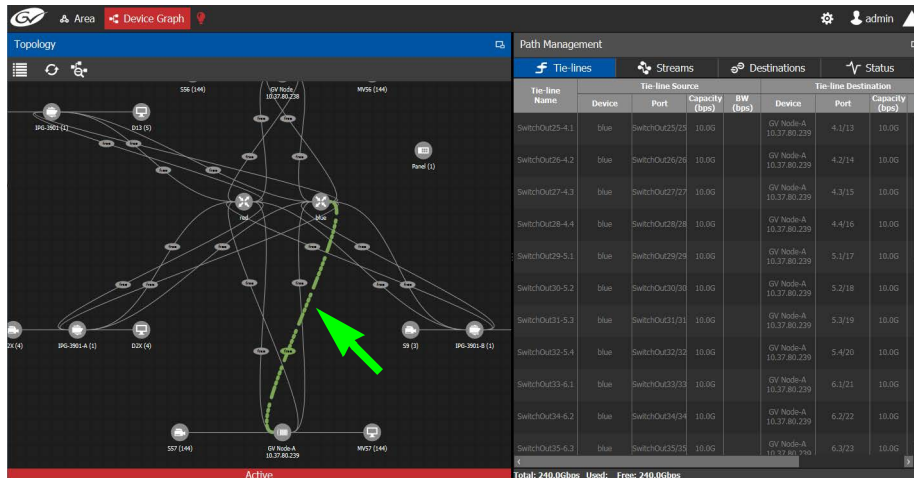
The Path Manager Topology menu has the following menu options.

Icon	Description
Refresh	Reloads the Topology's contents. See Refreshing the Topology, on page 202.
Overview	Shows the top level of the topology.
Refresh Tielines	Allows you to recompute the tielines usage based on the current crosspoints in each device, in case the tieline status in the control system has become out-of-sync with what is actually routed. During tieline refresh, all tielines are locked and you can not perform any takes. Only use this feature during off hours as this can take up to 30 seconds to complete.

Viewing Information about the Tie-lines

To view information about the tie-lines

1 Open the Path Manager for the selected topology. See Accessing the Path Manager, on page 451.

2 Click Overview ![icon] if available.

    The tie-lines show their currently-used capacity in percent.

3 Select a tie line in the Topology.

In the **Tie-lines** tab, the source and destination information is displayed under the following headings:

- Tie line Name
- Tie line Source: Device, Port, Capacity (bps), BW (bps)
- Tie line Destination: Device, Port, Capacity (bps), BW (bps)
- Source
- Destination

Viewing Information about the Streams

To view information about the streams

1 Open the Path Manager for the selected topology. See Accessing the Path Manager, on page 451.

2 Click Overview ![icon] if available.

3 Select a tie line in the Topology.

4 Select the **Streams** tab.

5 In Tie-lines, select a tie-line that you want more information on its streams.

The stream information is displayed under the following headings:

- Stream
- IP address
- BW (bps)
- Source
- Destination

Viewing Information about the Destinations

This tab shows the path for a signal to a destination. If a destination is showing the wrong signal, use this tab to trace the destination signal back to the source or to start fault-finding.

When a topology includes a GV Fabric / DCNM Network Switch, this tab shows operational status information about the path used by a signal to a destination through the GV Fabric / DCNM Network Switches, GV Node senders and receivers for example. When you select a Network Switch device that is in alarm, more information about the internal status of the GV Fabric / DCNM Network Switch is shown in the Status tab.

To view information about the destinations

1 Open the Path Manager for the selected topology. See

2 Select the **Destinations** tab.

All the destinations are listed on the right.

3 Select a destination. The path details to that destination are shown.

If the topology includes a DCNM Network Switch, the path details will include the spine and leaf connections within the DCNM network. This can be used to diagnose issues with the DCNM network switch or any other signal path issue. For example, the figure

below shows that the RED network is in alarm and as such no signal is passing through this part of the switch's fabric.
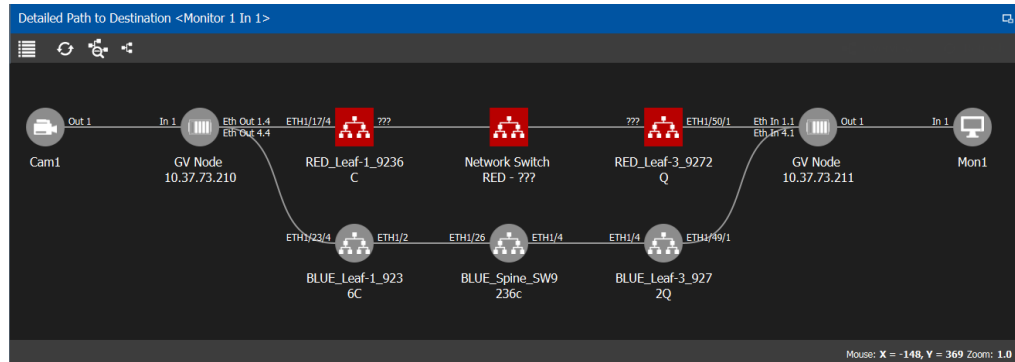
To know more about the DCNM Network switch symbols that are used for health monitoring, see Interpreting DCNM Network Switch Symbols, on page 451

4 If a DCNM network switch is in alarm, select it and more specific diagnostic information for the related flow shown under the **Path Management**, **Status** tab.
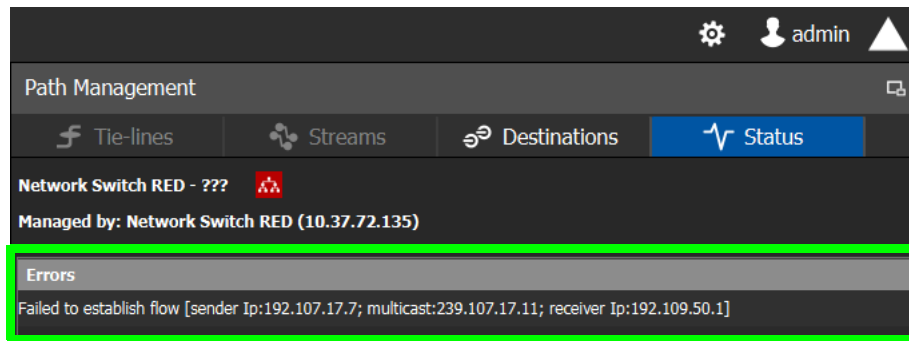
Use this information to diagnose path issues, for example, through the switch's or GV Node's native configuration interface.

5 Click **Overview** to view a highlighted path between the source, shown in green, and the destination, shown in brown.
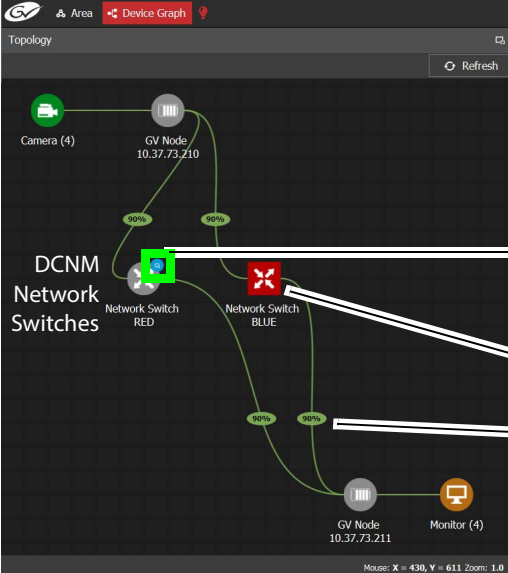
Viewing Information about the Status

When a topology includes a DCNM Network Switch, this tab shows more technical information about the DCNM Network Switches such as the Network Switch device's operational status that can be used to diagnose the issue in the path issue, for example, through the switch's or GV Node's native configuration interface.

To view information about the status

1 Open the Path Manager for the selected topology. See Accessing the Path Manager, on page 451.

2 Select the **Status** tab.

The flow status of the DCNM Network Switches are displayed, if applicable.
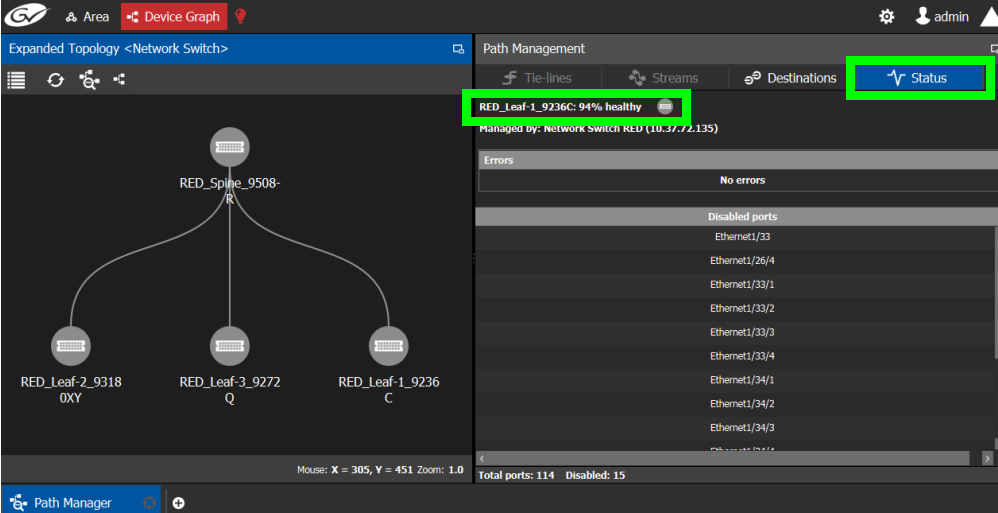
Network Switch devices have a link that when clicked shows the exploded network switch showing more information about spine and leaves, and the bandwidth capacity for each specific link.

Click each switch to see its health of the switch (as report by the switch itself).

Disabled Ports shows a list of all the switch's disconnected or unused ports that are currently disabled by the switch.

System Status Task

Use the System Status Task to monitor the health of the GV Orbit Servers and the devices in the selected topology. You can also perform a manual failover from this task.

Accessing the System Status Task

To access the System Status Task

1 Open GV Orbit Control Stage. See Navigating Back to Stage, on page 170.

2 Select the required Area. See Selecting an Area, on page 183.

3 Select the required topology. See Selecting a Graph, on page 184.

4 Select **Monitoring** > **System Status**.

The System Status task opens:

In this configuration, Controller 1 is the active controller and Controller 2 is not present.

The System Status task displays the following information for both GV Orbit Control controllers: **Controller 1** and **Controller 2**. Depending on the server hardware model

and the software applications that are currently installed, certain status parameters shown in the table below will not be displayed.

Parameter	Description
IP	The current controller's IP address.
Status	The current status of GV Orbit Control **Controller 1** and **Controller 2** (if equipped): **Active:** All GV Orbit Control task are being processed by this controller. **Inactive:** This controller is in hot standby. It is ready to take over from the active controller. **Force Active:** Make this controller the active controller. See Forcing the Inactive Controller to be the Active Controller, on page 459.
Health	The current controller's health metric: **Green bar:** Indicates that the controller's overall health is good. **Red Bar:** Indicates an issue requires attention / maintenance actions.
ID	Identifies the members of a cluster: **1:** The server that the administrator logged in to when creating the cluster. This is the *first* server of the cluster. **2:** The *second* server that was added by an administrator who was logged in to the first server when creating the cluster.
CPU and Memory	The current GV Orbit Server's CPU and memory usage show the current level of activity.
Orbit Control Memory	The current GV Orbit Server's memory usage for the local GV Orbit applications.
Densité Memory	The current GV Orbit Server's memory usage for the local Densité application. The percentage reflects the memory used out of its allocated heap size of 8 GB.
Fans	The current controller's cooling fan health: A **green** box indicates that the controller's fans are operating correctly.
PSU	**Green**: the PSU is plugged and detects power. **Red**: the PSU doesn't detect power. Possibly the power cable is unplugged. **Gray** or no status: the server doesn't detect correctly the PSU unit because the unit is physically removed or the initialization isn't done. In this second case, shutdown the server, disconnect both power cables, physically remove both power supply units, re-insert them both and apply power to both. Then start the server.
Network Interface	The current controller's Ethernet interface names and health: A **green** box indicates that the controller's Ethernet interfaces are operating correctly.
Panels Communications Status	Shows the network connection status between the GV Orbit Server and the panel that have been configured in GV Orbit Control.

Parameter	Description
Devices	The current status of the devices: **Active:** This device is in active operation. **Standby:** This device is in hot standby. It is ready to take over from the active device. **Primary / Secondary:** When a cluster of Audio Live devices are configured for redundancy, this shows the IP addresses and the health of those devices. See also Audio Live Redundancy Support, on page 441.
Faults	A list of any current faults.

For more information about the health status of a DCNM Network Switch device, see Path Manager Tasks, on page 450.

Forcing the Inactive Controller to be the Active Controller

If two controllers are configured in a redundant configuration, then during the normal course of operations, one controller is active and the other is inactive at all times.

If a problem occurs, such as network loss or connectivity issues, the inactive controller (Controller 2) becomes the active controller. The controller that was formerly active (Controller 1) reboots. This is an automatic failover. You can perform a manual failover if you have administrator rights in the selected Area. See Viewing Permissions by Role, on page 484.

To perform a manual failover

1 Open the System Status task for the required topology. See Accessing the System Status Task, on page 457.

2 Click the **Force Active** button for the Inactive Controller.

A confirmation message appears.
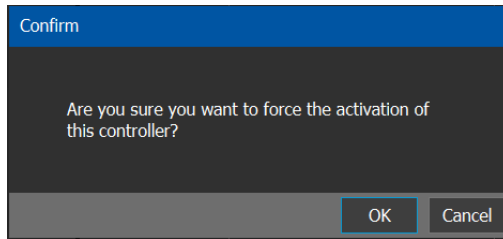
3 Click **OK** to continue.

The controllers switch states. The formerly inactive controller (Controller 2) becomes active. The formerly active controller (Controller 1) reboots. As it shuts down, the following changes occur and are reflected on the System Status task.
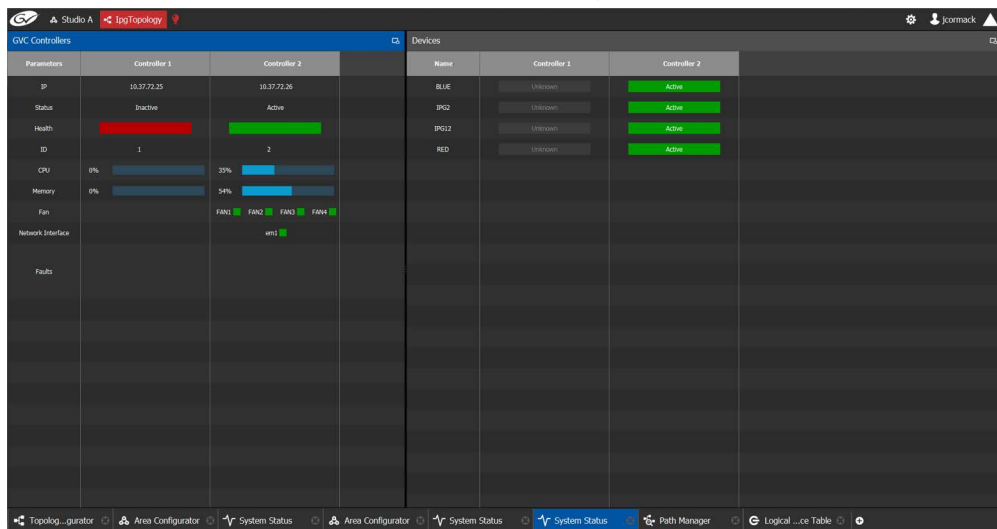
- The **Status** of the **Controller 1** is now **Inactive**.
- A **red bar** is displayed for the **Health** of Controller 1, indicating it is not good.
- The **CPU** and **Memory** are at **0%**.
- The **Fans** and **Network Interface** are blank.
- The **Status** of the **Controller 2** is now **Active**.
- A **green bar** is displayed for the **Health** of Controller 2, indicating it is good.
- The **CPU** and **Memory** fields show their level of activity.
- The **Fans** are green, indicating health.
- The **Network Interface** displays the Management Interface port name (em1).
- The status of all **devices** controlled by **Controller 1** is **unknown**.
- The status of all **devices** controlled by **Controller 2** is **active**.

When Controller 1 comes back, the following changes occur and are reflected in the interface.
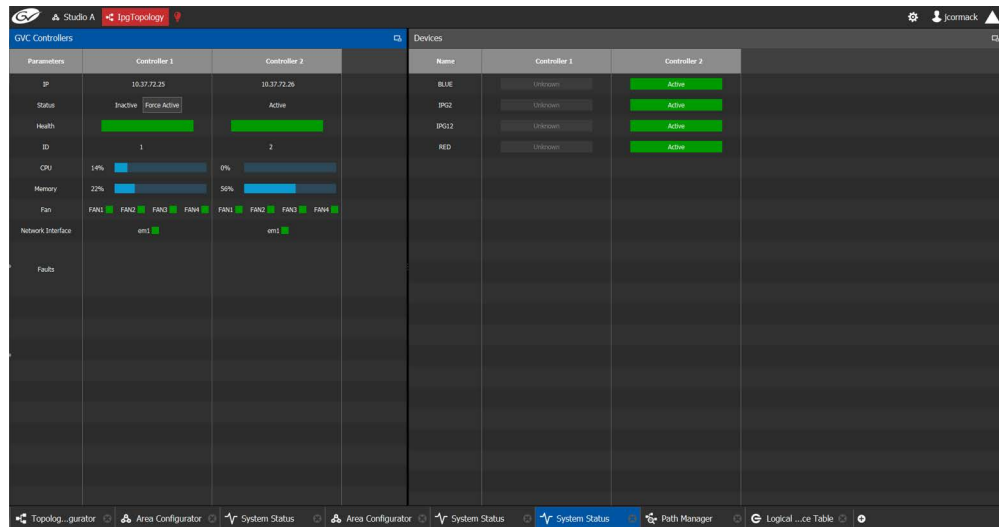
- The **status** of **Controller 1** is now **Inactive**.
- The **health** field for Controller 1 displays a **green bar** indicating it is good.
- The **CPU** and **Memory** fields for both controllers show the current level of activity.
- The **fans** for both controllers show **green** boxes indicating health.
- The **Network Interface** port of both controllers is displayed, **em1**.
- The **status** of the devices on **Controller 1** is **unknown**.
- The **status** of the devices on **Controller 2** is **active**.

Finally, when Controller 1 is fully rebooted, the following changes occur:
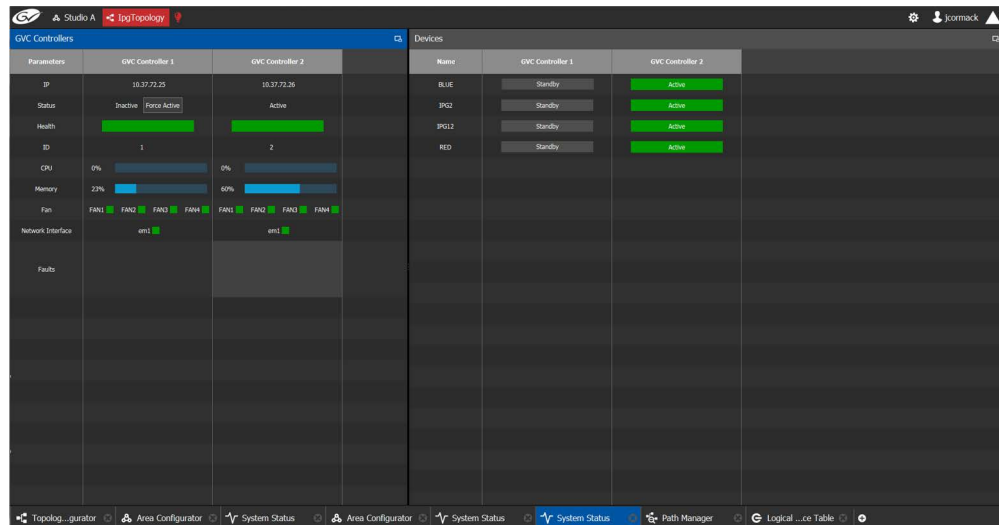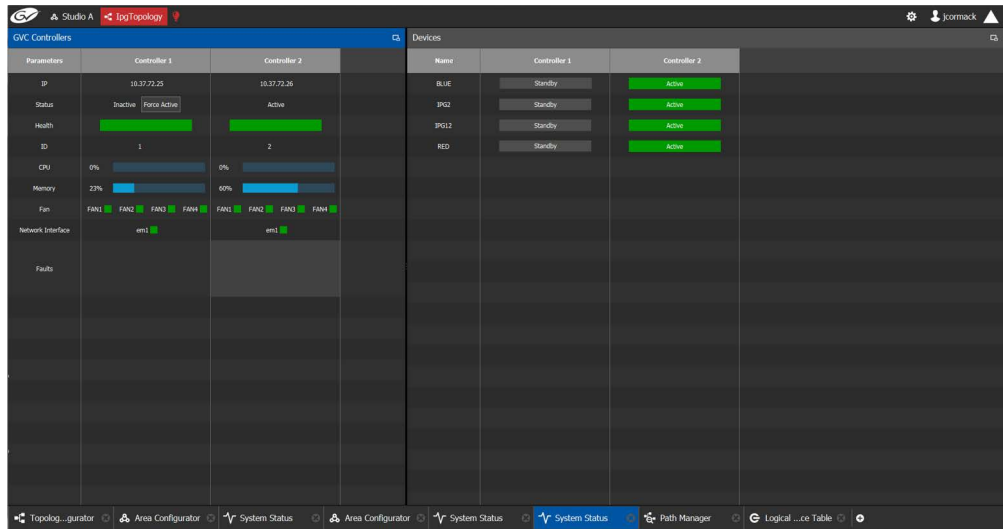
- The **status** of the devices on **Controller 1** is **standby**.

Permissions

Only users who are assigned to Administrators role in the selected area have View, Edit, and Delete permissions in the System Status task. Users who are assigned to Engineers, Operators, and Maintenance roles have view rights only. See Viewing Permissions by Role, on page 484.

Audio Live Usage

Use the Audio Live Usage Task to have more information about the loading and use of an Audio Live's capacity. This is a debugging tool to help you to better understand what the Audio Live's routing capacity.

PREREQUISITES: One of more Audio Live devices must have been configured on the current topology. See Configuring an IQAMD40 Device, on page 446.

Accessing the Audio Live Usage Task

To access the Audio Live Usage Task

1 Open GV Orbit Control Stage. See Navigating Back to Stage, on page 170.

2 Select the required Area. See Selecting an Area, on page 183.

3 Select the required topology. See Selecting a Graph, on page 184.

4 In the Topology Configurator, activate the topology. See Activating a Topology, on page 235.

5 Select **Monitoring** > **System Status**.
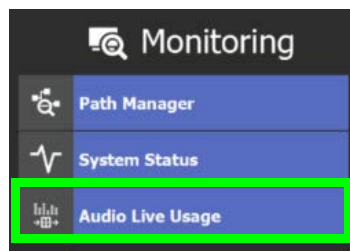
The Audio Live Usage task opens:

All table columns can be filtered. See Filtering Lists, Table Columns, Sources, and Destinations, on page 266.

Icon	Description
Refresh	Reloads the Audio Live Usage task contents. If you make a Take for audio streams through an Audio Live device, then you must click **Refresh** to see the results.
Audio Live Name	The device name configured for the Audio Live device, in the device's properties.
64ch Input Usage	The number of AES67-64 input levels currently being used out of the available number of AES67-64 input levels, expressed as a fraction.
16ch Input Usage	The number of AES67-16 input levels currently being used out of the available number of AES67-16 input levels, expressed as a fraction.
8ch Input Usage	The number of AES67-8 input levels currently being used out of the available number of AES67-8 input levels, expressed as a fraction.
4ch Input Usage	The number of AES67-4 input levels currently being used out of the available number of AES67-4 input levels, expressed as a fraction.

Icon	Description
64ch Output Usage	The number of AES67-64 output levels currently being used out of the available number of AES67-64 output levels, expressed as a fraction.
16ch Output Usage	The number of AES67-16 output levels currently being used out of the available number of AES67-16 output levels, expressed as a fraction.
8ch Output Usage	The number of AES67-8 output levels currently being used out of the available number of AES67-8 output levels, expressed as a fraction.
4ch Output Usage	The number of AES67-4 output levels currently being used out of the available number of AES67-4 output levels, expressed as a fraction.

6 Select an Audio Live device from the list. Detailed spigot information is shown under **Spigot Information**.

Icon	Description
Spigot Name	The name configured for this spigot, in the device's properties.
Channel Capacity	The number of AES-67 channels supported by the spigot.
Direction	Shows the signal direction for this spigot. **Input:** The spigot is a destination from another device. **Output:** The spigot is a source to another device.
Tieline Status	Shows this spigot's current connection status. **Free:** There is no device connection for this spigot. **Busy:** The tieline is connected to another device. **Exposed:** Indicates that the spigot's stream is exposed.
Multicast IP	Shows the current multicast IP address that is joined to this spigot. For an Input, this is the source multicast IP address that the Audio Live is connected to. For an Output, this is the Audio Live source multicast IP address that a destination device connects to.
Sources	Shows the current name of the source(s) connected to the input.
Destinations	Shows the current name of the destination(s) connected to the output.

Columns in the **Spigot Information** table can be multi-sorted, the same way the Stream Configurator List can be sorted. See

Control Tasks

Overview
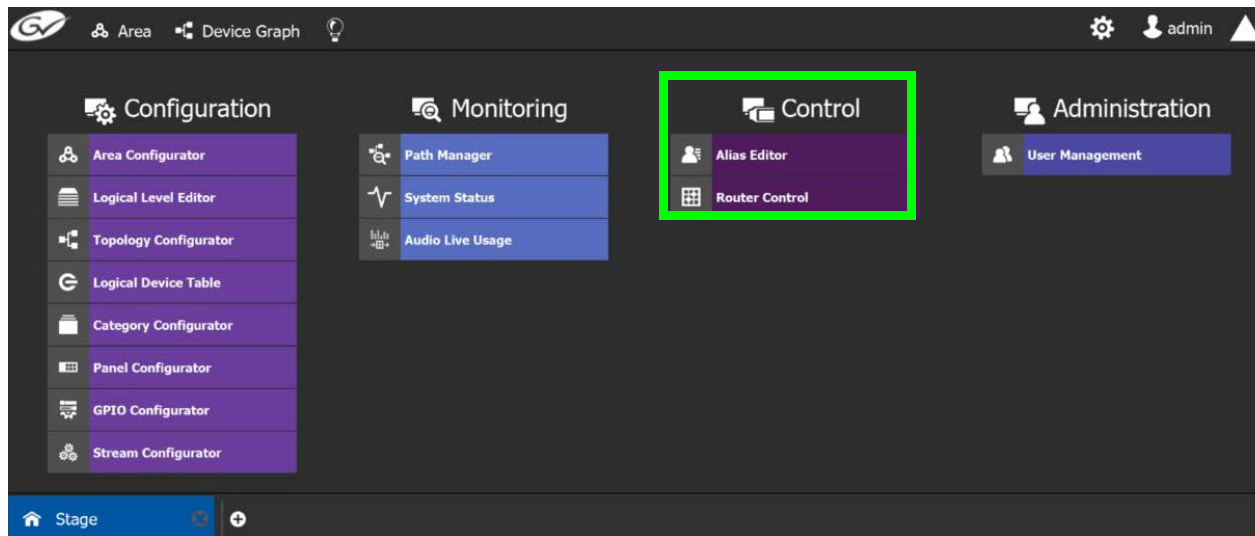
The GV Orbit Control Tasks include:

- Alias Editor Tasks, on page 466GV Orbit Client
- Router Control Tasks, on page 470

Alias Editor Tasks

Use the Alias Editor to assign aliases to sources and destinations. More than one set of aliases can be created to allow the source / destination naming conventions to be changed on the fly, for example, to change the interface for different programs or production staff, or to support another language(s).

Accessing Alias Editor Tasks

To access the Alias Editor

1 Open GV Orbit Control Stage. See

2 Select the required Area. See

3 Select the required topology. See

4 Select **Control** > **Alias Editor**.
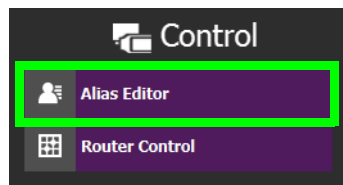
The Alias Editor task opens.
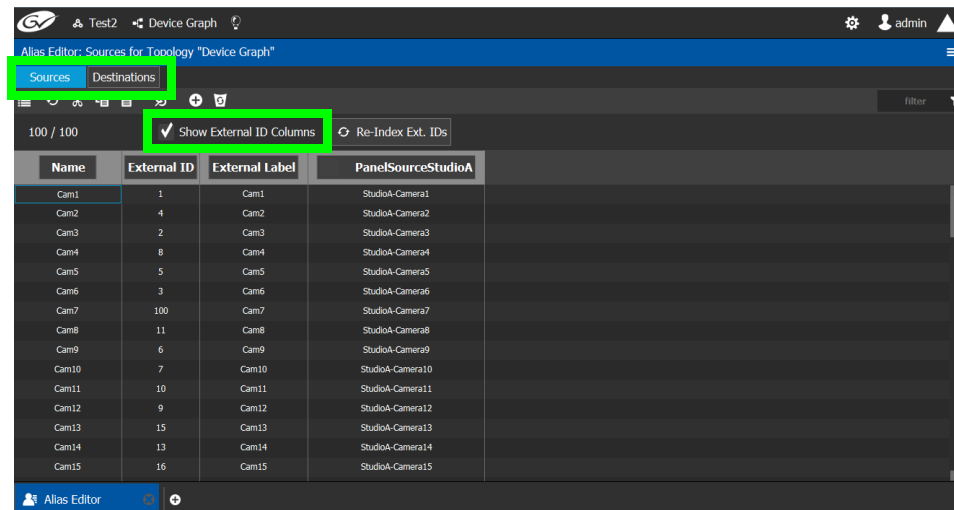
The Alias Editor has tabs for Source and Destination IDs.

Alias Editor Menu

The Alias Editor menu has the following menu options.

Icon	Description
Refresh	Reloads the Alias Editor's contents.
Cut	Cuts the selected contents from an alias column.
Copy	Copies the selected contents from an alias column.
Paste	Pastes the clipboard contents to the alias column.

Icon	Description
⟳ Restore default label	When a selected alias has been renamed, this resets the name to its original label.
⊕ New	Adds an alias column. See Adding Aliases, on page 467.
⟳ Delete	Removes the selected alias column.

About External IDs and Northbound Control Interfaces

External IDs are shown by setting **Show External ID Columns**. External IDs are used for Northbound control interfaces that use ID-based protocols.

Certain control protocols require that the numbering of external IDs must be contiguous. In this case, if they are not sequential, click **Re-Index Ext. IDs**. In order to protect against an erroneous click, a captcha-style dialog requires that you confirm this action which can have a large impact on router tables.

GV Orbit Client can use the GV Orbit Control External ID's when **Show External IDs** is set to **True**; see Step 7.3.1: Project Variables (Project -> Edit Variables), on page 70. If **Show External IDs** is set to **False**, and you click **Re-Index Ext. IDs**, then you will need to make sure that any external system that relies on this updated index will still have the correct associations for their external IDs, including GV Orbit Client.

External IDs that are larger than the total number of sources or destinations will not status northbound.

GV Orbit Control must have status for all destinations within GV Orbit Control or they will not report northbound for that external ID. For example, if a take has never been made to a destination, that destination will not have its status set. This behavior is different from a physical router where all destinations have a status set by default.

Adding Aliases

These aliases can be used in router control to change the name of sources and destinations from short labels to the labels of the corresponding alias. The alias can be composed of up to 24 characters to create a more descriptive name than its equivalent short label. Aliases can also be used with panels; see Creating a New Panel, on page 277. See also Using Source and Destination Aliases with a Panel, on page 291.

Once an alias column has been added, you can also copy/paste a list of values from an Microsoft Excel spreadsheet column into the alias column to bulk name the sources and destinations.

Aliases created here can be selected in GV Orbit Control's user interface where sources and destinations are used with the **Select Alias** option. For example, in the Category Configurator; see Category Configurator Tasks, on page 268.

To Add Aliases

1 Open the Alias Editor. See Accessing Alias Editor Tasks, on page 466.

   The Alias Editor task opens.
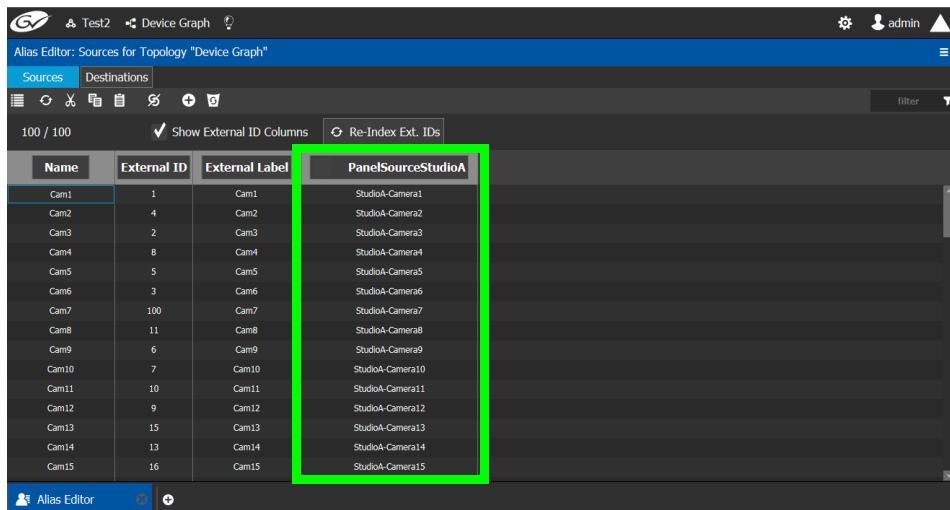
The Alias Editor has tabs for Source and Destination IDs.

2   Select **Show External ID Columns** columns if necessary.

The aliases are now available to be used with router control and panels. If aliases are used with a panel and they are longer than 8 characters, consider setting the **Display 24 characters** option for the panel in the Panel's **Property Editor**. See Creating a New Panel, on page 277. The alias to be used in the Category Configurator can be selected; see Sources & Destinations Menu, on page 269.

Renaming Source and Destination Labels

Source and destination labels can be renamed. You can also copy/paste a list of values from an Microsoft Excel spreadsheet column into the **Name** or Alias columns to bulk rename the sources and destinations. Or you can copy the content of one column and paste it into another column.

To rename Source and Destination Labels

1   Open the Alias Editor. See Accessing Alias Editor Tasks, on page 466.

The Alias Editor task opens.
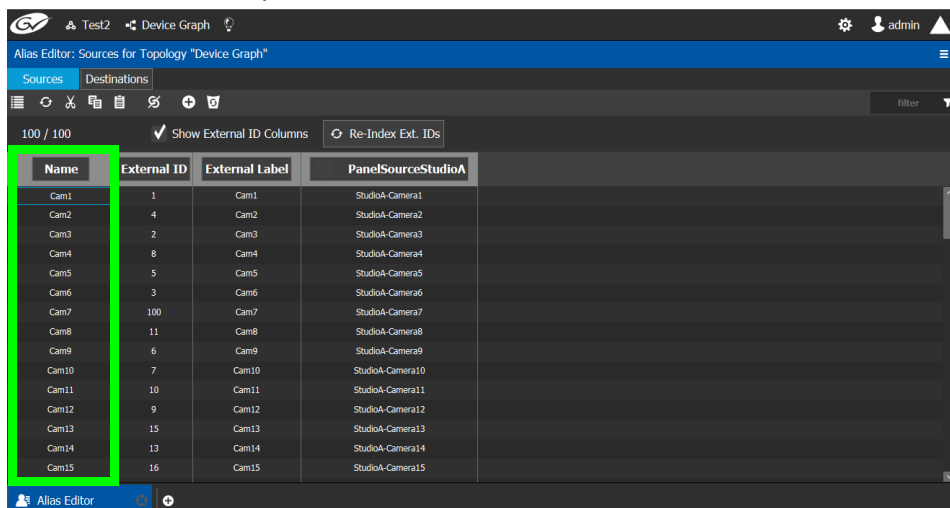
The Alias Editor has tabs for Source and Destination IDs.

2 Rename the source or destination by slow clicking it twice. Or paste a list of names from an Microsoft Excel spreadsheet column into the **Name** or Alias column to bulk rename them.

Source and Destination labels in the Alias Editor may be shown as grayed out and they cannot be edited. These devices' configuration properties come from GV Orbit Client. See Synchronization of Discovered GVOP Devices, Source, Destination, and Spigot Names made in GV Orbit Client, on page 211.

Router Control Tasks

Use the Router Control task to control the sources and destination in an active topology.

Accessing the Router Control Task

To access the Router Control task

1 Open GV Orbit Control Stage. See Navigating Back to Stage, on page 170.
2 Select the required Area. See Selecting an Area, on page 183.
3 Select the required topology. See Selecting a Graph, on page 184.
4 Select **Control** > **Router Control**.
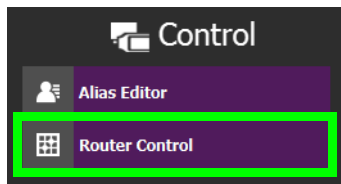
The Router Control task opens
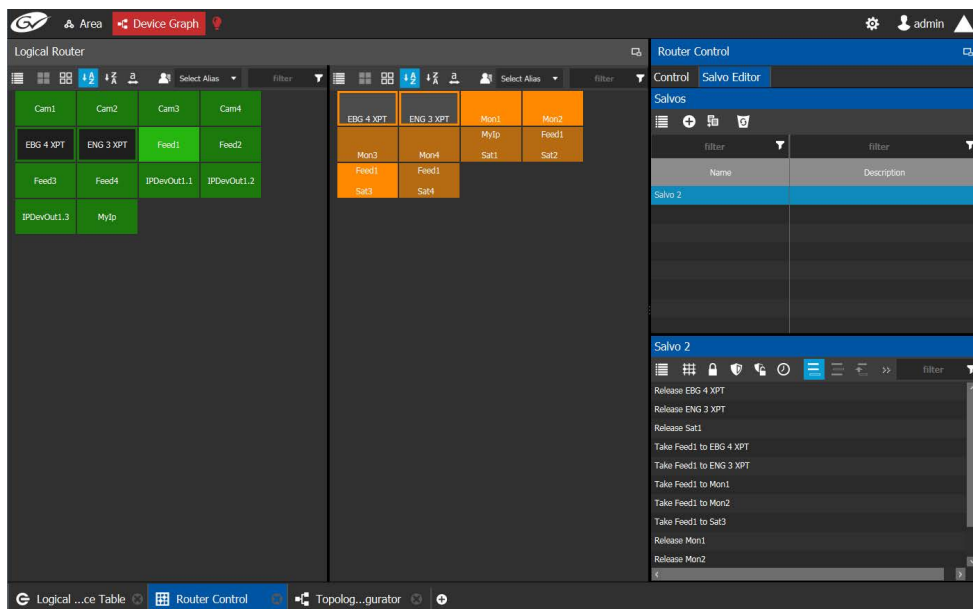
The sources are listed on the left under Logical Router. The destinations are listed in the center. The right hand column displays the actions you can perform.

Router Control Menu

The Router Control menu has the following menu options.

Icon	Description
Select All	Selects all source or destination items.
Clear All	Deselects all source or destination items.
Sort Ascending	Sort the source or destination items in alphabetical order from A to Z.

Icon	Description
Sort Descending	Sort the source or destination items in alphabetical order from Z to A.
Use Wide Widgets	Doubles the source or destination display width to accommodate longer labels. This option setting is remembered for the currently logged in user on the current client PC.
Select Alias	Select the Alias you want to use to identify Source and Destination streams in GV Orbit Control's interface. Select Alias ▼ None Alias 1 Alias 2 Alias 3 Aliases are created in the Alias Editor. See Adding Aliases, on page 467.

Performing a Take in Router Control

You can perform a take in Router Control as follows.

1 Under **Logical Router**, select a source, shown in green.

2 Select a destination, shown in brown.

3 Under **Router Control**, **Control** tab, click **Take**.

Parameter	Description
Take / Auto-Take / Salvos radio buttons	Sets the router control mode: • **Take:** Once the source and destination has been selected, you then click **Take** to make the take. • **Auto-Take:** Once the source and destination has been selected, the take is automatically made. • **Salvos:** Trigger previously-configured salvos. See also Creating Salvos, on page 474.
Take button	Makes the connection between the currently selected source and destination. In salvo mode, it triggers the selected salvo.
Cancel button	Cancels the current selection.
Lock button	Will lock the current destination to not allow the source to be changed by any user. High Tally when enabled on selected destination. See also About Lock, Protect, and Release, on page 472.
Protect button	Will protect the current destination to not allow the source to be changed by a user other than the current user. High Tally when enabled on selected destination.
Release button	Releases lock or protect on the selected destination.
Virtual XPT > Minimize Virtual XPT[a]	To minimize the destinations within the selected virtual XPT[b].
Virtual XPT > Expand Virtual XPT[a]	To show all the destinations within the selected virtual XPT, including the nested destinations of all other virtual XPTs[b].
Virtual XPT > Reset XPT[a]	Initialize the selected virtual XPT. This will route the appropriate virtual source to the logical destinations that were configured for the virtual XPT in the logical device table.

a. This becomes available when virtual XPTs have been previously configured (see Configuring Virtual Crosspoints (XPTs), on page 257). You must select a destination that is part of a virtual destination in the router control grid or select a virtual destination in the router control grid.

b. See Minimize and Expand Virtual XPT Destinations, on page 264 for more information.

About Lock, Protect, and Release

The following topics provide a detailed look at how GV Orbit Control manages Lock, Protect, and Release.

LIMITATIONS:

• iControl matrices do not support protect.

- Lock and protect currently affects all levels of the destination and does not consider individual levels. Locking one level locks all destination levels and the control system does not currently support specific lock levels.

Ability to Override a Lock or Protect according to User Rights

When logged in to GV Orbit Control, the permissions assigned to your user profile determine whether you can override a Lock or Protect made by other users. For example, when a user has *admin* or *Operator* rights, the user can override any lock or protection made by:

- Any other user. See Viewing Permissions by Role, on page 484.
- A third-party control system that uses NP0017 to control GV Orbit Control.
- A third-party control system that placed a lock on a device which is also controlled by GV Orbit Control and for which *in router lock and protect* is enabled. See About In router Lock/Protect enabled for a Router using NP0016 router control protocol, on page 429.
- A panel used to set a lock.

Otherwise, without *admin* or *Operator* rights, you will not be able to override a Lock or Protect set by other users.

See Administration Tasks, on page 477 for more information about how to create users and how to set a user's permissions to allow or deny them from overriding a Lock or Protect set by another user. The following user permissions control the ability to override a Lock or Protect.

- Force Unlock
- Force Unprotect

For example, the admin user has the user permissions for both Force Unlock and Force Unprotect. Therefore, an admin user can override any other user who has set a Lock or Protect on a destination.

Using a Panel to Override a Lock or Protect

If a configured panel in GV Orbit Control is used, a user must be assigned to it. Assign a user to a panel through the **Panel User** parameter (see Adding the New Panel to the Topology, on page 299). It is the user rights that are associated to the user selected in the **Panel User** parameter that determines the panel's priority to override a lock or protect made by another panel user. This can be used to prevent other users from being able to remove a lock. When the **Panel User** parameter is set to a user that has *admin* or *Operator* rights, the panel can be used to override any lock or protection made by:

- Any other user. See Viewing Permissions by Role, on page 484.
- A third-party control system that uses NP0017 to control GV Orbit Control.
- A third-party control system that placed a lock on a device which is also controlled by GV Orbit Control and for which *in router lock and protect* is enabled. See About In router Lock/Protect enabled for a Router using NP0016 router control protocol, on page 429.
- Another panel used to set a lock.

Identifying the User who has Locked a Destination

To see who has locked a destination, try to make a take to the destination in the *Router Control* task. See Router Control Tasks, on page 470. The user locking / protecting the destination is then shown in the lower left corner. If the user is *admin*, then this could be the result of a third-party control system having locked or protected a destination in the router.

Destination is locked by: SusanP   OK

How is Lock, Protect, and Release Implemented?

The router protocol and the GV Orbit Control's router control port configuration can affect how the Lock, Protect, and Release are implemented. For a further explanation, refer to the router protocol you are using.

Router Control Protocol	See
NP0016 Compact Router	About In router Lock/Protect enabled for a Router using NP0016 router control protocol, on page 429
NP0016 Enterprise Router	
NV9000 TCP/IP (NP0017 southbound)	Lock, Protect, and Release with the NV9000 Control Port, on page 431
NP0016 Enterprise Router	Lock, Protect, and Release with the NP0016 / NS-Bus / SAM SW-P-08 Control Ports, on page 474
NS-BUS	
SAM SW-P-08 TCP/IP	

Lock, Protect, and Release with the NP0016 / NS-Bus / SAM SW-P-08 Control Ports

GV Orbit Control stores the locks in its database and they are preserved after a restart/reboot. As such, destinations will remain locked/protected. GV Orbit Control system does not read a lock from a router and does not control a lock in the router.

Creating Salvos

When a salvo is triggered, it executes a list of pre-configured actions. You can create a salvo as follows.

1 Under **Router Control**, **Salvo Editor** tab, click **New** ⊕ .

2 Enter a name and description for the salvo in the **Salvos** list.

Icon		Description
⊕	New	Create a new salvo and associated salvo action list.
▤	Duplicate	Make a copy of the currently-selected salvo.
⬛	Delete	Remove the currently-selected salvo / take.
▦	Take	Add the currently-selected source and destination as a take action to the salvo list. The following functional behaviors are by design: • If multiple destinations are selected, then there will be multiple take actions added to the salvo list. • If there is only one source and multiple destinations selected, then that source is routed to all destinations. • If multiple sources are selected (for example, Source1, Source2, Source3) and multiple destinations are selected (for example, Destination1, Destination2, Destination3, and Destination4), then the takes added to the salvo list are Source1 to Destination1, Source2 to Destination2, Source3 to Destination3.
🔒	Lock	Lock the currently selected destination. See also About Lock, Protect, and Release, on page 472.
🛡	Protect	Protect the currently selected destination.
🔓	Release	Release the currently selected destination.
🕐	Pause	The wait time in milliseconds that can be added to the list of operations.
▤	Append	In this mode, any new salvo operation will be added to the end of the salvo action list.
▤	Insert	In this mode, any new salvo operation will be inserted at the currently selected spot in the salvo action list.

Icon	Description
Replace	In this mode, any new salvo operation will replace the currently-selected salvo action from the salvo action list.
Move Up	Move the selected salvo action up in the salvo action list.
Move Down	Move the selected salvo action down in the salvo action list.

3 Under **Logical Router**, select a source, shown in green.

4 Select a destination, shown in brown.

5 Under the salvo action list, click **Take**.

Selecting the Name of Sources and Destinations

When a source or destination has been assigned an alias, you can select the alias to be shown through the Alias drop-down menu. To create aliases, see Alias Editor Tasks, on page 466.

1 Select a source or destination under **Logical Router**.

2 Click the alias drop-down menu and select an alias option.
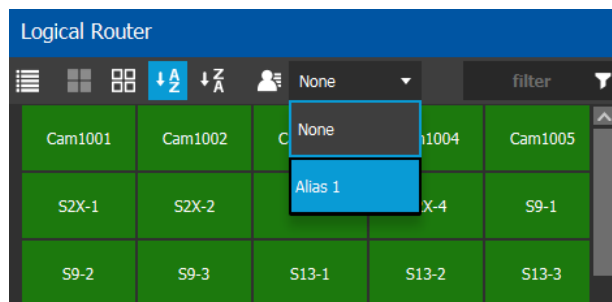
The label for the selected source or destination changes to the selected option.

Administration Tasks

User Management is the only Administration task. Only administrators have access to it.
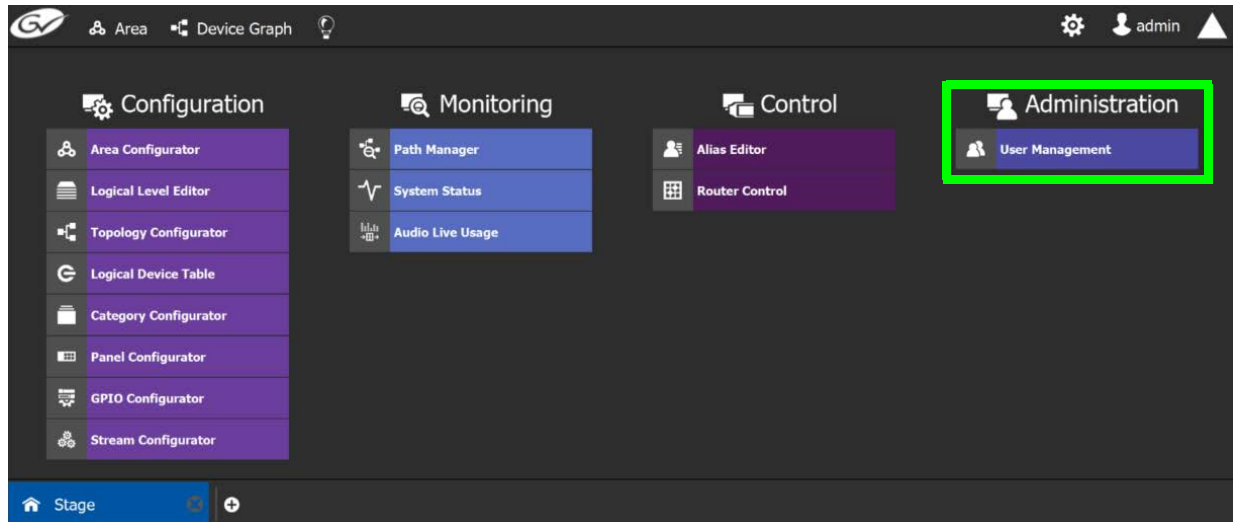
User Management Task

As an administrator, you have access to the User Management Task. This is used for:

- Creating, editing, and deleting user profiles. See Creating User Profiles, on page 479.
- Managing access rights to the areas in your system. See Granting Access Permissions to an Area, on page 481.
- Viewing and assigning permissions according to predefined user roles. See Viewing Permissions by Role, on page 484.

The User Management Task Overview

> **Note:** Before you assign access permissions, you must create areas in your system. For details, see Area Configurator Tasks, on page 177.

When you first log in to the User Management Task, the admin tile appears in the **Users** section.
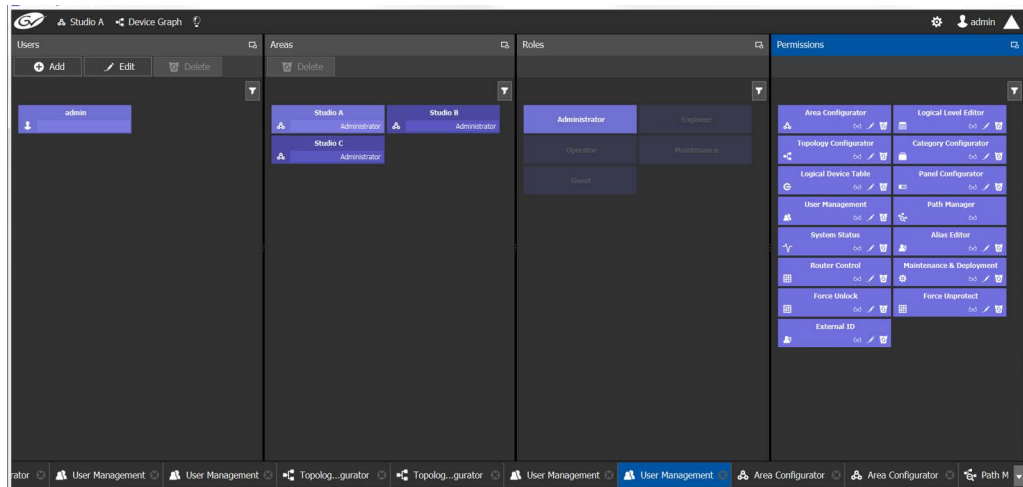
The User Management Task UI has four columns:

- **Users**: The column displays a tile for each user who has access to your system. See Creating User Profiles, on page 479.

- **Areas**: The column displays a tile for each area defined in your system. See Granting Access Permissions to an Area, on page 481.

- **Roles**: The column displays a tile for each of the predefined roles: Administrator, Engineer, Operator, Maintenance, and Guest.
  Permissions to view, edit, and delete within each client task vary by role. These permissions can be seen when you select the role in the Roles column; for example, **Administrator** is selected in the screen shot above. The permissions granted to the administrator role are shown in the **Permissions** column. (Members of the administrator role have full access permissions to all areas in the system). See Viewing Permissions by Role, on page 484 for a list of the permissions available to each role.

- **Permissions**: The column displays a tile for the tasks that users can perform within the areas in your system according to the selected User, Area, and Role. View, edit and delete icons show the current user's rights for the task.

Creating User Profiles

The first step is to create your user profiles.

Note: To access the user profiles, you must belong to the administrator role. Otherwise, Administration tasks are not visible in GV Orbit Control Stage.

To create a new user account:

1 Launch GV Orbit Control.

2 Log in as an administrator.

3 Select **Administration** > **User Management**.

   The User Management window appears.
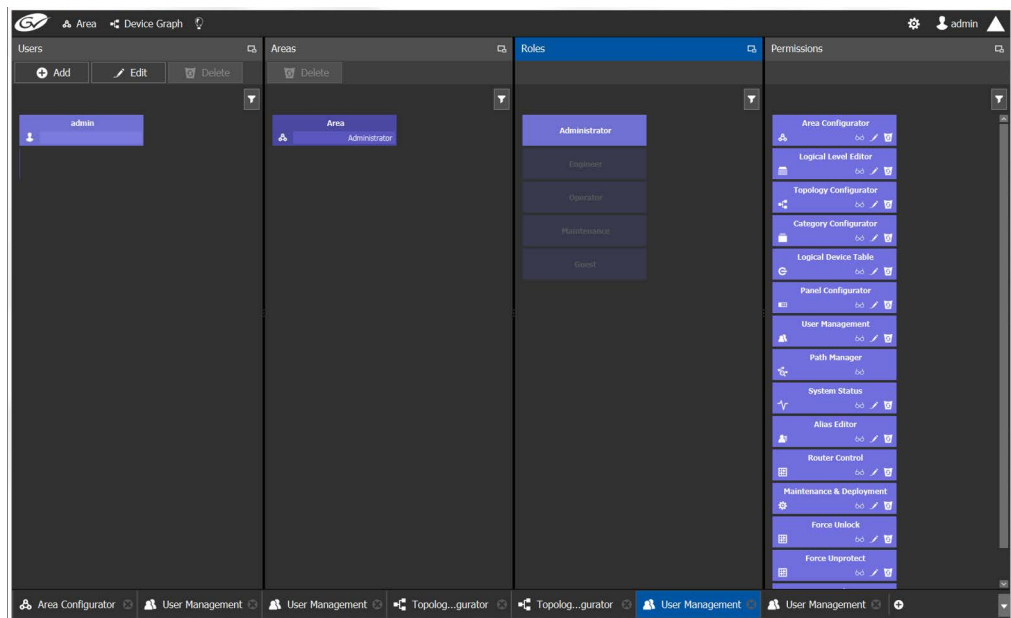
4 Click the **Add** button in the top left corner.

   The user configuration window appears.

5 Enter the required information in the **User ID**, **First Name**, **Last Name**, **Password**, and **Confirm Password** fields.

6 If this user is to represent an external northbound routing device for Lock, Protect, and Release with the NP0016 / NP0017 router control protocol, set the **External ID** that this

device uses in its NP0017 router protocol communications with GV Orbit Control. This value is an unsigned integer. See Setting a User ID for Lock, Protect, and Release with NDAC NP0016 / NP0017 Northbound Interfaces, on page 487 for more information.

> Note: User databases are not synchronized between the GV Orbit Client and GV Orbit Control. You must assign the same ID to the same user in both the GV Orbit Client and GV Orbit Control.

In all cases, you must ensure that user IDs are coherent between GV Orbit Client and GV Orbit Control.

Equivalent Parameter in GV Orbit Client	Equivalent Parameter in GV Orbit Control
User name	User ID
Control External Id	External Id

See How to Add a User, on page 159 for how to set these parameters in GV Orbit Client.

7   Click **OK**.

A new tile representing the new user account appears in the **Users** section.
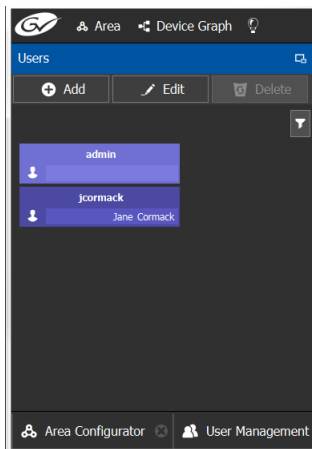
In addition, you can perform the following procedures in the **Users** section:

- **Edit:** Select the icon for the user and click **Edit** to modify the user's credentials.
- **Delete:** Select the icon for the user and click **Delete** to remove the user account. There is no confirmation when you click **Delete**. The user profile is immediately removed.

See also

- Switching User Profiles, on page 171

Granting Access Permissions to an Area

Users are granted access to each area via a predefined role. The procedure is as follows:

To grant access to an area

1 Launch GV Orbit Control.

2 Log in as an administrator.

3 Select **Administration** > **User Management**.

The User Management task appears.
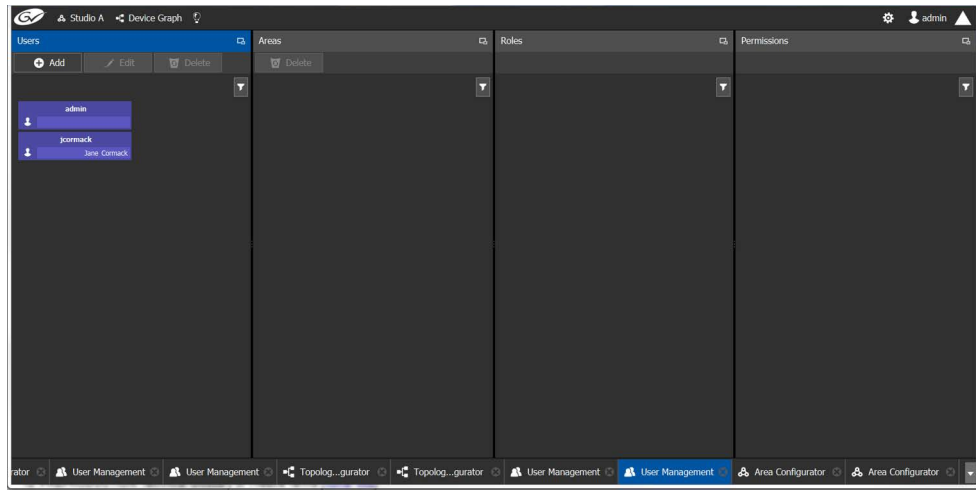
The **Users** column displays tiles for all the users who have access to the system.

4 Select the applicable user tile in the **Users** section.
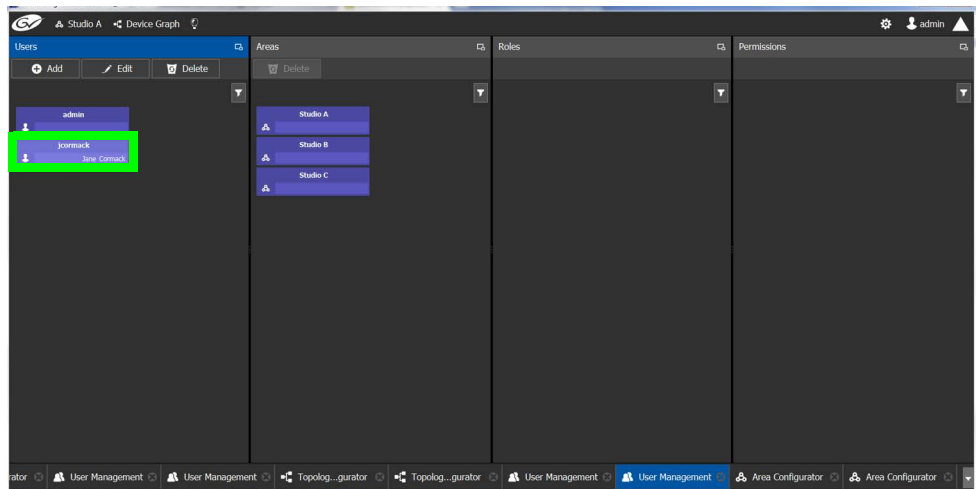
The **Areas** column displays tiles for all the areas defined in your system.
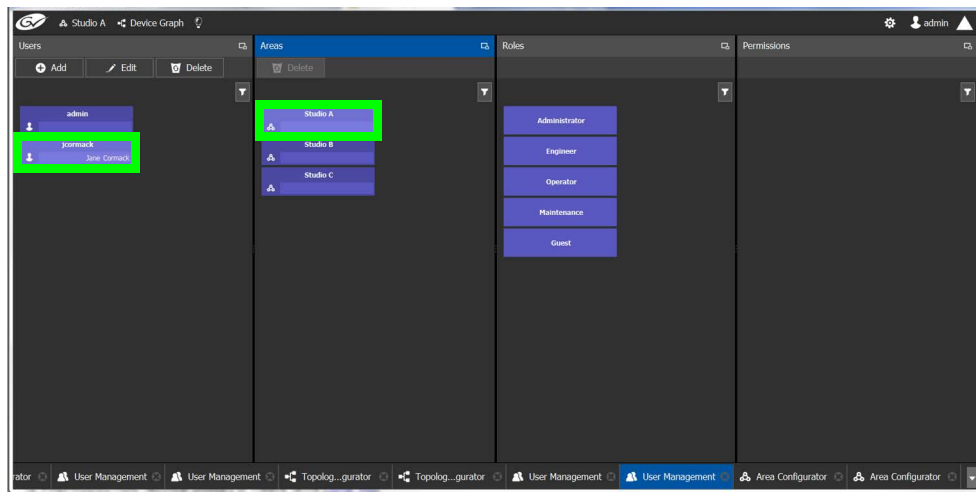
5   Select an area tile in the **Areas** section while keeping the user tile selected.

The **Roles** column displays tiles for all the roles when both the user tile and the area tile are selected, at the same time.

6   Select a role tile and drag it on top of the area tile.
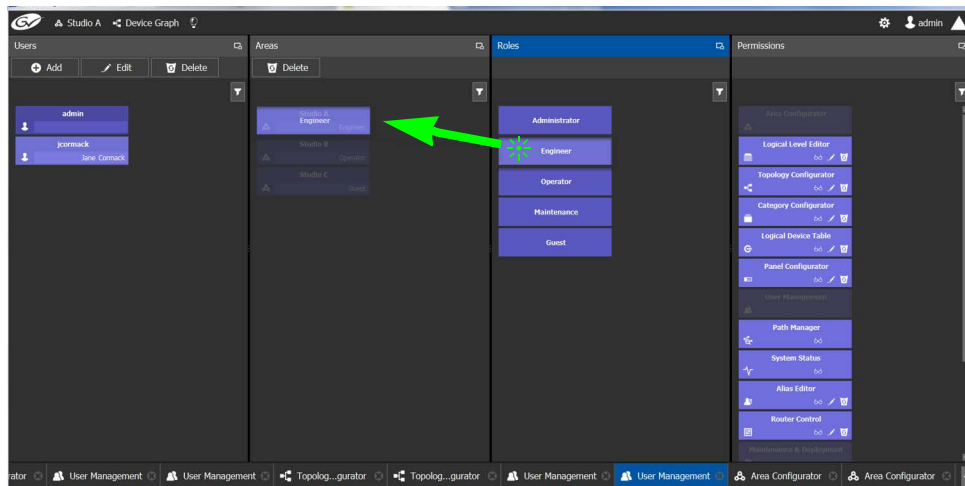
This action gives the user all the permissions defined for the role in the selected area.
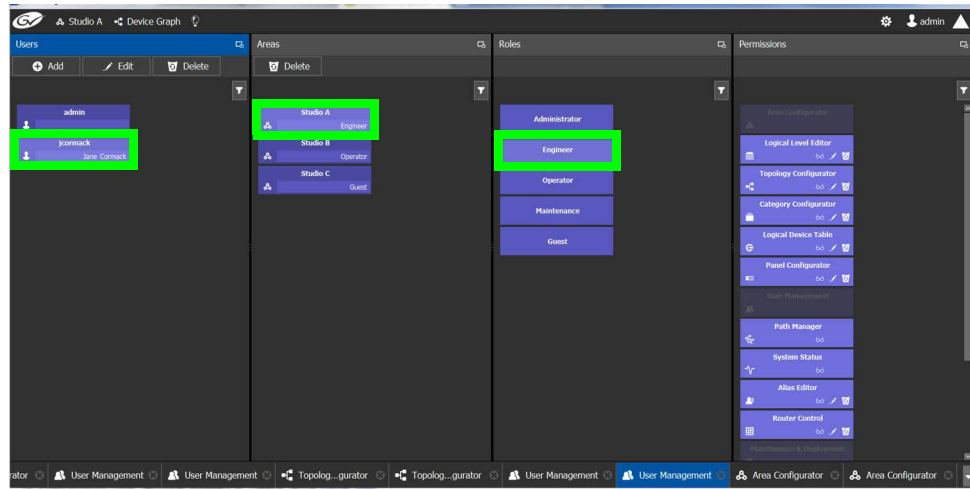
When you select the user tile in the Users section, the user's role in the area is displayed at the bottom right of the Area tile.
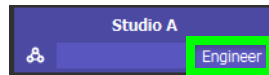
The permissions granted to the selected role; for example, view, edit, delete, are displayed on the Permissions tile in the **Permissions** column.
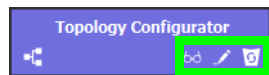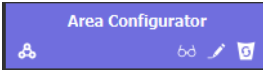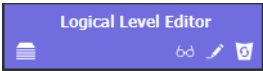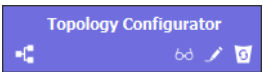
These are listed in the next section.
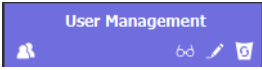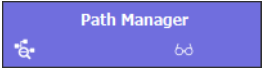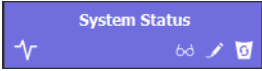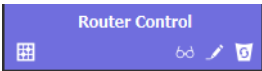
Viewing Permissions by Role
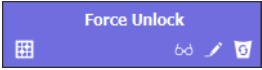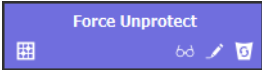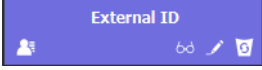
Users are granted access to the areas in the system via their assigned roles. The following rules apply:

- Users can be assigned to different roles in different areas.
- Users cannot be granted permissions as individuals, only according to role.
- The roles are predefined, as follows: Administrator, Engineer, Operator, Maintenance, and Guest. The roles cannot be modified.
- Administrators have full access to all tasks in all areas. Guests have the least permissions. The Engineer, Operator, and Maintenance roles have various permissions, as listed in the following table:

The permissions granted to each role can be viewed on the tiles in the Permissions list book of the User Management task. These can be viewed when the user, the area, and the role are all selected at the same time.

Task	Role	Permissions
Area configurator	Administrator	View, Edit, Delete
	Engineer	No access
	Operator	No access
	Maintenance	No access
	Guest	No access
Logical Level Editor	Administrator	View, Edit, Delete
	Engineer	View, Edit, Delete
	Operator	No access
	Maintenance	No access
	Guest	No access
Topology Configurator	Administrator	View, Edit, Delete
	Engineer	View, Edit, Delete
	Operator	View
	Maintenance	No access
	Guest	No access
Category Configurator	Administrator	View, Edit, Delete
	Engineer	View, Edit, Delete
	Operator	No access
	Maintenance	No access
	Guest	No access

Task	Role	Permissions
Logical Device Table	Administrator	View, Edit, Delete
	Engineer	View, Edit, Delete
	Operator	No access
	Maintenance	No access
	Guest	No access
Panel Configurator	Administrator	View, Edit, Delete
	Engineer	View, Edit, Delete
	Operator	No access
	Maintenance	No access
	Guest	No access
User Management	Administrator	View, Edit, Delete
	Engineer	No access
	Operator	No access
	Maintenance	No access
	Guest	No access
Path Manager	Administrator	View
	Engineer	View
	Operator	View
	Maintenance	No access
	Guest	No access
System Status	Administrator	View, Edit, Delete
	Engineer	View
	Operator	View
	Maintenance	View
	Guest	No access
Alias Editor	Administrator	View, Edit, Delete
	Engineer	View, Edit, Delete
	Operator	View, Edit, Delete
	Maintenance	No access
	Guest	No access
Router Control	Administrator	View, Edit, Delete
	Engineer	View, Edit, Delete
	Operator	View
	Maintenance	No access
	Guest	No access

Task	Role	Permissions
Maintenance & Deployment	Administrator	View, Edit, Delete
	Engineer	No access
	Operator	No access
	Maintenance	View
	Guest	No access
Router Force Unlock See also About Lock, Protect, and Release, on page 472 and Setting a User ID for Lock, Protect, and Release with NDAC NP0016 / NP0017 Northbound Interfaces, on page 487.	Administrator	View, Edit, Delete
	Engineer	No access
	Operator	View, Edit, Delete
	Maintenance	No access
	Guest	No access
Router Force Unprotect See also About Lock, Protect, and Release, on page 472 and Setting a User ID for Lock, Protect, and Release with NDAC NP0016 / NP0017 Northbound Interfaces, on page 487.	Administrator	View, Edit, Delete
	Engineer	No access
	Operator	View, Edit, Delete
	Maintenance	No access
	Guest	No access
External ID	Administrator	View, Edit, Delete
	Engineer	View, Edit, Delete
	Operator	No access
	Maintenance	No access
	Guest	No access

Setting a User ID for Lock, Protect, and Release with NDAC NP0016 / NP0017 Northbound Interfaces

With the NP0016 and NP0017 router control protocols, Lock/Protect commands require a User ID. So that users with different User IDs cannot release a destination locked by another user or panel user; in GV Orbit Control and GV Orbit Client, each user can be assigned a different **External ID / Control External Id** parameter value. Users with a different **External ID / Control External Id** cannot release a destination locked by another user with a different **External ID / Control External Id**, unless they have *admin* or *Operator* rights.

The NP0016 and NP0017 router control protocol User ID should be set in:

- GV Orbit Control: as of GV Orbit version 1.7.0 and above, the User ID provided in northbound commands is taken into account as follows:
  - You map this User ID to the **External Id** parameter of a GV Orbit Control user set in **User Management**.
  - If this GV Orbit Control user has its **External Id** parameter value configured to the same value as the User ID in a command, the operation will be performed internally using the alias of the matching user with the user's associated privileges with respect to Lock, Protect, and Release.
  - If this GV Orbit Control user does not have *admin* or *Operator* rights, the third-party control system that uses NP0016 / NP0017 to control GV Orbit Control cannot override the lock or Protect set by other GV Orbit Control users. See Viewing Permissions by Role, on page 484..
  - If no GV Orbit Control user has an **External Id** parameter value matching the command's user ID, the operation is performed internally as the GV Orbit Control *admin* user.
- GV Orbit Client: as of GV Orbit version 2.0.0 and above, the User ID provided in northbound commands from the GV Orbit Control Routing service is taken into account as follows:
  - You map this User ID to the **Control External Id** parameter of a GV Orbit Client user set in the **User** tab.
  - This user then issues NP0017 router control protocol communications with the User ID from the user's **Control External Id** value.
  - The admin user or a user with an **Control External Id** set to 0 can override locks set by any other user.

Note: User databases are not synchronized between the GV Orbit Client and GV Orbit Control. You must assign the same ID to the same user in both the GV Orbit Client and GV Orbit Control separately.

The User ID / **External ID / Control External Id** parameter is an unsigned integer.

To create a User to represent external northbound routing device in GV Orbit Control

Proceed as follows.

1. In GV Orbit Control, create a new user to represent the third-party control system. See Creating User Profiles, on page 479.

2 In GV Orbit Control, set the **External Id** parameter to that of the user ID used by the third-party control system in its NP0016 / NP0017 router control protocol.

User ID	Orbit Client
First Name	Orbit
Last Name	Client
Password	•••••
Confirm Password	•••••
External Id	1227
Ok	Cancel

3 In GV Orbit Control, assign the privileges to this new user. See Granting Access Permissions to an Area, on page 481:

- Assign *Engineer* or *Maintenance* rights to this new user to prevent the third-party control system from overriding the lock or Protect set by other GV Orbit Control users.

- Assign *admin* or *Operator* rights to this new user to allow the third-party control system to override the lock or Protect set by other GV Orbit Control users.

If the third-party control system's NP0016 / NP0017 router control protocol, Lock/Protect commands use a user ID that GV Orbit Control cannot match to the **External Id** value of any GV Orbit Control user, the Lock/Protect commands will be carried out as an Admin user (which has the **Router Force Unlock** and **Router Force Unprotect** privileges), thereby allowing the external control system to overrride the locks of other GV Orbit Control users.

See also About Lock, Protect, and Release, on page 472 to better understand how Lock, Protect, and Release works with other users and other GV Orbit Control components such as panels.

GV Orbit Control stores the locks in its database and they are preserved after a restart/reboot. As such, destinations will remain locked/protected. GV Orbit Control system does not read a lock from a router and does not control a lock in the router.

4 In GV Orbit Client, create a new user to represent the same user name you created in GV Orbit Control above. See How to Add a User, on page 159.

5 In GV Orbit Client, set the **Control External Id** parameter to the same User ID value you set above in the **External Id** parameter above.
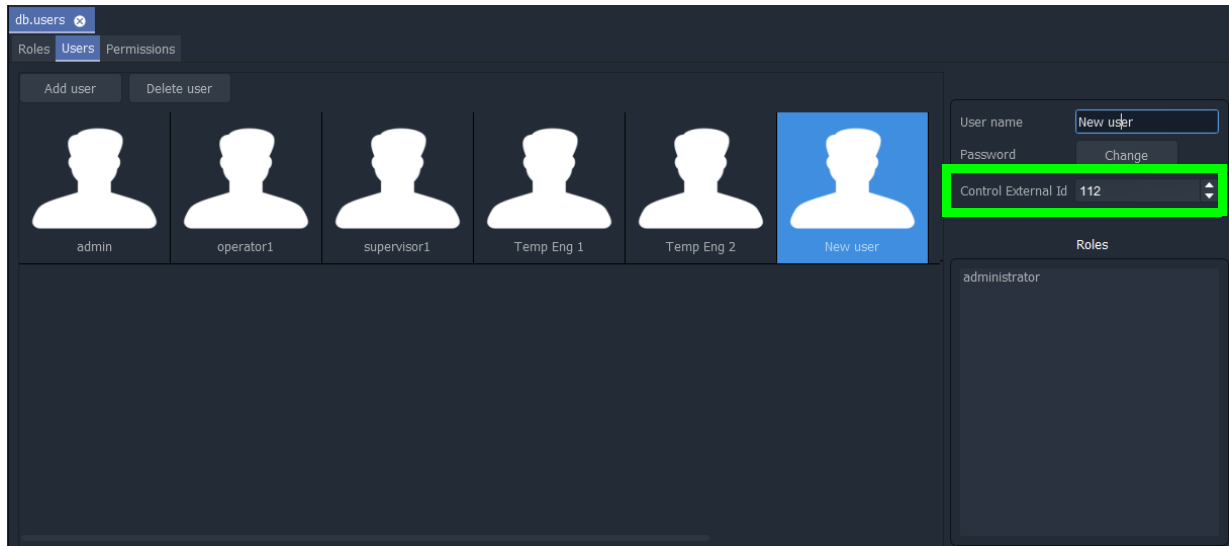
Channel Manager

The Channel Manager abstracts physical cards to make their processing channels available without having to know where the card is physically located in the system.

You can logically associate one or more processing channels by assigning them to a group. A group can represent the Channels used for ingest for example.

You can set and save card processing channel configuration parameters, and apply saved settings to other channels that may be on other cards of the same type.

PREREQUISITES:

- The Channel Manager is available by default in projects created in GV Orbit Control version 2.2.0 and above. To add it to projects created before this, see Adding Channel Manager to Projects Created before GV Orbit Control Version 2.2.0, on page 503.
- The Channel Manager is supported by the Channel Manager Service. The Channel Manager Service must be installed and running on the GV Orbit Server. Refer to **Channel Manager Service** in the *GV Orbit Admin Guide*. See Related Documentation, on page 7.
- One or more supported devices. Supported devices are listed in the GV Orbit Release Notes under *Channel Manager Card Support*. See Related Documentation, on page 19.
- Channels are auto populated from suitable devices found / discovered in the Network Tree. See *Network Tree* in Network Window, on page 84.

The channel Manager has the following panels.
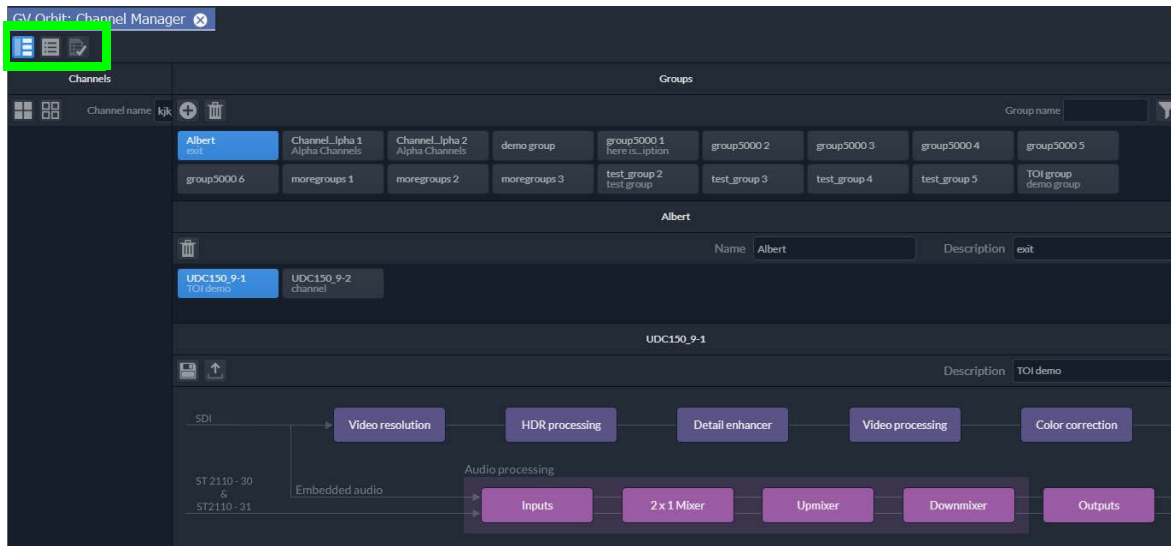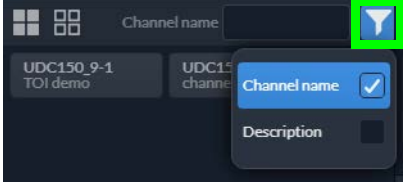
Icon / Parameter	Description
Channels	Shows all the processing channels, channel groups, and the configuration of channel parameters. See Channel Screen, on page 493.
Snapshots Configuration	Shows all the currently available snapshots and some of the configuration parameters used to create the snapshot. See Snapshots Configuration, on page 499.
Snapshots Logs	Shows a history of snapshot activity. See Snapshots Logs, on page 501.

Channel Screen

In the Channel screen, you can:

- Logically associate one or more processing channels by assigning them to a group. A group can represent the Channels used for ingest for example.
- Set and save card processing channel configuration parameters, and apply saved settings to other channels that may be on other cards of the same type.

Icon / Parameter	Description
⊞ Select All	Selects all items in the Channels Browser.
⊟ Clear All	Deselects all items in the Channels Browser.
Channel Name Group Name	Filters the Channels / Groups list according to the text you type in the filter field and according to the filter option set by clicking ▼ ; see below. Clear the filter text and press <Enter> to remove the filter.
▼	Click to set the scope for the filtering to the text contained in the **Channel Name**, **Group Name**, or **Description** of the channel's properties.
⊕ Add	Creates a new Channel Group. See Creating a New Channel Group, on page 494.
🗑 Delete	Removes the currently-selected Channel Group. This does not delete any of the channels in the group.

Icon / Parameter	Description
💾 Save Settings	Saves the configuration parameters to a configuration snapshot. A configuration snapshot can be later recalled to quickly recreate the configuration settings needed for a given system deployment. See Configuring the Channel and Saving the Channel Settings to a Snapshot, on page 495.
⬆ Recall Settings	Applies the saved configuration setting from a previously-created Channel snapshot, to the current channel. Configuration snapshots created from the settings of one channel can be applied to another compatible channel, that is, the channel's origin is of the same card bundle / SDC combination. See Recalling a Channel Snapshot, on page 496.
Name	Add / edit a unique Channel Group name.
Description	Add / edit an optional description for the Channel / Channel Group to make its role easier for you and others to distinguish.

Creating a New Channel Group

A Channel Group organizes a number of associated channels together.

1 In the Channel Manager, click Add ⊕ .

2 Configure the creation parameters.
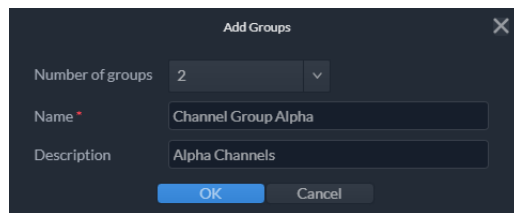
Parameter	Description
Number of groups	The number of Channel Groups to add. When this is set to 2 or more, the Channel Groups are suffixed with a number.
Name	A unique Channel Group name.
Description	An optional description for the Channel Group / Channel to make its role easier for you and others to distinguish.

3 Click **OK**.

The Channel Group(s) are added to the Groups section of the Channel Manager.

Adding Channels to a Channel Group

A Channel Group collects associated streams, for example a 4K UHD stream and an HD stream of the same content. A Channel can be added to more than one Channel Group.

PREREQUISITE: You must have created one or more Channel Groups. See Creating a New Channel Group, on page 494.

1 Select one or more Channels that you want to add to a Channel Group.

   You can multi-select using the <Shift> / <Ctrl> key:

   • By holding the <Shift> key and selecting the first and the last Channel, all Channels
     in between are selected.

   • By holding the <Ctrl> key, you can toggle the selection by clicking individual
     Channels.

2 Drag and drop the Channels into the Channel Group. The mouse cursor shows the
   channels that are to be added. Or if a Channel Group is currently selected, you can drop
   the Channels into the Channel Group.
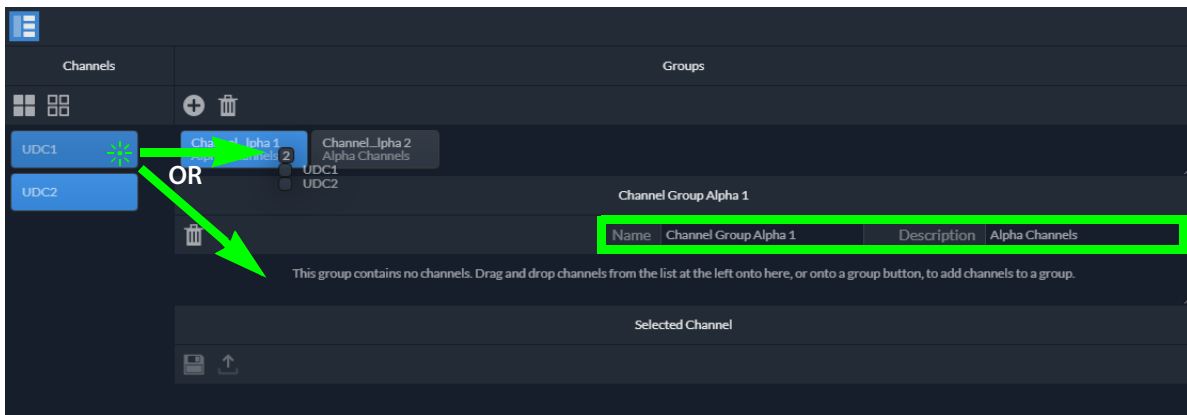
Parameter	Description
Name	Add / edit a unique Channel Group name.
Description	Add / edit an optional description for the Channel / Channel Group to make its role easier for you and others to distinguish.

Configuring the Channel and Saving the Channel Settings to a Snapshot

When a Channel is selected in a Channel Group, you can set and save card processing
channel configuration parameters, to create a snapshot. All current operational parameters
for that channel are saved in the snapshot. A configuration snapshot can be later recalled to
quickly recreate the configuration settings needed for a given system deployment.

1 Select a Channel in the Channel Group.

2 Set the Channel's processing parameters. Refer to the card's documentation for
   configuration information.
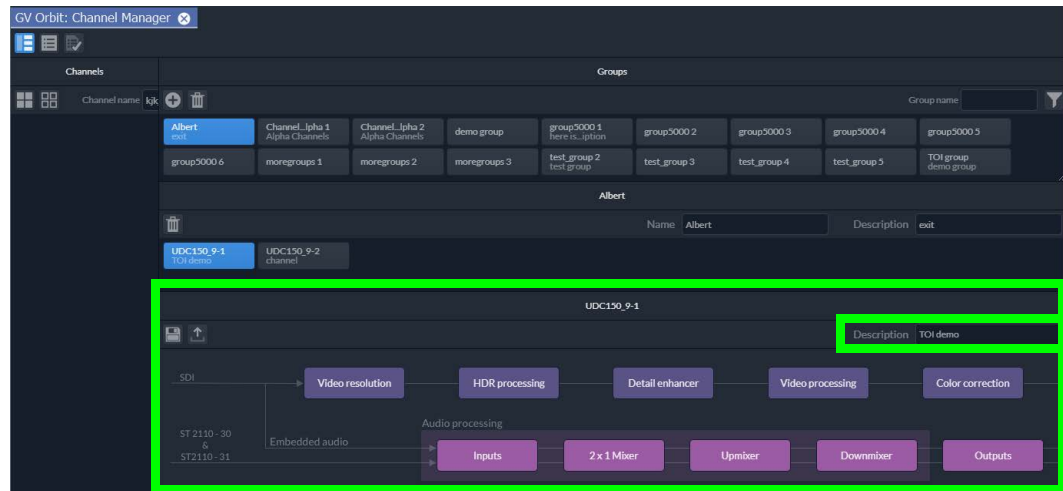
Parameter	Description
Description	An optional description for the Channel to make its role easier for you and others to distinguish.
Card parameter configuration screens	Configure the device/module/card parameters for this channel. These parameters are device-specific. For more information, see the documentation for the individual device/card/module type.

3 Click Save Settings ![save icon] to save the configuration parameters to a configuration snapshot.
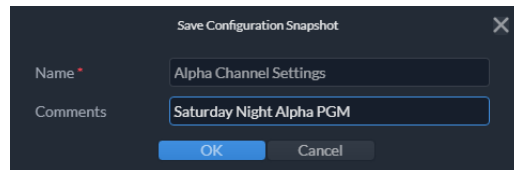
Parameter	Description
Name	A unique Channel name.
Comments	An optional comment for the Channel to make its role easier for you and others to distinguish.

All current operational parameters for that channel are saved in the snapshot. During snapshot generation, all users looking at this same channel will be blocked with a spinning icon to indicate that card configuration is temporarily suspended.

4 Click **OK**.

Once you have saved the Channel setting to a snapshot, you can apply the settings to other channels that may be on other cards of the same type. See Recalling a Channel Snapshot, on page 496.

Recalling a Channel Snapshot

Recalling a Channel Snapshot overwrites and applies the saved configuration settings and operational parameters from a previously-created Channel Snapshot, to the currently-

selected channel. Configuration Snapshots created from the settings of one channel can be applied to another compatible Channel, that is, the channel's origin is of the same card bundle / SDC combination.

PREREQUISITE: You must have created one or more Channel Snapshot(s). See Configuring the Channel and Saving the Channel Settings to a Snapshot, on page 495.

1   Select a Channel in the Channel Group.

2   Click Recall Settings ⬆ .
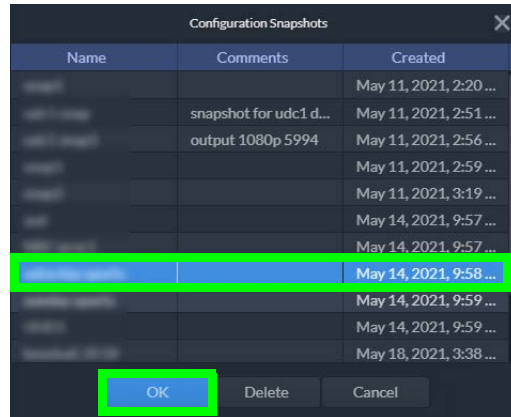
3   Select a Channel Snapshot to apply to the Channel.

4   Click **OK**.

All operational channel parameters and settings for the selected channel are overwritten by the parameters contained in the snapshot. During snapshot recall, all users looking at this same channel will be blocked with a spinning icon to indicate that card configuration is temporarily suspended.

Deleting a Channel Snapshot

A Channel Snapshot that is no longer needed can be removed.

1   Select a Channel in the Channel Group.

2   Click Recall Settings ⬆ .

3   Select a Channel Snapshot to delete.

4   Click **Delete**.

497
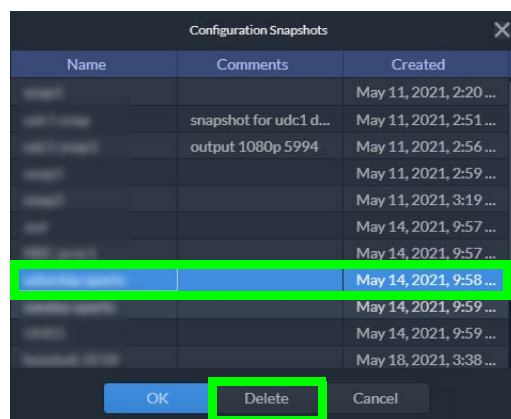
5 Click **OK** to confirm the deletion.

Snapshots Configuration

This screen shows all the currently available snapshots and some of the configuration parameters used to create the snapshot such as the channel's application type, the card's name, and so on. The contents of this screen can be copied or exported to Microsoft Office applications.

Parameter / Table Header	Description
🗑	Removes the currently-selected snapshot(s).
▼	Click to filter the content to allow you to focus on the snapshot of interest. See Filtering Table Columns, on page 504.
Snapshot Name	The name given to the snapshot. See Add or Modify a Snapshot's Comments or Name, on page 500.
Channel Name	The name given to a channel.
Channel Type	The channel application type.
Flow Type	The channel's video resolution.
Application Type	The card model.
Card Name	The NMOS name given to the card.
Frame	The name given to the frame in which the card is located.
Version	The card's application version.
Date	The date the snapshot was created.
Comments	The comment given to the snapshot. This optional comment makes its role easier for you and others to distinguish. See Add or Modify a Snapshot's Comments or Name, on page 500.

This screen allows you to:

- Find the right snapshot for your application as every column has a filter that allows you to narrow the list of snapshots down. See Filtering Table Columns, on page 504.

- Delete a snapshot when it is no longer needed. See Deleting a Channel Snapshot, on page 500.
- Copy or export the contents to Microsoft Office applications. See Copying or Exporting Details from the Snapshots Configuration or Snapshot Logs Screens, on page 502.

Add or Modify a Snapshot's Comments or Name

You can add or modify a snapshot's comments or name to make it easier to identify, use, and maintain the snapshots. Click on the field and type the new name or comment.

Deleting a Channel Snapshot

A Channel Snapshot that is no longer needed can be removed.

1 Select one or more Channels in the Snapshots Configuration list. More than one row can be selected at a time; to add to a selection, use Shift or Ctrl to select a range of rows or to add another row to the selection.

2 Click .

3 Click **OK** to confirm the deletion.

Snapshots Logs

Shows a history of the events that have occurred with each of the snapshots.

Icon / Parameter	Description
	Click to filter the content to allow you to focus on the snapshot logs of interest. See Filtering Table Columns, on page 504.
Date	The date the snapshot event was logged.
Operation Type	Shows the operation that was logged. **Delete:** The snapshot was deleted. **Recall:** The snapshot was applied to a channel. **Save:** The snapshot was created.
Snapshot Name	The snapshot's name associated to this event.
Channel Name	The snapshot channel's name: **For snapshot save:** shows the name of the channel that snapshot was saved from. **For snapshot recall:** shows the name of the channel that snapshot was recalled to.
Card Name	The snapshot card's name: **For snapshot save:** shows the name of the card that snapshot was saved from. **For snapshot recall:** shows the name of the card that snapshot was recalled to.
Frame	The name of the frame associated to this event.
Version	The application version associated to this event.
Status	Shows the status of the logged operation. **Complete:** The operation completed without failure. **Incomplete:** The operation did not complete (it failed).
Comments	The comment given to the snapshot associated to this event.

The contents of this screen can be copied or exported to Microsoft Office applications. See Copying or Exporting Details from the Snapshots Configuration or Snapshot Logs Screens, on page 502.

Copying or Exporting Details from the Snapshots Configuration or Snapshot Logs Screens

The details of one or more rows from the Snapshots Configuration or Snapshot Logs screen can be copied or exported to Microsoft Office applications.

1 Select one or more Channels / Logs in the Snapshots Configuration / Snapshots Logs list. More than one row can be selected at a time; to add to a selection, use Shift or Ctrl to select a range of rows or to add another row to the selection.

2 Right-click on one of the selected rows.
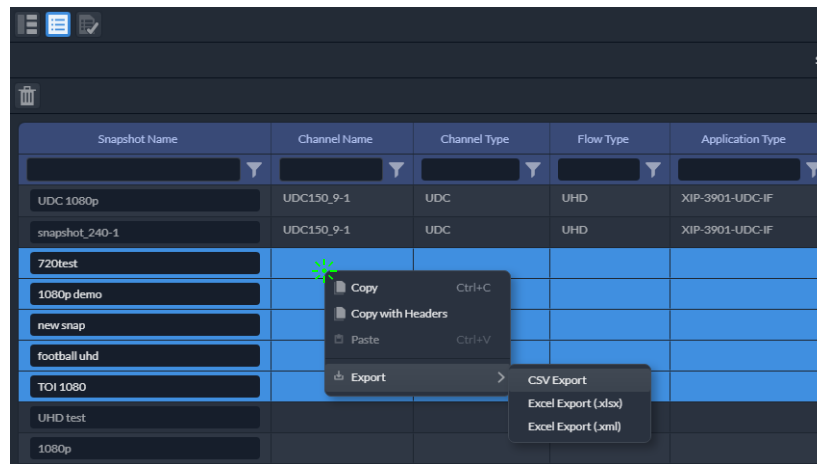
Right-click Option	Description
Copy	Copies the contents of the selected rows for pasting into a Microsoft Office application.
Copy with Headers	Copies the contents of the selected rows including the headers for pasting into a Microsoft Office application. Headers are the labels at the top of each column.
CSV Export	Saves the contents of the selected rows as a comma-separated values (CSV) file.
Excel Export (.xlsx)	Saves the contents of the selected rows as an XLSX Microsoft Excel file.
Excel Export (.xml)	Saves the contents of the selected rows as an XML Microsoft Excel file.

Adding Channel Manager to Projects Created before GV Orbit Control Version 2.2.0

To add Channel Manager to an existing project that was created before GV Orbit Control version 2.2.0, proceed as follows.

1 Upgrade the GV Orbit Client to version 5.2.x or higher. Refer the *GV Orbit Release Notes* and *GV Orbit Admin Guide* for more information. See Related Documentation, on page 19.

2 Ensure the project is not open in GV Orbit Client.

3 Copy the file `C:\Program Files\Grass Valley\GV Orbit\workflows\workflow.wfl` into the workflows folder of your project. For example: `C:\My-Project-Folder\My-Project-Name\workflows`

4 Open the project in GV Orbit Client.

Filtering Table Columns

Filters are available at the top of each column for you to filter on the criteria of that column to narrow the results show in the snapshot list below.

- Click to open filter tool
- Click to select a filter logical operator
- Set the filter criteria
- Optional: Set a logical operator for use with a second filter criteria
- Optional: Set the second filter criteria
- Click to clear the filter

- Click to open filter tool
- Click to select a filter logical operator
- Select a logical operator
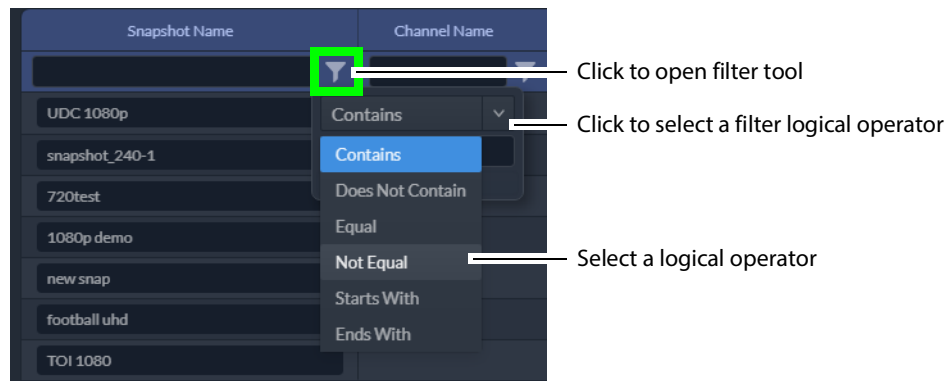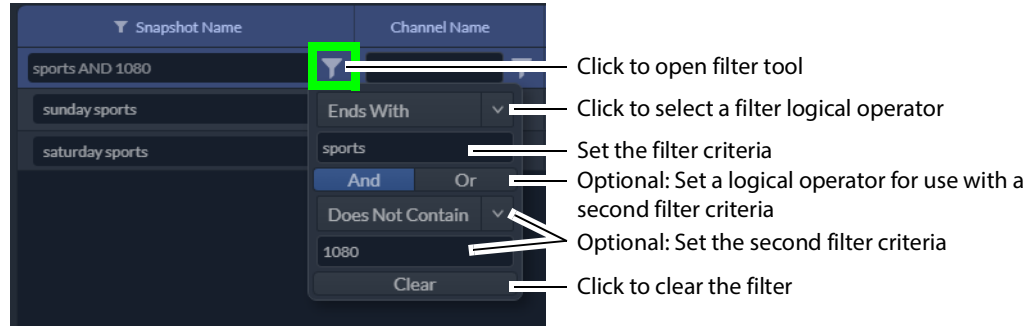
Filter Parameter	Description
And	When a second filter criteria is used, both filter criteria must be met for the item to be shown in the snapshot list below.
Or	When a second filter criteria is used, either filter criteria must be met for the item to be shown in the snapshot list below.
Contains	The items in the snapshot list below must have the same text as the search criterion.
Does Not Contain	The items in the snapshot list below must not have any of the same text as the search criterion.
Equal	The items in the snapshot list below must be an exact match to the search criterion.
Not Equal	The items in the snapshot list below must not match at all to the search criterion.
Starts With	The items in the snapshot list below must start with the search criterion.
Ends With	The items in the snapshot list below must end with the search criterion.

Routing Control - Bulk Routing Panel

Introduction

GV Orbit Client has user router control functionality and offers the following routing control panels:

- Routing Control - Bulk Routing Panel (see this chapter) - a simple, non-editable soft panel for fast control of all router cross-points.
- Routing Control - XY Routing Panel - an editable and customizable soft panel, typically used for small custom panels for specific routing needs.

This chapter describes the **Bulk Routing Panel**.

GV Orbit System

Routing control panels (soft or hard) connect to a GV Orbit Routing service running on a GV Orbit Server.
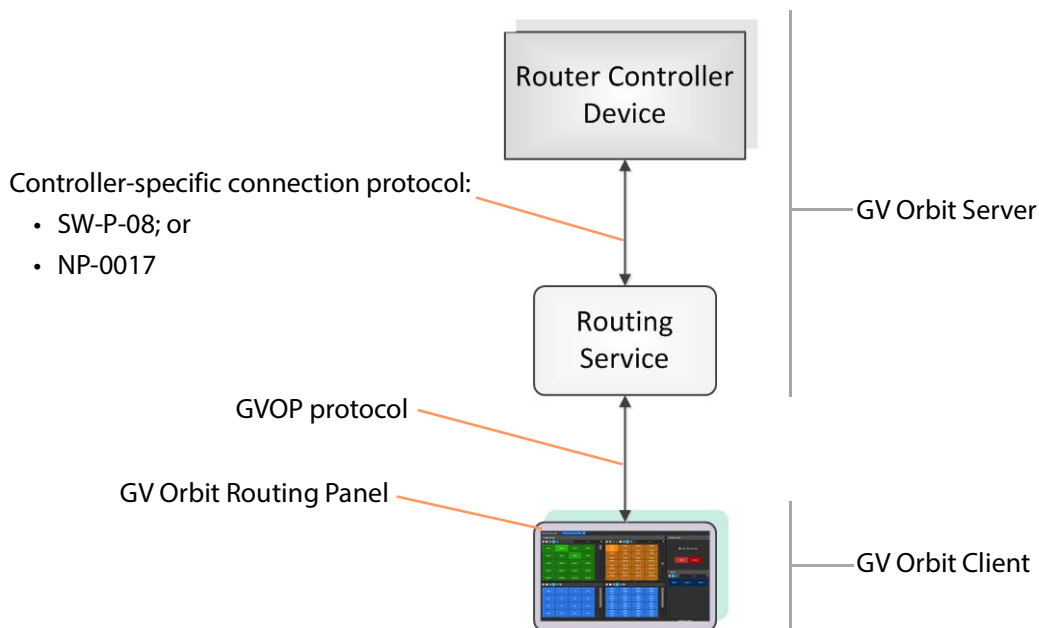
Fig. 12-1: GV Orbit Routing Panel, Routing Service and Router Controller

A GV Orbit system has one or more GV Orbit Servers which run GV Orbit services. Routing panels in a GV Orbit Client connect to a router controller device via the GV Orbit Routing service. Router controllers include GV Orbit itself, a Grass Valley Router Controller device, or

GV Convergent. The Routing service provides source/destination information to the client and acts on routing commands from the client. See Figure 12-2.
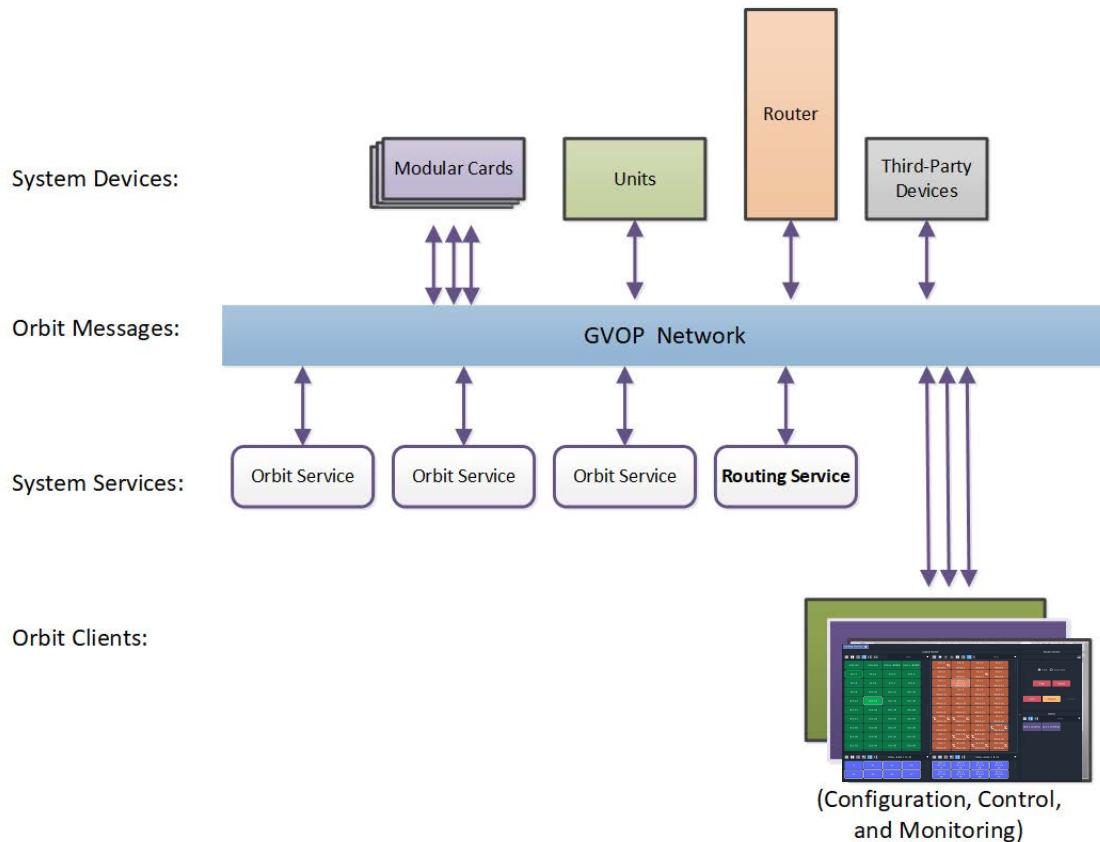
Fig. 12-2: GV Orbit System Diagram

Prerequisites

A GV Orbit Server is required, running:

- A GV Orbit Control application.
- A GV Orbit Routing service configured for connection to a Router Controller using either NP0017 or SW-P-08 protocol.

What is a Bulk Routing Panel?

The GV Orbit Bulk Routing panel is accessible from the GV Orbit Client application. This is a simple, quick, non-editable panel which has been designed to allow fast control of router cross-points and facilitate both keyboard and mouse navigation.
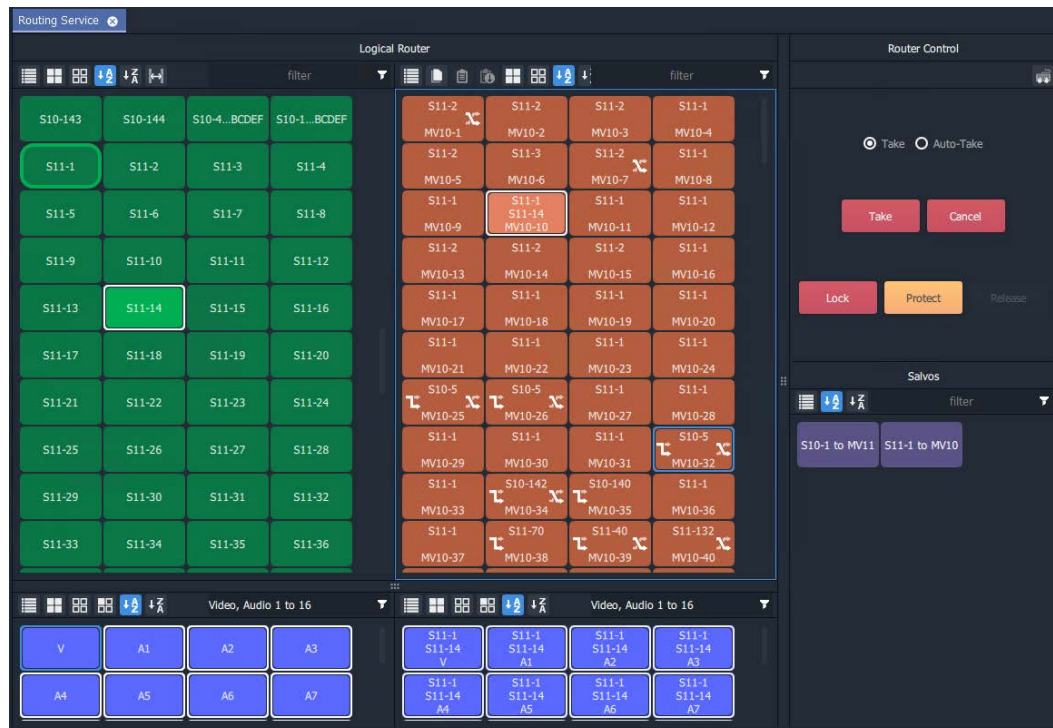
Fig. 12-3: Bulk Routing Panel Example

Key Features

- Keyboard navigation.

- Single source to single destination.
- Single source to multiple destinations.
- Multiple sources to multiple destinations.
- Copy Paste

- Take and Auto Take.

- Lock and Protect.

- Salvos.

- List View mode for level-focused routing.

- Shuffles and Breakaways.

- Filter Sources, Destinations, Levels and Salvos.

- Custom filtering.

- Filter destinations by routed source.

- Sort (ascending and descending).

- Source and Source-Level Dial-up.

Open a Bulk Routing Panel

The GV Orbit Bulk Routing Panel is accessible from the GV Orbit Client application:

- From the Workflow Window
- From the Network Window

> **Note:** The Bulk Routing Panel is best viewed in full-screen on a 1080P 16:9 monitor screen with GV Orbit Client.

From the Workflow Window

To open the Bulk Routing Panel from the **Workflow** window:

1. Open a GV Orbit C&M project in GV Orbit Client and adjust the window size to be full-screen.

   Full-size is the recommended window size for operation; all controls are visible.

2. Ensure the GVOP client domain is set to be the same as that being used by the GV Orbit Routing service on the GV Orbit Server. (Main menu: 'Connections > GVOP'.)

3. In the **Workflow** window, click on the **Bulk Routing** icon. (See Figure 12-4.)
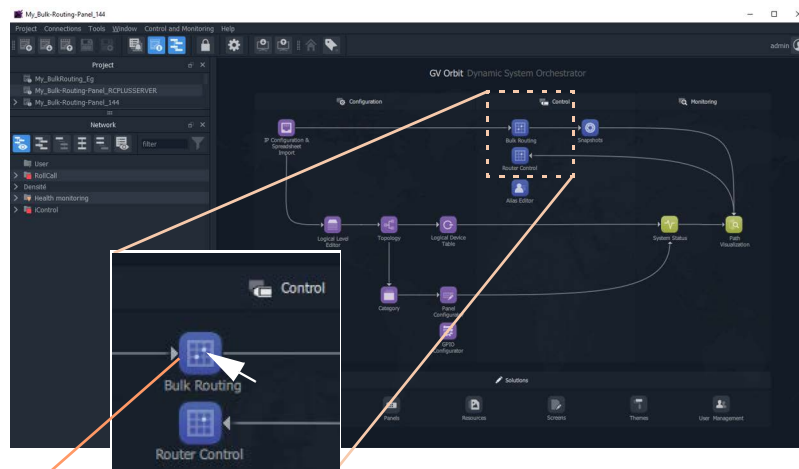
Click on **Bulk Routing** icon.

Fig. 12-4: Open a Bulk Routing Panel

The Bulk Routing Panel is opened. See Figure 12-6 for a sample Bulk Routing Panel.

From the Network Window

To open the Bulk Routing Panel from the **Network** window:

1. Open a GV Orbit C&M project in GV Orbit Client and set the window size to be full-screen.

2. Ensure the GVOP client domain is set to be the same as that being used by the GV Orbit Routing service on the GV Orbit Server. (Main menu: 'Connections > GVOP'.)

3. Locate the **Routing** service item in the **Network** window of GV Orbit Client. And right-click on the item and select 'Open Panel'. See Figure 12-5.

Right-click on the **Routing** service item and select 'Open Panel'.
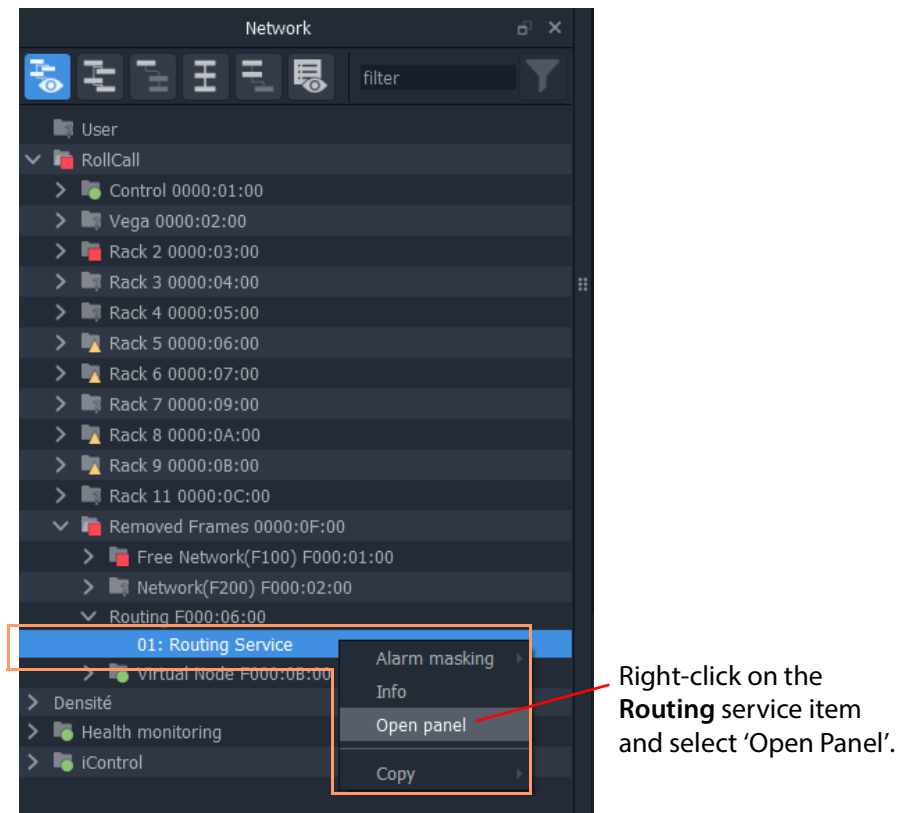
Fig. 12-5: Open a Bulk Routing Panel

> **Note:** A 'Routing service' item in the **Network** window is formed when a **Routing** service is running on the GV Orbit Server and is configured to talk to a router controller.

An example Bulk Routing Panel is shown in Figure 12-6.
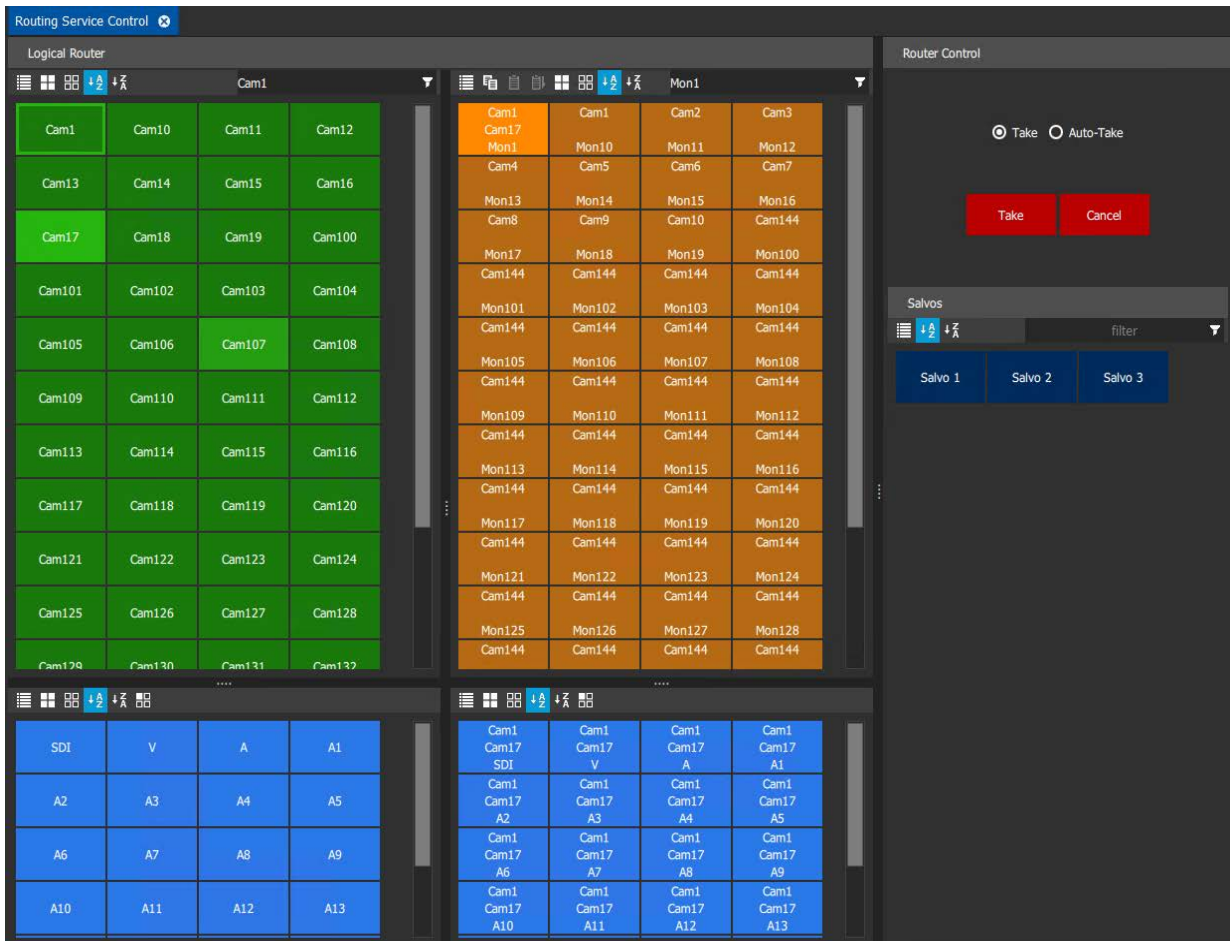
Fig. 12-6: Example Bulk Routing Panel

Bulk Routing Panel Layout and Controls
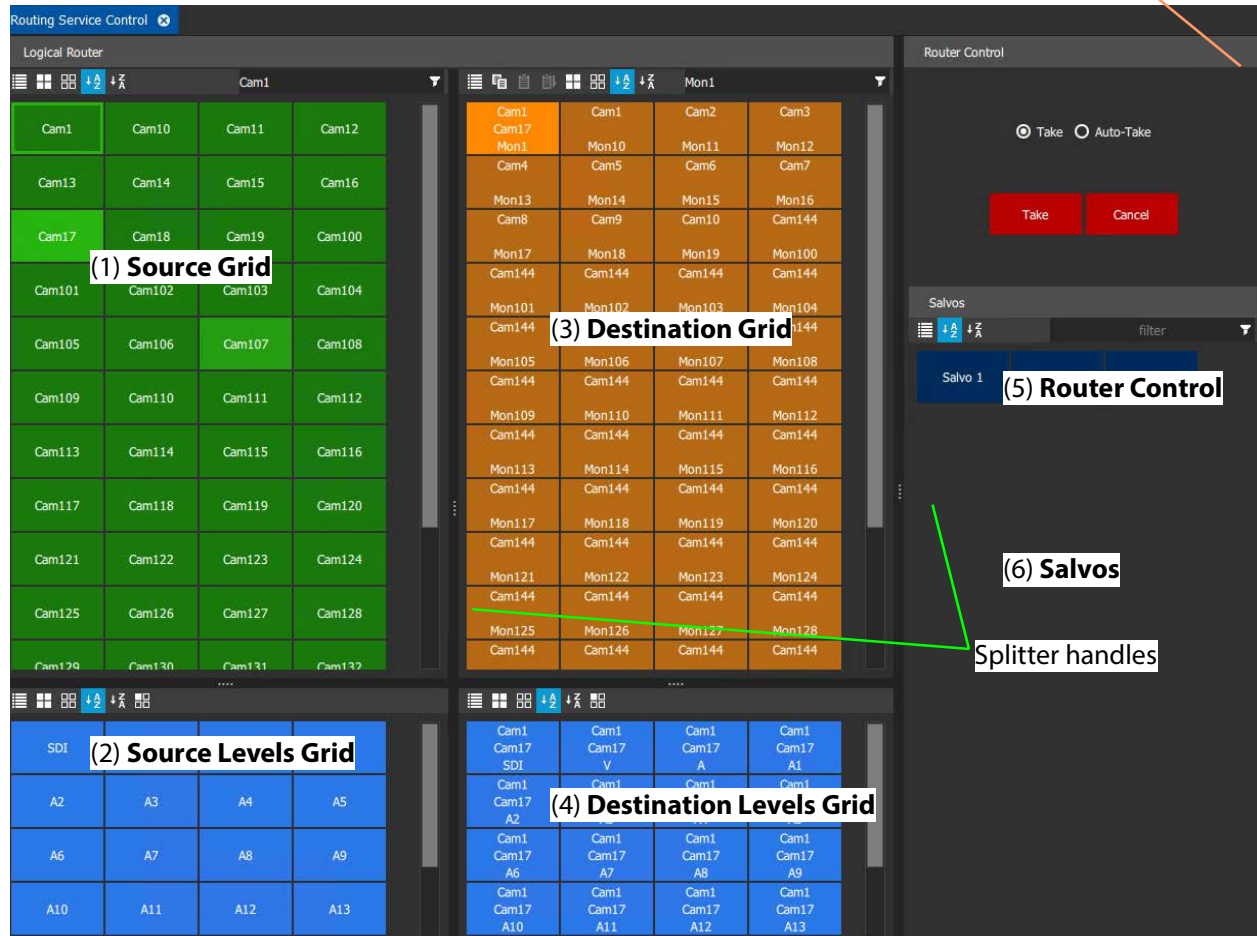
Fig. 12-7: Bulk Routing Panel Layout

The panel is laid out as six grids/panes (see Figure 12-7):

- (1) **Source Grid** – Scrollable list of all available sources.
- (2) **Source Levels Grid** – Scrollable list of available levels for selected source(s).
- (3) **Destination Grid** – Scrollable list of all available destinations.
- (4) **Destination Levels Grid** – Scrollable list of available levels for selected destination(s).
- (5) **Router Control Pane** – Take, Lock, and Protect functionality.
- (6) **Salvos Pane** – List of available Salvos when connected over the NP0017 protocol.

Vertical sizing of the Source and Destination grids can be altered by dragging a splitter handle up/down the screen. Horizontal sizing and sizing of the Router Control and Salvos panes can be altered by dragging a splitter handle left/right. Other sizing is handled automatically. See Figure 12-7.

Routing Control - Bulk Routing Panel
What are the Operational Keyboard Shortcuts?

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User Guide

What are the Operational Keyboard Shortcuts?

Keyboard shortcuts are available when navigating and operating the Bulk Routing Panel, in addition to using a mouse. You can freely mix 'mouse' and 'keyboard' methods.

A list of keyboard shortcuts may be displayed in a movable window which can remain on display while using the Bulk Routing Panel.
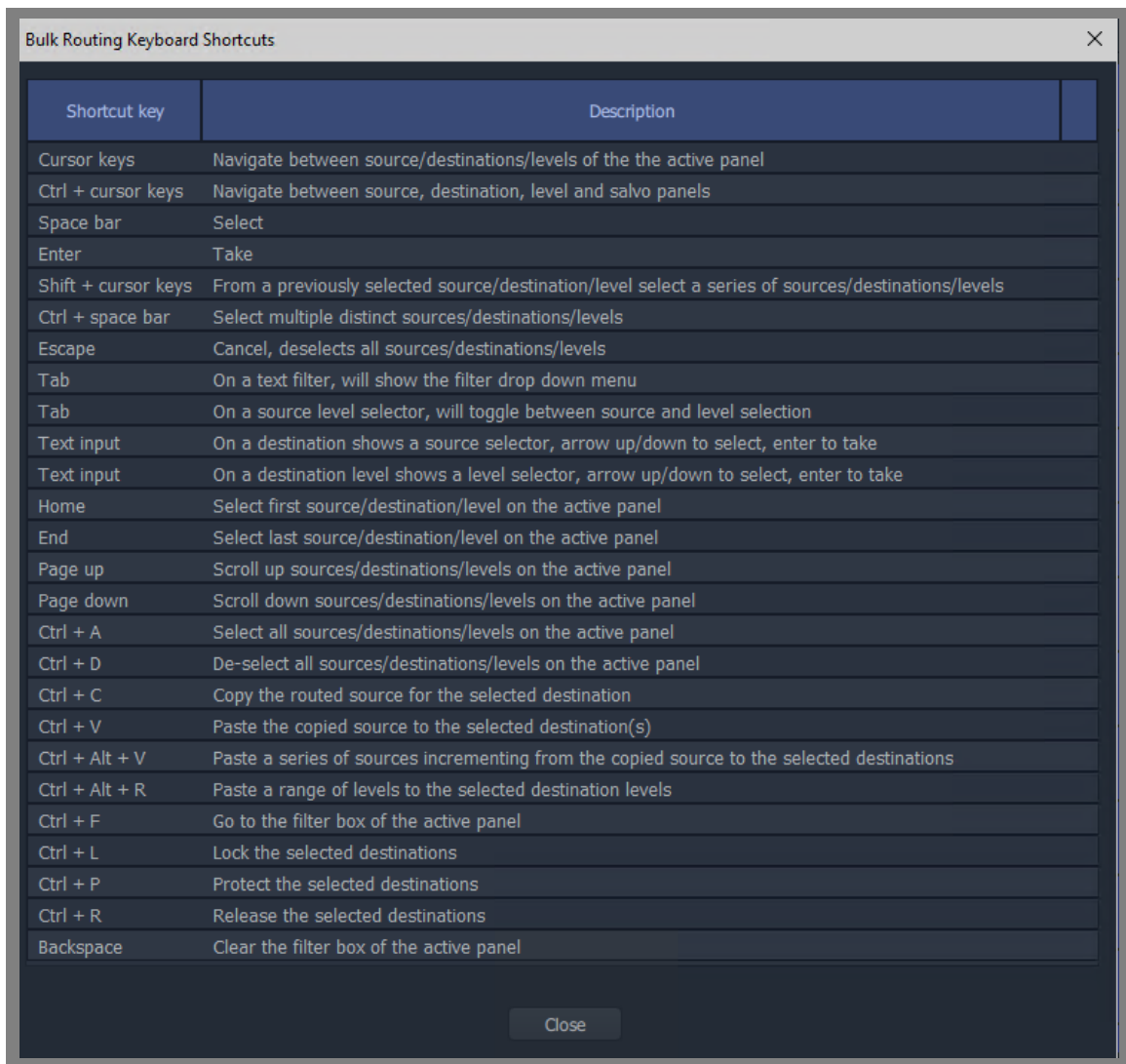
To see a list of keyboard shortcuts:

1 Click on the 'Keyboard Shortcuts' icon in the tool bar of the **Router Control** pane.
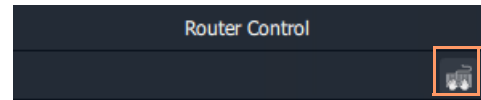
The **Bulk Routing Keyboard Shortcuts** window is shown, see Figure 12-8. This window lists the keyboard shortcuts. It remains on display and may be moved.

Shortcut key	Description
Cursor keys	Navigate between source/destinations/levels of the the active panel
Ctrl + cursor keys	Navigate between source, destination, level and salvo panels
Space bar	Select
Enter	Take
Shift + cursor keys	From a previously selected source/destination/level select a series of sources/destinations/levels
Ctrl + space bar	Select multiple distinct sources/destinations/levels
Escape	Cancel, deselects all sources/destinations/levels
Tab	On a text filter, will show the filter drop down menu
Tab	On a source level selector, will toggle between source and level selection
Text input	On a destination shows a source selector, arrow up/down to select, enter to take
Text input	On a destination level shows a level selector, arrow up/down to select, enter to take
Home	Select first source/destination/level on the active panel
End	Select last source/destination/level on the active panel
Page up	Scroll up sources/destinations/levels on the active panel
Page down	Scroll down sources/destinations/levels on the active panel
Ctrl + A	Select all sources/destinations/levels on the active panel
Ctrl + D	De-select all sources/destinations/levels on the active panel
Ctrl + C	Copy the routed source for the selected destination
Ctrl + V	Paste the copied source to the selected destination(s)
Ctrl + Alt + V	Paste a series of sources incrementing from the copied source to the selected destinations
Ctrl + Alt + R	Paste a range of levels to the selected destination levels
Ctrl + F	Go to the filter box of the active panel
Ctrl + L	Lock the selected destinations
Ctrl + P	Protect the selected destinations
Ctrl + R	Release the selected destinations
Backspace	Clear the filter box of the active panel

Fig. 12-8: Bulk Routing Keyboard Shortcuts Movable Window

Equivalent mouse clicks for some keyboard shortcuts are listed in Table 12-1.

Table 12-1: Bulk Routing Panel Operational Keys / Mouse operations

Operation	Keyboard	Mouse
Toggle Selection	Space bar	Mouse click
Take	Enter	Click Take
Panel Button Focus	Cursor Arrow Keys	Mouse movement/click
Panel/Grid Focus	CTRL + Arrow Keys	Mouse movement/click
Add a series of items to/remove from a multiple selection	SHIFT + Cursor keys	SHIFT + Mouse click
Add distinct items to/remove from a multiple selection	CTRL + Space bar	CTRL + Mouse click
Select Range (Select a contiguous range)	Space bar on first item then SHIFT + space bar on last item.	Mouse click on first item then SHIFT click on last item.
Paste Series	Alt-CTRL + V when a range of destinations are selected. See What is Copy-and-Paste Series Routing?, on page 534.	Click 'Paste Series' icon in panel.
Take	Return / Enter	Double-click
Dial Source	Begin to type the name of a Source when a destination is selected. See Dial Source Dialog, on page 526.	N/A
Dial Source-Level	Press any single alpha-numeric key when a destination *and* (one or more) levels are selected. See Dial Source-Level Dialog, on page 527.	N/A
Cancel	Escape	Click 'Cancel' button in the Router Control pane.
Select All in the focused panel	CTRL + A	Click 'Select All' icon in panel.
Select None in focused panel	CTRL + D	Click 'Select None' icon in panel.
Copy a Destination	CTRL + C when a destination is selected	Click 'Copy' icon in panel
Paste a Destination	CTRL + V when target destination, or destinations, are selected	Click on 'Paste' icon in panel

Select/Focus in a Bulk Routing Panel

Current Button-Focus

When the mouse cursor is moved over a button, or control item, the button/item is highlighted indicating the current item is in focus.

Selected Destination

Current Button- Focus

Navigate with:
Cursor Keys,

or use the mouse
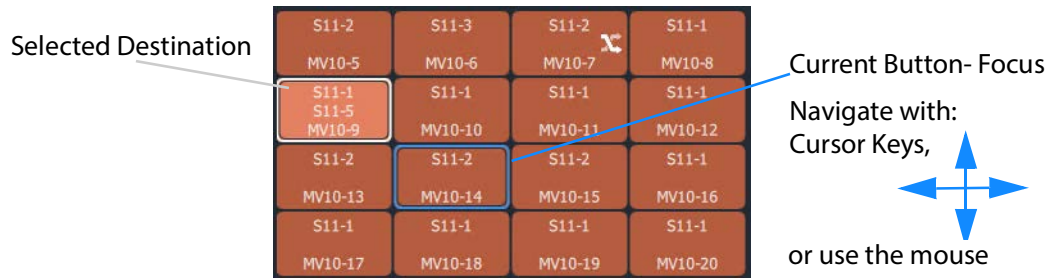
Fig. 12-9: Current Button-Focus Item

Select a Button

To select a button:

- click on a button; or
- press the space-bar key when a button is the current focus item.

De-select Buttons

To deselect all buttons:

- click Cancel in the Router Control pane; or
- press the ESC key.

Move Focus Between Grids/Panels of the Bulk Routing Panel

To move the focus between a grid/panel of the Bulk Routing panel:

- Use the CTRL key and one of the cursor arrow keys.

    Focus is indicated by a border around the focused grid.

Pre-selected Source

Currently-routed
Source

Current
Button-Focus

Current Panel/Grid Focus

Navigate with:
Control-Cursor Keys,

or use the mouse

Fig. 12-10: Current Panel/Grid Focus Item

Selecting Multiple Items

Select Multiple Items (CTRL select)

Select multiple items (such as destinations, or sources, etc.) by selecting the first item and CTRL-selecting the others. For example, to select multiple destinations:

1 Select the first destination by clicking on the destination selection button.
2 CTRL-click on the next destination to add that to the selection.
3 Add other destinations.

Select Multiple - Alternative Method

Multiple items can be selected using the Control key, the Cursor Arrow keys and the Enter key.

1 With the cursor over the first item to be selected, press enter to select it.
2 Use the cursor arrow keys to move to the next item.
3 Select it with CTRL-Enter. This adds to the selection.
4 Add other items similarly.

Select a Range of Items (SHIFT select)

When selecting multiple items (such as destinations, or sources etc.), a range may be selected by selecting:

1 The first destination in the range by clicking on the destination selection button.
2 Selecting the last destination by SHIFT + clicking on its destination button.

Source ranges can be selected similarly.

Select a Range - Alternative Method

A range of consecutive sources or destinations can be selected using the Shift key, Cursor Arrow keys, and Enter key.

1 With the cursor over the *first* item to be selected, press Enter to select it.

2 Move to the *last* item in the range with the cursor keys.

3 Hold down the SHIFT key and press Enter to select it.

   The last item and all the items from the first to the last are added to the selection.

Source/Destination Grid Buttons

The source/destination selection grid buttons and level-selection buttons are annotated to reflect the source/destination name or the level name. Additionally, the destination buttons may show the currently-routed source and currently-selected source for the selected destination. Buttons also change shape and are highlighted to show if they are selected or if sources are currently-routed or currently-selected. See Figure 12-11.

> **Note:**
> See Breakaway and Levels and Shuffle and Levels for examples of selecting levels.
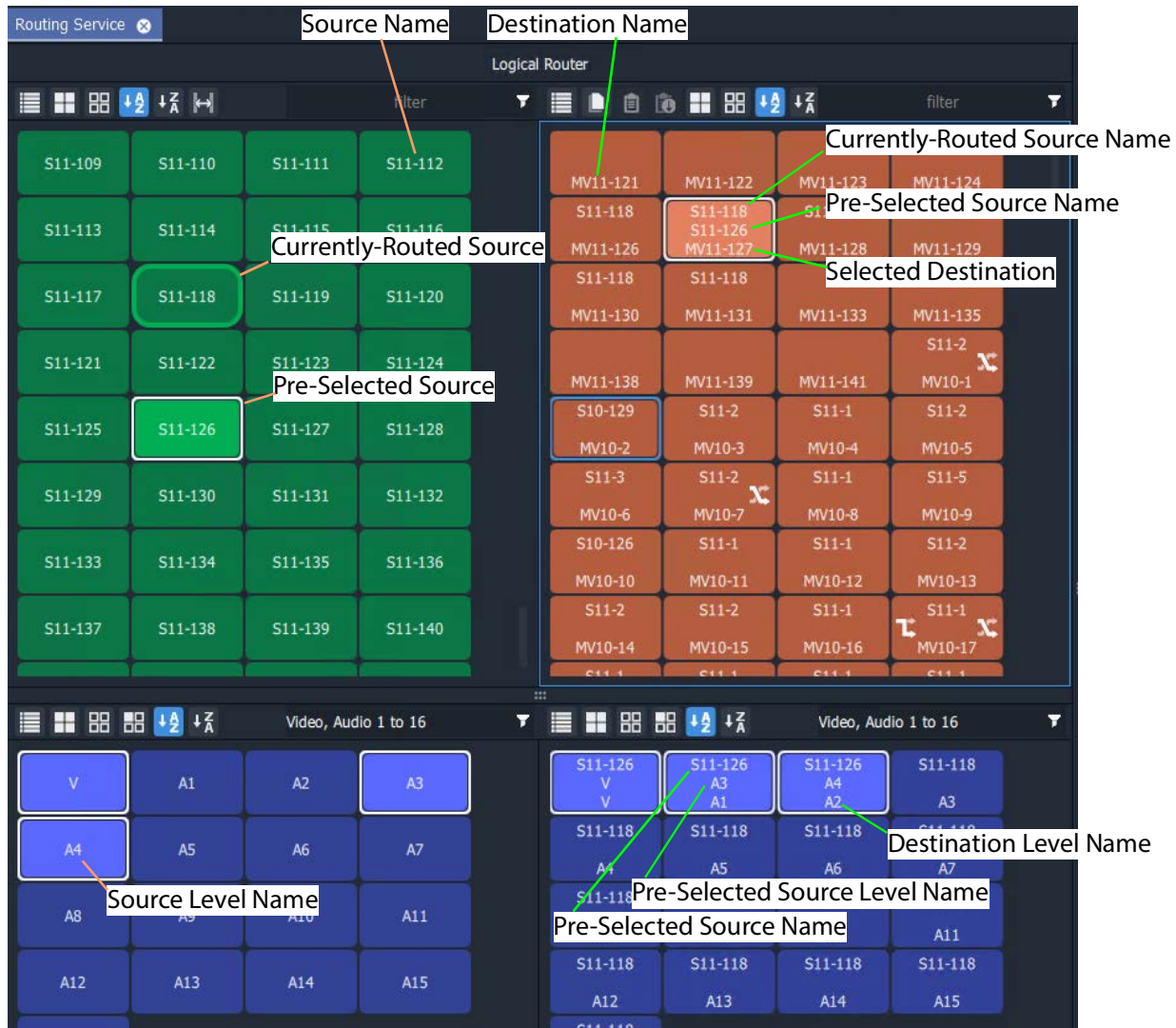
Fig. 12-11: Selection Buttons

Note: Select a Destination or a Source to see the corresponding Level selection buttons.

Level Selection

When a source or a destination is selected, the associated levels are shown in the corresponding 'Levels' grid. If *multiple* sources or destinations are selected, then only their *common levels* are shown.

All levels are selected by default. If you select one or more levels, then all other levels are deselected.

Keep Last Level Selection After Take

When a different source or destination is selected after a 'Take', the level selection is normally cleared. To keep the selected levels, select the **Keep Last Selection** button in the 'Levels Grid' pane tool bar (see Figure 12-12).

Keep Last Selection toggle buttons

Source Levels Grid   Destination Levels Grid
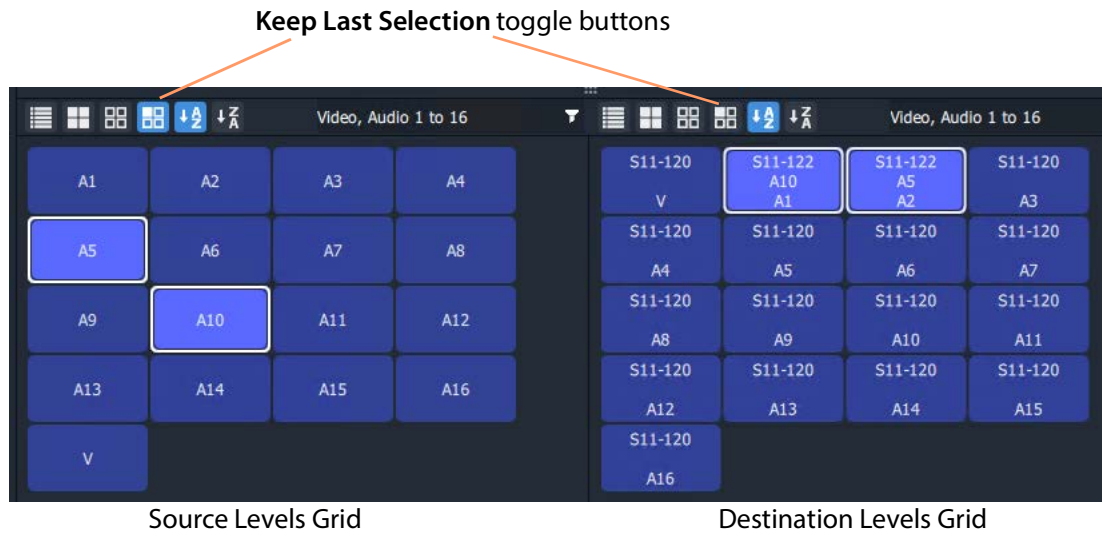
Fig. 12-12: Keep Last Selection Buttons

Router Control Pane

The **Router Control** pane in the Bulk Routing Panel contains the **Take**, **Lock** and **Protect** functions.

Click icon to see a list of keyboard shortcuts.

Select **Auto-Take** to make a route as soon as source(s) and destination(s) are selected.

Click **Cancel** to cancel all selections.

a) No Selections Made
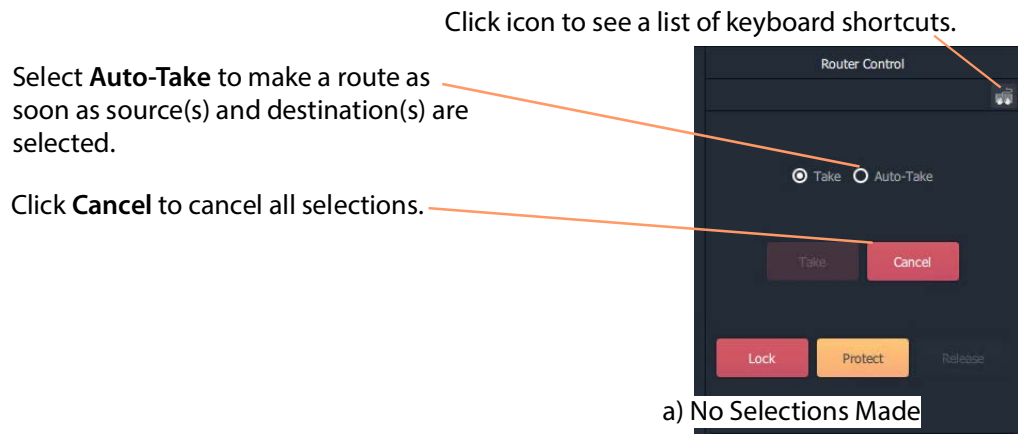
With a destination selected, **Lock** and **Protect** buttons are active.

b) Destination Selected
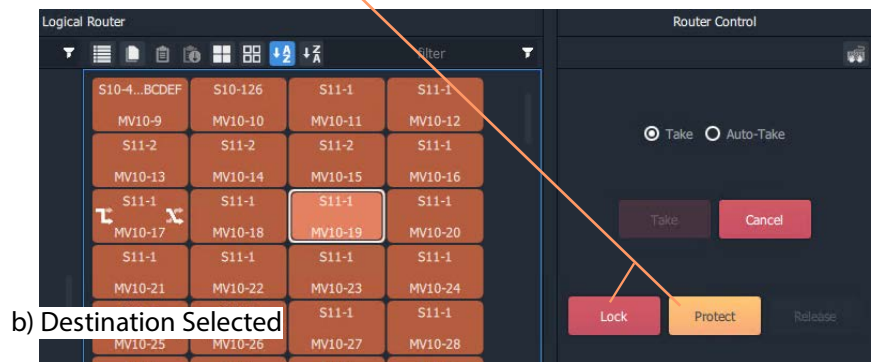
After destination(s) *and* source(s) are selected, the **Take** button goes active (red).

c) After Destination and Source Selection
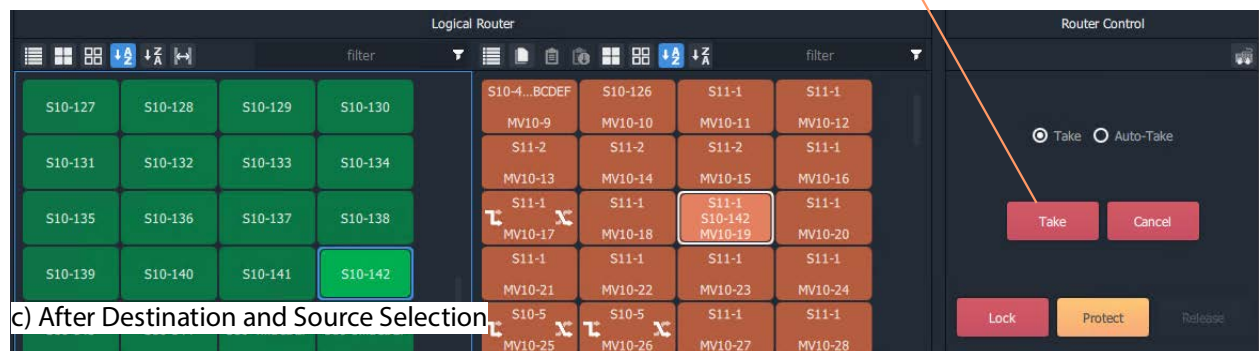
Fig. 12-13: Router Control Pane:
a) No Selections Made;
b) Destination Selected;
c) Destination and Source Selected.

Tool Bars in a Bulk Routing Panel

There is a small tool bar at the top of each grid/pane containing controls for selection/de-selection, sorting and filtering.

Source Selection Grid Tool Bar

Click to see drop-down menu of tool bar items.

Click to Select all sources.

Click to Deselect all sources.

Click to Sort sources A-Z.

Click to Sort sources Z-A.

Click to toggle the optional display of Wide Source and Destination Selection Buttons.
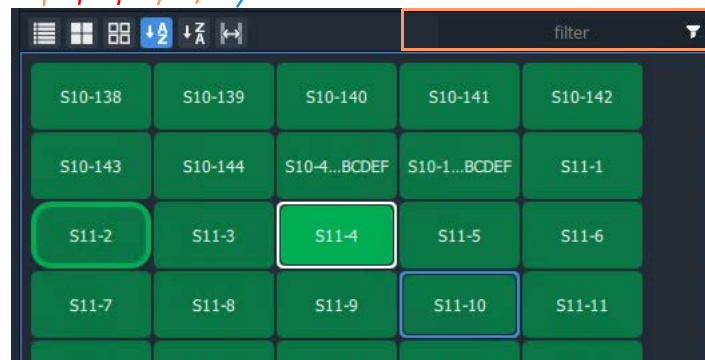
Filter control, see What is Bulk Routing Panel Filtering?, on page 547.

Fig. 12-14: Source Selection Grid - Tool Bar

Source Levels Grid Tool Bar

Click to see drop-down menu of tool bar items.

Click to Select all levels.
Click to Deselect all levels.

Click to keep the Levels selection after a Take.

Click to Sort levels A-Z.
Click to Sort levels Z-A.

Filter control, see What is Bulk Routing Panel Filtering?, on page 547.

Fig. 12-15: Source Level Selection Grid - Tool Bar

Destination Grid Tool Bar

Click to:

- See a drop-down menu of all tool bar items.

- Copy routing information of a Destination selection.
- Paste routing information to a Destination.
- Paste a series of sources to a Destination range.
    (See What is Copy-and-Paste Routing?, on page 533.)
- Select all destinations.
- Deselect all destinations.
- Sort destinations A-Z.
- Sort destinations Z-A.

- Toggle display of wide selection buttons.
- Toggle **Hide Sources**. See Hide Sources, on page 562.
- Toggle **List View** mode. See List View, on page 564.

Filter control, see What is Bulk Routing Panel Filtering?, on page 547.
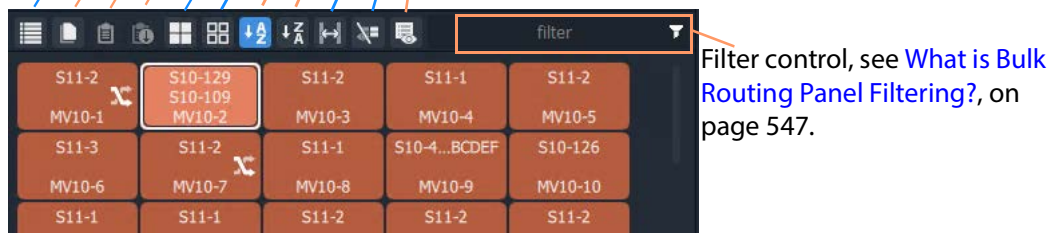
Fig. 12-16: Destination Selection Grid - Tool Bar

Destination Levels Grid Tool Bar

Click to see drop-down menu of tool bar items.

Click to Select all level.

Click to Deselect all levels.

Click to keep the Levels selection after a Take.

Click to Sort levels A-Z.

Click to Sort levels Z-A.
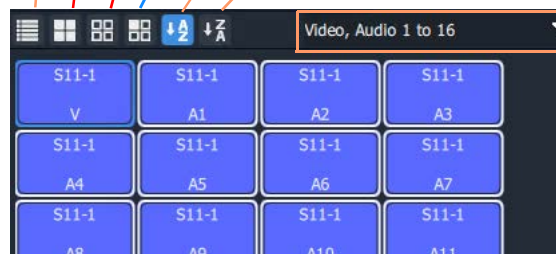
Filter control, see What is Bulk Routing Panel Filtering?, on page 547.

Fig. 12-17: Destination Level Selection Grid - Tool Bar

Router Control Pane Tool Bar
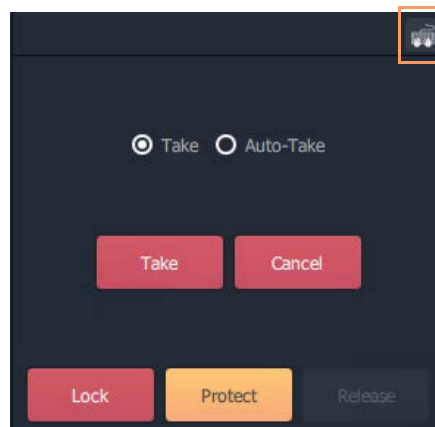
Keyboard Shortcuts icon

Fig. 12-18: Router Control Pane - Tool Bar

Salvos Pane Tool Bar

Click to see drop-down menu of tool bar items

Click to sort sources A-Z
Click to sort sources Z-A
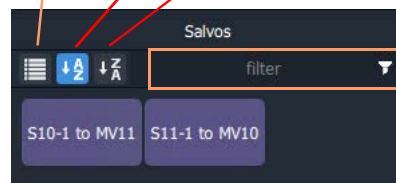
Filter control,
see What is Bulk Routing Panel Filtering?, on page 547

Fig. 12-19: Salvos Pane - Tool Bar

Wide Source and Destination Selection Buttons

To facilitate the display of longer source or destination names on selection buttons, there is a 'wide button' display option. This is selectable in the **Source Grid** and, independently, in the **Destination Grid.** The option is selected with a toggle button in the tool bar of each grid. See Figure 12-20.

The display option persists between sessions with the Bulk Routing Panel.

Click to toggle display of normal and wide buttons.
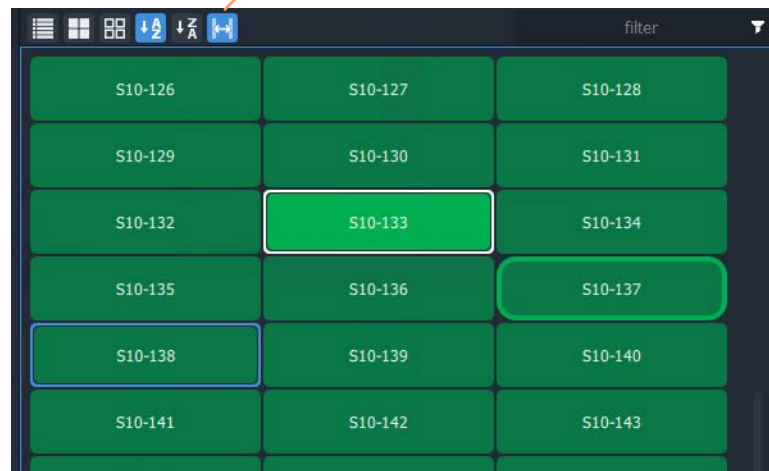
Fig. 12-20: Wide Buttons (Source Grid Shown)

Panel Pop-Up Items

Right-Click in a Bulk Routing Panel

Right-click on the Bulk Routing Panel to display a pop-up context menu. See Figure 12-21.
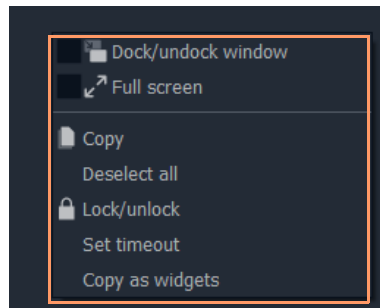
Fig. 12-21: Right-Click Context Menu

Table 12-2: Right-Click Context Menu Items

Item	Keyboard
Dock/Undock Window	Undock or dock the Bulk Routing Panel window from/to the GV Orbit Client window.
Full Screen	The Bulk Routing Panel window is shown full-screen. The control toggles full screen mode on/off.
Copy	Same as: • clicking on Copy icon in grid/pane tool bar; or • pressing Ctrl-C.
Deselect All	Deselects all items.
Lock/Unlock	Click to lock panel. When panel is locked, controls are grayed-out and user operation is disabled. The control toggles lock on/off
Set Timeout	Click to set a timeout (in seconds) for confirmation from the router controller of routing actions (that is setting the router's crosspoints). If the timeout is exceeded, a timeout notification is shown on screen. See Pop-up Notification Messages.
Copy As Widgets	Click to copy a selection of one or more buttons to the GV Orbit Client's copy-buffer. (This is used when designing an XY Routing Panel. See Chapter 13, Routing Control - XY Routing Panel, Quick Port-per-Button Assignment, on page 625.)

Pop-up Notification Messages

During Bulk Routing Panel operation, notification messages may pop up at the foot of the GV Orbit Client application window to provide information and advice, for example, on the setting up of a route, or of a broken/re-made Routing service connection. See Figure 12-22 for some example messages.

Click OK to clear a message.

Click OK to clear the message.
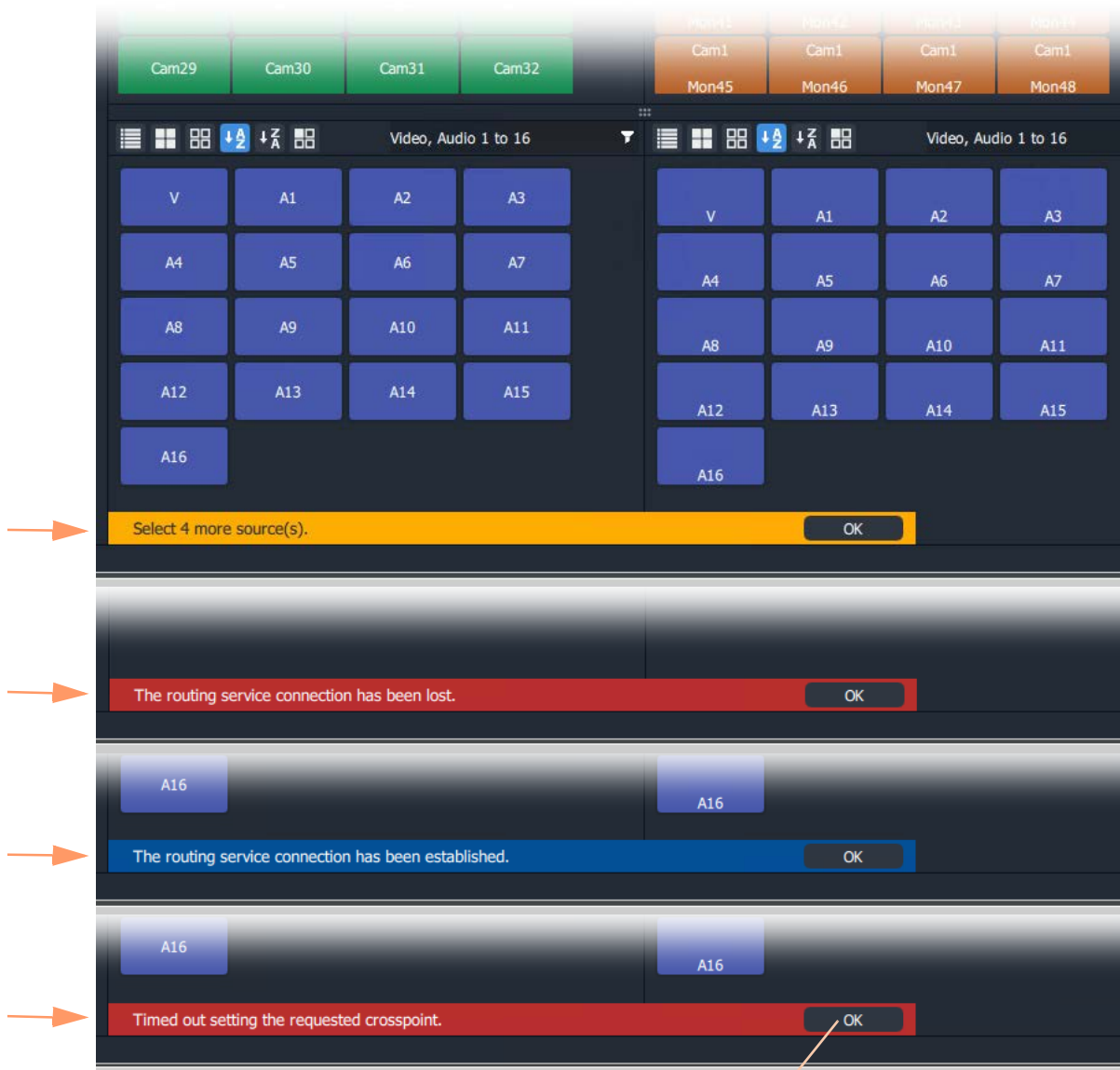
Fig. 12-22: Notification Message Examples

Dial Source and Dial Source-Level Dialogs

To help with source and source level selection when making a route, a 'dial-up' dialog allows you to begin to type in a source name and see a filtered list of sources and source levels.

There are two 'dial-up' dialogs

- Dial Source Dialog for Source selection.
- Dial Source-Level Dialog for Source *and* Level selection.

These dialogs enable a user to select a source and/or level and route it to a destination.

> **Note:** To clear a 'dial-up' dialog before making a route, click the ESC key.

Dial Source Dialog

Dial Source is a quick way of selecting a Source for a destination and routing it.

With a **Destination** selected, a **Source** may then be found by typing a part of a source name with the keyboard's alpha-numeric keys. A **Dial Source** dialog is displayed and, as characters are entered:

- **Sources** matching the entered characters are displayed in a drop down list; and the
- **Source Grid** is correspondingly filtered.

After a valid Source has been selected, a route can be made by pressing the Enter key.

Example

To see and use the **Dial Source** dialog:

1 Select a **Destination**.

2 Begin to type in a Source name.

A **Dial Source** dialog pops up. (See Figure 12-23.)

3 Continue typing in a valid source name and press Enter; and/or select a source from the (scrollable) filtered list in the dialog.

A route is made from the selected **Source** to the selected **Destination**. No 'Take' is required.

> **Note:** Enter will execute the route if a valid source has been selected. A mouse click on a source will also execute the route.
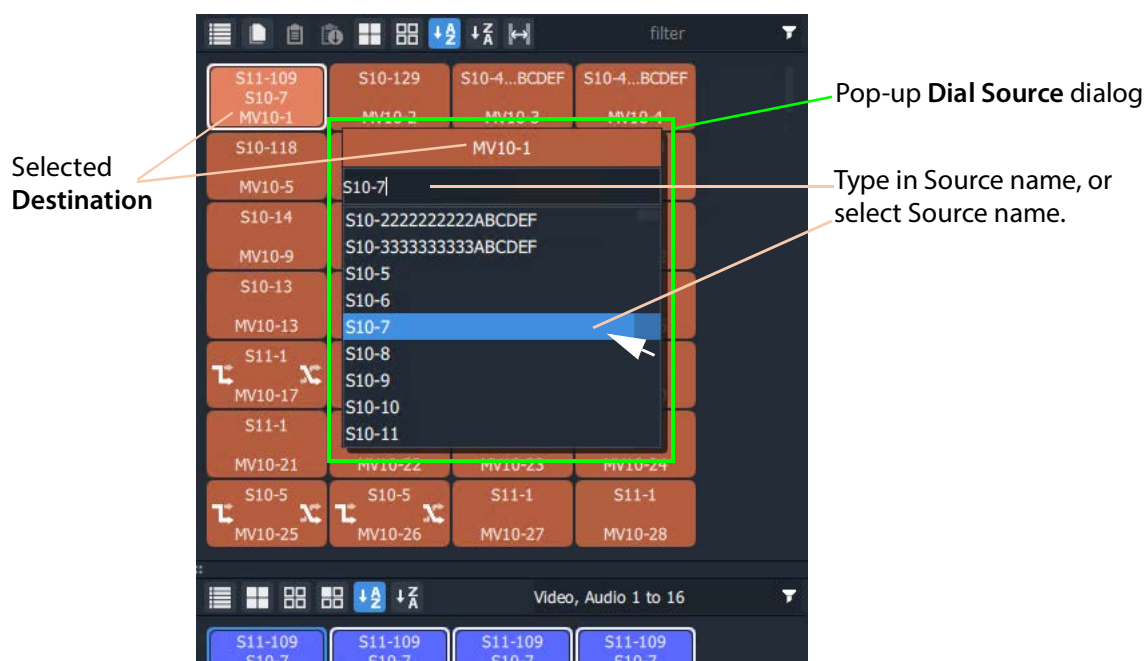
Fig. 12-23: Dial Source Dialog

Further routing examples can be found at:

- Route with Dial Source, on page 530.

Dial Source-Level Dialog

Dial Source-Level is a quick way of selecting a Source and a Level for a destination and routing it. By default, the **Dial Source-Level** dialog shows the currently-routed Source and Source-Level.

With a **Destination** and a **Destination Level** selected, type a single alpha-numeric character to display the default **Dial Source-Level** dialog.

A **Source** may then be found by starting to type a source name. As the Source name is typed, the Sources listed in the dialog are filtered.

After a valid Source has been highlighted, press Tab to select a valid Source Level and a route can be made by pressing the Enter key.

Routing a level from a different source to a destination forms a breakaway (see Breakaway and Levels). Routing a different level from the same source forms a shuffle (see Shuffle and Levels).

Example

To see and use the **Dial Source-Level** dialog:

1 Select a **Destination**.

2 Select *one or more* **Destination Levels**.

3 Type a single alpha-numeric character.

   A default **Dial Source-Level** dialog pops up and shows the currently-routed Source name and Level. (See Figure 12-24.)
   (**Note:** It is assumed that level-based routing is required.)

Selected **Destination**

Selected **Destination Levels**

Pop-up **Dial Source-Level** dialog

Type in a valid Source name; and press Tab key to toggle focus to Levels.

Type in Level name; and/or select Level name.
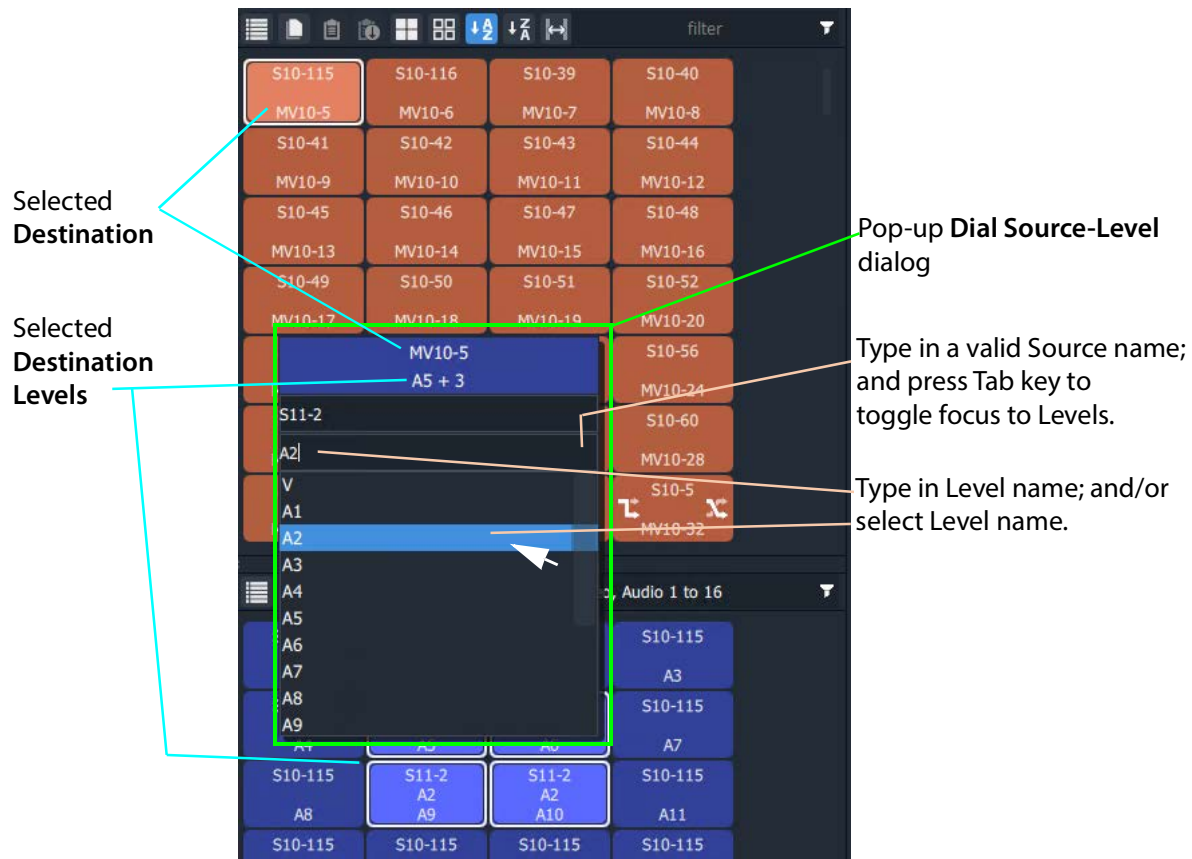
Fig. 12-24: Dial Source-Level Dialog

4   If a different Source Name is required, begin to enter the required Source name.

The list of Source names is filtered on the typed text.

5   Either:

- continue typing in a valid Source name (but *do not* press the Enter key); or
- highlight a Source name in the list (do not select it).

6   When the required (and valid) Source name is in the upper text box of the dialog, press the Tab key. (See Figure 12-24.)

This toggles focus from 'Sources' to 'Levels'; the filtered list changes to listing Levels.

Note: To clear a 'dial-up' dialog *before* making a route, click the ESC key.

7   Type in the Level name required and press Enter; and/or select the Level from the filtered list in the dialog.

A route is made from the (one) selected **Source Level** to the selected **Destination Level(s)**. No 'Take' is required.

Note: Enter will execute the route if a valid source and level has been selected. A mouse click on a source or source level will also execute the route.

Further routing examples can be found at:

Bulk Routing Panel Operation

Make a Simple Route

To make a simple route:

1 Select a **Destination**.

   The source currently routed to the selected destination is automatically highlighted in the Source Grid.

2 Select a **Source** to be routed to the selected destination.

   See Figure 12-25.

Before a **Take**, the **Levels Grids** show level information for the selected source and destination.

Fig. 12-25: Make a Route Example - Before TAKE.

3 Click **Take**. (Click **Cancel**, to deselect the source/destination.)

The selected source (all of its levels) is routed to the selected destination. See Figure 12-26.
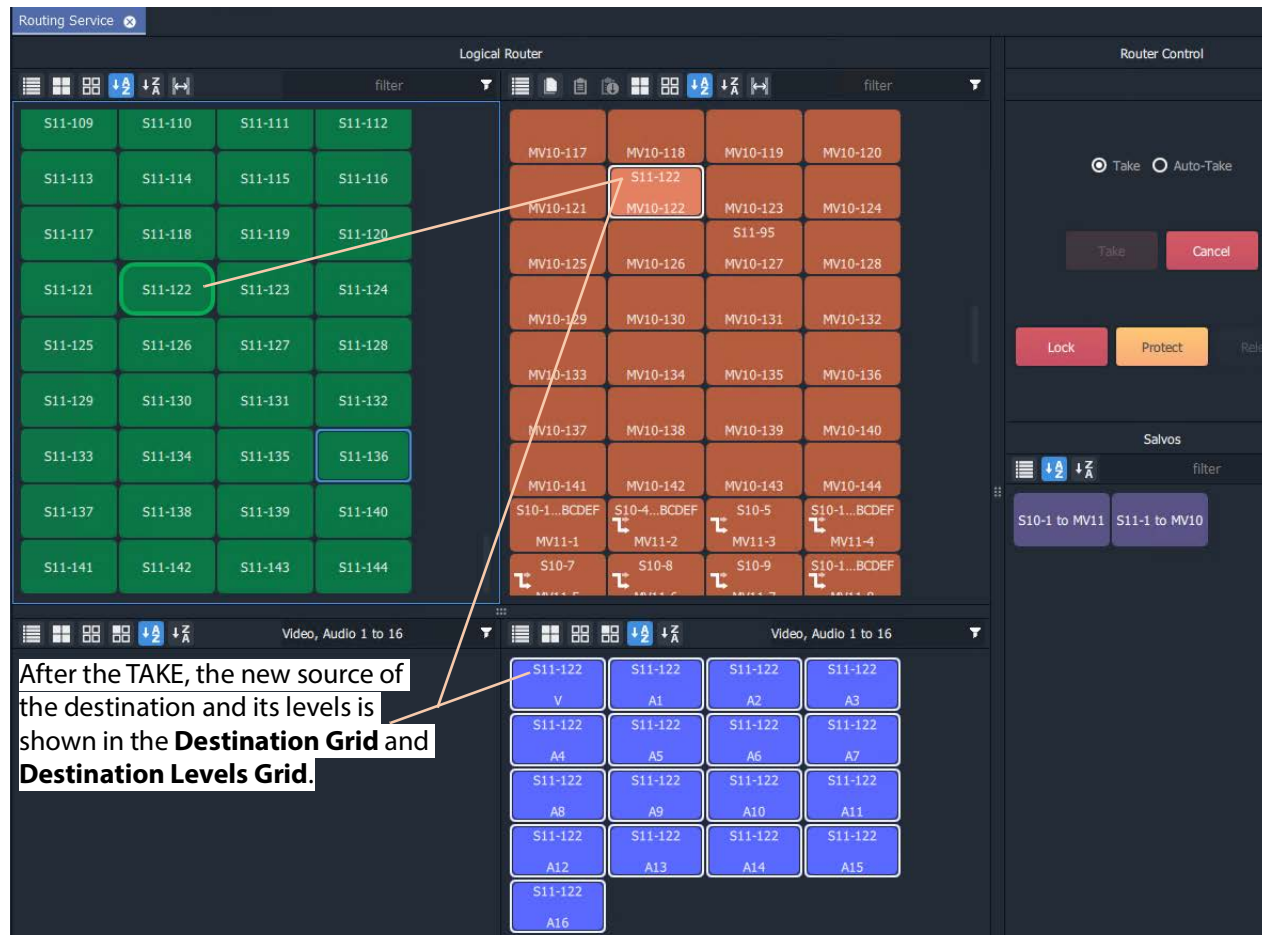
Fig. 12-26: Make a Route Example - After TAKE.

Simple Route - Alternative Method

Also, to make a route, the source may be selected first:

1 Select a **Source**.
2 Select a **Destination**.
3 Click **Take**.

Route with Dial Source

See Dial Source Dialog, on page 526, for more information. To make a simple route:

1 Select a **Destination**.
2 Begin to type in a Source name.

   A **Dial Source** dialog pops up.

3 Continue typing in a source name and press Enter; and/or
   select a source from the (scrollable) filtered list in the dialog.

A route is made from the selected **Source** to the selected **Destination**. No 'Take' is required.

Route One Source to Multiple Destinations

One to many.

Note: The Bulk Routing Panel may be operated with a mouse, or using keyboard shortcuts, or by using a mixture of both.

To route a single source to multiple destinations:

1 Select a **Destination** by clicking on the destination selection button.
    (Equivalent keyboard shortcuts = cursor arrow keys and space-bar.)
2 Select a second **Destination** by CTRL + clicking on a destination button.
    (Equivalent keyboard shortcuts = cursor arrow keys and CTRL-Space-Bar.)
3 Select further destinations with CTRL + click.

    A selection of destinations has been made.

Note: Alternatively, a range selection may be made by:
  • Selecting the first destination; and then
  • SHIFT-selecting the last one.
  This selects a sequential range of destinations, from first to last.

When all destinations have been selected:

4 Select a **Source**.
    (Equivalent keyboard shortcuts:
        Change to Source grid = CTRL-Cursor arrow keys.
        Select Source = cursor arrow keys and space bar.)
5 Click **Take**.
    (Equivalent keyboard shortcuts = Enter.)

    The selected source is routed to all selected destinations.

One Source to Multiple Destinations - Alternative Method

Alternatively, the source may be selected first:

1 Select a **Source**.
2 Make a selection of Destinations (by CTRL-clicking, or SHIFT-clicking, or a combination).
3 Click **Take**.

Route Multiple Sources to Multiple Destinations

Many to many.

To route multiple sources to multiple destinations:

1 Select a **Destination** by clicking on the destination selection button.
2 Select a second **Destination** by CTRL + clicking on a destination button.

3 Select further destinations with CTRL + click.

> **Note:** Alternatively, a range selection may be made by:
> - Selecting the first Destination; and then
> - SHIFT-selecting the last one.
>
> This selects a range, from first to last.

When all destinations have been selected:

4 Select a **Source** by clicking on the source selection button.
5 Select a second **Source** by CTRL + clicking on a source button.
6 Select further sources with CTRL + click.

> **Note:** Alternatively, a range selection may be made by selecting the first Source and then SHIFT-selecting the last one. This selects a range, from first to last.

> **Note:** Select the *same* number of sources as there are selected destinations. A reminding, pop-up notification message will appear.

7 Click **Take**.

The source is routed to all selected destinations.

Multiple Sources to Multiple Destinations - Alternative Method

Alternatively, the source may be selected first:

1 Select multiple sources.
2 Select multiple destinations.
3 Click **Take**.

Multiple Selection Type and Routing Order

Routing multiple Sources and/or multiple Destinations requires a selection of Sources and of Destinations to be made. This can be done as:

- a selection of multiple items (see Select Multiple Items (CTRL select), on page 515); or as
- a range selection of multiple items (see Select a Range of Items (SHIFT select), on page 515).

The selection order is different in each case and affects routing order.

CTRL-Selection Type Order

When routing multiple sources to multiple destinations and selecting multiple items with CTRL-clicks (that is, not by using a range selection), then the *order* of selection is significant and affects the order in which routing is done.

For example, to route sources 1 to 8 to destinations 8 to 1:

- Select sources 1 to 8 by CTRL-clicking on each source button in the order 1 to 8.
- Select destinations 8 to 1 in that order by CTRL+clicking on each destination button in the order 8 to 1.
- Click **Take**.

SHIFT-Selection (Range) Type Order

When routing multiple sources to multiple destinations and using a selection range (a selection made with 'SHIFT'), then selection order is from the first to the last item of the range, in the order that the items (Source or Destination buttons) are shown. This is the routing order used.

What is Copy-and-Paste Routing?

Copy and paste allow routing information from one destination to be copied onto another destination. The **Copy** and **Paste** controls are in the **Destination Grid** tool bar.
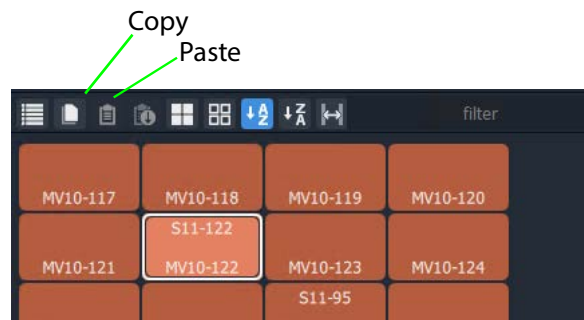
Copy
Paste

Fig. 12-27: Destination Grid Copy and Paste Controls

To Perform Copy-and-Paste Routing

1 Select a **Destination**.

2 Click the **Copy** icon in the tool bar of the **Destination Grid**, or press 'CTRL +C'.

   The copy-selected Destination is shown highlighted with a 'crawling', dashed outline. See Figure 12-28.

'Copy-Selected' Destination

Fig. 12-28: Copy-Selected Destination

Then:

3 Select a different **Destination** (the one to copy to).

4 Click the **Paste** icon, or press 'CTRL + V'.

   The routing of the first destination is applied to the second destination and a route is made automatically. The routing done is 'all-levels'.

The copy-selection is still selected (the dashed outline indicates this), so further pastes can be made. To paste the same to further Destination(s):

5 Select a Destination (or select multiple destinations) and click on the Paste icon (or press 'CTRL-V'.)

6 Repeat for any further Destinations.

Finally:

7 To clear the copy selection, press ESC. (This can be done at any time.)

What is Copy-and-Paste Series Routing?

Paste Series fills a range of **Destinations** with a consecutive series of **Sources**.

To Perform Copy-and-Paste Series Routing

1 Select a **Destination**.

2 Click the **Copy** icon, or press 'CTRL +C'.

The routing information of the selected destination is copied.

3 Select a range of **Destinations**.

4 Click the **Paste Series** icon, or press 'SHIFT + V'.
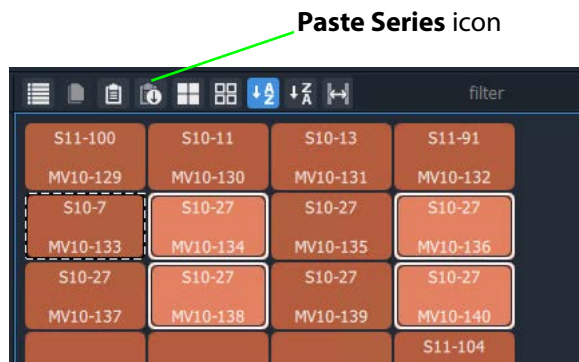
Paste Series icon

Fig. 12-29: Paste Series Icon

The routing of the first, 'copy-selected' destination is applied to the first destination in the selected range.
The *next sequential source* is routed to the next destination in the range
and so on.
Routing is done automatically (no Take required).

Paste Series Example

1 Select destination **1** and click **Copy**.

2 Select destination range **11** up to **19**. (Select first and Shift-select last.)

3 Click **Paste Series**.

The following routing is done:
Source **1** to destination **11**, source **2** to **12**, **3** to **13**, **4** to **14**, ... , **9** to **19**.

GV Orbit Version 2.3.0
User Guide

Routing Control - Bulk Routing Panel
What is Quick 1-to-1 Routing?

> **Note:** The rules of selection type and order apply. See Multiple Selection Type and Routing Order, on page 532.

What is Quick 1-to-1 Routing?

Quick 1-to-1 routing can be used to make 1-to-1 routes quickly. This can be useful at system set up. For example, for the first 100 sources routed to the first 100 destinations.

To Perform Quick 1-to-1 Routing

To make a set of quick 1-to-1 routes:

1 Select destination **1**, select Source **1**, and click **Take**.

This routes the first destination.

2 Click **Copy**.

Destination **1**'s routing information is copied.

3 Select destination range **1** to **100**. (Select first and Shift-select last.)

4 Click **Paste Series**.

The following routing is done:
Source **1** to **1**, source **2** to **2**, **3** to **3**, ... , **99** to **99**, and **100** to **100**.

This has quickly copied Sources to all selected Destinations.

Destination Protect

What is Destination Protect?

When a destination is protected by a user, users of other types of routing control panel cannot route to it.

This means that users of Bulk Routing Panels in GV Orbit Clients *would* be able to route to a destination protected by another such Bulk Routing Panel. But hardware panel users *would not* be able to route to a destination protected by a Bulk Routing Panel. (And vice versa.)

To Protect a Destination

1 Select a Destination.

2 Click the **Protect** button in the Router Control pane.

The destination is protected.

Protect button

Protected
Destination,
selected

A Protected
Destination,
not selected

Selected
Destination's levels
are also shown as
protected
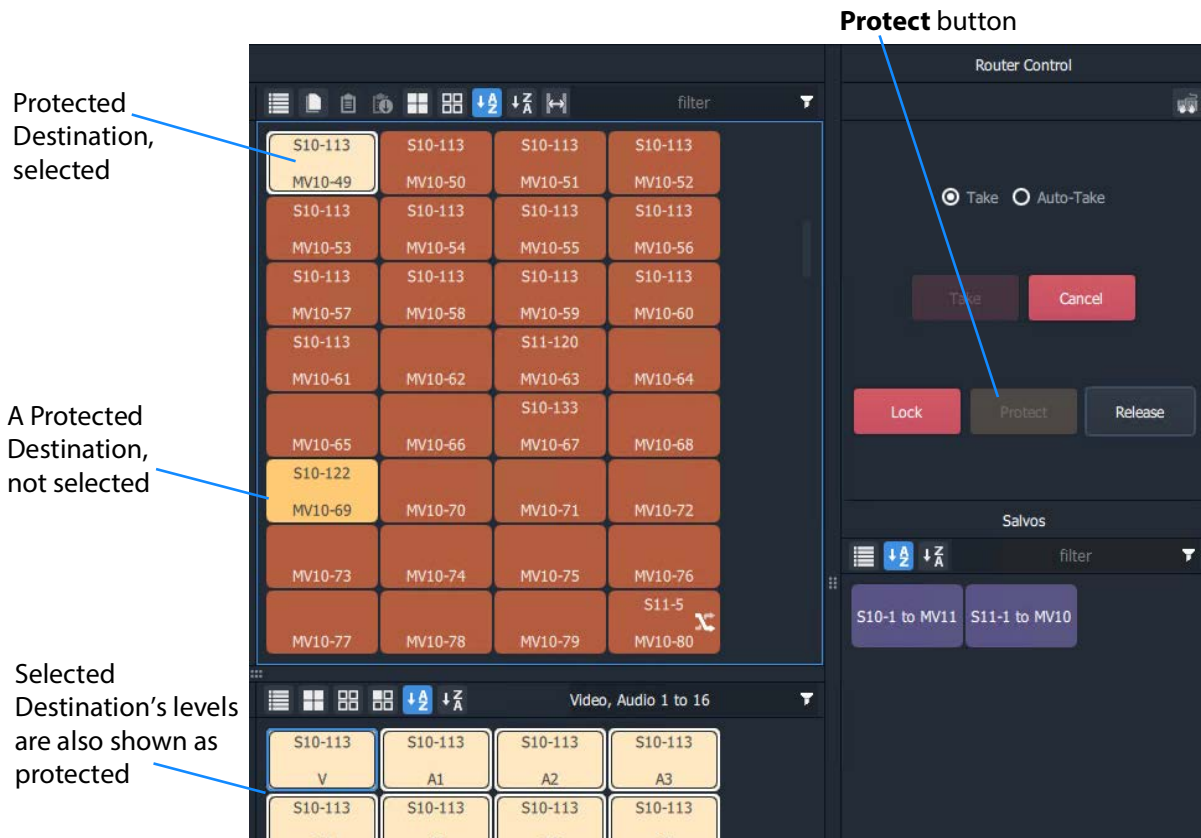
Fig. 12-30: Protected Destination

To Un-Protect a Destination

1 Select the protected destination.

2 Click the **Release** button in the Router Control pane.

The destination protection is removed from the selected destination.

Destination Lock

What is Destination Lock?

When a destination is locked, it cannot be routed to by any user. When a destination is locked by another user, click on a destination to see which user locked it.

To Lock a Destination

1 Select a destination.

2 Click **Lock** in the Router Control pane.

The destination is locked.

Lock button

Selected
Destination, Locked

Locked
Destination's levels
are also shown as
locked
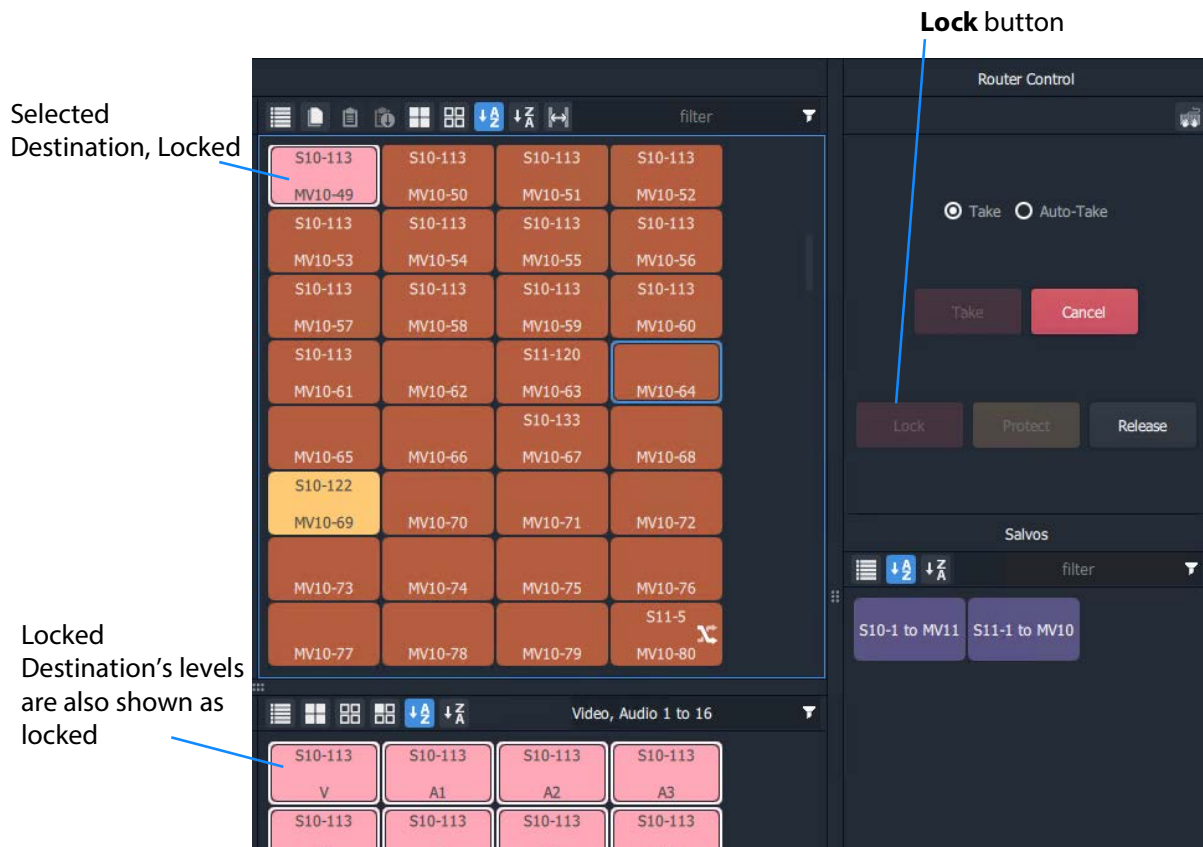
Fig. 12-31: Locked Destination

To Unlock a Destination

1 Select the locked destination.

2 Click the **Release** button in the Router Control pane.

The destination lock is removed from the selected destination.

Breakaway and Levels

What is a Breakaway?

A 'breakaway' occurs when all levels of a destinations do not come from the same source. This is also referred to as the destination being 'unmarried'.

Breakaway example shown:
Two audio channels of Destination B (A1 and A2) are obtained from a different source (Source C).
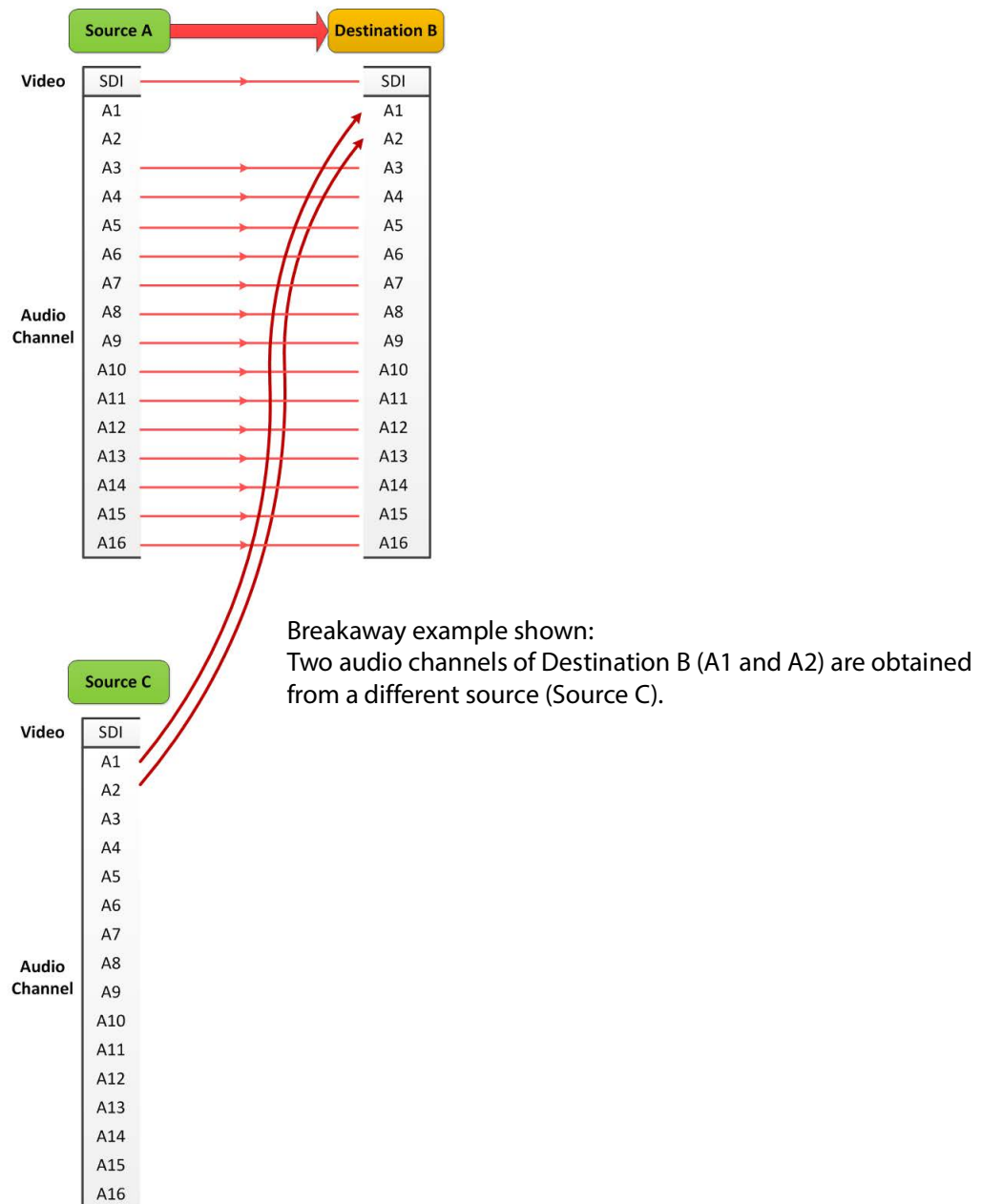
Fig. 12-32: Breakaway

Destinations which are 'unmarried' are indicated with a breakaway icon (Figure 12-33c) on the destination button.

Perform a Breakaway

To perform a breakaway:

1   Select a **Destination**.

2   Select the **Destination Levels** to make a route to (for example, audio channels A1 and A2). (See Figure 12-33a.)

3   Select a new **Source**.

4   Click **Take**.

The corresponding levels of the selected source are routed to the selected destination levels and a breakaway is formed. Figure 12-33b shows the breakaway result.

a) Before TAKE:

- Destination **MV10-9** is currently all routed from source **S10-9** (as shown in the **Destination Levels Grid**).
- Destinations levels **A1** and **A2** are selected.
- **S10-18** is the currently-selected source.

b) After TAKE:

- Destination **MV10-9** is routed partly from source **S10-9** and partly from **S10-18** (levels A1 and A2).
- This breakaway situation is indicated with a **Breakaway** icon on the destination button.
- The source of each destination level is shown in the **Destination Levels Grid**.

c) Breakaway icon on button

Fig. 12-33: Breakaway Example: a) Before TAKE;   b) After TAKE;   c) Breakaway Icon on Button.

Breakaway - Alternative Method

Also, to perform a breakaway, the source may be selected first:

1 Select a **Source**.

2 Select a **Destination**.

3 Select the **Destination Levels** to route.

4 Click **Take**.

> **Note:**
> A 'breakaway' occurs when not all of a destination's levels are selected for routing.
> This can also happen if a source with *fewer* levels than the selected destination is routed, this will result in a 'breakaway' (without selecting destination levels).

Quick Breakaway with Dial Source-Level

A quick single-level breakaway method uses the Dial Source-Level Dialog.

To perform a quick video-level breakaway:

1 Select a **Destination**.

2 Select a **Destination Level**. (See Figure 12-34.)
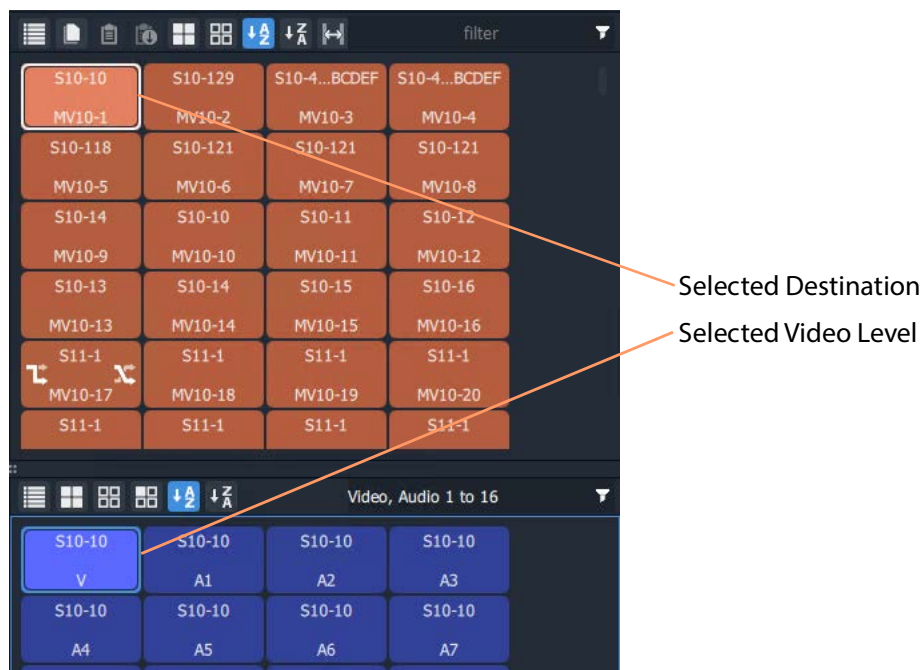
Fig. 12-34: Selected A Destination and a Level

3 Type a single alpha-numeric character.

A default **Dial Source-Level** dialog box appears showing the currently-routed Source and Level.

4 Begin to type a (new) Source name at the keyboard.
   (For example, type "s" or "S" if source names begin with "S" - "S10-10", "S10-11", etc.)

   A **Dial Source-Level** dialog box appears. See Figure 12-35.
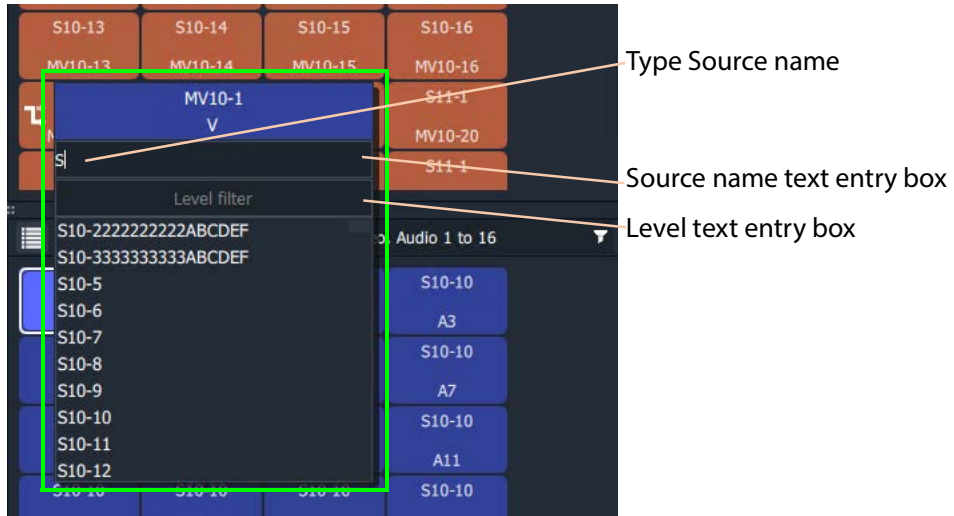
Fig. 12-35: Dial Source-Level Dialog

5 Type the new Source name into the dialog box. But *do not press* the Enter key yet.

6 When the Source name is typed, press the Tab key.

   This toggles focus from 'Sources' to 'Levels' and to the lower dialog text entry box.
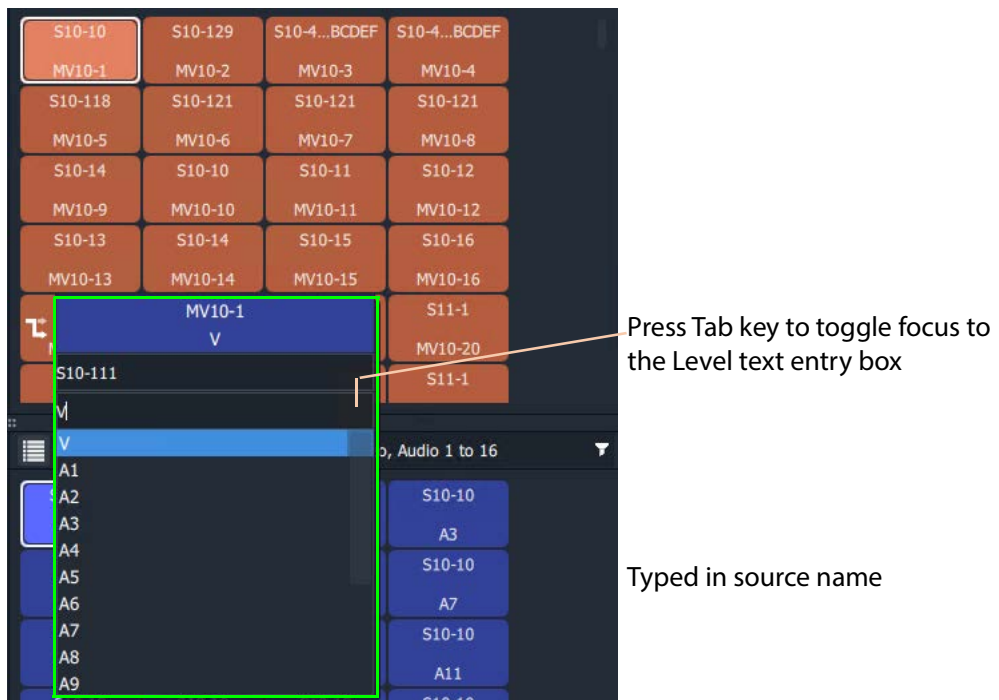
Fig. 12-36: Source and Level are Dialed-up

7 Type in the Level name, for example "V" and press the Enter key when done.
   Or select a level from the filtered list.

The route is made, connecting the dialed-up Source Level to the selected Destination Level and forming a breakaway. See Figure 12-37.
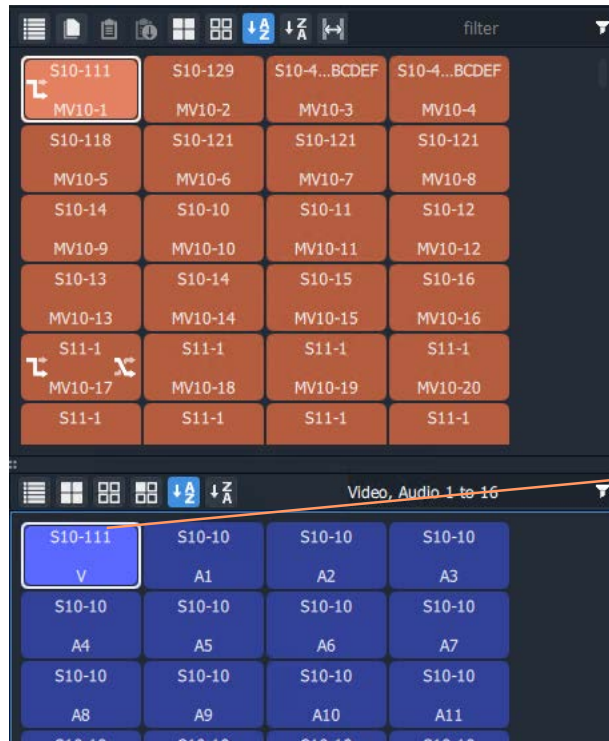
Video Level sourced from a different source. (Breakaway)

(Level sources:

'Video' - now from S10-111,

'other' - unchanged, S10-10.)

Fig. 12-37: Resulting Video Level Breakaway

Use this method to set up any breakaways (or shuffles, see Quick One-Level Shuffle with Dial Source-Level, on page 546) required.

Shuffle and Levels

What is a Shuffle?

A destination is said to be 'shuffled' when one of its levels is routed from another level *of the same source*. For example, destination audio channel 5 from source audio channel 4. When this occurs, the Bulk Routing Panel indicates a 'shuffled' destination with a Shuffle icon on the destination button.

Shuffle example shown:
Audio channels of Destination B (A1 and A2) are obtained from a source (Source A) but not all levels are mapped "1 to 1".

A source is routed to a destination and audio channels are 'shuffled' around; they are not routed '1-to-1'.
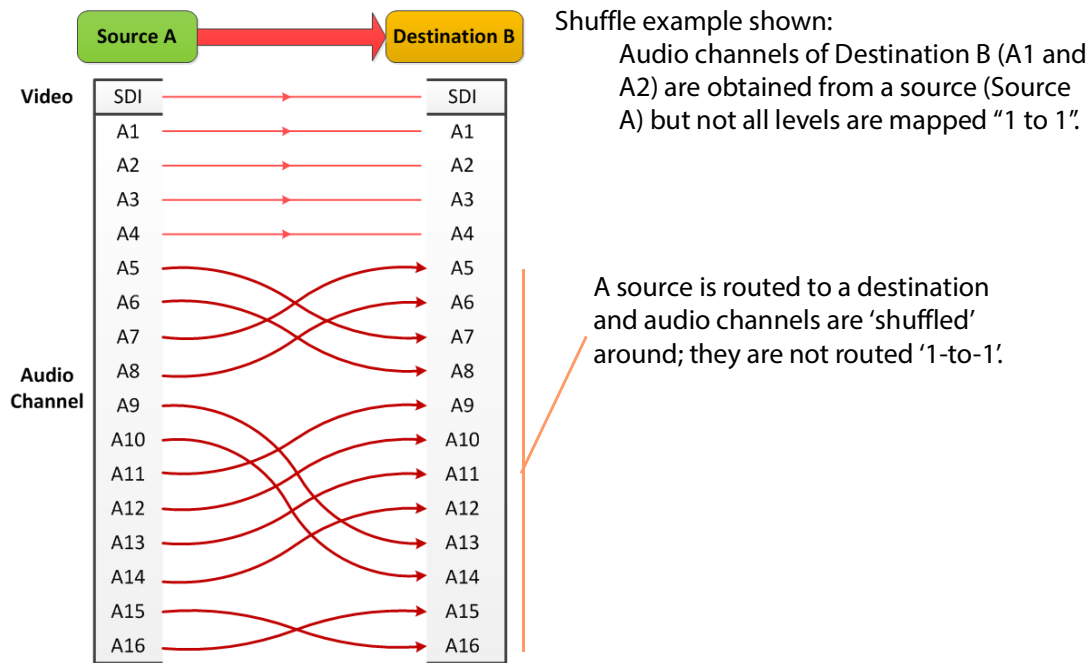
Fig. 12-38: Shuffles

To Perform a Shuffle

1 Select a **Destination**.

2 Select the **Destination Levels**.
For example, in Figure 12-40a, levels A1, A2, A3 and A4 are selected *in that order*.

3 Select a **Source**.

4 Now select the **Source Levels** in the *order* in which they shall apply to the destination Levels.
For example, in Figure 12-40a, levels A4, A3, A2 and A1 are selected *in that order*.

> **Note:** Selecting just one source level will route this to *all* selected destination levels.
> Otherwise select the same number of source levels as destination levels. A notification prompt appears at the bottom of the GV Orbit Client window, reminding you to select source levels (see Figure 12-39).
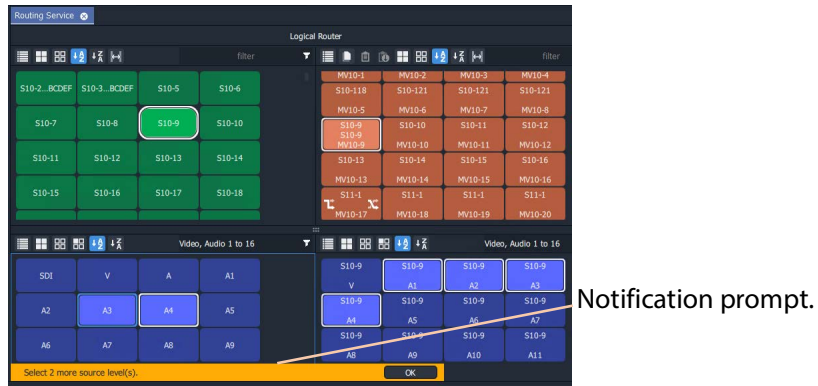
Fig. 12-39: Select Levels Notification

5 Click **Take**.

The selected source levels are routed to the selected destination levels and a shuffle is formed. Figure 12-40 shows a shuffle example reversing the order of the four audio channels (A1 to A4).
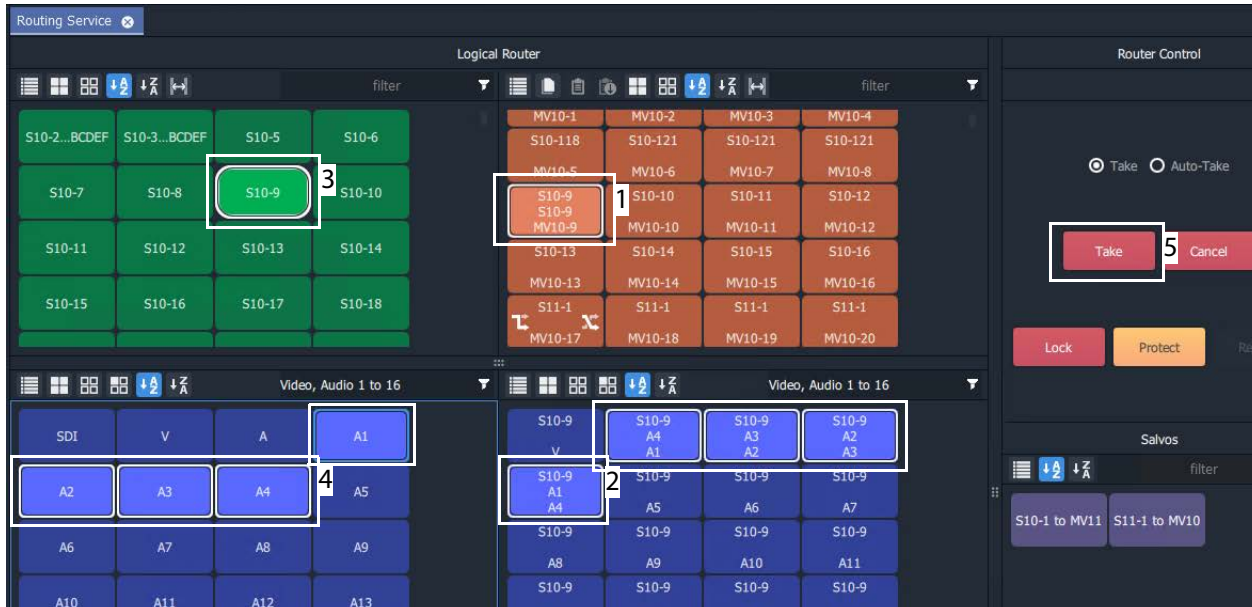
a) Before TAKE:

- Destination **MV10-9** is currently all routed from source **S10-9**
  (as shown in the **Destination Levels Grid**).
- Destinations levels **A1**, **A2**, **A3** and **A4** are selected.
- Source **S10-9** is selected.
- **Source Levels A4**, **A3**, **A2** and **A1** have been selected
  (in that reversed order).

b) After TAKE:

- Destination **MV10-9** is still all routed from source **S10-9**.
- This 'shuffled' situation is indicated with a **Shuffle** icon on the destination button.
- The source of each destination level is shown in the **Destination Levels Grid**.
  In particular, the destination's A1, A2, A3 and A4 are now routed from A4, A3, A2, and A1 respectively.
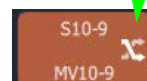
c) Shuffle icon on button

Fig. 12-40: Shuffle Example: a) Before TAKE;   b) After TAKE;   c) Shuffle Icon on Dest. Button.

Quick One-Level Shuffle with Dial Source-Level

To shuffle (route) one level using the Dial Source-Level Dialog:

1 Select a **Destination**.

2 Select a **Destination Level**.

A Destination and one Level are now selected.

3 Type a single alpha-numeric character.

A default **Dial Source-Level** dialog appears and showing a filtered list of source names. The currently-routed Source and Level are shown.

Do *not* click; do *not* press Enter at this time.

Note: The currently-routed Source name is shown in the default dialog.

4 Press the '**Tab**' key.

Focus then moves (toggles) from Source to Levels in the dialog.
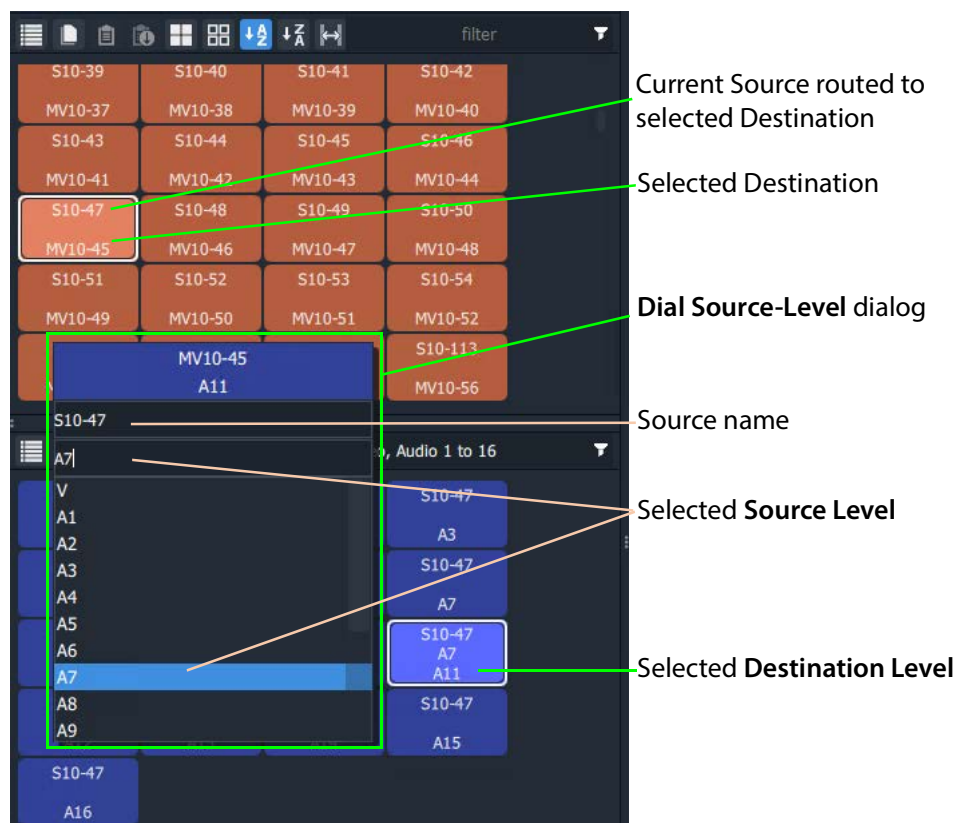
Fig. 12-41: Dial Source-Level Dialog

5 Type in a new Level name and press Enter, or
select a new Level item in the filtered list, click to select.

A route is performed, connecting the selected Source Level to the selected Destination Level. A shuffle is made, see Figure 12-42.

Shuffle now made, audio
level A11 at destination
comes from audio level A7.
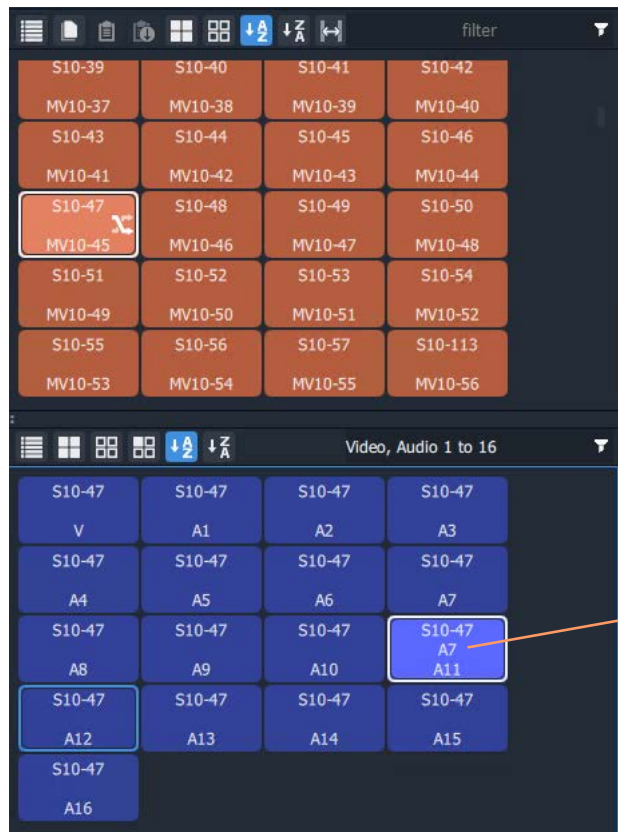
Fig. 12-42: Shuffle Routed

Note: Using this method, one Source Level can be routed to one or more
Destination Levels.

Use this method to set up any shuffles (or breakaways, see Quick Breakaway with Dial
Source-Level, on page 540) required.

Filtering

What is Bulk Routing Panel Filtering?

Most grids/panes of the Bulk Routing Panel have a filter control on their tool bar. The filters
control what items are shown in the grid/pane. Filters can be applied to the
Source/Destination grids, the Level Selection grids and the Salvos pane. Custom filters can
be created and applied. For destinations, filtering can also be by (routed) source.
By default, level filtering is set up to show the usual video and audio levels.

> **Note:** **Filtered Lists:**
> When a filter is applied, a filtered (reduced) set of items is shown in a grid/pane.
> Subsequent actions, such as 'select all items' or 'selecting a range', then all operate on the *filtered* items shown and not on the full list of items.

What are the Filter Controls in a Bulk Routing Panel?

Each grid/pane contains a similar filter text box and icon. These access a filter items list (also accessed by typing Ctrl-F when in a grid/pane), and filter options menu respectively.

Filter search text box   Click the Filter icon to show the Filter options menu.

a) Filter Controls - Text Entry Box

b) Filter Drop-Down Menu

Destination Grid's Filter options menu   Filter items list

c) Filter Drop-Down Menu - for the Destination Selection

d) Levels Grid Filter Default

> **Note:** The default 'Levels' filter list shows one video level and 16 audio channels.
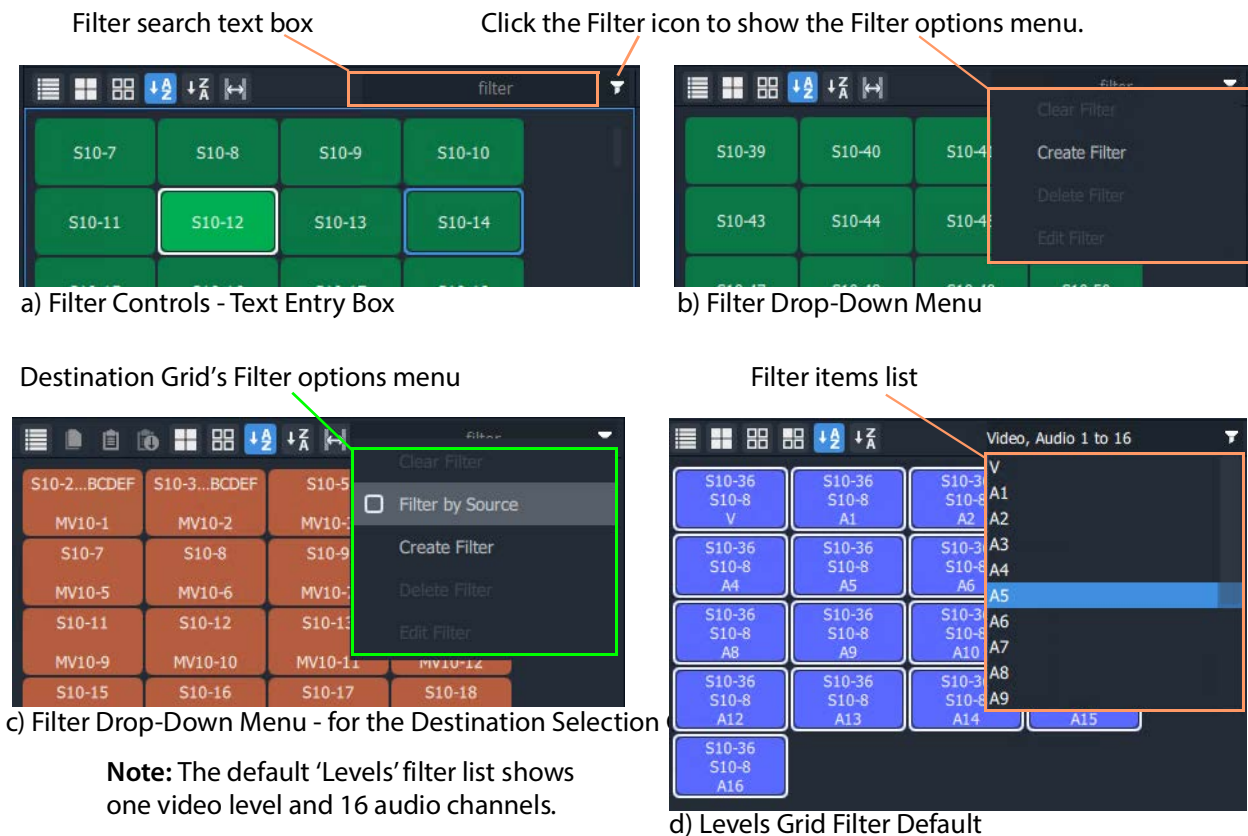
Fig. 12-43: Filter Controls:
a) Filter Text Entry Box;   b) Filter Drop-Down Options Menu;
c) Drop-Down Menu for Destination Grid;   d) Level Grid Filter Items List (Default).

Filtering Actions

Simple Filtering by Name

To simply filter items in a grid or pane by name:

1   Select the **Filter** text entry box.

2   Enter a filter search term into the **Filter** text box.
    For example, type 'S11' to only show source names starting with 'S11'.

As the filter search term is typed, the number of displayed items in the Grid/Pane is reduced (filtered). The reduced number of items gives a *preview* of the filter's action.

3 To abort the filter set up, press the ESC key.

4 When the required filtering is reached, press the Return/Enter key to *apply* the filter.

The filter has been applied to the grid. Then only filtered items are shown in the grid/pane, with names which contain the search term.

Filter search term

Fig. 12-44: Example of Simple Filtering Applied to a Grid/Pane (Search Term = "S11")

Clear Applied Filtering in a Grid/Pane

To clear filtering that has been applied in a grid or pane:

1 Either:
    - click on the Filter icon (▼) in the grid/pane's tool bar; or
    - in the Filter text entry box, press the Tab key.

And then select 'Clear Filter'.

The filtering is removed and all grid/pane items are shown.
The filter search term is also cleared and the Filter items drop-down list is shown.

2 At this point, a new search term may be entered.
Or the filter clearing action can be aborted by pressing the ESC key.

If no further filter set up is required:

3 Press the Enter/Return key to remove the Filtering and the Filter items drop-down list.

Set Level Filtering in a Grid/Pane

To set any applied Level filtering back to its 'default':

1 Either:
    - click on the Filter icon (▼) in the Level grid/pane's tool bar; or
    - in the Filter text entry box, press the Tab key,

And select 'Video, Audio 1 to 16'.

Select 'Video, Audio 1 to 16'
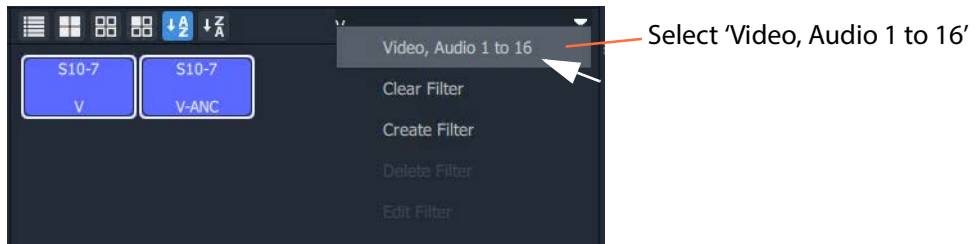
Fig. 12-45: Set Level Filtering to Default

Any filtering is replaced by the default 'Video, Audio 1 to 16' filtering and the filter search term reflects this.

Fig. 12-46: Level Filtering Default

2 Press Enter to apply this change (or press ESC to cancel this filter change).

Fig. 12-47: Level Filtering Default Applied

Dynamic Filtering By Name

Filter search term

List of names containing the search term (scrollable).

a) Enter Search Term and Select

b) Selected Item(s) Displayed
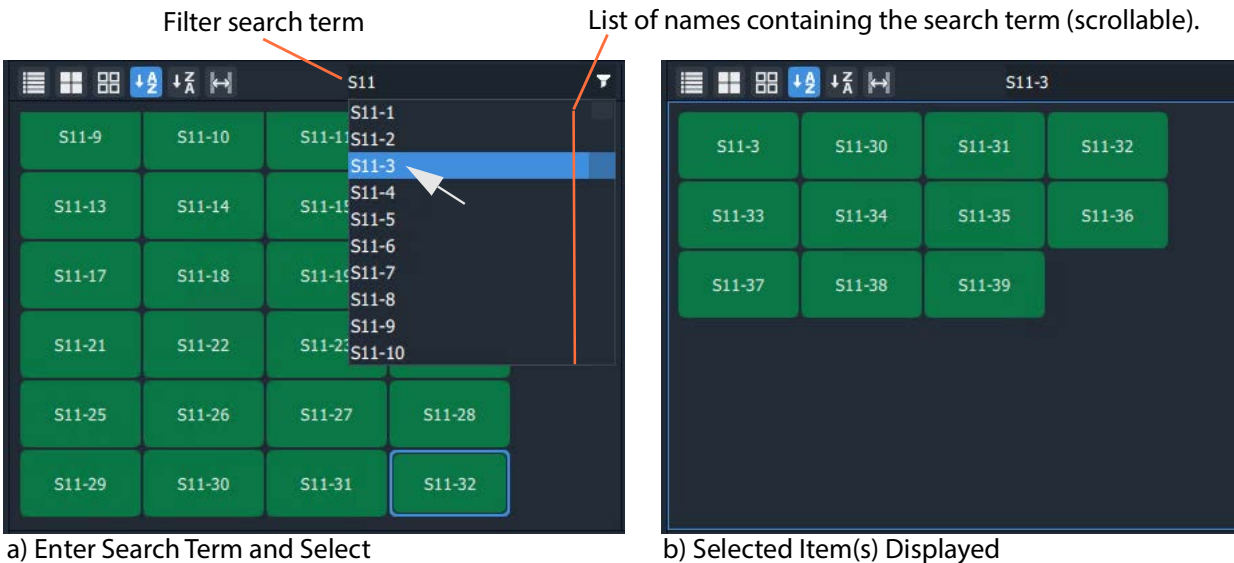
Fig. 12-48: Dynamic Filtering (Source Names Example):
a) Enter Search Term and Select.
b) Selected Item Displayed

To dynamically filter items by their name:

1 Enter the filter search term into the **Filter** text box.

GV Orbit looks for names which contain the filter search term.
A drop-down, scrollable filtered list of names is presented.
The list dynamically changes with the search term.

2 Find a name in the list by scrolling through the items.
(Use a mouse wheel, the scroll-bars, or up/down arrow keys to scroll through the list.)

3 Select an item.
(Click on it, or press the Return/Enter key when item is highlighted.)

The result of the selected filter item is shown in the grid.

Filtering Destinations by Source

Filtering of items by their names has been described so far. The filtering is extended for Destinations to enable Destination names to be filtered by the names of the *sources* that are routed to them. The filter drop-down menu of the Destination Grid contains an extra item, for this, 'Filter by Source'.

1 In the Destination Grid, click on the Filter icon (🔽) and select **Filter by Source**.
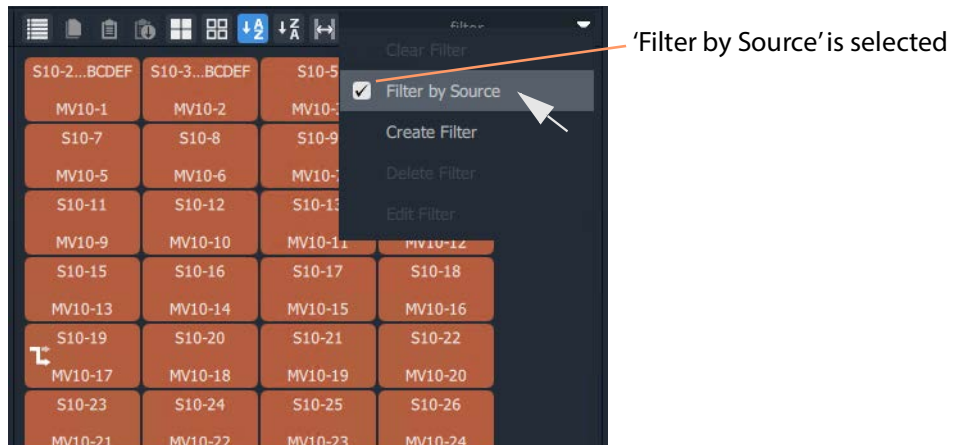
Fig. 12-49: Filtering of Destinations by Source is Enabled

2 Enter a search term in the Filter text box.
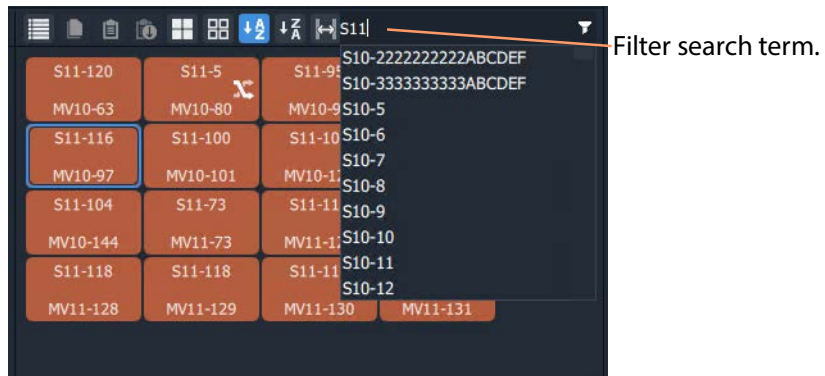
Fig. 12-50: Filter Destinations by Source

3 Press the Enter/Return key to apply the filtering.

With the **Filter by Source** option selected, the **Destination Grid** will show only destinations which have a filter-matching source routed to them.
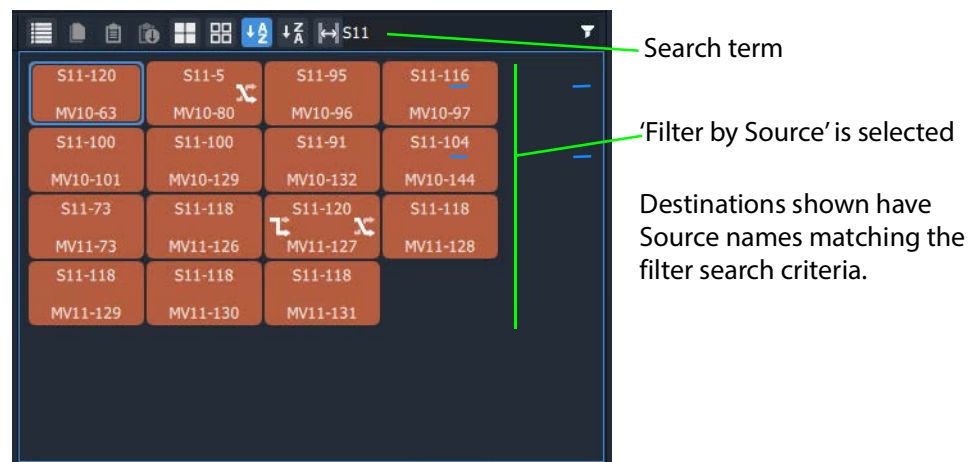
Fig. 12-51: Example Destination 'Filter by Source'

Preset Level Filters

The **Source Level** and **Destination Level** grids offer some preset filters to filter audio/video levels. For example, 'Video, Audio 1 to 16' which is for video and 16 audio channels. This preset filter is listed in the drop-down Filter items list, along with the names of the items (levels).

Custom Filters

What is a Custom Filter in a Bulk Routing Panel?

GV Orbit allows more complex and custom filters to be created. This can be done for any of the filterable grids/panes.

A custom filter can be:

- Created, given a name and saved.
- Edited or deleted.
- Re-named.

A custom filter is applied by entering the start of the custom filter name into the filter text box. The custom filter name will appear in the Filter items drop-down list for selection. Select the custom filter name to apply it.

Custom filters are stored in the GV Orbit Routing service for the currently-logged-in GV Orbit user. In this way, the filter will be available to the same user on other machines.

> **Note:** Custom filters will not be seen by other users on other machines.

What is a Custom Filter Rule?

Filter expressions can be defined and combined together to form complex filter conditions, filter rules. The filter rule of a custom filter is designed in a Filter dialog.

Expressions can be combined to make rules by ANDing and ORing them together:

- **AND** - filter condition is met if *both* filter expressions are satisfied.
- **OR** - filter condition is met if *either* filter expression is satisfied.

Custom Filtering

Creating a Custom Filter

In a grid/pane:

1 Click on the **Filter** tool bar icon and select 'Create Filter'.

An empty **Filter** dialog is shown. See Figure 12-52.
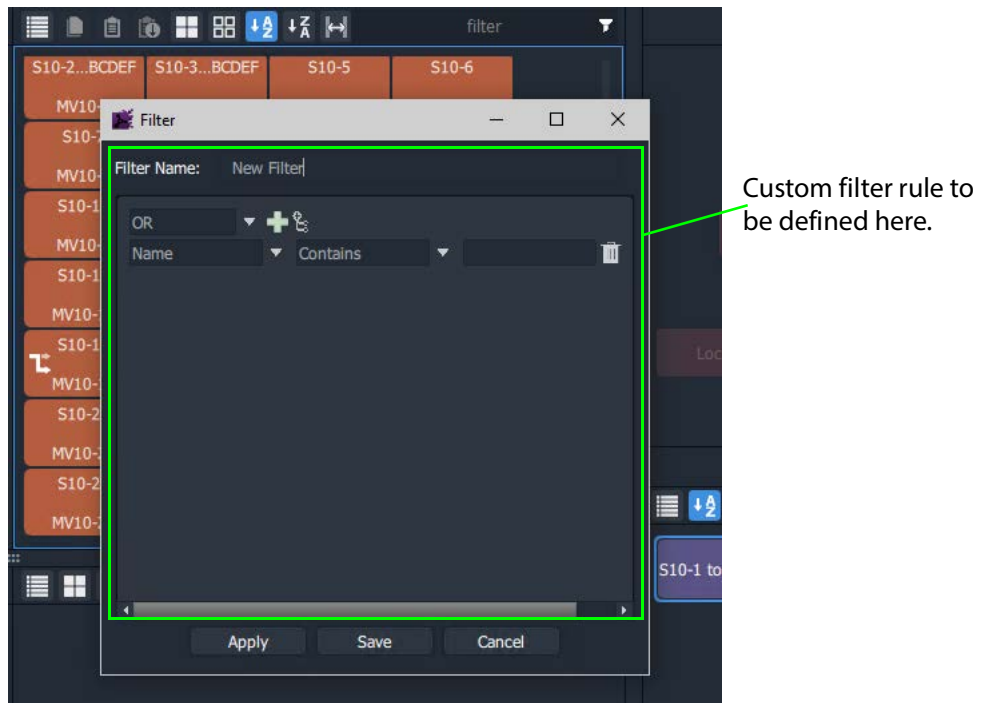
Fig. 12-52: Filter Dialog

2 Enter a Filter name for the filter.
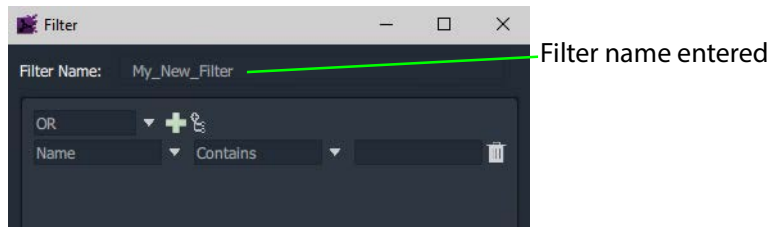
Fig. 12-53: Saving New Custom Filter

3 Click **Save**.

A new **Custom Filter** has been created.

Selecting a Custom Filter

A **Custom Filter** is listed in the drop-down Filter items list:

1 In the Filter text box, start to type the name of a **Custom Filter**.

The Filter items drop-down list contains the **Custom Filter** name.
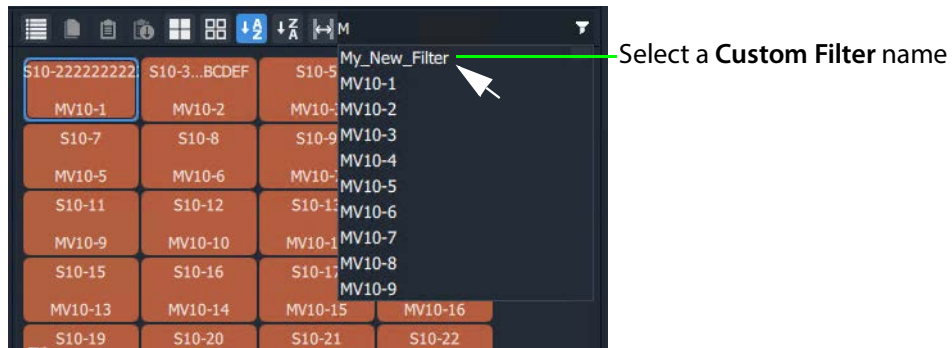
Fig. 12-54: Custom Filter in Filter Items List

Constructing the Rules for a Custom Filter

See Filter Dialog and Custom Filter Rules, on page 556, for adding filter rules with the dialog to construct the filter.

To Edit an Existing Custom Filter

1 Click on the **Filter** tool bar icon and select **Edit Filter**.
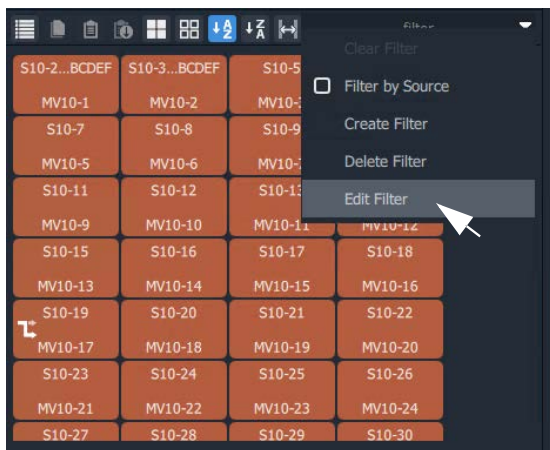
a) Select **Edit Filter** name
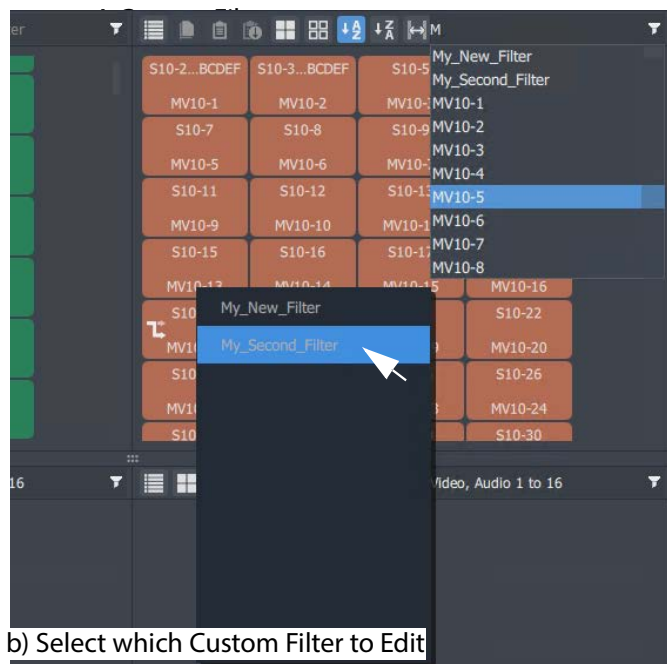
b) Select which Custom Filter to Edit

Fig. 12-55: Select Custom Filter to Edit

2 Select the filter to edit from the list shown. (See Figure 12-55b.)

The **Filter** dialog is shown for the selected custom filter.

To Delete a Custom Filter

1 Click on the **Filter** tool bar icon and select **Delete Filter**.
2 Select the filter to delete from the list shown.

The filter is deleted when the selection is made.

Filter Dialog and Custom Filter Rules

The filter rule of a custom filter is designed in the **Filter** dialog (see Figure 12-56). A rule is formed from the logical combination of filter expressions. Expressions can be ANDed or ORed together and complex AND/OR configurations can be defined for a custom filter:

- **AND** - filter condition is met if *both* filter expressions are satisfied.
- **OR** - filter condition is met if *either* filter expression is satisfied.

A worked example is given (Example Custom Filter, on page 557) which shows how to construct Filter rules with the Filter dialog.
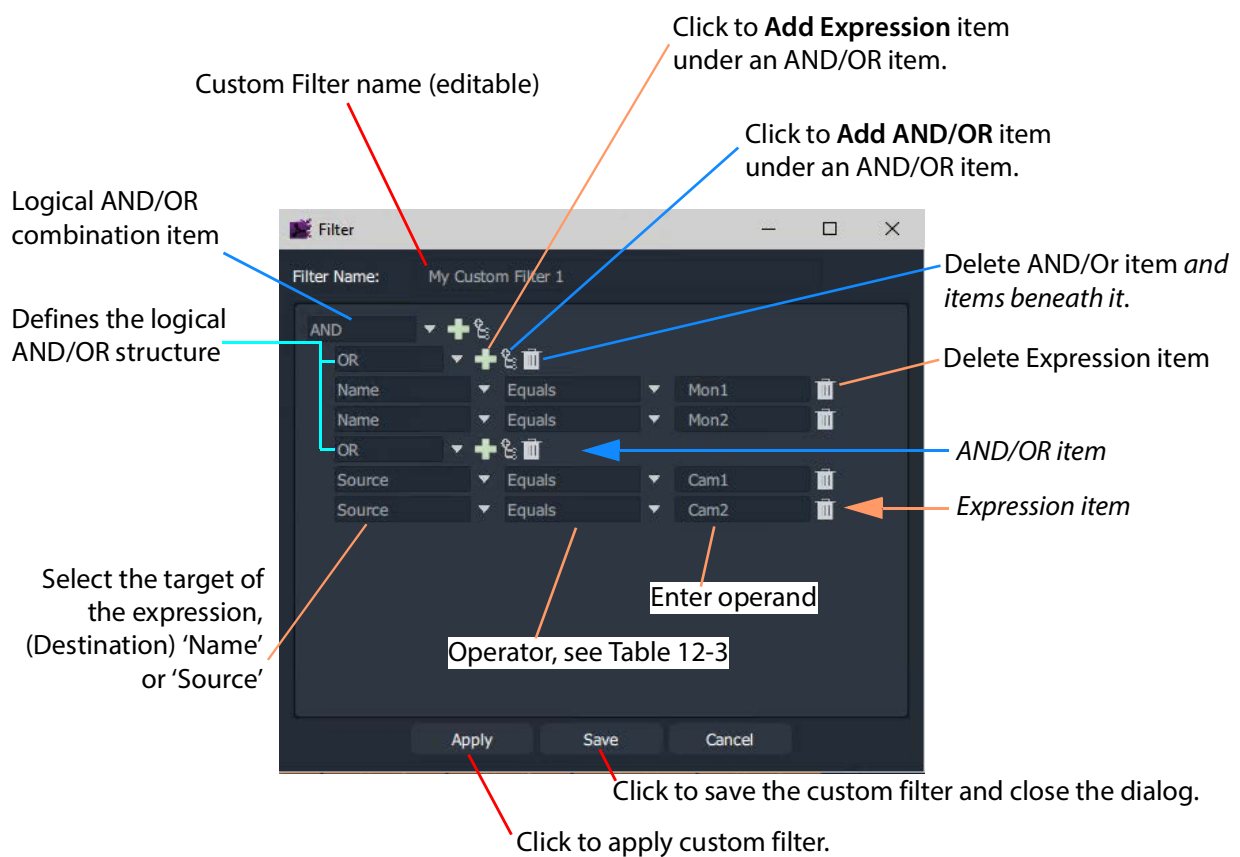
Fig. 12-56: Filter Dialog - Custom Filter Example

Logical AND / OR Combining

The **Custom Filter** being designed must be expressible in the form of a logical expression so that it can be captured in the **Filter** dialog.

A rule might be designed to filter:

- destination names that both start with a 'C' and contain a '6'.
- destination names that either end with a '4' or end with a '5'.
- destinations whose source names start with 'Cam'.

- destinations whose names end with a 'X' and whose source names are 'Cam12'.

Filter Expressions

An expression tests a Destination Name or Source Name with an operator and an operand.

Filter Expression Operators

The operators include:

Table 12-3: Operators - Name/Source and Operand

Operation	True when...
Equals	Name matches.
Not Equals	No match.
StartsWith	Starts with the operand.
EndsWith	Ends with the operand.
Contains	Contains the operand.
NotContains	Does not contain the operand.
Greater Than	Numerical part of name is greater than the operand.
Less Than	Numerical part of name is less than the operand.
GreaterThanEqual	Numerical part of name is greater than or equal to the operand.
LessThanEqual	Numerical part of name is less than or equal to the operand.

Example Custom Filter

This section explains What the Filter Should Do and Defining the Custom Filter Example via the **Filter** dialog.

What the Filter Should Do

"Display two destinations only if they have certain sources currently routed to them."

(Destinations **Mon1** and **Mon2** and sources **Cam1** and **Cam2** are used in this example.)

The filter for this example may be written:

*"Show a destination if the destination name is **Mon1** or **Mon2**, and its routed source name is **Cam1** or **Cam2**."*

This may be written out to show its logical expression structure.
Show a destination if the following is true:

Destination name is **Mon1**

OR

Destination name is **Mon2**

AND

its routed Source name is **Cam1**

OR

its routed Source name is **Cam2**
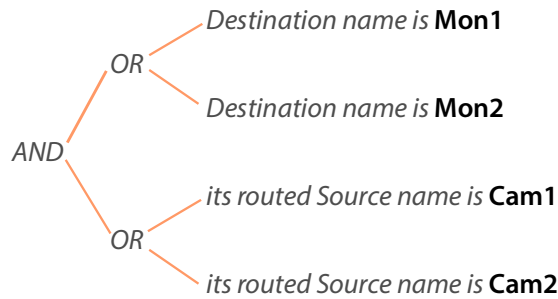
Defining the Custom Filter Example

This example **Custom Filter** filter may be entered into the **Filter** dialog as follows:

1 Click on the Destination Grid's Filter tool bar icon and select **Create Filter**.

   An empty **Filter** dialog is shown. See .

2 Enter a **Filter Name** for the filter.

3 Select AND as the first (top-level) logical combination item with the drop-down menu button. See Figure 12-57.
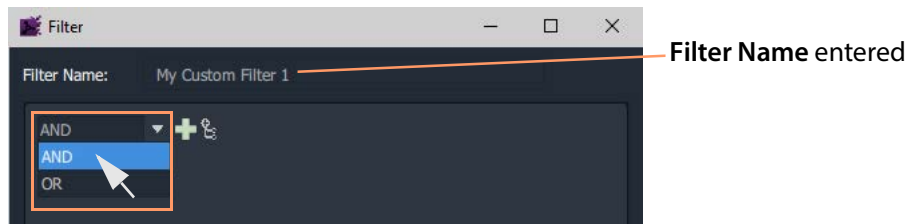
Fig. 12-57: Select AND

4 Click the **Add AND/OR** icon.

   An indented AND/OR item appears.
   An expression item also appears below the OR. See Figure 12-58.

5 Select OR as the new, indented logical combination item.
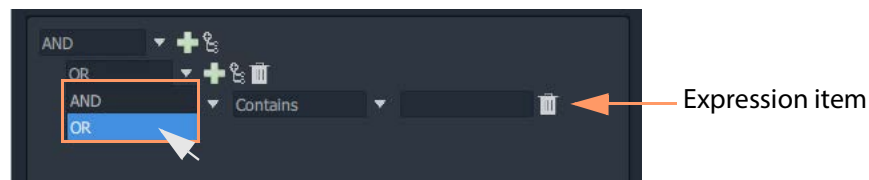
Fig. 12-58: Select OR

6 Click the new **Add Expression** icon.

   A second expression item appears under the OR. See Figure 12-59.

Second expression item
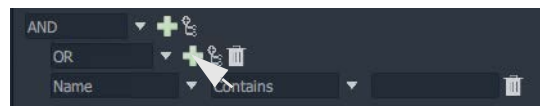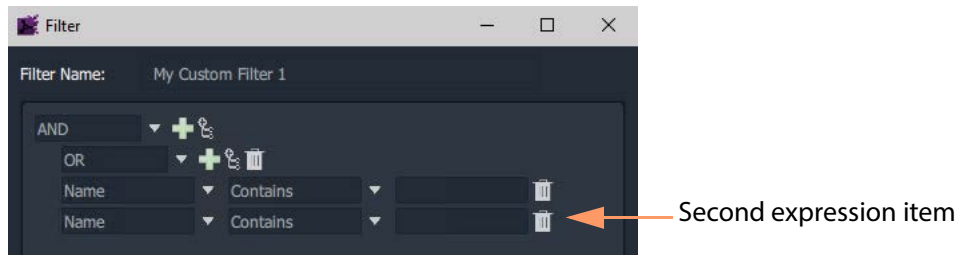
Fig. 12-59: Added a Second Expression Item

7   Click the first **Add AND/OR** icon again.

This add a second OR logical combination item indented under the AND. See Figure 12-60.
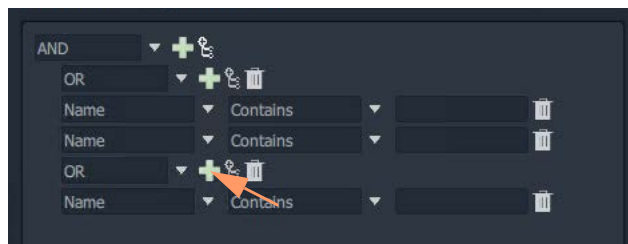
Fig. 12-60: Second OR Logical Combination Item Added

8   Add a second expression item under the new OR item. See Figure 12-61.

Operator
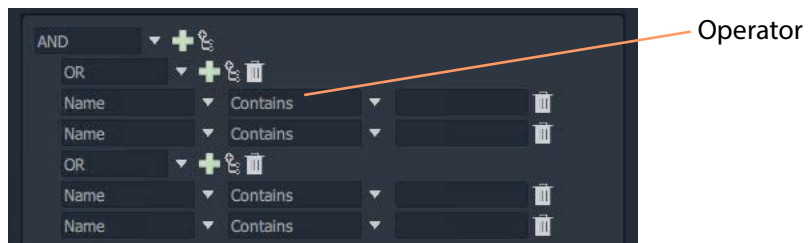
Fig. 12-61: Second Expression Item Added

The basic 'AND-OR-OR' logical combination structure for the example has now been entered for the Filter rule.

The next step completes the expression item and saves the filter:

9   Set up the expressions as shown in Figure 12-62.
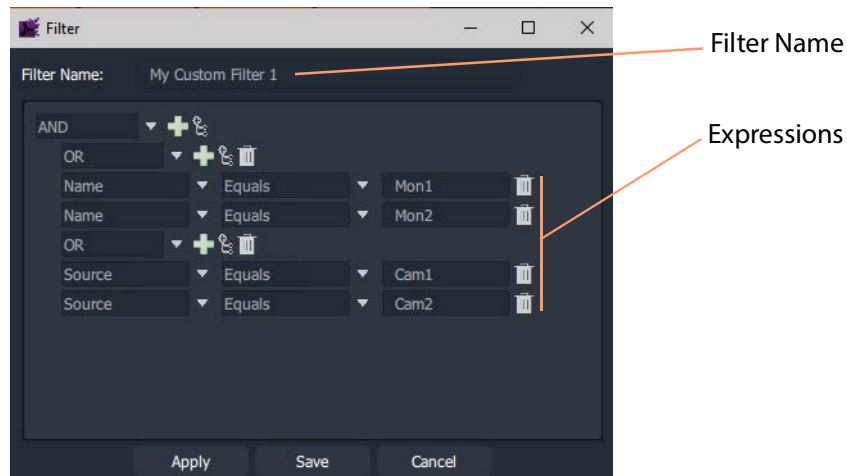
Fig. 12-62: Completed Custom Filter

10 Click **Save** in the **Filter** dialog to save the custom filter and close the dialog.

Custom filter rules have been entered; the **Custom Filter** has been created, ready to use. See Using a Custom Filter.

Using a Custom Filter

To use the custom filter 'My Custom Filter 1':

1 Start entering the custom filter name into the **Filter** text box.
('My' in this example.) A list of possible matching custom filters is presented.
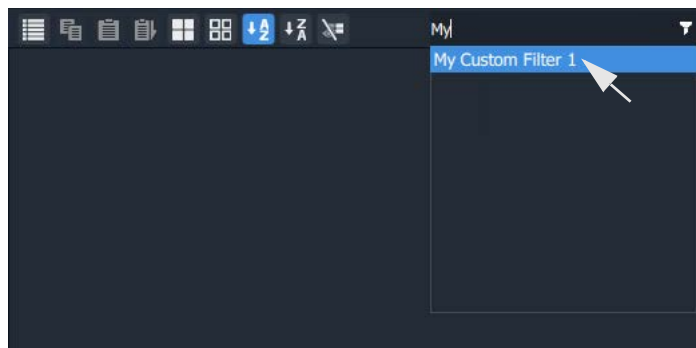
Fig. 12-63: Select Custom Filter

2 Select the 'My Custom Filter 1' item.

The filter is applied.
In this example, only destinations 'Mon1' or 'Mon2' are shown if they have sources 'Cam1' or 'Cam2' routed to them. See Figure 12-64.
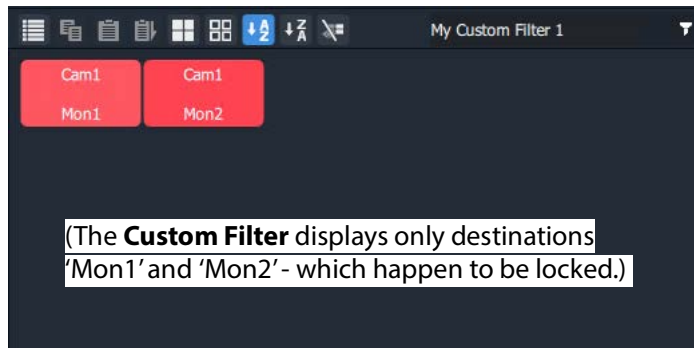
Fig. 12-64: Applied Custom Filter

To clear the filtering:

3　Click on the **Filter** tool bar icon and select **Clear Filter**.

Salvos

What is a Salvo?

Salvos are created and defined in Grass Valley's GV Orbit product and are available to the Bulk Routing Panel through the GV Orbit **Routing** service that the Bulk Routing Panel is connected to.

Salvos are shown in the **Salvos** pane of the Bulk Routing Panel. The list of Salvo names can be filtered using the tool bar controls. Filters can be set up in a similar way to the other grids/panes of the Bulk Routing Panel.
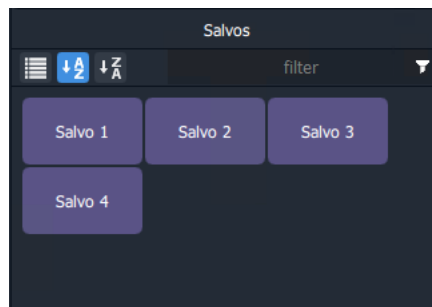
Fig. 12-65: Salvos Pane with Salvo Buttons

Executing Salvos

To Execute a Salvo

Either:

• double-click on the Salvo button;

   or,

• select the Salvo button (single-click) and click **Take**.

To Execute multiple Salvos

1 Select the first **Salvo**.

2 Select other **Salvos** with CTRL-click.

3 Press **Take**.

Hide Sources

What is the Hide Sources Mode?

In **Hide Sources** mode, the **Source Selection** and **Source Level Selection** grids may be hidden from view. Thus more destinations are displayed.

The **Hide Sources** icon in the Destination Grid's tool bar enables this mode.
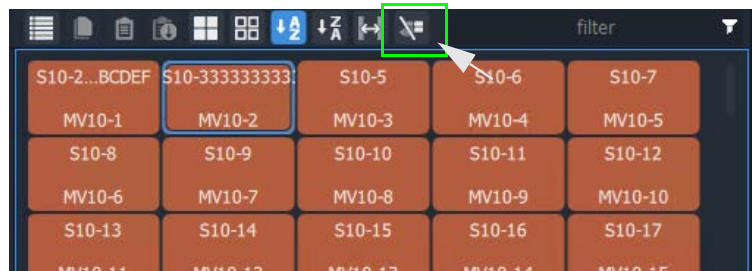
Fig. 12-66: Hide Sources Icon in Destination Grid Tool Bar

Enter Hide Sources Mode

Toggle **Hide Sources** on/off by:

• Click the **Hide Sources** icon in the **Destination Selection** grid tool bar.

The Bulk Routing Panel hides the Sources and more Destinations are shown. See Figure 12-67b on page 563.

Routing in Hide Sources Mode

Use the **Dial Source** or **Dial Source-Level** facility to route source signals and/or levels to destinations. See Dial Source Dialog, on page 526 and Dial Source-Level Dialog, on page 527.

a) Sources Shown
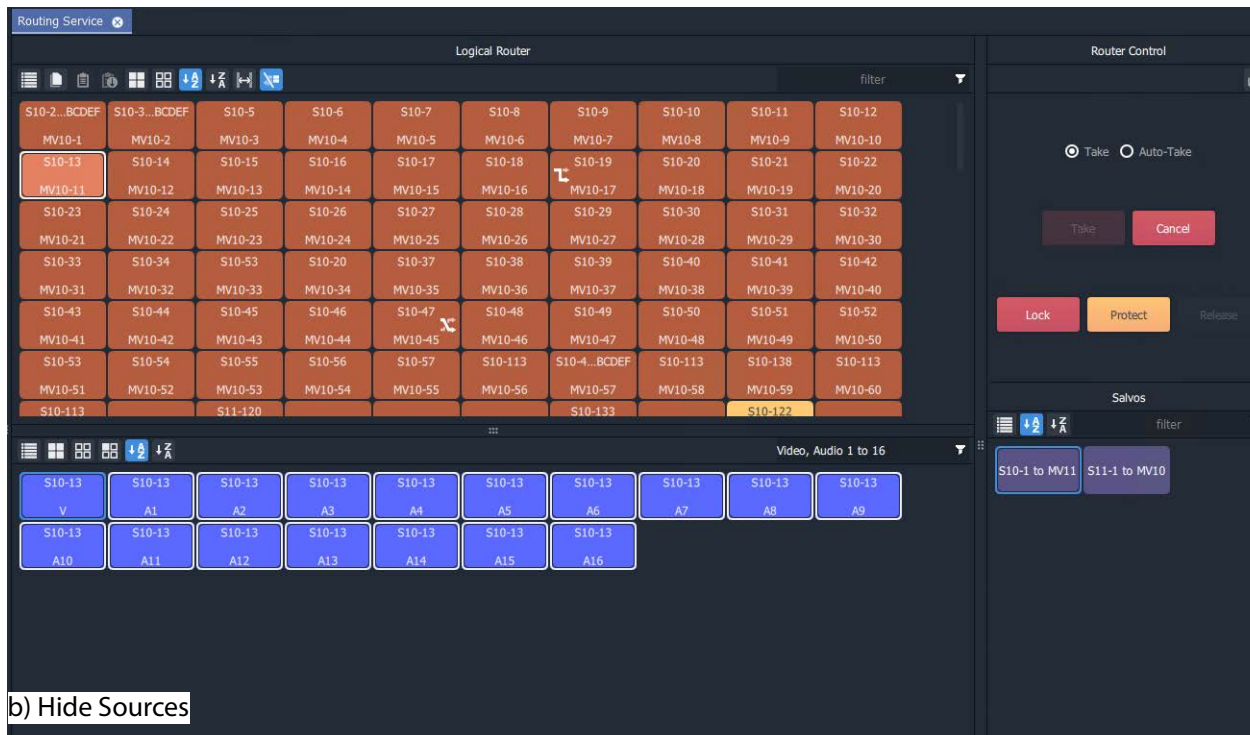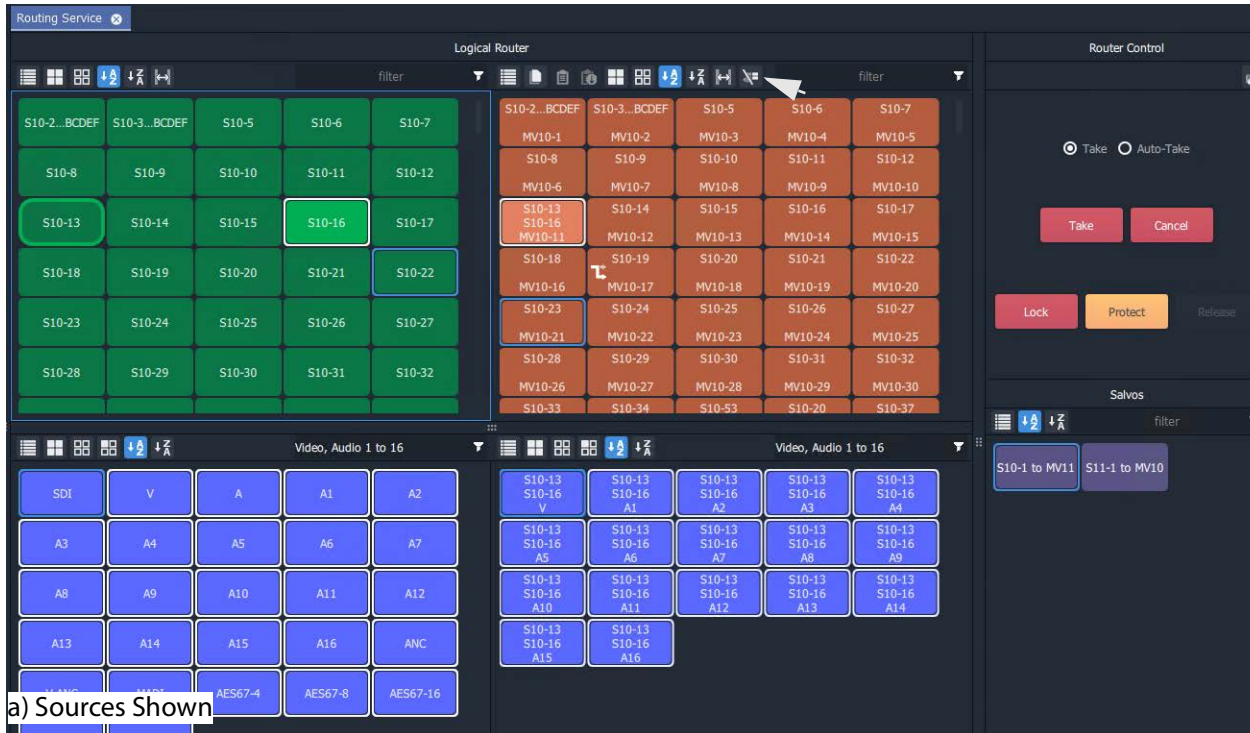
b) Hide Sources

Fig. 12-67: Bulk Routing Panel:
a) Sources and Destinations Shown;
b) Hide Sources.

List View

What is List View Mode?

List View is a level-centric view of a Bulk Routing Panel, allowing a user to focus on routing to Destination Levels. **List View** hides Sources and Source Levels and presents all of the destinations in a 'list' format; each list item is a Destination with all of its Levels.

Figure 12-68a shows a normal Bulk Routing Panel view and Figure 12-68b shows a **List View**.

Click icon to toggle between views

a) Normal Bulk Routing Panel View

Focus is on Destinations List

Destinations Column

Destination Levels Grid

Scrollable list of destinations
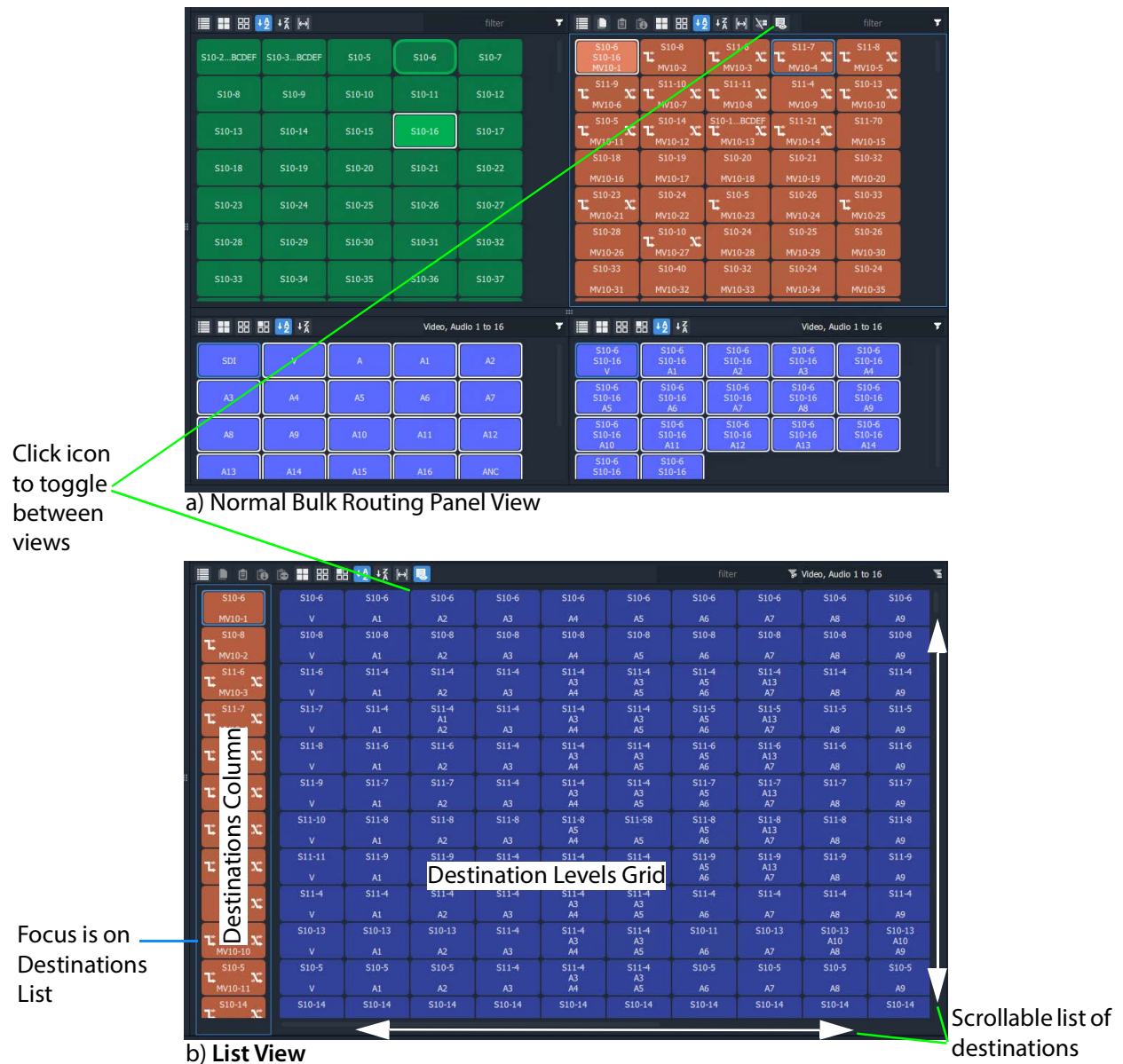
b) **List View**

Fig. 12-68: Bulk Routing Panel: a) Normal View;   b) List View

Focus between the Destination and Destination Levels sections can be moved with the CTRL-Cursor-arrow-keys, as usual. Focus is shown with a thin blue bounding box.

List View Tool Bar

The **List View** tool bar is an amalgamation of the tool bars of the normal Destination pane and Destination Level grid of a Bulk Routing Panel. Icons may be grayed-out according to panel focus. See Figure 12-69.

Icons, some may be grayed-out depending on panel focus.

Two filter boxes,
for **Destination** filtering and **Destination Level** filtering
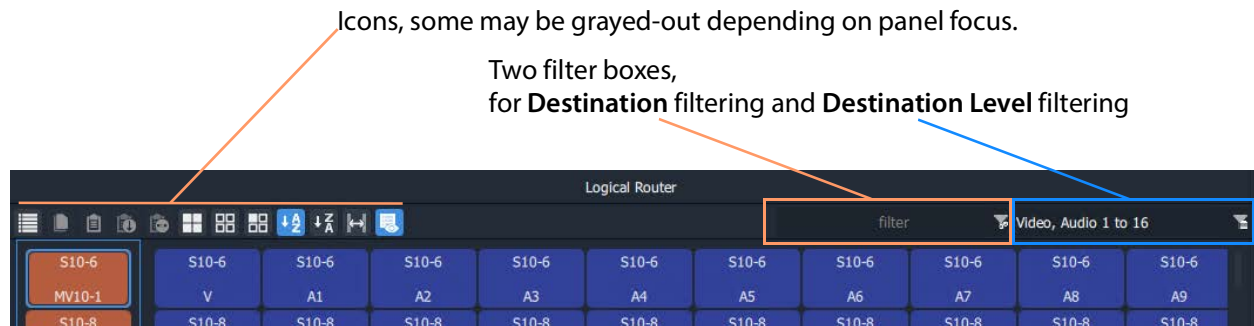
Fig. 12-69: List View Tool Bar

Destination Filtering

There are two filter boxes and these are for: **Destination** filter and **Destination Level** filter. See Figure 12-69. **List View** presents all of the destinations in a scrollable list. To aid selection of destinations and levels, and navigation of the list, the filter facility can be used to limit what is listed:

- **Destination** filtering may be done by name or by their routed Source.
- **Destination Level** filtering may be done by Level name.

See Filtering, on page 547, for more information about using the filter facility.

A filter may be invoked by pressing CTRL-F according to where your panel focus is. In **List View,** with panel focus on:

- the **Destination** column, then CTRL-F invokes **Destination** filter; or on
- the **Level** grid, then CTRL-F invokes **Destination Level** filter.

Selection in List View

Select a Destination

1 Click on a Destination.
   (Or move focus to the level with the cursor keys and press Space-Bar.)

   All of the destination's levels are automatically selected.

Select a Destination, then all Levels are selected
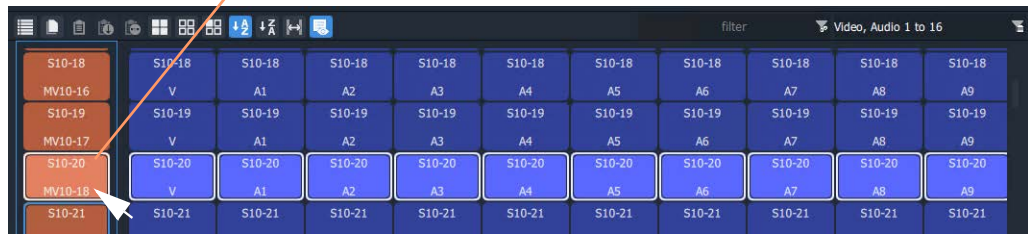
Fig. 12-70: Select a Destination

Select Multiple Destinations

1 Click on a Destination to select it.
(Or move focus onto the Destination with the cursor arrow keys and press the Space-Bar key.)

2 CTRL-click to add other Destinations.
(Or focus on another Destination and press CTRL-Space-Bar.)

Alternatively or additionally, SHIFT-select can be used when selecting a range.

Select a Destination Level

1 Click on a Destination Level.

The Level is selected and the Destination is selected automatically. No other Levels are selected.

e

Select a Level, then the Destination is selected.
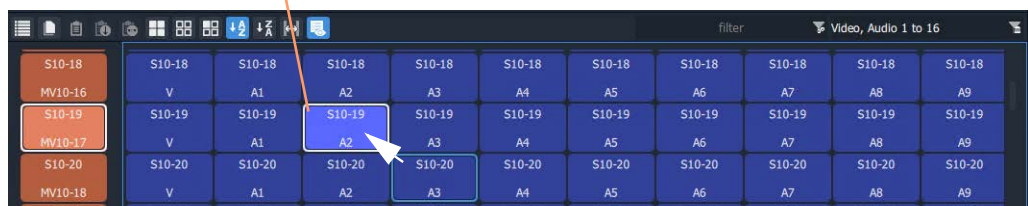
Fig. 12-71: Select a Destination Level

Select Multiple Destination Levels

CTRL-Selecting

1 Select a Destination Level.

2 CTRL-Select other Levels to add further Levels to the selection.

Select a Level, then CTRL-Select others.
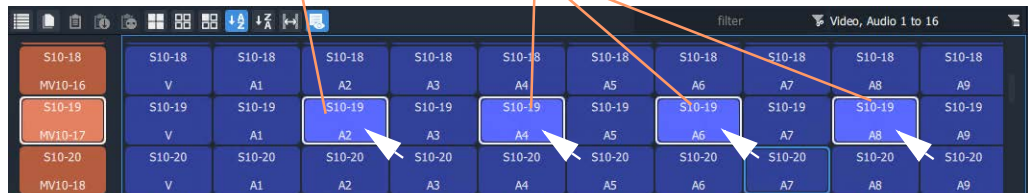
Fig. 12-72: Select Multiple Destination Levels

SHIFT-Selecting a Range of Destination Levels

To select a range of Levels:

1 Select the first Level in the range.
(Move button focus onto a Level and click on it, or press Space-Bar.)

2 SHIFT-Select the last Level in the range.
(To move focus from the first Level to the last, use the mouse or use SHIFT-cursor-left/right arrow keys. To select, click or press Space-Bar.)

Levels from the first to the last are selected.

Select the first Level, then SHIFT-Select the last.
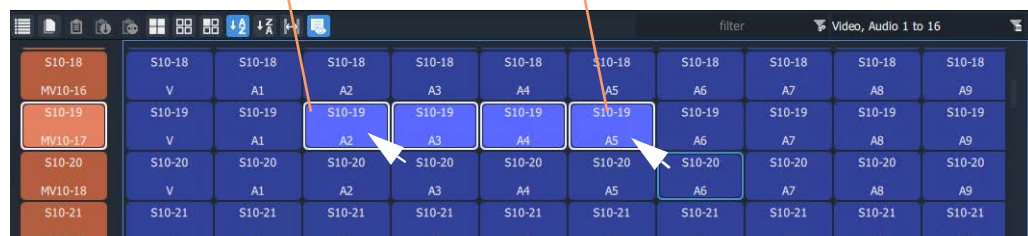
Fig. 12-73: Select a Range of Destination Levels

SHIFT-Selecting a Block of Destination Levels

A block of Levels may be selected. This is similar to selecting a range, but it goes across more than one destination. To select a block of Levels:

1 Select the first, 'top-left' Level in the block.

2 SHIFT-Select the last, 'bottom-right' Level in the block.

Levels from the first selection to the last in a block are selected.

Select the first, 'top-left' Level, then SHIFT-Select the last, 'bottom-right'.
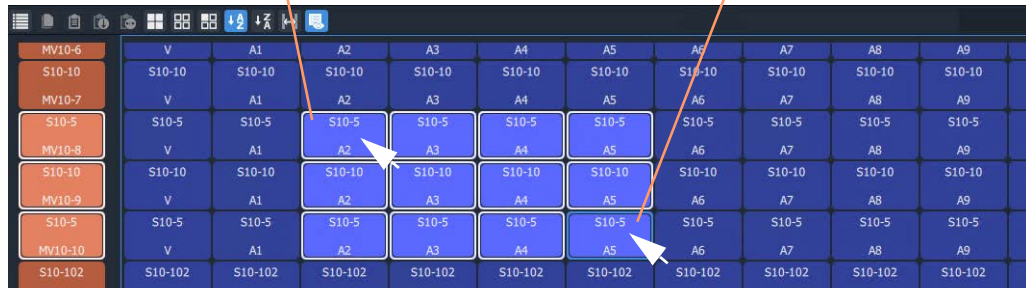
Fig. 12-74: Select a Block of Destination Levels

Selecting Source and/or Source Level

Source and Source Level selection is done via the **Dial Source** and **Dial Source-Level** dial-up dialog facility. After the required Destination(s) or Destination Level(s) are selected type in an alpha-numeric character to open one of the dial-up dialogs. (See Dial Source and Dial Source-Level Dialogs, on page 525.)

For normal routing operation in **List View** mode, only a single Source or a Single Source Level can be selected.

Routing in List View

Routing in **List View** is done by selecting a Destination (and Levels) and then selecting a Source and Source Levels via the **Dial Source** and **Dial Source**-Level facility. (See Dial Source and Dial Source-Level Dialogs, on page 525.)

Some Routing examples are provided, see:

- Routing Examples - 'All Levels', on page 568.
- List View Routing Examples - One-Level, on page 570.
- List View Routing Examples - Destination Copy-Paste, on page 575.
- List View Routing Examples - Copy-Paste Levels, on page 577.

A brief summary of these examples is found at List View Routing Summary, on page 581.

Routing Examples - 'All Levels'

Several routing examples are presented:

- Simple Route, One Source to One Destination ('All-Levels').
- One Source to Multiple Destinations ('All-Levels').

Routing utilizes the Dial Source and Dial Source-Level Dialogs.

Simple Route, One Source to One Destination ('All-Levels')

To make a simple 'all-levels' route in **List View**:

1 Select a Destination.

Fig. 12-75: Destination Selected

2 Begin to type a Source name, for example, 'S10-'.

A **Dial Source** dialog appears. Source names are listed in the dialog and are filtered on the typed text. See Figure 12-76.

Typed in text   Filtered Source List

Fig. 12-76: Dial Source Dialog

3 Continue to type in ('dial-up') a Source Name and press Return; and/or select the required Source name from the filtered Source list in the **Dial Source** dialog. For example, 'S10-22'.

An 'all-levels' route is made to the selected Destination.

New source is routed to the destination, all levels.

Fig. 12-77: Routed All-Levels

An 'all-levels' route has been made.

One Source to Multiple Destinations ('All-Levels')

To make a simple 'all-levels' route from one Source to multiple Destinations:

1   Select the first Destination.

2   CTRL-Select and/or SHIFT-Select other Destinations.

When all Destinations have been selected:

3   Begin to type a Source name, for example, 'S10'.

A **Dial Source** dialog appears. Source names are listed in the dialog and are filtered on the typed text.

4   Proceed to 'dial up' a Source name, as described in Simple Route, One Source to One Destination ('All-Levels').

5   Select a Source to make the route.

An 'all-levels' route is made to multiple Destinations.

List View Routing Examples - One-Level
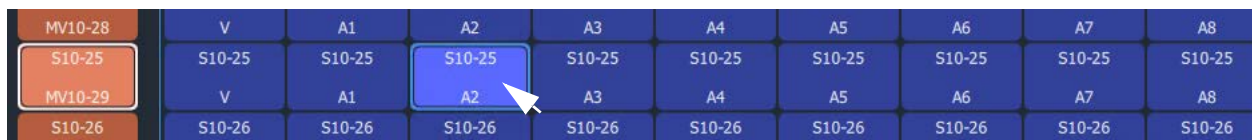
Several routing level-based examples are presented:

- Simple One-Level Route (Breakaway).
- One-Level Shuffle.
- One Level to Multiple Levels.

Simple One-Level Route (Breakaway)

To make a 'one-level' route in **List View**:

1   Select a Destination Level.

Fig. 12-78: Destination Level Selected

The corresponding Destination is also selected.

2   Type a single alpha-numeric character.

A default **Dial Source-Level** dialog appears. User focus is in the (upper, Source-name) text entry box. The dialog shows the currently-routed Source name and Level.

3   Begin to enter a new Source name into the upper text entry box, for example, 'S11-'.

Source names are listed, filtered on the typed text. See Figure 12-79.

Select a Source, or type in the name fully and press Enter.

Fig. 12-79: Select a Source Name

4 Either:

  • select the required Source name in the filtered list; or

  • finish entering the Source name into the dialog and press Enter.

A 'one-level' route is made to the selected Destination Level from the selected Source, on the same Level. This forms a Breakaway.

Fig. 12-80: One Level Routed from a Different Source, Breakaway

A one-level, breakaway, route has been made.

One-Level Shuffle

A shuffle is similar to a breakaway and, in **List View** mode, is routed is a similar way to Simple One-Level Route (Breakaway).

Note: When a **Dial Source-Level** dialog first appears, it shows the currently-routed Source and Level. For a Shuffle, the Source name simply needs to remain the currently-routed Source.

(Refer to What is a Breakaway?, on page 538, and What is a Shuffle?, on page 542, for general information.)

To do a one-level route:

1 Select a Destination Level.

   The corresponding Destination is also selected.

2 Type a single alpha-numeric character.

   A default **Dial Source-Level** dialog appears. User focus is in the (upper, Source-name) text entry box. The dialog shows the currently-routed Source and Level.

   Note: The default dialog already shows the currently-routed Source name and Level name, regardless of the single alpha-numeric character typed.

3 Press the **Tab** key.

   In the dialog, user focus changes from the (upper Source name) text entry box to the (lower, Source-Level-name) text entry box.

4 Either:

   • begin to type in a (new) Source Level name and then *select* the required Source Level in the list (by clicking on it, or by highlighting the Level and pressing the Enter key); or

   • fully type in the Source Level name (for example, 'A2') and press the Enter key.

   A 'one-level' route is made from the selected |Source Level to the selected Destination Level, which forms a one-level Shuffle in this case.

A one-level shuffle route has been made.

Channel-Swap Shuffle

To do a channel-swap in **List View**, carry out two One-Level Shuffle routes. See Figure 12-81.

a) Before one-Level routing

b) After first one-Level route   Routed-Source's channel A3 is routed to Destination's Channel A2

c) After second one-Level route

Routed-Source's channel A2 is routed to Destination's Channel A3, and vice versa

Fig. 12-81: Forming a Channel-Swap Shuffle:
a) Before any one-Level routing;
b) After first one-Level route;
c) After second one-Level route.

One Level to Multiple Levels

To route one Source Level to multiple Destination Levels:

1 Select a Destination Level.

2 CTRL-Select and/or SHIFT-Select other Destination Levels.
   (**Note:** These Levels do not have to belong to the same Destination.)

   Figure 12-82a gives an example of multiple selected Destination Levels.

This has selected the Destination Levels required.
Then:

3 Type a single alpha-numeric character.

   A default **Dial Source-Level** dialog appears. User focus is in the (upper, Source-name) text entry box. The dialog shows the currently-routed Source and Level.

   Note: The default dialog already shows the currently-routed Source name and Level name, regardless of the single alpha-numeric character typed.

4 Dial-up a Source Level with the **Dial Source-Level** dialog, see Simple One-Level Route (Breakaway) and make a one-Level route to all selected Destination Levels.

Figure 12-82b shows an example with Figure 12-82c showing the resulting route made.

a) Multiple Selected Destination Levels

b) Dialing Up the Source Level

c) Routed Levels

Fig. 12-82: One Level to Multiple Levels:
  a) Multiple Selected Destination Levels; b) Dialing Up the Source Level;
  c) Routed Levels.

List View Routing Examples - Destination Copy-Paste

With Copy-Paste routing, the Source assignments of a Destination (that is, the current routing to all the Levels of a Destination) can be copied to other Destinations. Alternatively, the routing to just one or more Destination Levels can be copy-pasted to other Destination Levels.

Several routing Copy-Paste examples are presented:

- Destination Copy-Paste.
- Destination Paste-Series.

Destination Copy-Paste

The routing to a Destination can be copied to one or more other Destinations. This operates on all levels and allows a routing to be quickly copied to other Destinations:

1 Select a Destination. (See Figure 12-83a.)

2 Copy the Destination by, either:

- CTRL-C; or
- right-click and select 'Copy'; or
- click on the 'Copy' icon in the **List View** tool bar.

The selected Destination (with its Levels) is outlined with a 'crawling' dashed line. (See Figure 12-83b.)
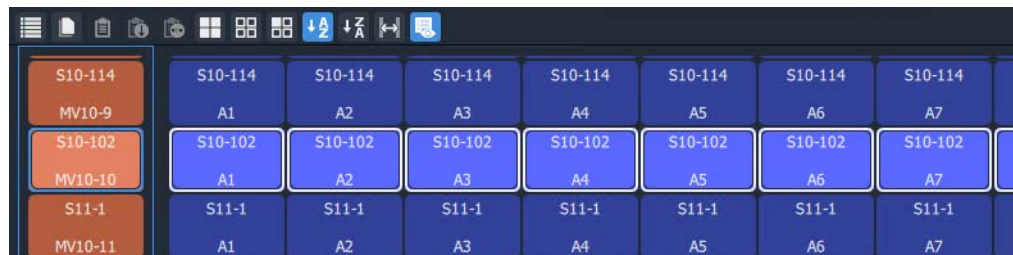
a) Selected Destination

b) Destination Copied

Fig. 12-83: Destination Copy-Paste: a) Selected Destination; b) Destination Copied.

3 Select a Destination to 'copy to'. (See Figure 12-84.)
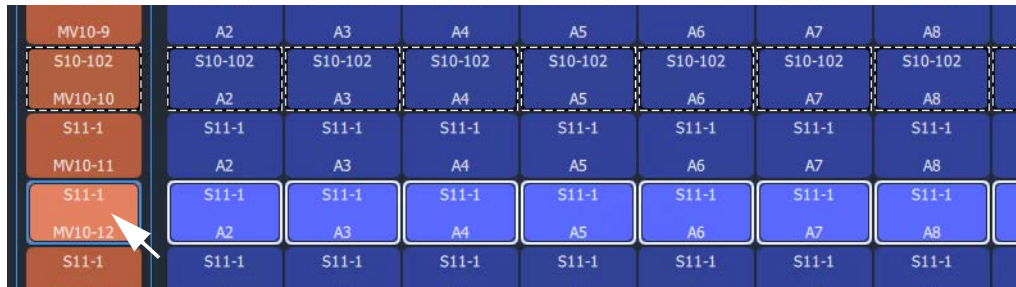
Fig. 12-84: 'Copy'To' Destination Selected

4 If required,
   further 'copy-to' Destinations can be added to the selection with CTRL-Select and/or
   SHIFT-Select.

When all 'copy to' Destinations are selected, to paste the 'copied' Destination's routing to
the selection:

5 Paste the 'copied' Destination's routing to the selection by either:

   • pressing CTRL-V; or

   • right-click and select 'Paste'; or

   • click the 'Paste' icon in the **List View** tool bar.

The routes are made (all levels) and the original copied Destination's routing is applied
(pasted) onto all the selected Destination(s). (See Figure 12-85.)
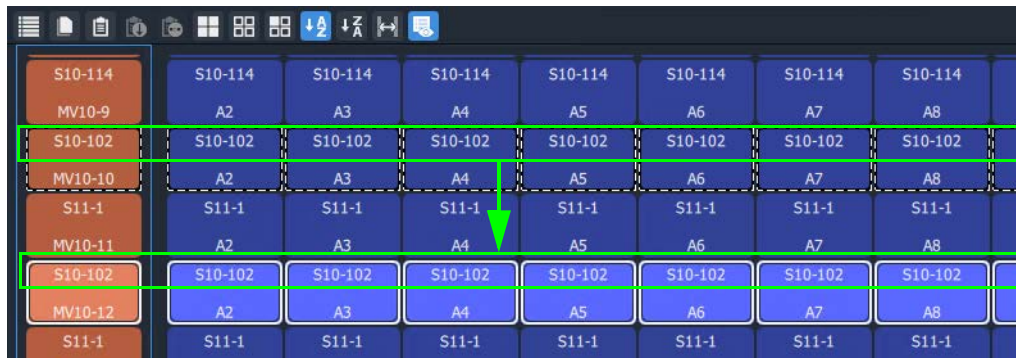
Fig. 12-85: Routing Pasted onto a Destination

Destination Paste-Series

Destination Copy-Paste applies the copied Destination into all of the selected 'Copy to'
Destinations. Alternatively, a *series* of sources can be applied to several selected 'Copy to'
Destinations. The series starts from the 'Copied' Destination's currently-routed Source and
the Source increments.

The operation is similar to Destination Copy-Paste. To paste a series onto a selection of
'Copy to' Destinations:

1 Select a Destination and copy it.

2 Select a first 'Copy to' Destination and select a range of these by SHIFT-Selecting the
   last 'Copy to' Destination.

   This has selected the 'Copy to' range.

At this point (with a Destination copied and several 'Copy to' destinations selected) a normal 'paste' would result in the copied routing being applied to all 'Copy to' Destinations. But, instead, to **Paste Series**:

   3 Press Alt-CTRL-V, or click the **Paste Series** icon in the **List View** tool bar.

      The currently-routed Source of the copied Destination is applied to the first 'Copy to' Destination in our 'Copy to' range. The next Source is applied to the next 'Copy to' Destination in the range, etc. See Figure 12-86 for an example.

Currently-routed
Source of the
copied Destination

Currently-routed
Source applied to
first 'Copy to'
Destination.

Next Source
applied to next
Destination.

And so on.

Fig. 12-86: Result of Destination Paste-Series

List View Routing Examples - Copy-Paste Levels

The routing to one or more selected Destination Levels can be copied and pasted onto other Destination Levels. This allows a user to set up levels quickly on one or more Destinations.

The copy-paste is a two-step process:

   1 **Copy** - Destination Levels are selected and copied.

   2 **Paste** - A paste 'starting Level' is selected and pasting is done from this 'starting Level'.

With more than one Destination Level copied, the pasting of routing onto 'Copy to' Destination Levels can be done in two ways:

- Paste Levels with CTRL-V - pastes with no gaps.
- Paste Levels with Alt-CTRL-R - pastes preserving gaps.

Both paste types are done in the Levels grid from the 'starting Level'.
When pasting to more than one 'starting Level', a warning is given if there are any pasting conflicts. See Levels Copy-Paste Footprint and Levels Paste Warning.

Paste Levels with CTRL-V

   1 Select Destination Levels and copy them. For example, A3, A4, A6 and A8, see Figure 12-87.

      This has copied the routing of these selected Destination Levels.

2 Select *one* 'Copy to' Destination Level. This is the 'starting Level'.
And click the **Paste** icon, or press CTRL-V, or select right-click 'Paste'.

Routes are made to consecutive Destination Levels and the copied routing is applied to the 'Copy to' Destination Level and to subsequent, consecutive Destination Levels. See Figure 12-87 for the result of CTRL-V paste from the copied Destination Levels.

One selected 'Copy to' Level, 'starting Level'

Selected Destination Levels

Routes made to consecutive Levels
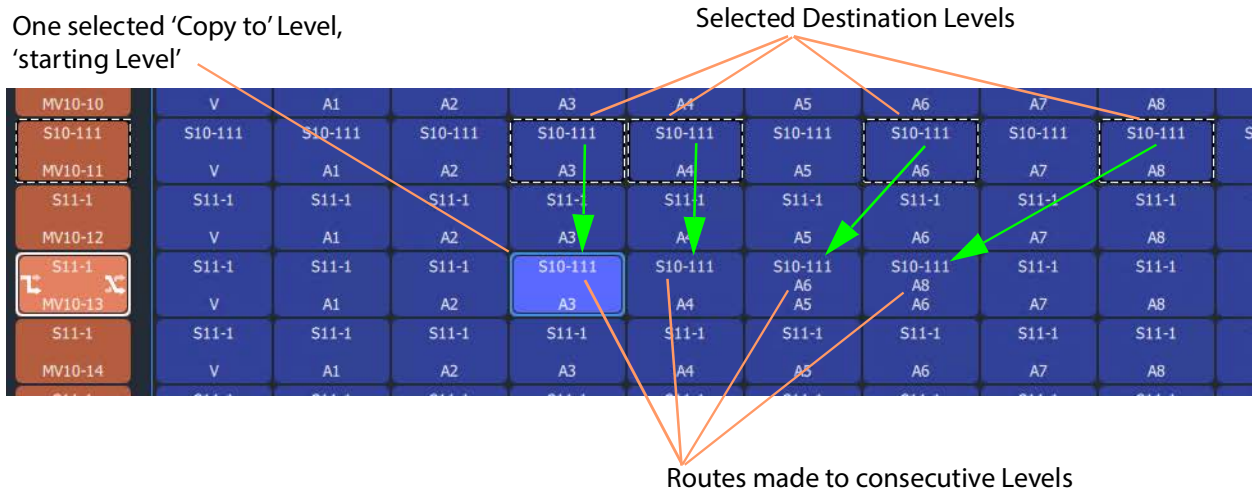
Fig. 12-87: Result of CTRL-V Paste

Paste Levels with Alt-CTRL-R

The CTRL-V pasting pastes into *consecutive* Destination Levels and ignores any gaps there might be in the original copied Levels. Whereas, pasting with **Alt-CTRL-R** retains the original copied Levels pattern, preserving any gaps in the original pattern. Pasting is still done from a 'starting Level'.

To paste and preserve gaps:

1 Select Destination Levels and copy them. For example, A3, A4, A6 and A8, see Figure 12-88.

2 Select *one* 'Copy to' Destination Level. This is the 'starting Level'.
And press Alt-CTRL-R.

Routes are made and the routing of the copied Levels is applied to the 'Copy to' Destination Level ('starting Level') and to subsequent Levels with any gaps preserved. See Figure 12-88 for the result of an ALT-CTRL-R paste from the two copied Destination Levels.

One selected 'Copy to' Level,
'starting Level'

Selected Destination Levels
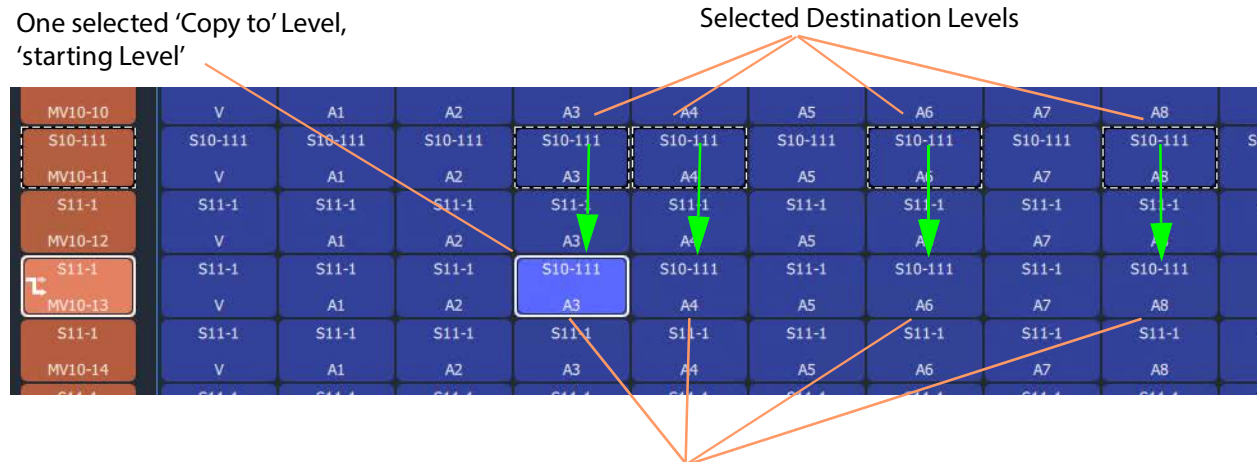
Routes made to Levels and the original copied pattern is retained, gaps are preserved.

Fig. 12-88: Result of Alt-CTRL-V Paste

Levels Copy-Paste Footprint

The copied Levels pattern and the pasting type determine a pasting 'footprint' in the **List View** Levels grid. The pasting footprint pattern

- retains or ignores any gaps in the copied Levels pattern, depending on pasting type (CTRL-V or Alt-CTRL-R);
- is applied in the **List View** Levels grid and is based at each 'starting Level' in turn, starting with the first 'starting Level'.
  (**Note:** It is possible to select more than one 'starting Level'.)

Figure 12-89 shows 2x1 copied Levels pasted with various 'Copy to' starting Levels. In Figure 12-89d, the pasting footprints overlap.

- Figure 12-89a - Single starting Level and a resulting 2x1 pasting.
- Figure 12-89b - One column of four starting Levels which result in four 2x1 pasting footprints.
- Figure 12-89c - Two columns of four starting Levels which result in two columns of four 2x1 pasting footprints, which do not overlap.
- Figure 12-89d - Two *adjacent* columns of four starting Levels which results in two columns of four 2x1 pasting footprints which do overlap. The overlap is warned with a pop-up Levels Paste message, see Levels Paste Warning.

Copied Levels, a '2x1' shape.

a) Single starting Level and resulting '2x1' pasting.

b)

c)

d)

Paste footprint overlaps
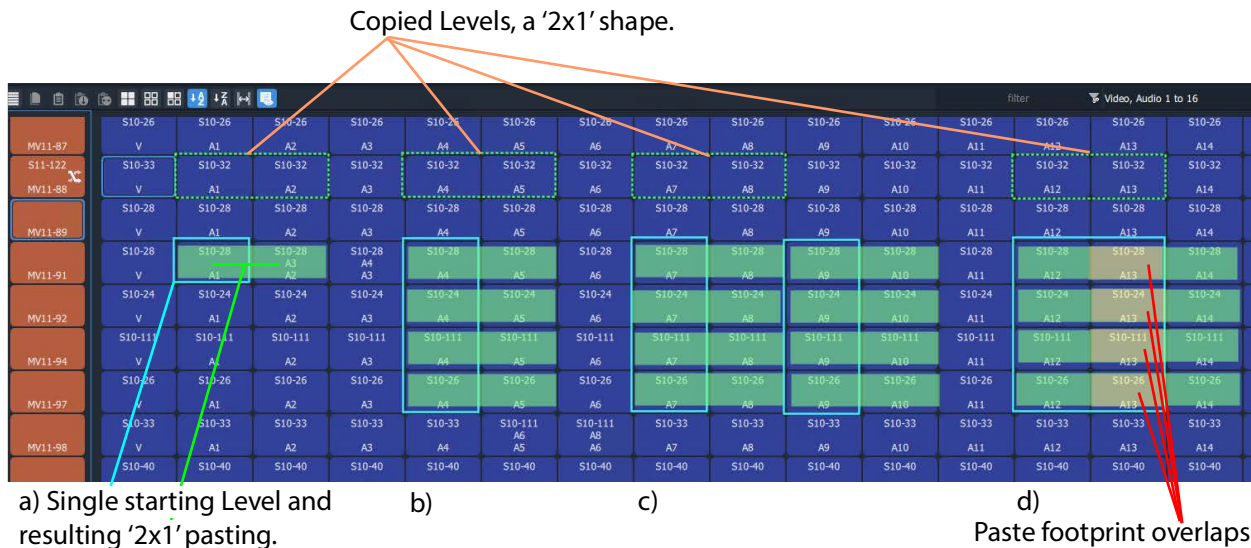
Fig. 12-89: Example Level Pasting

Levels Paste Warning

For a **Levels Copy-Paste** operation which has more than one 'starting Level', if the operation will result in overlapping paste footprints (see Figure 12-89d), a **Levels Paste** warning pops up. See Figure 12-90.

Fig. 12-90: Level Paste Warning

You can choose to not paste, or to paste anyway, in which case the paste footprints are applied sequentially, starting with the first 'starting Level' in the selection. If there is overlap, then some of the **Levels Copy-Paste** routing may be overwritten. The later routing wins.

List View Routing Summary

List View Routing Summary - All-Levels

	One Source to One Destinations	One Source to Multiple Destinations
To make:	An 'all-levels' route to a destination:	An 'all-levels' route to multiple destinations:
1	Select a single **Destination**.	Select a **Destination**.
2	-	Select further with CTRL-Select and/or SHIFT-Select.)
3		Begin to type a **Source** name. A **Dial Source** dialog appears.
4		Proceed to 'dial up' a **Source** name.

5		Then either:
		
		   • select the typed-in **Source** by pressing Enter/Return;
		
		 and/or:
		
		   • select a **Source** from the **Dial Source** filtered source list.

Result:	An 'all-levels' route is made to the destination.	An 'all-levels' route is made to the destinations.

List View Routing Summary - One-Level

	Simple One-Level (Breakaway)	Simple One-level (Shuffle)
To route:	One level from another source:	One level from same destination.
1		Select a single **Destination Level**.
2		Type a single alpha-numeric character. A default **Dial Source-Level** dialog appears showing currently-routed **Source** and **Level**.
3	Begin to enter a new **Source** name into the dialog's upper text entry box.	Press the **Tab** key. User focus changes to the lower text entry box in the dialog, for **Source Level** entry.

List View Routing Summary - One-Level *(continued)*

	Simple One-Level (Breakaway)	Simple One-level (Shuffle)
4	Then in the dialog, either: • select the required **Source** name; or • finish entering the **Source** name and press Enter/Return.	Then in the dialog, either: • begin to type in a (new) **Source Level** name and then *select* the required **Source Level** in the list; or • fully type in the (new) **Source Level** name (for example, 'A2') and press the Enter/Return key.
Result:	A one-level, breakaway route has been made. (For a channel-swap, do 2x Simple One-level (Shuffle)).	A one-level, shuffle route has been made.

	One Level to Multiple Levels
To route:	One level to multiple destination levels:
1	Select a **Destination Level**.
2	And select further with CTRL-Select and/or SHIFT-Select.
3	Type any single alpha-numeric character. A **Dial Source-Level** dialog appears showing currently-routed **Source** and **Level**.
4	Press the **Tab** key. User focus changes to the lower text entry box in the dialog.
5	Then, either: • begin to type in a (new) **Source Level** name and then *select* the required **Source Level** in the list; or • fully type in the (new) **Source Level** name (for example, 'A2') and press the Enter/Return key.
Result:	A one-level route is made to all selected **Destination Levels**.

List View Routing Summary - Destination Copy

	Destination Copy-Paste	Destination Paste-Series
To:	Copy a Destination's Source-assignments to another Destination:	'Copy-Paste' a series of Destinations:
1	Select a single **Destination**.	

List View Routing Summary - Destination Copy (continued)

	Destination Copy-Paste	Destination Paste-Series
2	Either: • type CTRL-C; or • right-click '**Copy**'; or • click on the '**Copy**' icon in the **List View** tool bar.	
	The **Destination**'s routing (all levels) is 'copied' and is outlined with a 'crawling' dashed line.	The **Destination** is copied.
3	Select a **Destination** to 'copy to'.	Select the first **Destination** in the range to 'copy to'.
4	(Optionally, select further 'copy-to' **Destinations** with CTRL-Select and/or SHIFT-Select.)	SHIFT-Select the last **Destination** in the range to 'copy to'. This has selected the 'Copy to' range. This has selected the 'Copy to' range.
5	Either: • press CTRL-V; or • right-click '**Paste**'; or • click the '**Paste**' icon in the **List View** tool bar.	Then either: • press Alt-CTRL-V; or • click the **Paste Series** icon in the **List View** tool bar.
Result:	The 'copied' routing (all levels) is pasted to the selected **Destination**(s).	The currently-routed **Source** of the copied **Destination** is applied to the first Destination in our 'Copy to' range. The next **Source** is applied to the next Destination in the 'Copy to' range, etc.

List View Routing Summary - Paste Levels

	Paste Levels with CTRL-V	Paste Levels with Alt-CTRL-R
To:	Copy multiple **Destination Level**s' routing and to consecutive **Destination Levels** with no gaps	Copy multiple **Destination Level**s' routing and to **Destination Levels**.with gaps.
1	Select a **Destination Level**.	
2	Select further with CTRL-Select and/or SHIFT-Select.	
3	Then either: • press CTRL-C; or • right-click '**Copy**'; or • click on the '**Copy**' icon in the **List View** tool bar. The routing of the **Destination Levels** is copied along with the *pattern* of levels.	

List View Routing Summary - Paste Levels *(continued)*

	Paste Levels with CTRL-V	Paste Levels with Alt-CTRL-R
4	Select *one* 'Copy to' **Destination Level** (the 'starting level').	
5	And then either: • click the **Paste** icon; or • press CTRL-V; or • select right-click '**Paste**'.	And press Alt-CTRL-R
Result:	The copied routing is applied to the 'Copy to' **Destination Level** ('starting level') and to subsequent, consecutive **Destination Levels**. Any gaps in the copied pattern are not preserved.	The copied routing is applied to the 'Copy to' **Destination Level** ('starting Level') and to subsequent Levels with any pattern gaps preserved.

GV Orbit Custom User Panels

Can a Bulk Routing Panel be Opened from a Custom User Panel?

The Bulk Routing Panel may be opened from a GV Orbit custom user panel (created as part of a GV Orbit control and monitoring, C&M, project).

When the custom user panel is designed, a 'Load Panel' GV Orbit Routing Behaviour is used to invoke the Bulk Routing Panel when the custom user panel is run.

Typically, this GV Orbit 'Behaviour' would be invoked upon the press of a button on an GV Orbit C&M project custom user panel.

See:
- Amend an Existing GV Orbit C&M Project
- Exercise the C&M Custom Screen

Amend an Existing GV Orbit C&M Project

To prepare a GV Orbit C&M project to be able to open a Bulk Routing Panel:

1. Open/create a GV Orbit C&M project.
2. In the main menu, click on **Control and Monitoring** > **Connections** > **GVOP** and set the **Client Domain** to a domain with an GV Orbit Routing Service running.
3. Create a **New Screen**. For example, in the **Project** window: expand the project item, right-click on 'screens', and select 'New Screen', enter a name, and click OK.

   A new blank C&M project screen opens as a tabbed screen.
4. In the new C&M project screen, add a **Button** widget. For example, drag on a **Button** widget from the widget icons along the bottom edge of the GV Orbit Client application window.
5. Edit the **Button** widget's **Caption** property. See Figure 12-91.

Button widget on screen

Project item expanded in **Project** window

Edit Behaviours button

Button widget icon

Set **Button** widget's **Caption** property
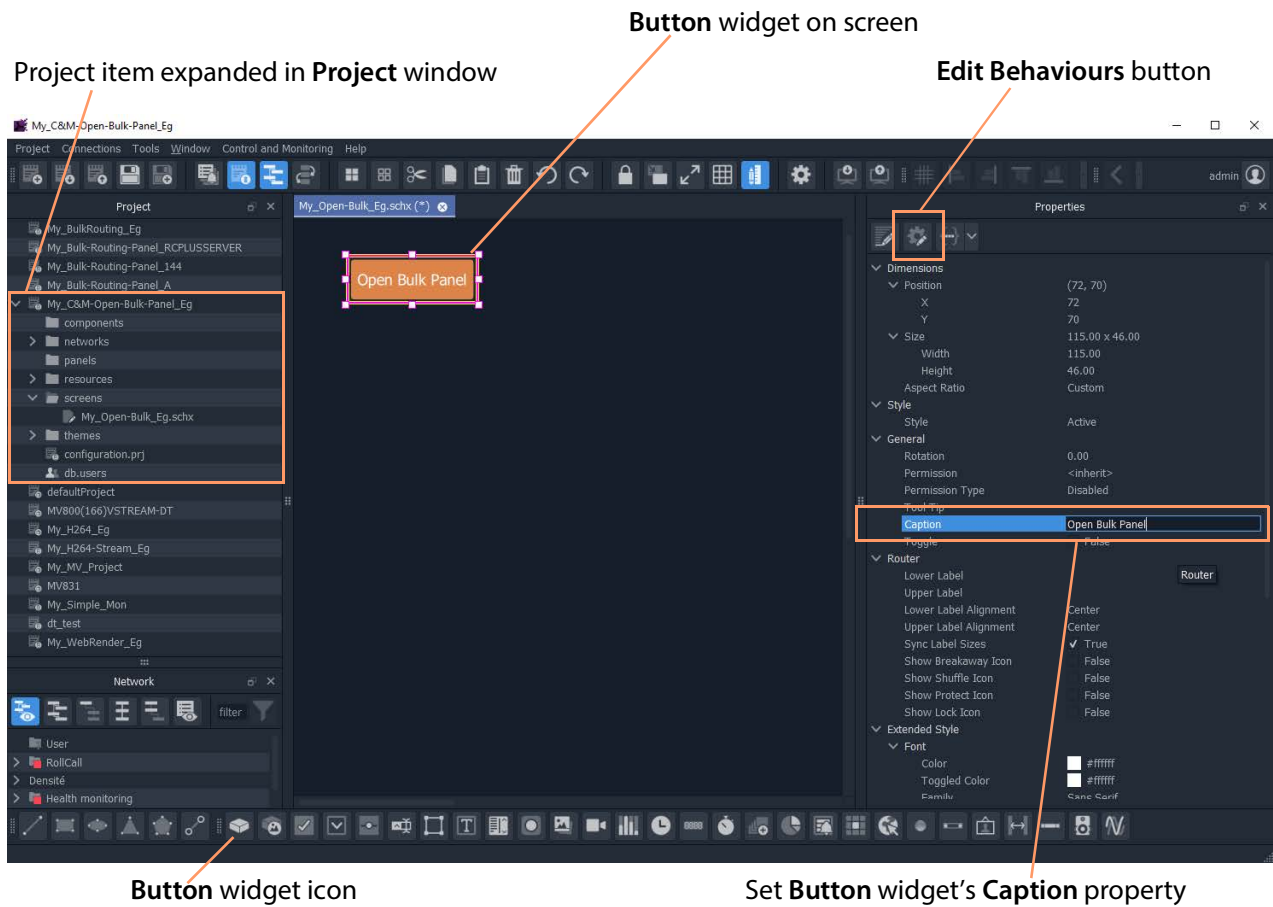
Fig. 12-91: C&M Project Screen with Button Widget

6 Select the **Button** widget on screen.

7 Click on the **Edit Behaviours** button.

The 'Behaviour and Bindings' graphical editor is shown. See Figure 12-92.

In the 'Behaviour and Binding' graphical editor:

8 Select to show 'Routing' Behaviours and click on the 'Load Panel' item.

A **Load Panel** Behaviour and a configured **Click Handler** Binding is automatically placed into the graphical editor.
See Figure 12-92.

'Behaviour and Binding graphical editor'

Select 'Routing'

Select 'Open Panel' item (single-click) to add a **Load Panel** Behaviour.
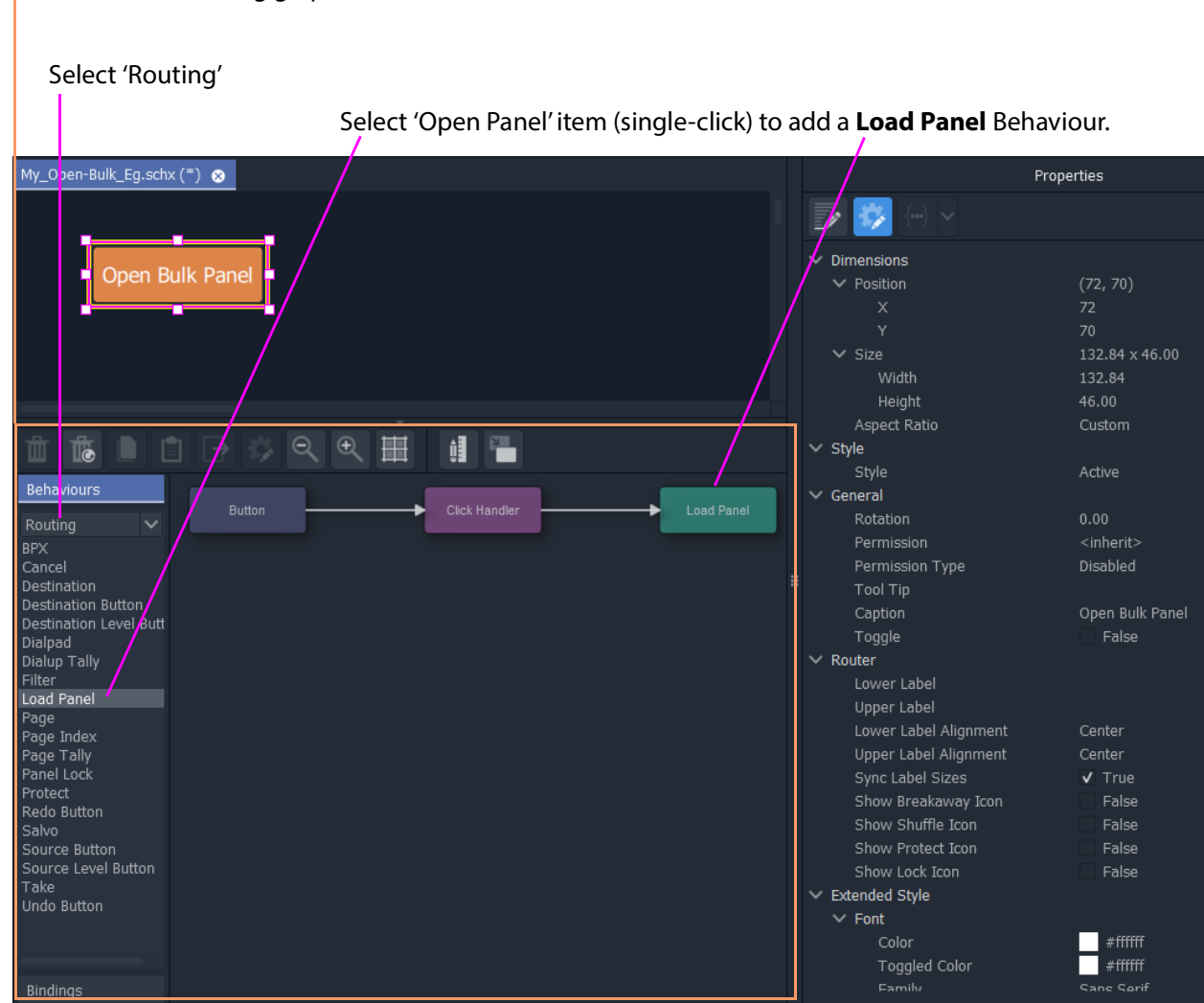
Fig. 12-92: Behaviour and Bindings Graphical Editor

9   Double-click on the added **Load Panel** Behaviour.

The Behaviour's configuration screen is shown in the graphical editor.

In the **Network** window:

10   Expand and locate the **Routing** service of the GV Orbit Server being used.

11   Right-click on the **Routing** service item and select 'Copy > Address'.

This copies the RollCall address of the **Routing** service.

In the graphical editor:

12   Paste the copied address into the 'Address' property of the **Load Panel** configuration.

See Figure 12-93.
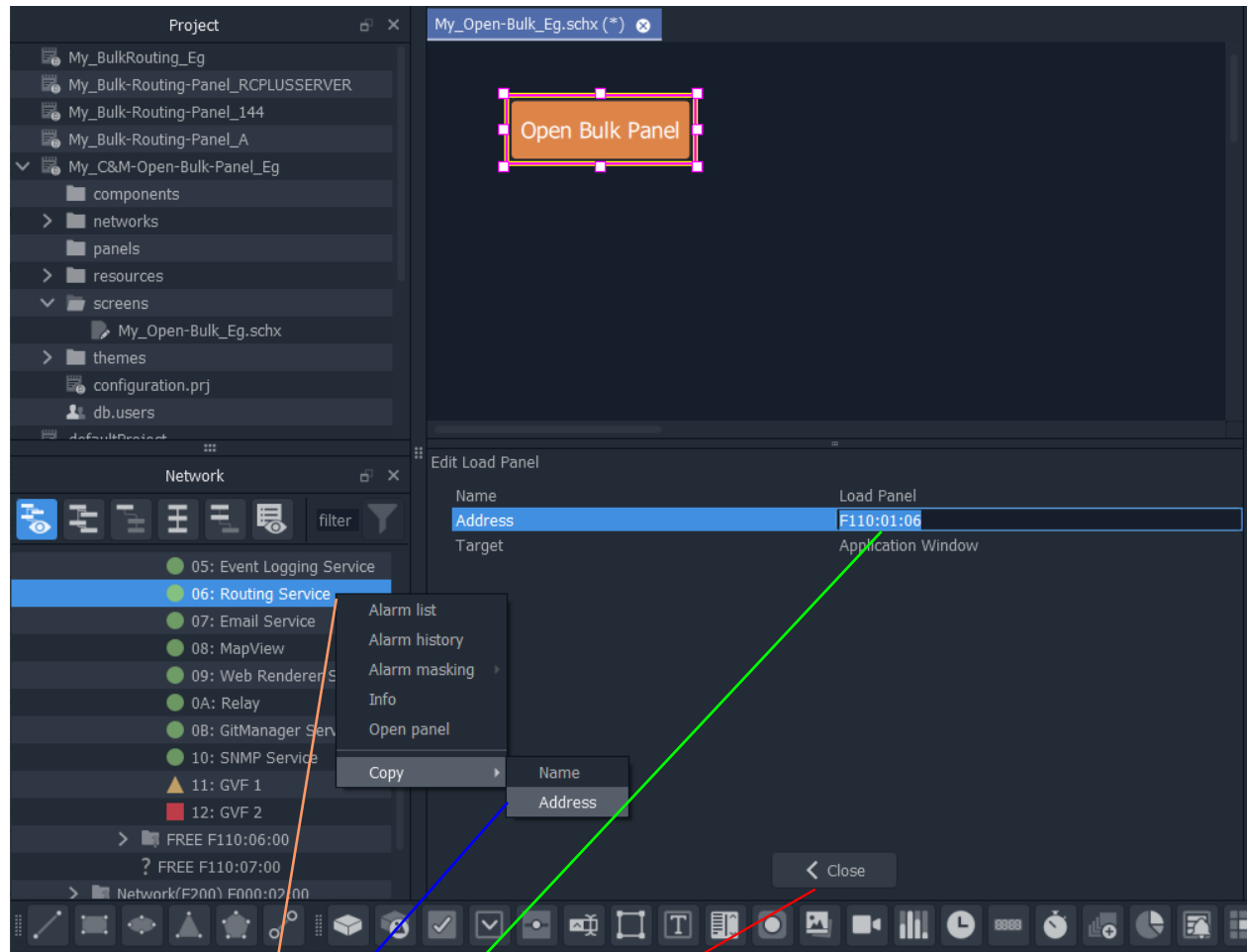
Right-click on a 'Routing Service' item in the **Network** window.

Select 'Copy > Address'.

Paste the address into the 'Address' property of the Load Panel configuration screen.

Click **Close in the Load Panel** configuration screen.

Fig. 12-93: Setting Load Panel Behaviour's RollCall Address

13 Click **Close** in the configuration screen.

To save this project change:

14 Click **Project > Save File** in the main menu

15 Click **Project > Save Project**.

This has designed (a simple) C&M custom screen which contains a button which will open the Bulk Routing Panel.

Exercise the C&M Custom Screen

With the designed C&M custom screen open in GV Orbit Client:

1 Click the **Design/Run Mode** button in the main tool bar of the GV Orbit Client application window. See Figure 12-96a.

Click to enter **Run** mode.

Click to enter **Design** mode.

Fig. 12-94: Design/Run Mode Icon (in Main Tool Bar)

The GV Orbit Client enters **Run** mode and the custom screen is run. See Figure 12-96b.

Design/Run Mode icon indicates GV Orbit is in **Design** mode.
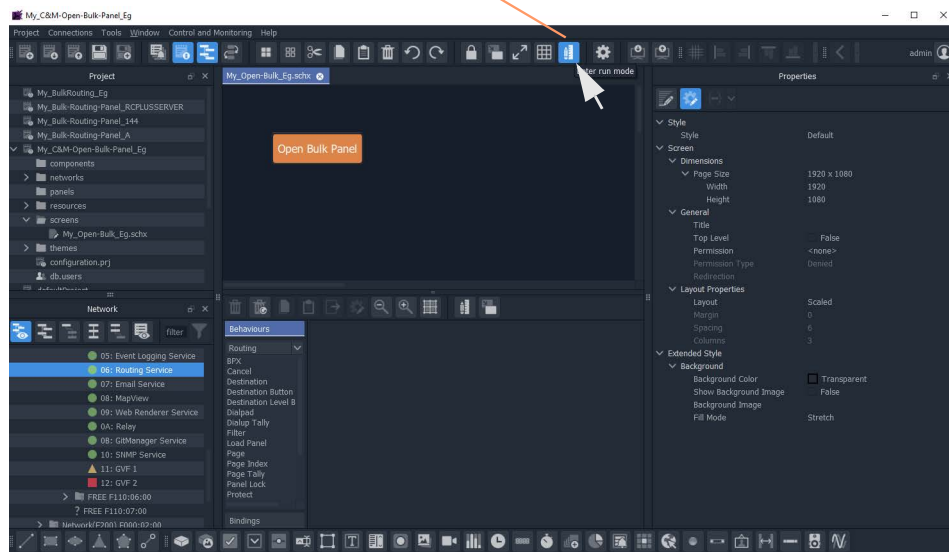
a) Click to Enter Run Mode

Design/Run Mode icon indicates GV Orbit is in **Run** mode.

Click on the **Button** widget to open the Bulk Routing Panel.
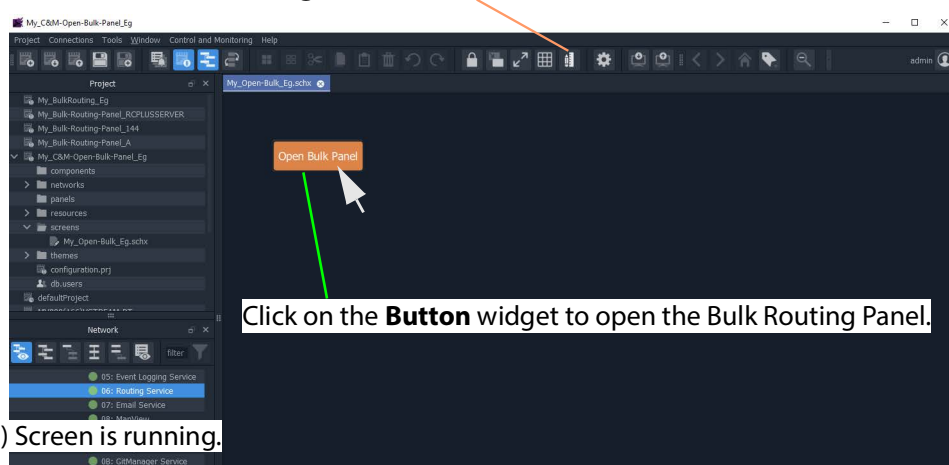
b) Screen is running.

Fig. 12-95: Running the Custom Screen

2 Click on the **Button** widget to open a new tab containing an Bulk Routing Panel. See Figure 12-96.

Tab running C&M Custom Panel   Tab running the opened Bulk Routing Panel
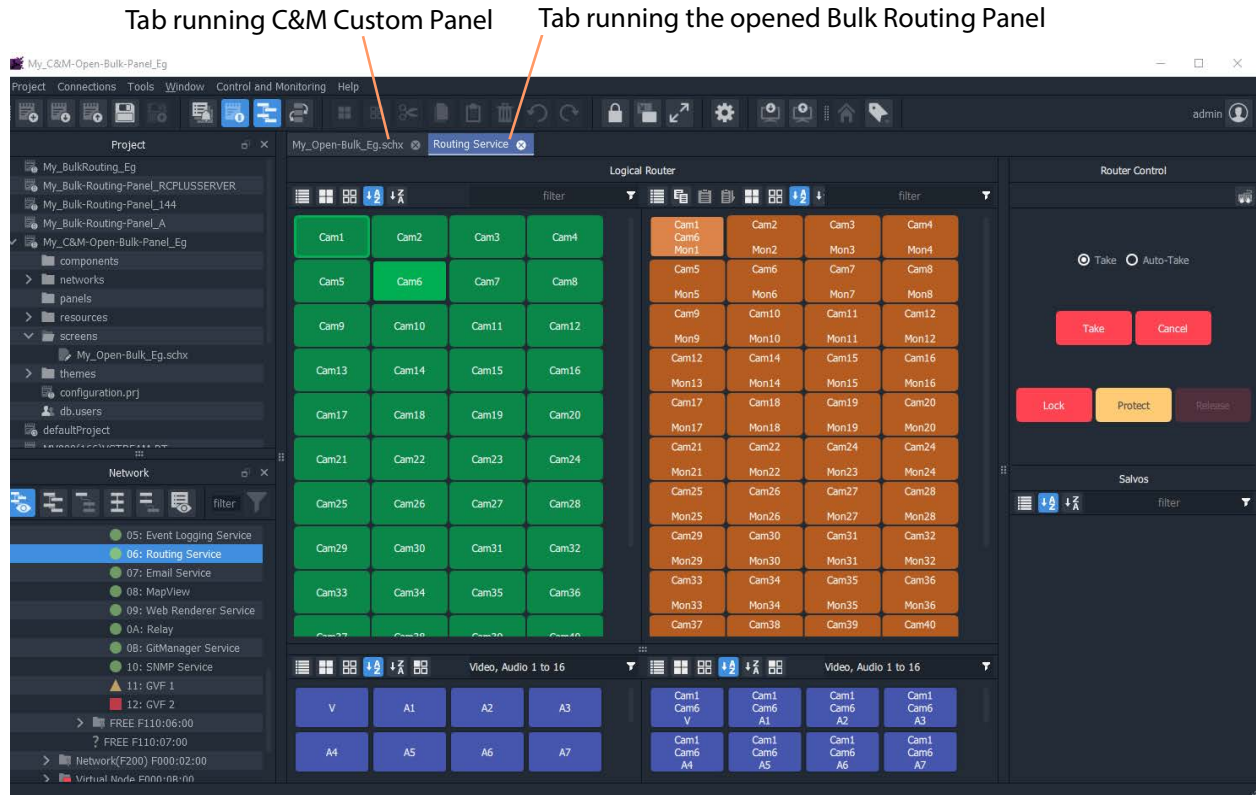
Fig. 12-96: Bulk Routing Panel Opened in a Tab

Routing Control - XY Routing Panel

Introduction

GV Orbit Client has user router control functionality and offers the following routing control panels:

- Routing Control - Bulk Routing Panel - a simple, non-editable soft panel for fast control of all router cross-points.
- Routing Control - XY Routing Panel (this chapter) - an editable and customizable soft panel, typically used for small custom panels for specific routing needs.

This chapter describes the **XY Routing Panel**.

GV Orbit System

Routing control panels connect to a GV Orbit Routing service running on a GV Orbit Server.
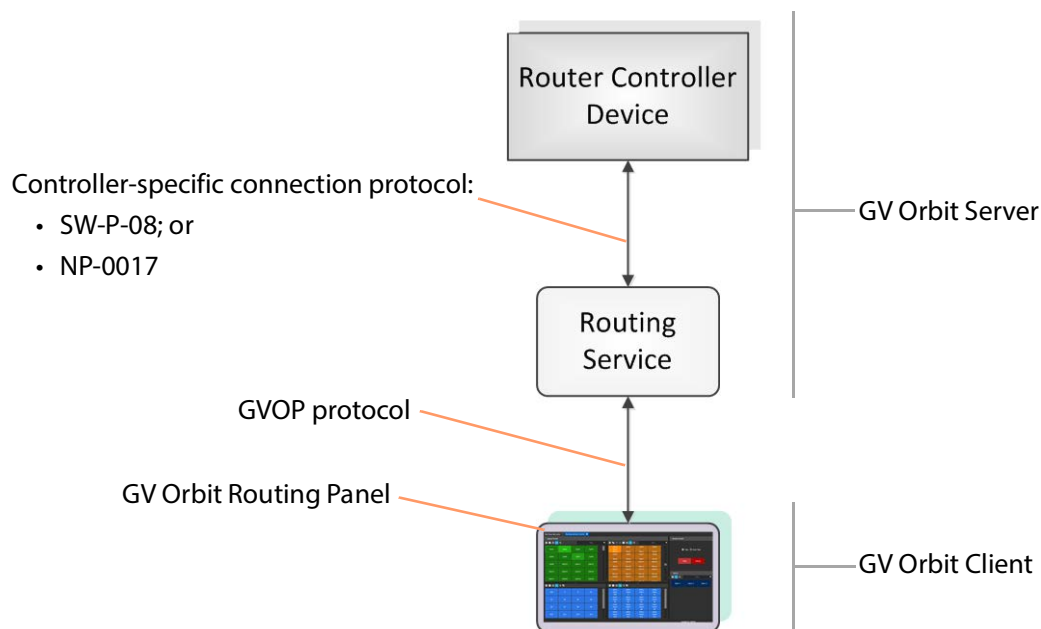
Fig. 13-1: GV Orbit Routing Panel, Routing Service and Router Controller

A GV Orbit system has one or more GV Orbit Servers which run GV Orbit services. Routing panels in a GV Orbit Client connect to a router controller device via the GV Orbit Routing service. Router controllers include GV Orbit itself, a Grass Valley Router Controller device, or GV Convergent. The Routing service provides source/destination information to the client and acts on routing commands from the client. See Figure 13-2.
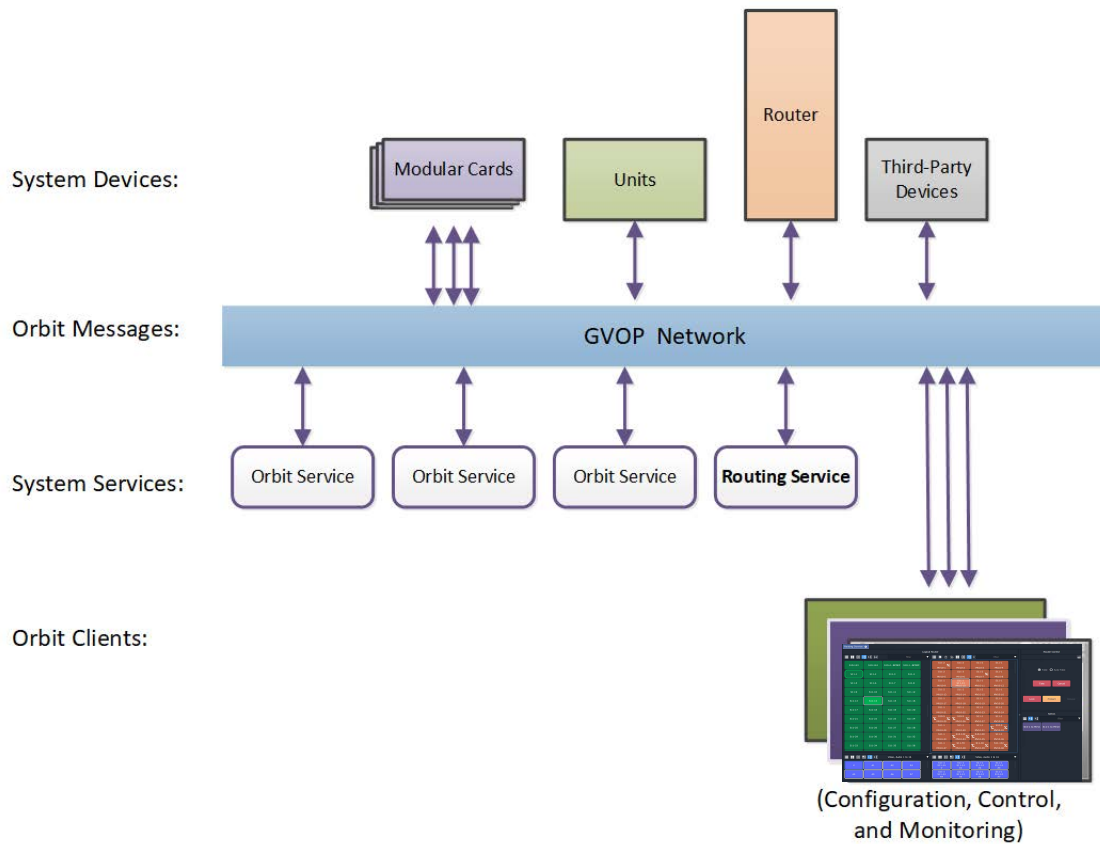
Fig. 13-2: GV Orbit System Diagram

Prerequisites

A GV Orbit Server is required, running:

- A GV Orbit Control application.
- A GV Orbit Routing service configured for connection to a Router Controller using either NP0017 or SW-P-08 protocol.

What is an XY Routing Panel?

An XY Routing Panel runs in the GV Orbit Client application. It is editable and customizable and is typically used for small, purpose-built routing panels for specific routing needs. It can be part of a custom soft user/operator panel in GV Orbit Client.

It can be created with a wizard and tailored to most needs. It is a flexible soft routing control panel which may be:

- Created with a wizard and used.
- Created and then edited for customized use.
- Created from scratch with the GV Orbit Client, in a similar way to a GV Orbit Client C&M project user/operator soft control panel.

XY panels can also be embedded in GV Orbit soft custom operator/user panels.
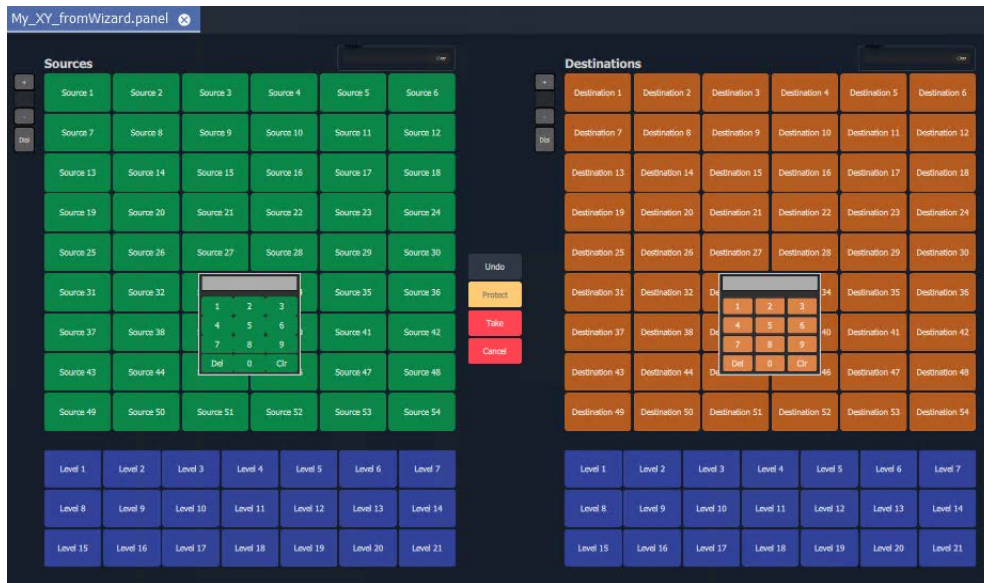
a) Example XY Routing Panel from the Wizard
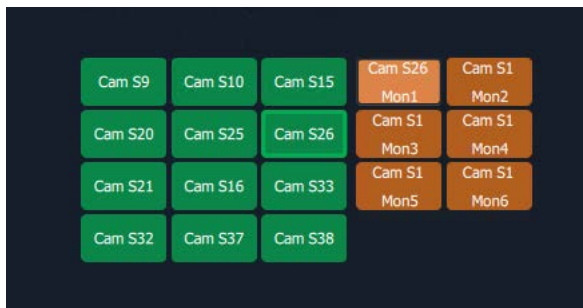
b) Example Customized XY Routing Panel
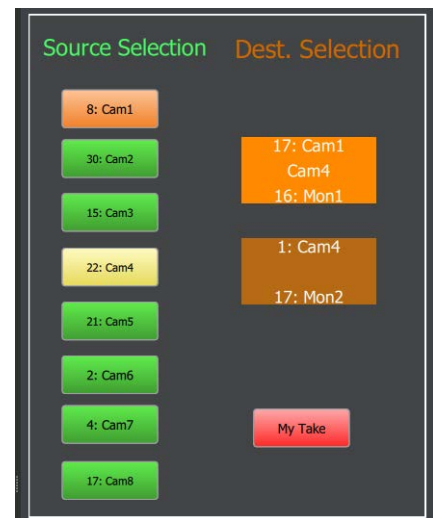
c) Example with Customized Layout

Fig. 13-3: XY Routing Panel Examples

Key Features

- X/Y panel wizard.
- Source and Destination filtering.
- Take, Auto-take, Cancel.
- Shuffles and Breakaways.
- Panel Lock.

- Customizable, editable.
- Source and Destination selection:
    - paged access to all ports; or
    - definable port-per-button.
    - Levels

This Chapter

This chapter describes:

How to Create a New XY Panel

One or more XY Routing Panels can be created in a GV Orbit C&M project.

XY Routing Panels are created in GV Orbit Client and stored in a 'panels' folder in the **Project** window. (If your project does not contain a 'panels' folder, see Creating a 'panels' Folder for Early GV Orbit Client Projects, on page 594 for instructions on creating one.)

For instructions on creating a new XY Panel, see Create a New XY Routing Panel, on page 595.

Creating a 'panels' Folder for Early GV Orbit Client Projects

Some early GV Orbit C&M projects *do not* contain a 'panels' folder in the **Project** window. If this is the case, then one may be created. See below.

If your project *does* have a 'panels' folder in the Project window, go on to Create a New XY Routing Panel, on page 595.

To create a missing 'panels' folder:

1　Open a C&M project in the GV Orbit Client application.

2　Right-click on the project name item in the **Project** window and select 'New Folder'.
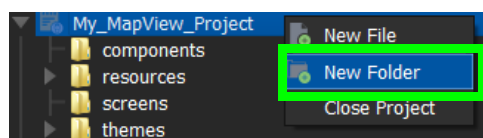
Fig. 13-4: Creating a New 'panels' Folder

3 Enter 'panels' as the folder name, and click **OK**.

A new folder called 'panels' is added into the **Project** window.
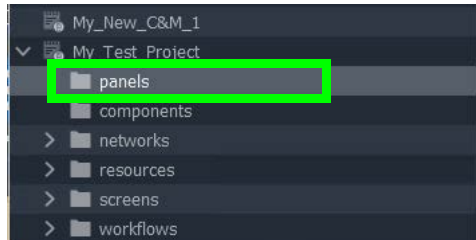
Fig. 13-5: New 'panels' Folder

4 Click **Save File**. Click **Save Project**.

This has created a default new 'panels' folder in the project.
Now go on to

> **Note:** A project folder named 'panels':
> - allows only files of type 'panel';
> - displays a 'New Panel' right-click menu item.
>
> The folder name is case-sensitive.

Create a New XY Routing Panel

To create an XY panel in a C&M project in the GV Orbit Client application:

1 Expand the project name in the **Project** window and look for the 'panels' sub-folder.

2 Right-click on the 'panels' folder and select 'New Panel'.
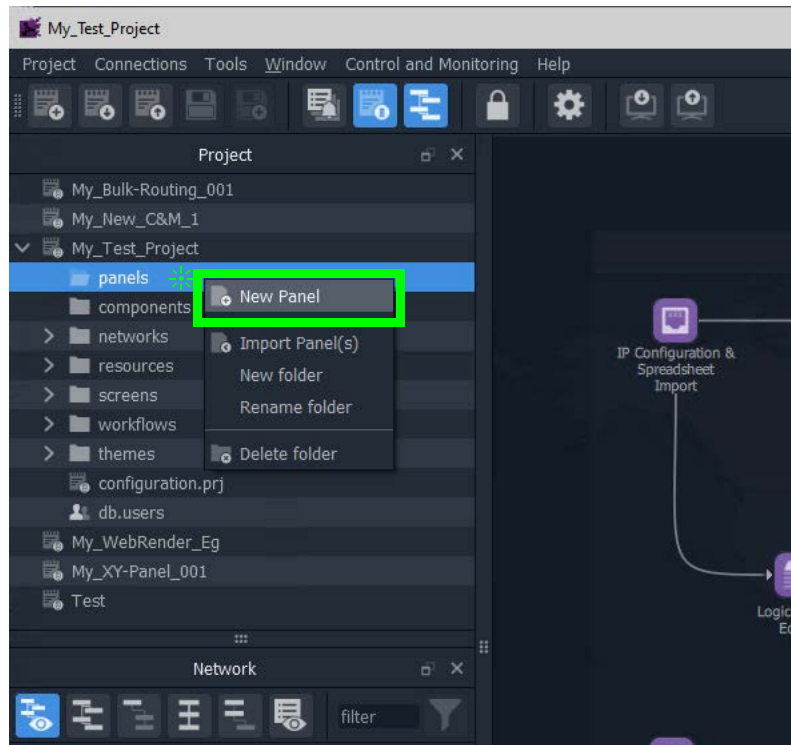
Fig. 13-6: Create a New XY Routing Panel

The **New X/Y Panel** dialog is shown.

3   Enter a name for the new XY Panel in the **New X/Y Panel** dialog.

4   And click **OK**.

A new panel item is then added into the 'panels' folder and a new generic XY Panel is shown in a tab.
Figure 13-7 shows an example with GV Orbit shown in 'Design Mode' (not 'Run Mode').

5   Click **Save File**. Click **Save Project**.

This has created a default new, generic XY Panel (see example in Figure 13-7) which is editable and customizable, see Customizing with the XY Wizard, on page 597. Various button types can be shown/hidden on the panel with the wizard.

GV Orbit Client shown in 'Design Mode'
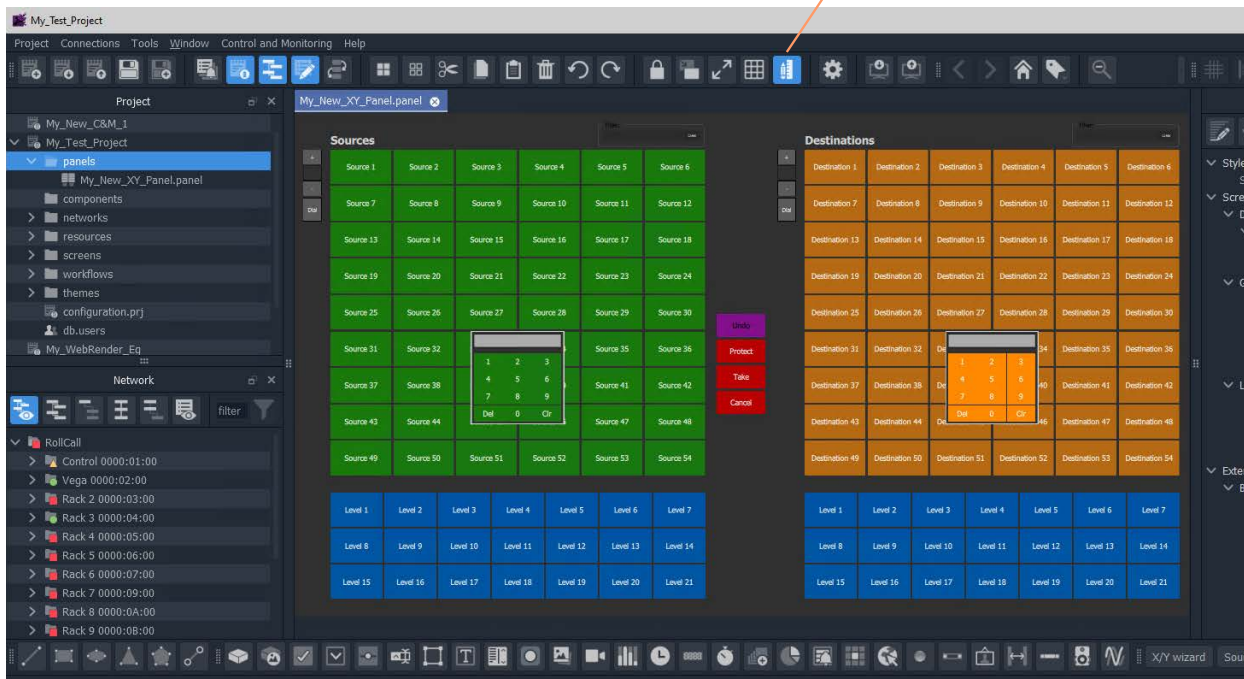
Fig. 13-7: Example New Generic XY Routing Panel

Customizing with the XY Wizard

A default new, generic XY Panel can be created which is editable and customizable. See How to Create a New XY Panel, on page 594. When an XY Panel is open in GV Orbit Client, the panel is editable with the client in 'Design Mode' (rather than in 'Run' mode).

Customizing may be done with the **XY Wizard** and editable items include the:

- panel size
- number of and arrangement of Sources/Destinations
- number of and arrangement of Levels
- enabling/disabling of other controls

Use the **XY Wizard** on new, generic XY Panels.

To Open the XY Wizard

To open the **XY Wizard** for an XY Panel:

1 Open the XY Panel and go to 'Design' mode in GV Orbit Client.
2 Click **XY Wizard** button. See Figure 13-8.

'Design' mode indicated

XY Panel open in GV Orbit Client
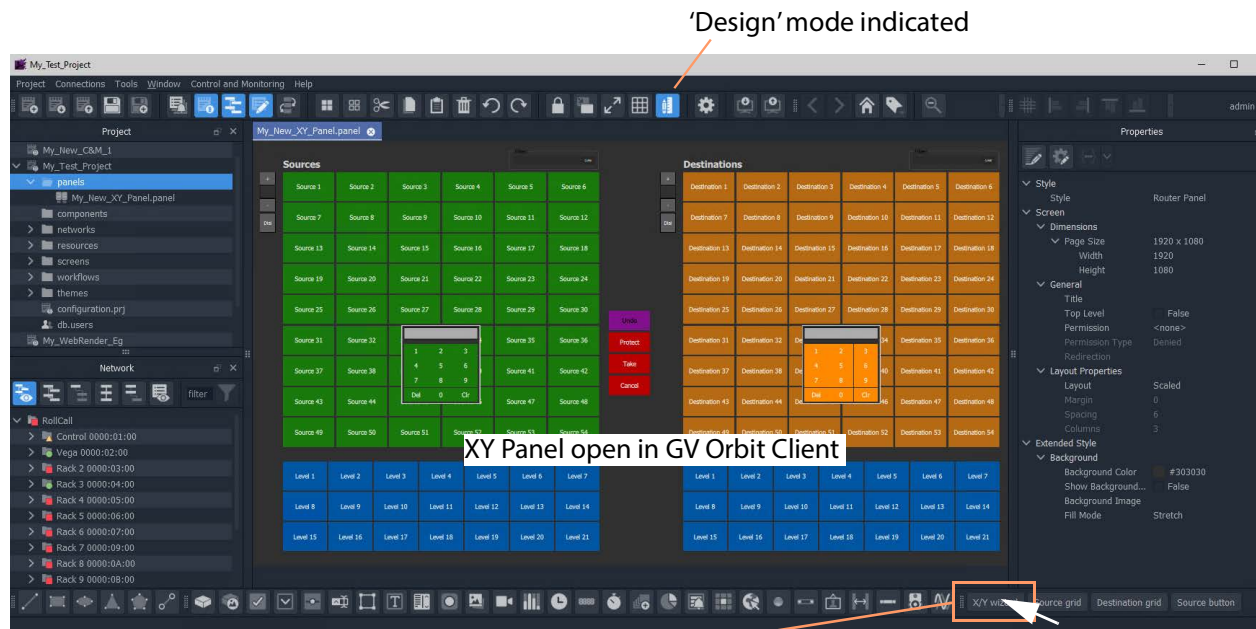
Click **XY Wizard** to open the **XY Wizard** dialog.

Fig. 13-8: XY Wizard Button

The **XY Wizard** dialog is displayed for editing the XY panel. For a new XY Panel, it is
generic XY panel settings that are shown selected. See Figure 13-9.
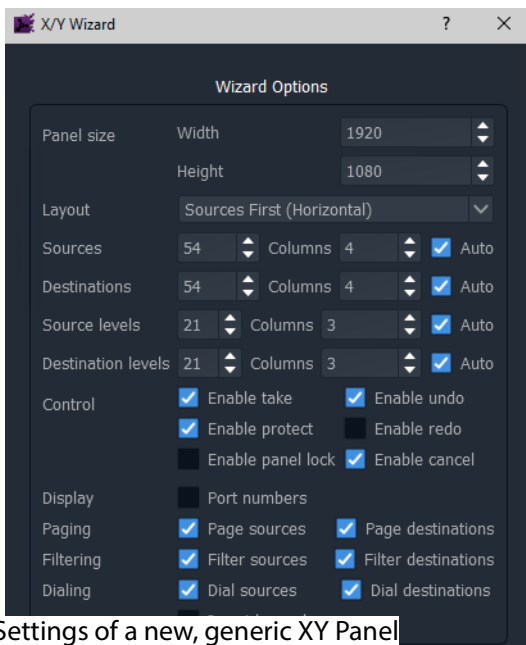
a) Settings of a new, generic XY Panel

b) Corresponding XY Panel

Fig. 13-9: XY Wizard Dialog (a) and Panel (b, New, Generic Panel Settings Shown)

Note:

Some settings are *not* currently applicable to a GV Orbit Client system, these include:

Undo, Re-do, Protect and Dial.

Recommendation:

Deselect these settings for GV Orbit Client systems. See Figure 13-10.

= Deselected for GV Orbit Client system cases

a) Deselected Settings for GV Orbit Client   b) Corresponding XY Panel
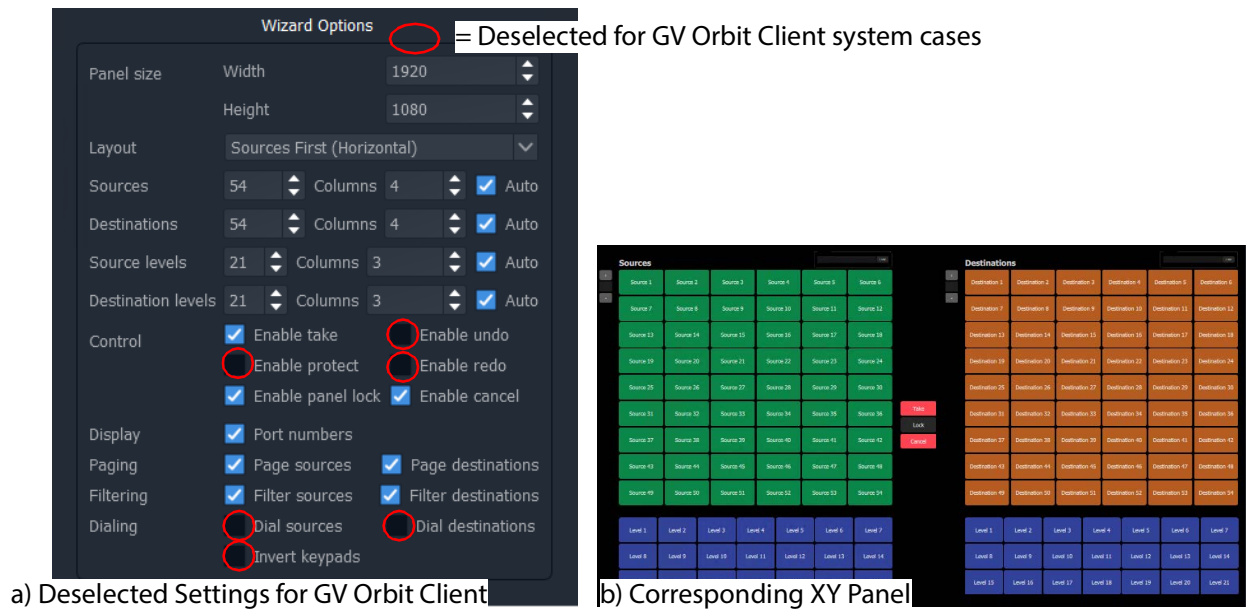
Fig. 13-10: XY Wizard Dialog and Panel (Deselected Settings Shown for a GV Orbit Client System)

3 Deselect the wizard options that are not applicable to GV Orbit Client. See Figure 13-10a.

The panel appearance changes in response to the settings changes as they are made. See Figure 13-10b.

For the remaining settings, these may be selected/deselected and configured as required:

4 Change the XY panel setting as required.
(See XY Wizard Settings and Table 13-1 for descriptions of each **XY Wizard** setting.)

The panel appearance changes in response to the settings changes as they are made.

5 Close the **XY Wizard** dialog when finished changing settings.
(This dialog can always be re-opened if required.)

6 Click **Save File**. Click **Save Project**.

The modified XY Panel has been saved.

XY Wizard Settings

Table 13-1: XY Wizard Dialog Settings
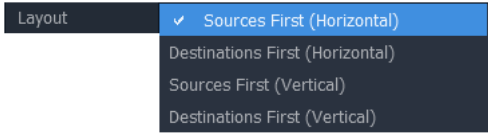
Item	For GV Orbit Client	Description
Panel Size:		Sets the overall size of the XY Panel (in pixels).
		Normally, set this to be the size of the monitor used to display the panel.
Width	✔	Text box. Enter the panel screen width (pixels). Default = 1920.
Height	✔	Text box. Enter the panel screen height (lines). Default = 1080.
Layout	✔	Select the left-right/top-bottom layout arrangement of the Source/Source-level and Destination/Destination-level grids:
Sources **Destinations** **Source Levels** **Destination Levels**		For selection buttons on the XY panel:
	✔	Text box. Select the number of items to control. (Sources, Destinations, etc.)
Columns	✔	Text box. Select the number of columns used to display items.
Auto	✔	Check box. • Select to automatically arrange the items in columns.
Control:		Enable various 'Routing Control' controls.
		Note: Some items do not apply to GV Orbit Client systems and should be deselected.
Enable Take	✔	Check box. • Select to enable a **Take** button.
Enable Undo	✘	This does not apply to GV Orbit Client systems. Check box. • Select to enable an Undo button. • Deselect for GV Orbit Client systems.

Table 13-1: XY Wizard Dialog Settings (continued)

Item	For GV Orbit Client	Description

Enable Protect	✖	This does not apply to GV Orbit Client systems.
		
		    Check box.
		      • Select to enable a Protect button.
		      • Deselect for GV Orbit Client systems.

Enable Redo	✖	This does not apply to GV Orbit Client systems.
		
		    Check box.
		      • Select to enable a Redo button.
		      • Deselect for GV Orbit Client systems.

Enable Panel Lock	✔	Check box. • Select to enable a **Panel Lock** button.
Enable Cancel	✔	Check box. • Select to enable a **Cancel** button.
Display:		
Port Numbers	✔	Check box. • Select to show router port numbers on Source/Destination selection buttons.

Paging:		The Source selection and Destination selection button-grids can be independently configured for either:
		  • paging through all of the respective router sources/destination ports; or for
		  • accessing a specific router source/destination port per button.

Page Sources	✔	Check box.
		
		Control Source button-grid configuration:
		  • Select for 'Paged':
		    Paged Source port selection. Button-grid gives paged access to all router Sources, indexed.
		    See Paged Ports, on page 605.
		  • Deselect for 'Port-per-Button':
		    A 'fixed' specific Source port is assignable per button. Each button accesses a specific Source port, non-indexed.
		    See Port-per-Button, on page 605.

Table 13-1: XY Wizard Dialog Settings (continued)

Item	For GV Orbit Client	Description

Page Destinations	✔	Check box.
		
		 Control Destination button-grid configuration:
		 • Select for 'Paged':
		   Paged Destination port selection. Button-grid gives paged access to all router Destinations, indexed. See Paged Ports, on page 605.
		 • Deselect for 'Port-per-Button':
		   A 'fixed, specific Destination port is assignable per button. Each button accesses a specific Destination port, non-indexed. See Port-per-Button, on page 605.

Filtering:		
Filter Sources	✔	Check box. • Select to show Sources filter control.
Filter Destinations	✔	Check box. • Select to show Destinations filter control.
Dialing:		For dial-up selection of a Source or a Destination via its router port number. **Note:** Dialing does not apply to GV Orbit Client systems and these controls should be deselected.

Dial Sources	✖	This does not apply to GV Orbit Client systems.
		   Check box.
		     • Select to show Sources dial-up controls.
		     • Deselect for GV Orbit Client systems.

Dial Destinations	✖	This does not apply to GV Orbit Client systems.
		   Check box.
		     • Select to show Destinations dial-up controls.
		     • Deselect for GV Orbit Client systems.

Invert Keypads	✖	This does not apply to GV Orbit Client systems.
		   Check box.
		     • Select to show Dial-up numeric keypads with 7,8,9 on top row.
		     • Deselect to show 1,2,3 on top row.

XY Panel Layout

The layout and controls of a newly-created XY Panel are shown in Figure 13-11.

Fig. 13-11: Example New XY Panel Layout

An XY Routing Panel is designed in and run from the Client application. Figure 13-11 shows a view of the XY Panel in 'Design Mode' and Figure 13-12 shows an annotated view in 'Run' mode.

The panel is laid out with the following main grids/areas (see Figure 13-12):

- **Source Grid** – Sources are presented here, configurable in the XY Wizard to be a:
  - Paged list of all available sources.
  - Sub-set of defined sources.
- **Source Levels Grid** – List of available levels for selected source(s).
- **Destination Grid** – Destinations are presented here, configurable in the XY Wizard to be a:
  - Paged list of all available destinations.
  - Sub-set of defined destinations.
- **Destination Levels Grid** – List of available levels for selected destination(s).
- **Routing Controls** – Buttons are configured as shown/hidden in the **XY Wizard**, and include: 'Undo', 'Redo', 'Protect', 'Take', 'Panel Lock' and 'Cancel'.

Source grid paging control   Sources filter box   Destination grid paging control   Destinations filter box

Shown when a Source is selected   Shown when a Destination is selected

Click to toggle
Source Port Dial Grid
on/off.

Note: Dial Grids are *not* applicable to GV Orbit
Client systems.

Click to toggle
**Destination Port
Dial** Grid on/off.

Button face legend:

(1) Destination selected.

(2) Currently-routed **Source** shown.

(3) New **Source** pre-selected.

(4) Click **Take** to make route.

Buttons show names and router port numbers.,see Figure 13-15.

Fig. 13-12: New XY Panel Layout and Controls (Annotated, 'Run' Mode)

Note: The following controls on a newly-created XY Panel are *not* applicable
to GV Orbit Client systems:

• Undo, Re-do, and Protect buttons; and

• Source and Destination Dial Grids.

Source and Destination Selection Button-Grids

The Source and Destination button-grids can be independently configured with the XY Wizard Settings for either:

- Paged Ports operation; or for
- Port-per-Button operation.

When an XY Panel is running, buttons are annotated to reflect the source/destination names, see Source/Destination Button Annotations.

Paged Ports

A Source or Destination button-grid can be configured for paging through all of the respective router sources/destination ports. (Configuration is done in the XY Wizard Settings.)

Figure 13-13 shows a running example XY Panel with 12-button button-grids configured for 'paged ports' operation. Each paged button grid has paging controls to access all router ports (source or destinations accordingly). Page 1 starts at port 1 and shows consecutive ports on the button grid buttons.

Paging controls

Fig. 13-13: Example Paged Ports Button Grid

Port-per-Button

A Source or Destination button-grid can be configured for accessing a 'fixed', specific router source/destination port per button. (Configuration is done in the XY Wizard Settings, on page 600.)

Figure 13-14 shows an example XY Panel with 12-button button-grids configured for 'port per button' operation. There is no paging here.

The example XY Panel is shown both in 'Design' mode and in 'Run' mode. This example has an initial, default assignment (from the XY Wizard) of ports-to-buttons, where buttons in each grid access ports starting from 1 onwards.

Each button can be further configured to access a specific port, as required. See Assigning Port-per-Button, on page 621.
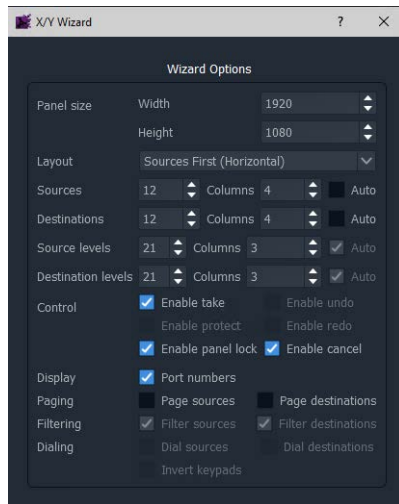
a) Wizard settings used in the example here
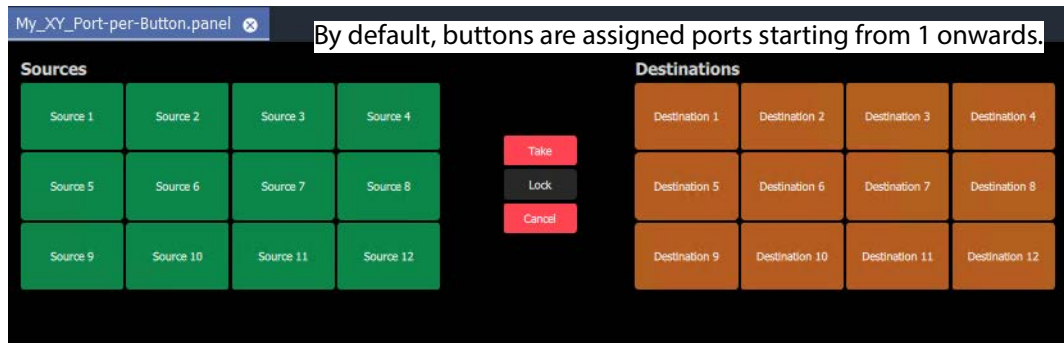
b) Example XY Panel, Port-per-Button, 'Design' mode
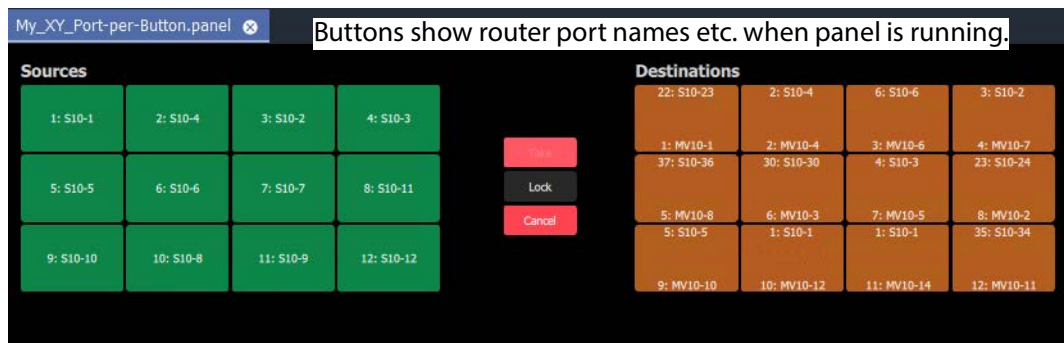
c) Example XY Panel, Port-per-Button, 'Run' mode

Fig. 13-14: Example Port-per-Button

Source/Destination Button Annotations

The source/destination selection and source/destination level selection buttons in 'Run' mode are annotated to reflect the source/destination name or level name etc. when the panel is running.

Additionally, when making a route, the selected destination button shows the currently-routed source and the current (pre-)selected source for that destination.

Buttons can be configured to show router port numbers and port names, see XY Wizard Settings, on page 600.

Figure 13-15 shows button-face annotations.
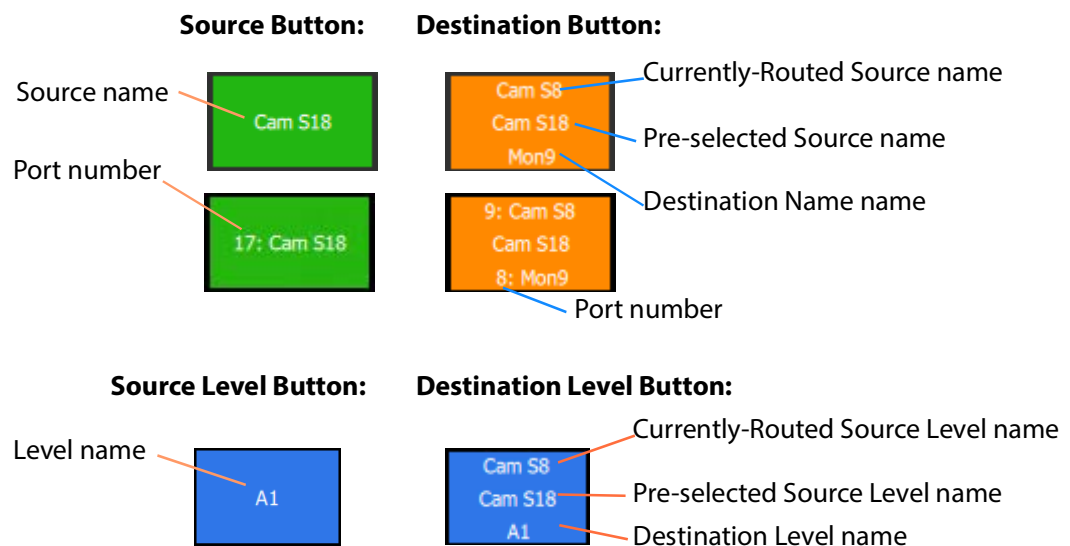
Fig. 13-15: XY Panel Buttons on a Running XY Panel

Routing Control Buttons

> Note: **Undo**, **Redo**, **Protect** functions are not currently available in an XY Panel for GV Orbit systems. (Use the Bulk Routing Panel for these functions.)

Depending on the settings in the XY Wizard, the Routing Control section of the panel contains:

- **Take** button.

  Click to make a route to the selected Destination from a pre-selected Source.

- **Cancel** button.

  Click to deselect all Destinations and Sources.

- **Lock** button.

  Click to lock the XY panel controls. Click again to unlock.

XY Routing Panel- Operational Keys

Table 13-2: XY Panel Operational Keys

Operation	Mouse
Select	Mouse click on a Source or Destination.
Select a Range	Mouse click on first item then SHIFT click on last item.
Add to/remove from a multiple selection	CTRL + Mouse click
Paste Series	Click 'Paste Series' icon in panel.
Take	Double-click on pre-selected Source; or click Take button.
Cancel	Click 'Cancel' button.

XY Panel Level Selection

When a source or a destination is selected, the associated levels are shown in the corresponding 'Levels Grid' panel. If multiple sources or destinations are selected, then only their *common* levels are shown.

All levels are selected by default. If you select one or more levels, then all other levels are deselected.

XY Panel Right-Click Menus

Right-click on background of a XY Routing Panel to show a drop-down context menu. See Figure 13-16.

a) In 'Run' mode'　　　　　　　　　　　　　　b) In 'Design' mode
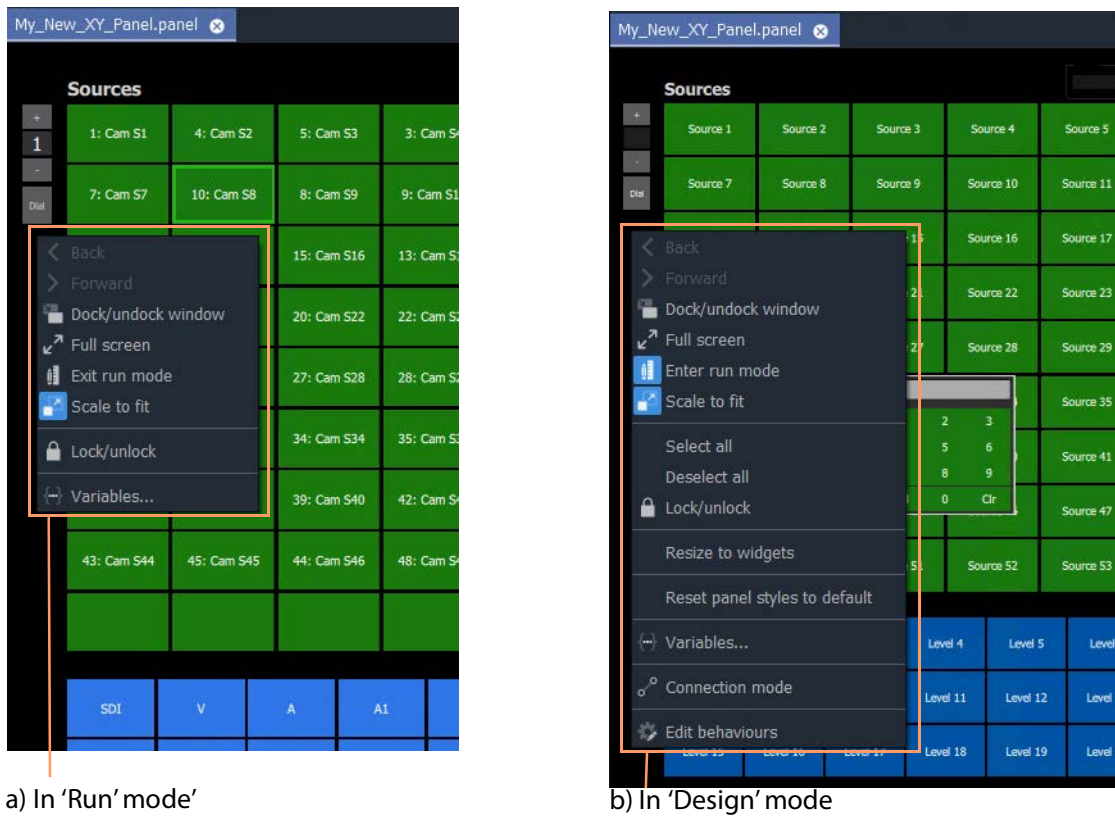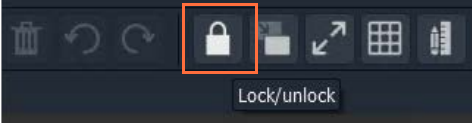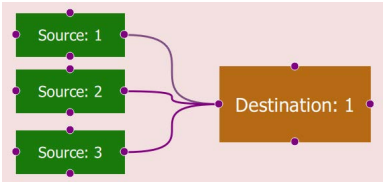
Fig. 13-16: XY Panel Background Right-Click Menu: a) in 'Run' Mode; b) in 'Design' Mode.

Table 13-3: XY Panel Right-Click Menu Items

Item	Shown in		Description
	'Run' Mode	**'Design'** Mode	
Dock/Undock Window	✓	✓	Undock or dock the XY Routing Panel window from the GV Orbit Client window.
Full Screen	✓	✓	Show the XY Routing Panel window full-screen. When full-screen, right-click > **Exit Full Screen**.
Exit Run Mode	✓		Click to exit 'Run' mode and enter GV Orbit 'Design' mode.
Enter Run Mode		✓	Click to enter GV Orbit 'Run' mode.
Scale to Fit	✓	✓	Click to fit the panel to the window.
Select All		✓	Selects all items.
Deselect All		✓	Deselects all items.

Table 13-3: XY Panel Right-Click Menu Items (continued)

Item	Shown in		Description
	'Run' Mode	'Design' Mode	
Lock/unlock	✔	✔	Click to toggle locking/unlocking the panel. When the panel is locked, user operation is disabled. **Note:** Clicking the 'Lock' icon in the GV Orbit Client main tool bar also toggles panel lock.
Resize to Widgets		✔	Click to resize the XY panel background to fit to its constituent widgets.
Reset Panel Styles to Default		✔	Click to set widget styles all to 'default'.
Variables...	✔	✔	Click to show the **Variables** dialog. **Note:** The **Variables** dialog is *not editable* in 'Run Mode'.
Connection Mode		✔	**Note:** This item is a generic widget feature, not routing-specific. Widget feature: When designing C&M project screens or XY Panels, the graphical widgets used may be shown to be visually connected together by a curved line. Click **Connection Mode** to show connection points on the widgets.
Edit Behaviours		✔	Click to toggle showing the Behaviours and Bindings graphical editor.

Getting XY Routing Panel Running

When an XY Panel runs on the GV Orbit Client in a C&M project, it controls signal routing via the **Routing** service running on a GV Orbit Server.

What is a Routing Service?

As part of setting up a GV Orbit Client system, a **Routing** service must be configured with a RollCall address and a GVOP domain, and started up to run on a GV Orbit Server. The **Routing** service uses its RollCall address and is visible in the **Network** window of a GV Orbit Client and see Figure 13-17.

Right-click and select 'Info' to see details of the Routing service item
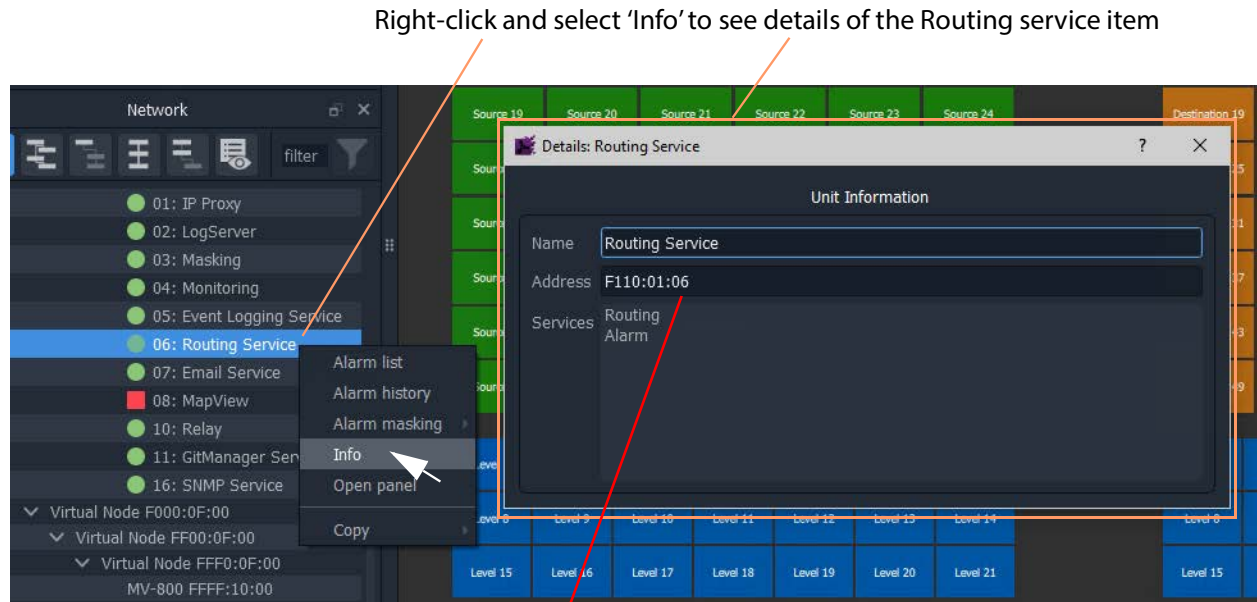
Routing service RollCall address'.
To copy this address, right-click in **Network** window and select 'Copy > Address'.

Fig. 13-17: Routing Service in Network Window

Note: The GVOP domain of the GV Orbit C&M project and the GVOP domain of the Routing service must be the same.

How to Connect an XY Panel to a Routing Service

Automatic Setup

To run in GV Orbit Client, an XY Panel must point at a **Routing** service on a GV Orbit Server. This is usually automatically set up for you, including:

• GV Orbit Client C&M project GVOP domain the same as the Routing service. This should be set automatically.

(To see the project's GVOP domain number, go to the main menu item 'Connections > GV Orbit Server', and look at the 'Client domain' setting. Edit the domain number here if required.)

- XY Panel set with a RollCall address of the **Routing** service. This should be set automatically.
  To do this, the XY Panel's 'Address' variable must be set to be the RollCall address of the target **Routing** service.

Manual Setup

To manually set up the XY Panel to point at a **Routing** service:

1 In the **Network** window, right-click on the **Routing** service item, and select 'Copy > Address'.

   This copies the RollCall address of the service into your copy buffer.

2 Go to the XY Panel and right-click on the XY Panel background and select 'Variables...'.

   The **Variables** dialog is shown. See Figure 13-18.

Paste copied address into 'Address' value field
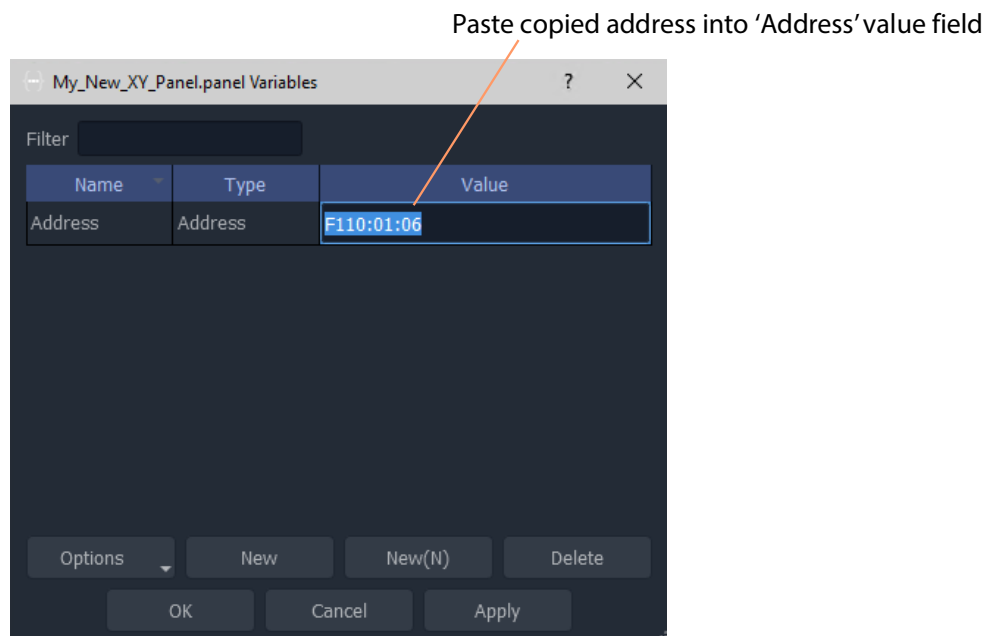
Fig. 13-18: Setting Routing Service RollCall Address for XY Panel

3 In the **Variables** dialog,
   paste in the copied RollCall address into the value of the 'Address' variable.
   See Figure 13-18. (Alternatively, simply enter the address manually.)

4 Click **OK**.

5 Click **Save File**. Click **Save Project**.

This has manually pointed an XY Panel at a **Routing** service.

To Run an XY Panel

When an XY Panel runs, it connects to the **Routing** service and collects routing information and data (Source names/port numbers, Destination names/port numbers, routed source names etc.) and populates the panel buttons with names and router port numbers etc.

To run an XY panel:

1   Open the panel in GV Orbit Client and click on the 'Run' mode/'Design' mode main tool
    bar icon to enter 'Run' mode. See Figure 13-20.

Click to enter 'Run' mode (from 'Design' mode)'   Buttons show actual source and
                                                          destinations name s etc.
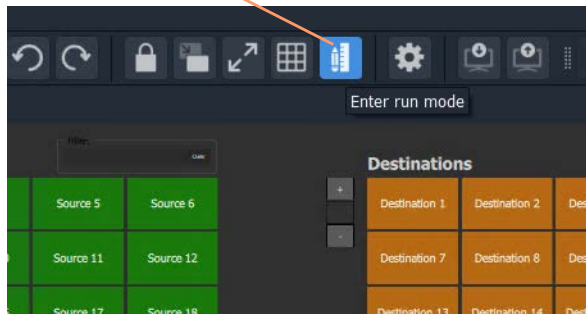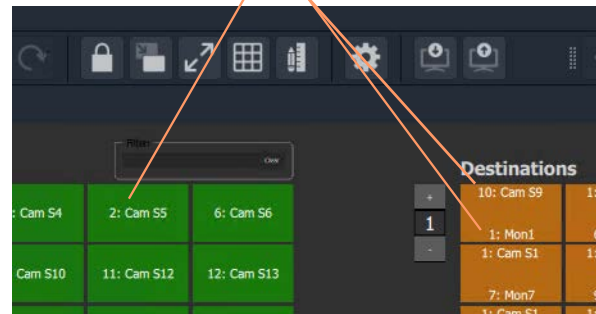
a) XY Panel in 'Design' mode   b) XY Panel in 'Run' mode

Fig. 13-19: Enter Run Mode

The XY Panel run and connects to the **Routing** service and gets source and Destination
names etc. See Figure 13-20.

(1) Destination selected.
(2) Current Source shown.
(3) New Source pre-selected.
(4) Click **Take** to make route.
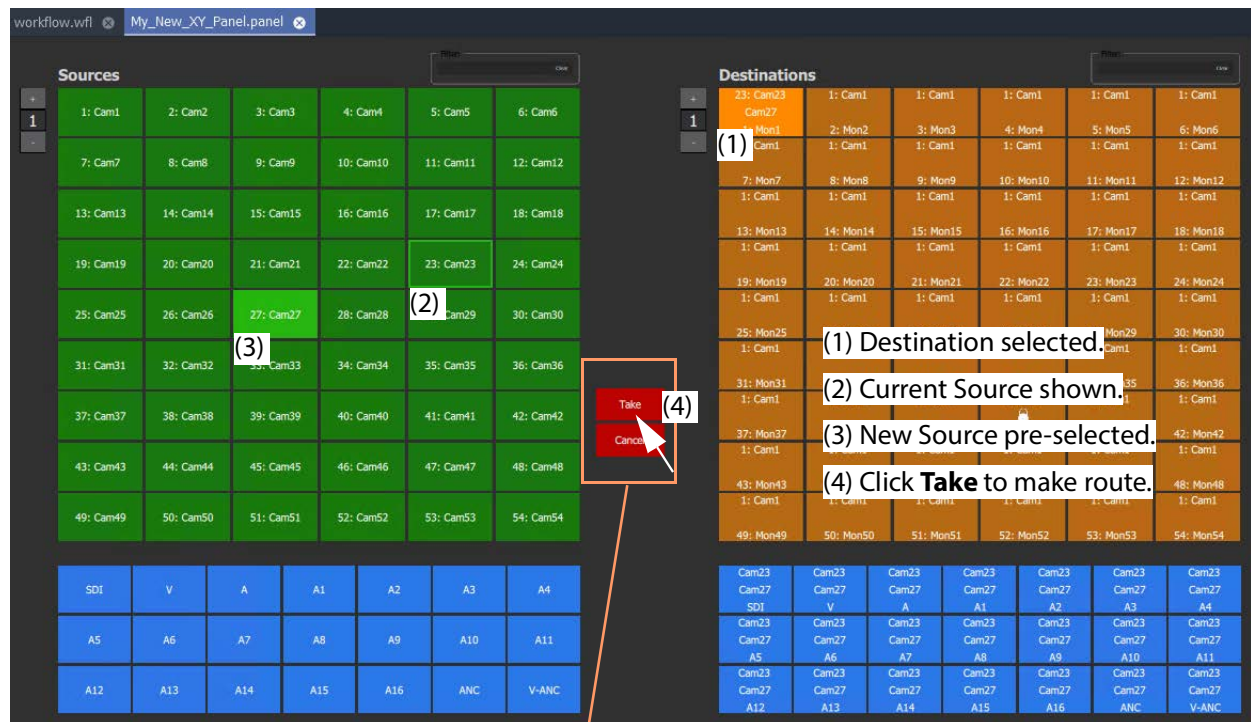
Note: Routing Control buttons can be shown/hidden with the XY Wizard tool.
(See Customizing with the XY Wizard, on page 597.)

Fig. 13-20: Running XY Panel Example

XY Panel Operation

Make a Simple Route with an XY Routing Panel

Simple Route

To make a simple route:

1　Select a **Destination**.

　　The currently-routed Source is shown.

2　Select a **Source**.

　　The pre-selected Source is shown.

3　Click **Take**. (Click **Cancel**, to deselect the source/destination.)

　　The selected source is routed to the selected destination. The route is made.

Alternatively, select the **Source** first.

1) Select **Destination**

Currently-routed Source is shown.

2) Select **Source**

3) **Take**

Fig. 13-21: Making a Simple Route

Route One Source to Multiple Destinations

1 Select a **Destination** by clicking on the destination selection button.

2 Select a second **Destination** by CTRL + clicking on a destination button.

3 Select further destinations with CTRL + click.

4 Select one **Source**.

5 Click **Take**.

The source is routed to all selected destinations.

> **Note:** A contiguous range of Destinations (or Sources) can be selected by clicking the first Destination (or Source) in the range and then SHIFT-click on the last Destination (or Source) in the range.

Pre-selected **Source**

Selected **Destinations**

Currently-routed **Sources** shown

Routed result
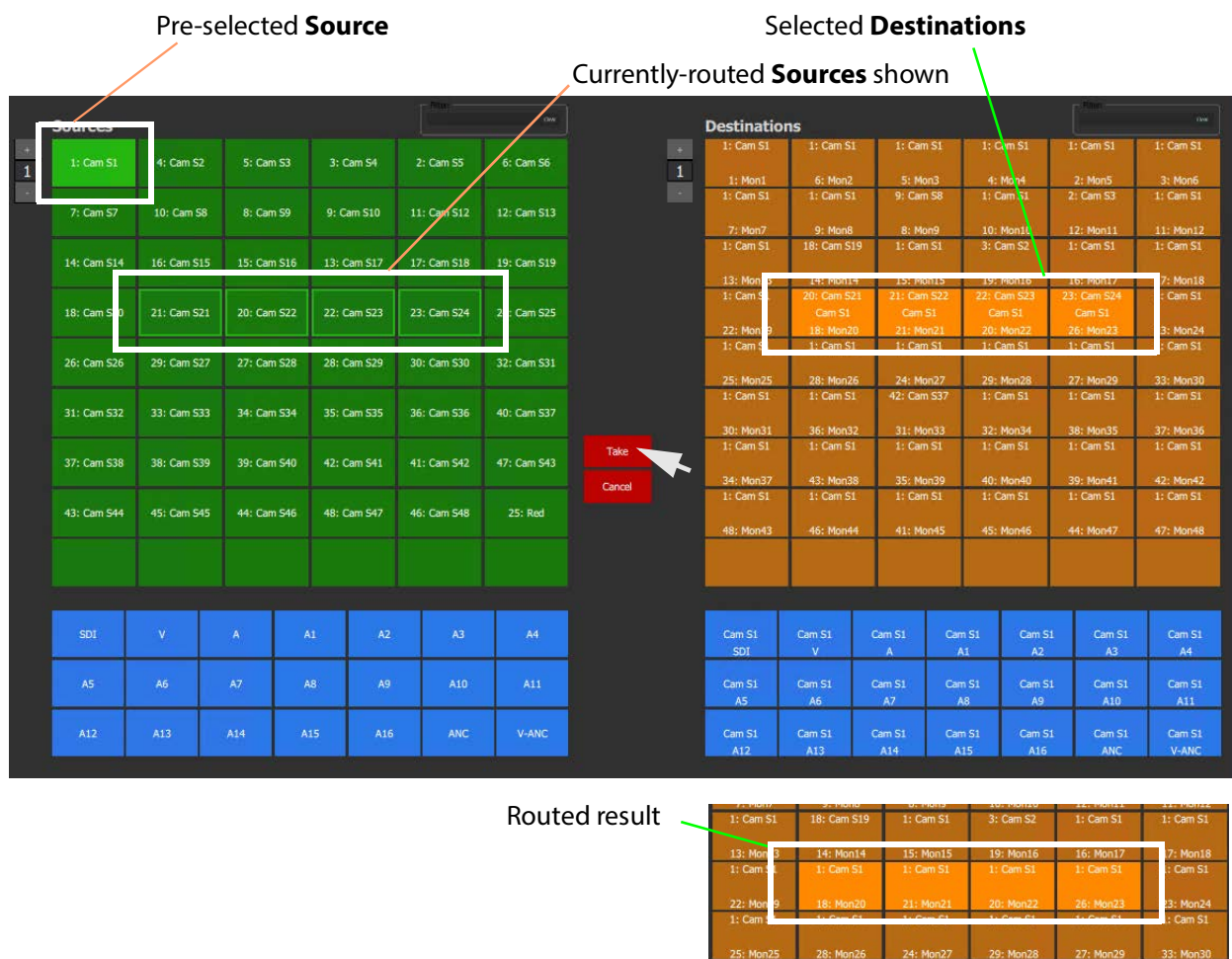
Fig. 13-22: One Source Routed to Multiple Destinations

Alternatively, the source may be selected first.

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Route Multiple Sources to Multiple Destinations

1 Select a **Destination** by clicking on the destination selection button.

2 Select a second **Destination** by CTRL + clicking on a destination button.
And select any further destinations with CTRL + click.

3 Select a **Source** by clicking on the source selection button.

4 Select a second **Source** by CTRL + clicking on a source button.
And select any further sources with CTRL + click.

> **Note:** Select the same number of sources as there are selected destinations.

5 Click **Take**.

The source is routed to all selected destinations.

Fig. 13-23: Making Multiple Routes

Alternatively, the **Sources** may be selected first.

> **Note: Source** or **Destination** CTRL-selection Order:
>
> When routing many sources to many destinations and making selections with CTRL-clicks, then the *order of selection* is significant and affects the order in which the routing is done. For example, to route sources 1 to 8 to destinations 8 to 1:
>
> - Select **Destinations** 1 to 8 by 'CTRL-clicking' on each button in the order 1 to 8.
> - Select **Sources** 8 to 1by 'CTRL-clicking' on each button in the order 8 to 1.
> - Click **Take**.
>
> **Note:** With the contiguous SHIFT-selection, the order used is that of the buttons on the panel, *not* the order of selection of buttons.

Breakaway

What is a Breakaway?

See for an explanation of a breakaway.

> **Note: Implied Breakaway:**
> A 'breakaway' occurs when not all of a destination's levels are selected for routing. This can happen if a source with *fewer* levels than the selected destination is routed, this will result in a 'breakaway' (without explicitly selecting destination levels when routing).

> **Note:**
> Performing a 'normal' route to a Destination which already has a 'Breakaway' will over-ride the breakaway on the Destination, resulting in no 'Breakaway'.

Perform a Breakaway

To perform a breakaway (see Figure 13-24):

1 Select a **Destination**.
2 Select one or more **Destination Levels** to route (for example, audio channels A1 and A2).
3 Select a new **Source**. (Pre-selected source)
4 Click **Take**.

A routing is made: The selected **Destination Levels** have corresponding levels from the preselected **Source** routed to them. See Figure 13-24b.
The **Destination** button shows a 'Breakaway' symbol.

Selected **Destination**

Selected **Destination Level(s)**

Currently-routed **Source** shown

Pre-selected **Source**

a) Before TAKE

Take

Breakaway symbol shown on button

Audio channels shown routed from another **Source**
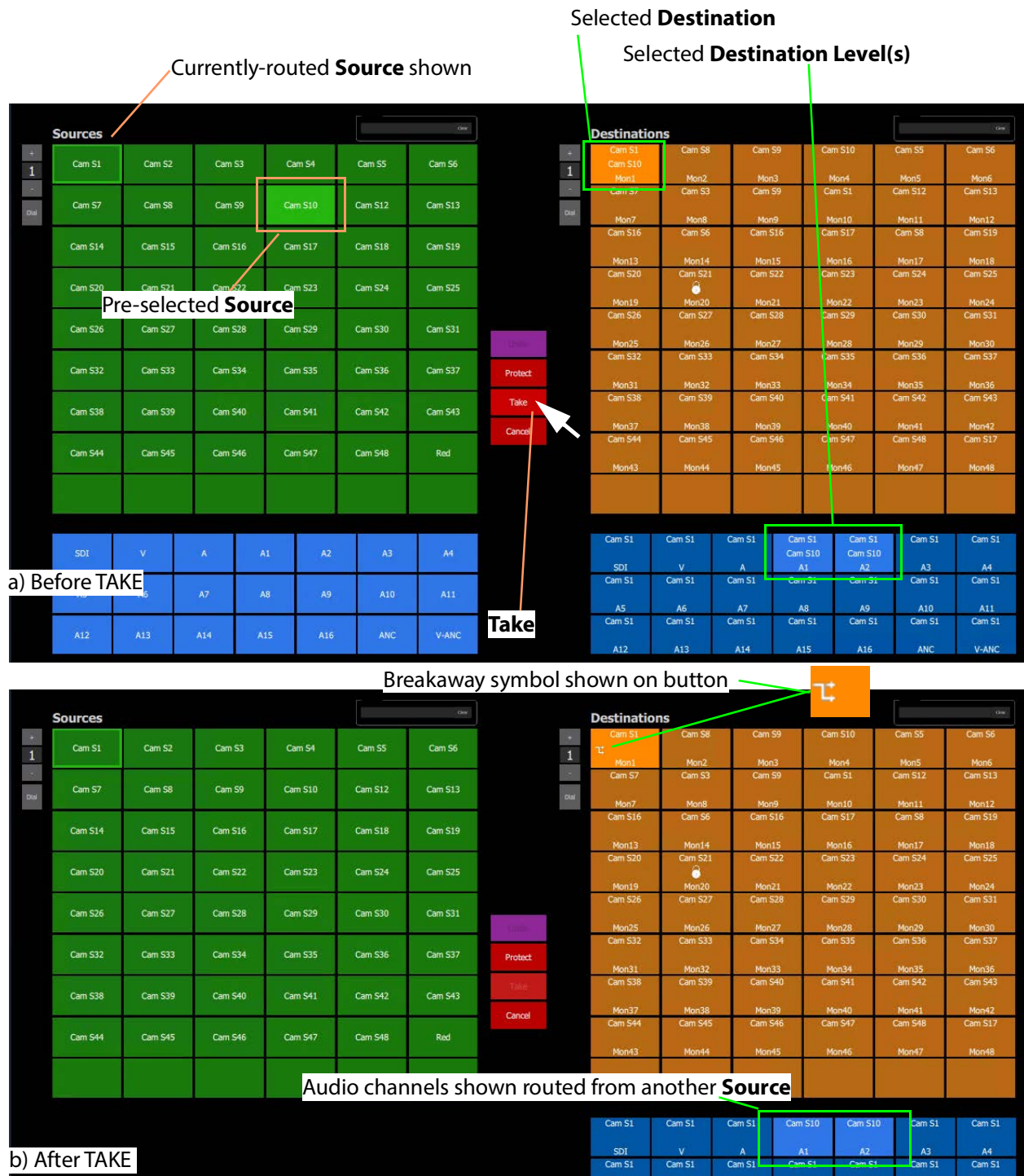
b) After TAKE

Fig. 13-24: Breakaway Example: a) Before TAKE; b) After TAKE.

As an alternative, to perform a breakaway, the source may be selected first.

Shuffle

What is a Shuffle?

See for an explanation of a shuffle.

> **Note:** A shuffle is applied to a destination and stays with that destination when other routes are made to it until the shuffle is explicitly undone.

Example Shuffle

This example swaps two audio channels pairs.
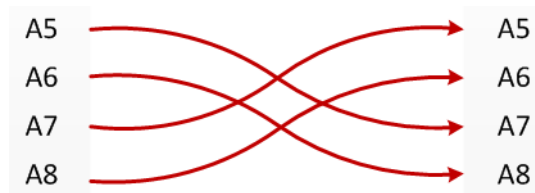
Fig. 13-25: Swap Two Audio Channel Pairs

1 Select a **Destination**.
2 Select one or more **Destination Levels**. (For example, click on audio channels A5, A6, A7 and A8. See Figure 13-26.)
3 Select the *currently-routed* **Source**.
4 Select the **Source Levels** in the *order* in which they shall apply to the destination Levels.
   (For example, audio channels A7, A8, A5 and A6 *in that order.*)

> **Note:** Selecting just one level will route this to all selected destination levels.

5 Click **Take**.

   The selected source levels are routed to the selected destination levels and a shuffle is formed. Figure 13-26 shows a shuffle example, swapping the order of two audio channel pairs, as per Figure 13-25.

Select the currently-routed **Source**

Select **Source Levels** A7, A8, A5 and A6 *in that order.*

Selected **Destination**

Selected **Destination Level(s)** A5 to A8

a) Before TAKE

Take

'Shuffle' symbol shown on button

b) After TAKE

A5 → A5
A6 → A6
A7 → A7
A8 → A8

Audio channels shown shuffled

Fig. 13-26: Shuffle Example: a) Before TAKE.   b) After TAKE.

Routing to a Shuffled Destination

When routing to a shuffled **Destination**, the 'Shuffle' persists.

For example, when a routing Source 'Cam S10' to the already-shuffled destination 'Mon1', created in Example Shuffle, the Source is routed and the audio stereo pair swapping of Figure 13-25 still exists (but with the new source).

A 'Shuffle' persists on a **Destination** until it is explicitly undone with a new routing operation.

Undo Shuffle

This example describes a new routing operation to undo the shuffle of the Example Shuffle, on page 619.

1 Click **Cancel** to cancel any selections already made.

2 Select the 'already-shuffled' **Destination**.

3 Select the shuffled **Destination Levels**.

4 Select the currently-routed **Source**.

5 Select the **Source Levels** in the *order* in which they shall apply to the **Destination Levels**.
   So, to undo our Example Shuffle, on page 619,
   select audio channels A5, A6, A7 and A8 *in that order*.

6 Click **Take**.

   The selected **Source Levels** are routed to the selected **Destination Levels**, undoing the shuffle. The 'shuffle' symbol no longer appears on the **Destination** button.

Assigning Ports to a Port-per-Button XY Panel

When creating an XY Panel, a Source button-grid or Destination button-grid can be defined for accessing a 'fixed', specific router source/destination port per button. (This 'fixed' definition is done in the XY Wizard Settings.)

Following definition with the XY Wizard, each button of a 'port-per-button' button-grid then can be configured to access a specific port. This port assignment is described here.

Assigning Port-per-Button

Following creation from the XY Wizard, buttons in a 'Port-per-Button' button-grid can be assigned specific ports on a per button basis, as required.

There are two ways to perform the port assignments to the buttons:

1 Assign Ports to Individual Buttons, on page 621. This describes individual assignment of ports to buttons.

2 Quick Port-per-Button Assignment, on page 625. This describes selecting all ports with the Bulk Routing panel and copy-pasting this into the XY Panel.

Assign Ports to Individual Buttons

Assigning individual buttons done in the XY Panel in 'Design' mode.

The example of Figure 13-14 shall be used to show how to assign a port to a button:

1 In 'Design' mode, select the Source button-grid and 'Alt-select' its first button.

   The first button is selected. See Figure 13-27a.

2 Click on the **Edit Behaviours** button in the **Properties** box. See Figure 13-27a.

   The graphical Behaviours and Bindings editor is opened. See Figure 13-27b.
   The editor shows the Behaviours and Bindings linked to the selected button widget.

a) First Source button selected, click **Edit Behaviours**

b) Graphical Behaviours and Bindings Editor
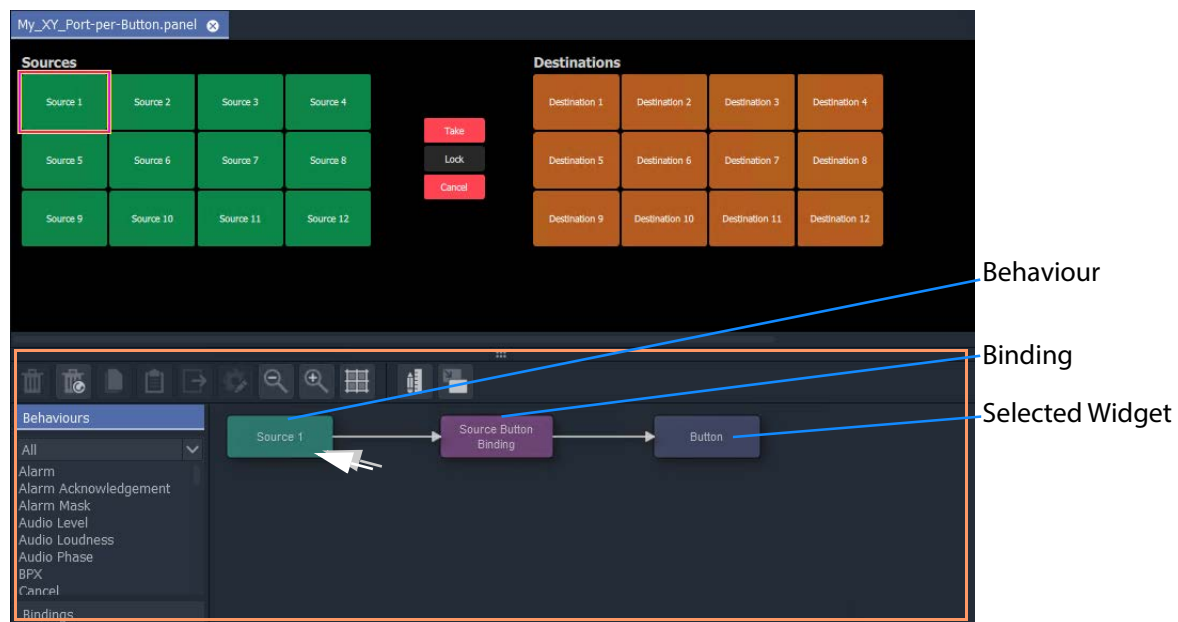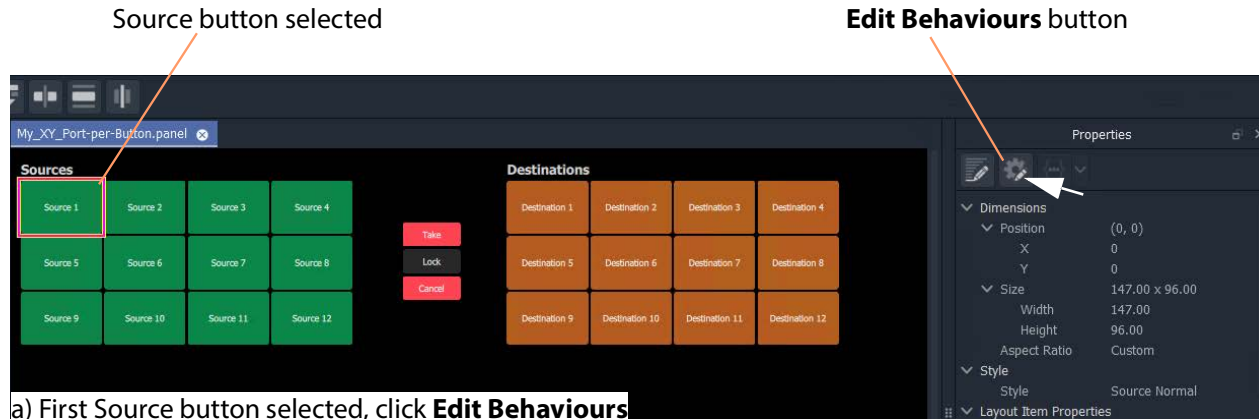
Fig. 13-27: Open Behaviour and Bindings Editor

3 Double-click on the Behaviour linked to the selected widget.

   The properties of the Behaviour are shown. See Figure 13-28a.

4 Select the value of the 'Source' property (see Figure 13-28a)
   and enter a router port to use:

- enter a port name and/or port number; or
- click on the ⬚ icon and select a Source name from the filterable list; or
- enter a GV Orbit Client variable. (For example, {My_Source_Port})

A new 'Source' property value has been entered.

Note: The entered router port may be:

- a port number;
- a port name; or
- a 'Number:Name', for example, 12:Cam1; or
- a GV Orbit Client variable.

In the case of a port name, the name is looked up automatically to find the port number to assign.

In the case of 'Number:Name', then the port number is used to assign with.

In the case of a user variable, this should be defined as a port number.

Note: To select a router port from a filterable list:

- Click on the ⬚ icon at the far end of the Source/Destination property value field (see Figure 13-28 a).

  The **Source/Destination Picker** dialog is shown and displays a list of Sources/Destinations. See Figure 13-28b.
- The list is filterable.
- Select a Source/Destination name from the filterable list.
- Click **OK** when done.

Enter a Port Number, or Name, or Number: Name.

Alternatively, click on the [icon] icon.
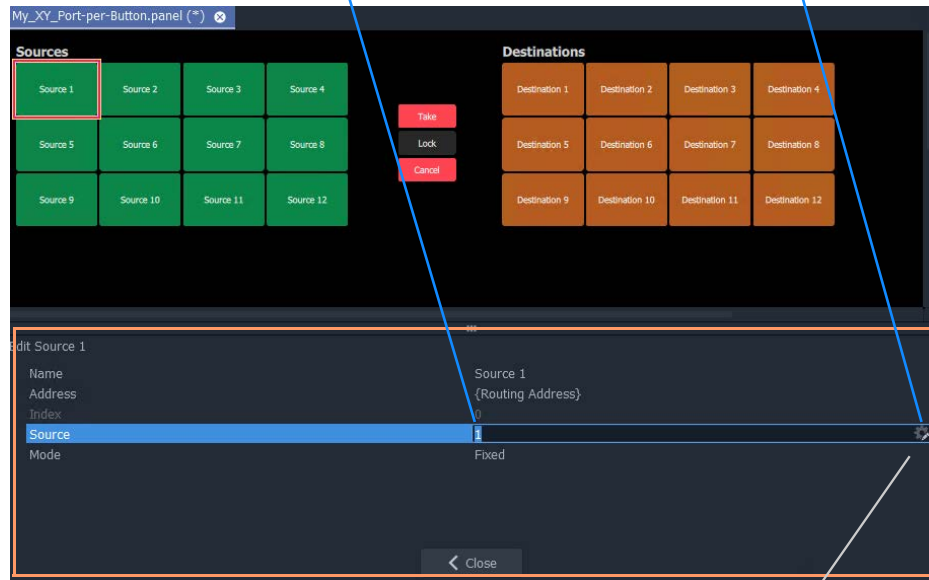
a) Setting 'Source' property of the Behaviour
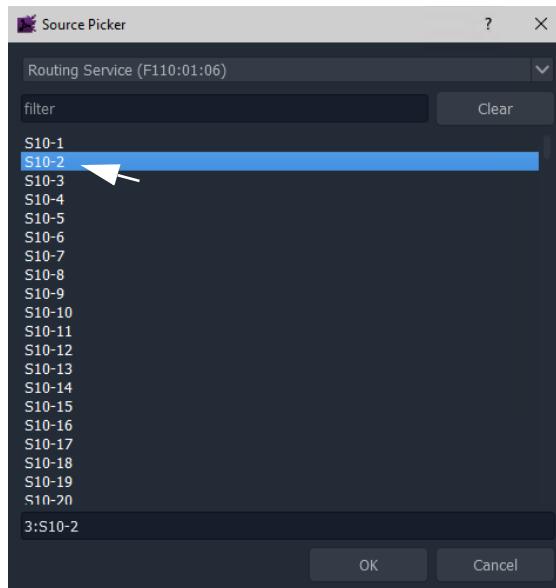
b) **Source Picker** Dialog (**Destination Picker** is similar)
Fig. 13-28: Setting 'Source' or 'Destination' Property Value
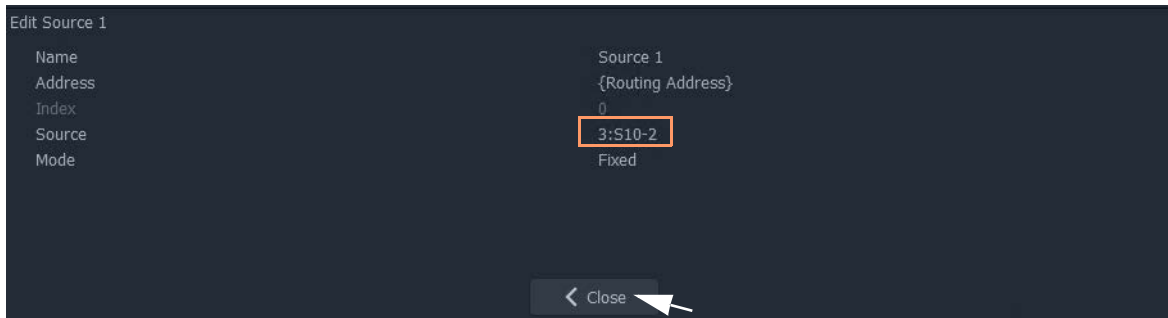
Fig. 13-29: New 'Source' Property Value

5   Click **Close**.

6   Click **Save File**. Click **Save Project**.

7   Enter 'Run' mode.

8   The XY Panel runs and the newly-assigned Source is assigned to the Source button, see Figure 13-30.
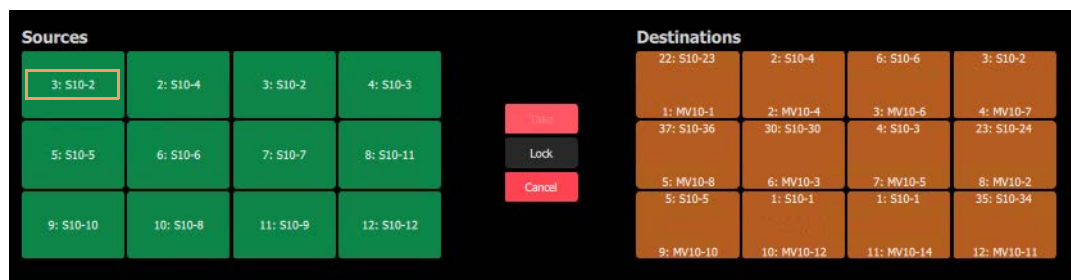
Fig. 13-30: Running XY Panel

Thus, a Source button can have a port assigned to it.

Destinations buttons are assigned similarly.

Assign all buttons as required.

There is a quicker way to make these assignments, which uses the help of the Bulk Routing Panel. See Quick Port-per-Button Assignment.

Quick Port-per-Button Assignment

This describes a quicker method of assigning buttons to 'Port-per-Button' XY Panel button-grids. All ports are selected via the Bulk Routing panel and then simply 'copy-pasted' into the XY Panel.

Prerequisites:

• A new XY Panel with one or more button grids set to be 'Port-per-Button' (not 'Paged Ports', see 'Paging' setting in XY Wizard Settings, on page 600).

The following example assumes that the buttons of both the Source button-grid *and* of the Destination button-grid require setting up in for 'Port-per-Button' operation. If an XY Panel just has one such button-grid, then that grid may be quickly set up in a similar way.

To quickly make port-to-button assignments:

1 Open a Bulk Routing Panel.
(Click the 'Bulk Routing' icon on the Routing Workflow, see Figure 13-31.)
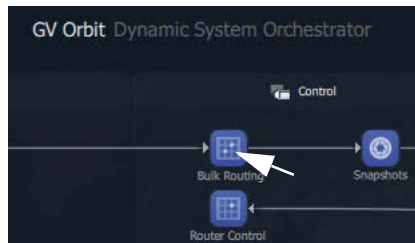
Fig. 13-31: Open Bulk Routing Panel

2 Select all the Destination and Source ports required.

> **Note:** When selecting the ports in the Bulk Routing panel, the filtering may be used and ranges of ports and individual ports can be selected.

Selected Sources and selected Destinations
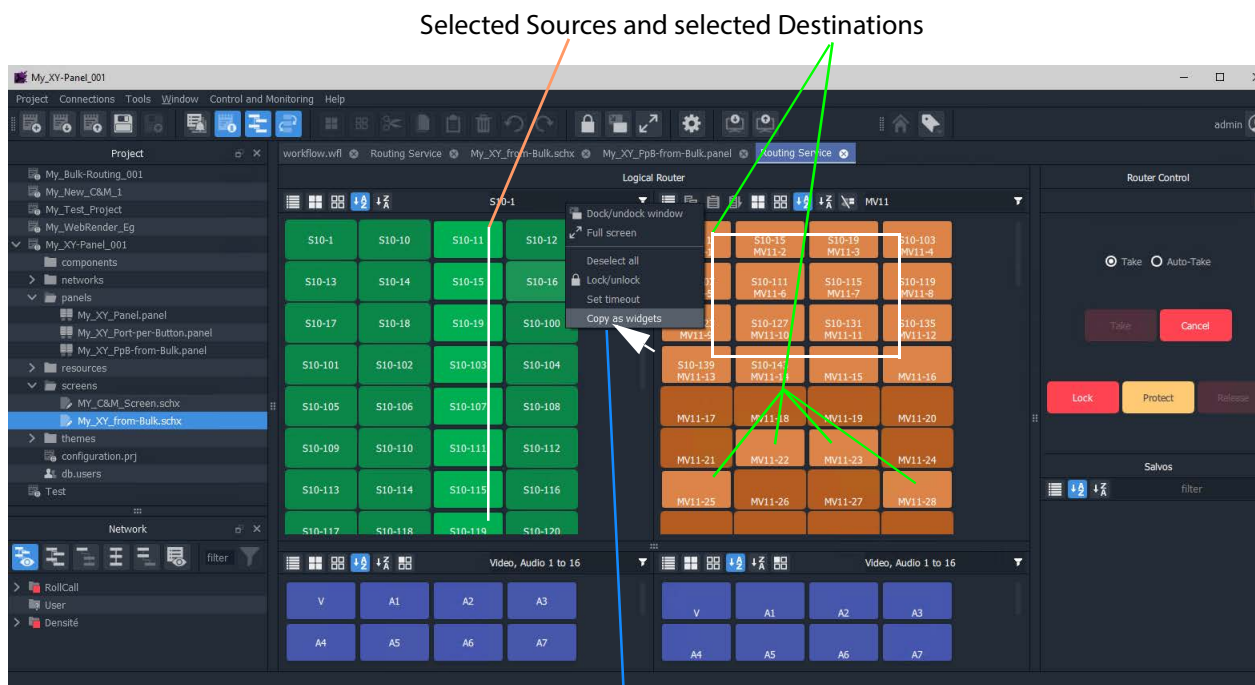
Right-click and select 'Copy as Widgets'.

Fig. 13-32: Copy As Widgets in Bulk Routing Panel

3 When all ports are selected,
right-click in the background of the Bulk Routing panel and select 'Copy as Widgets'.

The selected buttons (Source and Destination ones in this example) are copied to your GV Orbit Client copy-buffer.

4 Open the target XY Panel.

5 Enter 'Design' mode in GV Orbit Client.

6 Right-click in the background of the XY Panel and select 'Paste'.

The copied buttons are pasted into the XY Panel. See Figure 13-33.

Pasted buttons   'Design' mode is shown
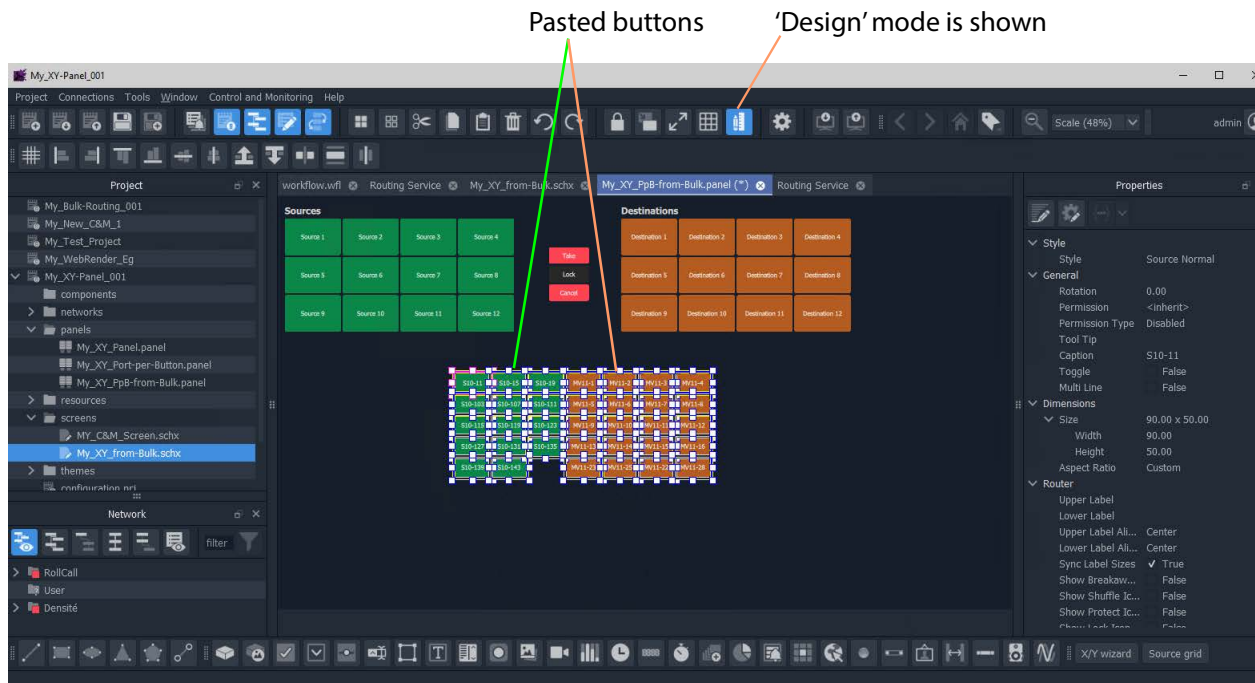
Right-click and select 'Copy as Widgets'.

Fig. 13-33: Paste Buttons in from Bulk Routing Panel 'Copy as Widgets'

7 The buttons now in the XY Panel can be arranged as required and any previously-existing Source/Destination buttons may be deleted if required.

8 Click **Save File**. Click **Save Project**.

9 Go to 'Run' mode to exercise the XY Panel.

Fig. 13-34: XY Panel with Quick-Assigned Ports

Port-per-Button Pasting into C&M Custom Soft Panel

The example in Quick Port-per-Button Assignment pastes selected button widgets from a Bulk Routing Panel into an XY Panel. This selection of buttons may also be pasted into a GV Orbit Client C&M user/operator custom panel.

:

> **Note:**
> In the GV Orbit Client **Project** window:
> - XY Panels are listed in the 'panels' folder; and
> - Custom user/operator soft panels are listed in the 'screens' folder.

In this case, the pasted buttons are still functional and will select Destinations and Sources when the soft panel is run. There is no 'Take' button and 'auto-take' applies. See Figure 13-35

Selected Destination

Pre-selected Source

Routed Source

Route automatically made to destination
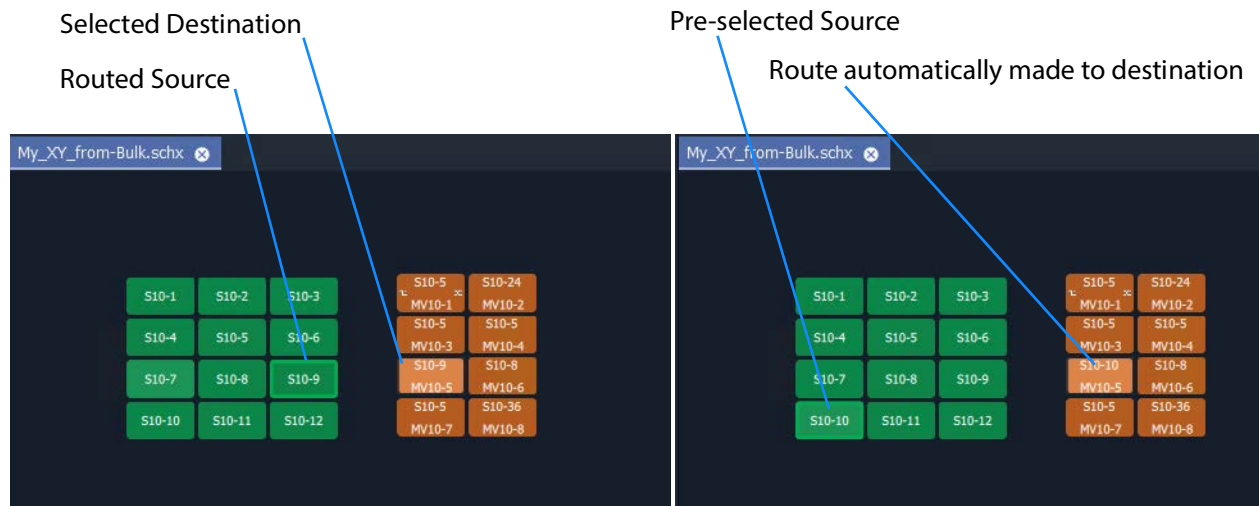
Fig. 13-35: Auto-Take with Pasted-in Routing Buttons (Running)

Customizing an XY Panel

An XY Panel may be modified and customized by simply using the XY Wizard. Additionally, an XY Panel may be further modified and customized by:

- Using the XY Wizard and *then* further editing the XY panel,
  see Further Editing an XY Panel, on page 628.

An XY Panel may also be created from scratch without using the XY Wizard.
This is done with GV Orbit graphical widgets and GV Orbit Client Behaviours and Bindings in a similar way to designing a custom user/operator panel in a C&M project.
See:

- Creating a Custom XY Panel from Scratch, on page 629; and see
- Creating a Custom BPX Panel, on page 637.

To enhance the appearance of a control panel, lines, labels etc may be added.
See Enhancing the Appearance of a Panel, on page 643.

Further Editing an XY Panel

Editing an XY panel is done in a similar way to editing a GV Orbit Client C&M Project custom user/operator screen and an XY Panel can be customized as required. For example:

- buttons may be re-positioned, re-sized;

- other widgets can be added (Labels, Tally Lamps, etc.);
- colors can be changed (background colors); and
- widget style themes can be selected.

Figure 13-36 shows an example XY Panel that has been edited after being started with the XY Wizard. See Enhancing the Appearance of a Panel, on page 643, for further examples of enhancing the appearance of an XY Panel.

Fig. 13-36: Edited XY Panel Example

Creating a Custom XY Panel from Scratch

A custom **XY Panel** can be created from scratch in a GV Orbit Client C&M project. A custom panel can be made to be smaller and more suited to be embedded *into* a C&M project screen. An example small panel with two destinations and a handful of possible sources is given in Figure 13-37 and the steps to generate it are below.

Fig. 13-37: Custom XY Panel Example

Step1: New Empty Basic XY Panel

Firstly, create a new empty **XY Panel**:

1 Open an GV Orbit C&M project in the GV Orbit Client application.
2 Right-click on the 'panels' folder item in the **Project** window and select 'New Panel'.
3 Enter a name into the **New XY Panel** dialog and click **OK**. See Figure 13-38.
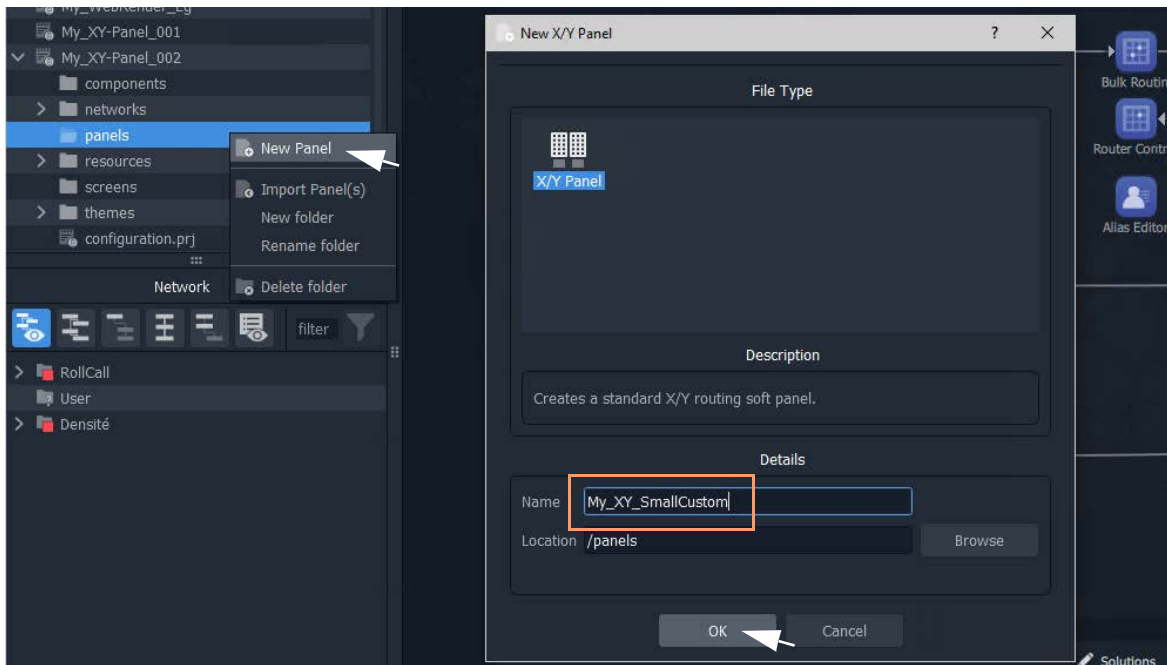
Fig. 13-38: Create New XY Panel

A new XY Panel is created in the 'panels' folder and is shown in the **Project** window and is open in a tab.

4 In the new XY Panel tab, delete all widgets.
(Type CTRL-A in the tab to select all widgets and then press the Delete key.)

An empty XY Panel results.

5 Click **Save File**.

This has created an empty XY Panel in the C&M project. See Figure 13-39.
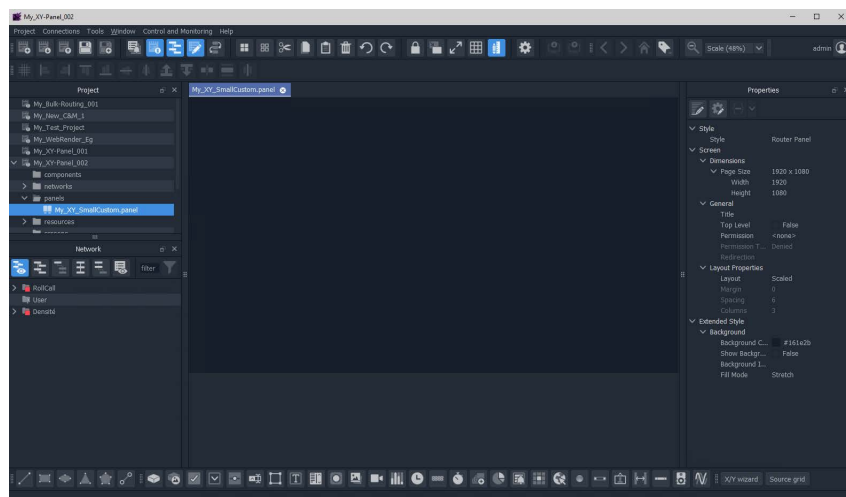
Fig. 13-39: Empty XY Panel

When editing the XY Panel, it is useful to adjust the position of the routing control widgets tool bar in the GV Orbit Client, to make it more accessible. To do this:

6 Drag the routing control widgets tool bar by its handle to a convenient position. See Figure 13-40.

Drag handle and release to re-position Routing Control widget tool bar
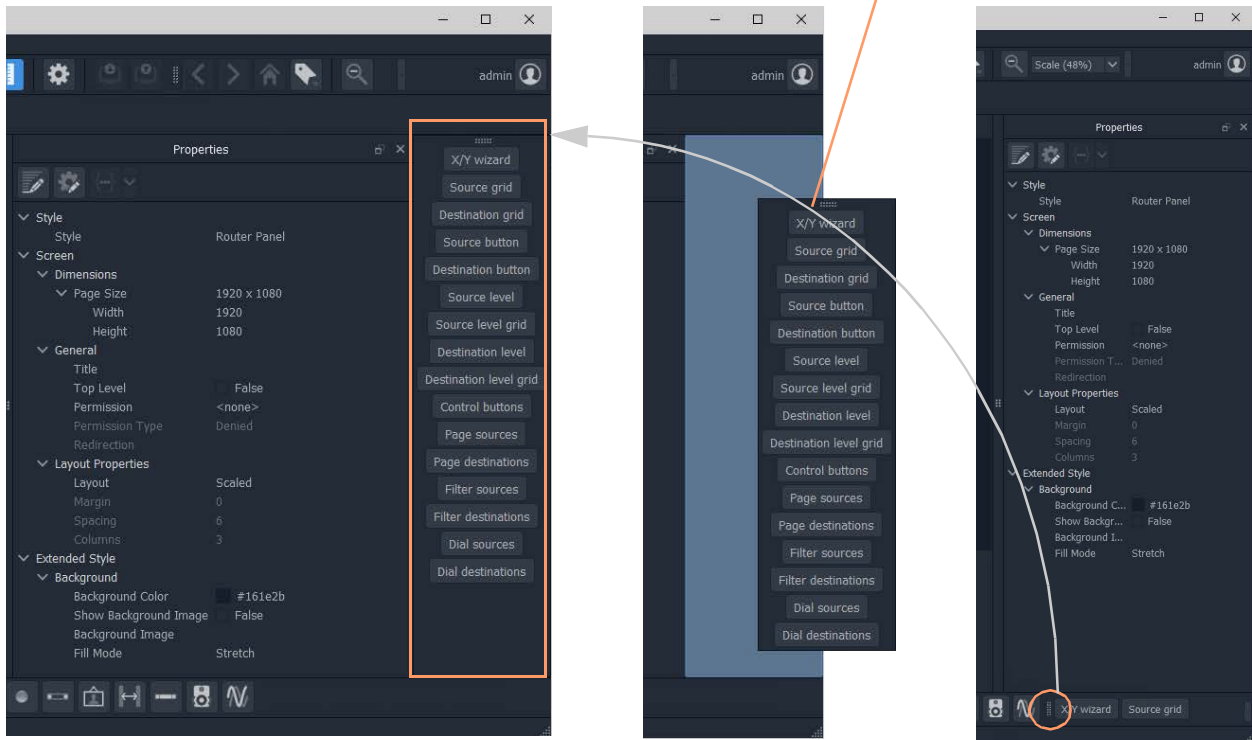
Fig. 13-40: Re-positioning the Routing Control Widgets Tool Bar

Step 2: Add Routing Control Widgets to (empty) XY Panel

With the empty **XY Panel** open in GV Orbit Client:

1 Add 8 **Source Button** widgets from the Routing widget tool bar (see Figure 13-41). (Click on 'Source Button' button on the tool bar and drag on button widgets.)

The button annotation names increment automatically for each added button.

2 Similarly add 2 **Destination Button** widgets.
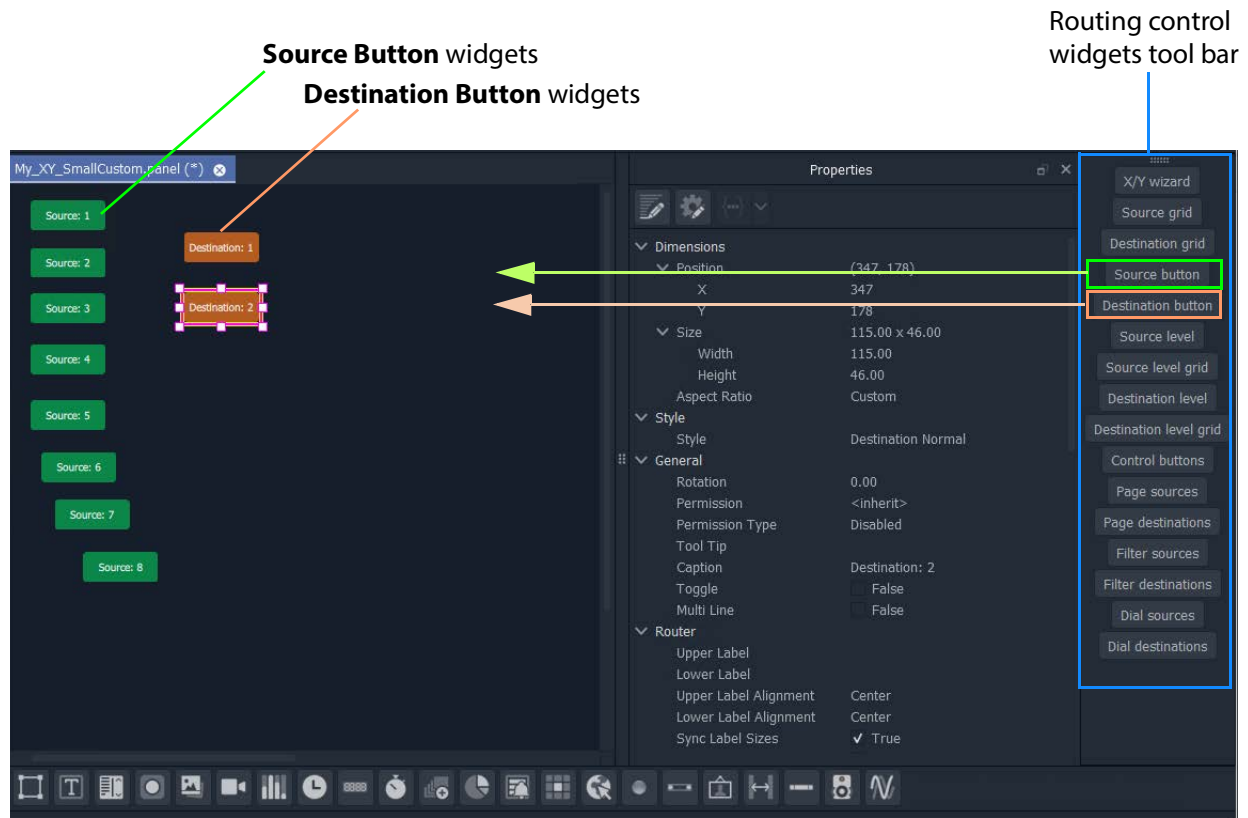
Fig. 13-41: Adding Source and Destination Buttons

Finally, add a **Take** button:

3   Select 'Control Buttons' in the tool bar.

A small dialog appears.
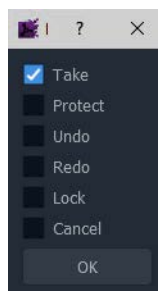
Fig. 13-42: Adding a Take Button

4   Select 'Take' and click **OK**.

A **Take** button widget appears at your cursor, drop this onto the XY Panel.

5   Arrange the buttons as required.

6   Click **Save File** and **Save Project**.
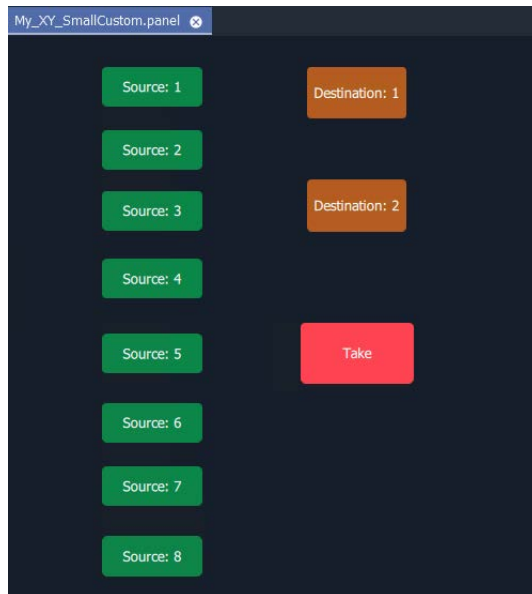
Fig. 13-43: Added Buttons

Step 3: Exercise Panel

This XY Panel, when run, will allow you to select a source from sources 1 to 8 and route it independently to destinations 1 or 2.
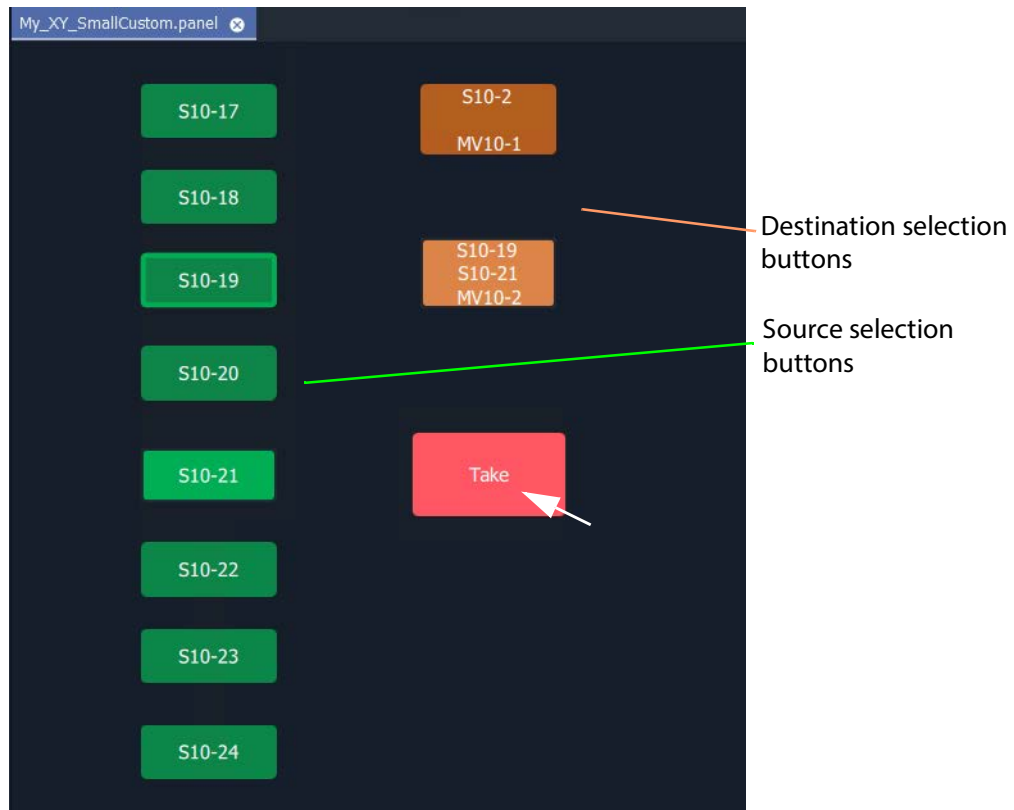
Fig. 13-44: Running the New XY Panel

Step 4: Assigning a Port-per-Button

With the XY Panel in 'Design' mode in GV Orbit Client, the Source buttons and Destination buttons can be configured for other source or destination ports in the same way as in a 'Port-per-Button' panel (See Assigning Ports to a Port-per-Button XY Panel, on page 621, for more information.)

To assign ports:

1   Right-click in the XY Panel's background and select 'Edit Behaviours'.

The 'Behaviours and Bindings' graphical editor is shown.
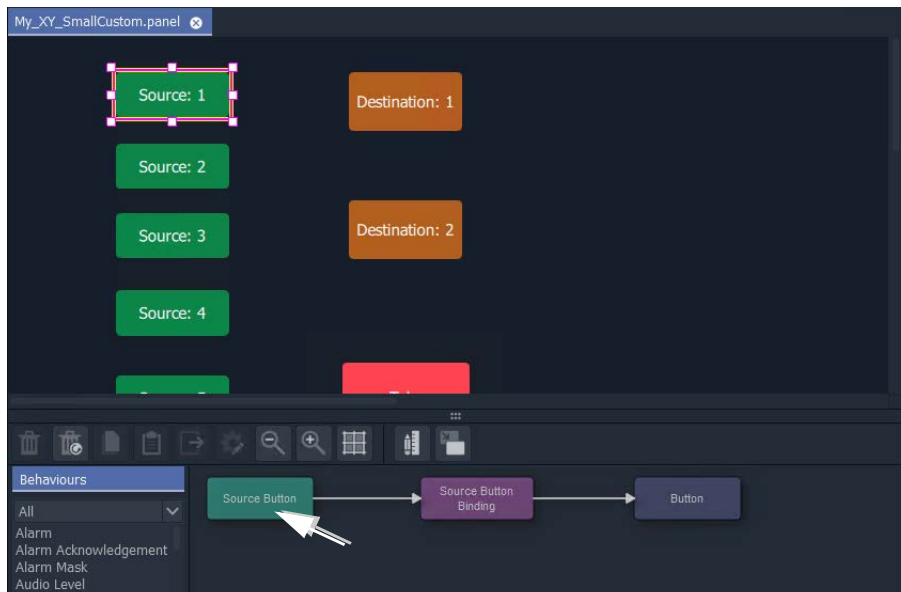
Fig. 13-45: Double-click on 'Source Button' Behaviour

2   Select a Source button in the XY Panel and double-click on the 'Source Button' Behaviour in the editor. See Figure 13-45.

The Behaviour's properties are shown.

3   Set the 'Mode' property to 'Fixed'.

4   Set the 'Source' property to a chosen Source name.

5   Click **Close**.

A Source button now has a port assigned.

6   Repeat for the other Source buttons.

And then:

7   Perform similar steps for each Destination button.

The buttons now all have assigned ports.

Step 5: Styling

1 Arrange the buttons and resize as required.

2 Add any further labels/shapes/colors to enhance the panel's appearance, as required.

Finally:

3 Right-click on the XY Panel background and
select 'Resize to Widgets'.
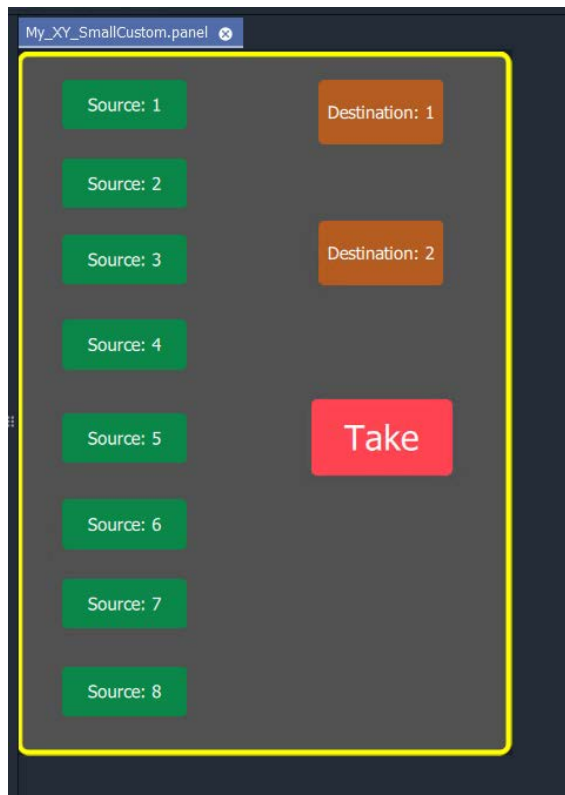
Fig. 13-46: Custom XY Panel

4 Click **Save File**.
Click **Save Project**.

Step 6: Exercise Panel

1 Click the 'Run Mode' icon in the main tool bar and exercise the panel.

- Select Destination.
- Select source to route
- Click Take.
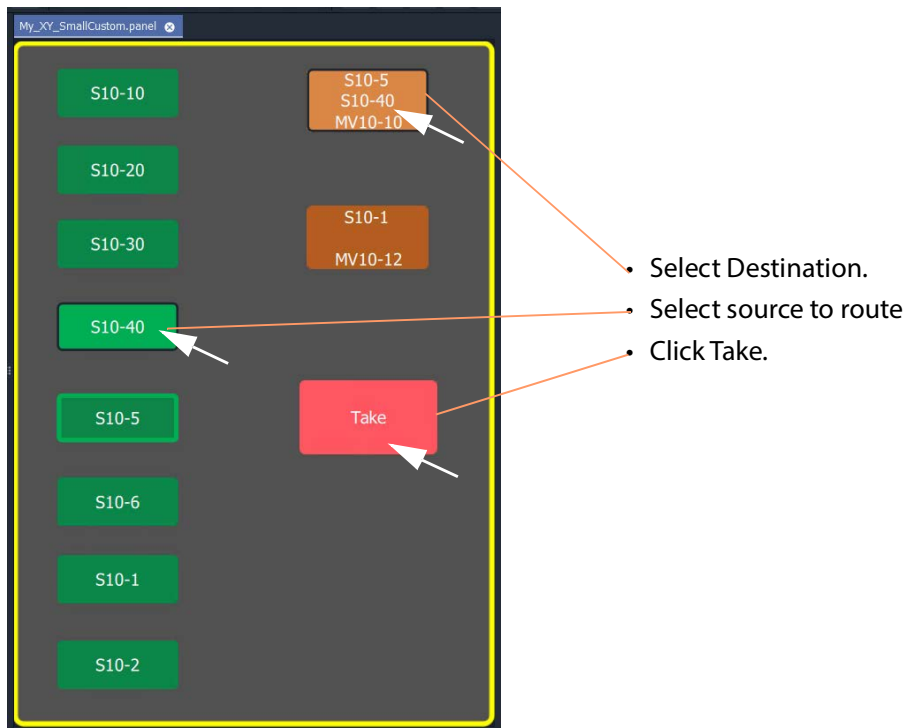
Fig. 13-47: Exercising the XY Panel

The small custom panel operates like a fixed, reduced-size XY Panel and may be dragged onto a C&M project custom user panel screen and embedded into it, if required. See How to Embed an XY Panel into a Custom User Panel, on page 650.

Creating a Custom BPX Panel

What is a BPX Panel Type?

A **BPX** (BPX, button per crosspoint) panel enables a button-click to specify and make a route between a source and destination. A simple custom panel can be designed as part of a C&M project, for example, to route one of several sources to a single destination.

A **BPX** Behaviour is available in GV Orbit which can be associated with a button widget. This enables a button-click to make a route between a specific source and destination. BPX Panel Example

An example BPX panel is a simple panel where each button is configured to set a route to the same destination, but from a different source. This simple BPX panel is shown in Figure 13-48 and the steps to generate it in GV Orbit are given below.
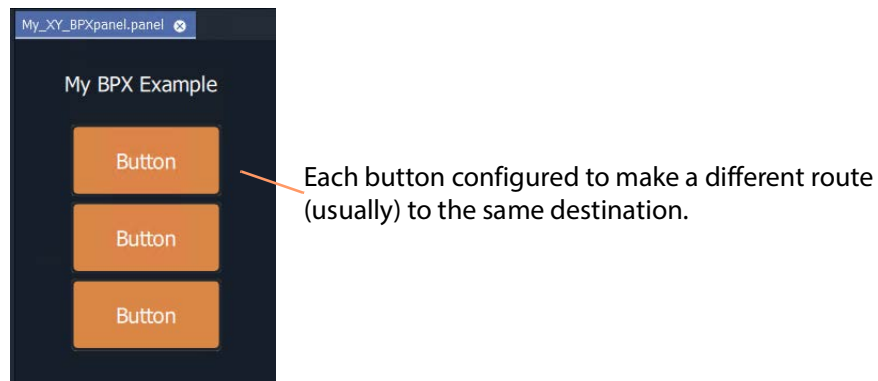
Fig. 13-48: Custom BPX Example

Each button configured to make a different route (usually) to the same destination.

Basic BPX Panel

To create this panel:

1 Create a new empty **XY Panel**.
   (This is described in Step1: New Empty Basic XY Panel, on page 630 for the Creating a Custom XY Panel from Scratch, on page 629.)

2 Add a graphical **Button** widget to the panel. (See Figure 13-49.)
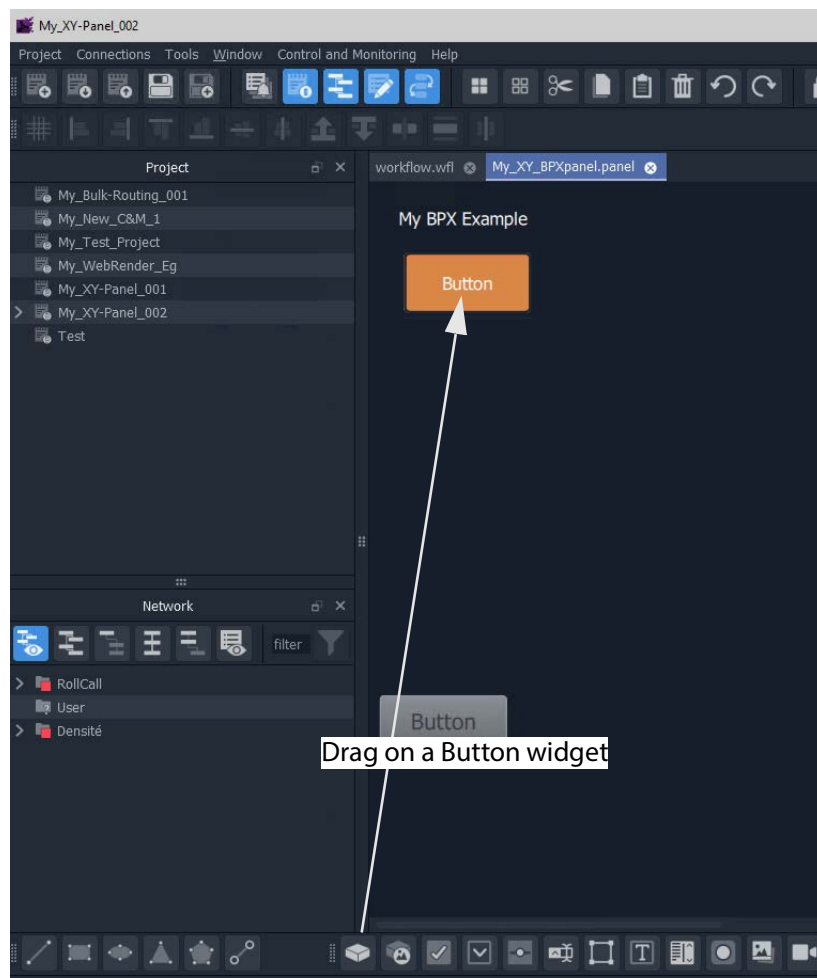
Fig. 13-49: Add a Button Widget

3 Right-click in the XY Panel's background and select 'Edit Behaviours'.

The 'Behaviours and Bindings' graphical editor is shown.

4 Select the **Button** widget.

The 'Behaviours and Bindings' graphical editor for the selected button is shown.
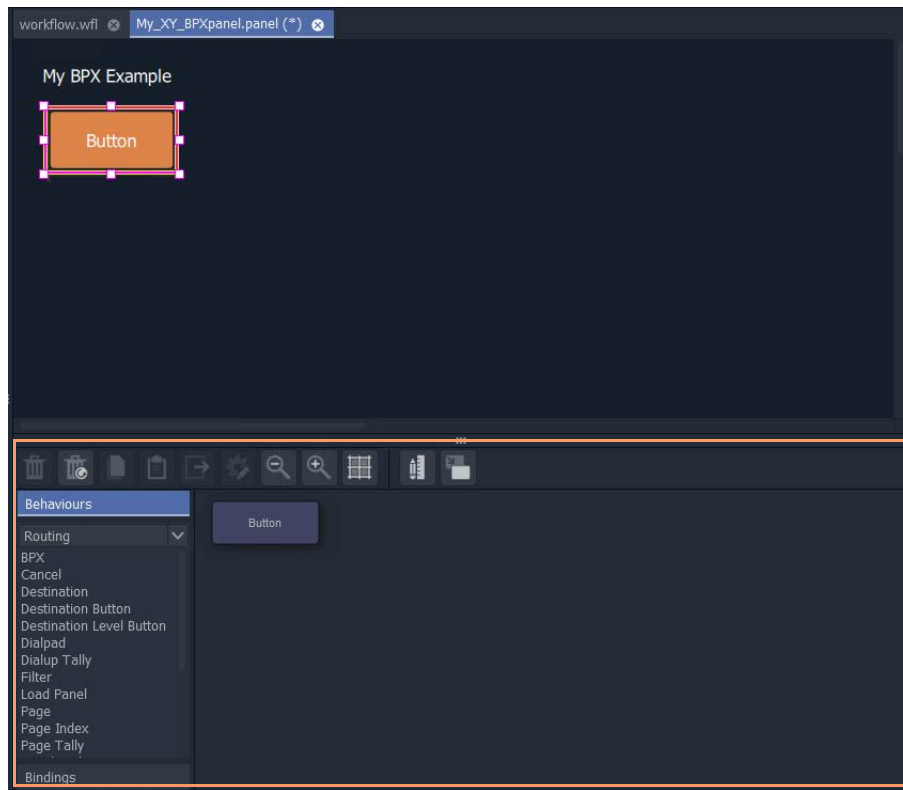
Fig. 13-50: Behaviours and Bindings of Selected Button Widget

In the editor:

5 Filter the Behaviours on 'Routing'. See Figure 13-51a.

6 Select a BPX Behaviour. See Figure 13-51b.

A **BPX** Behaviour is added to the 'Behaviour and Bindings' editor and a Binding too. See Figure 13-51b.
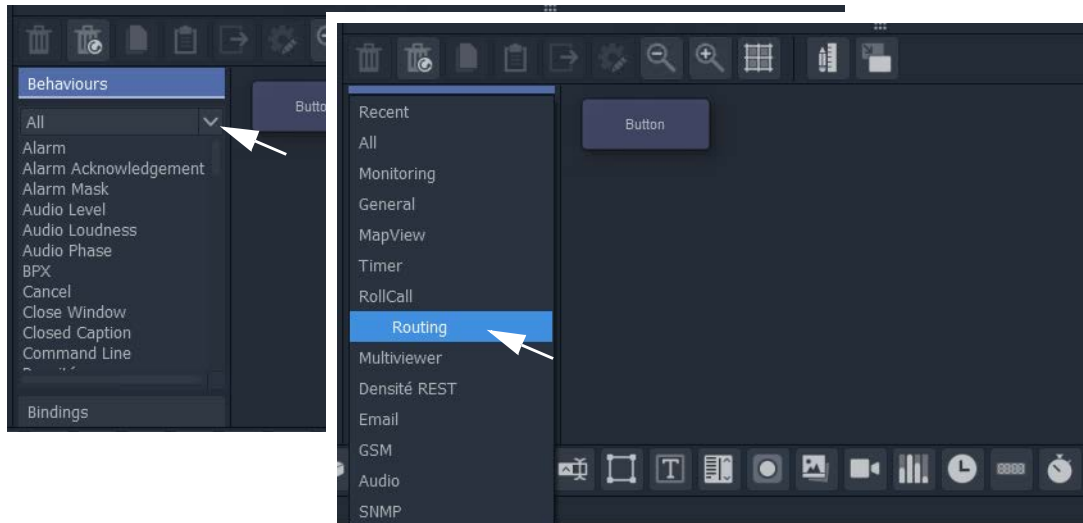
a) Filter Behaviours on 'Routing'

Filtered list of
Routing
Behaviours

b) Select a BPX Behaviour   BPX Behaviour is added and a Binding
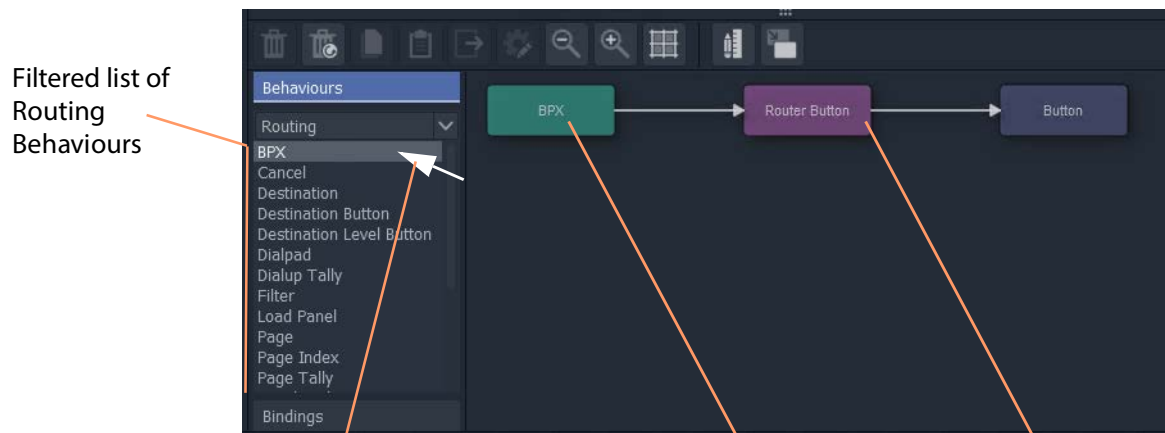
Fig. 13-51: Adding a BPX Behaviour

A BPX button's function is to specify a Source and a Destination and a route between the two:

7 Double-click on the **BPX** Behaviour.

   The Behaviour's properties are shown. See Figure 13-52.

8 Set the 'Source' property to a required Source.

9 Set the 'Destination' property to the required Destination.

Fig. 13-52: Setting 'Source' and 'Destination' Property Values

10 Click **Close**.

This has defined one BPX button. For example, a route between the Source and Destination.

Now we will copy this button (with its Behaviour/Binding settings) twice:

11 In the BPX panel, select the one **Button** widget, right-click on it and select 'Copy'.

12 Select the panel's background, right-click and select 'Paste'.

13 And again, select the panel's background, right-click and select 'Paste'.

This copies the button twice more on the panel.

14 Select the panel's background, right-click and select 'Edit Behaviours'.

For *each* button that was copied:

15 Select the button, and edit the button's **BPX** Behaviour.

16 Change the 'Source' property to select a different Source each time.

Then:

17 Click **Close**.

18 Click **Save File**.

19 Click **Save Project**.
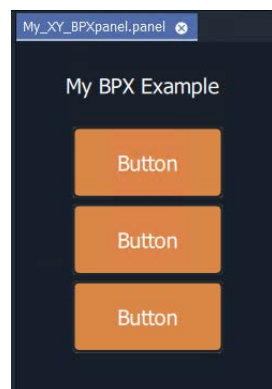
Fig. 13-53: BPX Panel, Designed

This has created a basic BPX panel with three buttons. Each button is configured to set a route to the same destination, but from a different source.

Exercise the BPX Panel

1 Enter 'Run' mode in GV Orbit Client.

2 Operate the panel. See Figure 13-54.

Click the second button to make a route from its source, S10-2. See the result

Click the third button to make a route from its source, S10-3. See the result

Currently routed Source to the Destination

Source which the button will route to the Destination, if selected.

Destination
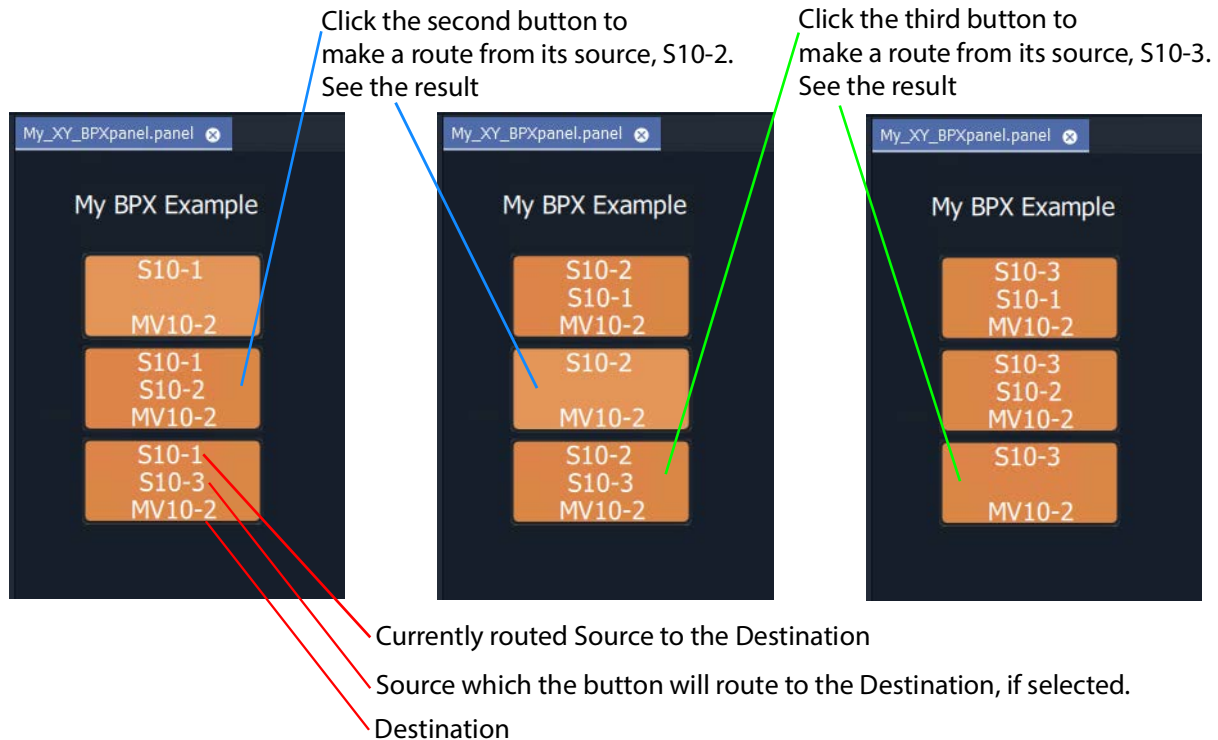
Fig. 13-54: BPX Panel Running

Enhancing the Appearance of a Panel

- Panel Enhancement - Add Labels, on page 643.
- Enhancement - Add Lines, on page 647.

> **Note:** Carry out edits to the panel design in GV Orbit Client in 'Design' mode.

Panel Enhancement - Add Labels

Label widgets can be added for the display of information. In this example, some text is added to the BPX panel to display the destination name and the source routed to it.

1 Add four **Label** widgets to the BPX panel. See Figure 13-55.

2 Set two labels to have fixed 'Caption' properties. See Figure 13-55.

Label widgets with fixed 'Caption' property   **Label** widgets using a Destination Behaviour
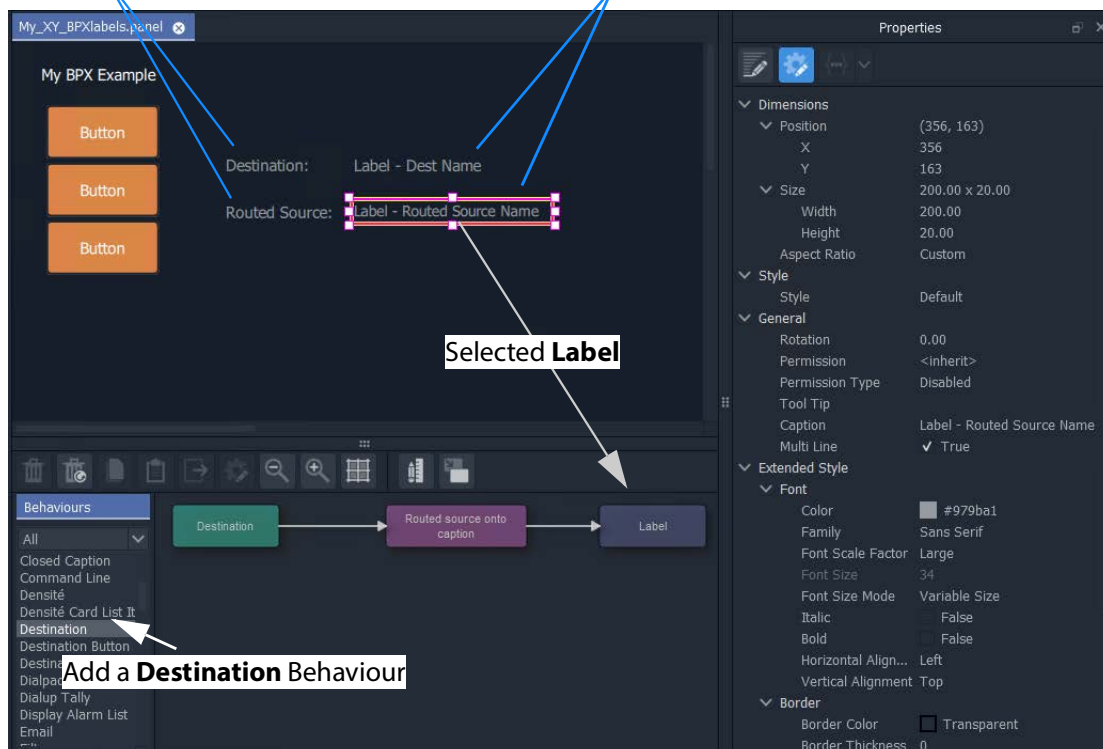
Fig. 13-55: Adding Labels

For each of the other two **Label**s:

3 Open the 'Behaviour and Bindings' graphical editor.
   (Right-click and select 'Edit Behaviours' in the panel background.)

4 Select one of the **Label**s. See Figure 13-55.

5 Add a **Destination** Behaviour. See Figure 13-55.

   A **Destination** Behaviour and a Binding are added to the 'Behaviour and Bindings' editor.

6 Double-click on the **Destination** Behaviour and set its 'Destination' property to the same destination that each of the **Buttons** control. See Figure 13-56.

7 Click **Close**.

Destination Behaviour pointed at the same destination monitored as the BPX buttons.
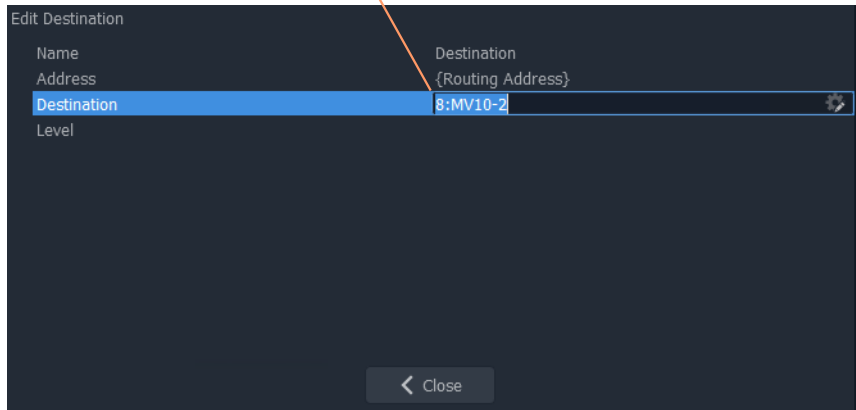
Fig. 13-56: Setting Destination for a Label's Destination Behaviour

This has set up both of the **Label** captions to show the Source name of the pointed-to Destination. To modify one of the **Label** captions to show the Destination name instead:

8 Select the Label to see its Behaviours and Bindings. See Figure 13-57.
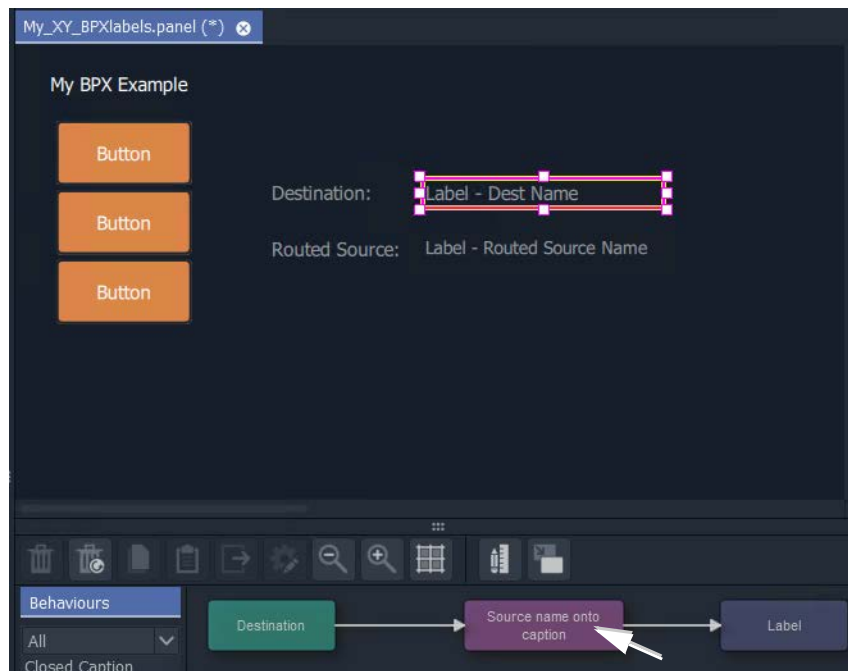
Fig. 13-57: Select a Label

9 Double-click on the Binding to see the Binding's properties.

See Figure 13-58.
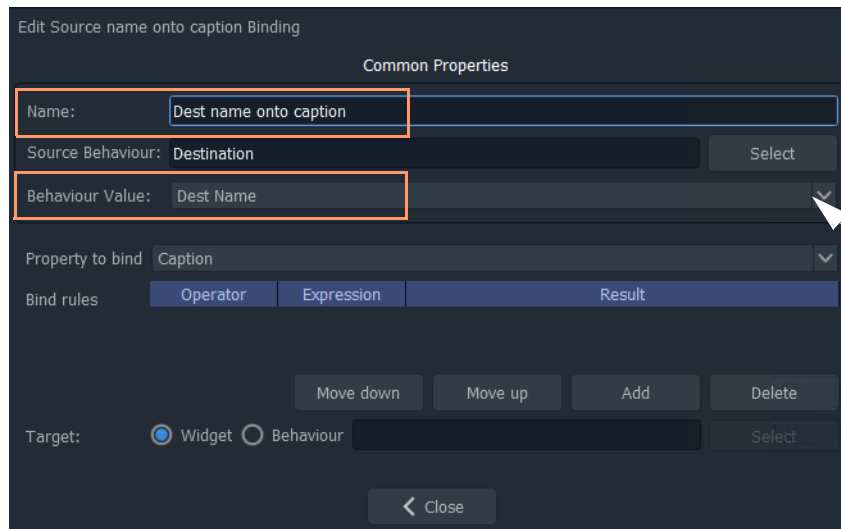
Fig. 13-58: Edit Binding Properties

10 Change the following properties of the Binding:

- 'Behaviour Value' property from 'Source Name' to 'Dest Name'.
- 'Name' property from 'Routed source onto caption' to 'Dest name onto caption'.

11 Click **Close**.

12 Click **Save File**. Click **Save Project**.

This has modified our BPX Panel design. See Figure 13-59a.

13 Exercise the BPX panel with the **Labels**.

When a button is clicked, the resulting route is shown by the labels. See Figure 13-59b.

a) Designed BPX Panel with Labels   b) Running BPX Panel with Labels

Fig. 13-59: BPX Panel with Labels: a) Designed; b) Running

Enhancement - Add Lines

Lines (**Line** widgets) or any shapes may be added to a panel.

Fig. 13-60: Added Lines

Additionally, **Line** widgets can have their visibility controlled from the state of the routing. This is shown by using the example panel from Panel Enhancement - Add Labels, on page 643. To do this:

1 Open the panel and show the 'Behaviour and Bindings' graphical editor.

2 Add the required lines, in this example, three lines are added.

For each button:

3 Select the button and then view the properties of the associated **BPX** Behaviour; change the 'Name' property to a unique name. (for example, to 'BPX-1', 'BPX-2', and 'BPX-3'.)

This gives each **BPX** Behaviour a unique name.

For each line:

4 Select the line and add a **Property** Binding. See Figure 13-61.
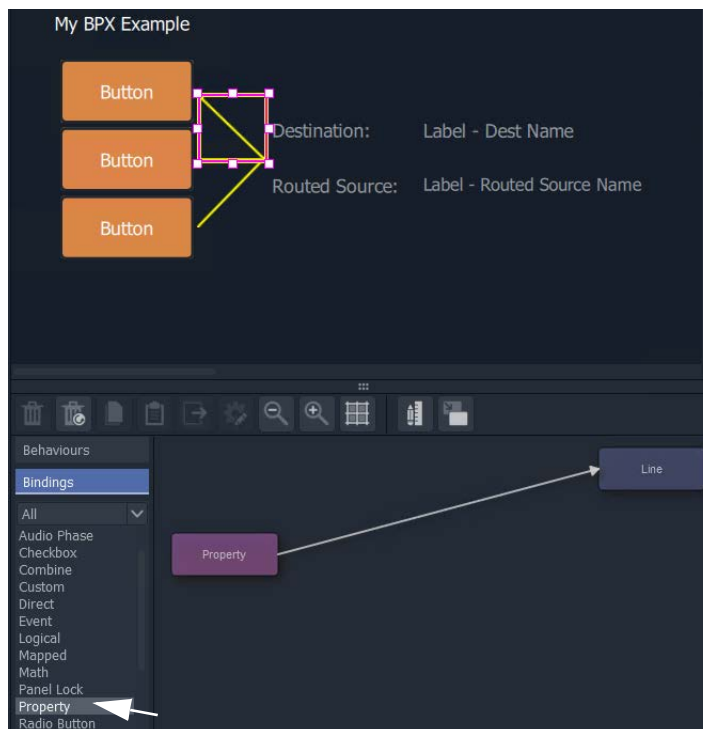
Fig. 13-61: Add Property Binding

5 Double-click on the added **Property** Binding to edit its properties.

6 Change the following **Property** Binding property values: (See Figure 13-62.)

- 'Source Behaviour', select a unique BPX Behaviour. For example, 'BPX-1',or 'BPX-2', or 'BPX-3'.
- 'Behaviour value' to 'Is Routed'.
- 'Property to Bind' to 'Visibility'.
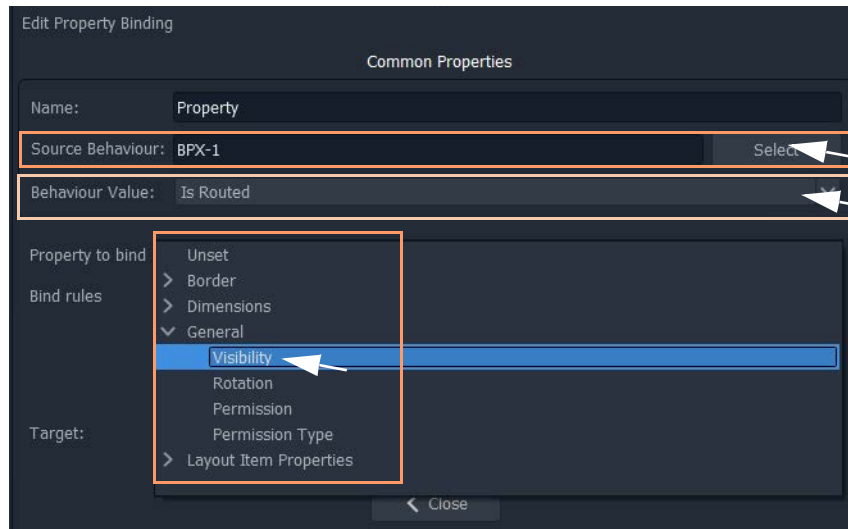
Fig. 13-62: Added Property Binding

7 Click **Close**.

This has set the visibility of a line to be controlled by the routing status of the **BPX** Behaviour associated to a **Button**.
Do this for each line and select a unique **BPX** Behaviour name each time.
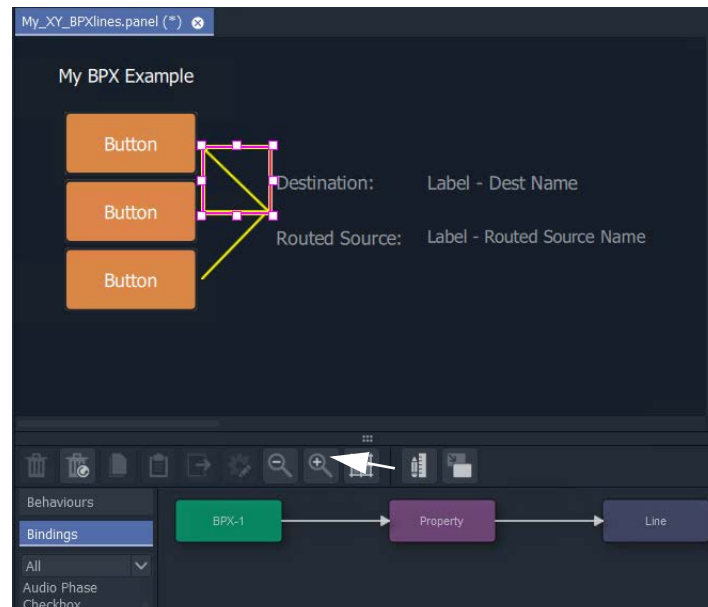
Fig. 13-63: BPX Panel Example

When the visibilities of all three lines are changed:

8 Click **Save File**. Click **Save Project**.

9 Exercise the panel. See Figure 13-64.

   The lines simply indicate the route that is made when clicking buttons.

Click button:

Route is made and a line indicates the routing made.

Click Button:

Route is made and a line indicates the routing made.

Click Button:

Route is made and a line indicates the routing made.
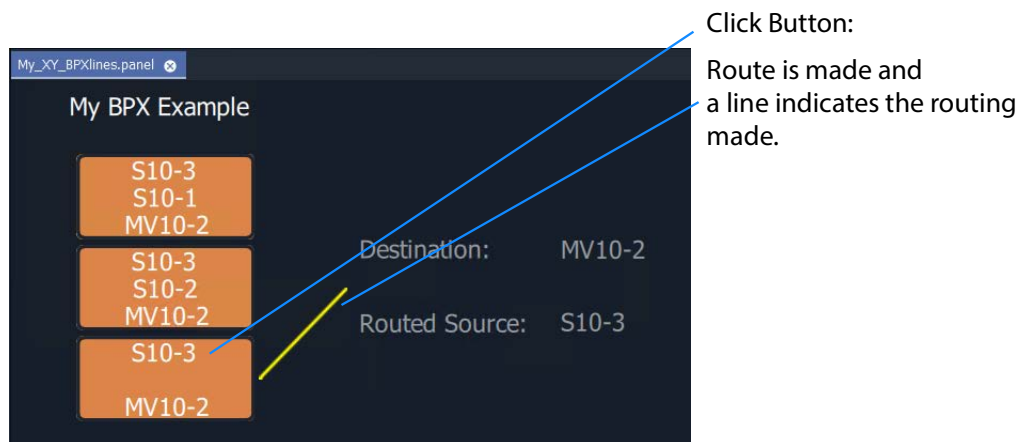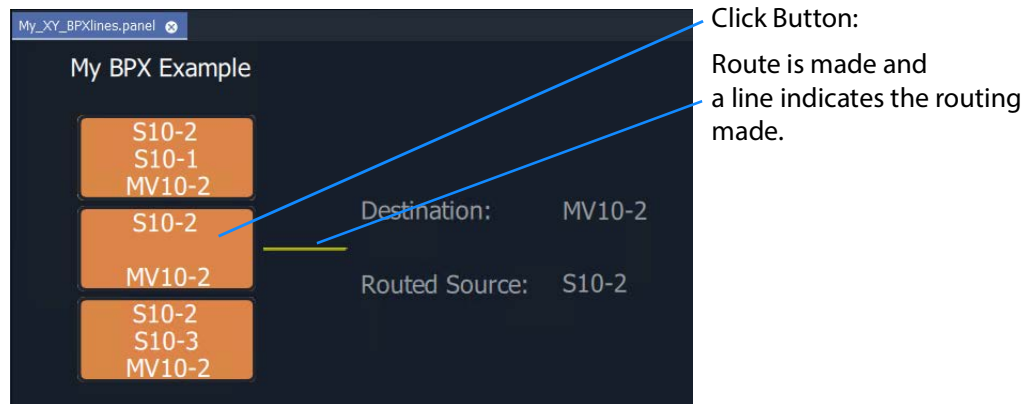
Fig. 13-64: Exercising BPX Panel with Lines

How to Embed an XY Panel into a Custom User Panel

An XY Panel may be embedded into an XY Routing Panel C&M project screen as an GV Orbit 'Component'.

To embed:

1 Open the GV Orbit project containing the XY Panel and a C&M project screen.

Firstly, check that the overall XY Panel size is just bigger than the widgets it contains. To do this:

2 Open the XY Panel and check the size values in the **Properties** box.
   (**Properties** box: Screen > Dimensions > Page Size > 'Width' and 'Height'.)

3 If the panel size needs adjusting:
   • right-click in the panel background and select 'Resize to Widgets', and/or
   • adjust the background's screen 'Width' and 'Height' properties directly.

4 Close the XY Panel.

Now embed the XY Panel into a C&M project screen:

5 Open a C&M screen.

6 Drag an XY panel from the **Project** window onto the C&M project screen.
   and release. See Figure 13-65.
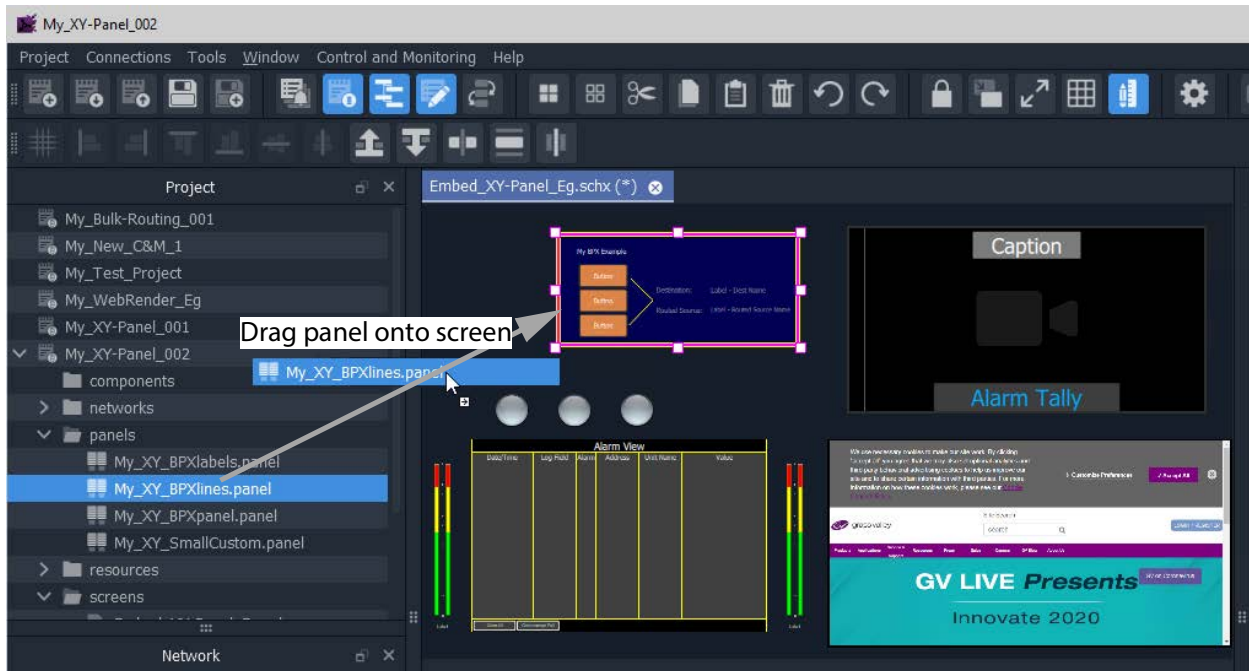
Fig. 13-65: Drag on an XY Panel

The panel object is like a GV Orbit component object on a C&M project screen.

7 Resize the panel object as required.

8 Click **Save File**. Click **Save Project**.

9 Run the C&M screen and exercise the XY Panel on the screen.

One or more instances of an XY panel on a screen can be used.

Multiviewer Cluster

Introduction

Lite	Professional	Enterprise
	●	●

A multiviewer cluster (**MV Cluster**) is a group of multiple MV-8 Series multiviewer devices in a GV Orbit system which are all acting together to serve one or more video walls. The cluster is treated as one multiviewer resource, rather than as a set of single, individual multiviewer devices.

All of the video walls served by the multiviewer cluster are designed in a single 'Clustered Multiviewer' project in GV Orbit Client. This is done using the '**Room Editor**' tool and an **MV Cluster Manager** service is required to be running on a GV Orbit Server. The resulting video wall(s) are managed at a higher level (at a 'cluster-level') and router destinations are referred to in operation rather than video wall tiles or multiviewer inputs.

MV Cluster Information

What is an MV Cluster?

An **MV Cluster** is a cluster of multiviewer devices configured together and all acting together to serve one or more video walls. An MV cluster contains one or more multiviewer devices.

Table 14-1: MV Cluster Numbers for MV-8 Series Multiviewers

Number of Multiviewer Devices	Number of head display outputs:		Number of video wall tiles:	
	per device	maximum available	per device	per video wall
1	up to 12	12	48	up to 48
2	up to 12	24	48	up to 48 * 2 (=96)
3	up to 12	36	48	up to 48 * 3 (=144)
...	...	...	...	...
$N_{Cluster}$[a]	up to 12	$12 * N_{Cluster}$	48	up to $48 * N_{Cluster}$

a. The number of devices in an MV Cluster has no fixed limit. See MV Cluster Size for more information.

MV Cluster Size

The number of devices in an MV Cluster ($N_{Cluster}$) has no fixed limit: The number of multiviewers that GV Orbit Client and the MV Cluster Manager service can handle has no real limit.

However, in practice, limiting factors are anticipated. The maximum number of MV-8 Series multiviewers in an MV Cluster ($N_{ClusterMax}$) is determined by performance and various system factors, including:

- GV Orbit system size; and
- network speed.

Contact Grass Valley Technical Support for further information on $N_{ClusterMax}$ for specific use cases.

Defining Video Walls for an MV Cluster

A user can define a set of video walls for a broadcast production studio or OB truck using the GV Orbit Client with a 'Clustered MV' project. The video walls are all served by a cluster of MV-8 Series multiviewers.

GV Orbit Client is used along with GV Orbit system services. Video walls are defined and managed independently from the individual multiviewer devices used. Video wall tiles are referred to by their router destination name.

Additionally, for a 'Clustered MV' GV Orbit project, TSL tally settings and audio bars configuration can be done for each whole video wall.

MV-8XX Multiviewer Cluster Example
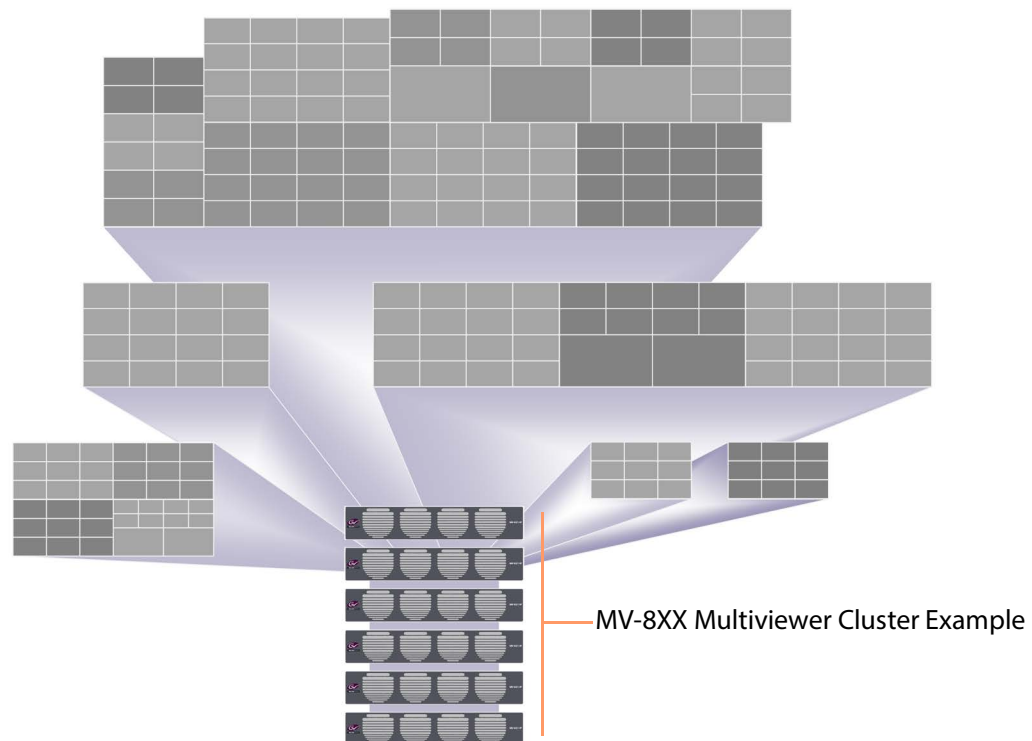
Fig. 14-1: Video Walls Served by Multiviewer Cluster (Example shown has an MV Cluster of 6 Devices)

What is a Clustered Multiviewer Project?

A GV Orbit Clustered MV project (Clustered MV project) enables a user to define a set of video walls for a broadcast production studio or OB truck served by an MV Cluster.

The video walls can each comprise one or more display monitors. One or more video walls may be defined, all served by a cluster of multiviewer devices.

All of the video walls are designed in one 'Clustered MV' project, which then holds the designs of one or more video walls for a studio or an OB truck.

Overall TSL tally set up and Audio Bars audio channel configuration of audio bars is also integrated and handled within such a project.

The project is stored centrally on the GV Orbit Server and the entire video wall design is then automatically parsed and administered across the individual multiviewers in the cluster.

Multiviewer Discovery

Is the Multiviewer device on the network?

Yes — **Is Multicast data enabled on network?**

Yes — Multiviewer is automatically discovered by GV Orbit Client for the Clustered MV project.

No — Require manual entry of multiviewer devices into the Clustered MV project.

No — Add the device to the network.
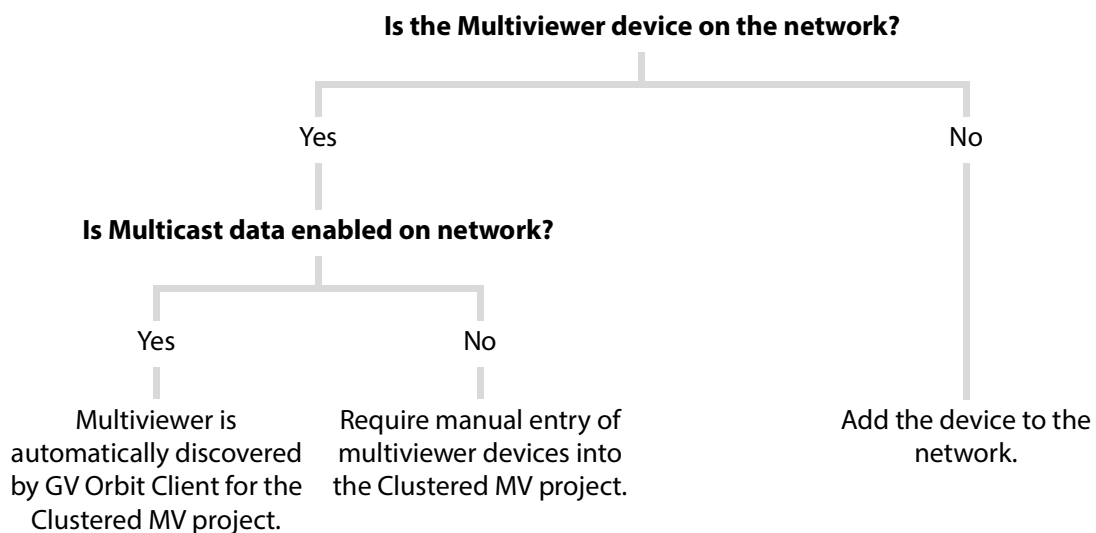
Video Wall Design

Video walls are formed from a physical arrangement of one or more display monitors and each display monitor is driven from any one of the multiviewer head display outputs available from the multiviewer cluster. Video wall tile layouts can be applied and layouts for the whole video wall and also for individual monitors can be saved and switched between. Assignment of router destinations to video tile layouts completes the video wall design. Finally, the assignment of video sources to video tiles (PiPs) is integrated into the GV Orbit routing control system and the routing of video to wall tile positions can be interactively achieved.

Deployment

Deployment is a one-step process, requiring the finished project to be simply pushed to the GV Orbit Server. Behind the scenes, the video wall designs are then automatically translated

into constituent, individual 'multiviewer projects' which are targeted at each individual multiviewer of the cluster. The constituent projects are automatically pushed out to the individual multiviewer devices.

> **IMPORTANT**
>
> Multiviewers should be operated either in a clustered mode or as individual, *non*-clustered single-multiviewers.
> Changing readily between these operational modes is not supported.
>
> Recommendation:
>
> All multiviewer set-up and configuration is carried out fully for the intended mode of operation.

Clustered MV project vs. Multiviewer Project

A Clustered MV project is opened, saved, pushed etc. in a similar way to other GV Orbit multiviewer projects; the main exceptions/differences are listed in Table 14-2.

Table 14-2: Clustered MV Project Differences

Item	GV Orbit Project Type	
	Clustered Multiviewer	**Multiviewer, or Connected Multiviewer**
Video wall design tool	**Room Editor** in GV Orbit Client	**Wall Editor** [a] in GV Orbit Client
Multiviewer resource(s)	One or more multiviewer devices. ($N_{Cluster}$ devices in an MV Cluster)	A single multiviewer device.
GV Orbit System	Required, running a MV Cluster Manager Service	Can operate with or without a GV Orbit system
Deployment	Push project to a GV Orbit Server repository.	Push project to a single multiviewer device.
Max number Video Walls	up to 12x $N_{Cluster}$	12
Max number Video Tiles	up to 48x $N_{Cluster}$	48
Video Wall Arrangement	Flexible	Constrained
Video Wall Layouts	Yes, Room Layout	No.
Monitor-level Layouts	Yes, Monitor Layout	Yes, Wall Layout

a.For information on the Wall Editor, refer to Orbit documentation.

Use a Clustered MV project when defining and managing video walls from a cluster of MV-8xx multiviewers.

Room Editor vs Wall Editor

Wall Editor - Both the original Orbit Client tool and the current GV Orbit Client allow configuration of video walls from single multiviewers using the original GV Orbit 'Multiviewer' type projects and the **Wall Editor** tool (refer to Orbit documentation).

Room Editor - GV Orbit *additionally* allows configuration of video walls from a multiviewer cluster with a 'Clustered MV' project. This is done via the new **Room Editor** tool in GV Orbit Client with the **MV Cluster Manager** service running on a GV Orbit Server.

Note: **Room Editor** vs **Wall Editor**:

	MV-8 Series multiviewer(s)	
	Cluster of *one or more*	**Single, individual**
Client tool?	**Room Editor**	**Wall Editor**[a]
GV Orbit project type?	Clustered Multiviewer	Multiviewer
Minimum system configuration	GV Orbit system with server	None
Uses MV Cluster Manager service?	Yes, an MV Cluster Manager service is required.	No

a. For information about the Wall Editor, refer to Orbit documentation.

Single Multiviewer as an MV Cluster

A single multiviewer may be considered as an '**MV Cluster** of one' and a video wall design can be generated for a single multiviewer with the **Room Editor** in a 'Clustered MV' project.

Note: For an **MV Cluster** of *any* size, an **MV Cluster Manager** service is required to be running on a GV Orbit Server.

What is an MV Cluster Manager?

The **MV Cluster Manager** is a service running on the GV Orbit Server which automatically translates a GV Orbit 'Clustered MV' project into its constituent, single-multiviewer projects. The service automatically manages each individual multiviewer device of an **MV Cluster**. A GV Orbit system may have zero or one such service.

Once it is configured, the service will:

- check for the availability of multiviewers in the room; and
- put a watch on the relevant GV Orbit Server repositories for any project changes.

The service processes any detected repository project changes and rebuilds any constituent single-multiviewer projects where necessary, automatically pushing the projects to the appropriate multiviewer device(s).

The service will alert the GV Orbit system to any off-line multiviewers and missing repositories.

The service is automatically discovered by a GV Orbit Client in a GV Orbit system and a user can then create a 'Clustered MV' project.

Configuring an MV Cluster Manager Service

The **MV Cluster Manager** service configuration is carried out on the GV Orbit Server.

Refer to:	Refer to the *GV Orbit Admin Guide* for information about GV Orbit services, including configuring the **MV Cluster Manager** service. See Related Documentation, on page 7.

The following settings can be configured from the **MV Cluster Manager** service's configuration page on the GV Orbit Server:

- Service Settings:
    - GVOP Client Domain ID number for the service to use.
    - Network interface(s) on the GV Orbit Server for the service to use.
    - RollCall address of the service in the GV Orbit system.
    - A friendly name for the service, to be used in a GV Orbit Client's **Network** window.
- Project Settings:
    - GV Orbit Server repository name of the Clustered MV project for the service to use.

Note:	The 'Project Settings' may be set up separately later, when a 'Clustered MV' project has been created along with its repository.

Video Wall Configuration Workflow (Clustered Multiviewers)

This user guide describes the configuration and operation of clustered MV-8XX multiviewers in a GV Orbit control and monitoring system for multiple video walls, for example in an OB truck environment.

This chapter has provided some MV Cluster definitions. It proceeds to provide some MV Cluster information:

1 Configuring an MV Cluster Manager Service, on page 658.
2 Creating a New Clustered Multiviewer Project for an MV Cluster, on page 659.
3 Clustered MV Project Screens, on page 668.
4 Managing Multiviewer Cluster Information in a Project, on page 671.

Additionally, the workflow description is continued in further user guide chapters:

5 Chapter 15, MV Cluster - Room Editor:
    a Room Editor Introduction, on page 675.
    b Room Editor Workflow, on page 686.
    c Step 1: Create a Room, on page 689.
    d Step 2: Arrange Monitors and Assign Multiviewer Outputs, on page 691.
    e Step 3a: Design Layout - Assign Tile Grid Layouts to a Video Wall, on page 704.

Also see Chapter 16 MV Cluster - TSL Tally Configuration, on page 757, and Chapter 17 Audio Bars Configuration, on page 783.

Creating a New Clustered Multiviewer Project for an MV Cluster

The video walls served by an MV Cluster are defined with a 'Clustered Multiviewer' Project in GV Orbit Client.

Procedure

To create a new 'Clustered Multiviewer' project (Clustered MV project) in GV Orbit Client:

Step 1: Create and Connect a Project to a GV Orbit Server

1 Open GV Orbit Client.

The initial screen is shown.
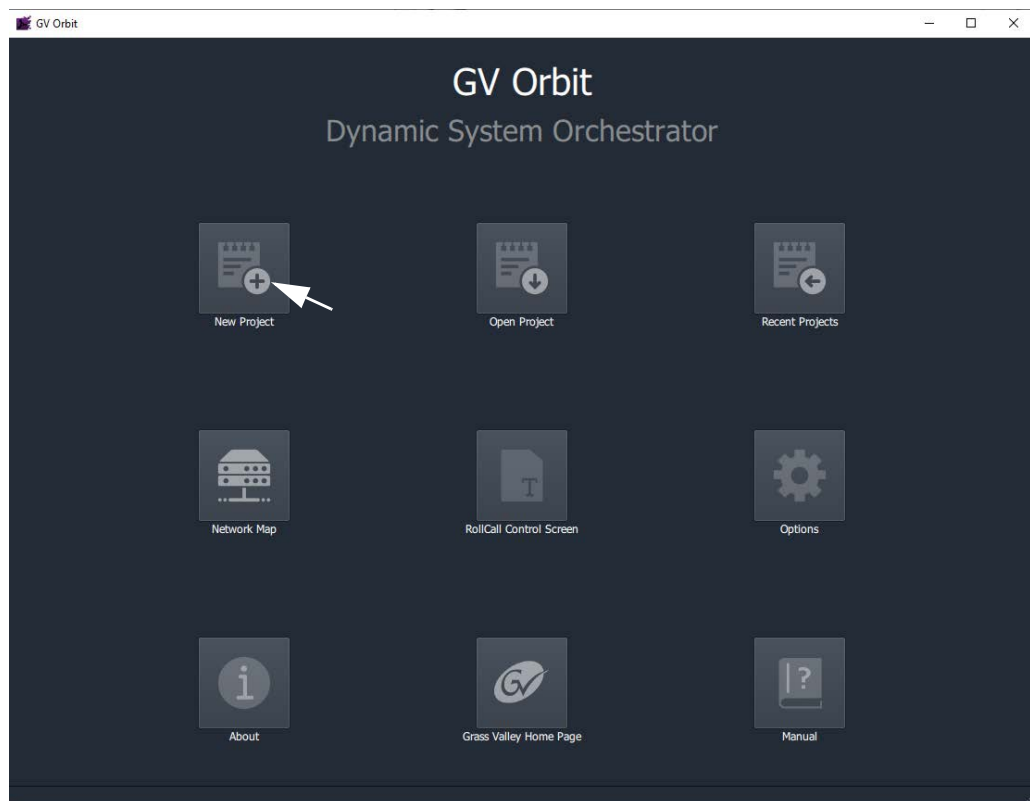
Fig. 14-2: Initial Screen of GV Orbit Client

2 Select **New Project** on the initial screen.

The **New Project** dialog is shown.
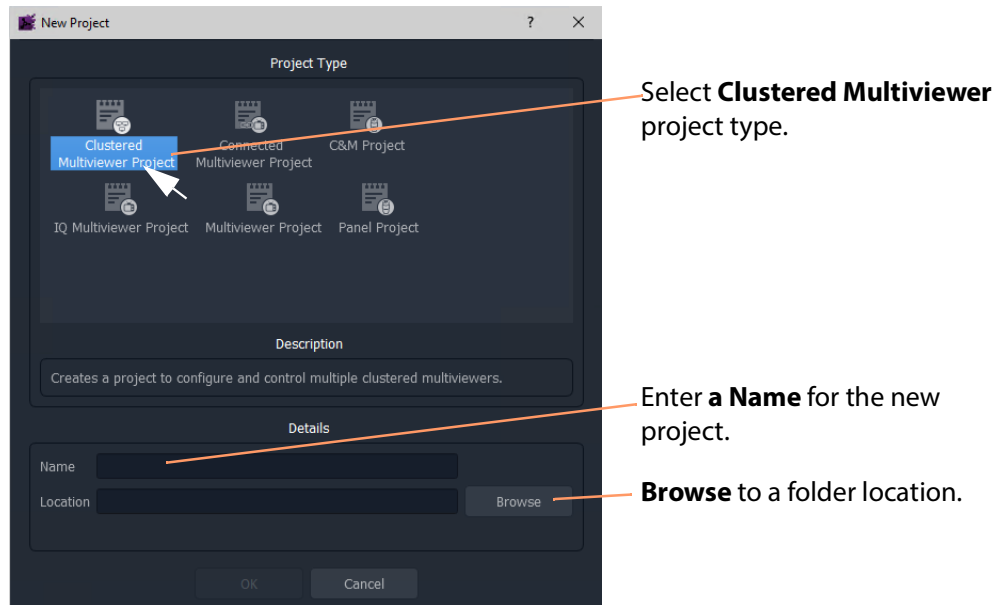
Fig. 14-3: New Project Dialog

Select **Clustered Multiviewer** project type.

Enter **a Name** for the new project.

Browse to a folder location.

3 Select the **Clustered Multiviewer** project type. (See Figure 14-3.)

4 Enter a **Name** for the new project in the 'Details' section.

  This is a name for the local storage of project information.

5 **Browse** to a folder location (local or network) for the project to be stored in while the multiviewer video walls are being designed.

> Note: **Folder Location:**
> The folder location must be accessible from the client computer running the GV Orbit Client tool. This location is used while the project is being edited.
> When the editing is complete and the project is ready to be deployed, it is pushed from the GV Orbit Client to a central repository location on the GV Orbit Server of the GV Orbit system.

6 Click **Choose** to select the folder.
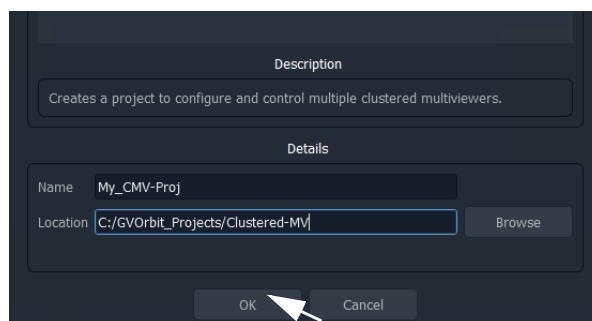
Fig. 14-4: Filled Out New Project Dialog

7 Click **OK** in the dialog.

A **Setup** dialog for the project is then shown. See Figure 14-7.

Project Setup Dialog:
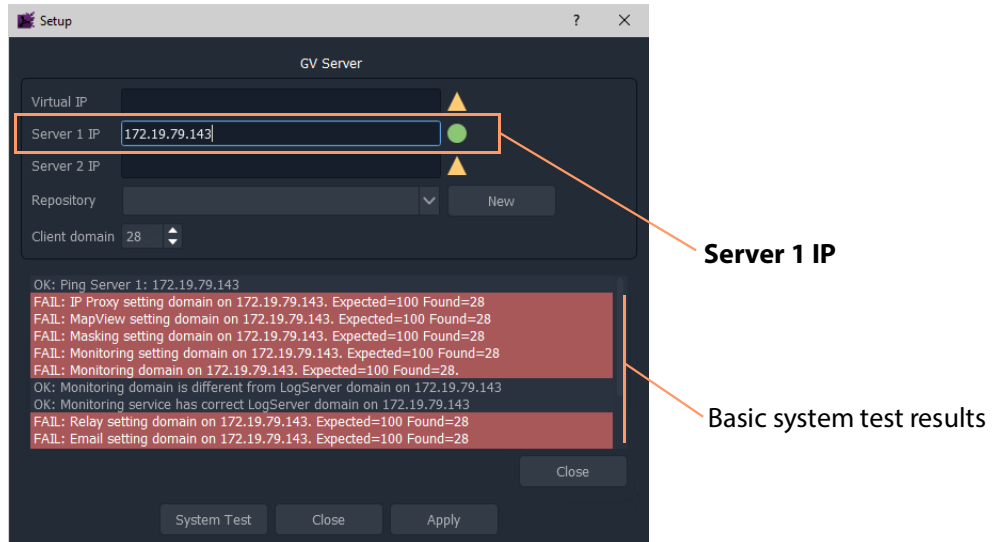
Fig. 14-5: Setup Dialog

In the clustered multiviewer project's **Setup** dialog:

8 Set **Server 1 IP** to the IP address of the GV Orbit Server and press Enter.
    (For a GV Orbit Server Cluster system, still just enter the IP address of *one* server. The
    second server will be discovered automatically in the steps below.)

    After the IP address is entered, some basic system tests are carried out using the
    current, original settings of the **Setup** dialog.
    (This basic system testing includes testing system connectivity and gathering some
    basic system information from the GV Orbit Server.)

    The results of these basic system tests are then shown in the **Setup** dialog's console
    window.

> Note: The current, original dialog settings will most likely differ from those
>   of the GV Orbit system being connected to. Discrepancies are shown
>   in red-highlighted text in the dialog's console window. This is normal.

9 After these basic system tests are done, any differences in the settings are adopted by
    the **Setup** dialog.

Step 2: Repository for Clustered MV Project

When creating a new 'Clustered Multiviewer' project, a new repository needs to be created.

(Compare to when opening an *existing* 'Clustered Multiviewer 'project; in this case, an
existing repository must be specified, see Open an Existing Clustered Multiviewer Project,
on page 664.)

To Create a New Repository for the Project:

In the **Setup** dialog, to create a new **Repository** to be used:

1   At the **Repository** setting, click **New**.
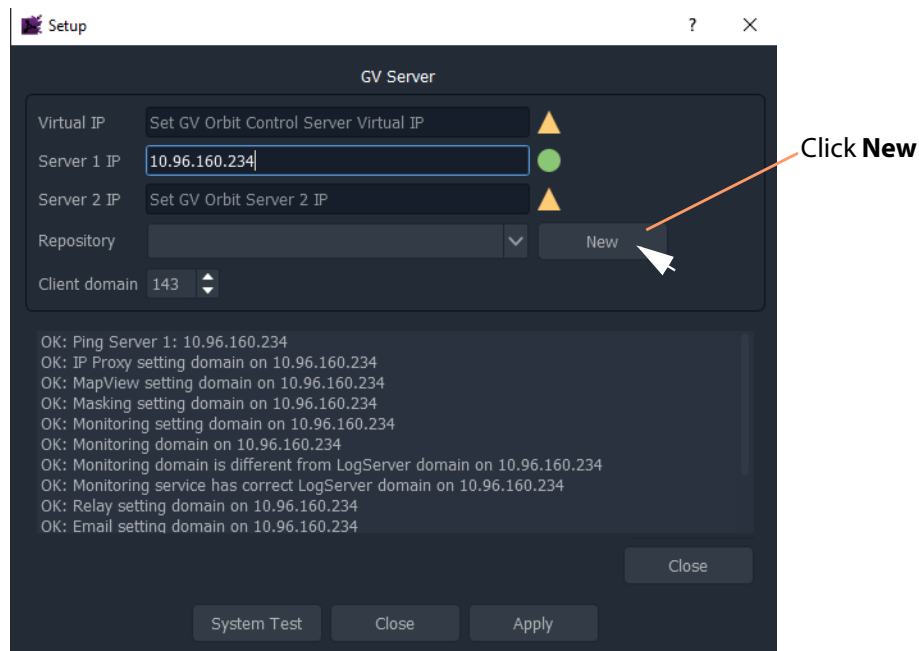
Fig. 14-6: Click New in Setup Dialog

The **Create Repository** dialog is shown.
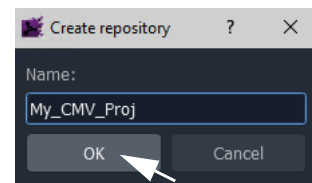
2   Enter a **Name** for the new repository on the
GV Orbit Server for the 'Clustered MV' project to use and press Enter, or click **OK**.

> Note: **Characters to use in a Repository Name:**
> Use only:
> - alpha-numeric characters (0 1 2 A B C x y z etc.); and/or
> - underscore characters (_); and/or
> - tilde characters (~).

> Note: **Repository Name:**
> Use a unique and identifiable repository name for the 'Clustered MV'
> project to use. In this way, it is easily identified and found in a list of all
> repositories on a server.

The new repository name is shown in the **Setup** dialog.

> IMPORTANT
> If a new **Repository** has been created during the 'Clustered MV'
> project creation, then the **MV Cluster Manager** service repository
> needs to be configured with the new **Repository**.
> (See the 'Project Settings' part of Configuring an MV Cluster Manager
> Service, on page 658.)

Step 3: System Re-Test (optional) During Project Setup

With a new or an existing **Repository** name shown in the **Setup** dialog, a system re-test can
be carried out.

Note: At this point, a system re-test is optional and will now remove any
red items in the console pane. Optionally, in the **Setup** dialog:

1   Click **System Test**.

This re-does the basic system tests. The results are shown in the console. Any 'red' items
from before should now be cleared. See Figure 14-7.
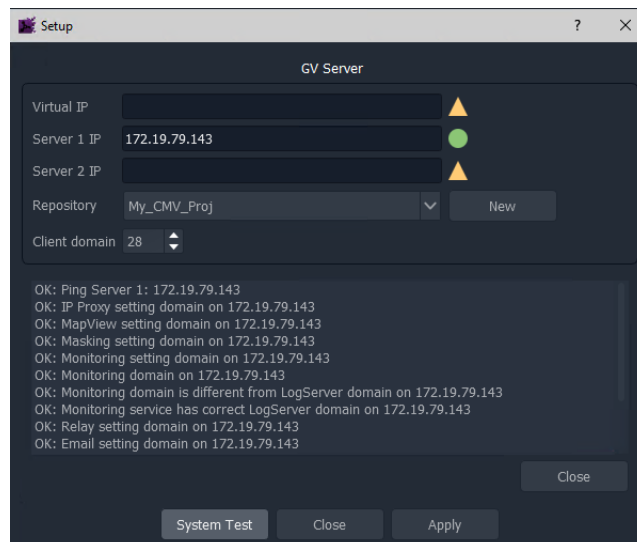
Fig. 14-7: System Re-Test

Step 4: Finally, Create Project

1   Click **Apply** in the **Setup** dialog.

The settings are applied
to the project and a
progress bar appears in
the dialog.

2 While settings are applied, a pop-up dialog may appear, asking if the local project should be updated from the chosen repository:

For a new project where no changes have been made locally, answer **Yes**.

Fig. 14-8: Update Local Project?

- Click **Yes** to update the local project from the repository on the server (this will lose any local changes made); or
- Click **No** to keep any local project changes made (and *not* pull the project from the repository on the server).

3 While the applying of the settings continues, progress is shown in the progress bar.

4 When the settings changes are all applied, an **All Done** message pops up. :

Fig. 14-9: Applying of Project Settings is All Done

5 Click **OK**.

6 Close the **Setup** dialog.

The new **Clustered Multiviewer** project is created and its **Home** screen is then shown. See Clustered MV Project Home Screen.

Note: The **Setup** dialog can also be viewed when a GV Orbit project is open by clicking **Connections > GV Server** in the main menu.

---

7 Click **OK**.

The **Clustered Multiviewer** project information is contained in the local folder, ready for editing. For a newly-created project it is an empty project.

Open an *Existing* Clustered Multiviewer Project

To open an *existing* 'Clustered Multiviewer' project from a repository on the GV Orbit Server, the procedure is similar to the procedure for creating a new 'Clustered Multiviewer' project (refer to Creating a New Clustered Multiviewer Project for an MV Cluster, on page 659).

The steps below open an existing project from an existing repository.

Procedure

Step 1: Create and Connect

1 Carry out the steps in Step 1: Create and Connect a Project to a GV Orbit Server, on page 659.

This creates an empty, locally-stored project.

Step 2: Repository for Clustered MV Project

When opening a Clustered MV project from a repository, an existing repository must be specified:

To specify an existing Repository for the project, in the **Setup** dialog:

1. At the **Repository** drop-down box, select a Repository from the drop-down list. (See Figure 14-10.)
   The repository must be a 'Clustered Multiviewer' repository.

Click on drop-down arrow   Select an existing Repository
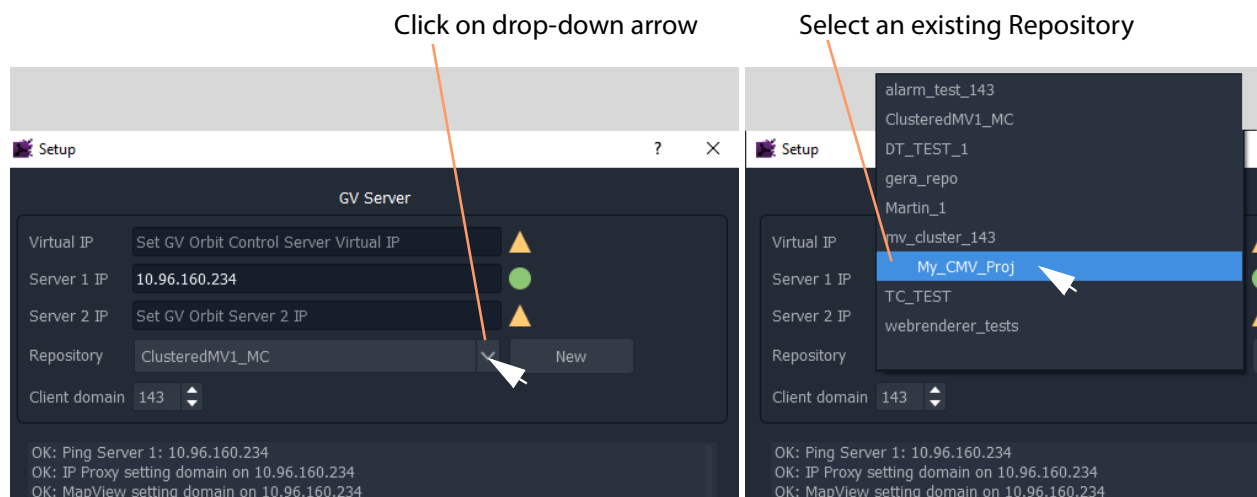
Fig. 14-10: Select Existing Repository

The selected Repository name is shown in the **Setup** dialog.

Step 3: System Re-Test (optional)

With a **Repository** name shown in the **Setup** dialog, a system re-test can be carried out.

1. Carry out the steps in Step 3: System Re-Test (optional) During Project Setup, on page 663.

Step 4: Finally, Open the Project from the Repository

1. Click **Apply** in the **Setup** dialog.

The settings are applied to the project and a progress bar appears in the dialog.
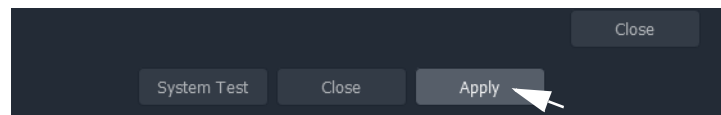
2. While settings are applied, a pop-up dialog may appear, asking if the local project should be updated from the chosen repository:

For a new project where no changes have been made locally, answer **Yes**.
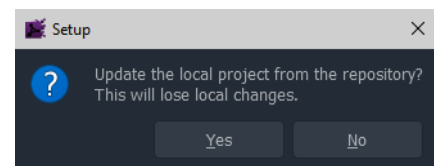
Fig. 14-11: Update Local Project?

- Click **Yes** to update the local project from the repository on the server (this will lose any local changes made); or

- Click **No** to keep any local project changes made (and *not* pull the project from the repository on the server).

> Note: To edit an existing repository project information on a new PC, then click **Yes** to pull the existing project information from the repository into the newly created 'Clustered MV' project.
> If you click **No** here, then subsequent pushing back to the repository will overwrite the existing project information in the repository.

3 While the applying of the settings continues, progress is shown in the progress bar.

4 When the settings changes are all applied, an **All Done** message pops up.
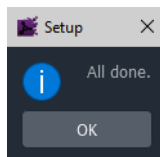
Fig. 14-12: Applying of Project Settings is All Done

5 Click **OK**.

6 Close the **Setup** dialog.

The exiting **Clustered Multiviewer** project is opened and its **Home** screen is then shown. See Clustered MV Project Home Screen.

> Note: The **Setup** dialog can also be viewed when a GV Orbit project is open by clicking **Connections > GV Server** in the main menu.

7 Click **OK**.

The **Clustered Multiviewer** project information is contained in the local folder, ready for editing. For a newly-created project it is an empty project.

> Note: The Home Page is not automatically refreshed, and *new* **Room** files will not be shown.
> Close and re-open the project to refresh and then see files pulled from the repository.

Deploying a Clustered Multiviewer Project (Push/Pull)

For deployment, a Clustered MV project is pushed to a central store on the GV Orbit Server, for example, to the **Repository**. There is one project per **Repository**.
Compare this to a single-multiviewer project: that is for a *non*-clustered multiviewer device, in which case the project is pushed to the multiviewer itself.

Push Project to Repository

To send a locally-saved and edited project to the Repository for automatic deployment on the multiviewer cluster by the MV Cluster Manager Service on the GV Orbit Server:

1   Click **Push** in the main tool bar.

Fig. 14-13: Push in Tool Bar

A **Choose Projects** dialog is shown.
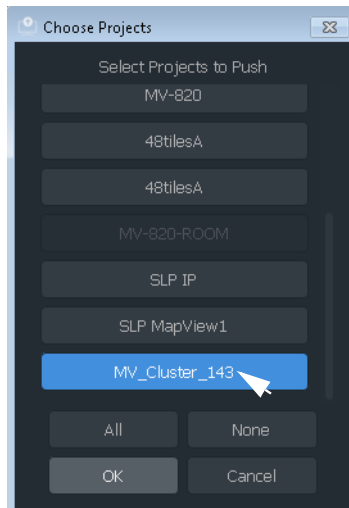
Fig. 14-14: Choose Push

2   Ensure that the project Repository to be pushed is selected (highlighted in blue) in the dialog. See Figure 14-14.

3   Click **OK**.

The project information is pushed to the Repository.

4   When the Push is done, a **Push** dialog is shown.
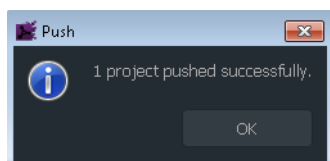
Fig. 14-15: Push Done

5   Click **OK** to close the **Push** dialog.

Pull Project from Repository

To get a project from a Repository into an opened project for editing and/or locally saving:

1   Click **Pull** in the main tool bar.

Fig. 14-16: Pull in Tool Bar

A **Choose Projects** dialog is shown.
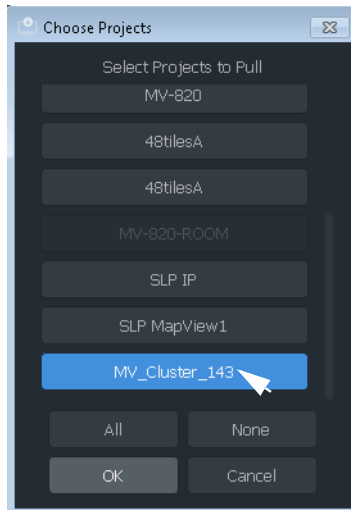
Fig. 14-17: Choose Pull

2   Ensure that the project Repository to be pulled is selected (highlighted in blue) in the dialog. See Figure 14-17.

3   Click **OK**.

The project information is pulled from the Repository.

4   When the Pull is done, a **Pull** dialog is shown.
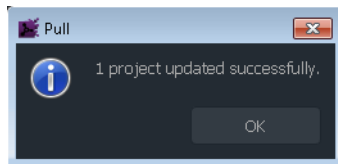
Fig. 14-18: Pull Done

5   Click **OK** to close the **Pull** dialog.

> Note: For best practice, **Pull** a project *before* starting to edit it.
> This ensure that the most up to date project information is used.
> If there are any conflicts between locally-stored project information
> and the repository, then you are prompted. You may then either
> discard their changes, or keep their changes and discard any server-
> side changes.

Clustered MV Project Screens

Clustered MV Project Home Screen

The **Home** screen of a **Clustered Multiviewer** project is shown in Figure 14-19.

Main menu bar

Main tool bar

Project name

Click **Edit** to edit Project name

Local path to project folder

Click 'Multiviewer > Multiviewer Cluster' in the main menu for information on the multiviewers in the **MV Cluster**.

Click **Rooms** icon to create a **.room** file in the project and open it in the **Room Editor**.
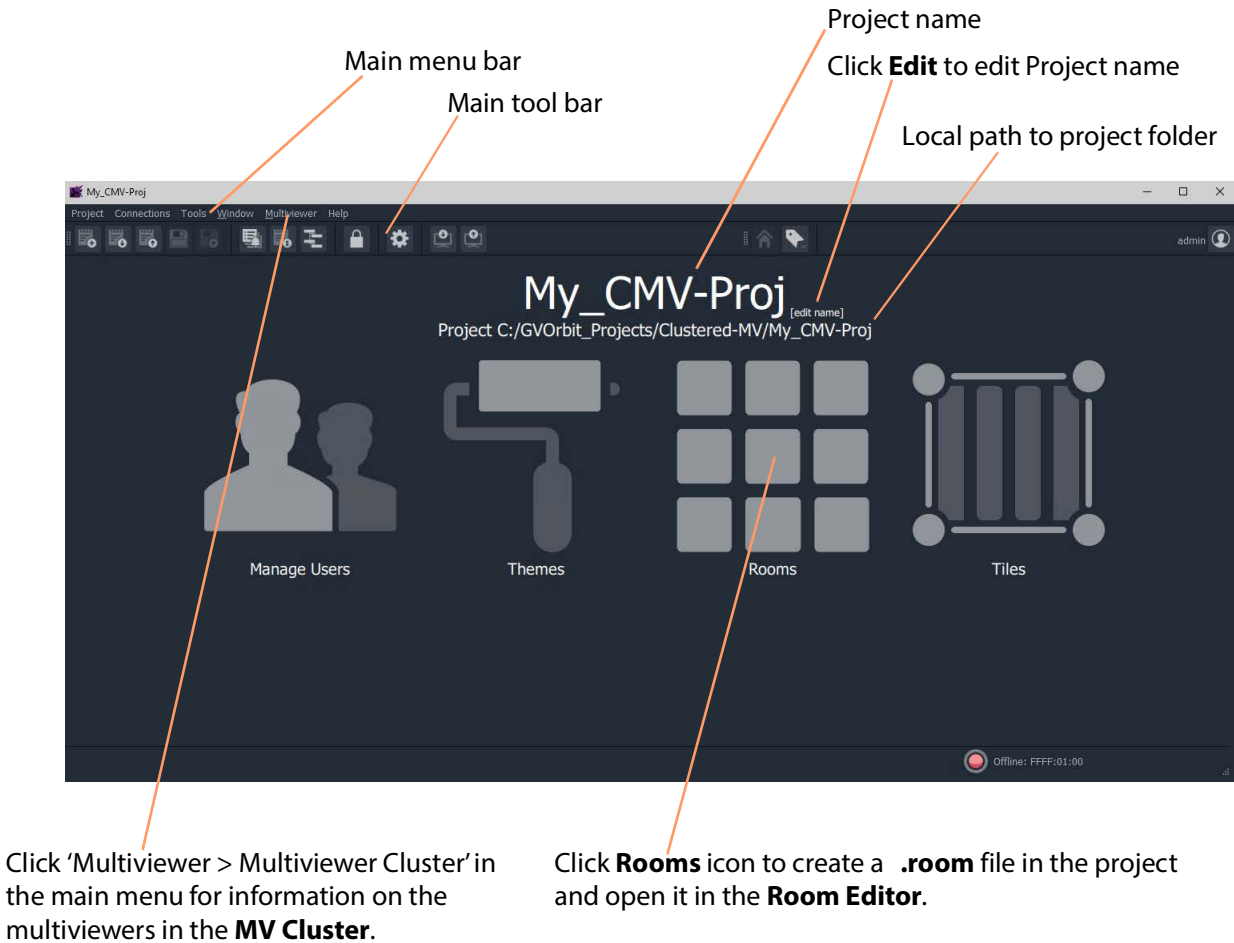
Fig. 14-19: Clustered Multiviewer Project Home Screen

The **Home** screen of the Clustered MV project is similar to that for a GV Orbit Multiviewer project; differences include:

- **Multiviewer Cluster** dialog which lists the multiviewers of the cluster. (Main menu item 'Multiviewer -> Multiviewer Cluster'.)
- **Rooms** icon on the **Home** screen which allows you to create **.room** files and edit them in the **Room Editor**. (See Chapter 15, MV Cluster - Room Editor, on page 675.)
- **Project** window has a 'rooms' sub-folder for **.room** files.

The large icons are similar to (non-clustered) multiviewer projects:

- **Manage Users** - Set up project users and their roles. (See Chapter 4, Manage Users, on page 141.)
- **Themes** - Edit or create new on-screen appearance styles for graphical widgets for use on the video wall.
- **Rooms** - Edit or create **.room** file(s) with the **Room Editor** tool for the 'Clustered Multiviewer' project. (See Chapter 15, MV Cluster - Room Editor, on page 675.)
- **Tiles** - Edit or create new **Custom Tiles** for use on the video wall.

Main Menu Items

See Main Menu Items, on page 127.

Main Tool Bar Items

See Main Tool Bar Items, on page 132.

Further Tool Bar items are shown when a multiviewer video wall is open. See Main Tool Bar with Room Editor Open.

Clustered MV Room Editor Screen

The **Home** screen of the **Room Editor** is shown in Figure 14-20.

Main menu bar

.room file open in **Room Editor** tab window

Main tool bar

Room Editor tool bar

Properties Box

Project window

Network window
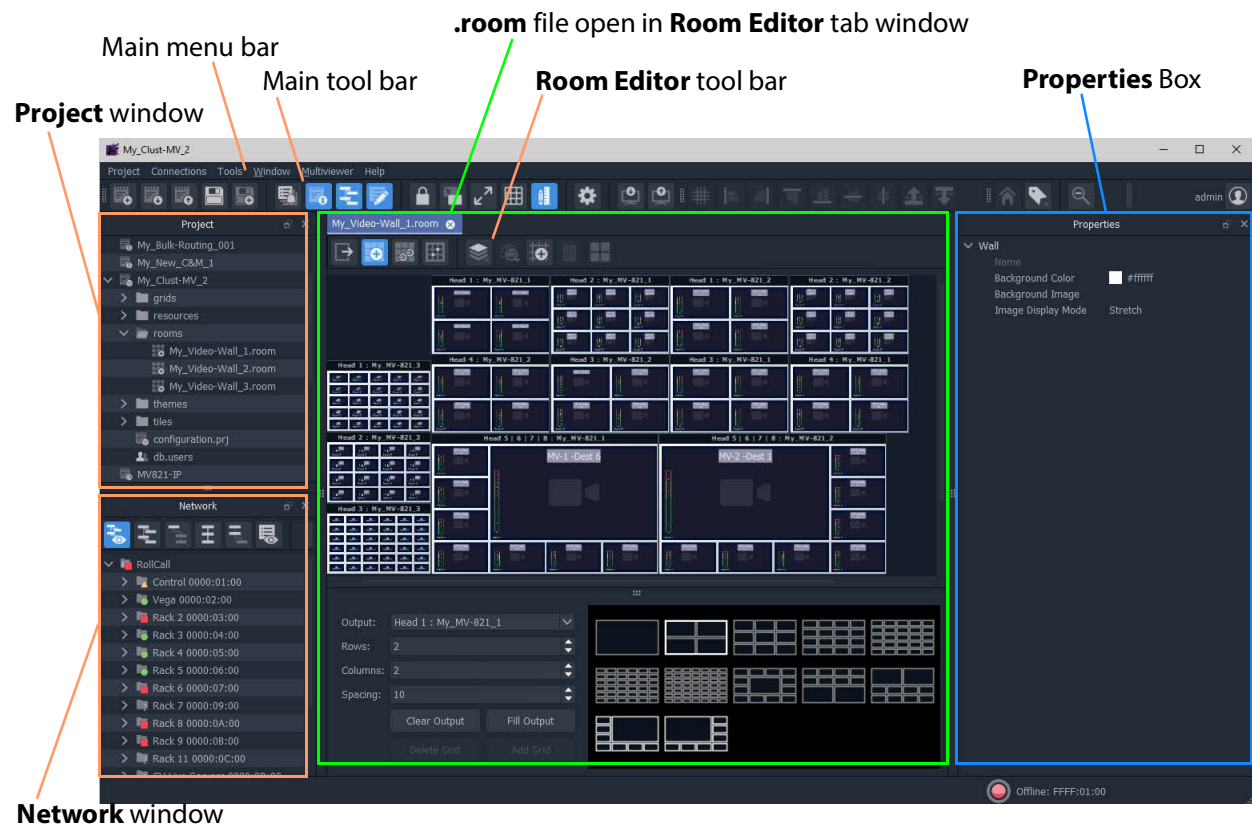
Fig. 14-20: Clustered Multiviewer Room Editor Screen

For further description of the **Room Editor**, see Chapter 15, MV Cluster - Room Editor, on page 675.

Main Tool Bar with Room Editor Open

Additional tool bat icons are shown here. See Main Tool Bar Items for the other icons.
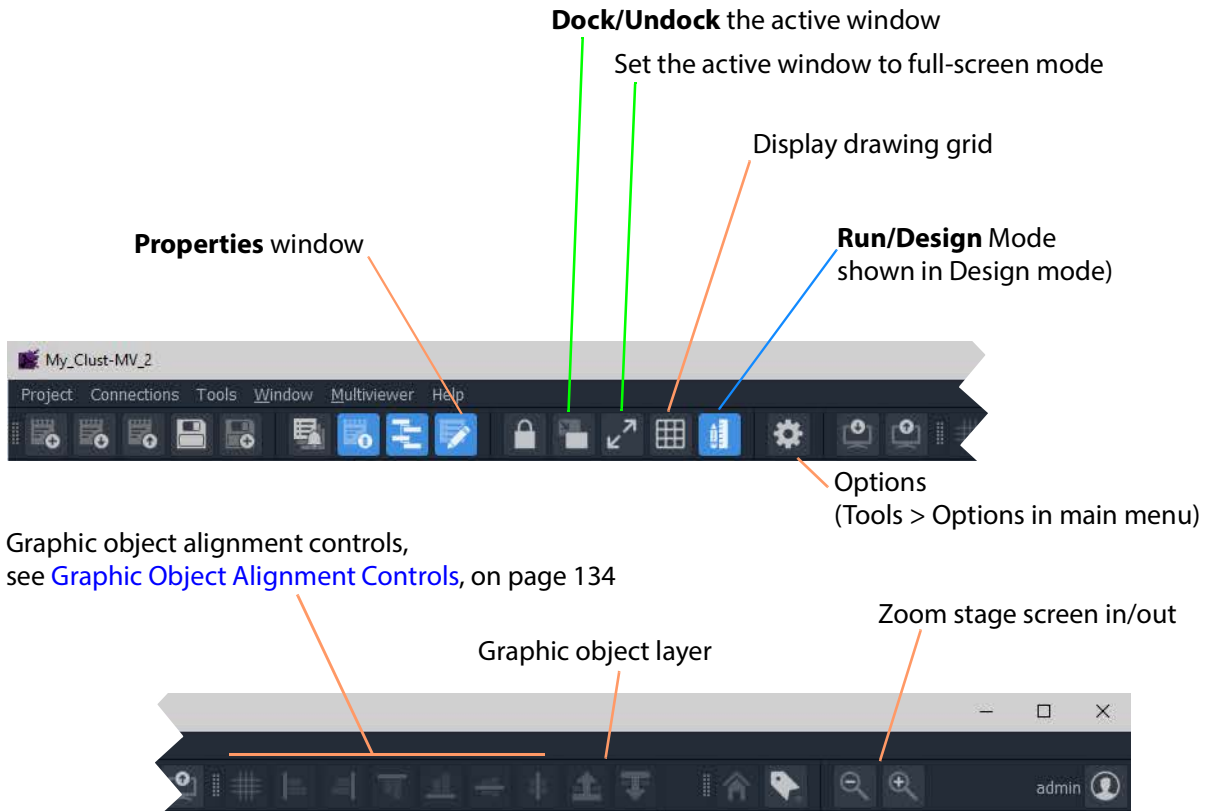
Fig. 14-21: Clustered Multiviewer Main Tools Bar with Room Editor Screen Open

Managing Multiviewer Cluster Information in a Project

The multiviewers in a multiviewer cluster are automatically discovered by GV Orbit where a network allows multicast discovery data packets.

In addition, a user can manually add one or more networked multiviewers to the cluster.

> Note: Manual entry of multiviewer devices is required where a network does not have multicast data enabled.

View/Edit Multiviewer Information about Multiviewers in the Cluster

Procedure

To view information about each multiviewer in the multiviewer cluster:

1   Click 'Multiviewer > Multiviewer Cluster' in the GV Orbit Client main menu.

The **Multiviewer Cluster** dialog is shown. See Figure 14-22.
The dialog shows the auto-discovered multiviewers of the cluster.

IP address

RollCall address

Number of supported, licensed
multiviewer head display outputs

Multiviewer output resolution
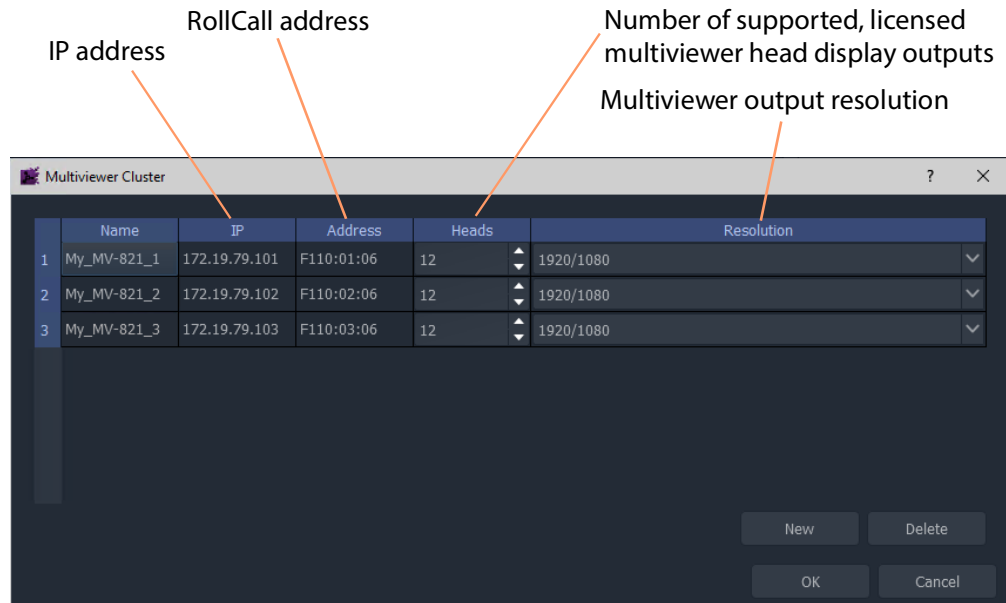
Fig. 14-22: Multiviewer Cluster Dialog

In the **Multiviewer Cluster** dialog, the following should be manually set up:

2 Select the number of 'Heads' that are licensed for each multiviewer in the list.

3 Select the output 'Resolution' for the multiviewers.

4 Click **OK**.

If required, multiviewers can be explicitly added, see Adding Multiviewers Explicitly.

> Note: The head display outputs of an MV-8 Series multiviewer all share the
> same resolution. Select either 1920x1080 or 720x1280.
> UHD (4K) is achieved with four outputs and 1080p quad-link.

Adding Multiviewers Explicitly

It is possible to add multiviewers to the list in the **Multiviewer Cluster** dialog. This may be
required if, for example, multicast discovery data packets are not allowed on a network.

Procedure

To add multiviewers manually:

1 Click **New** to add the information about each multiviewer of the cluster. See Figure 14-
23.

2 Click **OK** to close the dialog.

3 Click **Project -> Save Project** in the main menu to save the project locally.

MV-8 Series multiviewer head display outputs all share the same resolution.
Select either 1920x1080 or 720x1280.
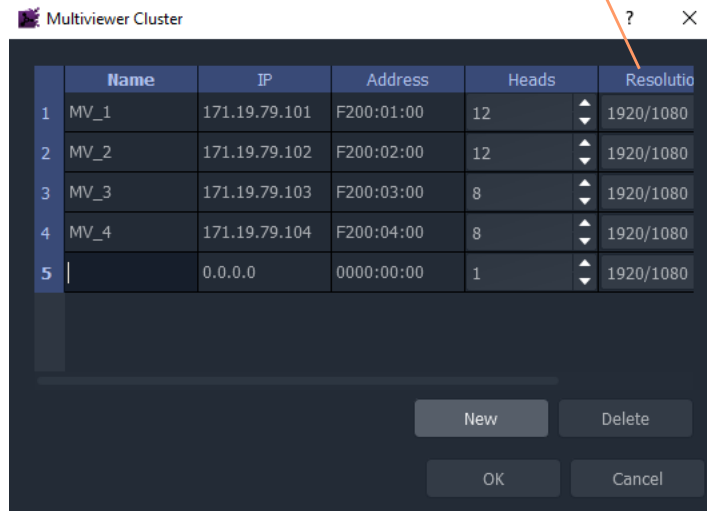
Fig. 14-23: Multiviewer Cluster Dialog- Adding New Multiviewer Device

Video Walls Etc. Design Workflow for an MV Cluster

For instructions on designing video walls in a 'Clustered MV' project see the workflow described in:

- Chapter 15, MV Cluster - Room Editor, on page 675.

Also see these additional design steps:

- Chapter 16 MV Cluster - TSL Tally Configuration, on page 757.
- Chapter 17 Audio Bars Configuration, on page 783.

MV Cluster - Room Editor

Room Editor Introduction

Lite	Professional	Enterprise
	●	●

Room Editor is a facility offered in a 'Clustered MV' project in GV Orbit Client. It enables a user to design one or more video walls that are served by a cluster of multiviewers. This allows a user to design and manage all the video walls in a production-facility (for example, studio, or OB truck). The multiviewer devices are automatically discovered by GV Orbit Client.
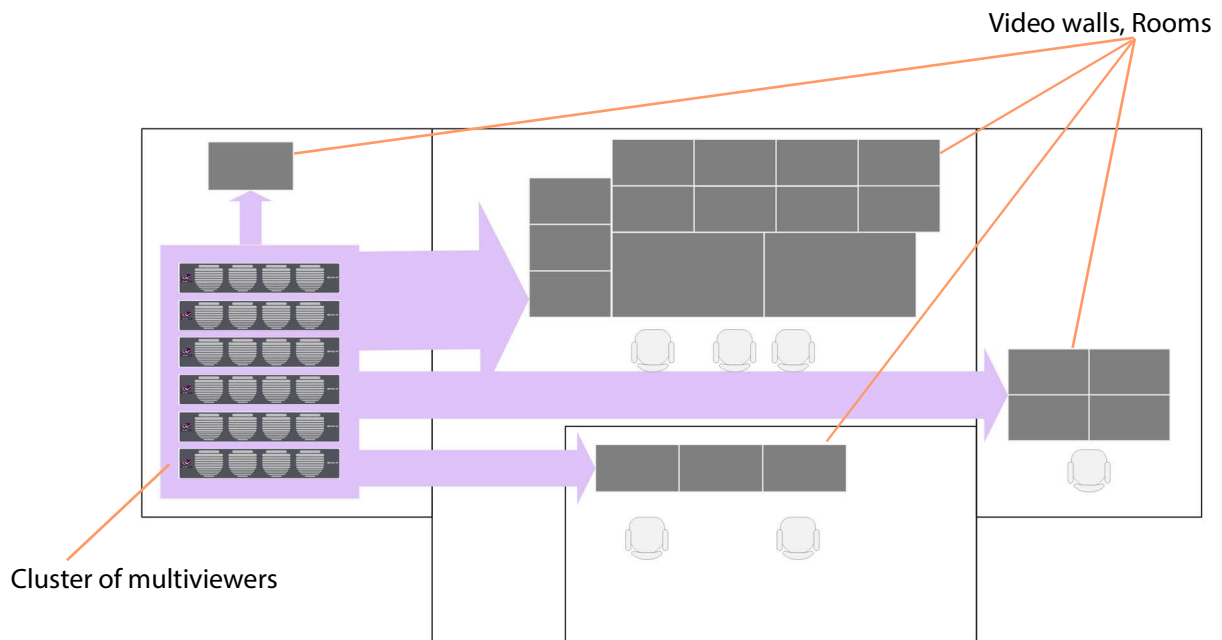
Fig. 15-1: Example Facility Schematic - Cluster of Multiviewer Devices Serving a Production Facility

In the This section defines and describes some terms etc. used when using the Room Editor in GV Orbit Client., a user can define and position all of the physical monitor displays for all their video walls. Assignment of multiviewer devices and outputs to video wall monitors is performed once. Video walls can be fed by any multiviewer output available in the multiviewer cluster and are assigned to router destinations. Assignment of video signals to the video wall for monitoring is integrated into the GV Orbit routing system and carried out with a graphical interface in GV Orbit Client.

Subsequent design and management of all the various video walls is then independent of the individual multiviewers in the cluster and video tile positions on the video wall are referred to with router destination names.

The **Room Editor** also enables a user to set up TSL tally settings and audio bars configuration for a video wall.

This section defines and describes some terms etc. used when using the **Room Editor** in GV Orbit Client.

What is a Room?

A **Room** (also known as a **Room** file, or, simply, a **Room**) is part of a Clustered MV project. A file holds information for a video wall (**Room Design**). There can be more than one **Room** in a Clustered MV project.

The files are stored in the 'Clustered MV' project's folder structure, in the 'rooms' sub-folder, and are accessible from the **Project** window in GV Orbit Client or from the opening project **Home Page**.
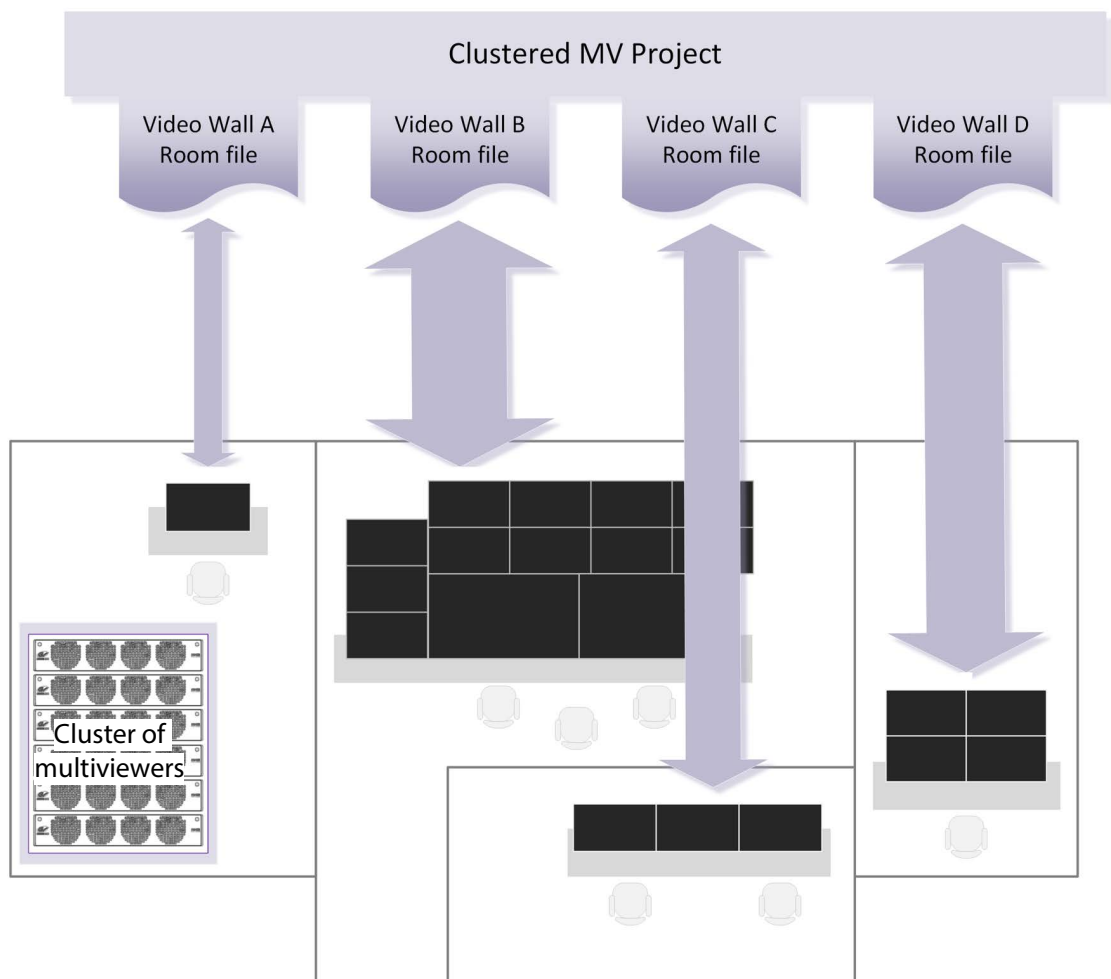
Fig. 15-2: Room Files in a Clustered Multiviewer Project Describe Video Walls

What is a Room Design?

A video wall is formed in a 'Clustered MV' project from 'physical' video monitor displays. Each video wall design is a **Room Design**. A user can form a large video wall from multiple 'physical' displays arranged and configured. They can be driven from one or more multiviewer devices from an MV cluster. Video wall tile layouts can be applied and video tiles can be assigned router destinations.

A **Room Design** is stored in a **Room** file.

See for the workflow steps.

What is Monitor Arrangement and Multiviewer Output Assignment?

As part of a **Room Design**, a user can configure a large video wall from multiple 'physical' displays and driven from one or more multiviewer devices from an MV cluster.

a) Arrange Monitors for each video wall

Monitors

a **Room Design**

Cluster of multiviewers

b) Assign a Multiviewer Output to Each Monitor
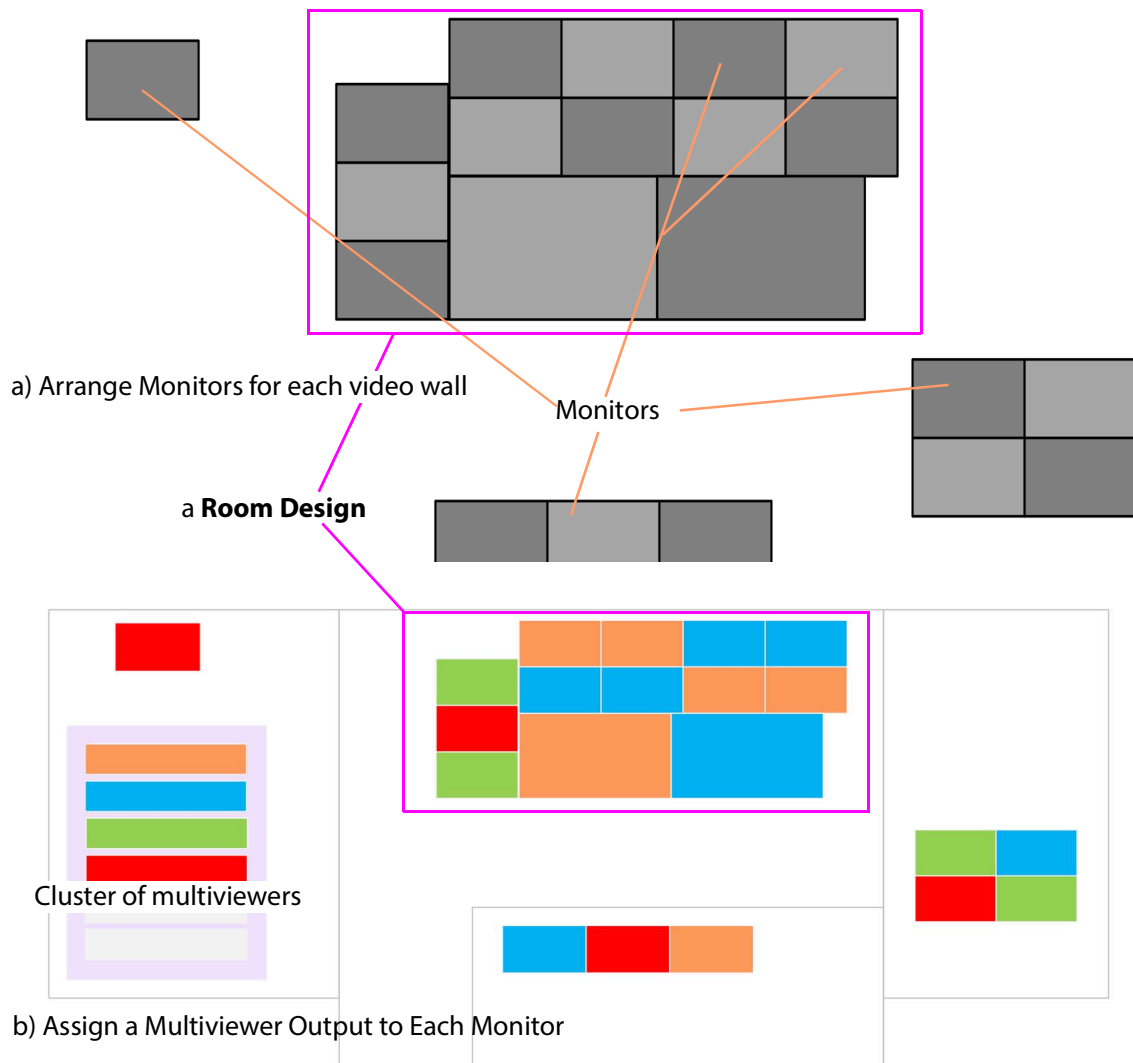
Fig. 15-3: Room Designs: a) Arranging Monitors;   b) Assigning and Configuring Multiviewer Outputs.

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Monitor Arrangement includes:

1 Creating a representation of a large video monitor wall by positioning 'physical' displays on a 'stage'.

2 Defining each display, including:

- Display size, geometry.
- Type: single HD, or quad-split for UHD.
- Orientation: Vertical or Horizontal.

Note:	A UHD monitor is fed from four MV-8 Series multiviewer "HD" multiviewer outputs. These must be multiviewer outputs from the same multiviewer device.

Note:	Monitor aspect ratio is assumed to be 16:9.

Assign Outputs includes:

3 Assigning a multiviewer output to each physical monitor display.

A monitor arrangement and assigned outputs in a **Room** file can be saved locally and, when complete, the **Room Design** can be saved centrally on a GV Orbit Server in a 'Clustered Multiviewer' project.

See Step 2: Arrange Monitors and Assign Multiviewer Outputs, on page 691, for the workflow steps.

What is Room Design Layout?

This defines the arrangement of *tiles* used in a project for each video wall monitor.

The arrangement of tiles *plus* their connection to multiviewer inputs on a monitor is termed its Layout.

Tiles

Tile layouts added to video wall monitors
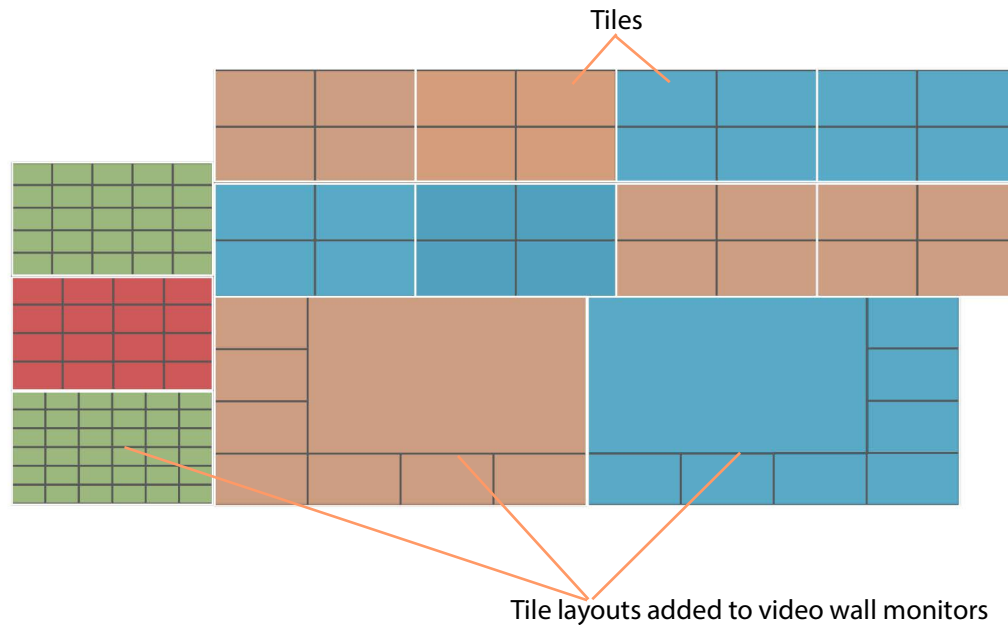
Fig. 15-4: Video Wall Design Layout

Layout Workflow

For a created **Room Design**, for each monitor:

- A tile-grid is applied from a selection of templates (for example, 2x2, 3x3 etc.) to position tiles and fine-positioning can be done.
- Each tile type is then defined (for example, video tile, audio tile, or custom tile).

This has prepared a basic **Design Layout** in a **Room Design**.

(See What is a Monitor Layout?, and What is a Room Layout?)

See Step 3a: Design Layout - Assign Tile Grid Layouts to a Video Wall, on page 704, for the workflow steps.

What is a Tile-Grid?

A tile-grid determines the position and size of tiles on a monitor, irrespective of tile type. For example, a tile-grid may comprise:

- 3x3 tiles; or of
- one larger, central tile surrounded by twelve smaller tiles .
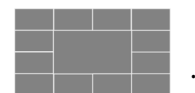
A tile-grid includes the assignment of multiviewer inputs and router destinations to each tile position in the grid.

Tile-Grid Excludes Tile Types

A tile-grid *excludes* the tile types that populate the tile-grid.

> **Note:** Tile-grid + Tile types = **Monitor Layout**.
> (See What is a Monitor Layout?.)

What is a Monitor Layout?

In a project, monitors on the video wall are each configured to show a tile-grid layout, either from pre-configured grids (2x2 or 3x3 etc.), or from user-defined grids. These 'monitor layouts' then make up the layout of the entire video wall.

Further, an individual monitor may be set up with a set of two or more alternative tile-grid layouts which can be available to the monitor at run time. (For example, there may be a 2x2, 3x3, a 4x4 tile grid and a user-defined tile grid layout in the set of alternative layouts to select from at run time on the monitor.)

These alternative layouts are saved for an individual monitor for selecting at run time on the video wall. These are called **Monitor Layouts** and they apply to individual monitors on the video wall.

These 'monitor-level' layouts form part of the overall **Layout Configuration**.

> **Note:** Live-Selecting of Monitor Layouts:
> **Monitor Layouts** are live-selectable.
>
> (**Monitor Layout** in the **Room Editor** tool is equivalent to **Wall Layout** in the **Wall Editor** tool in GV Orbit Client.)

Monitor Layouts can be created (see Create a New Monitor Layout, on page 713).

Monitor Layouts can be selected live for a video wall in X/Y Routing mode (see Step 5b: Change Layouts in X/Y Routing Mode, on page 751).

What is a Room Layout?

A **Room Layout** is a snapshot of **Monitor Layouts** across the monitors on a video wall. A **Room Design** can have one or more **Room Layouts** to select from. This 'room-level' layout applies across a whole video wall in a **Room**.

(See Step 3b: Create Optional Alternative Layouts for a Video Wall, on page 713, for the workflow steps.)

Room Layouts enable a video wall to have various optional, alternative, similar layouts to use for different scenarios. Table 15-1 shows some possible example combinations.

Table 15-1: Example Room Layouts with different Monitor Layouts Combinations

| Room Layouts | Monitor 1 Monitor Layouts | | | Monitor 2 Monitor Layouts | | | | Mon 3 | Mon 4 | Mon 5 Monitor Layouts | | Mon 6 | Mon 7 |
	All Feeds	Main +2x2	Main+3x3	Pvw–Live	Large Live	Center Live	Side Live			4x4	5x5		
Soccer Layout 1	⊙			⊙				⊙	⊙	⊙		⊙	⊙
Soccer Layout 2		⊙		⊙				⊙	⊙	⊙		⊙	⊙
Soccer Layout 3			⊙	⊙				⊙	⊙	⊙		⊙	⊙
Hockey Layout 1		⊙			⊙			⊙	⊙	⊙		⊙	⊙
Hockey Layout 1b		⊙			⊙			⊙	⊙		⊙	⊙	⊙
Hockey Layout 2		⊙				⊙		⊙	⊙	⊙		⊙	⊙
Hockey Layout 3		⊙					⊙	⊙	⊙	⊙		⊙	⊙

Room Layouts can be created (see Create a Room Layout for a Video Wall, on page 717).

Room Layouts can be selected live for a video wall in X/Y Routing mode (see Step 5b: Change Layouts in X/Y Routing Mode, on page 751) and, in this mode, they may also be created live and saved.

What is Destination Assignment for a Room?

Assignment of router destinations to tile positions on the video wall tile-grid allows you to manage video walls, and their specifically tile positions, in terms of router destinations.

Assignment of destinations is done for all video walls in a Clustered MV project (for example, for all **Rooms** in the project). There are two destination assignment mechanisms that can be used:

- **Static Destination Assignment** - see What is Static Destination Assignment?, on page 682.
- **Dynamic Destination Assignment** - see What is Dynamic Destination Assignment?, on page 683.
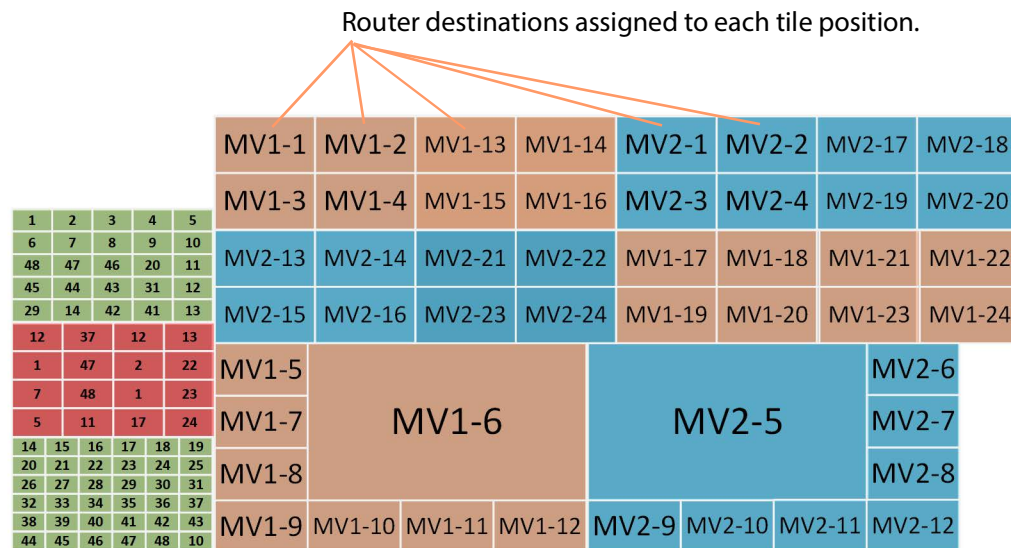
Fig. 15-5: Video Wall - Assigned Destinations

TSL Configuration and Audio Bars Configuration

Additionally, this **Room Editor** mode allows:

- TSL settings to be configured globally for the **Room**.
  (See Chapter 16, MV Cluster - TSL Tally Configuration, on page 757.)
- Audio bar configuration for Audio Bars in on-screen graphical widgets to be configured globally for the **Room**.
  (See Chapter 17, Audio Bars Configuration, on page 783.)

What is Static Destination Assignment?

Static Destination Assignment is where one, or more, or all video tiles on video walls are manually assigned specific router destinations. It may be implemented partly or fully in a system. Full static assignment is suitable in routing systems where each video tile on each video wall from each multiviewer is assigned a fixed, specific router destination, which needs to remain static throughout routing operation. (For example, this may be suitable for systems with third-party router controllers.)

For a created **Room Design**, for each monitor in a video wall, the workflow for static destination assignment is:

1. Router destinations are manually mapped to multiviewer inputs for all devices in the MV cluster.
2. Destinations are then manually assigned to tile positions on the video walls.

This has prepared the **Destination Assignments** for monitors in a **Room**. The multiviewers are ready have signals routed to them.

What is Dynamic Destination Assignment?

Dynamic Destination Assignment implements routing based on video wall tiles rather than on router destinations. This is made possible with the integrated nature of multiviewing and routing in a GV Orbit system.

The assignment of router destinations to video tiles is done at run time by a GV Orbit service. This keeps track of the current video wall active layouts for each multiviewer. The service then knows which multiviewer inputs are actively feeding video tiles and which are free. This information is shared with the GV Orbit system.

> **Note:** The GV Orbit Multiviewer Cluster Manager Service (MVCMS) is required for the dynamic destinations assignment to function.

Upon a video wall layout change, the service re-assigns destinations on the fly to meet the needs of the newly switched-to layout.

In this way:

- A user does not have to keep track of multiviewer input usage across different video wall layouts.
- Multiviewer inputs (up to 48 per multiviewer) can flexibly accommodate the needs of different video wall layouts.
- It is easier for a user to design video walls, because dynamic destination assignment is the default on video tiles from the outset.
  (**Note:** A video tile can still be set to a static destination, preventing the destination to be assigned dynamically if required.)

> **Note:** TSL assignments made will automatically follow any destination re-assignments done in dynamic destination assignment mode.

MV Cluster - Room Editor
What is X/Y Routing Source Assignment for a Room?

GV Orbit Version 2.3.0
User Guide

What is X/Y Routing Source Assignment for a Room?

The final step in designing the video wall (**Room**) involves routing sources to all of the tile positions in each monitor tile-grid. This is done with an integrated, easy-to-use, graphical routing panel enabling you to route by selecting sources and destination tiles.
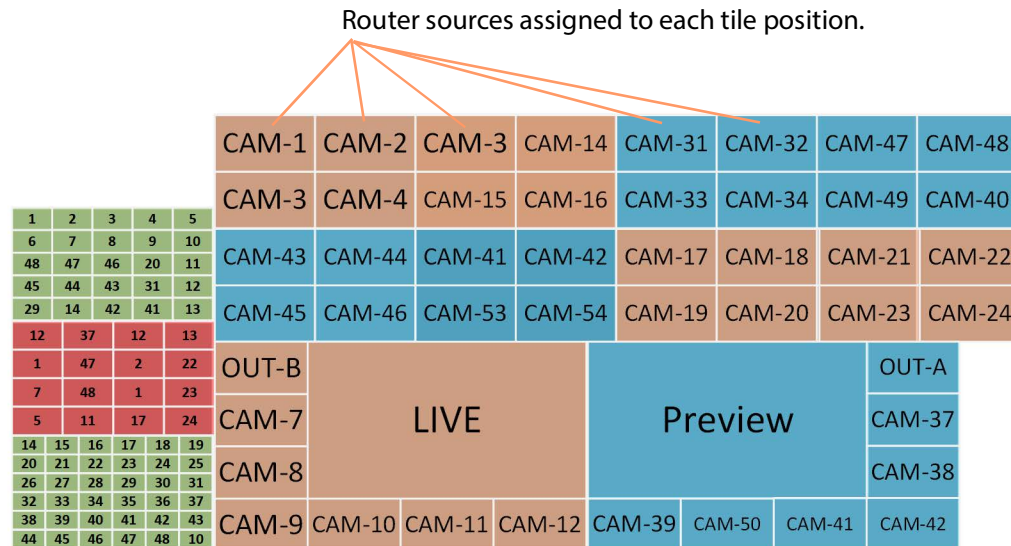
Fig. 15-6: Video Wall - Routed Sources

The 'X/Y Routing' tool mixes a graphical representation of the monitor wall with a (router) source selection panel. The monitor wall representation is the (router) destination selection panel.

A source can easily be assigned (routed) to a tile position on a monitor of a video wall.

See for the workflow steps.

Routing Sources Workflow

The workflow for each video tile position on a monitor is:

1 select the tile position in the monitor's tile-grid (this is the destination to route to); and

2 select the source.

When a route is made, all levels are routed. and tile positions on the tile-grid show their logical names.

Room Editor Home Screen

Video wall design open in **Room Editor** tab window

Room Editor Tool Bar
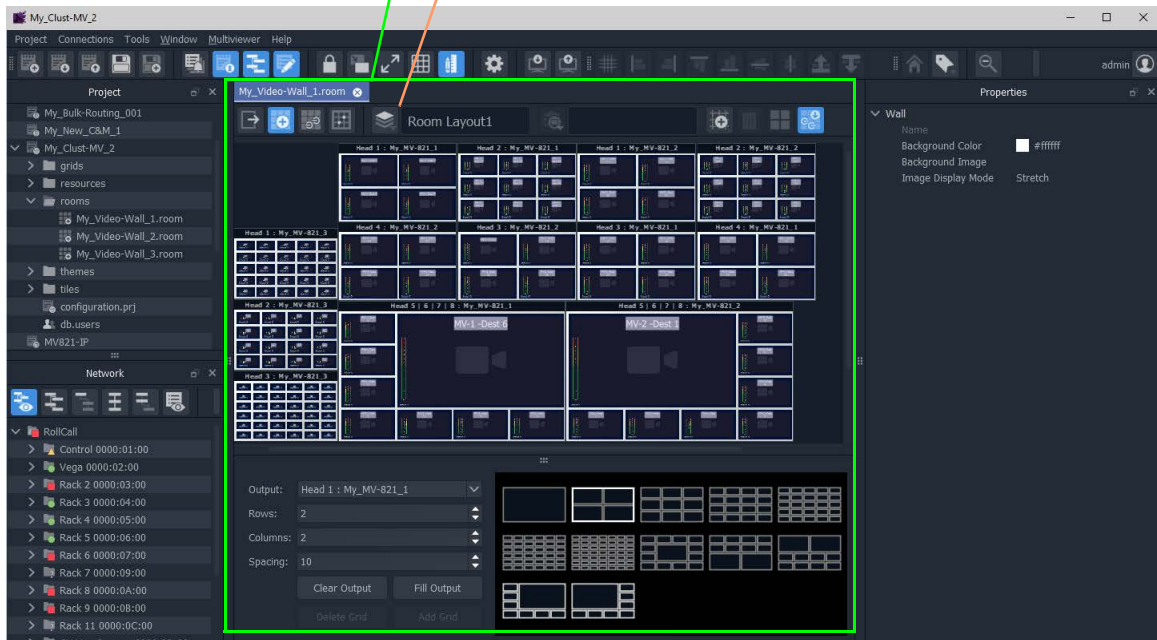
Fig. 15-7: Room Editor Screen Example

The **Room Editor** stores video wall design information for one or more video walls in a single 'Clustered MV' GV Orbit project (see What is a Clustered Multiviewer Project?). Each video wall design is stored in a **Room** file (see What is a Room?) in the project.

Room Editor Workflow Overview

Room Editor allows a user to easily create video walls. This is an overview of the workflow:

1. Create monitor wall arrangements from one or more monitors and assign multiviewer outputs.
2. Create the layout - Assign tile-grids to each monitor in the video wall and populate with tile types, and create all room layouts and monitor layouts.
3. Assign router video destinations to video wall tile positions in the grid.
4. Assign video sources to video wall tile positions in the tile-grid.

The **Room Editor** workflow steps are outlined in Room Editor Workflow, on page 686. The steps are then fully described in the subsequent sections of this chapter, that is in sections: Step 1: Create a Room through to Step 5a: X/Y Routing Video Sources to Tiles.

Room Editor Tool Bar

The first few icons in the **Room Editor** tool bar follow the MV Cluster video wall design's **Room Editor** workflow and take you through the various modes of operation of the **Room Editor** workflow.

Icon	Description
Switch to assign multiviewer outputs mode	Select for **Arrange Monitors and Assign MV Outputs Mode**. See Arrange Monitors and Assign Multiviewer Outputs, on page 687.
Switch to design layout mode	Select for **Design Layout Mode**. See Design Room Layout - Assign Tile Grid Layouts, on page 687.
Switch to assign destinations mode	Select for **Assign Router Destinations Mode**. See Assign Router Destinations to Tile Positions, on page 688.
Switch to X/Y routing mode	Select for **X/Y Routing Mode**. See Routing Video Sources to Tile Positions, on page 688.
Delete	Click to delete the selected item (monitor).
Room layouts	Room Layout actions.
Monitor layouts	Monitor Layout actions.
Configure the mapping from multiviewer input to router destinations	Map multiviewer inputs to router destinations.
Enable freehand positioning of tiles	Fine, free-hand positioning of tiles on tile-grid.
Select all tiles	Select all tiles on selected monitor.
Save and load source assignments by default	When set, this automatically saves the sources associated with tiles for each layout. On a layout change the source is automatically recalled and routed.

Room Editor Workflow

The workflow for creating **Room** designs in the **Room Editor** is listed here and described in the following sections of this chapter. A prerequisite is a GV Orbit 'Clustered MV' project open in GV Orbit Client. (See Creating a New Clustered Multiviewer Project for an MV Cluster, on page 659.)

Workflow steps overview:

- Create a Room (Room File)

- Arrange Monitors and Assign Multiviewer Outputs
- Design Room Layout - Assign Tile Grid Layouts
- Create Optional Alternative Layouts for a Video Wall
- Assign Router Destinations to Tile Positions
- Tally Configuration
- Routing Video Sources to Tile Positions

These steps are outlined in subsequent sections of this chapter, listed as Workflow Procedure Steps, on page 689.

Create a Room (Room File)

Firstly, for each video wall, create a **Room** for each video wall.
See Step 1: Create a Room, on page 689.

Then, for each **Room**, create a **Room Design** to form the video wall design, as described in subsequent sections:

Arrange Monitors and Assign Multiviewer Outputs

See Step 2: Arrange Monitors and Assign Multiviewer Outputs, on page 691.
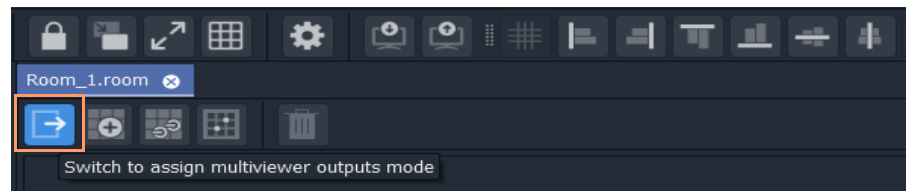
Position monitors on a 'stage'; define monitor types (includes size, orientation, single HD or quad-split for UHD); and assign one or more MV outputs to each monitor.

> Note: The **Assign Multiviewer Outputs** mode of the **Room Editor** does not use 'Run mode'; the 'Design/Run Mode' tool bar icon is hidden (See Design Mode / Run Mode, on page 133.)

Design Room Layout - Assign Tile Grid Layouts

See Step 3a: Design Layout - Assign Tile Grid Layouts to a Video Wall, on page 704.

Assign tile-grid templates to the monitors of the video wall; populate with tiles; and customize if required to form the video wall layout. Additionally, manage destinations assigned to the video wall tiles.

> **Note:** **Design Room Layout** mode of the **Room Editor** may operate in
> GV Orbit Client's **Design** or **Run Mode**.
> (See Design Mode / Run Mode, on page 133.)

Create Optional Alternative Layouts for a Video Wall

See Step 3b: Create Optional Alternative Layouts for a Video Wall, on page 713.
This mode enables creates different layouts for the video monitor wall.

Assign Router Destinations to Tile Positions

See Step 4a: Assign Destinations to Tile Positions, on page 722.
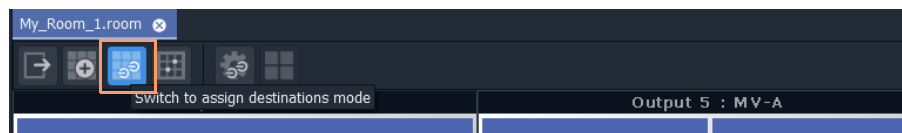
This mode: maps destinations to multiviewer inputs; assigns destinations to video wall tile positions on each tile-grid; and can also be used to assign TSL settings for the **Room**.

The mapping made between router destinations and multiviewer inputs needs to be made whether operating in the **Dynamic Destination Assignment** mode or in the **Static Destination Assignment** mode, or in a mixture of both. All the destinations that are mapped to tiles configured for dynamic assignment will be assigned dynamically.

> **Note:** The **Assign Router Destinations** mode of the **Room Editor** does not
> use 'Run mode'; the 'Design/Run Mode' tool bar icon is hidden.
> (See Design Mode / Run Mode, on page 133.)

Tally Configuration

See Step 4b: Configure TSL Tally Settings for a Room, on page 741.
Optional at this stage and may be done separately later.

Routing Video Sources to Tile Positions

See Step 5a: X/Y Routing Video Sources to Tiles, on page 741.
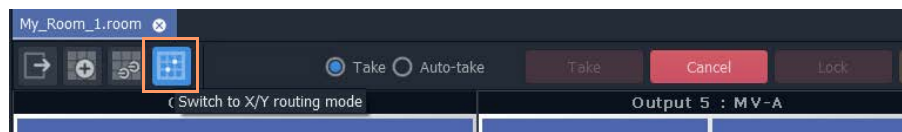
This mode routes required sources to video tiles for the required video monitoring. Different video monitor wall layouts can be selected from this **Room Editor** mode and seen live on the video monitor wall. Additionally, new layouts can be tried and saved.

> **Note:** **Routing Video Sources** mode of the **Room Editor** operates in 'Run
> Mode', allowing live changes on a video wall to be made.
> (See Design Mode / Run Mode, on page 133.)

Workflow Procedure Steps

Workflow steps described in subsequent sections of this chapter:

Step 1: Create a Room

Create a **Room** (**Room** file) with the **Rooms** icon from the **Home Page** or from the **Project** window. All video wall design information for one video wall will be stored in the **Room** file. A project may contain one or more **Room** files, which are shown in the **Project** window.

Create a **Room** for each video wall.

Procedure

To create a **Room** in the project from the **Home Page**:

1 Click the **Rooms** icon on the **Home Screen** and click **New Room**.

The **New Room File** dialog is shown. (See Figure 15-8)

Click **New Room**.

Enter a name for the **Room** file.
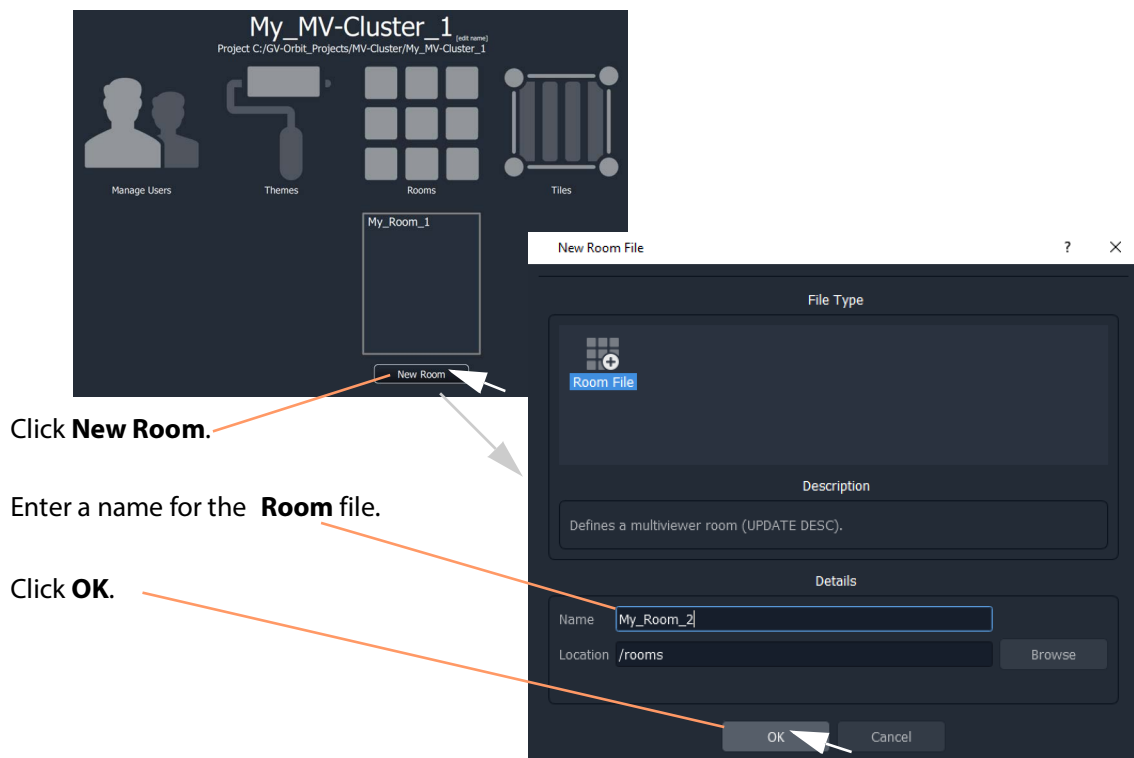
Click **OK**.

Fig. 15-8: New Room File Dialog

2 Enter a name for the **Room** and click **OK**.

A new, empty **Room** is created and is shown in the **Project** window in the 'rooms' sub-folder.

Project window 'rooms' sub-folder.

Room file is created and shown in the **Project** window.
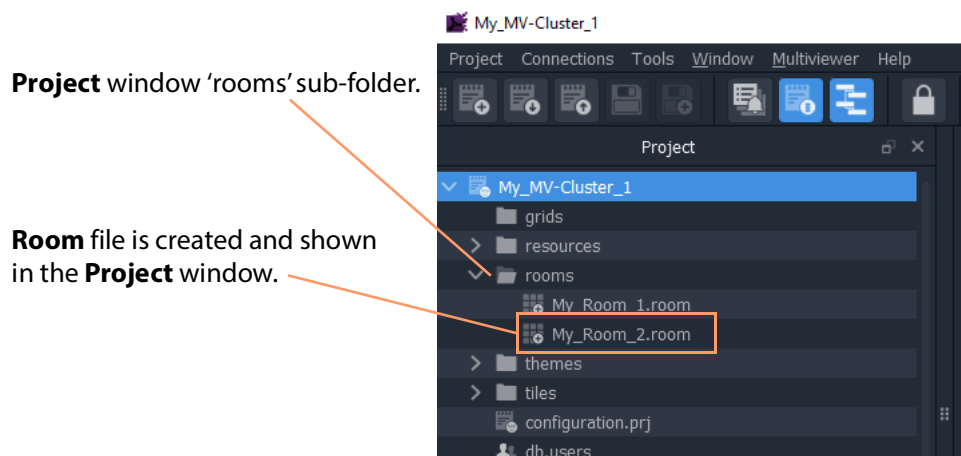
Fig. 15-9: Create New Room File

Alternative Procedure, from Project Window

Alternatively, to create a **Room** from the **Project** window (see Figure 15-10):

1 Right-click on the 'rooms' folder in the **Project** window and select **New Room**.

Rt-click on 'rooms' folder in **Project** window.
Select **New Room**.
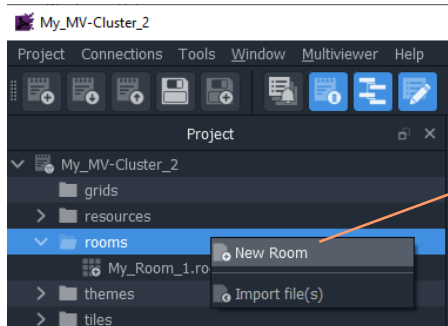
Fig. 15-10: Create New Room File

The **New Room File** dialog is shown.

2 Enter a name for the **Room** and click **OK**.

A new, empty **Room** file is created and is shown in the **Project** window in the 'rooms' sub-folder.

Step 2: Arrange Monitors and Assign Multiviewer Outputs

a) Arrange Monitors

Monitors

Cluster of multiviewers

b) Assign Multiviewer and Multiviewer Outputs
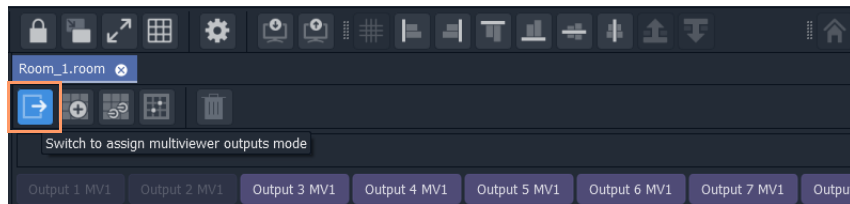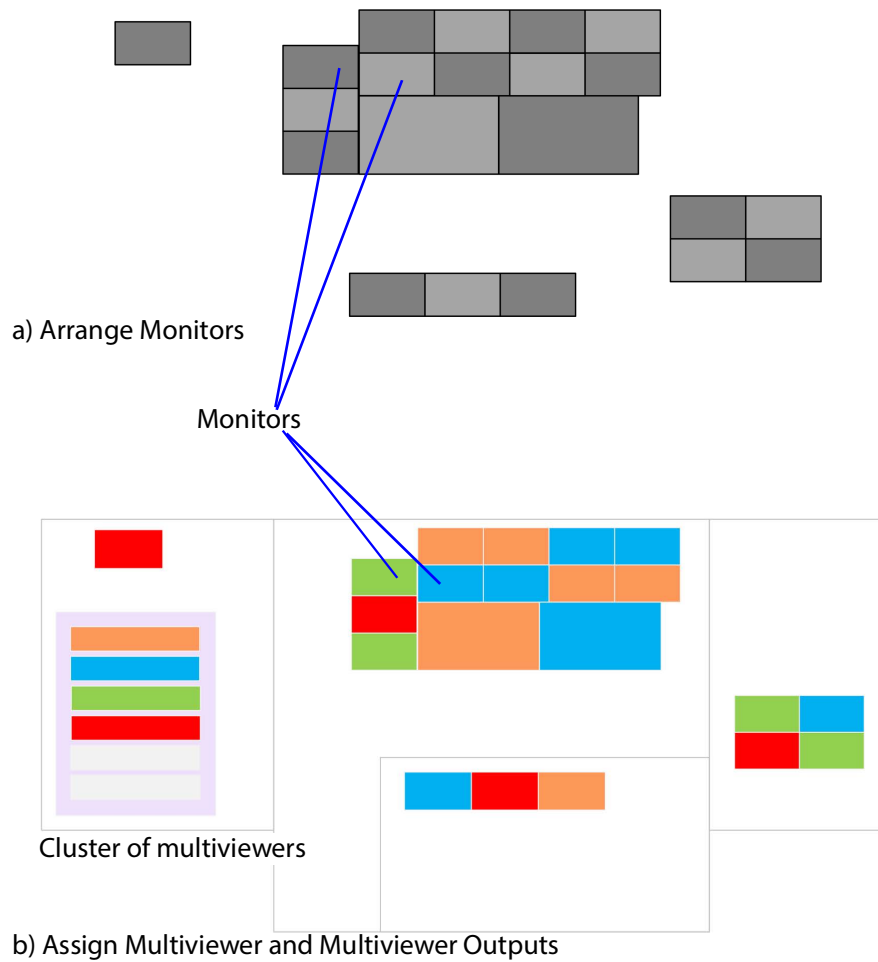
Video Wall Room Design

Prerequisites:

- There is a new **Room** in GV Orbit Client as part of a Clustered MV project.
- Multiviewers in the multiviewer cluster are discoverable or have been manually entered into the GV Orbit Client via the 'Multiviewer > Multiviewer Cluster' dialog of the Clustered MV project.

Procedure

Overview of procedure:

- Drag Monitors onto Video Wall Stage Area, on page 693.
- Configure Monitor on Video Wall Stage Area, on page 696.
- Arrange Monitors on Video Wall Stage, on page 700.

Drag Monitors onto Video Wall Stage Area

To position monitors for one video wall, in the **Project** window:

1 Open the **Room** by double-clicking on the **Room** file name, or by right-clicking on it and selecting **Open**.

   The **Room** opens in the **Room Editor** in GV Orbit Client. When first opened, the **Room** is shown in its 'Assign Multiviewer Outputs' mode. And All multiviewer outputs are listed in a banner at the top of the central stage area.

'Assign Multiviewer Outputs' mode button is selected.

Room Editor tool bar

Multiviewer outputs listed in banner,

Room name shown in tab.
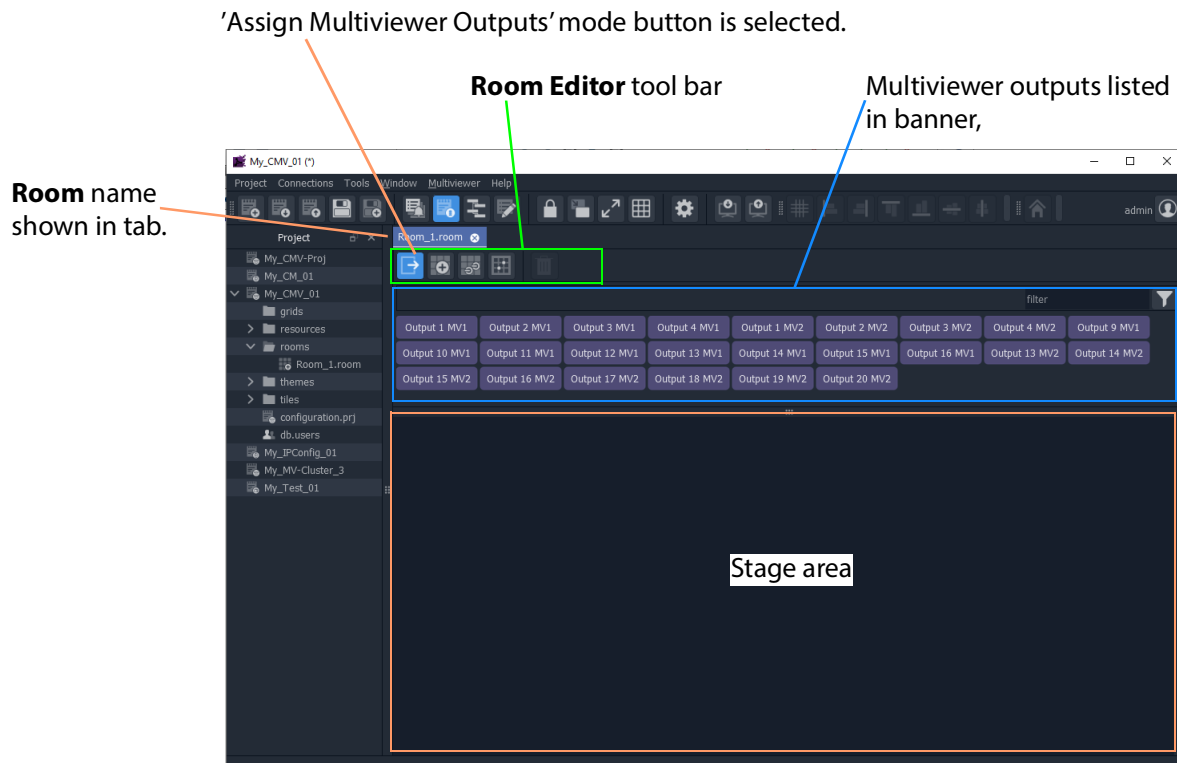
Fig. 15-11: New Room in Room Editor ('Assign Multiviewer Outputs' Mode shown)

Note: If there are no multiviewer devices in the cluster, then the banner area is empty and a message appears at the bottom of the stage area, instructing you on how to add multiviewer devices to the cluster.

> *"No multiviewers have been automatically discovered.*
> *To manually add a multiviewer,*
> *click 'Multiviewer > Multiviewer Cluster' from the tool bar menu."*

No multiviewers have been automatically discovered. To manually add a multiviewer click Multiviewer -> Multiviewer Cluster from the toolbar menu.

Fig. 15-12: Message at the Bottom of the Stage Area

(See Managing Multiviewer Cluster Information in a Project, on page 671 for a description of adding multiviewers to cluster.)

Note: **Banner Controls:**

The multiviewer outputs banner area has controls to help locate multiviewer outputs (especially useful with several multiviewers and outputs). Controls are (see Figure 15-13):

- **Scroll control** - A vertical scroll to see multiviewer outputs.
- **Resize control** - A splitter bar to re-size the banner and see more multiviewer outputs at one time.
- **Filter control** - A filter control to locate multiviewer outputs in the banner.

- – Enter text in the filter text box.
  For example, Enter 'Output 1' to see:
  multiviewer outputs 'Output 1 MV1', 'Output 10 MV1' ... and 'Output 1 MV2', 'Output 10 MV2' etc.
  Note that this is case sensitive. For example, seraching for *output* returns nothing, where *Output* does find results.
- – Click on the filter symbol and select a multiviewer name in the drop-down list to see all outputs from that multiviewer.
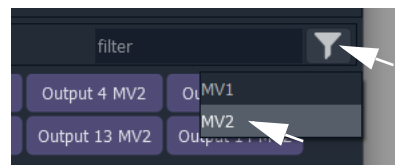
To clear the filter, clear the filter text box.

2   Drag a multiviewer output from the banner onto the stage area and release.
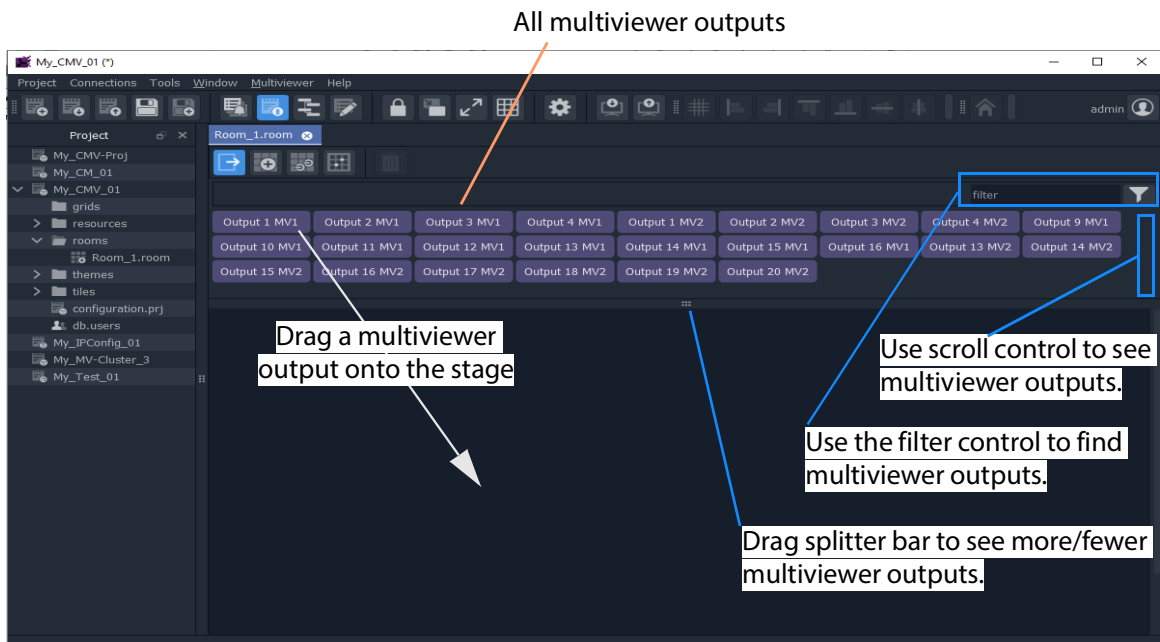
Fig. 15-13: Drag on a Multiviewer Output

A representation of the monitor appears on the stage. See Figure 15-14.
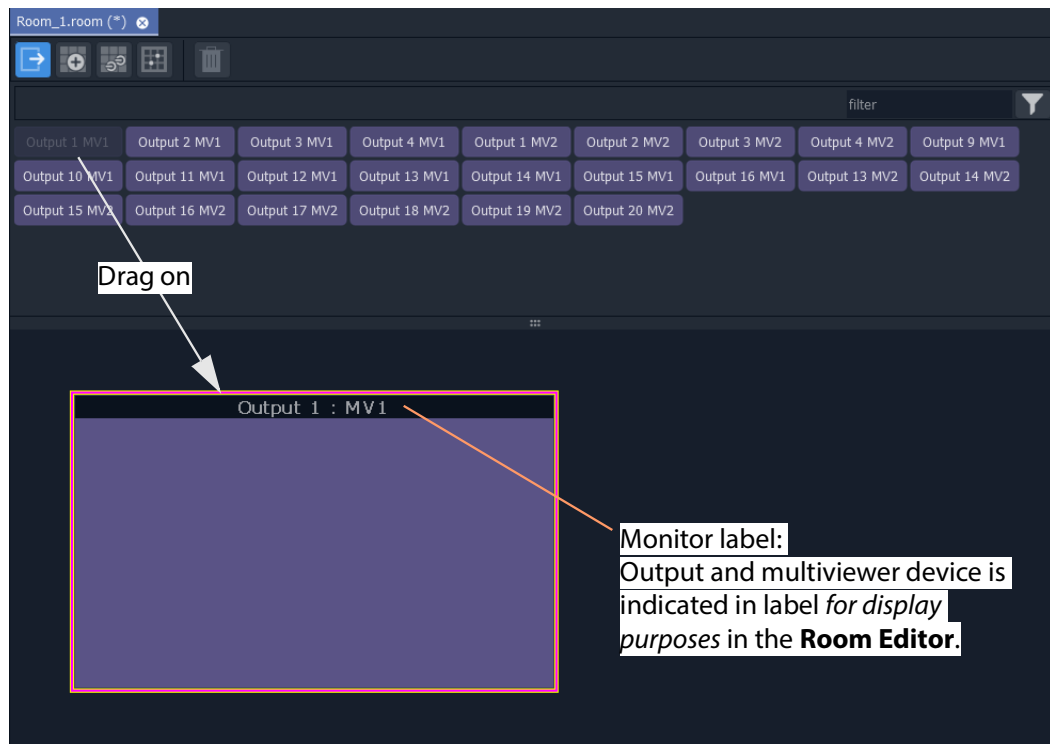
Fig. 15-14: Dragged-on Monitor

> **Note:** For display purposes in the **Room Editor**,
> each monitor on the stage area has a label indicating which
> multiviewer output and device is being used for the monitor.

> **Note:** **Monitor Aspect Ratio**:
> Monitors aspect ratio should be 16:9.

Configure Monitor on Video Wall Stage Area

1 Configure the monitor on the stage area by double-clicking on it.

 The **Configure Monitor** dialog is shown (see Figure 15-15), where monitor properties can be changed.

2 Also, when a monitor is selected,
 its properties may be viewed and edited in the **Properties** window.
 To view the **Properties** window:

 • Select the 'Properties Window' button in the main tool bar. See Figure 15-15.)

 • Right-click on the monitoring and select *Configure Output*.

Double-click on monitor to show its **Configure Monitor** dialog

Select **Properties Window** button to show **Properties Window.**
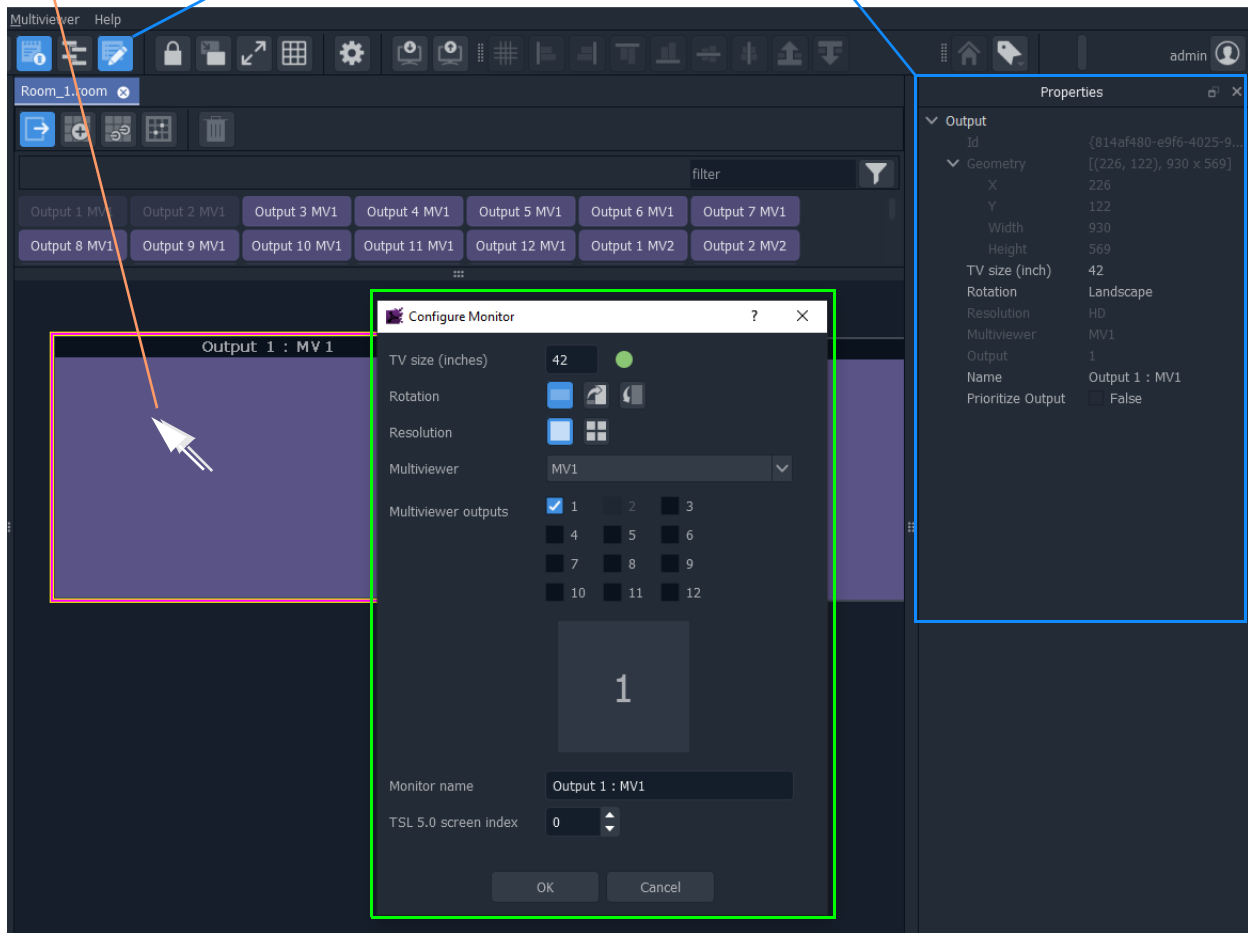
Fig. 15-15: Configure Monitor Dialog

To edit monitor properties, set up the monitor parameters in the **Configure Monitor** dialog, including:

3 **TV Size** - Enter the nominal monitor screen diagonal size (inches).

   When a value is entered:

   •   indicates a supported size; and

   •   indicates an unsupported size.

4 **Rotation** - Select the monitor screen orientation used:

   • Landscape ( ),

- Portrait ( ); or
- Inverted Portrait ( ).

5 **Resolution** - Define whether monitor is an HD monitor, or a UHD monitor (requiring quad-link multiviewer outputs) by selecting the corresponding icon:

- HD monitor ( ).
- UHD monitor, requires 4x multiviewer (HD) outputs ( ).

The following multiviewer assignment settings of the monitor are automatically set up when the monitor is dragged onto the screen. However, these may be changed in the **Configure Monitor** dialog, if required:

6 **Multiviewer** - Select a different multiviewer device to be assigned to the monitor, if required.

7 **Multiviewer Output** - Select different multiviewer output(s) (head output) to be assigned to drive the monitor. (Already-used outputs are grayed-out.)

For:

- HD monitors, select one output (see Figure 15-16a).
- UHD monitors, select four outputs for driving the four monitor picture quadrants (see Figure 15-16b).

8 Re-ordering UHD monitor quadrants, if required, enables you to quickly and easily compensate for any quadrant wiring mis-matches. For UHD monitors:

- Re-order four the quadrant inputs by dragging monitor quadrants in the dialog, see Figure 15-16c.
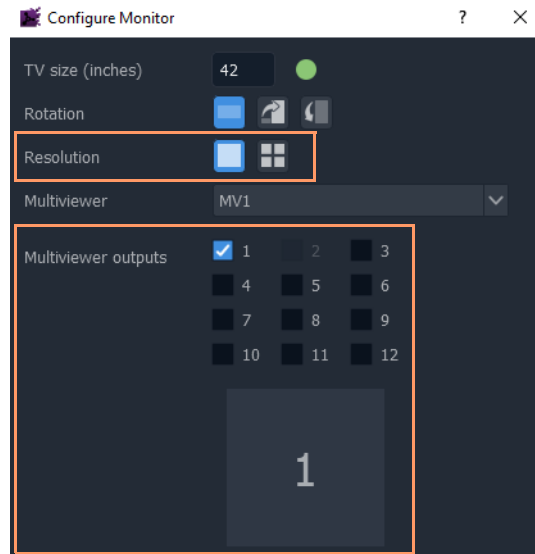
a) HD Monitor - one output selected.
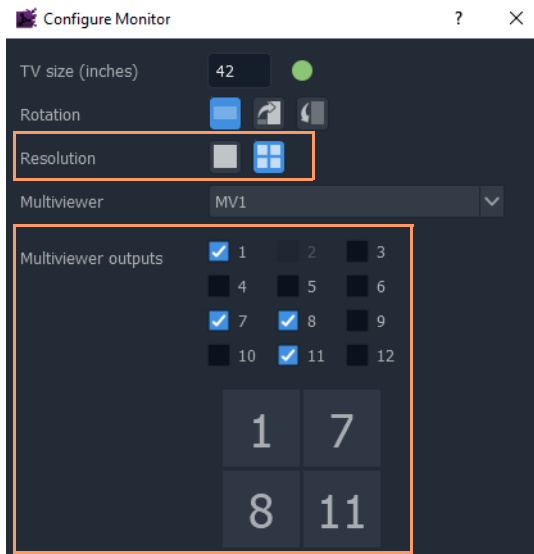
b) UHD Monitor - four outputs selected.
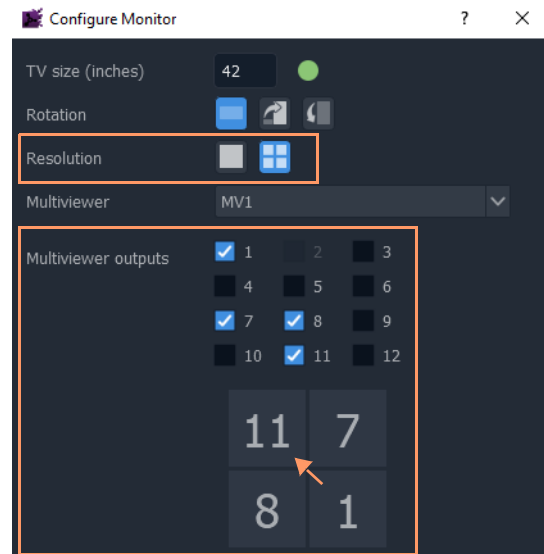
c) UHD Monitor - outputs rearranged

Fig. 15-16: Select Multiviewer Outputs for Monitor:
   a) HD Monitor - one output selected.
   b) UHD Monitor - four outputs selected.
   c) UHD Monitor - selected outputs rearranged.

9 **Monitor Name** - Enter an optional operational name for the monitor, which will appear on the monitor label. For example "Cameras", see Figure 15-17.

Enter an operational name for the monitor,
which appears on the monitor label.
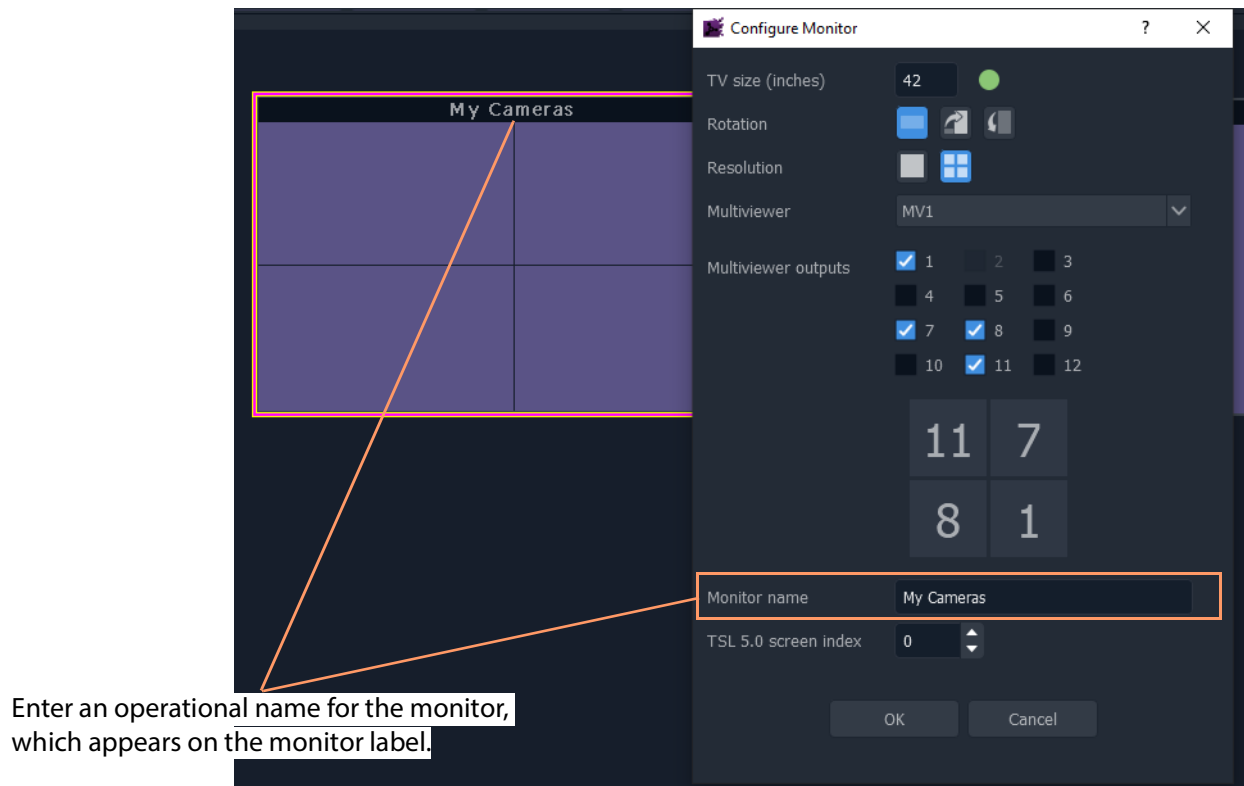
Fig. 15-17: Monitor Name

Additionally, the following TSL item may be set up:

10 **TSL 5.0 screen index** to use by default for video tiles shown by the multiviewer output.

> **Note:** If using the TSL 5.0 tally protocol, then set the **TSL 5.0 screen index** for each monitor screen.

Finally,
when all settings changes are complete in the dialog:

11 Click **OK** in the **Configure Monitor** dialog.

This has configured the monitor.

Arrange Monitors on Video Wall Stage

1 Position the monitor on the video wall stage area.

> **Note:** **Undo / Redo**:
> Edits in the **Room Editor** are all un-doable and re-doable with the usual GV Orbit Client key strokes:
>   • CTRL-Z (undo action); and
>   • CTRL-Y (redo action).

> **Note:** **Fine Positioning**:
> Monitors can be finely-positioned using the arrow keys.

Then:

2 Drag on further monitors, configure and position these to form your video wall monitor arrangement by abutting monitors on the stage.

> **Note:** When dragging monitors on the stage, overlap of monitors is not permitted in a video wall. Any overlapping areas are shown in red.
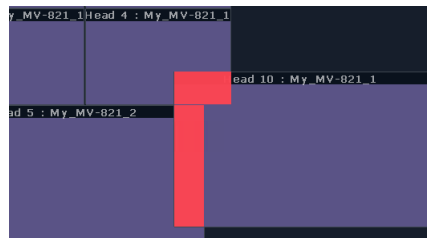
> **Note:** **Monitor Alignment**:
> Monitors can be aligned and arranged on the stage using the GV Orbit Client's alignment tools in the tool bar.
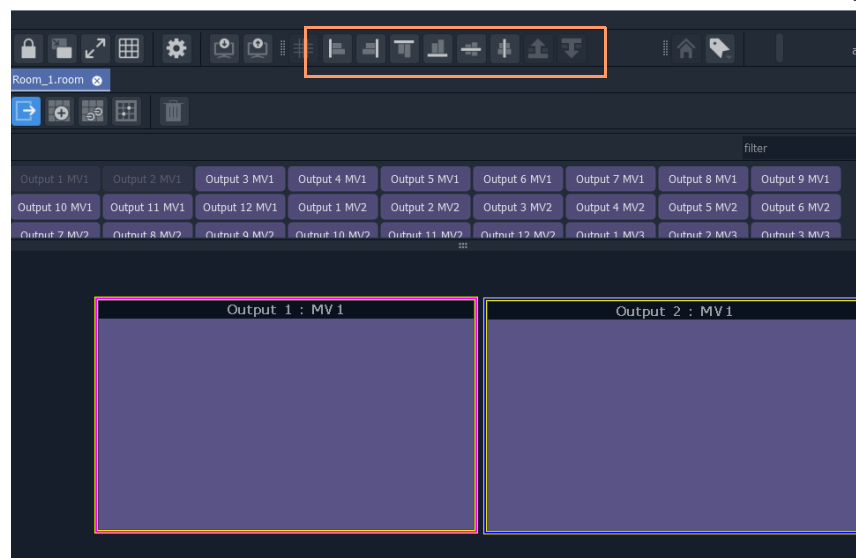
> **Note:** **Snap-to-Monitor and Snap-to-Grid**:
> Monitors will snap to other monitors on the stage when brought close.
> If 'snap to grid' is turned on for the **Room Editor**, then snap-to-grid takes precedence over snap-to-monitor when positioning monitors. ('Tools > Option > App' in main menu for **Room Editor** grid controls.)

3 Click **Project > Save File** in the main menu to save changes to the **Room** file.

This has created a **Room Design** in a **Room** file in the Clustered MV project.

A video wall is defined with its constituent monitors and connected to multiviewer outputs from the MV cluster.

Finally:

4 Repeat this for each video wall required for each **Room**.

Note: **Copy-Paste Monitors with CTRL-C and CTRL-V**:
Monitors can be copy-pasted for quick editing on the stage. The configuration of a copied monitor must be set up accordingly in the **Configure Monitor** dialog.
To copy-paste a monitor:

- Select a monitor on the stage and press CTRL-C.

- Click elsewhere on the stage and press CTRL-V to paste a copy of the monitor.
  (Further CTRL-V will paste more monitors.)

Notes Etc. for Monitor Arrangement

CAUTION

Multiviewer Outputs for UHD monitors:
When assigning four multiviewer outputs for a UHD monitor use *any* four licensed outputs from the same multiviewer device.

Note: *All four* outputs must be from the *same* multiviewer device. (This enables the required quad-split to be formed from four (HD) multiviewer outputs.)

Note: **Landscape** and **Portrait**:
Room Editor:
When using the **Room Editor**, a monitor arrangement can mix 'Landscape' and 'Portrait' monitors.

Wall Editor:
However, when using the older **Wall Editor**, there is a restriction that 'Landscape' and 'Portrait' <u>must not</u> be mixed on a video wall.
(This restriction *does not apply* when using the **Room Editor** and a cluster of multiviewers.)

> Note: **Monitor Properties**:
>   When the **Properties** window is open, selecting a monitor in the
>   video wall stage area will show the monitor's properties in the
>   **Properties** window.
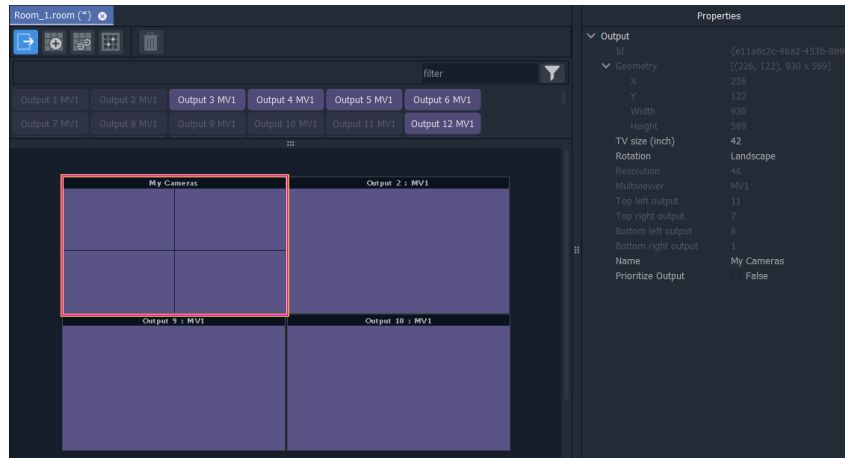
Fig. 15-18: Monitor Properties in Properties Window

Example Monitor Arrangement

Figure 15-19 shows an example video wall monitor arrangement with assigned multiviewer
outputs.
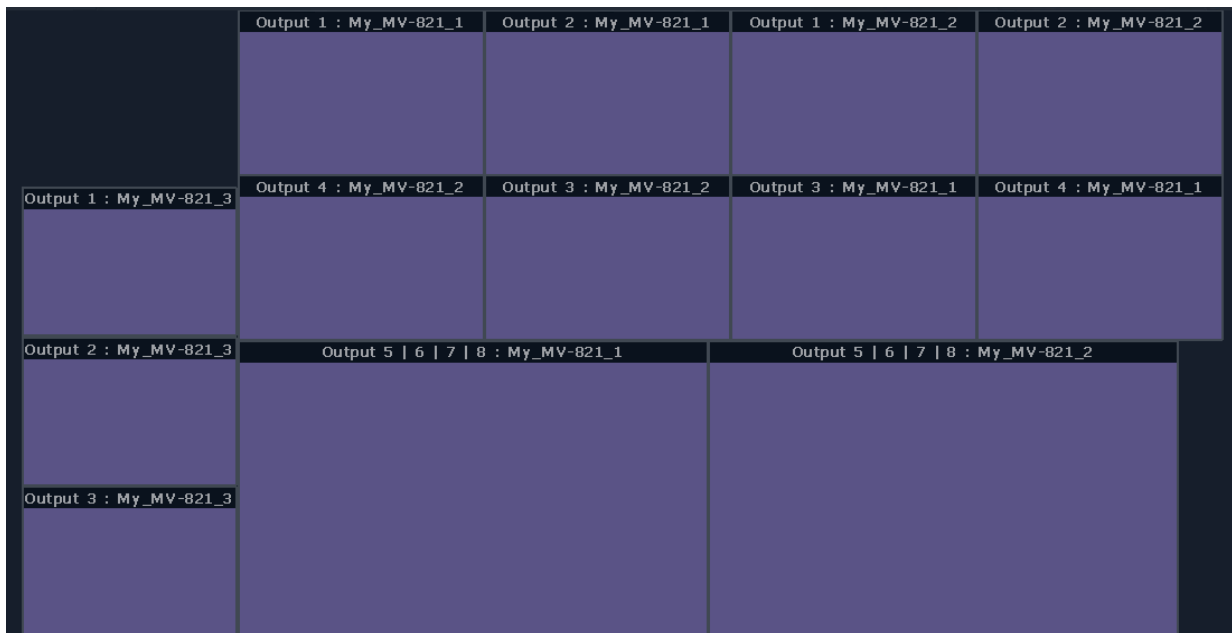
Fig. 15-19: Example Video Wall Monitor Arrangement

Next step: Step 3a: Design Layout - Assign Tile Grid Layouts to a Video Wall

Step 3a: Design Layout - Assign Tile Grid Layouts to a Video Wall
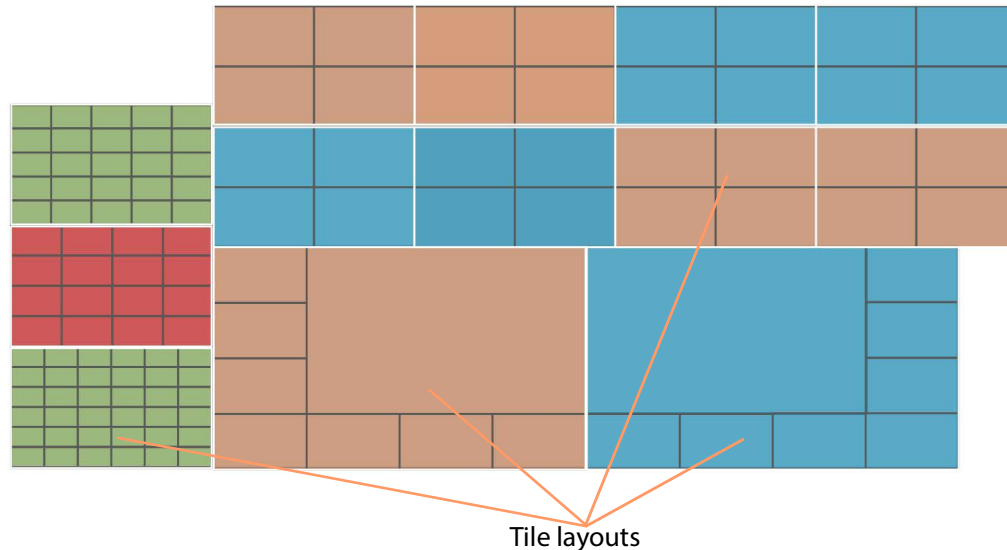
Video Wall Tile Layout Configuration

Prerequisites:

- There is a **Room** file open in the **Room Editor** which has a **Room Design**.

> **Note:** **Tile Grid** relates to a grid arrangement of tiles on a video wall monitor. This 'grid' is different to the 'drawing grid' that can be enabled in graphical drawing tools, such as in the **Room Editor** in GV Orbit Client.
> ('Drawing grid' controls are accessed via 'Tools > Options > App' in the main menu.)

Procedure to Assign Tile Grids

To assign tile-grids to a video wall, in the **Project** window:

1 Open the **Room** file in the **Room Editor**.

2 To select the grid design mode, select the **Design Layout** icon.
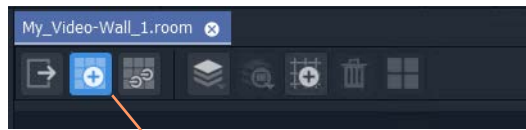
Design Layout icon selected

Fig. 15-20: Room Editor Tool Bar - Design Layout Icon

The **Room Design** is now shown in **Design Layout** mode which shows the available **Tile Grid** templates. See Figure 15-49.

Monitor header, showing: Multiviewer Output and Device

Available **Tile Grid** templates
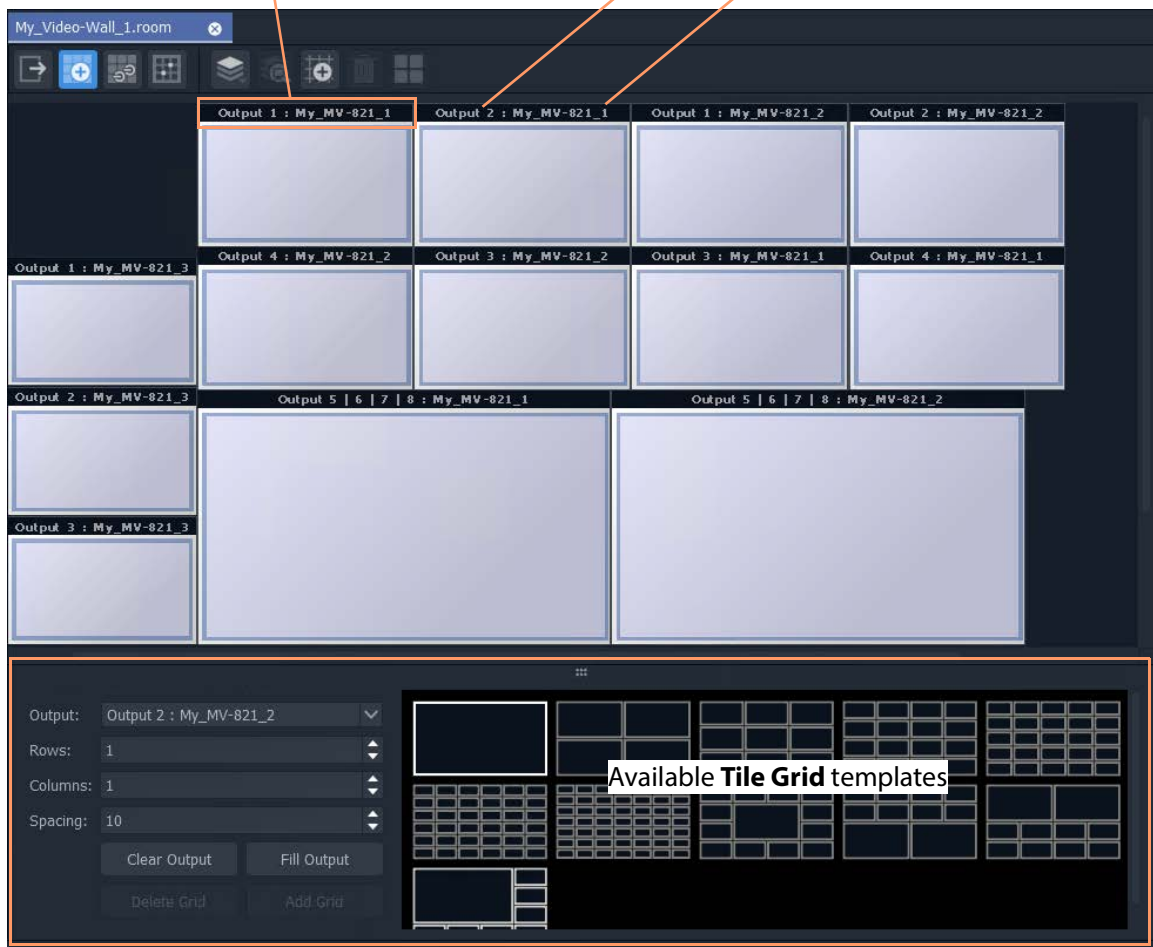
Fig. 15-21: Design Layout Mode in Room Editor

To apply a grid layout to a monitor:

3 Select a monitor by clicking on its monitor header.

4 Then select a tile-grid from the available **Tile Grid** templates.

   The grid is applied to the monitor.

Two things have actually happened to the monitor:

i) a grid layout has been applied; and

ii) the grid has been automatically populated with video tiles.

Note: Tile-grids are automatically populated with video tiles by default when added to a monitor. The tiles populated on a tile-grid can be configured as required or replaced with customs Tiles. See Monitor Layouts and Tiles, on page 715.
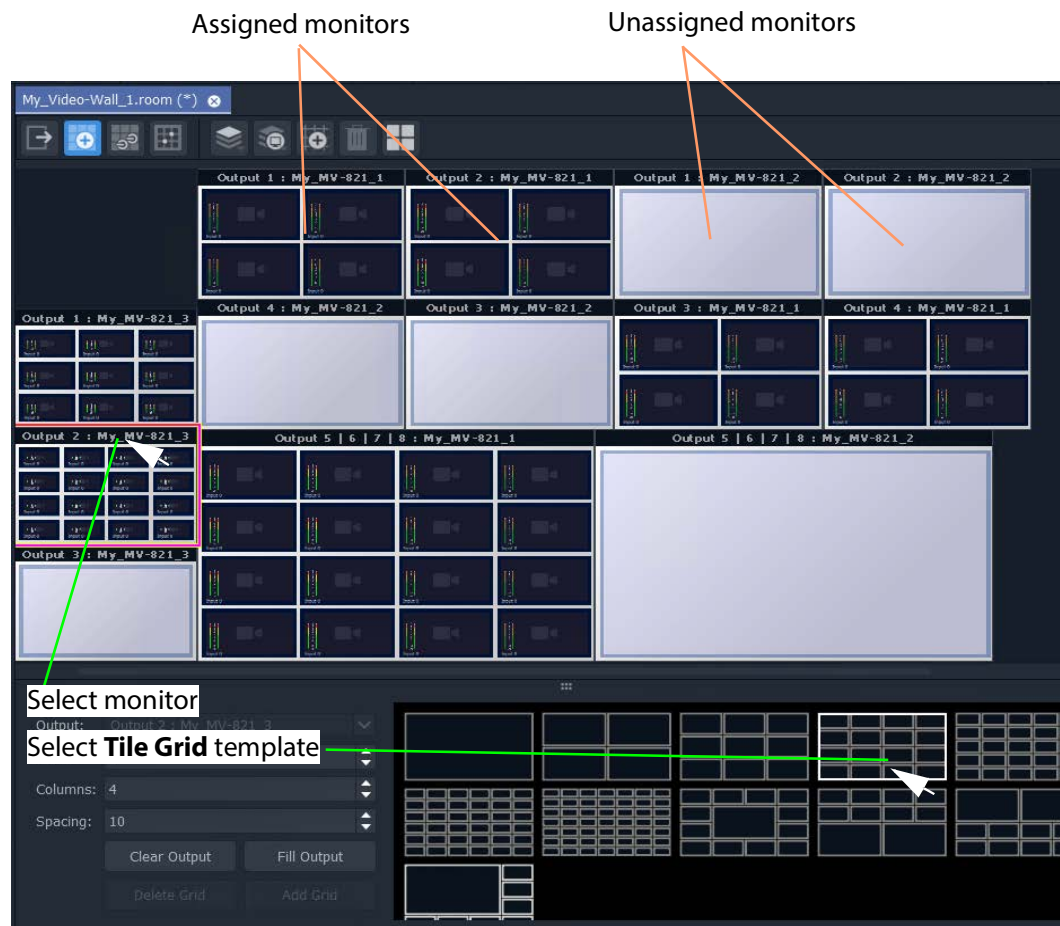
Fig. 15-22: Apply Tile Grid Template to Monitor

5 Apply grid layouts to all monitors.

When all monitors have been assigned grid layouts:

6 Click **Project > Save File** in the main menu to save the grid layout changes to the **Room**.

This has quickly defined the layout of the video wall using tile grids from the available templates. Figure 15-23 shows an example.

'Dynamic' indicates tile has
Dynamic Destination Assignment enabled.
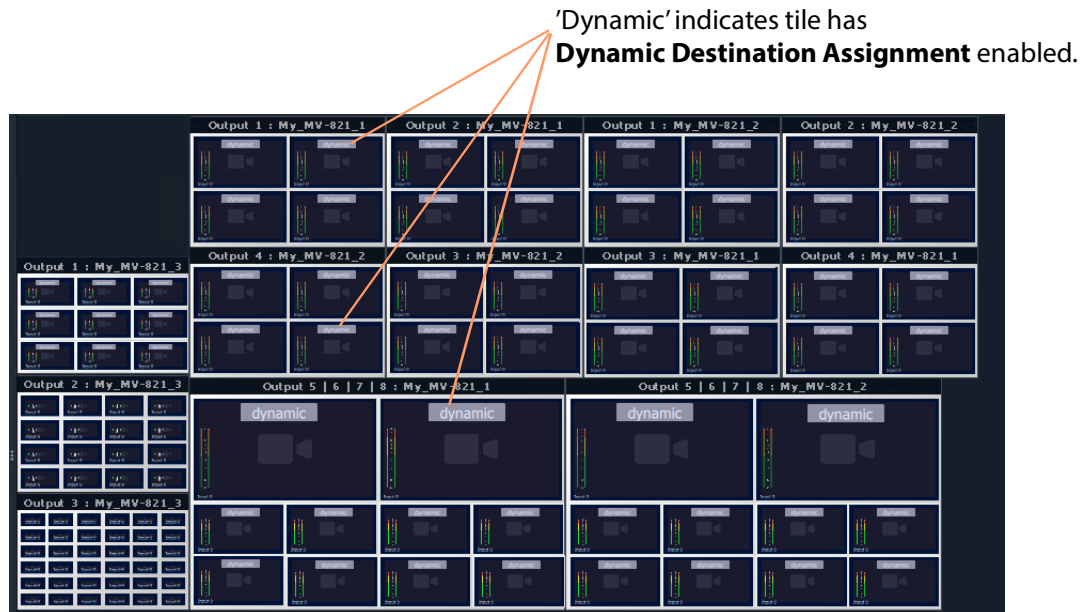
Fig. 15-23: Example Quick Grid Layout on Video Wall

A **Room Layout** has been generated.

> **Note:** Each video tile in each tile-grid by default has 'Dynamic Destination Assignment' enabled, by default.

Modifying a Tile-Grid on a Video Wall

Quick edits to a tile-grid of a video wall can be done in **Design Layout** mode. The following example modifies the video wall shown in :

1 Select a monitor to modify.

Selected Monitor to modify

Fig. 15-24: Selected Monitor to Modify

2 Select a new **Tile Grid** template.

The new **Tile Grid** is assigned and shown on the monitor.

New grid layout on monitor

Select new **Tile Grid** template to use.

Fig. 15-25: Modified Grid Layout

3 Click **Project > Save File** to save the grid layout in the **Room** file.

Customizing a Tile-Grid on a Video Wall

Further, a custom change can be made to a grid layout in **Design Layout** mode.

In **Design Layout** mode:

1 Select a monitor to modify.
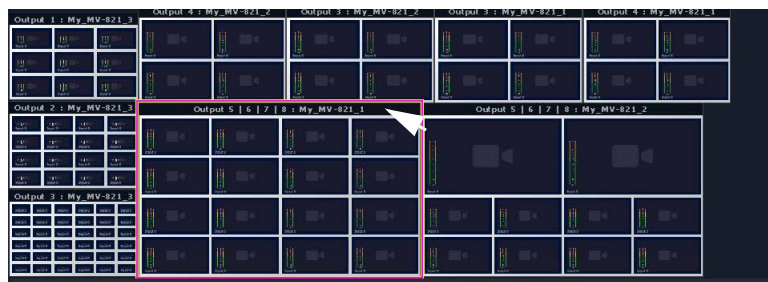
Fig. 15-26: Select a Monitor

2 Select a tile position in the monitor's tile-grid.

Select a tile position.

Fig. 15-27: Select a Tile Position in a Tile-Grid

3 Drag a corner of the tile position and release it to resize it.

a) Drag a Corner of a Tile Position
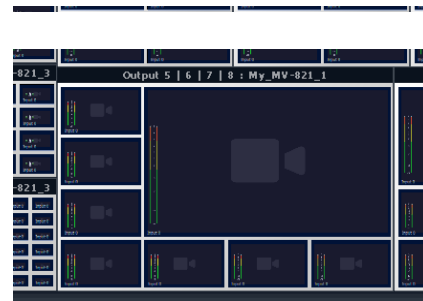
b) Release a Corner of Tile Position

Fig. 15-28: Resize a Tile Position in a Tile-Grid

A video wall's tile-grid layout on one monitor has been customized.

This customized tile-grid may be saved, see Saving a Customized Tile-Grid.

Saving a Customized Tile-Grid

For a customized tile-grid that is on a video wall, to add it to the available templates in **Design Layout** mode:

1   Select the monitor containing the with the customized tile-grid.

Select customized monitor
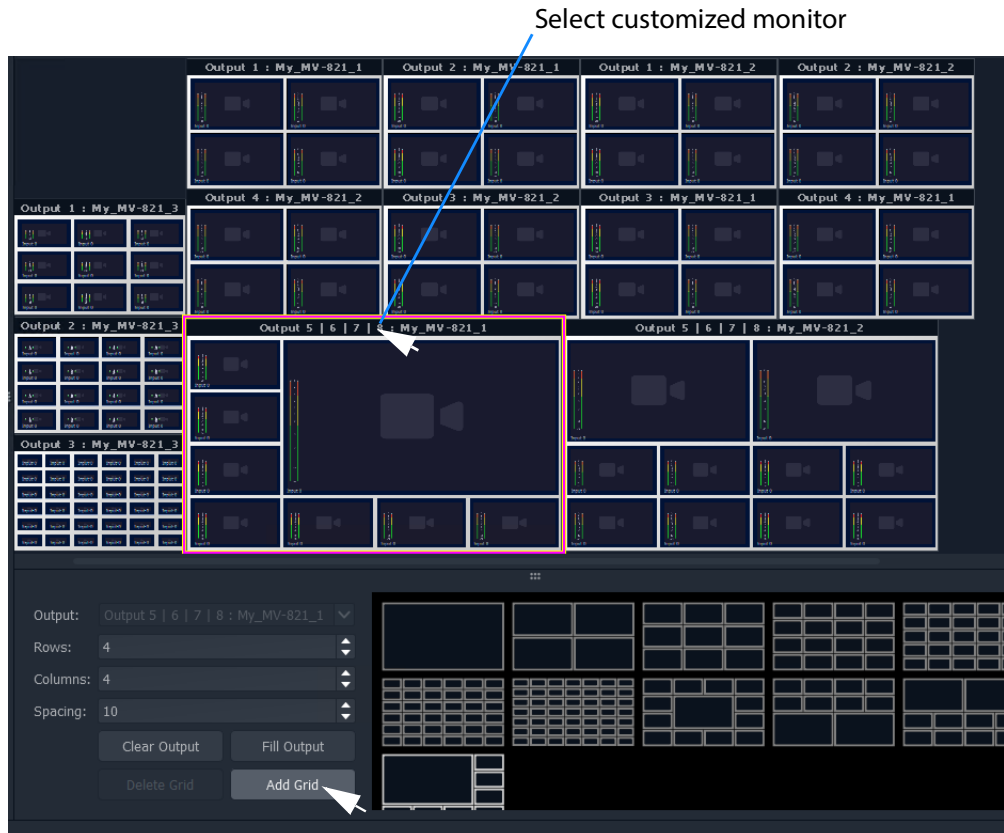
Fig. 15-29: Select a Monitor Grid Layout

2   Click **Add Grid**.

The **Tile Grid** of the selected monitor is added to the available templates and is then available for use in the project.
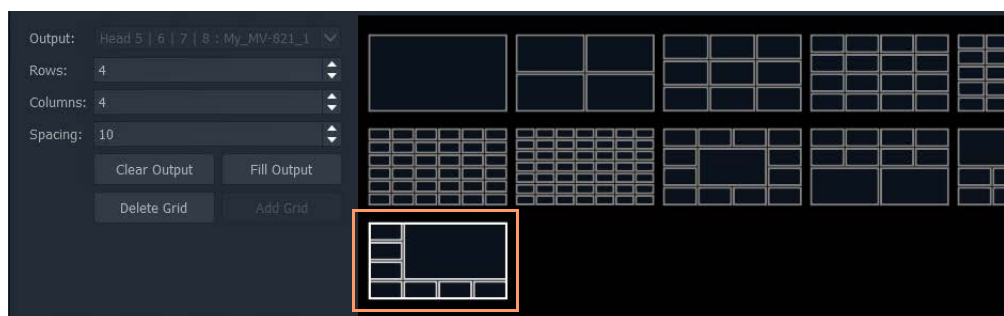
Fig. 15-30: Custom Grid Layout Added to Available Grid Templates

3   Click **Project > Save File** to save the video wall's grid layout in the **Room** file.

A customized grid layout has been saved in the **Room** and can be re-used. The information is stored in the **Room** file in the project.

Example Customized Tile-Grids

Fig. 15-31: Example Grid Layout with Two Customized Monitor Grid Layouts

Fine Positioning of Tile Positions on a Tile-Grid

So far in this chapter, the tile grids have been populated with tiles placed at tile-positions of the (template) tile-grid. A tile-position may be repositioned 'off-grid' when in **Design Layout** mode:

1 Click on the **Freehand Positioning** icon (see Figure 15-32).
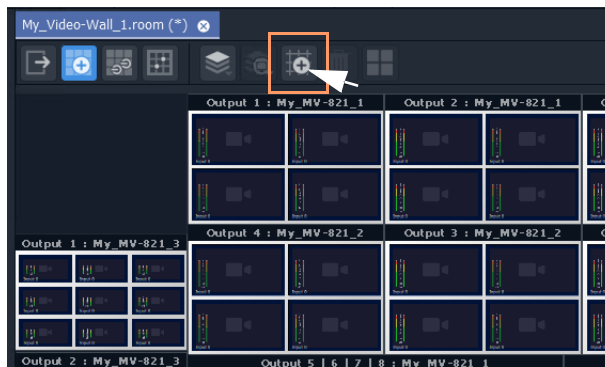
Fig. 15-32: Freehand Positioning Icon

The stage now enables the freehand positioning of tile-positions.
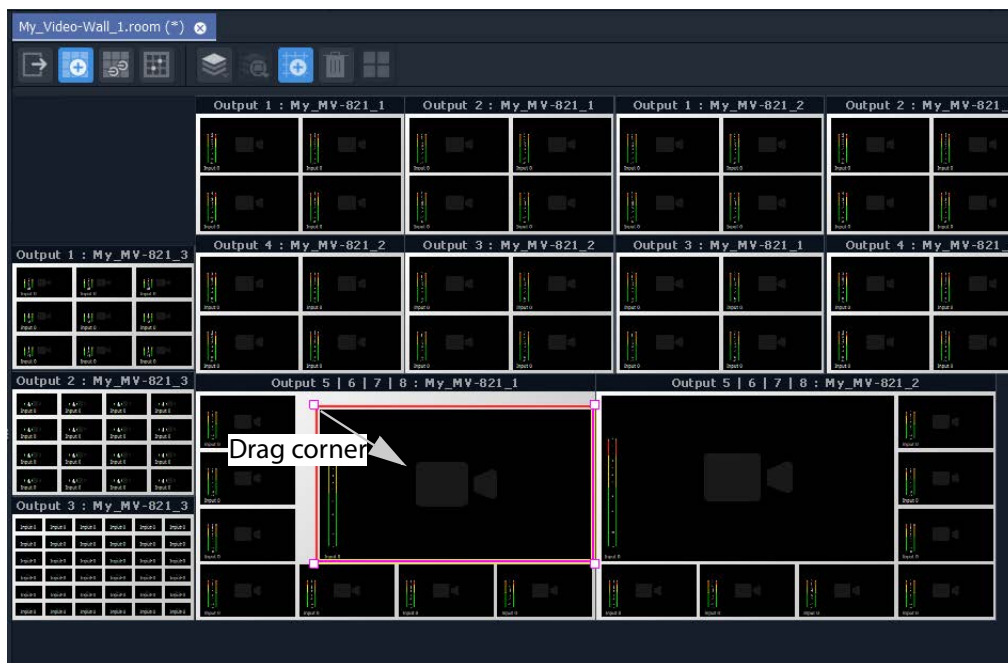
Fig. 15-33: Freehand Positioning Icon

2 Select a tile at a tile position on a tile-grid.

3 Move it, or drag one of its corners, to finely reposition it.

4 Click **Save File** in the main tool bar to save the change.

Lastly:

5 Click on the **Freehand Positioning** icon to toggle freehand mode off.

Step 3b: Create Optional Alternative Layouts for a Video Wall

Design Layout mode can be used to create different layouts for a video wall.

In a **Room**, each video wall monitor can have more than one possible tile-grid layout. (This is called a **Monitor Layout**. See What is a Monitor Layout?, on page 680 for further information.)

A **Room Layout** is a snapshot of **Monitor Layouts** on a video wall and a **Room** can have more than one **Room Layout** for its video wall.
(See What is a Room Layout?, on page 680 for more information.)

Use the **Room Editor**'s **Design Layout** mode to optionally create alternative layouts for a video wall, either for its monitors:

- Create a New Monitor Layout.
- Monitor Layouts and Tiles.

Or for the whole video wall:

- Create a Room Layout for a Video Wall.

Create a New Monitor Layout

To create a new **Monitor Layout** for a monitor on a video wall, in **Design Layout** mode:
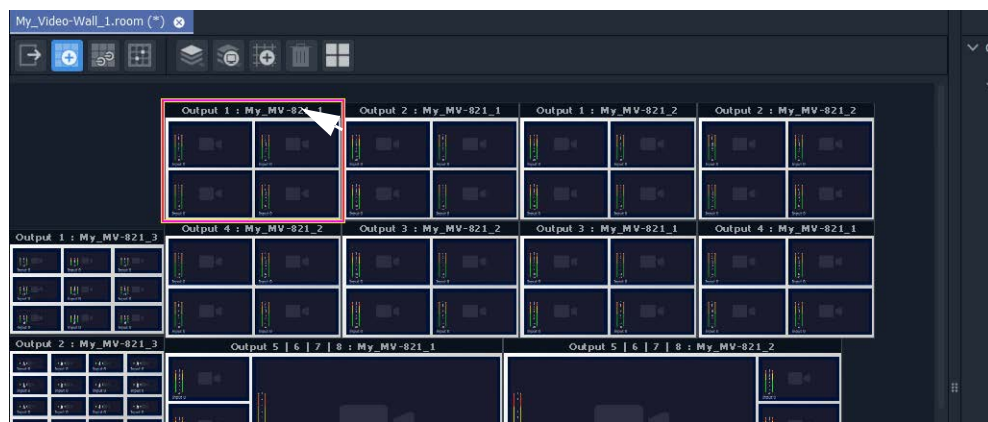
1 Select a monitor.

Fig. 15-34: Select a Monitor

2 Click on the **Monitor Layout** icon ( ) in the **Room Editor** tool bar and select 'New Monitor Layout'.
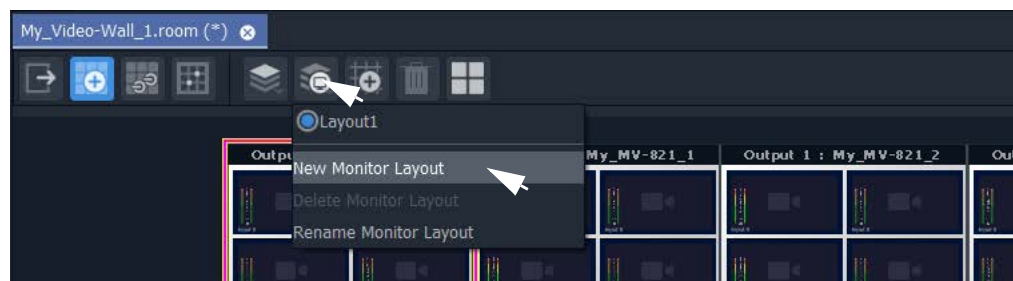
Fig. 15-35: Select 'New Monitor Layout'

3 Enter a name for the new **Monitor Layout** and click **OK**.
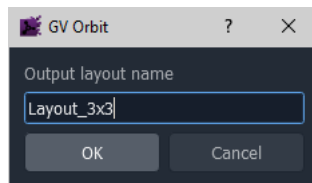
Fig. 15-36: Enter a Name for the New Monitor Layout'

4 Select a new **Tile Grid** template from those available.

The selected template appears on the selected monitor.

New selected **Tile Grid** appears on monitor.
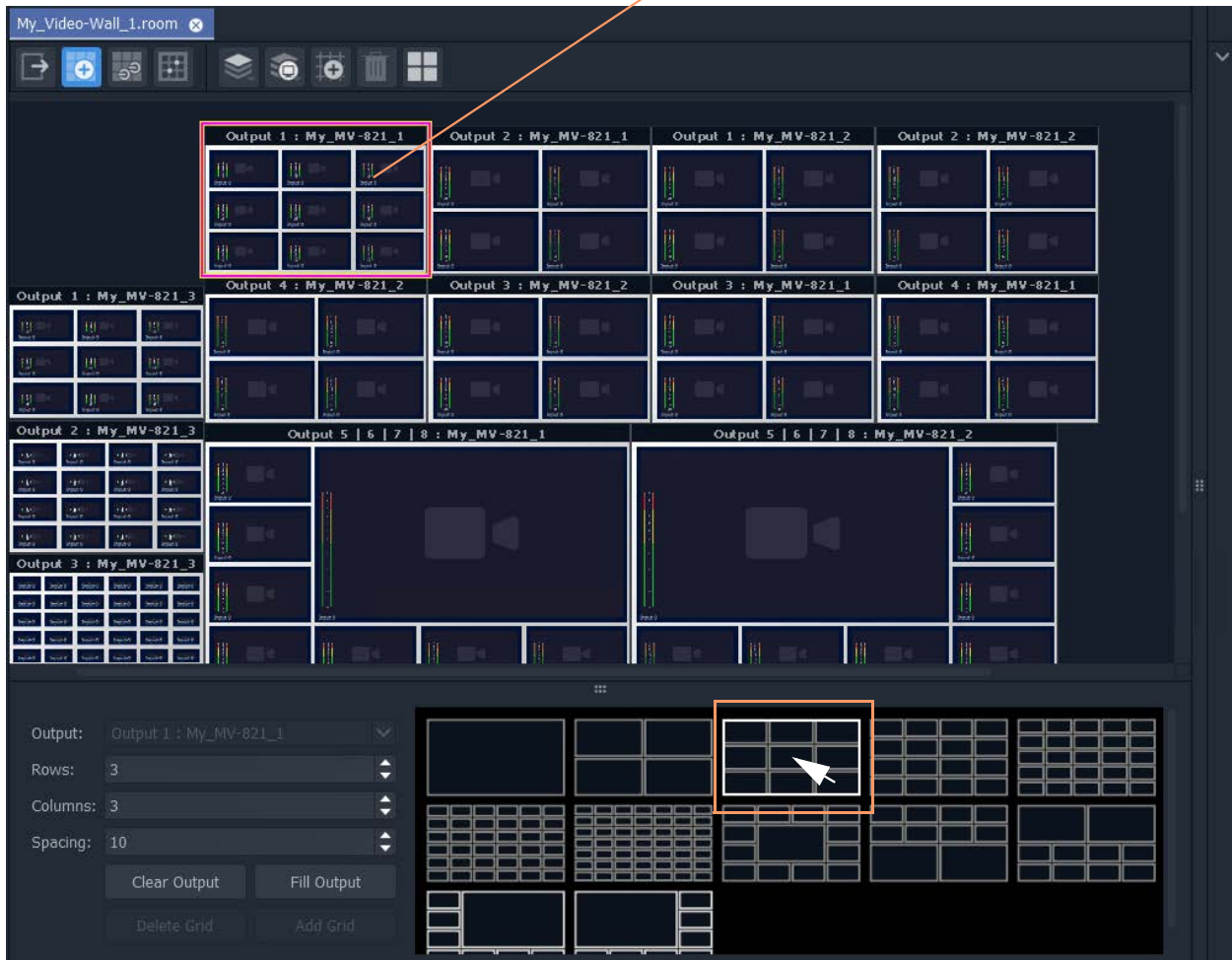
Fig. 15-37: Select New Tile Grid Template

5 Click **Save File** in the main tool bar.

This has created a new tile-grid layout for use by the selected monitor. Further **Monitor Layouts** for the monitor may be created.

List Monitor Layouts

To see what **Monitor Layouts** there are for a monitor:

1 Select the monitor.

2 Click the **Monitor Layout** icon.

   The pop-up menu lists the available **Monitor Layouts** *for the selected monitor*. See Figure 15-38. A radio button allows a **Monitor Layout** to be selected.
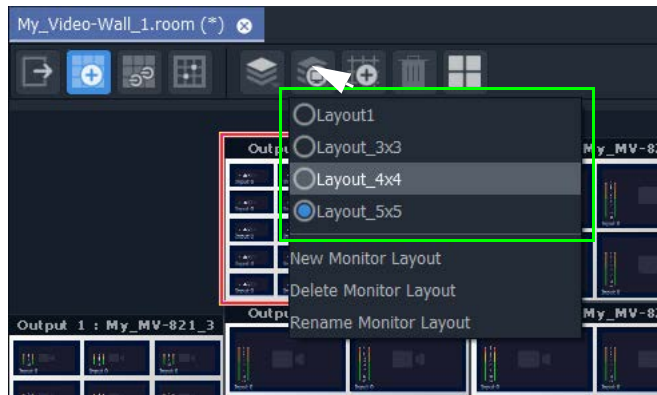
Fig. 15-38: List Monitor Layouts for a Selected Monitor

Monitor Layouts and Tiles

A tile grid is populated with tiles. **Monitor Layouts** also record the type of tile at each populated tile position. In this way, two **Monitor Layouts** may have the same tile-grid but contain different tiles. Tile change-overs on a video wall can then be recalled with a **Monitor Layout**.

Tile types to populate a tile-grid with include:

• an Auto-tile configured as a video tile. (See Configured Video Tile, on page 716.)

• an Auto-tile configured as a clock tile. (See Clock Tile, on page 716.)

• a Custom Tile.

A new **Monitor Layout** can be created for each change of tile type and saved. Then a **Monitor Layout** can be recalled and saved as a **Room Layout** (see Create a Room Layout for a Video Wall, on page 717).

Configured Video Tile

Properties of selected tile
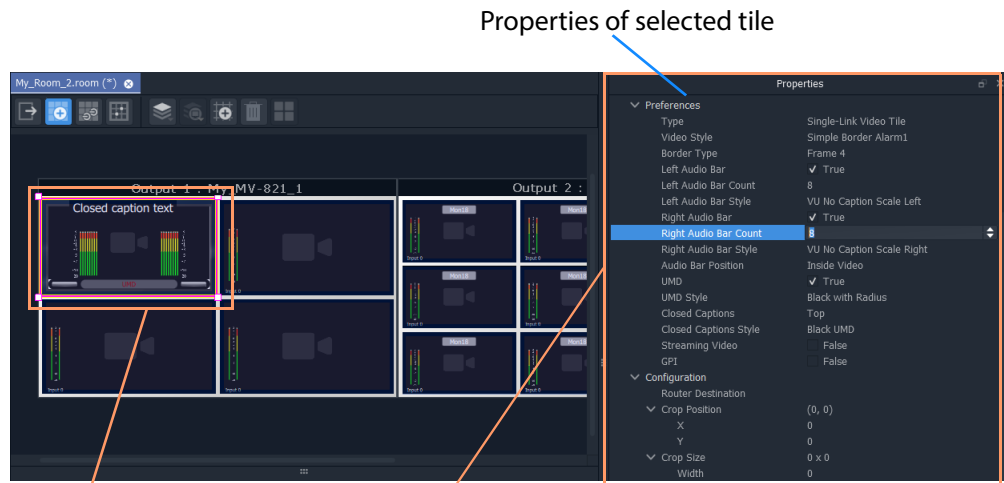
Video tile properties changed in **Properties** box

Fig. 15-39: Configured Video Tile Example

Clock Tile
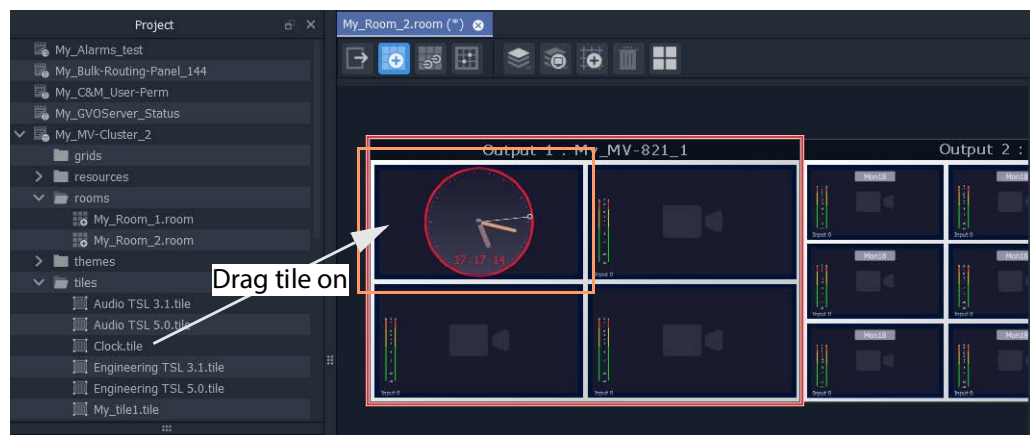
Fig. 15-40: Dragged-On Clock Tile Example

Custom Tile

Image widget added   Digital Clock widget added

Audio Bars widget configured for more bars etc.

UMD widget added
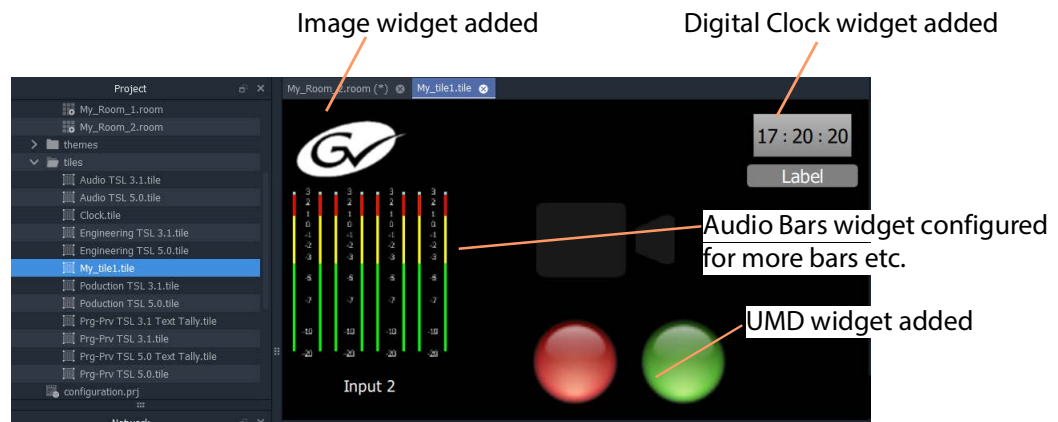
a) Edit a video tile in the **Tile Editor** to create a **Custom Tile**

Drag tile onto the stage
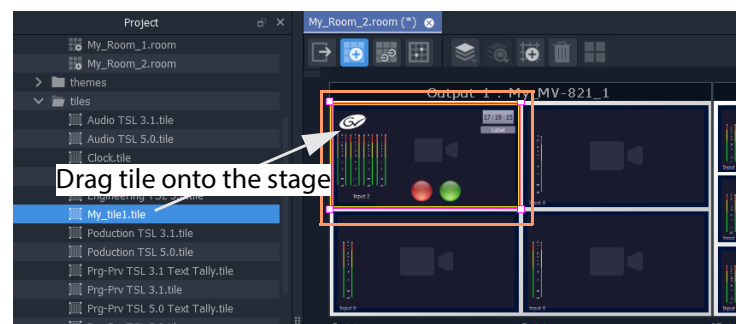
b) Drag Custom Tile onto Tile Grid in Room Editor

Fig. 15-41: Drag on Custom Tile

Create a Room Layout for a Video Wall

Prerequisite:

• One or more **Monitor Layouts** have been generated for *each* monitor in the video wall of the Room.

With various **Monitor Layouts** created for monitors, different **Monitor Layouts** can be selected and saved as new **Room Layouts** for a video wall.

To create a new **Room Layout** based on the current **Room Layout**:

1 View a video wall in **Design Layout** mode.
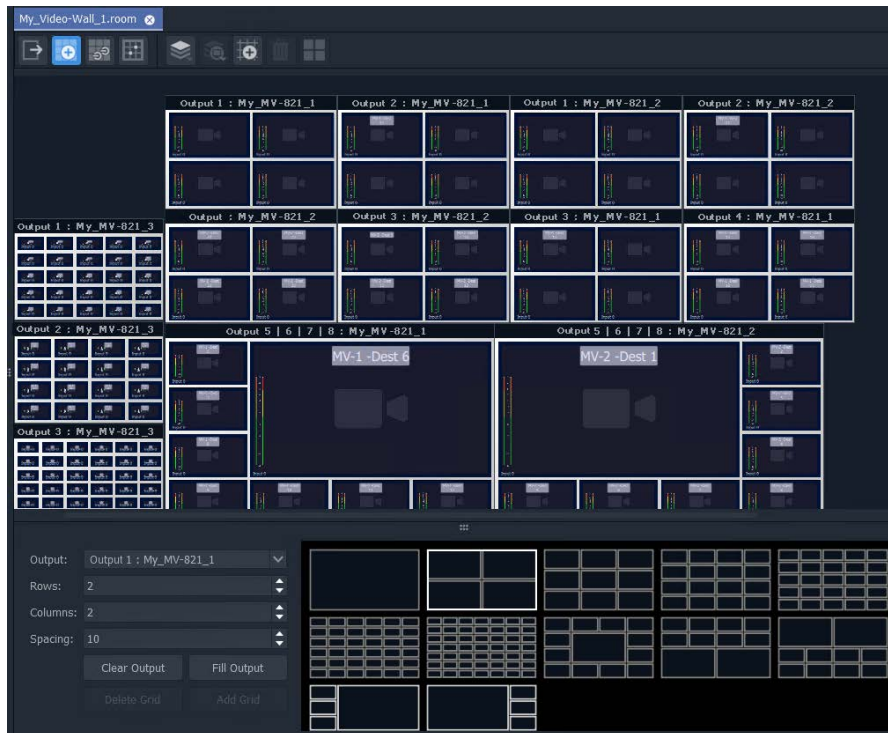
Fig. 15-42: Video Wall in Grid Layout Mode.

2   On each monitor in the video wall, select the required **Monitor Layouts** on each monitor.

3   Click on the **Room Layout** icon ( ) and select 'New Layout'.
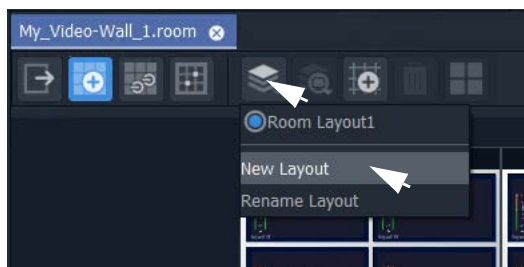
Fig. 15-43: Select New (Room) Layout

4   Enter a name for the new **Room Layout** and click **OK**.
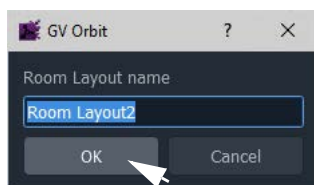
Fig. 15-44: Enter a Name for the New Room Layout

This creates a new **Room Layout** from the current one.

To make a change to this new **Room Layout**:

5 Select a monitor that has more than one **Monitor Layout** and
then right-click on it.

A drop-down menu appears.

6 Select 'Switch Monitor Layout' and
select a **Monitor Layout** from the list. (See Figure 15-45.)
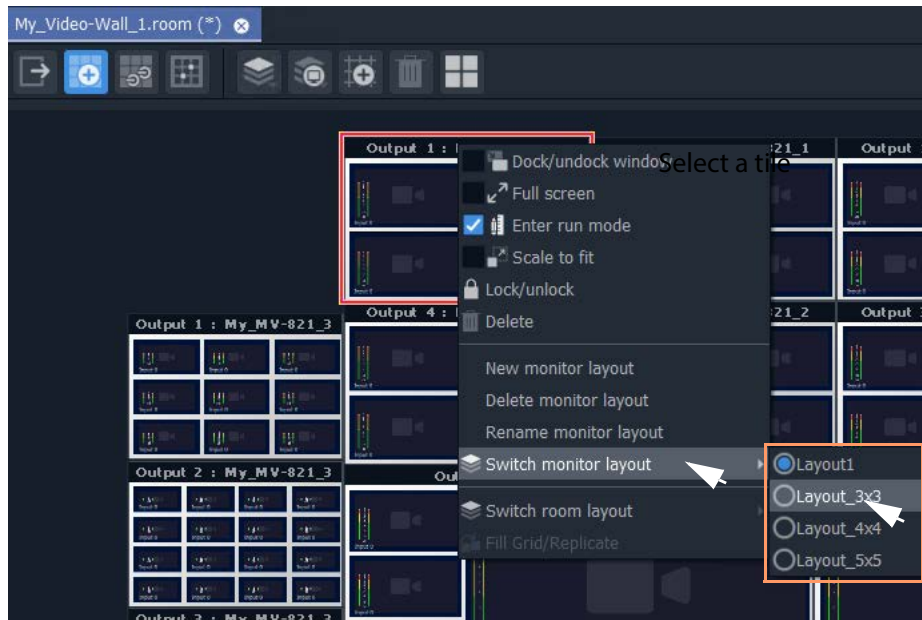
Fig. 15-45: Select a Monitor Layout

The selected monitor shows the new **Monitor Layout**.
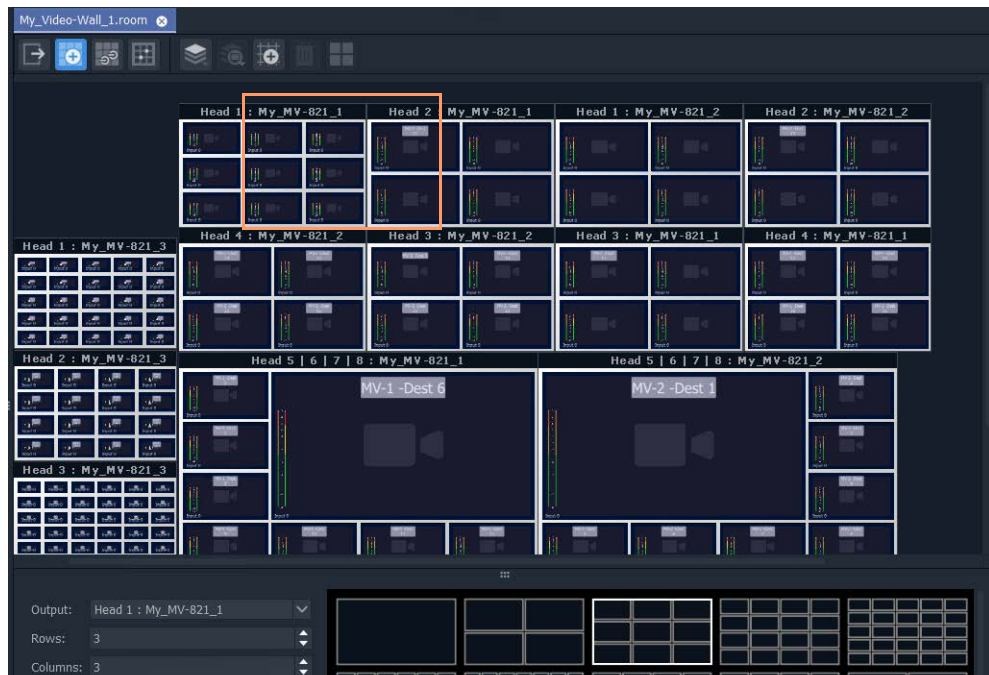
Fig. 15-46: New, Selected Monitor Layout

7 Click **Save File** in the main tool bar.

   The new **Room Layout** now uses the selected **Monitor Layout** for the selected
   monitor.

Edit an Existing Room Layout

To edit an existing **Room Layout**:

1 View the **Design Layout** mode and select the **Room Layout** to be edited.

2 Select a monitor and, for that monitor, select a new **Monitor Layout**.

3 Click **Save File** in the main tool bar to save the modified **Room Layout**.

Example Room Layouts

Example Room **Layout1**
Uses Monitor Layout = "**Layout1**"

Example Room **Layout2**
Uses Monitor Layout = "**Layout_2x2**"

Example Room **Layout3**
Uses Monitor Layout = "**Layout_3x3**"

Example Room **Layout4**
Uses Monitor Layout = "**Layout_4x4**"

Example Room **Layout5**
Uses Monitor Layout = "**Layout_5x5**"

Fig. 15-47: Example Room Layouts 1 to 5

Next step: Step 4a: Assign Destinations to Tile Positions

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Step 4a: Assign Destinations to Tile Positions

This step associates router destinations to video wall tiles.

Router destinations assigned to each tile position.
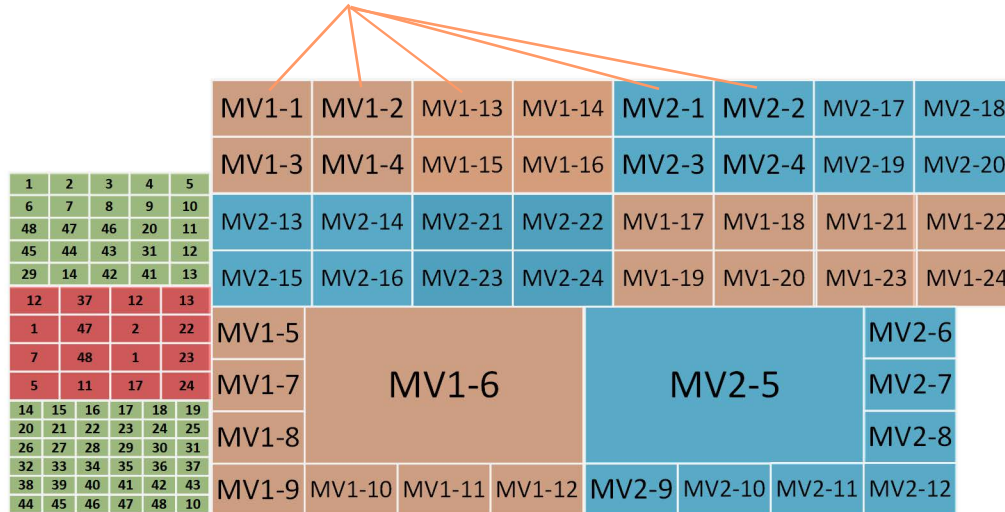
Assign Router Destinations to Video Wall Tile Positions

For video tiles which are configured for **Static Destination Assignment**, the assignments made are used unchanged.

For video tiles configured for **Dynamic Destination Assignment**, then the assignments made define which destinations may be dynamically routed.
(**Note:** This needs the Multiviewer Cluster Manager Service running on the GV Orbit Server),

Prerequisites:

- There is a **Room** open in the **Room Editor** which has a **Room Design** which defines a video wall which has a **Design Layout**.
- Router destinations have been set up in the router controller (GV Orbit Control).
- The **Routing** service is connected to GV Orbit Control.

Procedure Overview

The **Assign Router Destinations** workflow is presented below in the following steps:

- Step 4a-1: Open Room Editor in Assign Destinations Mode
- Step 4a-3: To Edit a Tile to be Static
- Step 4a-2: Map Router Destinations to Multiviewer Inputs
- Step 4a-4: Assign Mapped Destinations to Tile Positions

And then some TSL configuration settings may be optionally set up (or set up later, as required):

- Step 4b: Configure TSL Tally Settings for a Room

Step 4a-1: Open Room Editor in Assign Destinations Mode

By default, destinations are set to dynamic mode. To assign multiviewer router destinations to a video wall, in the **Project** window:

1 Open the **Room** in the **Room Editor**.

2 To select the destination assignment mode, select the **Assign Destinations** icon.

Fig. 15-48: Room Editor Tool Bar - Assign Destinations Icon

The **Room Design** is now shown in **Assign Destinations** mode. See Figure 15-49.
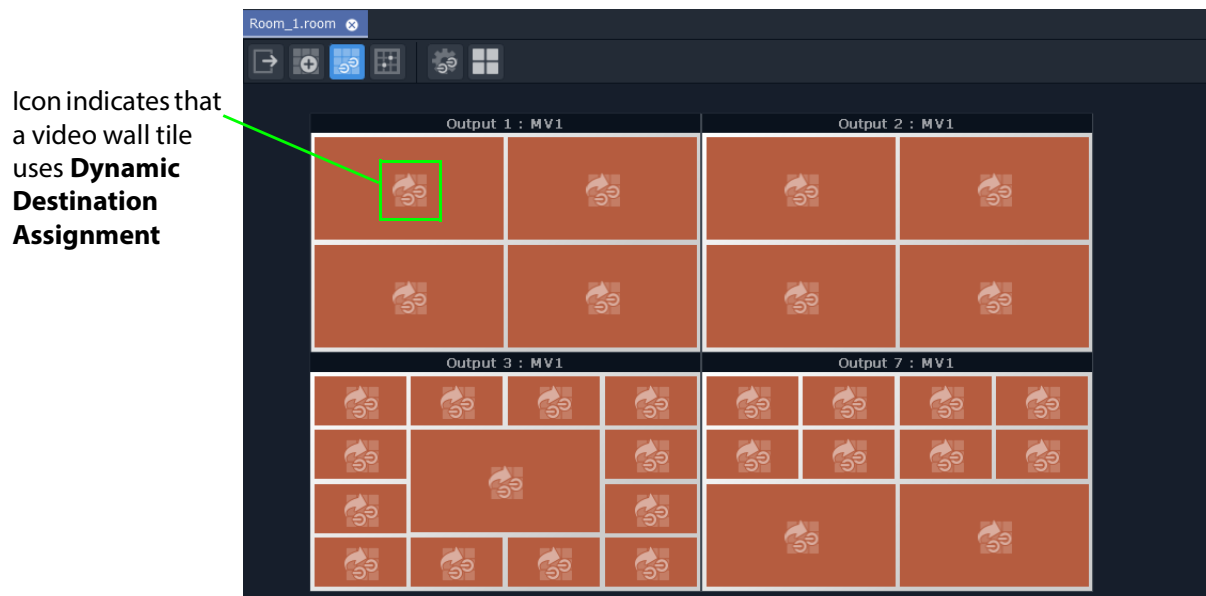
Fig. 15-49: Assign Destinations Mode in Room Editor - First Screen

> **Note:** Video tiles that are using the **Dynamic Destination Assignment**
>
> mode are indicated with a icon.

Step 4a-2: Map Router Destinations to Multiviewer Inputs

Router destinations should have already been reserved for all multiviewer inputs of the MV cluster in the routing system. These each need mapping to the multiviewer inputs for our Clustered MV project for either the **Static Destination Assignment** case or **Dynamic Destination Assignment** case.

First, map the destinations before the assignments can be done.

In the **Room Editor** tool bar in **Assign Destinations** mode, to map destinations to multiviewer inputs:

1 Click on the **Configure Mapping** icon.
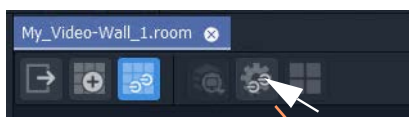
Click on **Configure Mapping** icon

Fig. 15-50: Room Editor Tool Bar - Assign Destinations Mode, Configure Mapping Icon

A **Destination Configuration** tab is opened which lists all multiviewer devices in the cluster. For each multiviewer, all multiviewer inputs are listed. Initially this list is empty.See Figure 15-51.

Fig. 15-51: Destination Configuration Tab

To map router destinations to multiviewer inputs:

2   Select the multiviewer.

3   Click on the 'Destinations' column heading to select all multiviewer inputs.
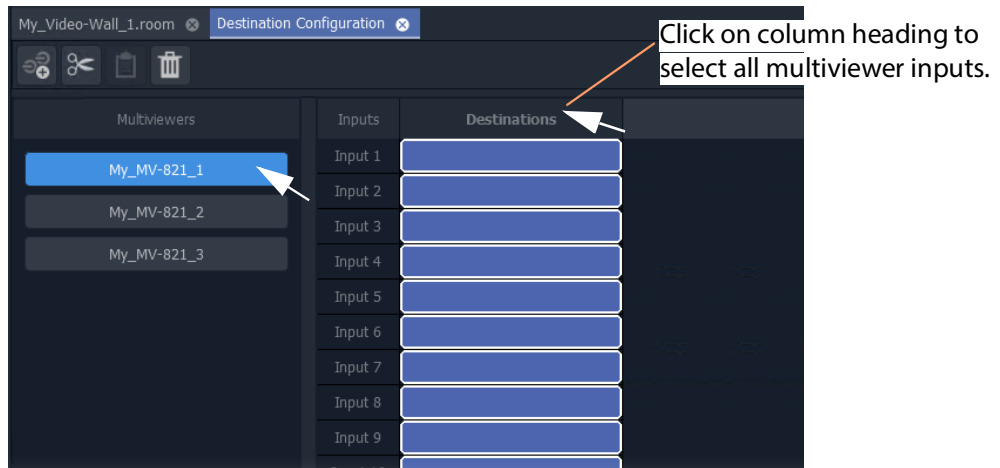
Fig. 15-52: Select Multiviewer, Select All Inputs

All inputs of the selected multiviewer are selected.

4   Alternatively, select a range of inputs by:

  • clicking on the first empty destination box in the range;

  • scrolling down the list; and

  • SHIFT-clicking on the last item.

See Figure 15-53.

All inputs in the range are selected.
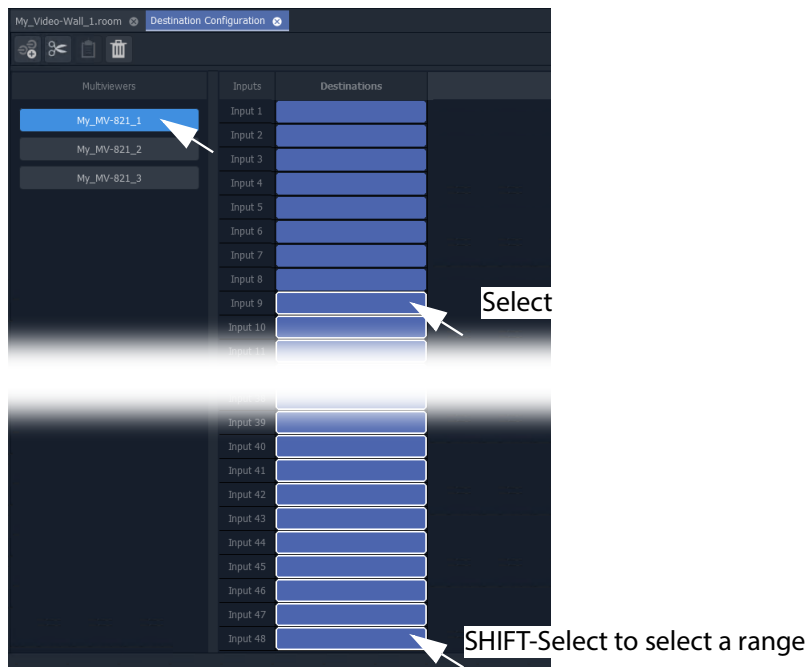
Fig. 15-53: Select Multiviewer and Select Multiviewer Input Range

With inputs selected:

5   Click on the **Destination Picker** icon in the **Destination Configuration** tab tool bar.

Click on the **Destination Picker** icon
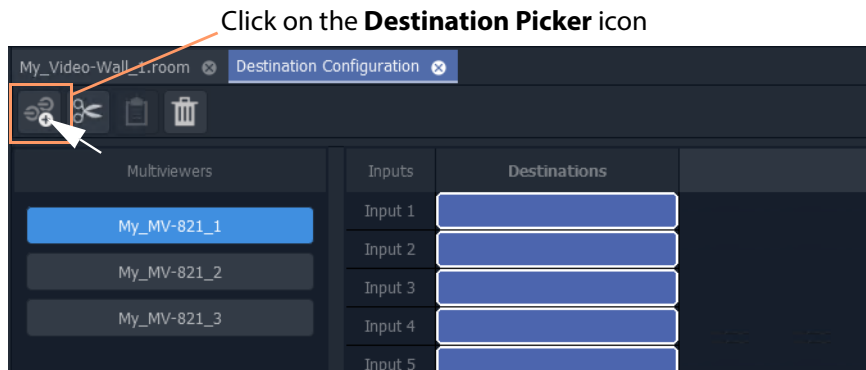
Fig. 15-54: Multiviewer Selected and Inputs Selected

The **Add Destinations** dialog is shown, which shows a filterable and scrollable list all of the destinations of the GV Orbit routing system. See Figure 15-55.

Tool bar icons:

- Select all - Select all destinations displayed in the dialog.
- De-select All - De-select all destinations.
- Wide Buttons - Click to toggle Destination button width.
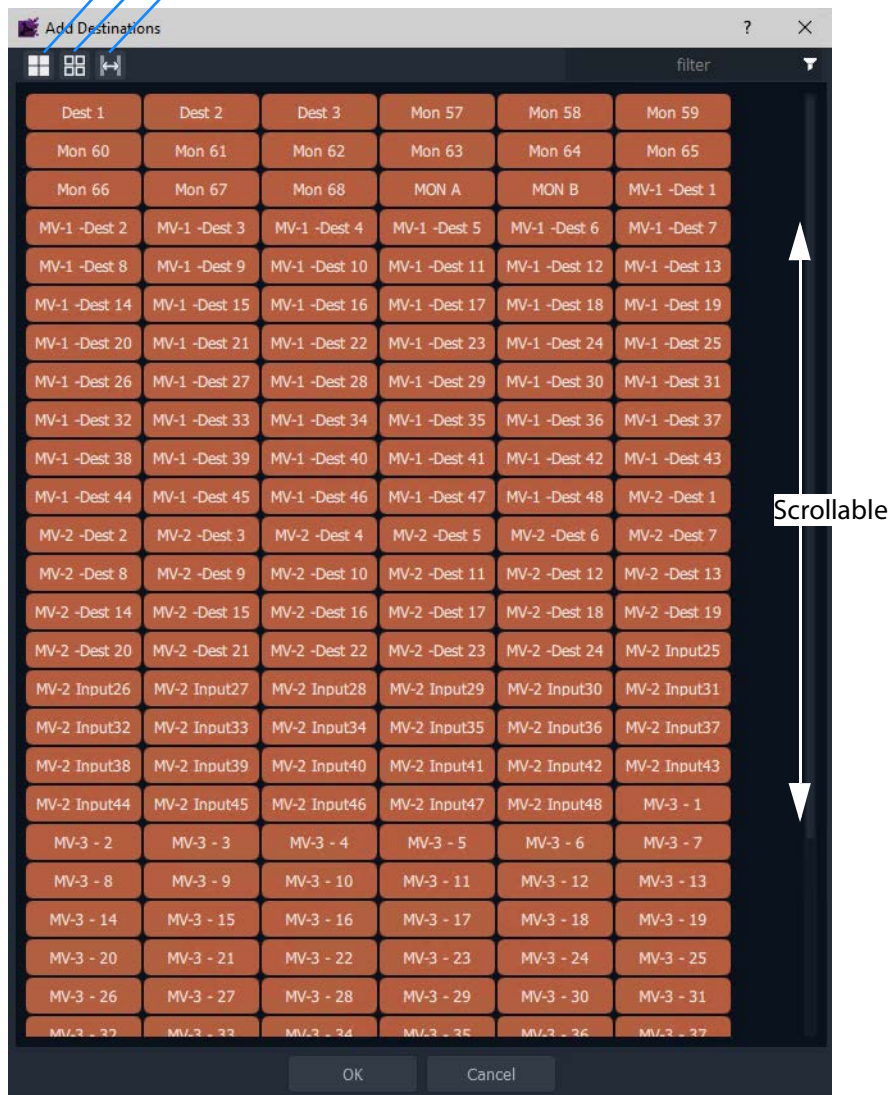
Fig. 15-55: Add Destinations Dialog

Note:	List items can be selected in a similar way to using the Bulk Routing Panel: Select and item, then SHIFT-select to select a range of items and CTRL-select to add individual items to the selection.

6 Typically, destination names have consistent and logical naming. (For example, 'MV-1 Dest**', or 'MV-2 Input**'.)

If required, use the filtering to locate the destinations for your selected multiviewer inputs.

7   Select the range of destinations for the selected multiviewer inputs. (Select, then SHIFT-Select.)
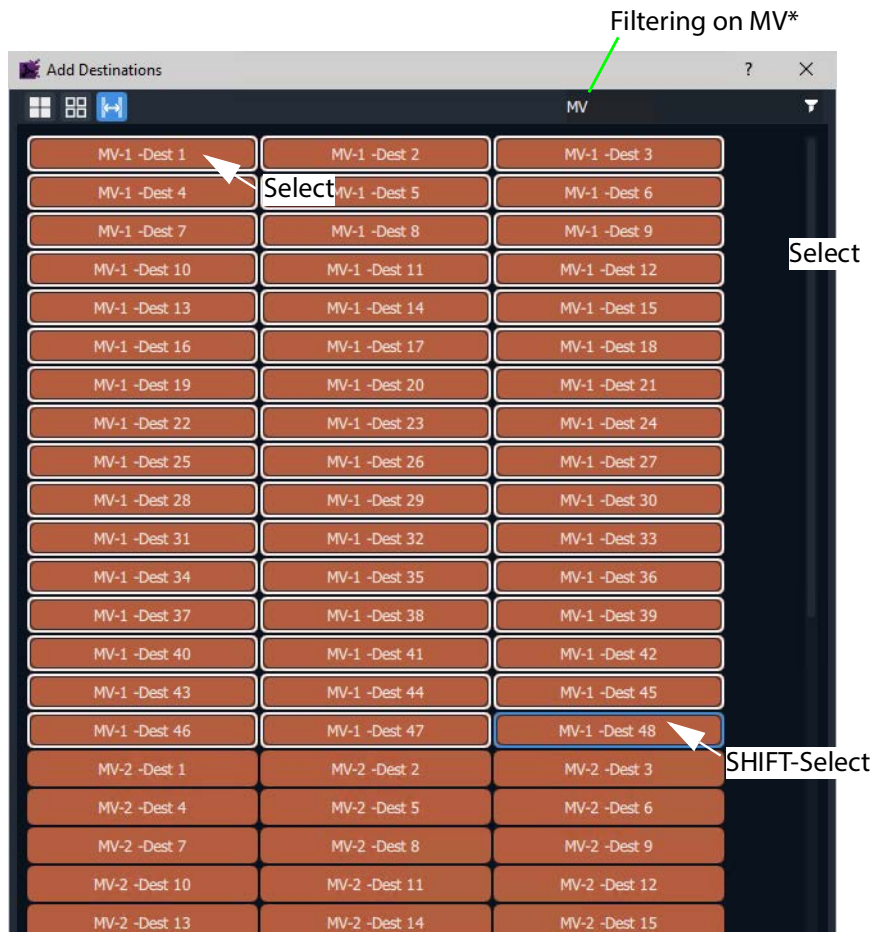
Fig. 15-56: Selected Range of Destinations

8   Click **OK** in the **Add Destinations** dialog.

The selected destinations are mapped and listed against the multiviewer inputs.

> Note: **Useful Filter feature:**
> When assigning router destinations to multiviewer inputs, typically, the destinations intended for multiviewer inputs are consistently and logically named. The filter feature of the **Add Destinations** dialog can then be used to easily list the destinations required.
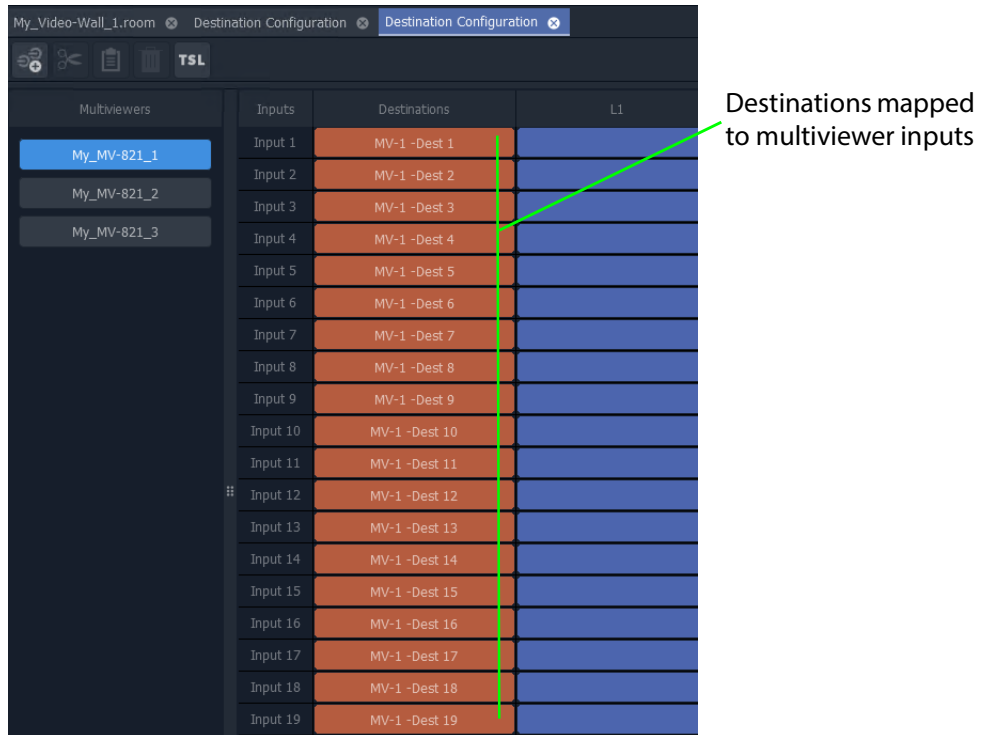
Fig. 15-57: Selected Destinations Mapped to Multiviewer Inputs

Some multiviewer inputs have been mapped to destinations.

Now:

9   Repeat these steps to map *all* of the multiviewers and their inputs to router
    destinations.

10   Click **Save File**.

When all multiviewer inputs have been mapped to destinations and saved:

11   Close the **Destination Configuration** tab.
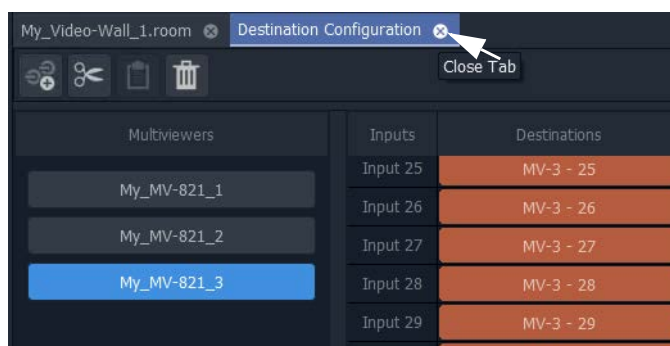
Fig. 15-58: Close Destination Configuration Tab

All multiviewer inputs have been mapped to router destinations.

> **Note:**   Changes made in the **Destination Configuration** tab need to be
> saved before the changes can be seen in the **Room Editor**.

Step 4a-3: To Edit a Tile to be Static

Dynamic Destination Assignment is the default tile configuration. It may be applied to one, or more, or all video tiles. It is possible to mix dynamic- and static-assigned tiles.

To configure a tile for **Static Destination Assignment**:

1 Select a tile.

Select a tile.

Deselect the
**Automatic
Destination
Assignment**
button.
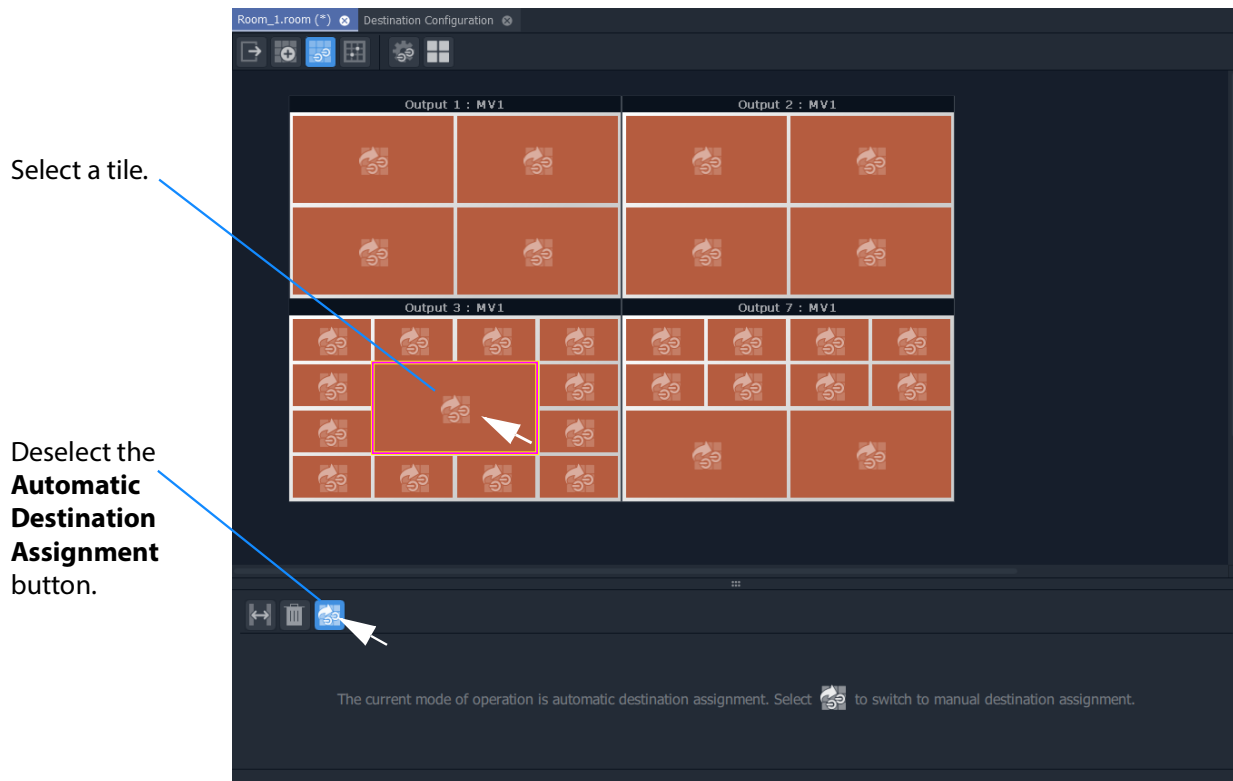
Fig. 15-59: Preparing to Set a Static Destination

2 Deselect the **Automatic Destination Assignment** button.

Router destinations are listed in the lower pane. See Figure 15-72.
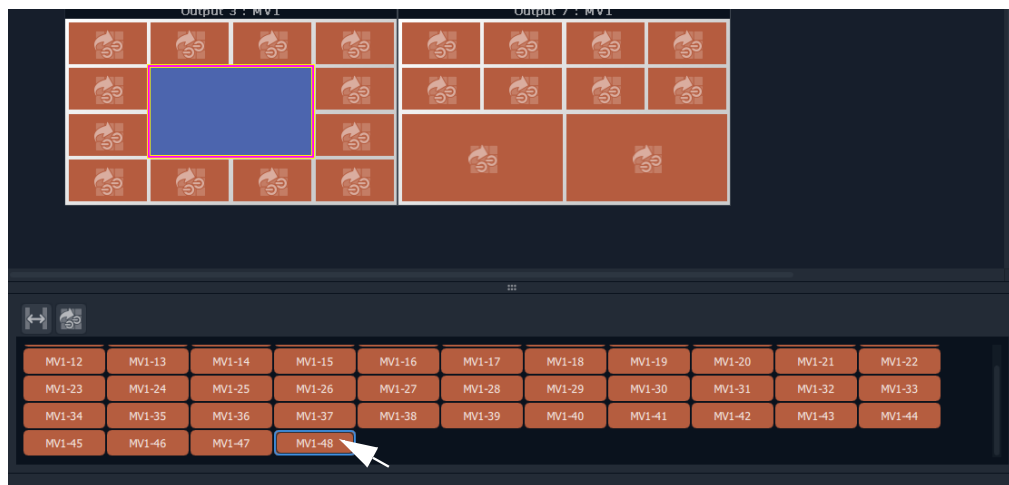
Fig. 15-60: Set a Static Destination

If no destinations are listed on the lower pane, then see Step 4a-2: Map Router
Destinations to Multiviewer Inputs, on page 724, for instructions for manually mapping
router destinations.

Once destinations are listed:

3 Select a multiviewer input in the lower pane.

The selected tile now indicates its static router destination setting.

Selected tile has a static router destination setting.

Fig. 15-61: Static Destination for a Tile

4 Click **Save File** in the main menu.

Step 4a-4: Assign Mapped Destinations to Tile Positions

The video wall tab shows our video wall and we have mapped destinations to multiviewer inputs.

> **Note:** This step is only required to be done for tiles which are configured for **Static Destination Assignment**.

Monitor header areas annotated with multiviewer output information.

Video wall tiles populated in the tile positions
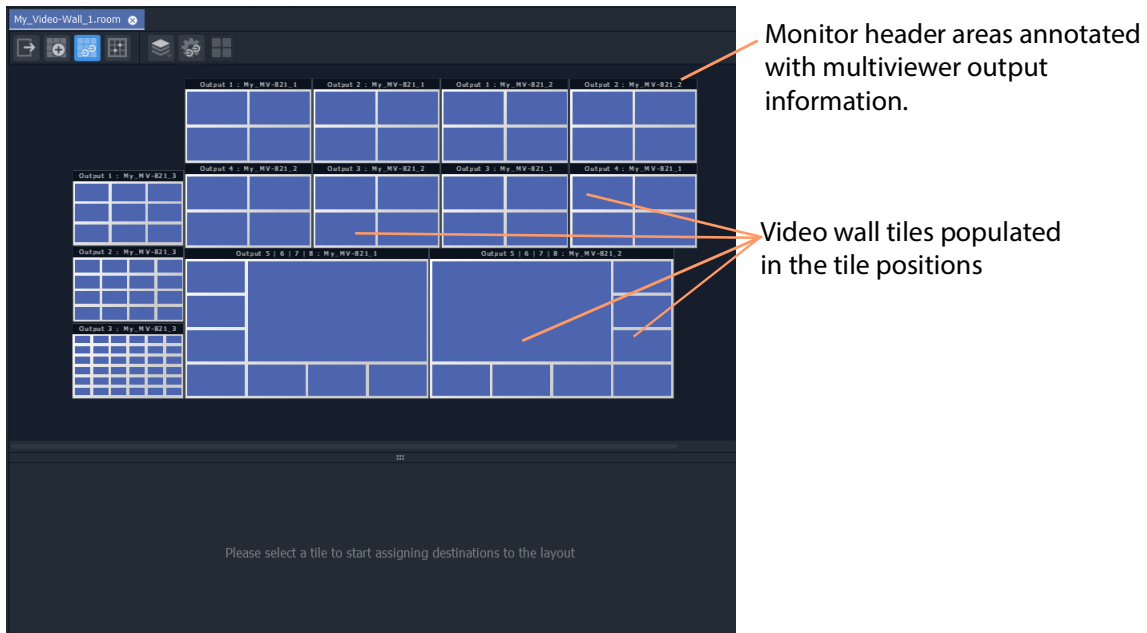
Fig. 15-62: Video Wall Tab Ready for Assigning Mapped Destinations to Tile Positions

The workflow is presented with these sub-sections:

- Assign Single, Static Destination to Single Tile Position.
- To Assign Static Destination(s) to All Tile Positions on a Monitor's Tile-Grid.
- Assign (Static) Series of Destinations to Multiple Tile Positions.

And:

- Delete a Destination Assignment.
- Edit a Static Destination Assignment.
- Edit a Tile - Static to Dynamic Destination Assignment.

Assign Single, Static Destination to Single Tile Position

To assign static destinations to tile position:

1 Select a tile position on a monitor.

   For the selected position, the destinations mapped to the corresponding multiviewer are listed below. These are all possible destinations for the selected position. See Figure 15-63.

Selected tile position

Destinations mapped to multiviewer

Click to toggle wide buttons
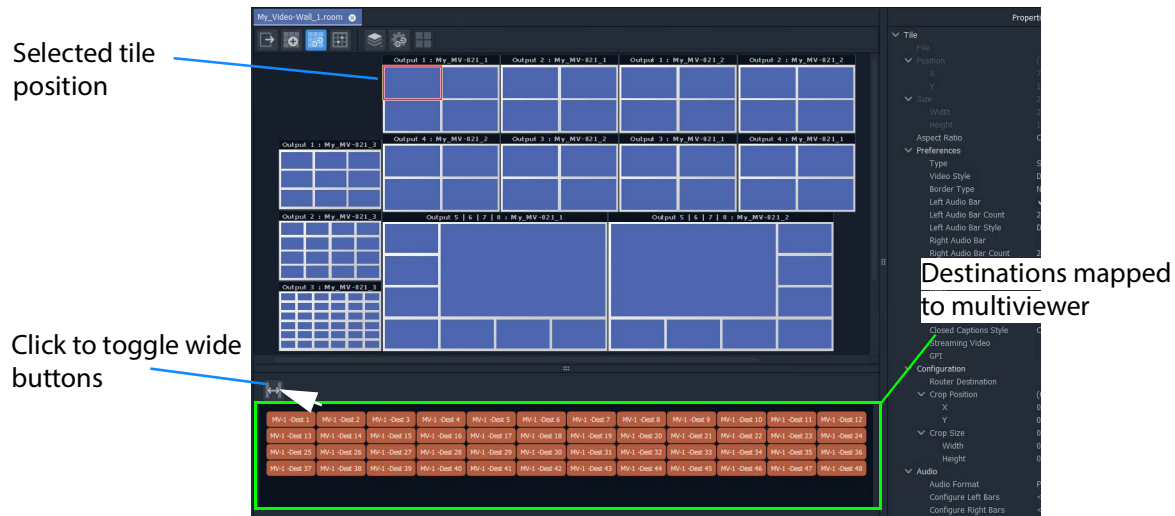
Fig. 15-63: Possible Mapped Destinations for Selected Tile Position

2 Select a destination.

The destination is assigned as a static destination to the tile position, which is annotated with the destination name.

Tile position annotated with assigned (static) destination name.

Tile position is unassigned.
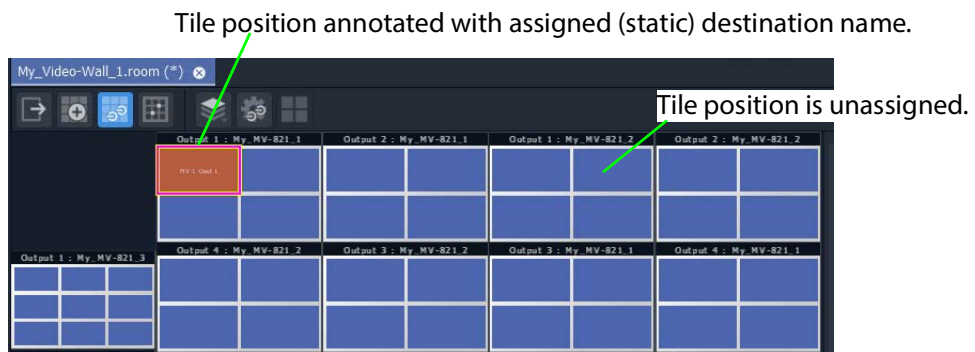
Fig. 15-64: Static Destination Assigned to Tile Position

This has assigned a static destination to a tile position on the tile-grid. Other tile positions can be assigned static destinations similarly.

To Assign Static Destination(s) to All Tile Positions on a Monitor's Tile-Grid

To quickly assign static destinations, all tile positions on a monitor can be selected and assigned:

1 Double-click on a monitor header area.

All tile positions on the monitor are selected.

Double-click on monitor header area to select all tile positions on the monitor.
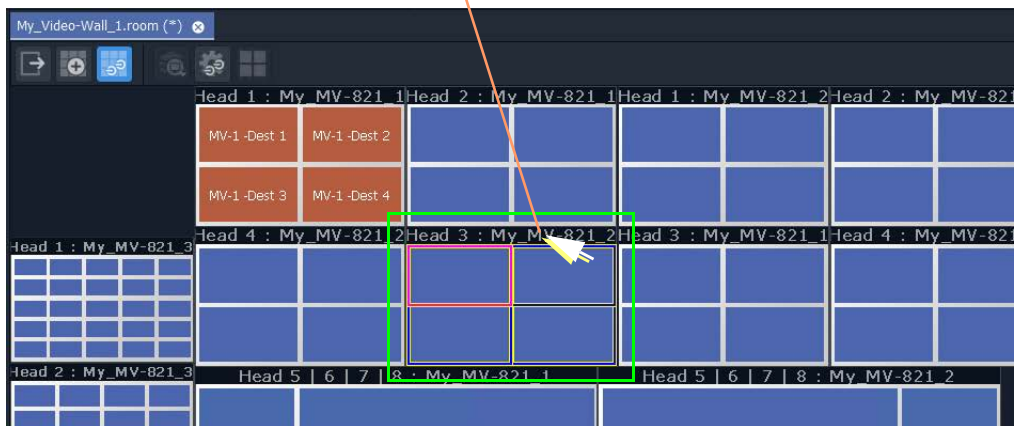
Fig. 15-65: Select All Tile Positions on Monitor

2 Select a destination.

An **Assign Destination to Multiple Tiles** dialog pops up. See Figure 15-66.
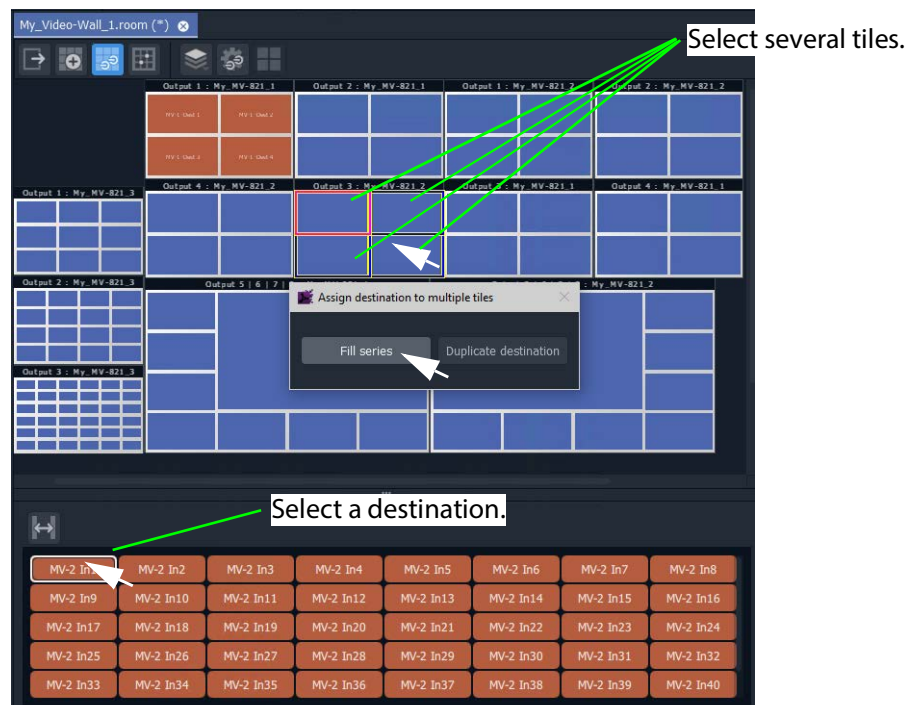
Fig. 15-66: Assign Destination to Multiple Tiles Dialog

3 In the **Assign Destination to Multiple Tiles** dialog:

- Click **Fill Series** to fill the selected tile positions with a series of destination, starting from the selected one.
- Click **Duplicate Destination** to fill all the selected tile positions with the selected destination.

Figure 15-67 shows the result of doing **Fill Series**.
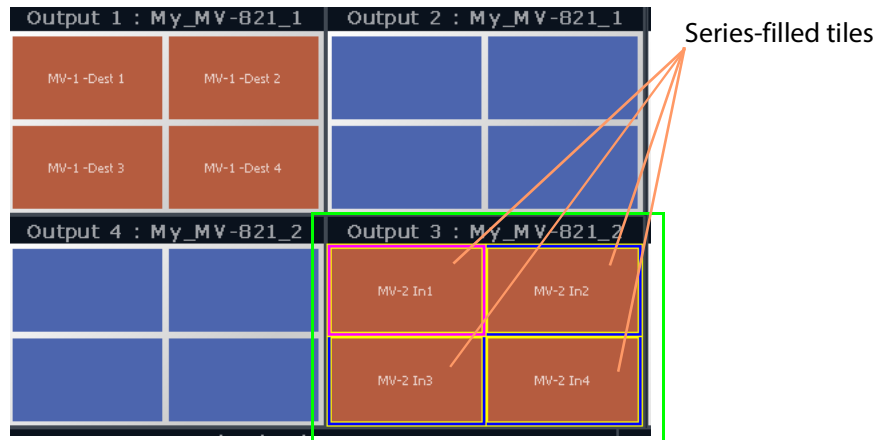
Fig. 15-67: Result of Fill Series

Assign (Static) Series of Destinations to Multiple Tile Positions

Assignment by **Fill Series** can be done to a selection of tile positions:

1 Select tile positions from the same multiviewer with 'select' and 'SHIFT-select'.
2 Use 'Fill Series' to assign static destinations.

Delete a Destination Assignment

1 Select one or more tile positions.

2 Click the **Unassign** icon or press the Delete key to delete the destination assignment.
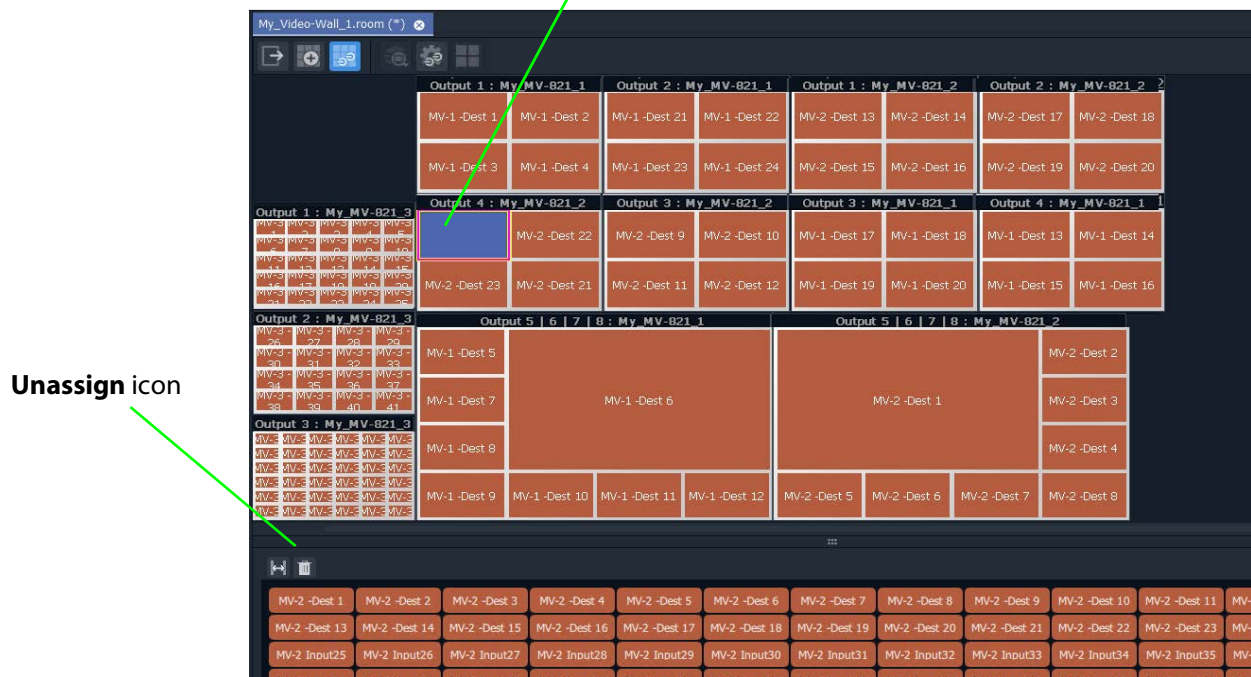
Fig. 15-68: Deleted Destination Assignment

Edit a Static Destination Assignment

1 Select a tile position.
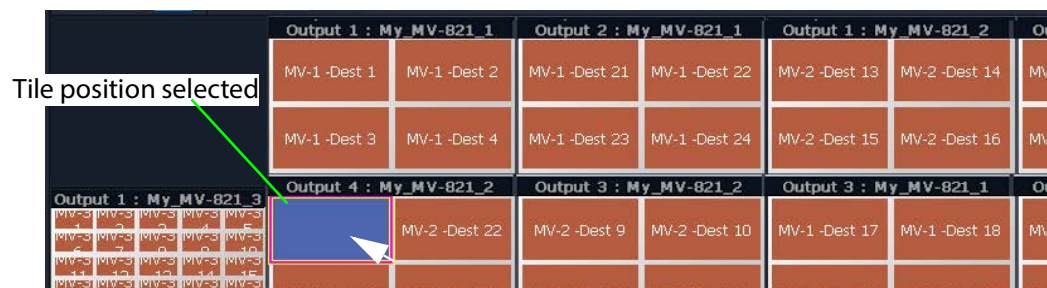
Fig. 15-69: Selected Tile Position

2 Select a new static destination.

Fig. 15-70: Select New Destination

The new static destination assignment is made.

New static destination assignment
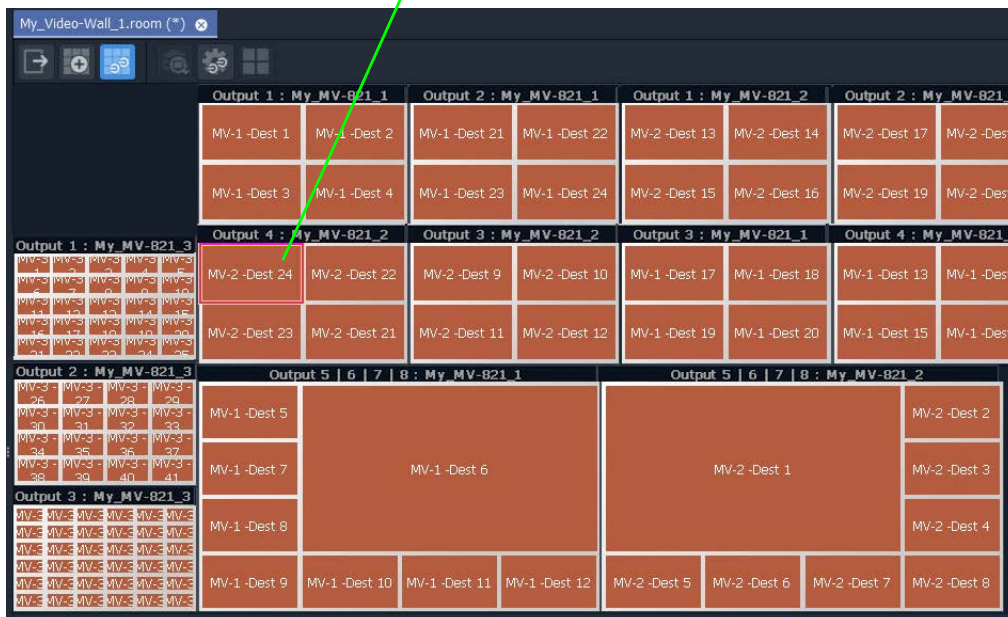
Fig. 15-71: New Static Destination Assignment

Edit a Tile - Static to Dynamic Destination Assignment

To set dynamic assignment for a static assignment tile:

1 Select a tile.

2 Select the **Automatic Destination Assignment** button in the lower pane.

The selected tile now indicates its dynamic router destination setting. See Figure 15-72.

a) Select a static tile   b) Tile now has dynamic destination assignment
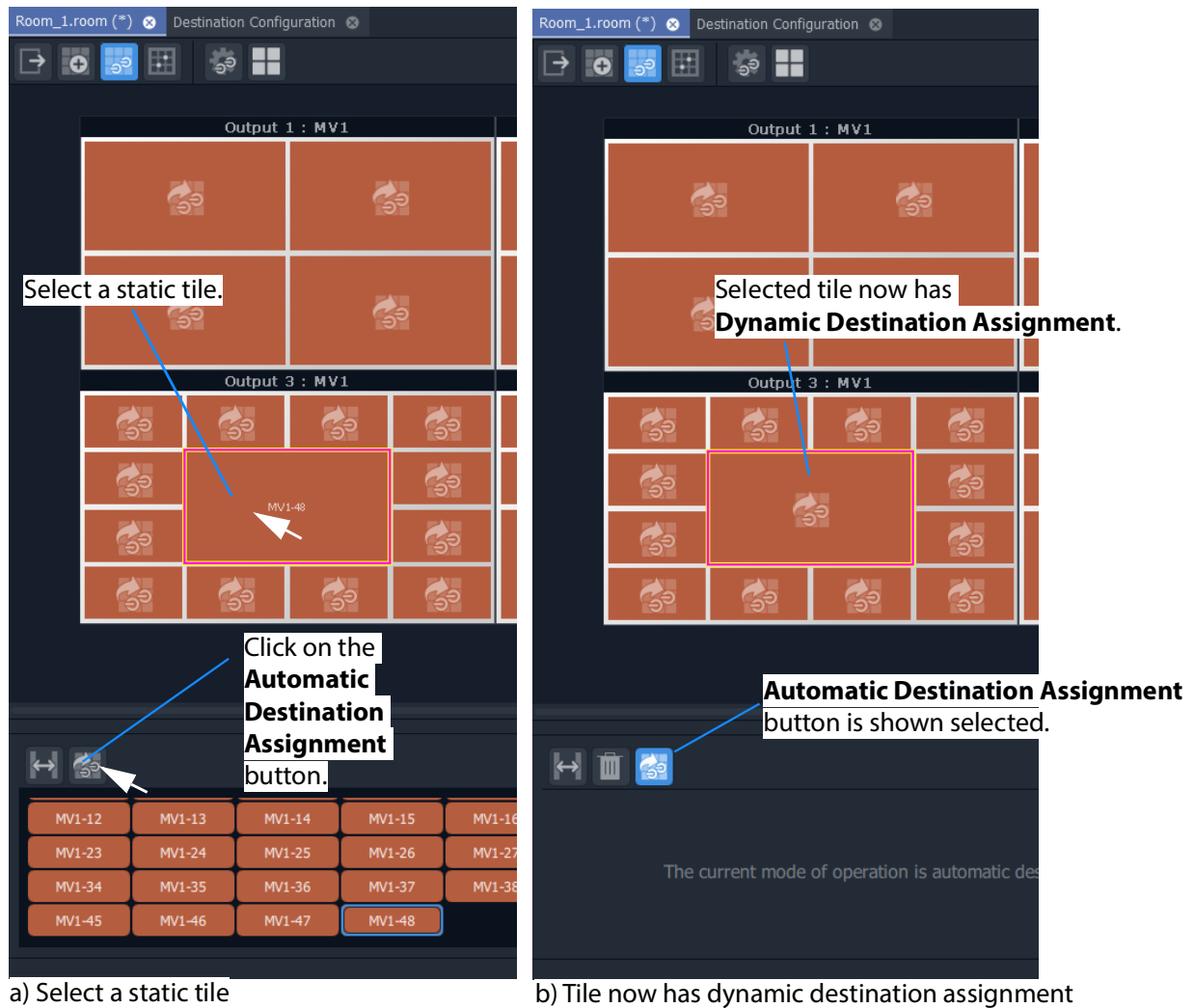
Fig. 15-72: Make a Static Destination Assigned Tile Dynamic

3 Click **Save File** in the main menu.

Destination Assignment Notes

Note: When assigning static destinations:

- assigning the same destination to more than one tile position is permitted.
  Note: For MV-8XX multiviewers, the architecture of the MV-8 Series core multiviewer has one image scaling function per multiviewer input. If one destination is assigned to more than one tile position, then the video image is viewed at the smallest resizing scale.
- not all destinations need to be assigned.

Note: Prerequisites of assigning router destinations is that:

1. The router controller ('GV Orbit Control' in the GV Orbit system) is configured with destinations reserved for use by multiviewer inputs in its topology. See Logical Device Table Tasks, on page 241.

2. The GV Orbit Routing service must have a valid connection to 'GV Orbit Control'. See the *GV Orbit Admin Guide*. See Related Documentation, on page 7.

Example Static Destination-Assigned Video Wall

The video wall is now managed in terms of destinations.

Fig. 15-73: Example Video Wall Tab

The destination assignment needs only to be done once in a project.

Next

When all destination assignment is done (dynamic, static, or a mixture) to multiviewer inputs and tile positions, then TSL Tally configurations (including for TSL address mappings to multiviewer inputs and video wall tile) can optionally be done. See Step 4b: Configure TSL Tally Settings for a Room.

> **Note:** The TSL Tally configuration can also be done separately later. It is optional at this stage in video wall design.

After this, the next step in *video wall design* is: Step 5a: X/Y Routing Video Sources to Tiles

Step 4b: Configure TSL Tally Settings for a Room

Following the assignment of destinations to multiviewer inputs and mapping to video wall tile positions in the **Room Editor** 'Assign Destinations' mode, TSL Tally configuration for the **Room** can also be done.

> **Note:** The **Destination Assignments** should be all completed in the **Room Editor** before for the Tally settings can fully function and map to video wall tiles etc.

Configuring the TSL settings is described in Chapter 16, MV Cluster - TSL Tally Configuration, on page 757.

> **Note:** TSL configuration is optional at this stage of the video wall design (**Room** design) and it can be set up later, if required.

After this optional TSL Tally configuration step during video wall design, the next step in *video wall design* is: Step 5a: X/Y Routing Video Sources to Tiles

Step 5a: X/Y Routing Video Sources to Tiles

Router sources assigned to each tile position.
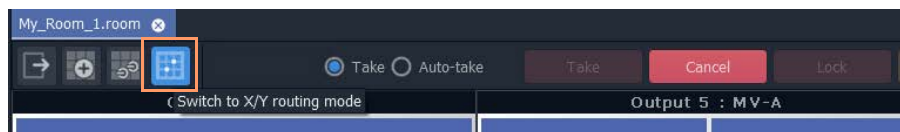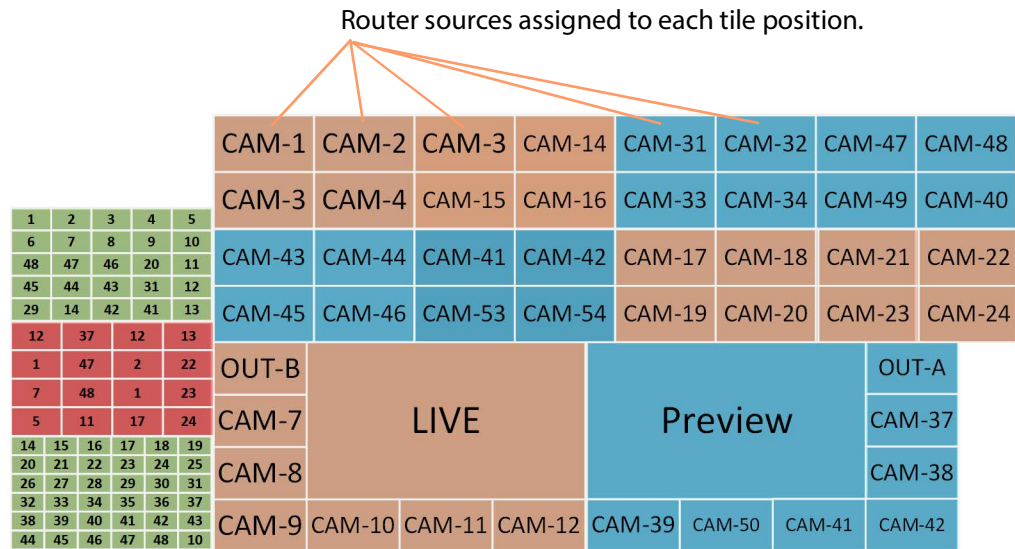
X/Y Routing of Video Sources to Video Wall Tile Positions

Prerequisites:

- There is a **Room** file open in the **Room Editor** which has a **Room Design** defining a video wall which has a assigned router destinations.
- Clustered Multiviewer project has been pushed to the repository on the GV Orbit Server.
- The Multiviewer Cluster Manager Service (MVCMS) is running on the GV Orbit Server and is set to use the pushed project from the repository.

Introduction

X/Y Routing mode has a live connection to the multiviewer cluster via the MVCMS service.

When using dynamic destinations, a live connection (through the MVCMS service) to an MV unit is required, otherwise the tiles will show up without any destinations assigned to them.

The **X/Y Routing** workflow is presented in the following sub-sections:

- Open 'X/Y Routing' in the Room Editor
- Procedure for 'X/Y Routing' to a Video Wall Tile Position
- Route a Source to Multiple Tile Positions
- Route Multiple Sources to Multiple Tile Positions

Additionally, in this **X/Y Routing** mode of the **Room Editor,** the selection or creation of a different **Room** or **Monitor Layout** is shown live on the multiviewer video wall, see Step 5b: Change Layouts in X/Y Routing Mode, on page 751.

Open 'X/Y Routing' in the Room Editor

The routing of sources to video tiles (actually to the tile positions) is done in the **Room Editor**, in its 'X/Y Routing' tool.

> **Note:** If you do not have the Edit screens permission then when you open a MV Cluster Room File, you will be taken directly to the X/Y Routing Screen and GV Orbit Client will be put into full screen mode. You will only be able to switch Rooms, switch Room Layout and switch Monitor Layouts. See Manage Users, on page 141.

To open this **Room Editor** facility:

1　Open the **Room** file in the **Room Editor**.

2　Click on the **X/Y Routing** icon to select the mode.

X/Y Routing icon selected

Fig. 15-74: Room Editor Tool Bar - XY Routing Icon

The **Room Design** is now shown in **X/Y Routing** mode. See Figure 15-75.

X/Y Routing Mode in Room Editor

Room Video Wall Tile Destinations

Routing 'Take' controls

Filter box

Router sources grid

Sources Filter box
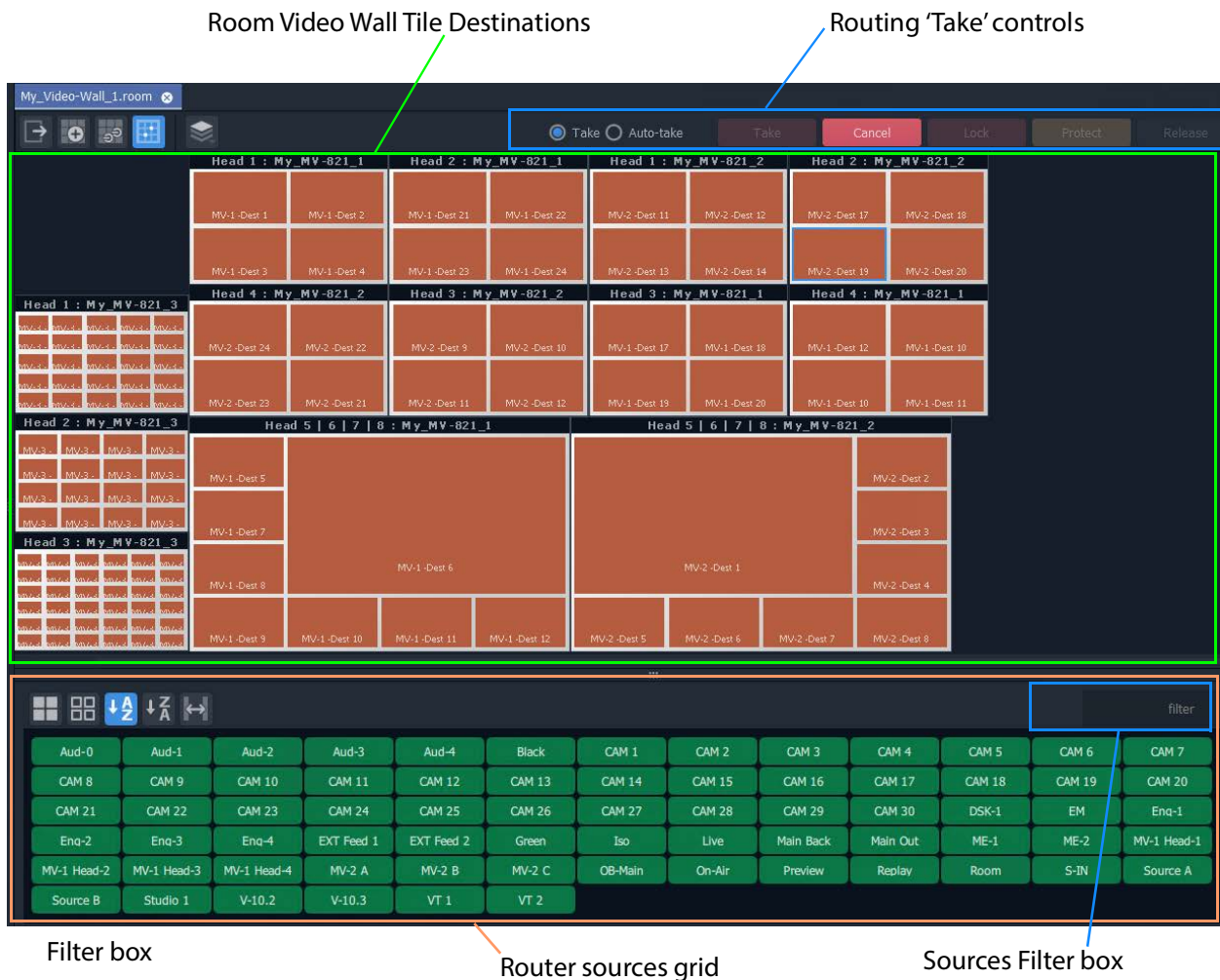
Fig. 15-75: X/Y Routing Mode in Room Editor

Router sources are listed in a grid below the representation of the video wall showing the tiles, which are the routing destinations. Routing 'Take' controls appear in the banner area. The **X/Y Routing** mode provides you an XY routing panel.

> **Note:** For full information on routing with an XY routing panel, refer to Chapter 13, XY Panel Operation, on page 614.

Routings that are made will be reflected on the **Room** video wall itself.

X/Y Routing Mode Controls

- Select 'Take' action. Make route:
  - When Take button is clicked, or when double-clicking on source.
  - Immediately when source is selected.

- Click to Take destination-source selection.
- Click to Cancel destination-source selection.

- Click to Release selected destination from Lock/Protect.
- Click to Protect selected destination.
- Click to Lock selected destination
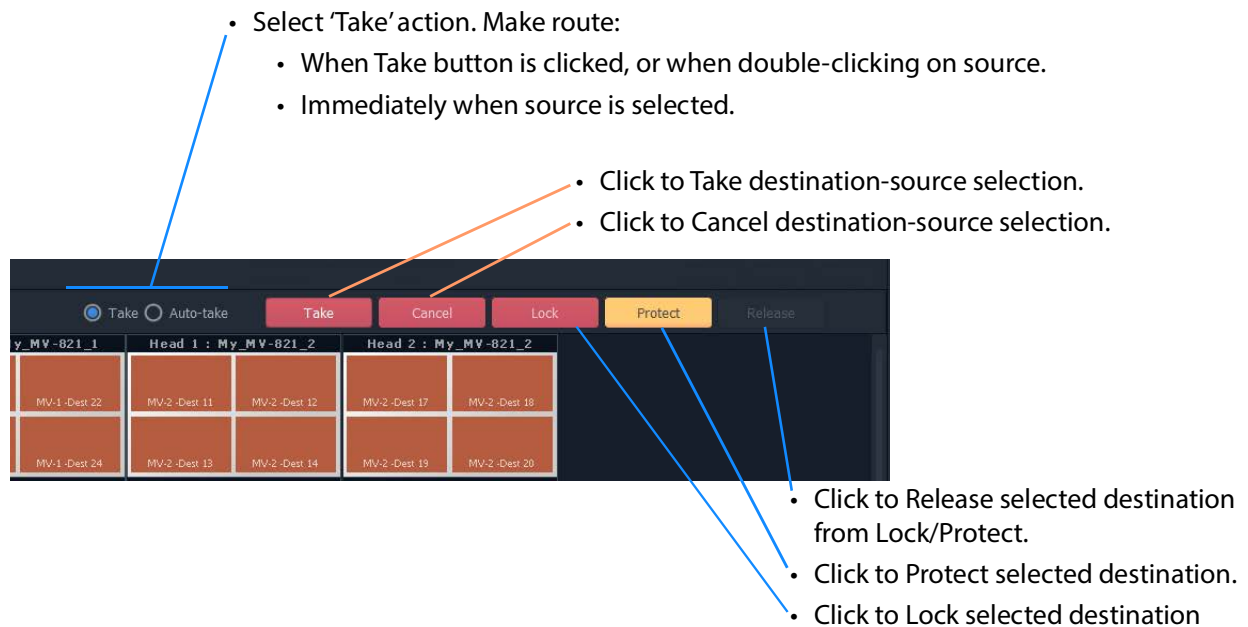
Fig. 15-76: Routing Controls

- Select All
- Deselect all.
- Sort A to Z
- Sort Z to A
- Toggle wide button size

Sources Filter box, to limit which sources are shown.

Fig. 15-77: Router Sources Grid Banner Tool Bar Controls

Note: When routing sources to the video wall, typically, such sources are consistently and logically named. (For example, 'CAM 1', 'CAM 2' etc.) The filter feature of the **X/Y Routing** mode can then be used to easily list the source(s) required.

Procedure for 'X/Y Routing' to a Video Wall Tile Position

The procedure broadly operates like an XY routing panel:

- select the destination (where the route is to be made to); and
- then select the source of the route to be made; and
- then there is an optional 'Take' step.

To route a source:

1. Select a tile position. (This is the destination of the route to be made.)

   Note: Any other tile position that is fed by the same source as the selected tile position is also selected.

2. Select a router (video) source in the sources grid. (This is the source of the route to be made.)

   With a destination selected and a source selected, a route is ready to be made. See Figure 15-78.

Fig. 15-78: Ready to Make a Router

3 Click the **Take** button.

The route is made from the selected source to:

a) the selected tile position (see Figure 15-79); and also to

b) any other tile Position on the video wall that is fed with the same source.
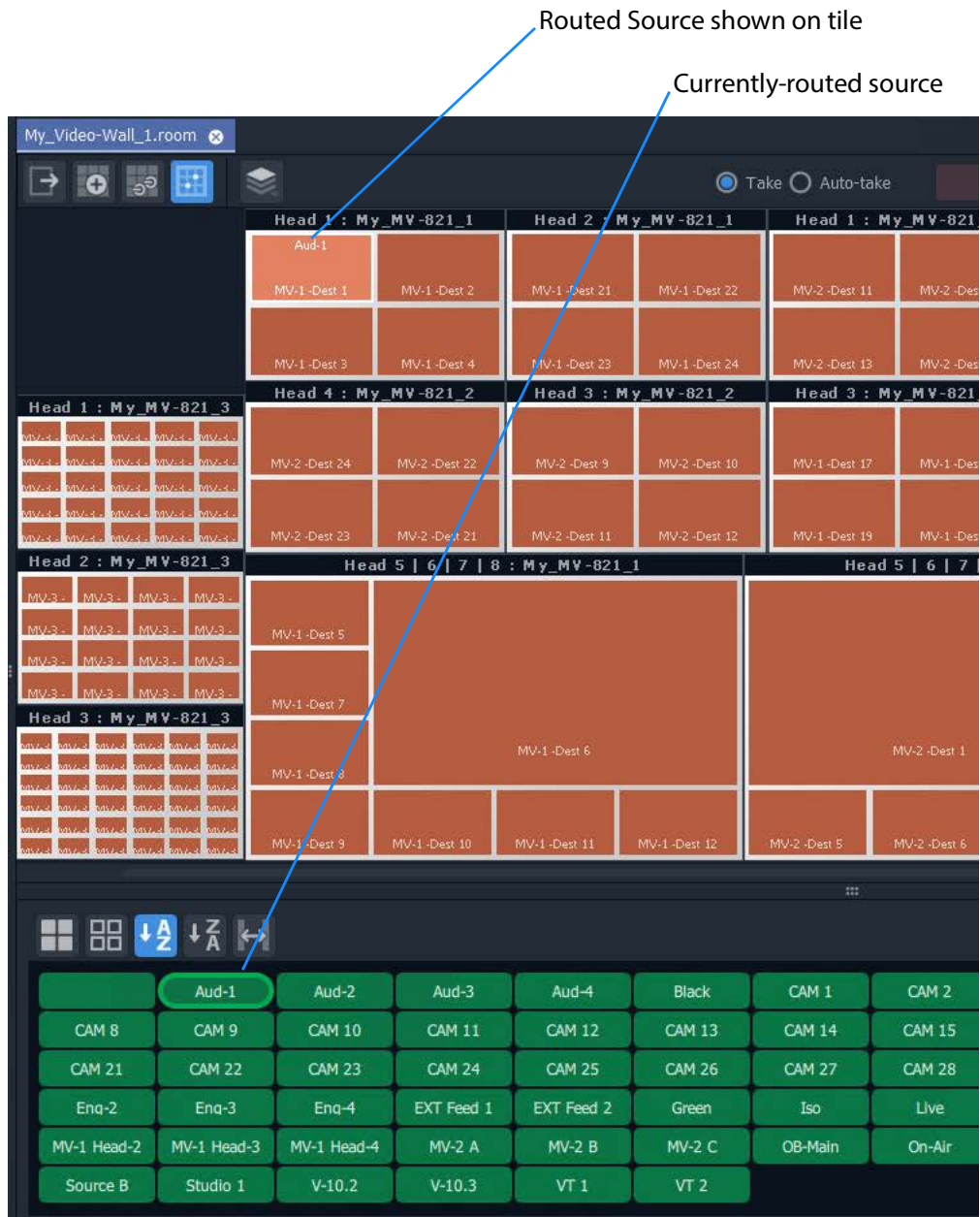
Fig. 15-79: Routed Result

Route a Source to Multiple Tile Positions

To route router sources to a video wall, in the **Project** window:

1 Select a tile position.

2 Select further positions with:

- SHIFT-select a range of tile positions; and/or
- CTRL-select to add positions to the selection.

3 Select a router (video) source in the sources grid.

4 Click **Take**.

The routes are made.

Route Multiple Sources to Multiple Tile Positions

To route router sources to a video wall, in the **Project** window:

1 Select a tile position.

2 Select further tile positions with:

- SHIFT-select a range of positions; and/or
- CTRL-select to add positions to the selection.

3 Select a router (video) source in the sources grid.

4 Select further sources with:

- SHIFT-select a range of sources; and/or
- CTRL-select to add sources to the selection.

5 Click **Take**.

The routes are made.

Routing with Dynamic Destination Assignment

If dynamic destination assignment is operating, routing is performed in the same way as before. See Procedure for 'X/Y Routing' to a Video Wall Tile Position, on page 746, etc.

When using dynamic destinations, a live connection (through the MVCMS service) to an MV unit is required, otherwise the tiles will show up without any destinations assigned to them.

Quick Dial Source Routing on the X/Y Routing Screen

Dial Source routing speeds up the selection of a source for routing to a tile.

In **X/Y Routing** mode:

1 Select a tile on a monitor using the mouse.

> **Note:** Navigation:
> - To navigate between tiles on the selected monitor, use the left- and right-arrow cursor keys.
> - To select a different monitor, use the mouse.

2   With a tile selected,
    start typing a source name.

    A filtered list of sources pops up.
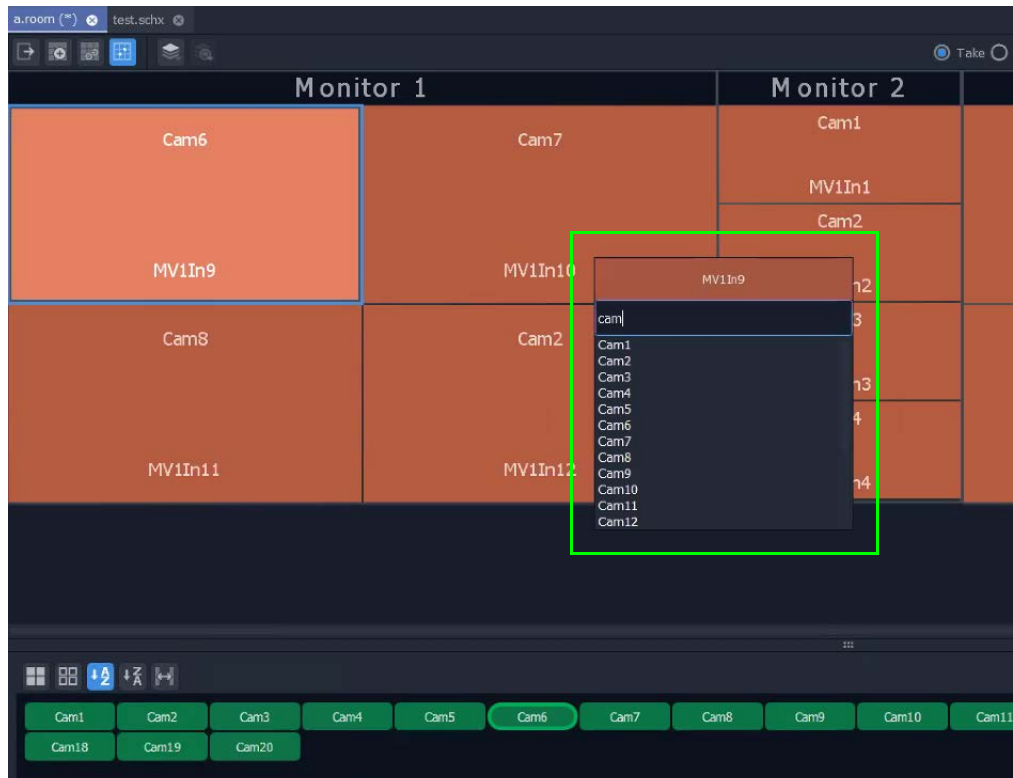
Fig. 15-80: Pop-Up Filtered Sources List

Continue to type in the source name. While characters are entered, source names matching the entered characters are displayed in the pop-up list.

3   To pre-select a source to be routed and make the route (see Figure 15-81), either:

    • Use the down- and up-arrow keys to highlight the required source in the filtered list (thus pre-selecting the source).
      And then press the Enter key to route the pre-selected source to the selected tile.

    or:

    • Click on the required source in the filtered list to select it and make the route.
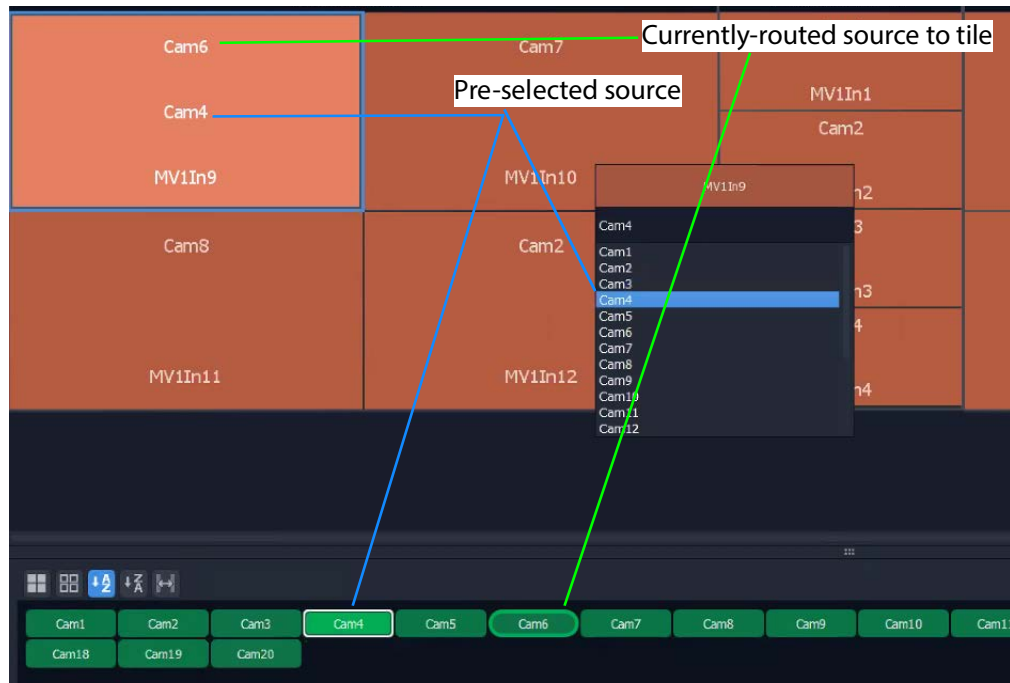
Fig. 15-81: Select Source

The route is made. See Figure 15-82.

Fig. 15-82: Pre-Selected Source is Routed to the Selected Tile

Step 5b: Change Layouts in X/Y Routing Mode

X/Y Routing mode has a live connection to the multiviewer cluster (via the MVCMS service) and the stage area shows the video wall layout of the multiviewer devices.
The mode offers the facility to change **Room Layouts** (see What is a Monitor Layout?, on page 680) and **Monitor Layouts** (see What is a Monitor Layout?, on page 680).

In this section:

- Select a Room Layout in X/Y Routing Mode
- Select a Monitor Layout in X/Y Routing Mode
- New Layouts:
    - Select a New Current Video Wall Layout
    - X/Y Routing Mode Video Wall Layout vs Room Layout
    - Saving a New Video Wall Layout as a Room Layout

> **Note:** The live selection of **Room** or **Monitor Layouts** is only possible in the **X/Y Routing** screen of the **Room Editor**. This is not available in other **Room Editor** modes.

Select a Room Layout in X/Y Routing Mode

If there is more than one **Room Layout**, then a different **Room Layout** may be selected in the **X/Y Routing** mode of the **Room Editor**. This will also change the layout on the physical video wall. Sources may then be routed to this layout, as required.

In **X/Y Routing** mode in the **Room Editor**, to select a **Room Layout**:

1   With no monitor selected,
     click on the **Room Layout** icon and select a different layout to show.

     The **Room Editor** screen shows the selected layout and commands are sent to the live video monitor wall to change layouts. The selected **Room Layout** is then shown on the monitor wall.
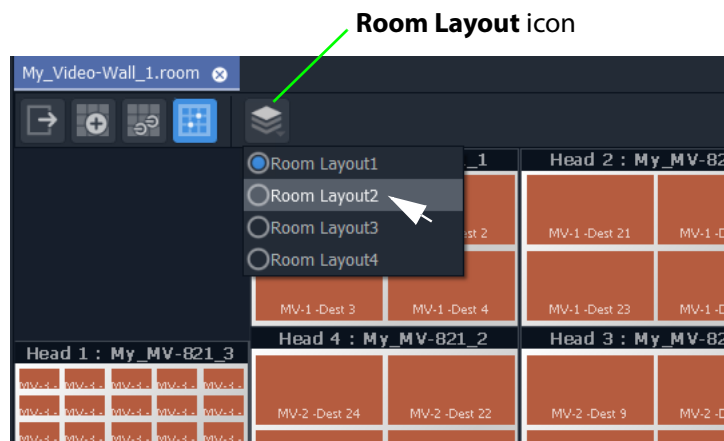
Fig. 15-83: Select an Alternate Room Layout in X/Y Routing mode in Room Editor

Note: Tile positions in this newly-selected monitor's layout require more routed sources
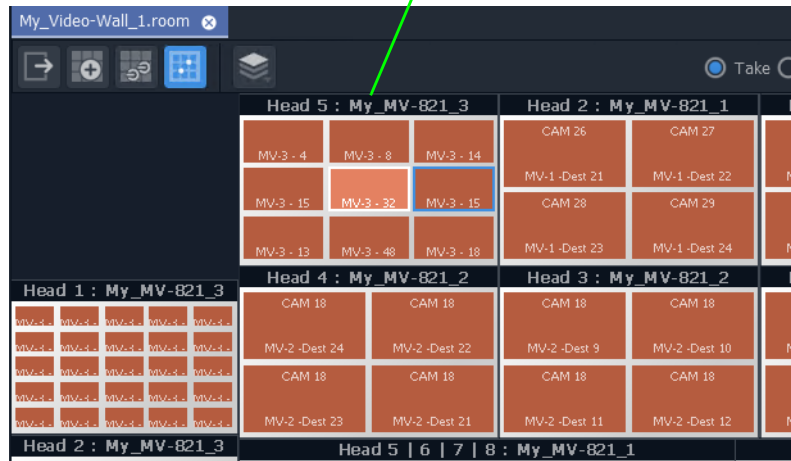
Fig. 15-84: Newly-Selected Room Layout

Select a Monitor Layout in X/Y Routing Mode

If there is more than one **Monitor Layout** for a monitor, then a different **Monitor Layout** may be selected in the **X/Y Routing** mode of the **Room Editor**. This will change the layout on the physical video wall also.

In **X/Y Routing** mode in the **Room Editor**, to select a new **Monitor Layout**:

1 Select a monitor in the **X/Y Routing** screen stage area. (See Figure 15-85.)

Select a monitor in the stage area.

Monitor Layout icon

Select a Monitor Layout.
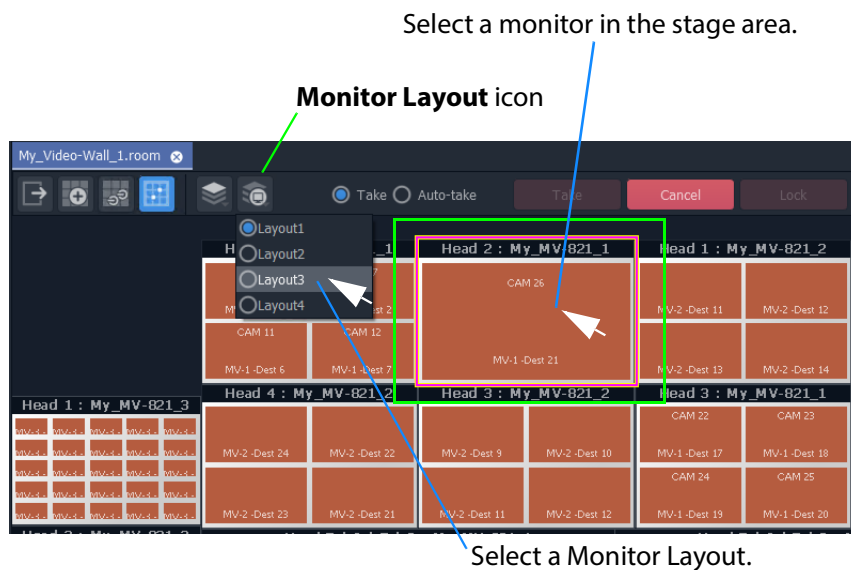
Fig. 15-85: Select Alternate Monitor Layout

2 Click on the **Monitor Layout** icon in the **Room Editor** tool bar and select the required **Monitor Layout** to show. (See Figure 15-85.)

The **Room Editor** screen shows the selected layout and commands are sent to the live video monitor wall to change layouts. The selected **Monitor Layout** is then shown on the monitor wall. (See Figure 15-86.)
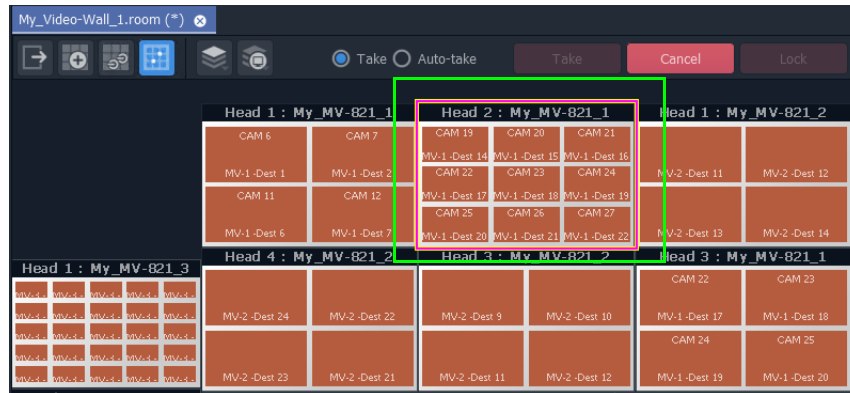
Fig. 15-86: Selected Alternate Monitor Layout Shown

Layout Change in Dynamic Destination Assignment Mode

Layout changes are made in the same way when **Dynamic Destination Assignment** is active.

If a layout change results in not enough multiviewer destinations being available to meet the layout's needs, then this is indicated in the X/Y Routing mode screen in GV Orbit Client and on the video wall with one or more 50%-transparent blue tiles in GV Orbit Client. See Figure 15-87. The actual video wall will show a black tile area.
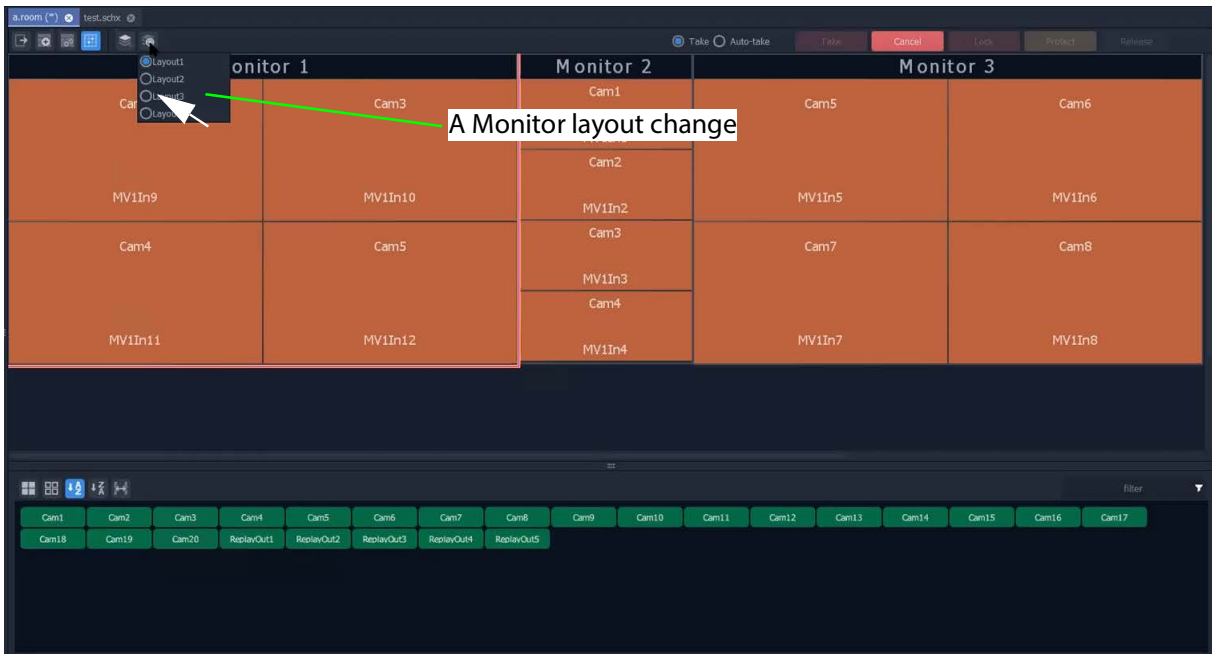
a) Selecting another Monitor Layout

Blue coloration to tile indicates that the current overall on-screen layout requires more multiviewer destination than are currently available from the multiviewer.

A pop-up message reinforces this, explaining that the number of destinations has been exceeded.
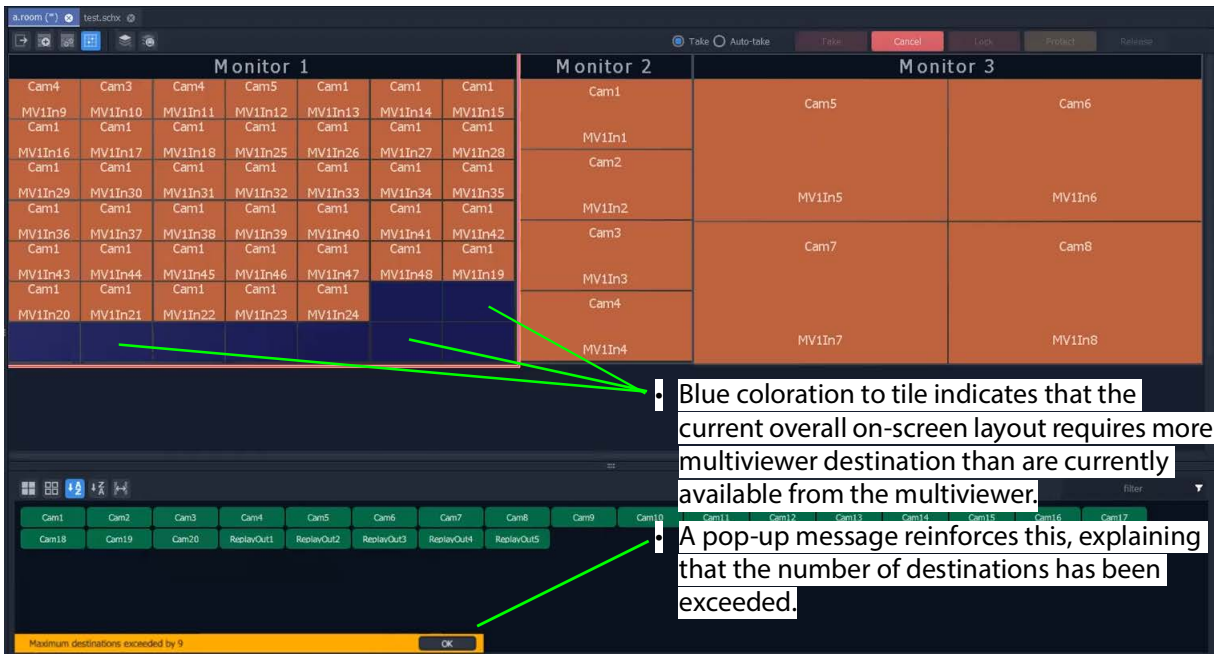
b) New Monitor Layout Shows there are not enough free multiviewer destinations

Fig. 15-87: New Layout and Not Enough Free Multiviewer Destinations

New Layouts

Room Layouts and **Monitor Layouts** can be selected when in **X/Y Routing** mode and the video wall changes accordingly. (See Select a Room Layout in X/Y Routing Mode, on page 751, and Select a Monitor Layout in X/Y Routing Mode, on page 752.)

A video wall layout can be adjusted 'on the fly' in the **X/Y Routing** mode of the **Room Editor**.

Select a New Current Video Wall Layout

With a **Room Layout** selected and displayed:

1 Select an alternate **Monitor Layout** for a monitor, in order to change the on-screen video wall layout.

The resulting new overall video wall layout is shown.

X/Y Routing Mode Video Wall Layout vs Room Layout

The displayed video wall layout is a combination of **Monitor Layouts** which may, or may not, correspond to an already-saved **Room Layout** in the 'Clustered Multiviewer' project. If the **Monitor Layout** combination:

- **Does Correspond to a Room Layout**:

  GV Orbit recognizes this and automatically selects the corresponding **Room Layout**.

- **Does NOT correspond to a Room Layout**:

  GV Orbit detects this and automatically creates a new, '**Untitled***' item in the **Room Layout** drop-down menu (see Figure 15-88), which may be saved and renamed as required, see Saving a New Video Wall Layout as a Room Layout.

Room Layout icon   Monitor Layout icon

New item in Room Layout drop-down menu, '**Untitled***'
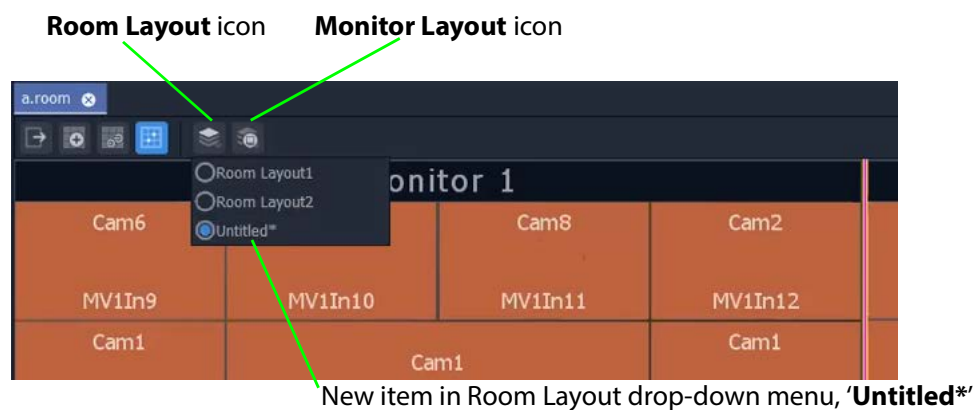
Fig. 15-88: 'Untitled*' Room Layout

Saving a New Video Wall Layout as a Room Layout

To save a 'Untitled*' video wall layout as a Room Layout, with the layout displayed in the stage area:

1 Click the **Design Layout** icon in the **Room Editor** to leave the **X/Y Routing** mode.

A **Room Layout Changes** dialog asks you if you want to save the layout as a new **Room**

Layout.
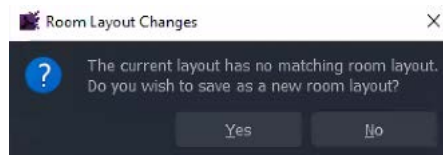
Fig. 15-89: Room Layout Changes Dialog

2   Click **Yes**.

You are asked and which **Room Layout** name to use.
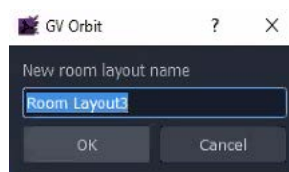
Fig. 15-90: New Room Layout Name Dialog

3   Enter a new name and click **OK**.

> **Note:**   If the X/Y routing mode screen is returned to in GV Orbit Client, then the X/Y Routing stage will reflect the current video wall layout of the multiviewer devices.

MV Cluster - TSL Tally Configuration

Introduction

Lite	Professional	Enterprise
	●	●

TSL tally configuration is integrated and centralized for a 'Clustered MV' project. Configuration is done on a *per **Room*** basis and the whole video wall inherits the Tally configuration. This provides the basic Tally settings for the video wall's graphical, on-screen widgets to use to display Tally status. (For example, a Tally Lamp, Label, or Shape.)

TSL tally protocols supported:

- **TSL 3.1** - Basic industry tally standard protocol over UDP.
- **TSL 5.0** - Advance industry tally protocol over UDP or TCP.

In GV Orbit Client, TSL tally configuration is carried out from the **Room Editor**'s **Destination Assignment** mode. Tally configuration includes:

- Selecting TSL protocol to use.
- Optionally customizing Tally names, Tally address level names, and on-screen Tally colors.
- Mapping of TSL addresses and video wall video tiles (multiviewer device logical inputs and their assigned router destinations).

When TSL tally configuration is done, 'tally-indicating' graphical widgets in video wall tiles can be configured. This then determines which TSL data packets are indicated by which widgets.

Note: When designing a video wall and using widgets to display Tally status, the Tally configuration provides the basic settings. It is still possible to change local settings on a video wall tile to modify widget behavior and/or appearance on a *tile-by-tile* basis in GV Orbit Client.

Tally Protocols

Up to four Tally addresses supported per multiviewer input (that is up to four address levels).

The TSL protocols are compared in the table below:

Table 16-1: Comparing TSL Protocols

	TSL Protocol	
	TSL 3.1	**TSL 5.0**
Tallies	'Tally 1' to 'Tally 4'	'Left', 'Right', and 'Text'
Tally States	Two states: On, Off	Four states
Number of Tallies per MV-8 Multiviewer Video Wall Tile	16	12
Address Range	0 to 126	0 to 65534
IP data packet protocol used	UDP	UDP or TCP

Tally Configuration in Room Editor

TSL Tally settings for a **Room** are configured in a **Destination Configuration** tab which is found in the **Destination Assignment** mode of the **Room Editor**.

> Note: The **Destination Assignments** should be all completed in the **Room Editor** before for the Tally settings can fully function and map to video wall tiles etc.
> (For **Destination Assignment** steps, see Chapter 15 Step 4a: Assign Destinations to Tile Positions, on page 722.)

Open Destination Configuration Tab

1 Open the **Room** file in the **Room Editor** and select the **Assign Destinations** icon in the **Room Editor** tool bar.
(Refer to Chapter 15, Step 4a: Assign Destinations to Tile Positions, on page 722 for full instructions.)

The **Room Design** is shown in its **Assign Destinations** mode. See Figure 16-1.

Selected **Assign Destinations** icon

Click on **Configure Mapping** icon

Room Editor tool bar
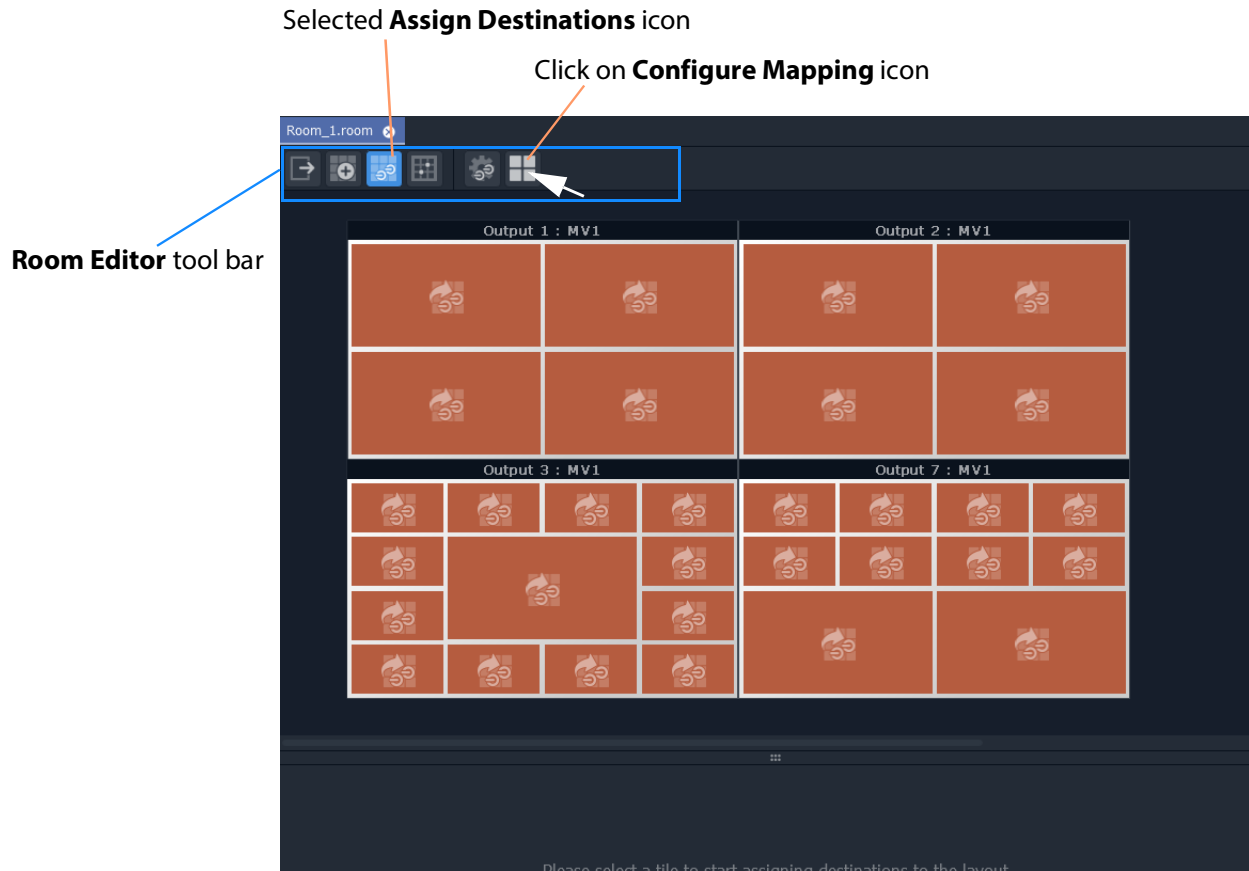
Fig. 16-1: Assign Destinations Mode in Room Editor

2 Click on the **Configure Mapping** icon in the **Room Editor** tool bar.

A **Destination Configuration** tab is opened. See Figure 16-2.

Destination Configuration Tab

TSL button

TSL Tally Levels Config columns
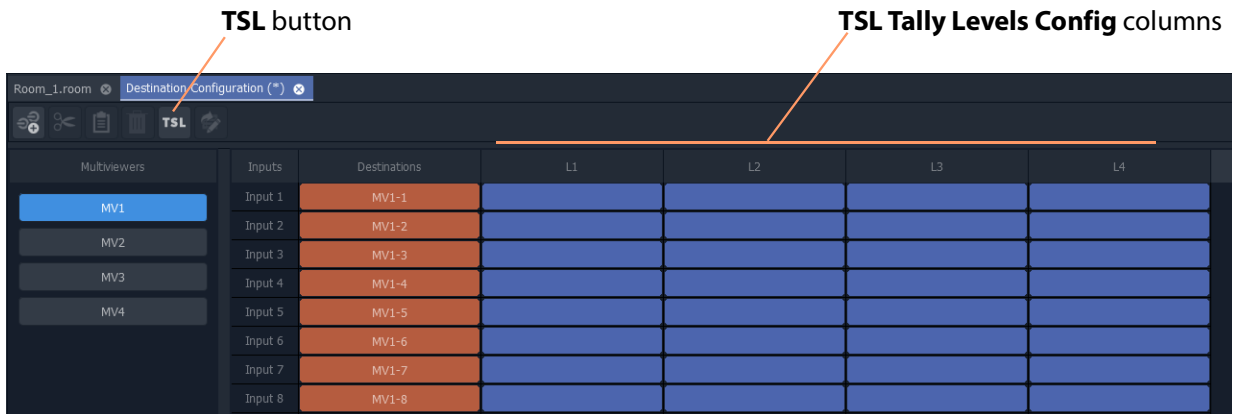
Fig. 16-2: Destination Configuration Tab - TSL Tally Levels Config Columns

Following a **Destination Assignment** step in video wall design, the 'Destinations' column is filled out and multiviewer inputs are mapped to video wall tiles. See Chapter 15, Step 4a: Assign Destinations to Tile Positions, on page 722.

'Tally' features of the **Destination Configuration** tab are:

- **TSL Tally Levels Config** columns 'L1' to 'L4':
  - Initially the columns are empty.
  - Assign TSL Tally Addresses to Multiviewer Inputs.
  - Customize TSL Tally Address Level Names by renaming columns, if required.
- **TSL** button in the tool bar. Use the TSL button to:
  - Select TSL 3.1 or 5.0 Tally Protocol; and
  - Customize Tally Names and On-Screen Colors.

Assign TSL Tally Addresses to Multiviewer Inputs

Assign Addresses

TSL Tally addresses can be assigned for each multiviewer input. Up to four addresses may be assigned (that is up to four address 'levels' for a video wall tile).

The **TSL Tally Level** address mapping defaults to being 'empty'. Assign TSL addresses to each multiviewer input. Up to four are allowed per input.

Ranges of TSL addresses can be automatically assigned and manually edited/entered as required.

Auto-Assignment

To automatically assign a range of addresses to **TSL Tally Levels** in the **Destination Configuration** tab screen:

1 Select a multiviewer. (See Figure 16-3.)

To select a contiguous range of TSL addresses to fill out:

2 Click in the first TSL Level table cell of the range.
   And SHIFT-click in the last cell of the range.

   (Further cells may be added to the selection with CTRL-click/SHIFT-click.)

   This selects the TSL addresses to be filled out. See Figure 16-3.

Select a multiviewer   **Auto-Assign TSL Addresses** button
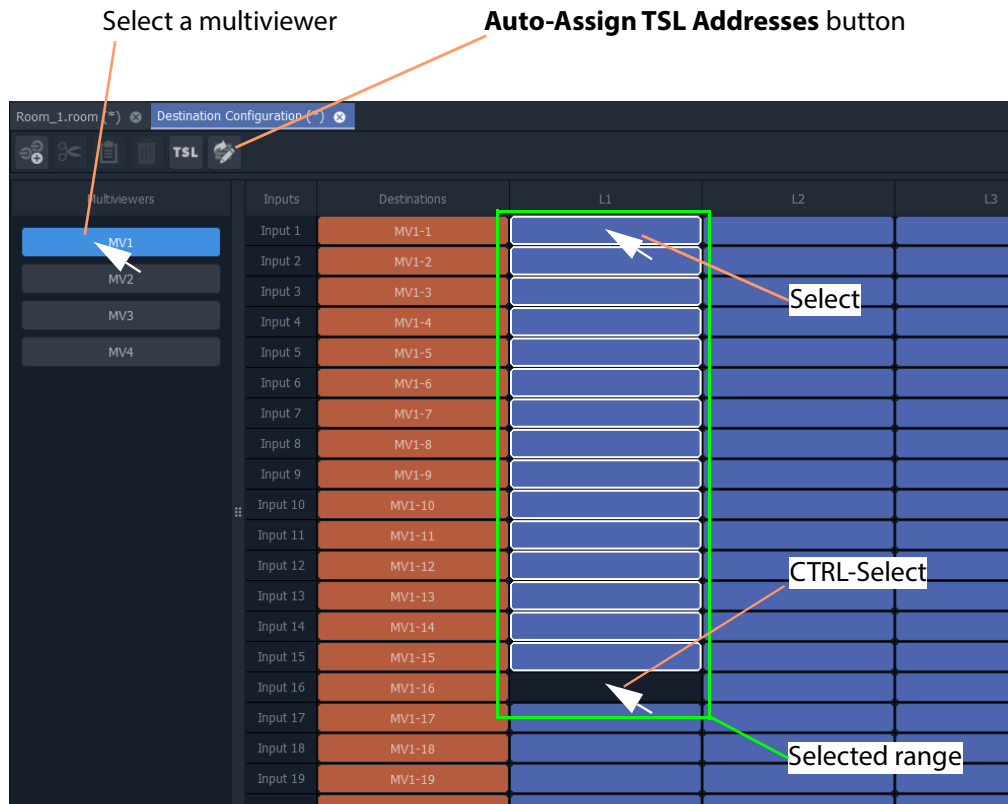
Fig. 16-3: Destination Configuration Tab - TSL Tally Level Config Columns

3 Click on the **Auto-Assign TSL Addresses** button
   and enter a start TSL address in the pop-up dialog. (See Figure 16-4.)

4 Click **OK**.

a) Enter start address to fill from.   b) Filled out TSL addresses.
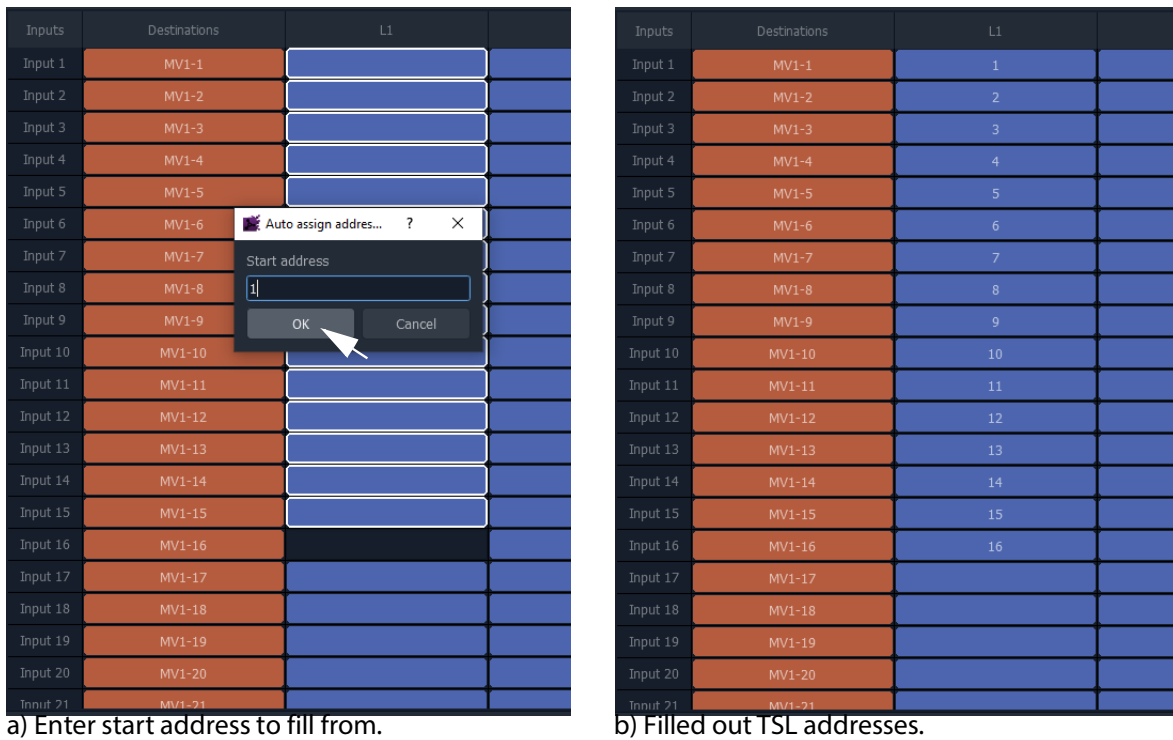
Fig. 16-4: TSL Address Range Filled Out

The selected TSL addresses cells are filled out from the entered start address.

This has quickly assigned some TSL addresses.

5 Repeat this to assign up to four addresses (columns 'L1' to 'L4') per multiviewer input, using the four columns.

Then:

6 Repeat for each multiviewer.

And finally:

7 Click **Save File**.

This has quickly assigned TSL addresses for each multiviewer input.

> Note: Checking and Auto-Assigned TSL Tally Addresses:
> The addresses added during auto-assignment are checked and an error message pops up to alert you that the address is already in use.

It is possible to manually enter addresses or to edit addresses, see Manual Assignment.

Manual Assignment

To assign addresses to **TSL Tally Levels**:

1 Select a multiviewer.

2 Click in a TSL Level column row item and enter a TSL address.

3 Press the Down-arrow key to go on to the next row in the column.
   Enter another address. Etc.

4 Repeat for all multiviewer inputs.

Select multiviewer
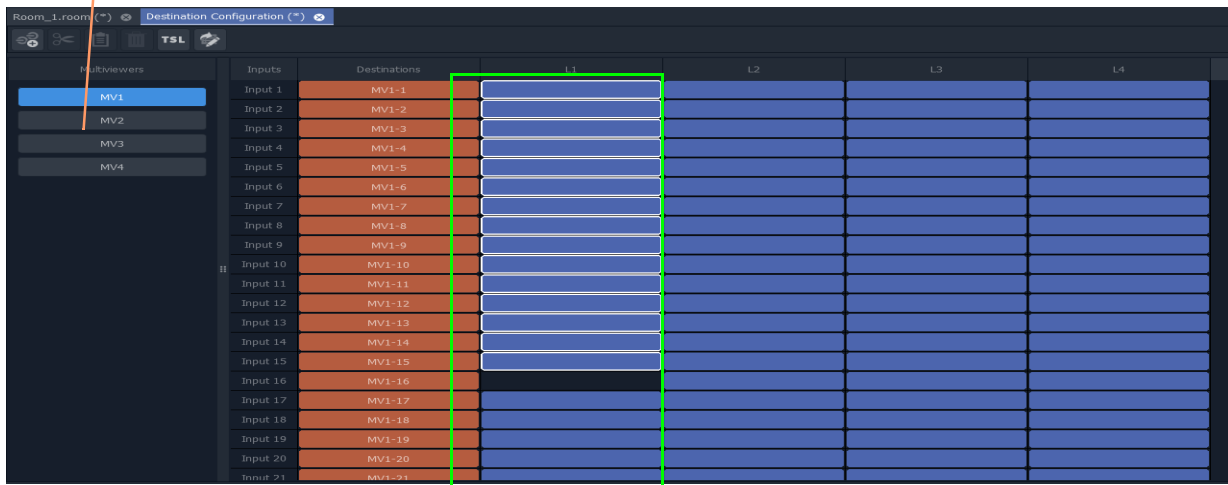
Fig. 16-5: Destination Configuration Tab - TSL Tally Level Config Columns

5 Press Return when done to exit the address level column.

CAUTION	Unlike auto-addressing, there is no check on entered addresses when manually editing the addresses.

Note:	TSL addresses can be duplicated, if required, by using manual entry of TSL addresses.

6

When four addresses (columns 'L1' to 'L4') have been assigned for each multiviewer, finally:

7 Click **Save File**.

This has assigned TSL addresses for each multiviewer input.

Customize TSL Tally Address Level Names

Fig. 16-6: Customized Tally Address Level Names

TSL Tally address level names can be customized, which is useful when assigning Tallies to on-screen Tally indicators such as Tally Lamps or UMDs.

Procedure

To rename a Tally address Level across the whole **Room**:

1 Click on the 'Tally Level' column heading in the **Destination Configuration** tab.

A Header dialog is shown.
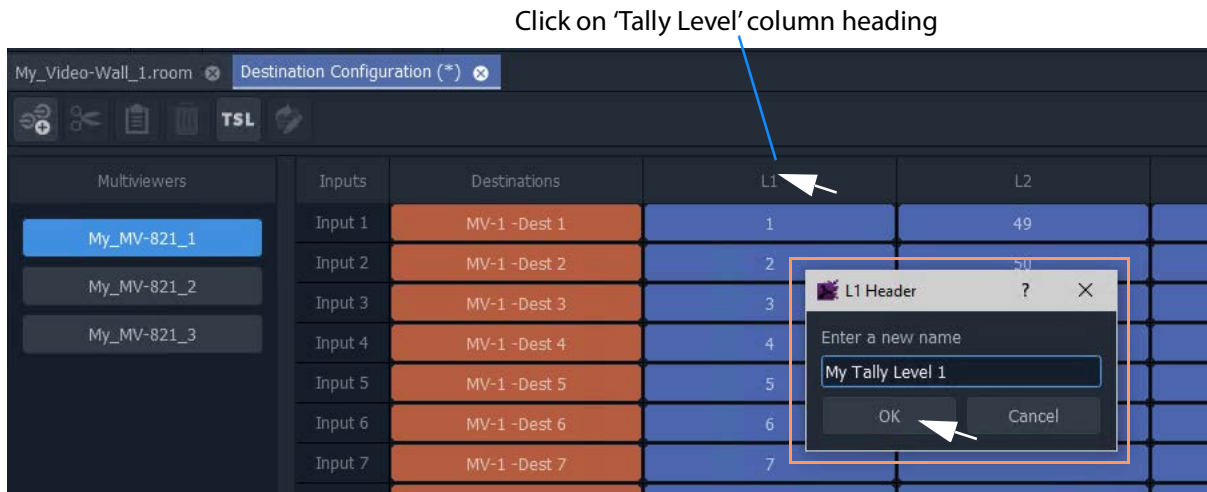
Fig. 16-7: Customize Tally Address Level Name

2 Enter a new name for the address level and click **OK**.

The new address level name is used for the **Room Design** and appears in the column header and persists for all multiviewers used by the **Room**. See Figure 16-8.

Fig. 16-8: New Address Level Name Persists for Other Multiviewers in the Room

3 Click **Save File**.

TSL Tally Configuration for a Room

The TSL tally settings assigned here will be assigned to the video wall tiles for the **Room** and will be available to on-screen, graphical, tally-indicating widgets (such as Lamps, Labels, Shapes, UMDs).

Configuration is done the **Destination Configuration** tab in the **Room Editor**.

Configuration items:

- Select TSL 3.1 or 5.0 Tally Protocol
- Customize Tally Names and On-Screen Colors
    - TSL 3.1 Customizing
    - TSL 5.0 Customizing

Select TSL 3.1 or 5.0 Tally Protocol

To select the TSL Tally protocol to be used in the **Room Design**:

1 Click on **TSL** icon in the **Room Editor** tool bar.
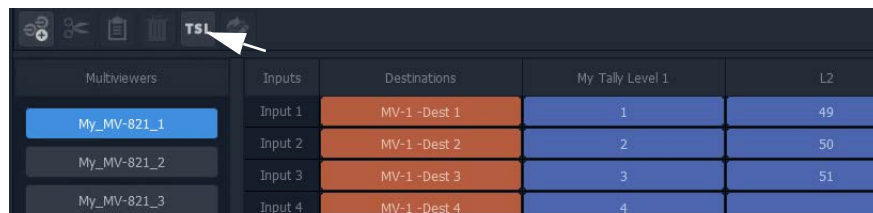
Fig. 16-9: TSL Icon

A **TSL Configuration** dialog is shown.
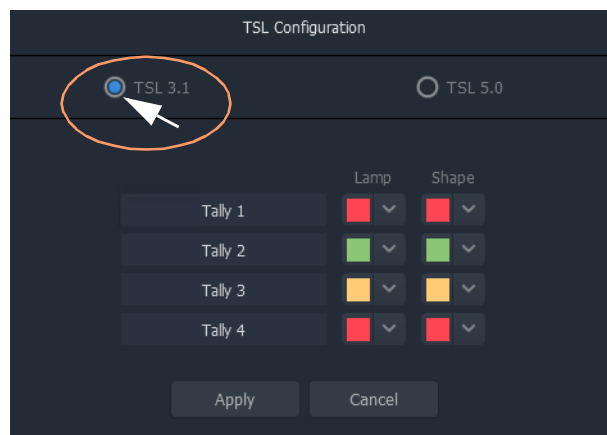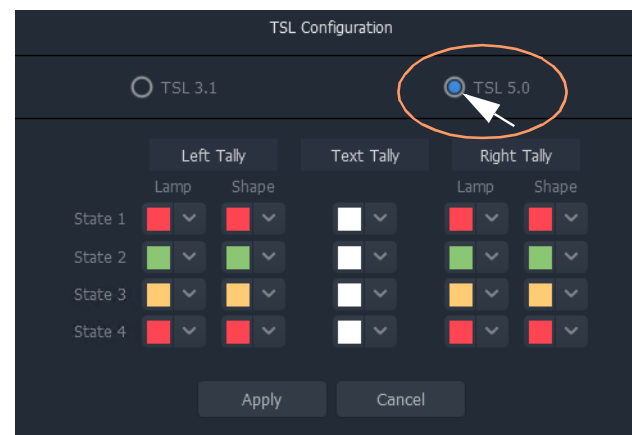
a) TSL 3.1 Dialog   b) TSL 5.0 Dialog

Fig. 16-10: TSL Configuration Dialogs: a) TSL 3.1 Selected;   b) TSL 5.0 Selected.

2 Select **TSL 3.1** or **TSL 5.0**.

3 Click **Apply**.

This has selected the TSL Tally protocol to be used in the **Room**.

Note: **Dynamic selection of Tally protocol on MV-8 multiviewer devices:**
The Tally protocol is usually selected once in a project and then does not change.
The *dynamic* selection of the Tally protocol in a project will be supported in MV-8 multiviewer software version v4 onwards.

CAUTION Typically the TSL Tally protocol is set once.
If, however, the setting is changed between protocols, it is recommended that all the Tally assignments that have been made are re-checked.

TSL Protocols

- **TSL 3.1**

  There are four Tallies (**Tally 1** to **Tally 4**) and each has an associated Tally color.
  There are colors for graphical on-screen Tally Lamp widgets and for Shape widgets.

- **TSL 5.0**

  There are four Tally states (**State 1** to **State 4**) and each has an associated 'Left-Tally', 'Right-Tally', and 'Tally Text'. And, in turn, each has associated on-screen colors.

The protocols are compared in Table 16-1, on page 758.

Customize Tally Names and On-Screen Colors

The names of each tally and the on-screen colors used can be customized in the **TSL Configuration** dialog. A customized Tally name can help to identify it when assigning tallies to on-screen graphical widgets (Tally Lamps etc.) in the video wall design steps.

Customizations:

- TSL 3.1 Tally Name
- TSL 3.1 Tally Lamp Color
- TSL 3.1 Shape Fill Color
- TSL 5.0 Tally Name
- TSL 5.0 Tally Lamp State Color
- TSL 5.0 Shape Fill State Color
- TSL 5.0 Text Tally Font Color

Show TSL Configuration Dialog

To show the **TSL Configuration** dialog:

- Click on the **TSL** icon in the **Room Editor** tool bar.

  The **TSL Configuration** dialog is shown. (See Figure 16-10 on page 765.)

TSL 3.1 Customizing

TSL 3.1 Tally Name

In the TSL 3.1 **TSL Configuration** dialog:

1 Click on a Tally name.

2 Enter a new name and Click **OK**.

   The new tally name is shown.

3 Click **Apply**.
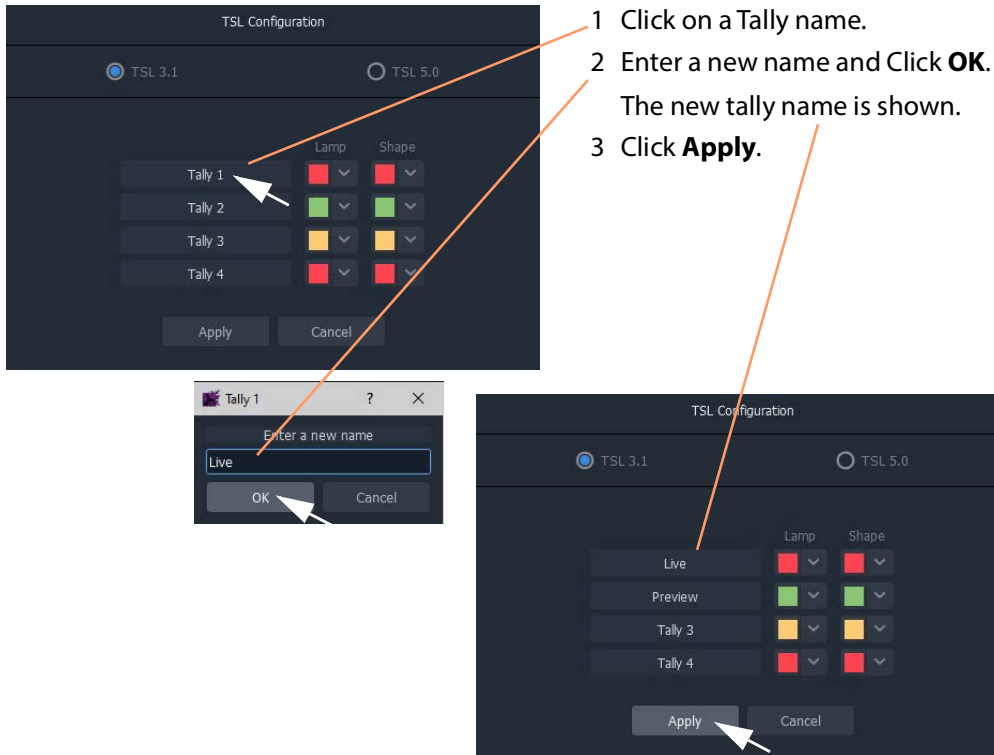
Fig. 16-11: Customize TSL 3.1 Tally Name

TSL 3.1 Tally Lamp Color

Three standard colors are available (🟥 🟩 🟨).

In the TSL 3.1 **TSL Configuration** dialog:

1 Click on a Lamp color.

2 Select a new color.

   The new color is shown.

3 Click **Apply**.
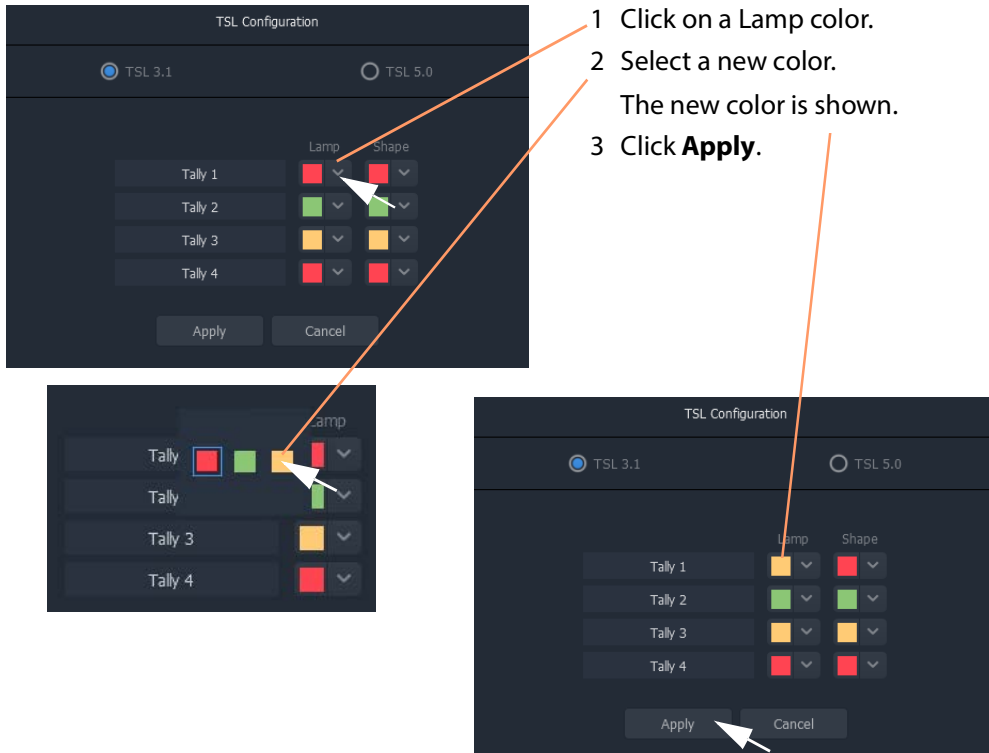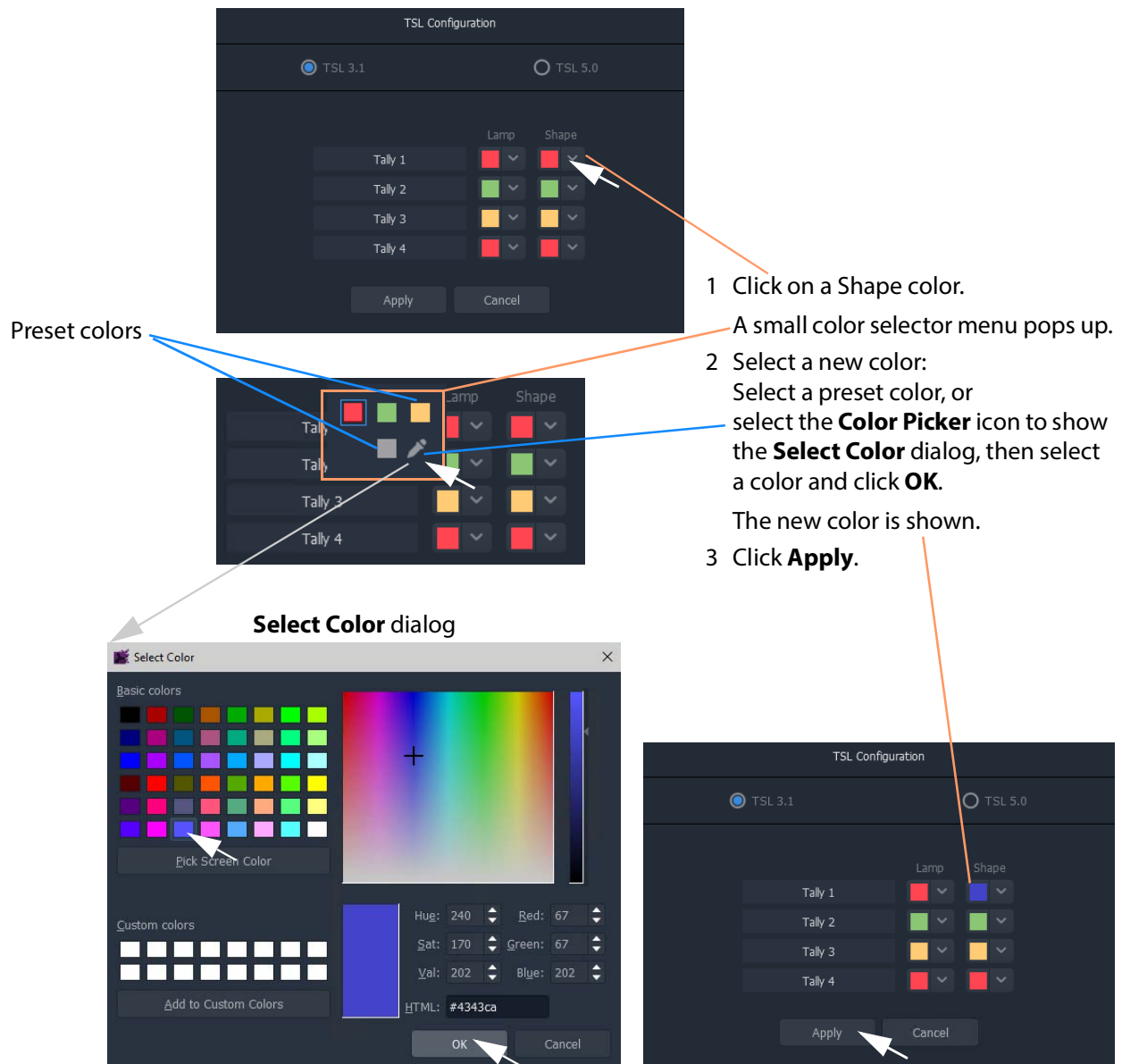
Fig. 16-12: Customize TSL 3.1 Tally Lamp Color

TSL 3.1 Shape Fill Color

For an on-screen shape, four standard colors are available ( ) to be used as the shape fill color. Alternatively, a custom color may be picked to allow custom colors to be used.

In the TSL 3.1 **TSL Configuration** dialog:

Preset colors

Select Color dialog

1 Click on a Shape color.

    A small color selector menu pops up.

2 Select a new color:
    Select a preset color, or
    select the **Color Picker** icon to show the **Select Color** dialog, then select a color and click **OK**.

    The new color is shown.

3 Click **Apply**.

Fig. 16-13: Customize TSL 3.1 Tally Shape Fill Color

TSL 5.0 Customizing

TSL 5.0 Tally Name

(The procedure for TSL 5.0 is similar to TSL 3.1 Tally Name, on page 767.)

In the TSL 5.0 **TSL Configuration** dialog:

1 Click on a Tally name ('Left Tally', or 'Text Tally', or 'Right Tally').

2 Enter a new name and Click **OK**.

   The new name is shown.

3 Click **Apply**.
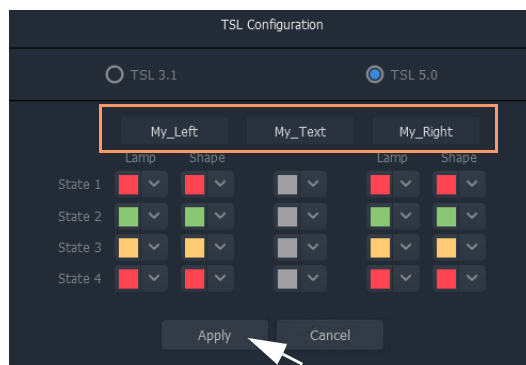
Fig. 16-14: Customized TSL 5.0 Tally Names

TSL 5.0 Tally Lamp State Color

(The procedure for TSL 5.0 is similar to TSL 3.1 Tally Lamp Color, on page 768.)

In the TSL 5.0 **TSL Configuration** dialog:

1 Click on a Lamp state color.

2 Select a new color.

   The new color is shown.

3 Click **Apply**.
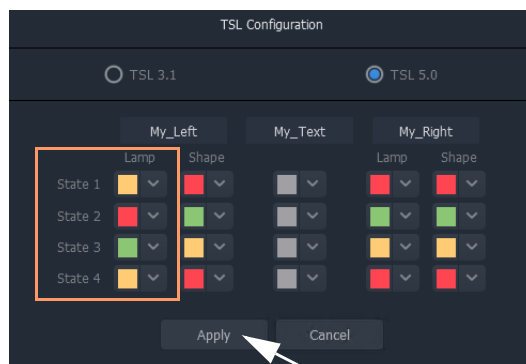
Fig. 16-15: Customizes TSL 5.0 Tally Lamp State Colors

TSL 5.0 Shape Fill State Color

(The procedure for TSL 5.0 is similar to TSL 3.1 Shape Fill Color, on page 769.)

In the TSL 5.0 **TSL Configuration** dialog:

1 Click on a Shape state color.

2 Select a new color to be used for the shape's fill color.

   Or, if the color picker icon is selected, the **Select Color** dialog is shown. Select a color and click **OK**.

   The new color is shown.

3 Click **Apply**.
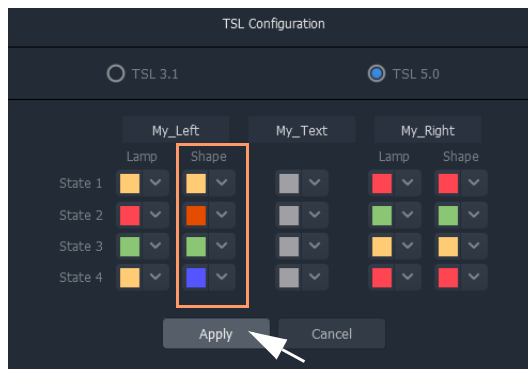
Fig. 16-16: Customized TSL 5.0 Tally Shape State Colors

TSL 5.0 Text Tally Font Color

(The procedure for TSL 5.0 is similar to TSL 3.1 Shape Fill Color, on page 769.)

In the TSL 5.0 **TSL Configuration** dialog:

1 Click on a Text Tally state color.

2 Select a new color.

   Or, if the color picker icon is selected, the **Select Color** dialog is shown. Select a color and click **OK**.

   The new color is shown.

3 Click **Apply**.
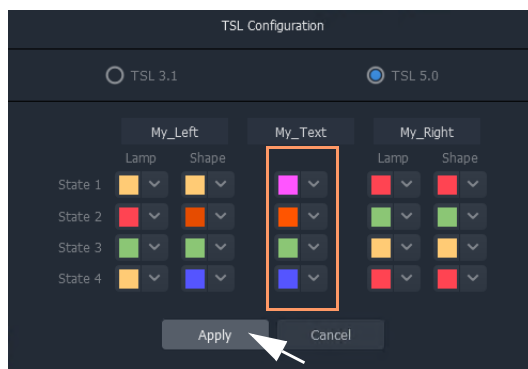
Fig. 16-17: Customized TSL 5.0 Text Tally Font Colors

Configuring On-Screen Widgets

With each multiviewer input configured for TSL Tallies, graphical widgets on video tiles can be configured. The widget editing is done when editing a **Custom Tile** in the **Tile Editor**.

> Note: Typically for a video wall, a few particular 'template' video tile designs are used throughout. In GV Orbit Client, you can design custom video tiles for use on video walls (**Custom Tiles**).

Open a Custom Tile in the Tile Editor

Open an Existing Custom Tile:

To open a **Custom Tile** in the **Tile Editor**:

Either:

- Expand the project in the **Project** window and in the 'Tiles' folder, double-click on the Custom Tile name. The tile is opened in the editor.

Or:

- Open the video wall double-click on the **Custom Tile**. The tile is opened in the editor.

Create a New Custom Tile

New Empty Custom Tile

A **Custom Tile** may be created from scratch, if required:

- Expand the project in the **Project** window and right-click on the 'Tiles' folder and select 'New'. Then select the tile type. A new tile is opened in the editor.

Quick Custom Tile

Alternatively, a new Custom Tile can be created quickly from an existing video auto-tile by double-clicking on a video tile to copy it and open it in the **Tile Editor**.

To quickly create a new **Custom Tile**:

1 Double-click on a video tile in the video wall.

The **Create Custom Tile** dialog is shown.
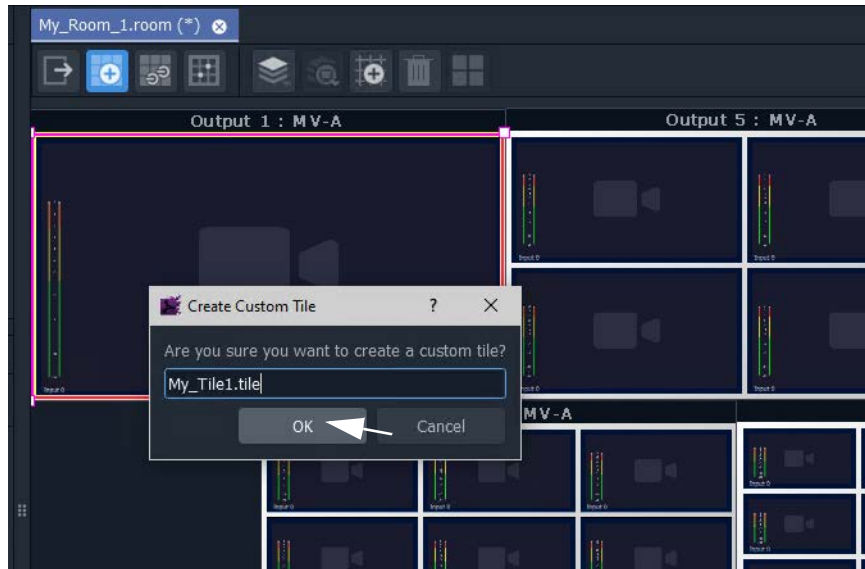
Fig. 16-18: Create Custom Tile

2 Enter a name for the **Custom Tile** and click **OK**.

The selected tile is copied and opened in the **Tile Editor**. See Figure 16-19.

Custom Tile tab

Widget palette
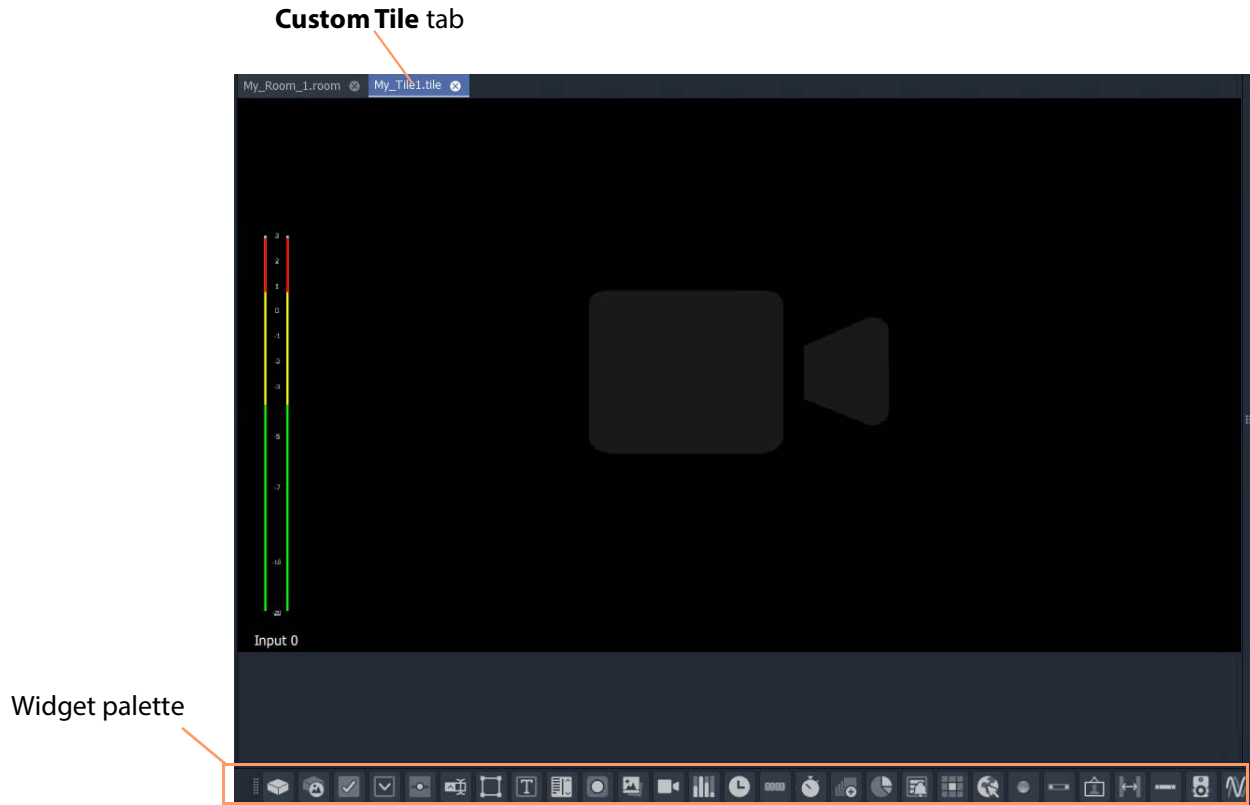
Fig. 16-19: Custom Tile in Tile Editor

TSL Tally Configuring Widgets

Certain graphical widgets can be used on video wall tiles to display Tally information. The TSL Tally configuration of a widget comprises specifying what Tally data is to drive the widget. Widgets include:

- Tally Lamp Widget
- Label Widget (Font Color)
- Shape Widget (Fill Color)

Tally Lamp Widget

Open a **Custom Tile** in the **Tile Editor**.

If a Tally Lamp widget needs to be added, then:

1 Click on the **Tally Lamp** icon in the **Widget Palette** and drop on a **Tally Lamp** widget. repeat for a second one if required. See Figure 16-20.

Drop widget onto tile stage area.

Click on **Tally Lamp** widget icon in the Widget palette, then drop a widget onto the Tile stage area.
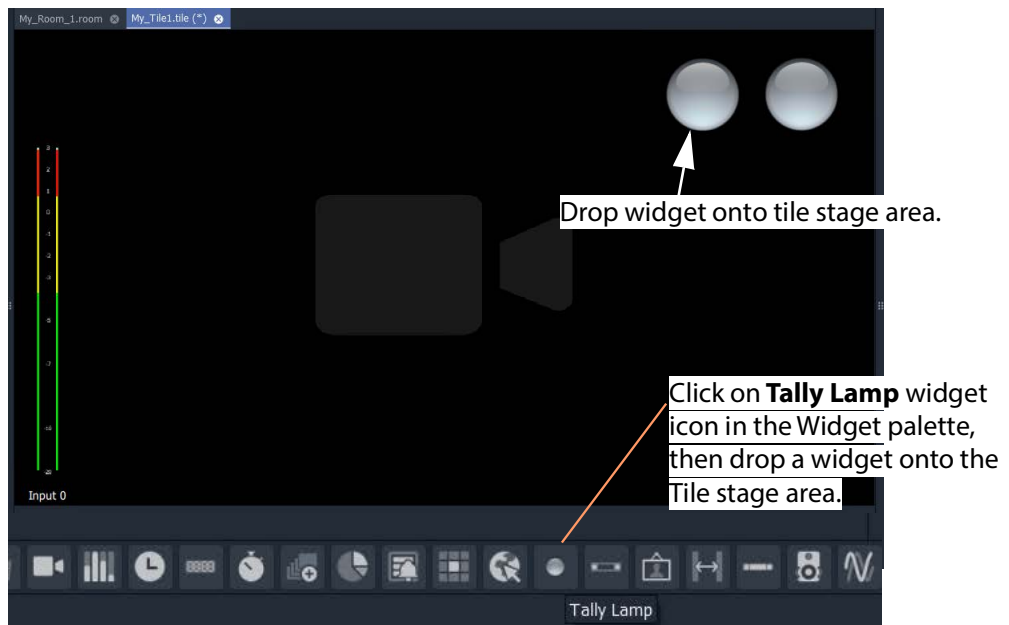
Fig. 16-20: Added Tally Lamp Widget(s)

Configure the widget tallies:

2 Right-click on a Tally Lamp widget and select 'Tally Configuration'.

A **Tally Configuration** dialog is shown, either for TSL 3.1 (see Figure 16-21a) or for TSL 5.0 (see Figure 16-21b).
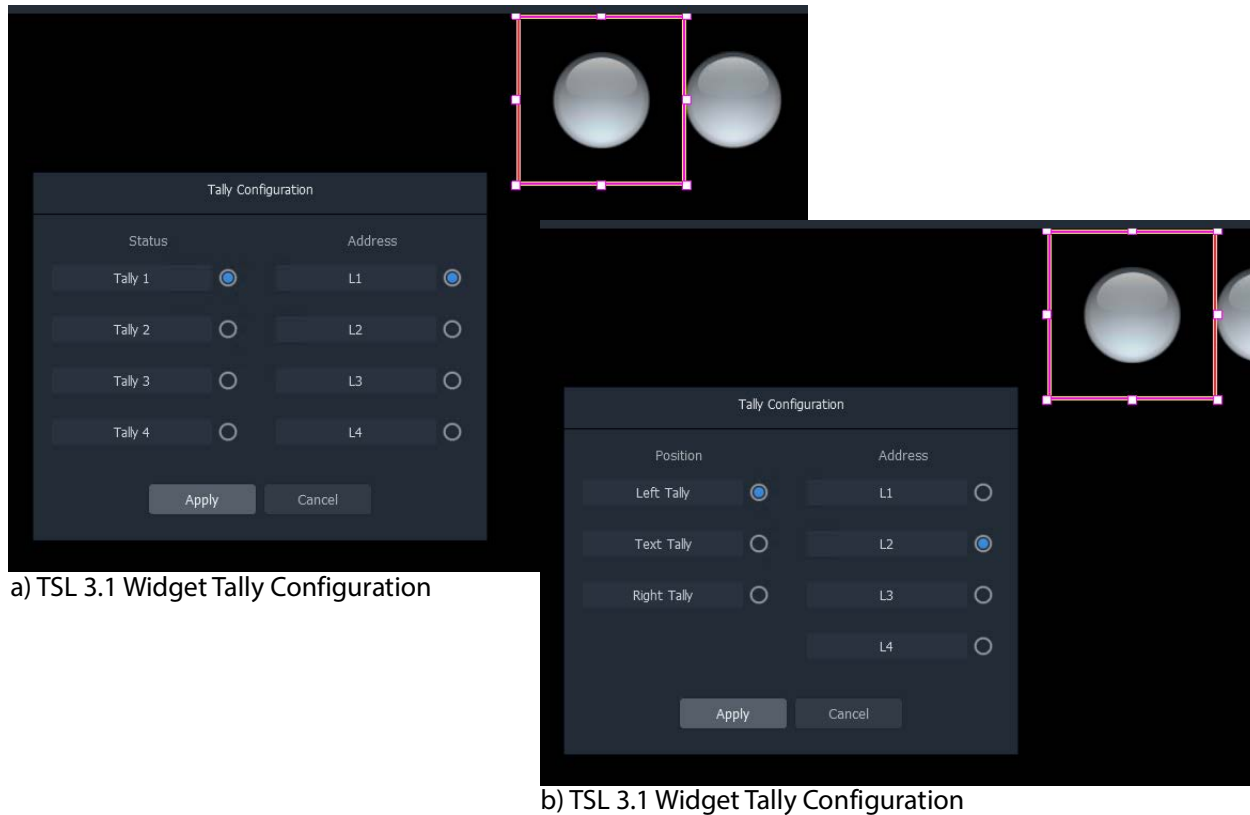
a) TSL 3.1 Widget Tally Configuration

b) TSL 3.1 Widget Tally Configuration

Fig. 16-21: Tally Lamp Widget Tally Configuration Dialogs: a) TSL 3.1; b) TSL 5.0

3 In the dialog,
   select the Tally Status and Address level, or Tally Position and Address level for the widget
   for TSL 3.1 or 5.0 respectively.

4 Click **Apply**.

This configures the TSL settings for the widget.

• Configure each Tally Lamp widget on the tile.

With the tallies up for the widget in the **Room**, the following will determine which TSL data packet controls the Tally Lamp's color:

• the widget's Tally Configuration setting (above);

• the video tile position on the video wall; and

• the TSL address mapping set up in the **Destination Configuration** tab.

Label Widget (Font Color)

A Label widget can have its font color controlled by TSL messages. The widget tally configuration is done in a similar way to the Tally Lamp Widget.

Fig. 16-22: Label Widget

Shape Widget (Fill Color)

A Shape widget (for example, a Rectangle) can have its fill color controlled by TSL messages. The widget tally configuration is also done in a similar way to the Tally Lamp Widget.

Tally Lamp widget

Label widget

Rectangle shape widget.
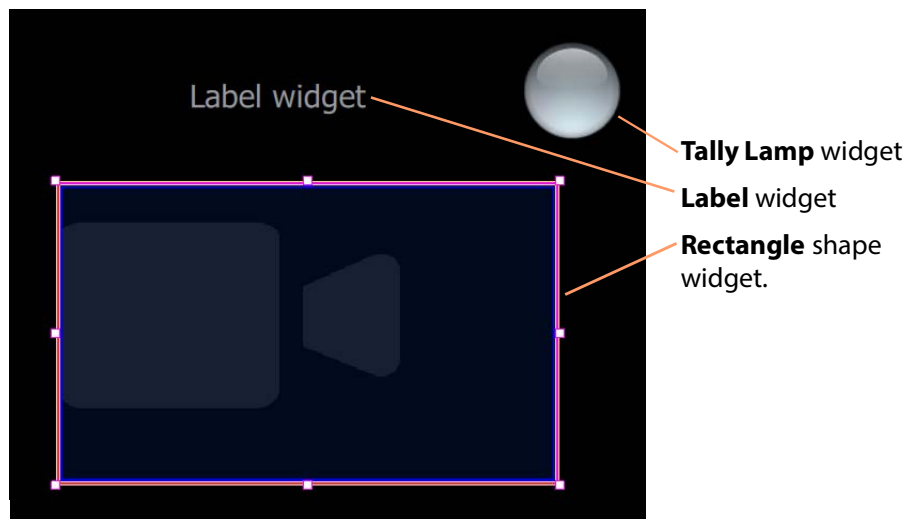
Fig. 16-23: Shape Widget

Tally Border Video Tile Example

This example forms a video tile with a customizable colored border which is bound to a TSL tally message.

Assumptions

- A **Room** has been created.
- Monitors have been arranged to form a video wall.
- Monitors have been assigned to multiviewer outputs.
- A layout has been designed for the video wall.
- Destinations have been assigned to multiviewer inputs and to video wall tiles

TSL address mapping has been done in the **Destination Configuration** tab in the **Destination Assignment** mode of the **Room Editor**.

Create a Starter Custom Tile

A custom video tile can be created quickly to start with in GV Orbit Client:

1 Double-click on a video tile in the video wall.

The **Create Custom Tile** dialog is shown.

2 Enter a name for the **Custom Tile** and click **OK**.

The selected video tile is copied and opened in the **Tile Editor**.
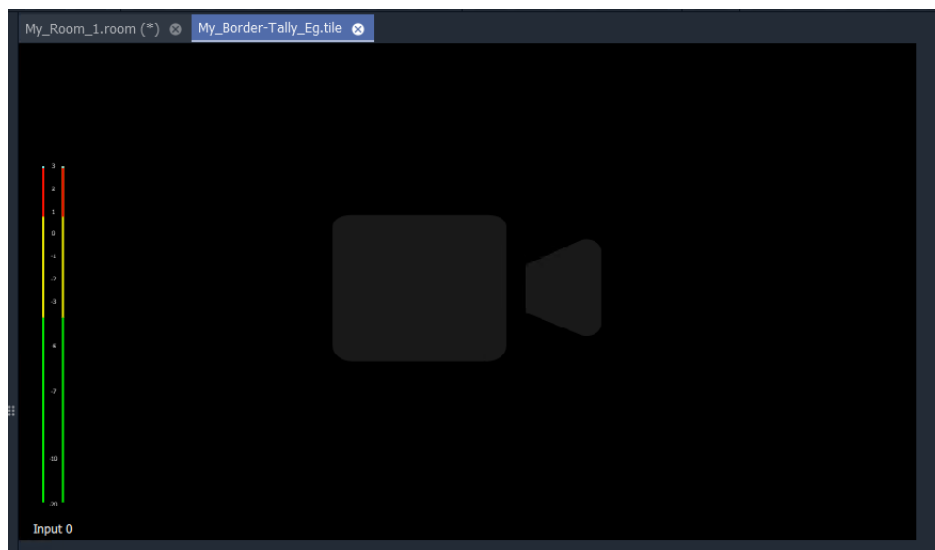
Fig. 16-24: Starter Custom Tile

Tile Size:

3 Click off the Tile but in the **Tile Editor** stage area. See Figure 16-25.

The Tile's **Width** and **Height** are shown in the Properties box.

Click off the Tile, but on the **Tile Editor** stage area.
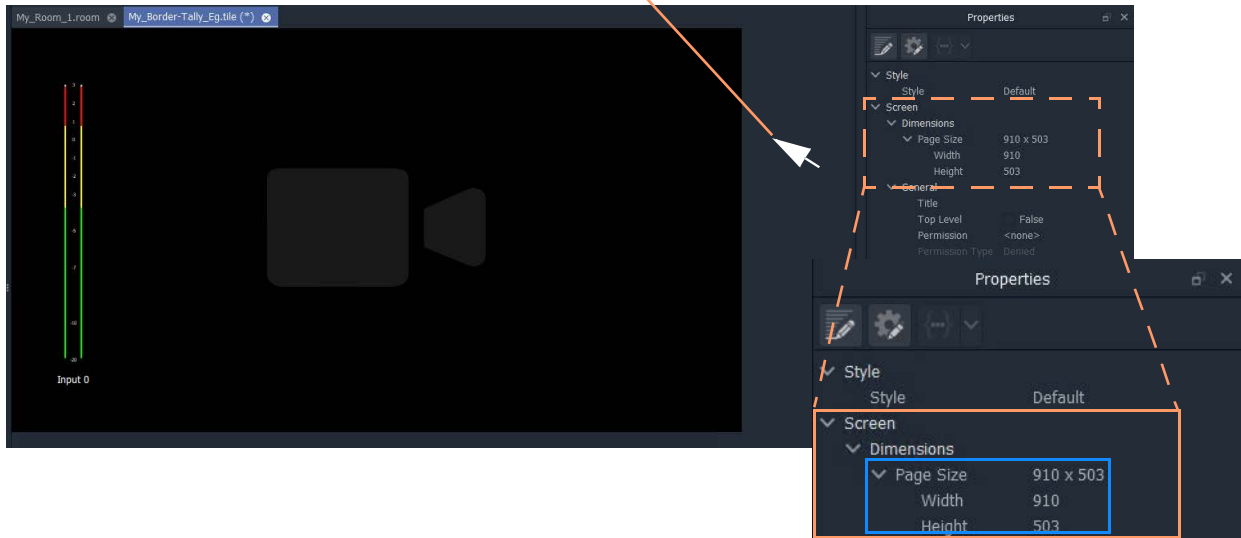
Fig. 16-25: Tile Size in Properties

In the example in Figure 16-25, the **Custom Tile**'s dimensions are:

- width = 910 pixels
- height = 503 pixels.

Add a Border Tally

A border Tally may be added to the **Custom Tile** by:

- slightly resizing the Video widget and centering it on the Tile;
- adding a Rectangle shape widget;
- setting the shape to be the same size as the Tile itself;
- placing the shape behind the Video widget; and
- configuring the TSL settings for the Rectangle shape
(that is, which TSL data packets will drive the shape fill color).

Procedure Example

For this example, to add a 15 pixel wide TSL Tally border:

Resize and re-position Video widget:

1 Select the Video widget.

2 Change the Properties:

- 'Dimensions > Position > X' = 15.
- 'Dimensions > Position > Y' = 15.
- 'Dimensions > Size > Width' = 880.   (880 = 910 - 2x15)
- 'Dimensions > Size > Height' = 473. (473= 503 - 2x15)

This reduces the widget size and centers the widget on the Tile, adding a 15 pixel

margin around the sides.

Video widget resized and centered.
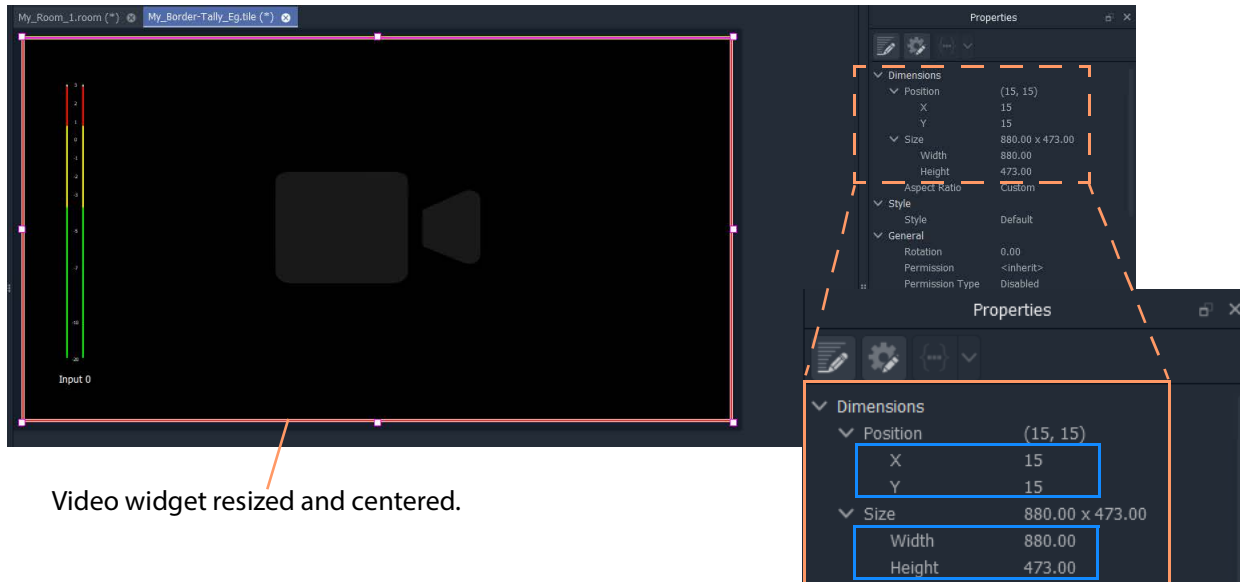
Fig. 16-26: Video Widget Size/Position Properties

Add border shape:

3 Click on the **Rectangle** shape icon in the Widget Palette.

Click **Rectangle** shape widget icon
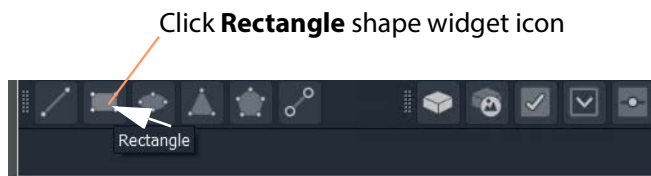
Fig. 16-27: Rectangle Shape Widget Icon in Widget Palette

4 Add a **Rectangle** shape widget to the tile.

5 Select the shape and change its position/size properties:
   - 'Dimensions > Position > X' = 0.
   - 'Dimensions > Position > Y' = 0.
   - 'Dimensions > Size > Width' = 910. (910 is the Tile width.)
   - 'Dimensions > Size > Height' = 503. (503 is the Tile height.)
   - 'Extended Style > Border > Border Thickness' = 0.

6 Right-click on the **Rectangle** shape widget and select 'Tally Configuration'.

7 Set up the widget's Tally settings (so as to control the shape's Fill color).

8 With the shape still selected, click the **Move to Back** icon in the main tool bar.

Click **Move to Back** icon

Fig. 16-28: Move Selected Object to Back

The **Rectangle** shape moves to be behind the Video widget.
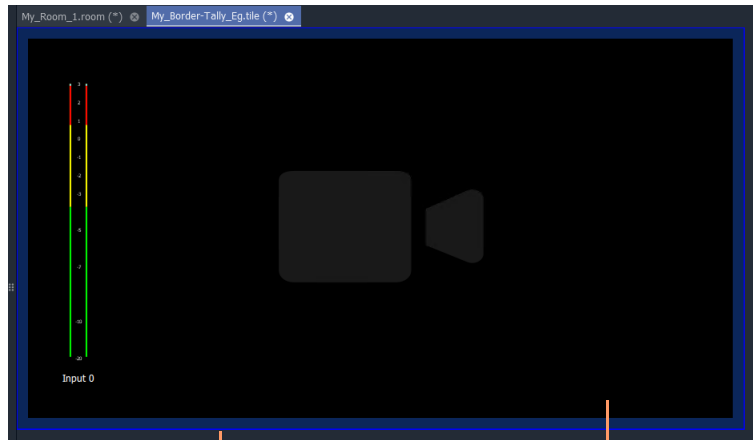
Rectangle shape widget is behind the Video widget

Fig. 16-29: Video Widget Size/Position Properties

  9 Click **Save File**.

Add more Tally widgets:

If required, further tally-indicating widgets may be added:

10 Add two **Tally Lamp**s.

11 Right-click on each widget and set up the widget Tally settings.

12 Add a **Label** widget.

13 Right-click on the widget and set up the widget settings (to control the Label text's font color).

14 Click **Save File**.

The **Custom Tile** has been prepared.

Deploy Tile

The tile may already be present on the video wall in the **Room Design**. In this case, the new **Custom Tile** will be seen in the **Room Editor**. Otherwise, the tile may be added to the **Room**'s video wall in the **Room Editor** in its **Design Layout** mode. (See Chapter 15, Step 3a: Design Layout - Assign Tile Grid Layouts to a Video Wall, on page 704.)

Fig. 16-30: Deployed Custom Tile Example

Audio Bars Configuration

Introduction

Audio meters are implemented on video wall tiles with graphical **Audio Bars** widgets, which require configuring for the audio channels they will monitor.

Widgets are configured from the **Tile Editor** by selecting them and editing their properties in the **Properties** box. For an **Audio Bars** widget on a **Custom Tile**, its audio channel configuration may be set up quickly via a pop-up menu.

> Note: Typically for a video wall, a few particular 'template' video tile designs are used throughout. In GV Orbit Client, you can design custom video tiles for use on video walls (**Custom Tiles**).

Audio Bars Widget Configuration

The **Audio Bars** widget may be set up by selecting the widget in the **Tile Editor** and modifying properties in the **Properties** box. See Figure 17-2.

Selected **Audio Bars** widget
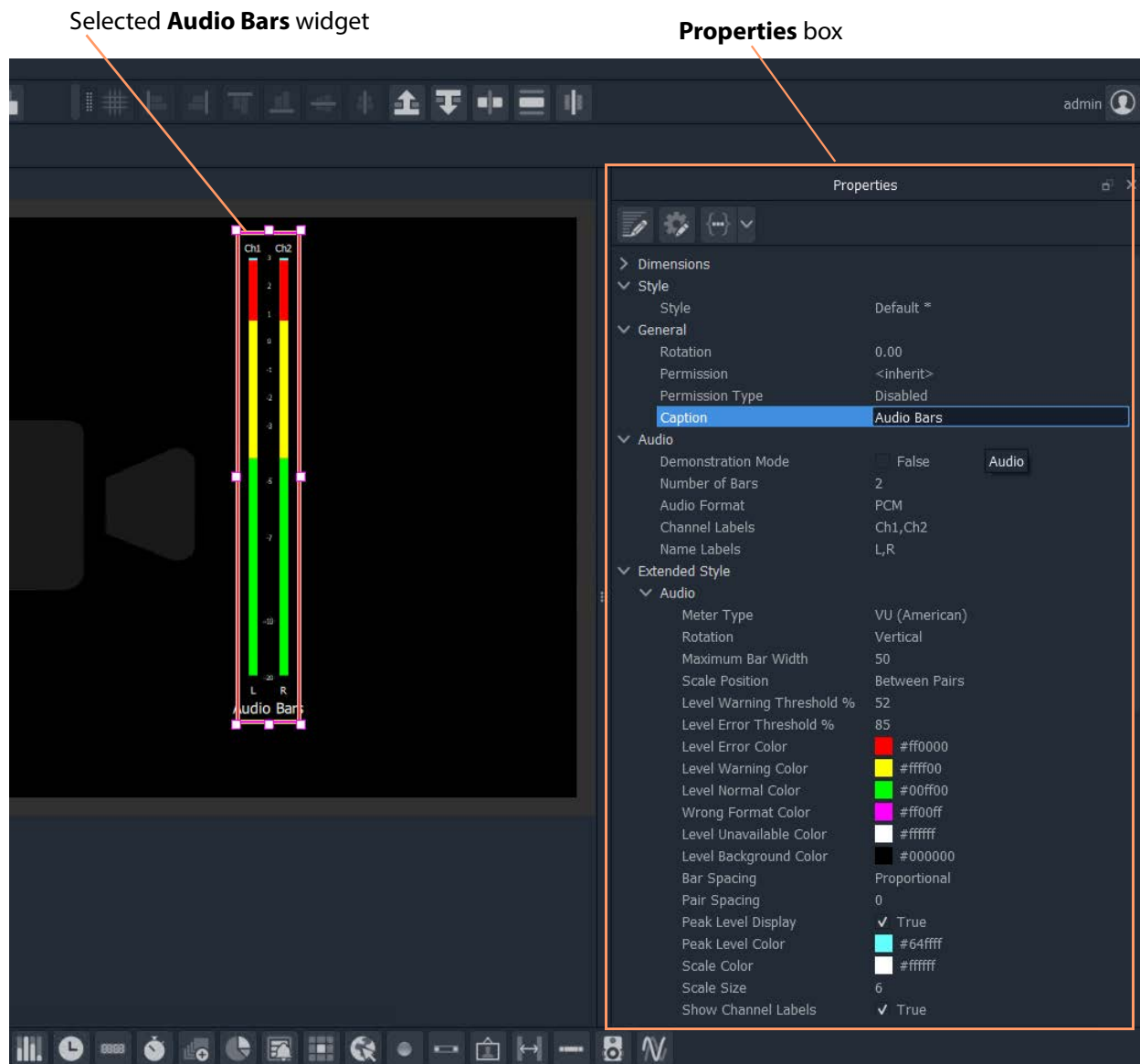
Properties box

Fig. 17-1: Audio Bars Widget Properties

The setting up of which audio channels are being monitored by the widget is done in a pop-up menu, see Audio Bars Widget Audio Channels.

Audio Bars Widget Audio Channels

An **Audio Bars** widget shows one or more bars of audio data from specified audio channels. This 'bars' configuration is set up in a dialog which is accessible from a right-click in the **Tile Editor**.

Open Audio Configuration Dialog

> Note: **Audio Configuration** and **MV-8 Multiviewer Software Version:**
> The **Audio Configuration** dialog feature will be supported in MV-8 multiviewer software version v4 onwards.

For an **Audio Bars** widget on a **Custom Tile** its audio bars configuration can be quickly set up:

1 Select the **Audio Bars** widget in the **Tile Editor**.

2 Right-click on the widget and select 'Audio Configuration' in the pop-up menu. (See Figure 17-2.)

Right-click on selected **Audio Bars**   **Properties** box
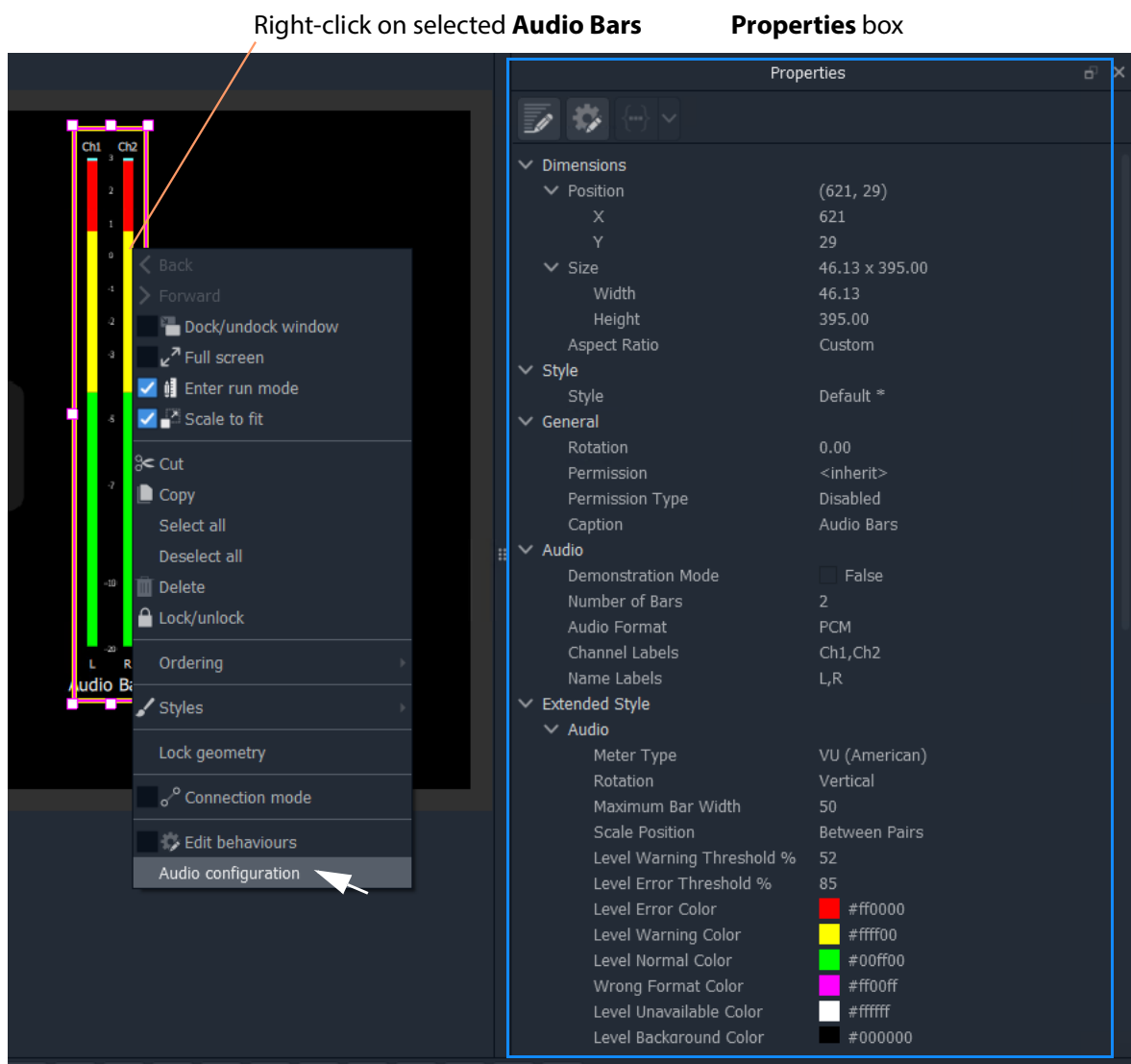
Fig. 17-2: Right-Click on Audio Bars Widget

The **Audio Configuration** dialog is shown.

The dialog is described in Audio Configuration Dialog - PCM Audio Bars Configuration, on page 787.

3 To set up the audio bars configuration, see instructions in:

  • Audio Configuration Dialog - PCM Audio Bars Configuration, on page 787; or in

  • Audio Configuration Dialog - DolbyE Audio Bars Configuration, on page 789.

4 When the audio bar configuration is done, click **Apply**.

The **Audio Bars** widget on the **Custom Tile** now shows the number of audio bars set up.
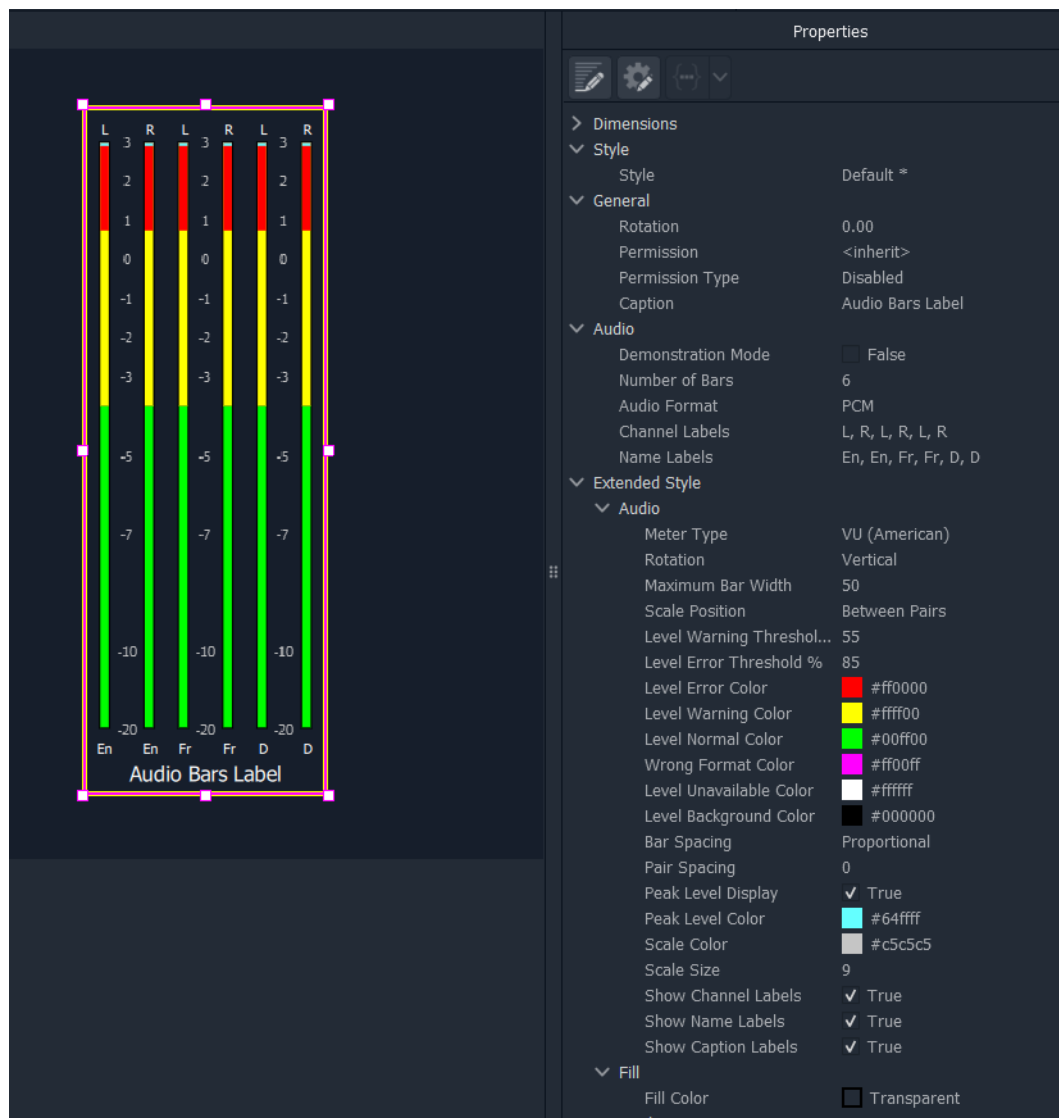
Fig. 17-3: Example 6-Bar Audio Bars Widget
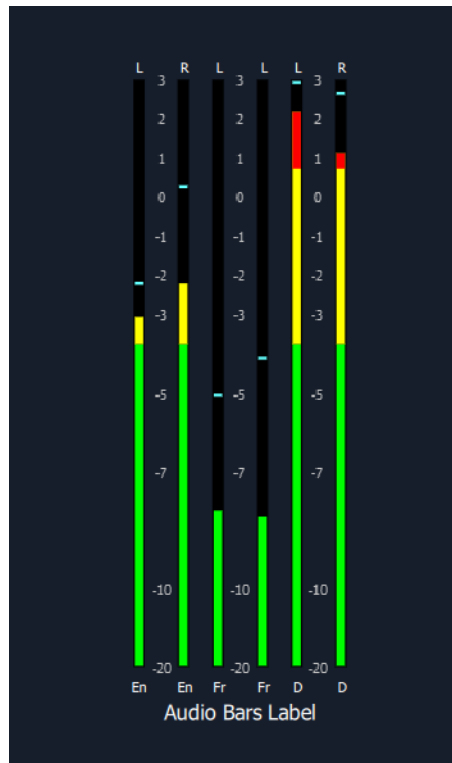
Fig. 17-4: Example Audio Monitoring with Audio Bars Widget

CAUTION **Ballistics and MV-8 Series Multiviewer Devices:**
For MV-8 Series multiviewers, each multiviewer device has a *global* audio data ballistics setting.
All audio metering data generated by the device uses this one global ballistics setting.
A device's global ballistics setting is found:

• For a <u>non</u>-*clustered* multiviewer -

    See the GV Orbit Client main menu
    'Multiviewer > Input Audio > Meter' item
    'Meter Type' setting.

• For a *clustered* multiviewer -

    See the device's control screen (RollCall template).

Audio Configuration Dialog - PCM Audio Bars Configuration

The dialog has a 'PCM' or a 'DolbyE' mode (see Figure 17-5 and Figure 17-6 respectively) and permits the configuration of up to 8 audio bars in the **Audio Bars** widget.
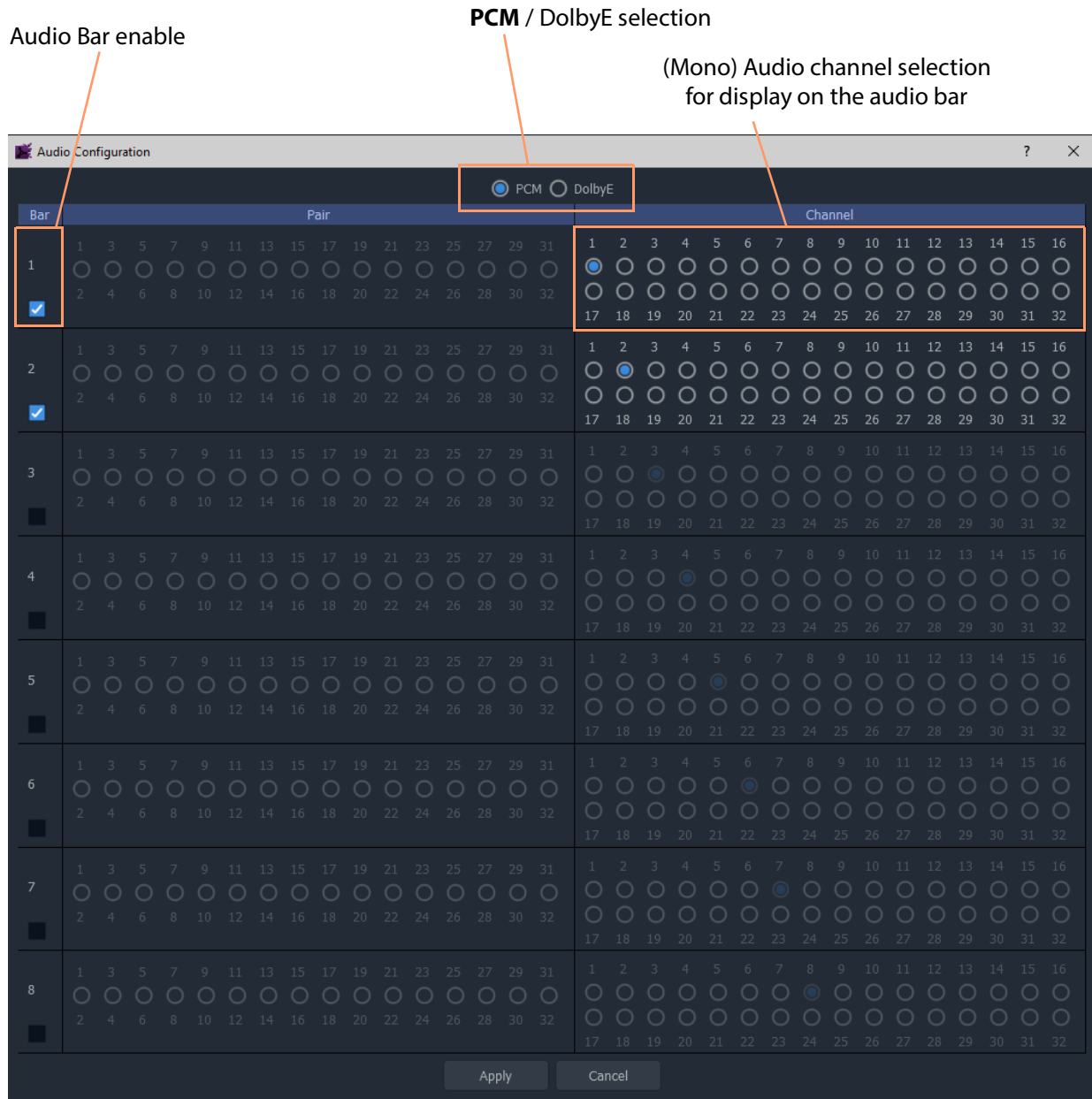
Fig. 17-5: Audio Bars Configuration Dialog PCM Selected)

Bar Configuration

To configure audio bars for monitoring PCM audio channels:

1 Select **PCM** in the **Audio Configuration** dialog.

2 Enable the number of audio bars required.
   Note: These must be contiguous in the dialog, starting with 'Bar 1'.

   Tip: For example, to enable six bars:

- Simply enable 'Bar 6'.

  Bars 1 to 5 are enabled automatically.

Note: As bars are enabled, the (mono) audio channel selection increments automatically.

For each enabled bar:

3 Select a mono audio channel (if the automatically selected channel is not what is required). There are 32 mono audio channels to choose from.

4 Repeat the above for each enabled bar.

5 Click **Apply**.

The **Audio Bars** widget shows the new number of audio bars in the **Tile Editor**.

Audio Configuration Dialog - DolbyE Audio Bars Configuration

The dialog has a 'PCM' or a 'DolbyE' mode (see Figure 17-5 and Figure 17-6 respectively) and permits the configuration of up to 8 audio bars in the **Audio Bars** widget.

Audio Bar enable

Channel-pair selection

PCM / **DolbyE** selection

(Mono) Audio channel selection
for display on the audio bar
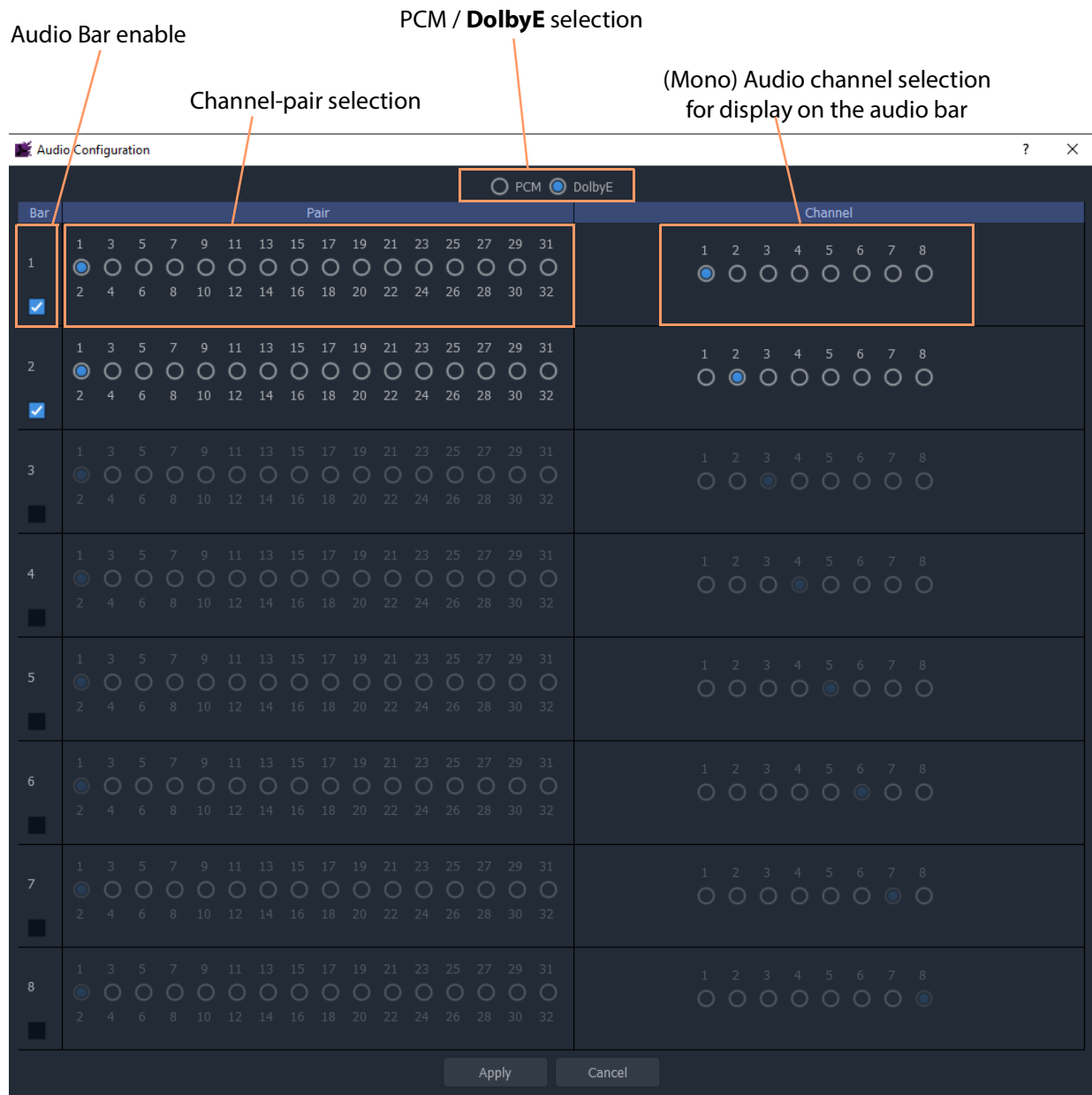
Fig. 17-6: Audio Bars Configuration Dialog (DolbyE Selected)

Bar Configuration

To configure audio bars for monitoring DolbyE audio channels:

1 Select **DolbyE** in the **Audio Configuration** dialog.

2 Enable the number of audio bars required.
   Note: These must be contiguous in the dialog, starting with 'Bar 1'.

   Tip: For example, to enable six bars:

- Simply enable 'Bar 6'.

  Bars 1 to 5 are enabled automatically.

Note: As bars are enabled, the (mono) audio channel selection increments automatically.

For each enabled bar:

3 Select a channel-pair to use (if the automatically selected channel-pair is not what is required). There are 16 channel-pairs to choose from.

4 Select a mono audio channel (if the automatically selected channel is not what is required). There are 8 audio channels to choose from (decoded from the DolbyE data in the selected channel-pair).

5 Repeat the above for each enabled bar.

6 Click **Apply**.

The **Audio Bars** widget shows the new number of audio bars in the **Tile Editor**.

IP Configuration

Introduction

GV Orbit is a dynamic system orchestrator tool. One of its many features is that it can configure, control and monitor signal routing in a GV Orbit IP routing system: It is the GV Orbit Control application that handles routing. GV Orbit Client is used to enter and manage the configuration settings of IP endpoints of devices for the IP routing system. This 'IP configuration' uses the **IP Configuration** tool within GV Orbit Client.

The **IP Configuration** tool automatically discovers all GVOP-supporting devices in a GV Orbit system which are on a GVOP domain, connected to the network and up-and-running. The resulting list of discovered devices is presented to you. The tool allows you to configure IP settings for the devices ready for IP routing. Settings include:

- device name, device short name, and network host name;
- multicast group IP address settings;
- spigot names and port numbers; and
- IP flow enabling from spigots on a device etc.

GV Orbit Client provides the **IP Configuration** information to the GV Orbit system, and in particular it is automatically passed to the router controller application, GV Orbit Control. The information is automatically used as the basis for IP device and spigot naming etc. for the routing topology that GV Orbit Control controls.

More than one IP routing system can be 'IP-configured' with GV Orbit Client in the same GV Orbit project.

> **Note:** The **IP Configuration** tool currently supports all endpoint devices that support GVOP, the GV Orchestration Protocol.

Spreadsheet Import

IP routing configuration information can be added manually into the **IP Configuration** tool or, more practically, it can be imported from a spreadsheet. The spreadsheet import/export facility provides a quick and convenient way of defining and saving IP endpoint settings, automating data entry and saving system settings.

Some validation of the data in the spreadsheet is performed automatically, checking for duplicate entries.

Certain IP addresses are reserved by GV Orbit Control and cannot be used. Refer to the Release Notes for more information. See Related Documentation, on page 19.

IP routing devices in the system are either sources of or destinations for IP streams, or both. Data validation is carried out at import and status reporting on the devices and their IP streams is provided in the **IP Configuration** tool.

Manual Edits

IP routing configuration information can be edited manually in the **IP Configuration** tool. Some validation of each new manual entry is performed automatically, checking for duplicate entries.

IP Configuration Tool

The **IP Configuration** tool in GV Orbit Client enables fast, easy and reliable configuration of IP routing device parameters for use in a GV Orbit system. In this way, configurations are entered by you and then used by GV Orbit applications – for example by GV Orbit Control for the system routing.

Such parameters are editable in GV Orbit Client only.

What the IP Configuration Tool Does Do...

IP Configuration tool is used to:

- Assign device and spigot names.
- Configure all IP flows sourced by the devices.
- Assign (traditional) router port numbers to the spigots used by the flows. (Source spigots and destination spigots.)
- Set (traditional) router port numbers and names.

Once a source flow within a Grass Valley device has been configured with multicast parameters, it starts to send IP flow data to the IP network switch.

> **Note:** GV Orbit Client talks to devices while carrying out its configuring and monitoring.

GV Orbit Client **IP Configuration** tool does do the following:

- Discovers devices of an IP network system which use the same GVOP domain.
- Enables the setting up of IP routing device parameters, including for A and B redundant network fabrics.
- Sets up 'traditional' router port assignments.
- Provides the IP configuration information to the GV Orbit system, and in particular to its router controller application, GV Orbit Control.

What the IP Configuration Tool Does Not Do...

GV Orbit Client **IP Configuration** tool does *NOT* do the following:

- *Does not* configure network settings etc. on the devices themselves (such as: device IP addresses or VLAN information). This must be done when setting up each device.
- *Does not* know about any IP network topology nor about physical networks.

IP Configuration Tool and IP Router Operation

Once the **IP Configuration** is made, the information is passed to the GV Orbit system and then routing can be done in the usual way.

While the IP router is operating and continues to operate:

- GV Orbit Client may be run with the **IP Configuration** screen open.
- The GV Orbit project may be closed.
- GV Orbit Client may be closed.
- If the PC hosting the GV Orbit Client is running no other Grass Valley applications, then it too may be shut down (and disconnected from the network).

If GV Orbit Client is re-started and the GV Orbit project is re-opened, then GV Orbit Client will auto-discover the devices and gather all the information it needs. GV Orbit Client will present all of the IP Routing project screens as usual, listing discovered devices and with IP configuration details filled out.

GV Orbit Control

The **GV Orbit Control** part of a GV Orbit system uses information from GV Orbit Client: It automatically and dynamically generates Logical sources and destinations from the **IP Configuration** information.

> **Note:** Parameter values from the **IP Configuration** tool are use in GV Orbit Control but are *not* editable in GV Orbit Control; they are shown 'grayed-out' in GV Orbit Control screens.

For more information on GV Orbit Control, refer to the *GV Orbit Control User Guide*, see Related Documentation, on page 19.

> **Recommend:** Ensure GV Orbit Control is running in the GV Orbit system while the **IP Configuration** tool is being used and while any whole configuration IP end point records are deleted.

Devices that Support GVOP

Devices that support GVOP include:

- IQ-UCP - Universal Compute Processor,
- IQ-MIX - 3G/HD/SD-SDI Multi-channel IP Transceiver,
- IQ-AMD - Multi-channel MADI to IP Interface
- Audio Live - Audio Router for Multi-stream IP Audio Processing.
- IPVU - IP-to-HDMI Monitoring Gateway,
- MV-821 - Multiviewer.

More than One IP Configuration

It is possible to have more than one **IP Configuration** in a GV Orbit project.

More than one IP routing system can be 'IP-configured' in the same GV Orbit project by specifying a different GVOP domain and creating a GV Orbit **IP Configuration** (.net file) for each IP routing system.

Each **IP Configuration** must connect to different devices. An **IP Configuration** deals with devices that it can discover. Devices can be segregated by either:

- Devices being on separate IP networks.

  (Requires two separate IP networks and GV Orbit Client's host PC to have separate network connection to each IP network.)

- Devices being on separate GVOP Domains.

  (This may use one IP network. It requires devices to be set up to be in one of two GVOP domains.)

Then create a new **IP Configuration** .net file for use with each other IP routing system. (See Create a New IP Configuration.)

IP Routing Networks and the IP Configuration Tool

This section presents some aspects of IP routing systems which are encountered in the **IP Configuration** tool screens.

IP Routing Redundancy - Fabric A and Fabric B

GV Orbit supports network redundancy. Two independent IP networks may be used for routing redundancy. These two media networks are referred to as 'fabric A' and 'fabric B'.

Within a device, a source flow is split into identical source flows, A and B. These are sent from the same source spigot and onto different networks (fabrics A and B). The flows travel independently through their respective networks. Both flow A and flow B arrive at the destination spigot of the destination device. The original IP signal is then re-formed from the data packets from fabric A or fabric B.

Devices must connect to both fabrics and GV Orbit Client must also connect to both fabrics.

Device Control Networks

Devices typically have one or more media network connections (for example, A and B redundant) and possibly a control network connection.

Devices may be controlled either in-band or out-of-band:

- **In-band** - This means control is done over the media network(s).
- **Out-of-band** - This means there is a separate control network.

)

  > **Note:**   It is possible for a device to be controllable but to have no connection to media network(s).

Switching at Destination

A traditional router switches source signals going to a destination. A Grass Valley IP routing system can do the same. In a Grass Valley IP routing system, switching is done *at the destination spigot*. This means that switching can be asynchronous to the underlying network fabric and the network system does not have to be media-aware.

Switching is done from a current IP flow to a new IP flow in a 'Break before Make' or in a 'Make before Break' way:

- **Break before Make** (BbM): The current IP flow is dropped and then a connection is made to a new IP flow.
- **Make before Break** (MbB): While connection to a new IP flow is being made, extra connection bandwidth is momentarily required. The current IP flow is then dropped once the new connection is made.

> **Note:**   For each device, 'Break before Make' or 'Make before Break' is set up on a 'per destination spigot' basis as part of the set up of each *device*; this is *not* set up in GV Orbit Client.

Grass Valley IP devices derive timing information from the IP network for switching between signals. For example, switching is done on video frame boundaries and a Grass Valley device's destination spigot will switch and can provide a continuous video signal input to the device:

- **BbM**: continuous signal achieved with "repeat current video frame".
- **MbB**: video simply cuts seamlessly from the current to a new video signal.

In This Chapter ...

In the remaining part of this chapter, the steps required to get started with an **IP Configuration** are outlined.

- Open the IP Configuration Tool, on page 800.
- IP Configuration Tool Screen, on page 804.

Importing data from a spreadsheet is described in:

- Import Preview Dialog and Spreadsheet Duplicate Scan Dialog, on page 809; and
- Getting Started with Spreadsheet Import, on page 824.

The ability to over-ride some import checking and keep duplicate port names (GV Orbit Control mnemonics) is described in Allowing Duplicate Port Names on Import, on page 822.

Additionally, if a further **IP Configuration** is required, then Create a New IP Configuration, on page 797, describes creating a new configuration in a C&M project.

Create a New IP Configuration

A Control and Monitoring GV Orbit project (C&M project) has an existing default IP Configuration (default.net) that may be used.

If more than one **IP Configuration** is required in a project, then one or more further, new **IP Configuration(s)** can be created, as required, from the **Project** window in GV Orbit Client. They are created as separate .net file(s) in the project.

A second IP configuration would need to be set up to look at a different set of devices, typically on a different GVOP domain.

To create a new **IP Configuration** file:

1 In the **Project** window, expand the item for the currently-open project.
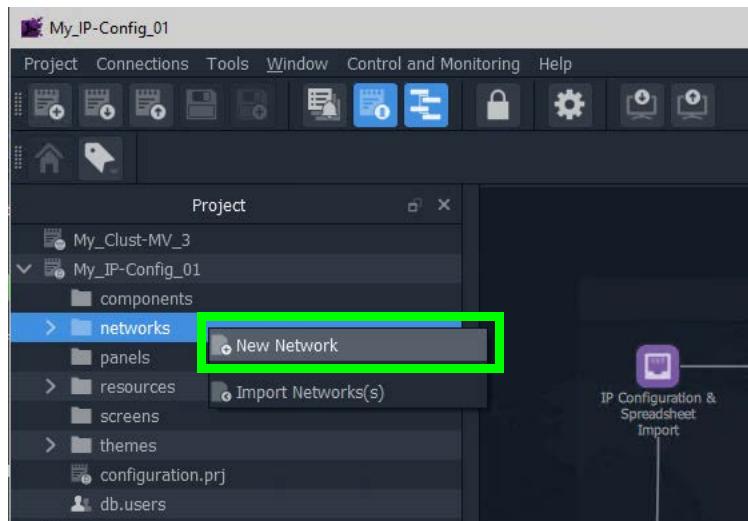
Fig. 18-1: New Network

2 Right-click on the 'networks' sub-folder item and select 'New Network'.

The **New Network File** dialog is shown.
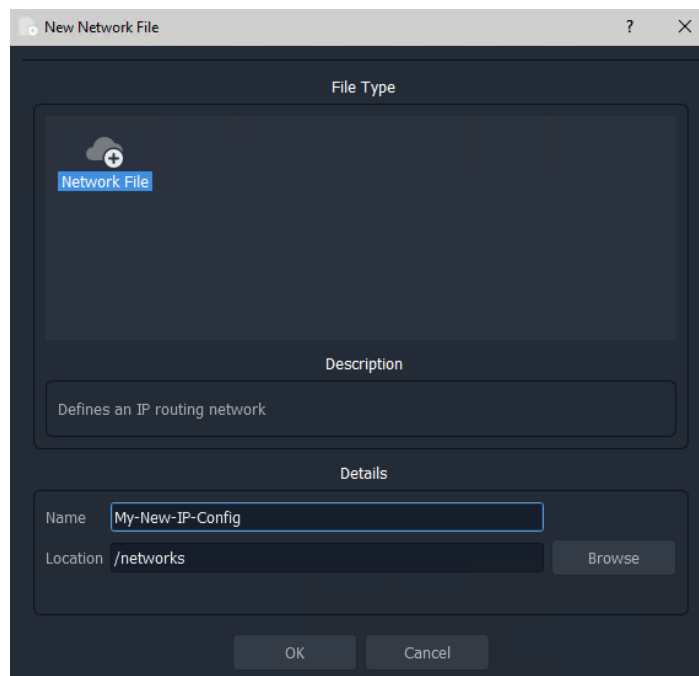
Fig. 18-2: New Network File Dialog

3 Enter a name for the new **IP Configuration** and click **OK**.

A new **IP Configuration** .net file is created in the **Project** window in the 'networks' sub-

folder and is opened in the main screen area.

New **IP Configuration** in the **Project** window and also open in GV Orbit Client
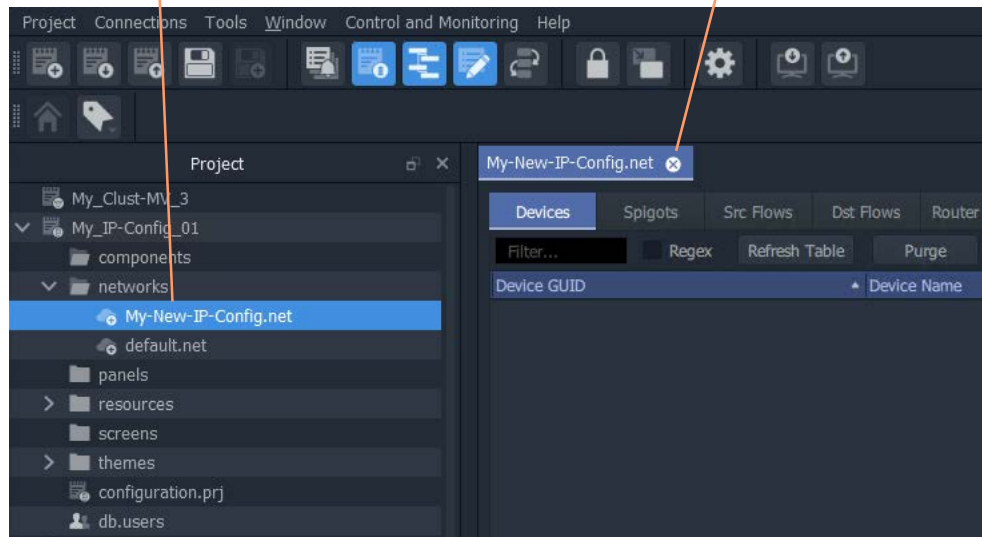
Fig. 18-3: New IP Configuration
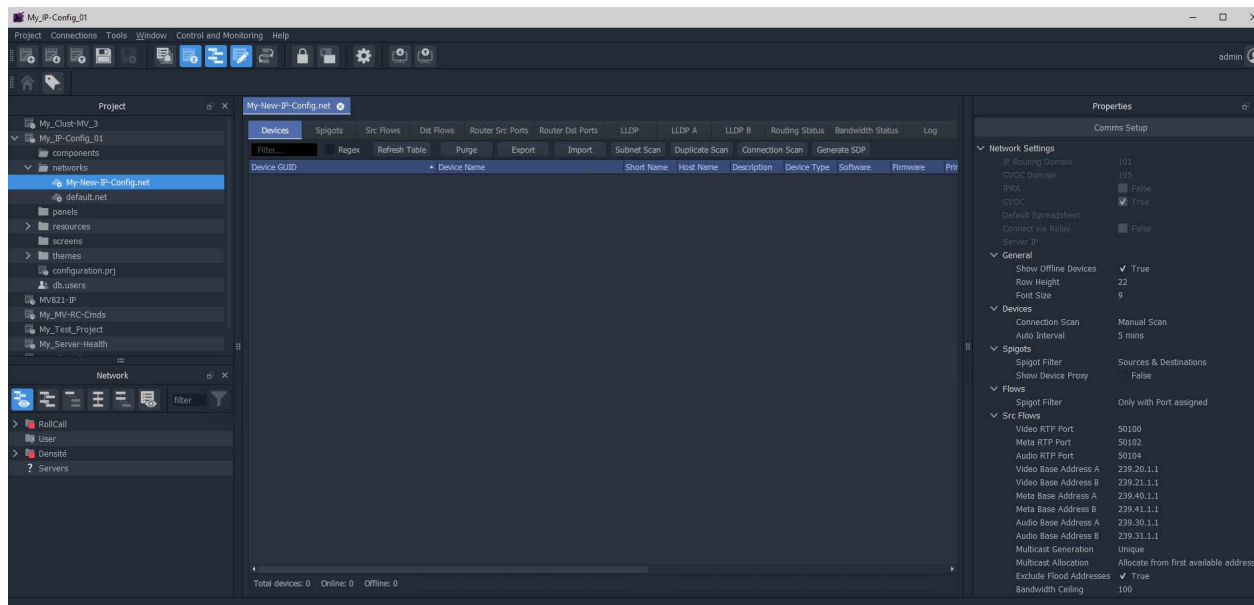
Fig. 18-4: New IP Configuration Open in GV Orbit Client

4   Configure the **IP Configuration** by clicking on the **Comms Setup** button in the
    Properties box. See instructions in IP Configuration Tool Comms Setup, on page 802.
    Setup the **IP Configuration** up to look for devices on a different GVOP domain and/or
    on a different network.

Open the IP Configuration Tool

Prerequisites

Before performing **IP Configuration**, the following are required:

- A GV Orbit system.
- Each device must be configured with basic settings (such as valid IP addresses and sub-nets, and on the same GVOP domain).

> **Note:** Each device must be set up independently of GV Orbit Client via its usual control screen; it is set up as part of the configuration step for each device and also includes IP addresses for each of the device's IP network ports. (Refer to the specific documentation for each device for this setting up.)

- Each device must be powered on and connected to all the network(s) (that is to one or more media networks, and/or to a control network).
- GV Orbit Client running on a client PC with a Control and Monitoring GV Orbit project opened.
- A list of required configuration settings - multicast IP addresses, device names, spigot names etc. in a spreadsheet format for importing.

> **Note:** The default GVOP domain ID number is 101.
> For a newly-created network, if there are any devices present on the default domain, then they will be shown in the 'Devices' tab.

Procedure

In a configuration and monitoring project (C&M project) that is already set up on a GV Orbit system, to open the **IP Configuration** tool:

1 View the Routing Workflow screen.

2 Click on the 'IP Configuration and Spreadsheet Import' icon. See Figure 18-5.

An **IP Configuration** tab is opened. For a new project, the default tab name is 'default.net'. See Figure 18-6.

The **IP Configuration** tool requires setting up, see IP Configuration Tool Comms Setup,

Fig. 18-5: IP Configuration and Spreadsheet Import Icon in the Routing Workflow Screen

Project name in the **Project** window

IP Configuration name in
Project window and on main tab

Devices tab

IP Configuration tool editor screen main area

Properties box
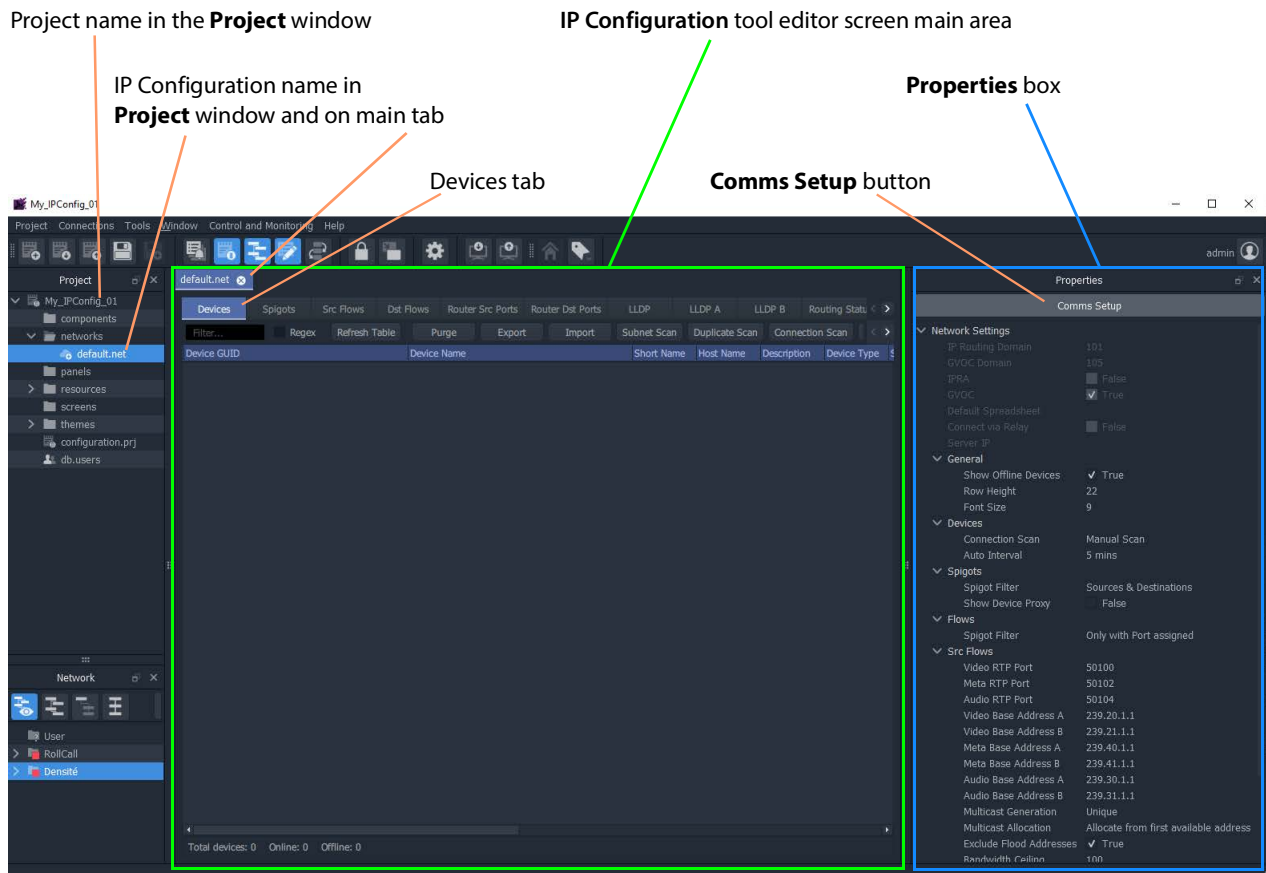
Comms Setup button

Fig. 18-6: IP Configuration Editor Screen

IP Configuration Tool Comms Setup

To initially set up the **IP Configuration** tool:

1 Click the **Comms Setup** button.

The **Comms Setup** dialog is shown.
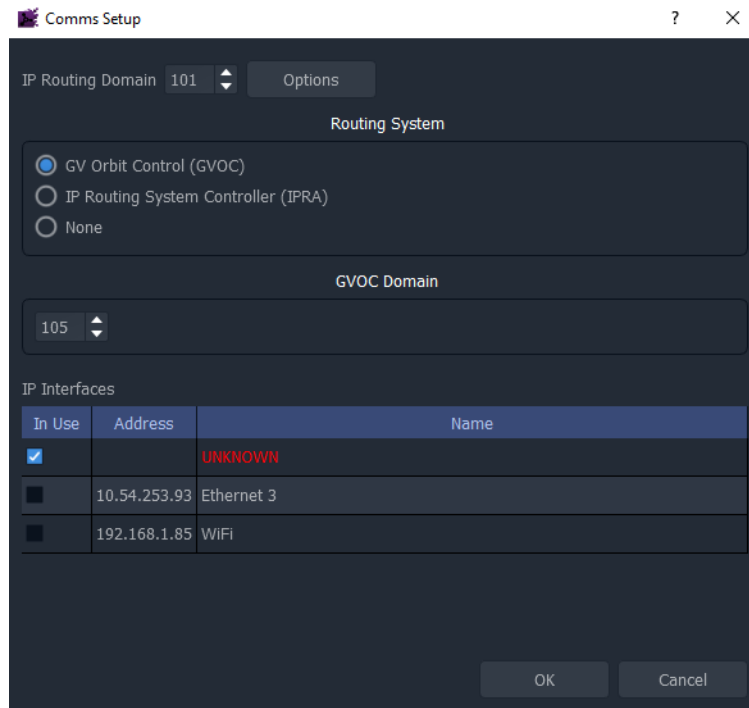
Fig. 18-7: Comms Setup Dialog

2 In the **Comms Setup** dialog:

a) **IP Routing Domain** - The default IP Routing GVOP Domain for a GV Orbit system is '101' and should not need to be changed here if there is only one **IP Configuration**.

b) **Routing System** - The selected **routing** controller type should be 'GV Orbit Control' ('GVOC').

This selects to work with the router controller of the GV Orbit system.

c) **GVOC Domain** - The default **GVOC Domain** for a GV Orbit system is '105' and should not need to be changed here.

d) **IP interfaces** - Select the client PC network IP interfaces for the **IP Configuration** tool to use.
This will depend on the network connections that the PC has.

For example, in order for the **IP Configuration** tool to discover all devices on a GVOP Domain, the client PC may need connections to:

– both media network interfaces (A and B, for in-band control); and

– the system's control network (for out-of-band control).

These PC interfaces need to be selected.

> IMPORTANT   Do not enable more than four network interfaces.

3   Click **OK**.

GV Orbit Client will discover IP End-points on devices and list them in the main screen area. See Figure 18-8.
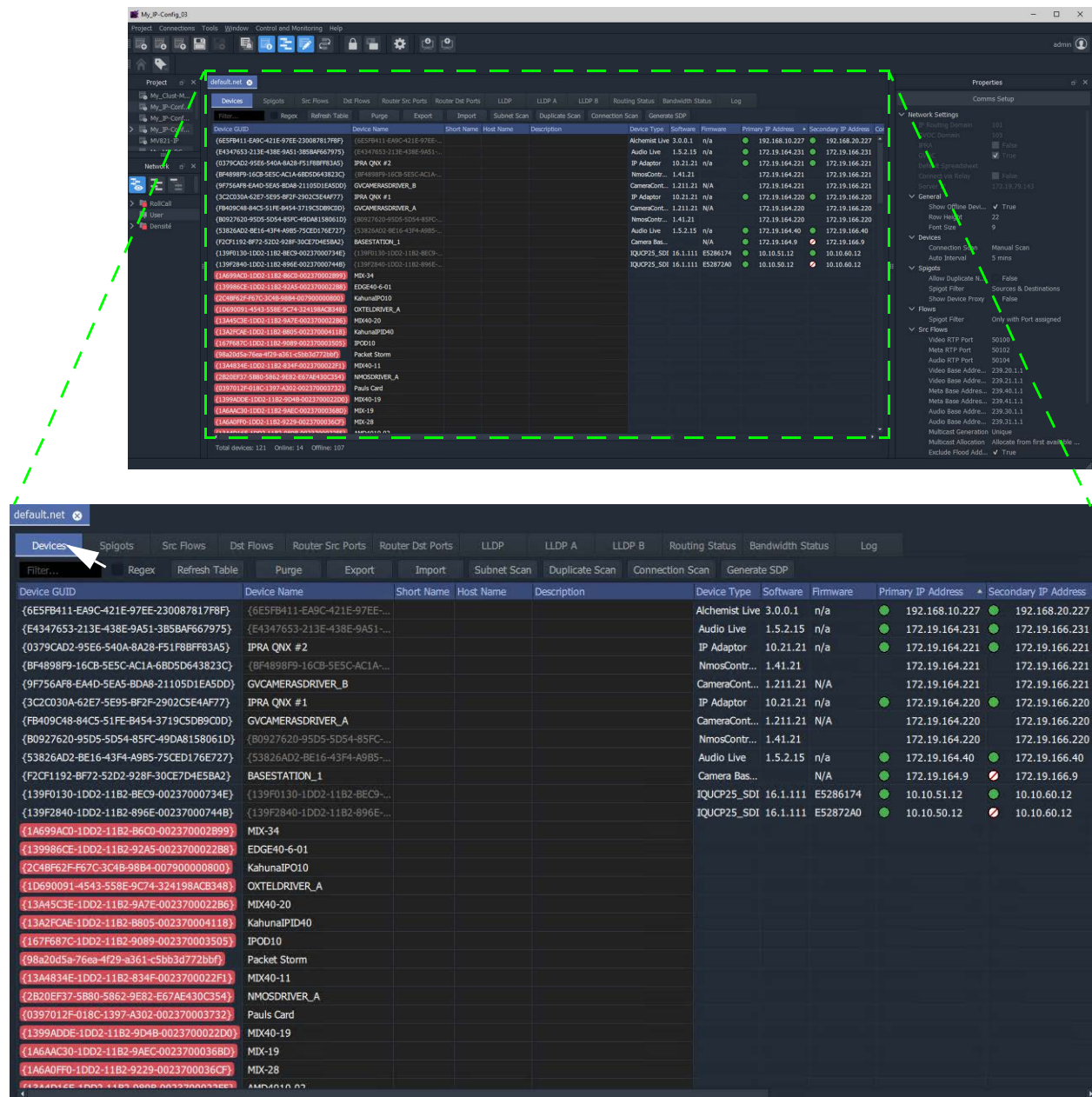
Fig. 18-8: Listed Discovered Devices

In the main screen area:

4   Click on the **Devices** tab, if it is not already shown, to see the listed devices. See also IP Configuration of End Point Devices and Spreadsheet Import, on page 75.

5   Verify that all devices are shown listed in the **Devices** tab.

The **IP Configuration** tool is ready.

IP Configuration Tool Screen

The **IP Configuration** tool comprises several tabbed screens and a **Properties** box.

For a description of each tab in the **IP Configuration** tool screen and the **Properties** box, refer to the *Orbit for IP Routing* user manual.
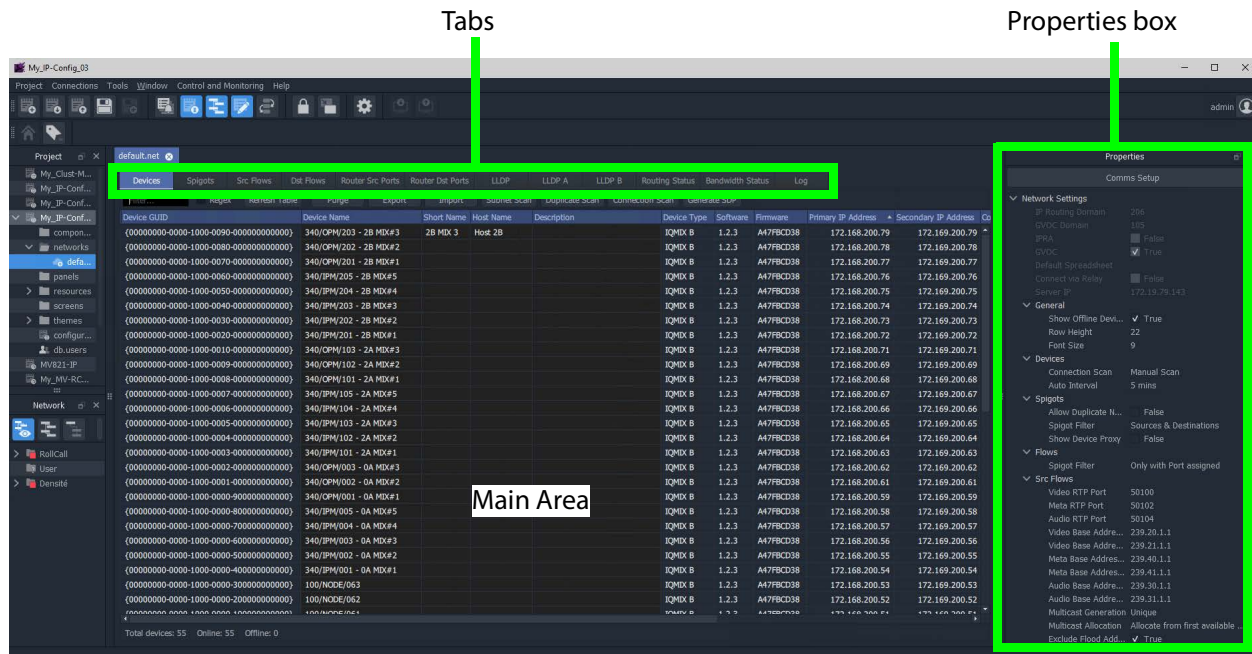
Fig. 18-9: IP Configuration Tool Screen

IP Configuration Tabs

The **IP Configuration** tool tabs are presented from left to right in the order in which they are used when configuring an IP routing network system: configuration of and information about devices, spigots, flows, and router ports; and status and log information.

Table 1: IP Configuration Tool Tabs

IP Configuration Tool Tab	Description
Devices	Shows discovered devices.

Table 1: IP Configuration Tool Tabs

IP Configuration Tool Tab	Description
Spigots	Connects spigots to router ports.
Src Flows	Assigns multicast groups to source flows.
Dst Flows	Assigns destination flows to multicast IP streams.
Router Src Ports	Summarizes the router source ports.
Router Dst Ports	Summarizes the router destination ports.
LLDP, LLDP A, LLDP B	Presents local link device information.
Routing Status	Graphical presentation of routing.
Bandwidth Status	Graphical presentation of device bandwidth usage.
Log	Shows log messages.

For a description of each tab in the **IP Configuration** tool screen and the **Properties** box, refer to the *Orbit for IP Routing* user manual.

Columns

Sort Columns

In tables in the tabs, click on column headings to toggle sorting of row entries alphabetically in ascending or descending order (that is, A-to-Z or Z-to-A).

Expand/Collapse Rows

Individual Row Items

Some table rows may be individually expanded and collapsed by clicking on the small triangular icon at the left hand side of each row. See Figure 18-10.

a) Collapsed Row Item

Click the small triangle to expand the row item.

Click the small triangle to collapse the row item.

b) Expanded Row Item

Fig. 18-10: Expand/Collapse Individual Row Items

All Row Items

To expand or collapse *all* rows, use the **Expand All** and **Collapse All** icons. Figure 18-11.

- Click to collapse rows.
- Click to expand to one level.
- Click to expand to all levels.
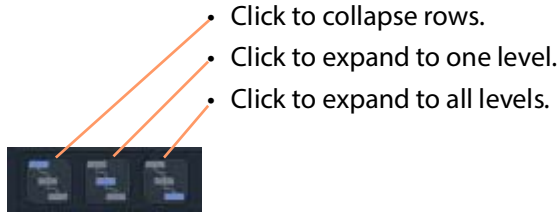
a) Expand/Collapse Controls
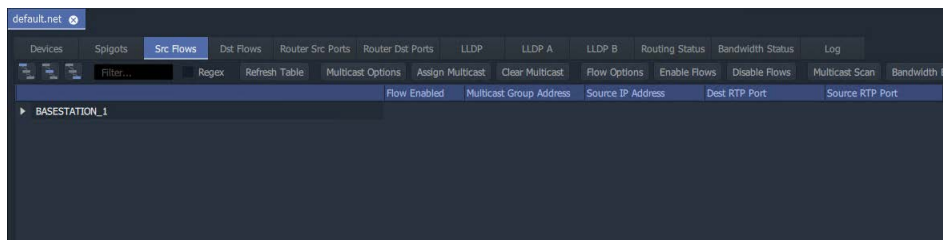
b) Collapsed
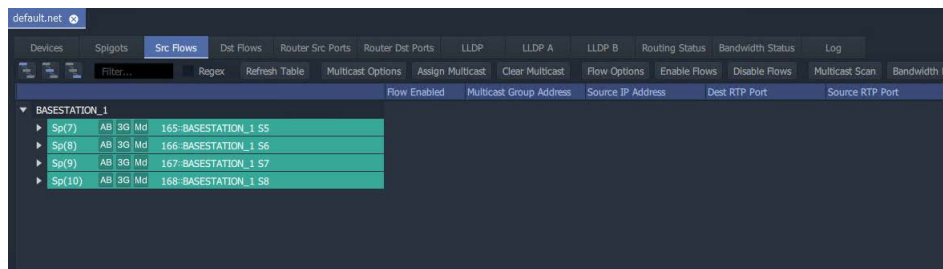
c) Expanded to One Level
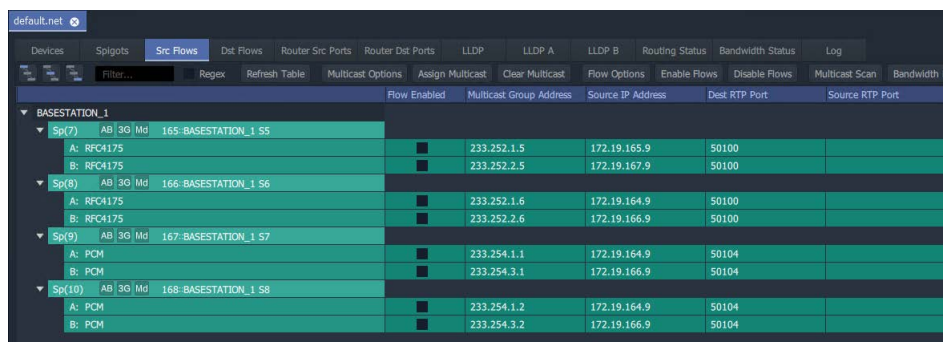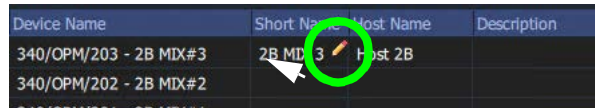
d) Expanded to All Levels

Fig. 18-11: Expanding/Collapsing All Row Items

Editable Cells

Many of the tabs in the **IP Configuration** tool have similar features. Several tabs permit manual editing of some table cells. Table cells which may be edited are shown with a 'pencil' edit icon when the cursor is hovering inside them. See Figure 18-12.

Fig. 18-12: Editable Cell and Pencil Edit Icon

To edit an editable table cell:
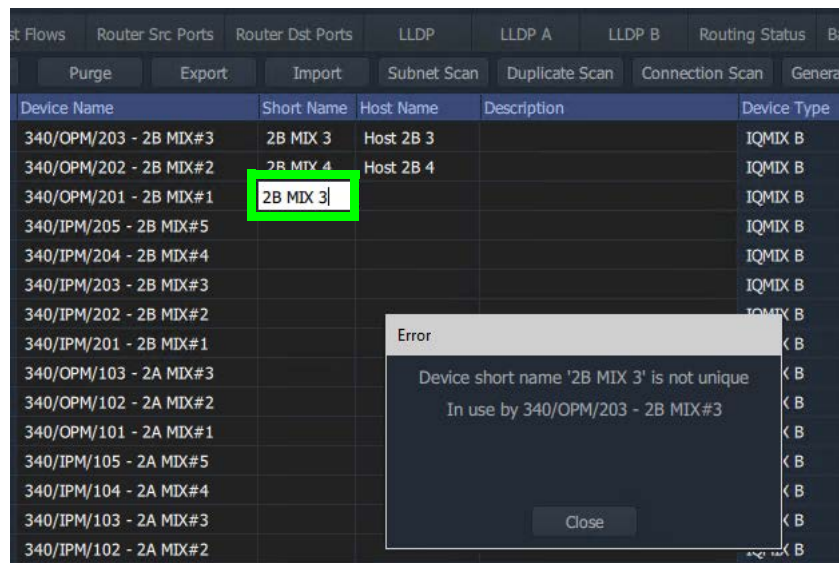
1 Click in the cell.

2 Enter new text.

3 When new text has been entered:

   • Press the Enter key to enter the new text.

   Or:

   • To abort changes, click outside the cell to keep the original text.

Automatic Entry Checking

When a cell value is changed, a check is automatically carried out, checking for duplicate values and you are alerted. See Figure 18-13.

Fig. 18-13: Cell Text Entry Error

Checking is done for uniqueness of:

- Device Name
- (Device) Short Name
- (Device) Host Name
- (Spigot) Port Name
- (Spigot) Short Name
- (Spigot) Port Number

Notes

The duplicates checking that is carried out is insensitive to case.
For example, the duplicate checking will warn you that *MVinput* is the same as *MVINPUT*.

A short name must not be more than 8 characters long.

Import Preview Dialog and Spreadsheet Duplicate Scan Dialog

This section describes the spreadsheet import options that there are for the **IP Configuration** tool in GV Orbit Client and which are shown in the **Import Preview** dialog and the accompanying **Spreadsheet Duplicate Scan** dialog:

In this section:

- Viewing the Dialogs, on page 809
- Spreadsheet Duplication Scan Dialog, on page 811
  - Import Data Validation - Duplicate Scan, on page 811
  - Resolving Duplicate Issues, on page 812
  - Before Allowing Duplicate Port Names in an Import, on page 813
- Import Preview Dialog, on page 814
  - Import Preview Dialog - Spreadsheet Section, on page 814
  - Import Preview Dialog - Options Section, on page 820
  - Import Preview Dialog - Preview of Device Changes, on page 821

Viewing the Dialogs

To see the **Import Preview** dialog and the **Spreadsheet Duplicate Scan** dialog:

1. In the **Devices** tab, click **Import**. See also IP Configuration of End Point Devices and Spreadsheet Import, on page 75.
2. Select the required spreadsheet and click **Open**.

   The spreadsheet is opened and the resulting **Import Preview** dialog is shown. (See Figure 18-14.) And, automatically:

   - the spreadsheet contents are automatically analyzed;
   - some basic checks are carried out; and
   - the result of these checks is shown in a summary **Spreadsheet Duplicate Scan** dialog, which pops up. See Figure 18-15.
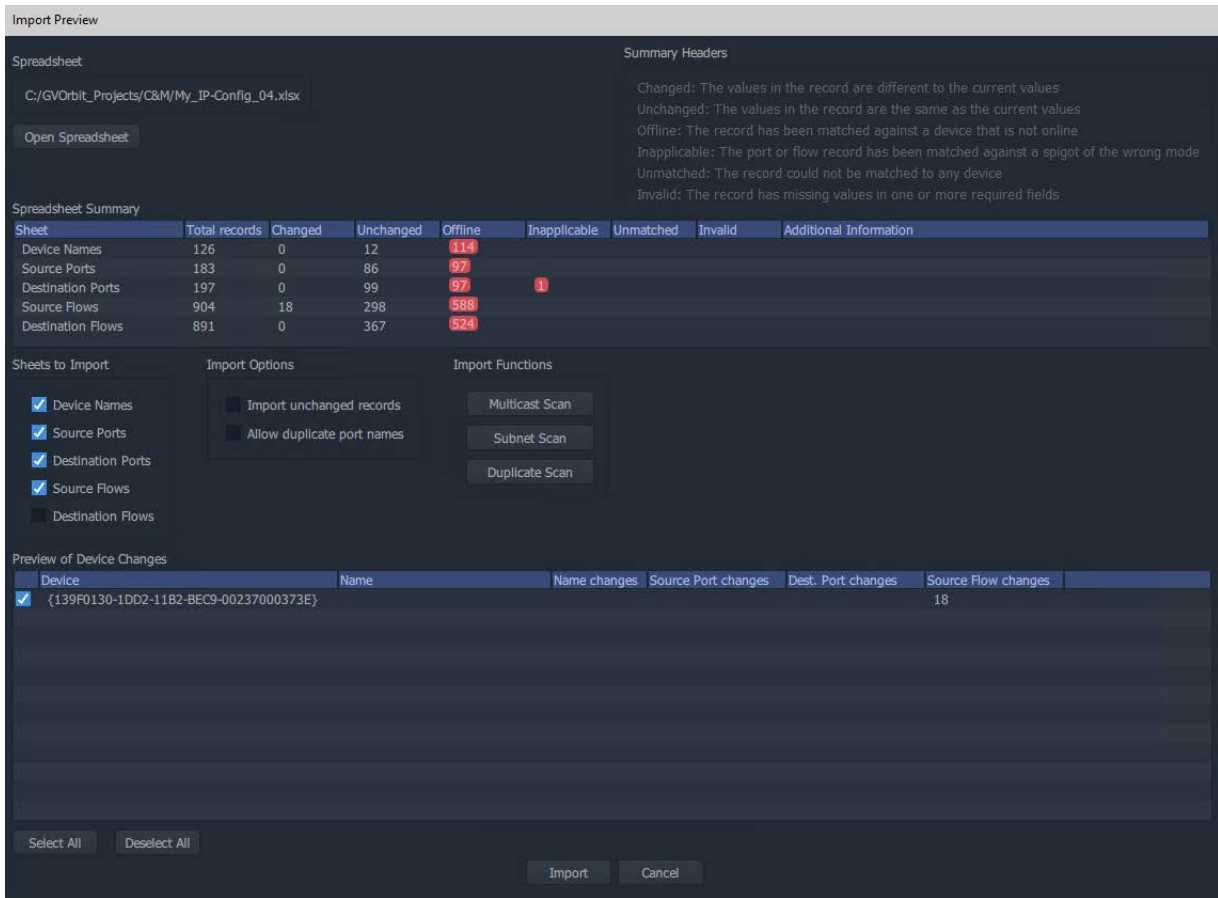
Fig. 18-14: Import Preview Dialog
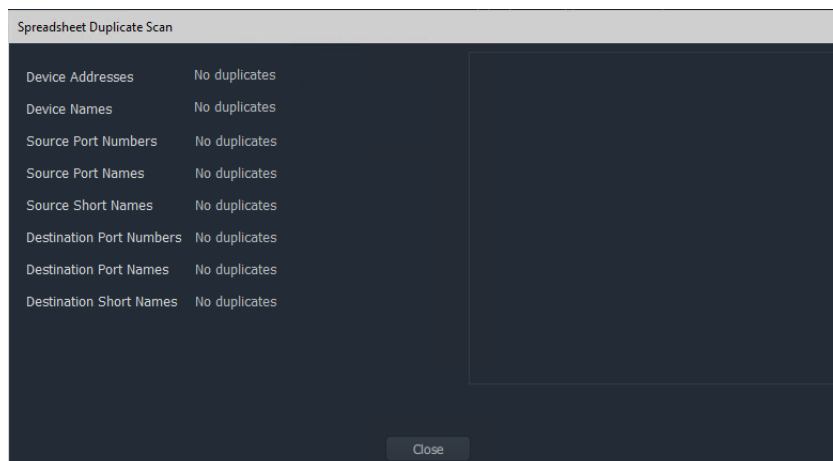
Fig. 18-15: Spreadsheet Duplication Dialog

If the Spreadsheet Duplication Scan Dialog shows that there are some issues when importing, then these must be resolved in the spreadsheet before importing can be done.

3   Correct any problem(s) in the spreadsheet and re-import the spreadsheet.

See Import Data Validation - Duplicate Scan, on page 811 and Resolving Duplicate Issues, on page 812.)

If the **Spreadsheet Duplication Scan** dialog shows no issues,

4 Close the **Spreadsheet Duplicate Scan** dialog.

For a description of each of these dialogs, see:

- Spreadsheet Duplication Scan Dialog, on page 811; and
- Import Preview Dialog, on page 814.

Spreadsheet Duplication Scan Dialog

A **Spreadsheet Duplication Scan** dialog is shown after the start of a spreadsheet import after an automatic **Duplicate Scan** check is carried out.

Click **View** to see a list of the duplicate issues found.
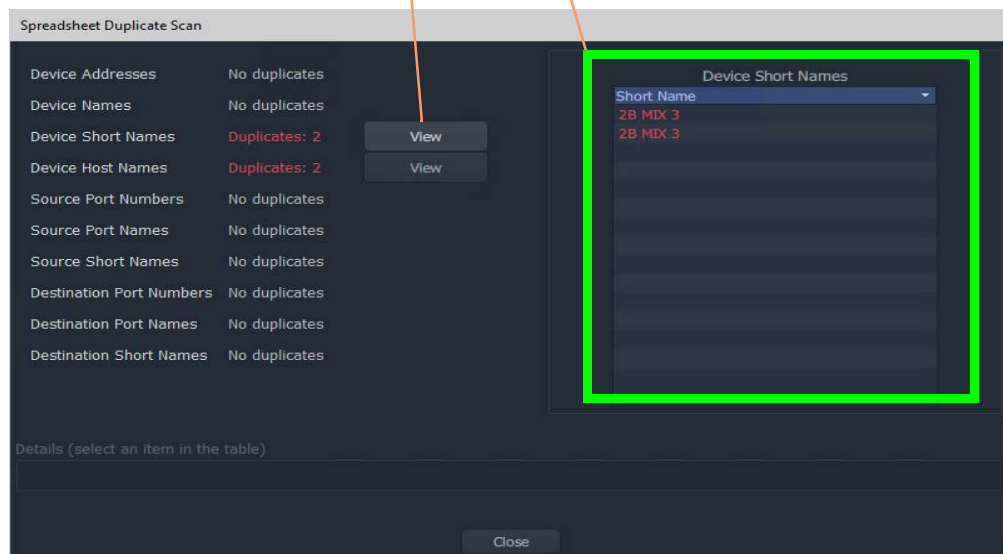
Fig. 18-16: Spreadsheet Duplication Dialog

Import Data Validation - Duplicate Scan

A **Duplicate Scan** checks the imported **IP Configuration** data to ensure that the GV Orbit Control application does not receive incorrect or conflicting IP configuration data. The following are checked:

- Duplicate IP addresses.
- Duplicate device names, short names and host names.
- Duplicate router source port numbers, port names and short names.
- Duplicate router destination ports numbers, port names and short names.

A short name must be unique and not be more than 8 characters long. Short names that are longer than 8 characters are truncated upon import and data validation, and then the truncated short names are checked to see if there is a duplicate with any other truncated short names. Any duplicates must be resolved before continuing. In a large network system, this check can help find typographical errors in the system set up.

The results of the checks are shown in the **Spreadsheet Duplicate Scan** dialog.

Resolving Duplicate Issues

If the **Spreadsheet Duplication Scan** dialog shows that there are some issues when importing:

Inspect and correct each issue:

1 Click **View** beside the problem issue(s) in the dialog.

   This lists the issues.

2 Select an issue item in the list.

   More details about the issue are shown. See Figure 18-17.

Fig. 18-17: Inspecting Duplication Scan Issues

3 Correct the problem(s) in the spreadsheet by eliminating duplicate values.

Do this for each issue.

Finally, once all issues are addressed:

4 **Close** the **Spreadsheet Duplicate Scan** dialog and **Cancel** the **Import Preview** dialog.

   This aborts the import.

5 Re-import the spreadsheet.

> **Note:** The default behavior on importing new values from a spreadsheet is to not allow duplicate values. For user cases where duplicate Port Names, for some reason, are required, there is a mechanism for getting round this.

Before Allowing Duplicate Port Names in an Import

For Port Names, it is possible to override the checking and perform an import with duplicate Port Names, if required.

Before allowing duplicate Port Names when importing data:

1 Clear other issues that there might be from the duplicate scan.

This should leave only a duplicate 'Port Name(s) alert' in the **Spreadsheet Duplicate Scan** dialog that results from known Port Name duplicates that you want to allow.

2 Close the **Spreadsheet Duplicate Scan** dialog.

Then:

3 See

> IMPORTANT With **Allow Duplicate Port Names** selected in the Import Preview dialog, duplicate Port Name values are allowed when importing. However, you should take care that such duplicate value entries will not impact their system.

Import Preview Dialog
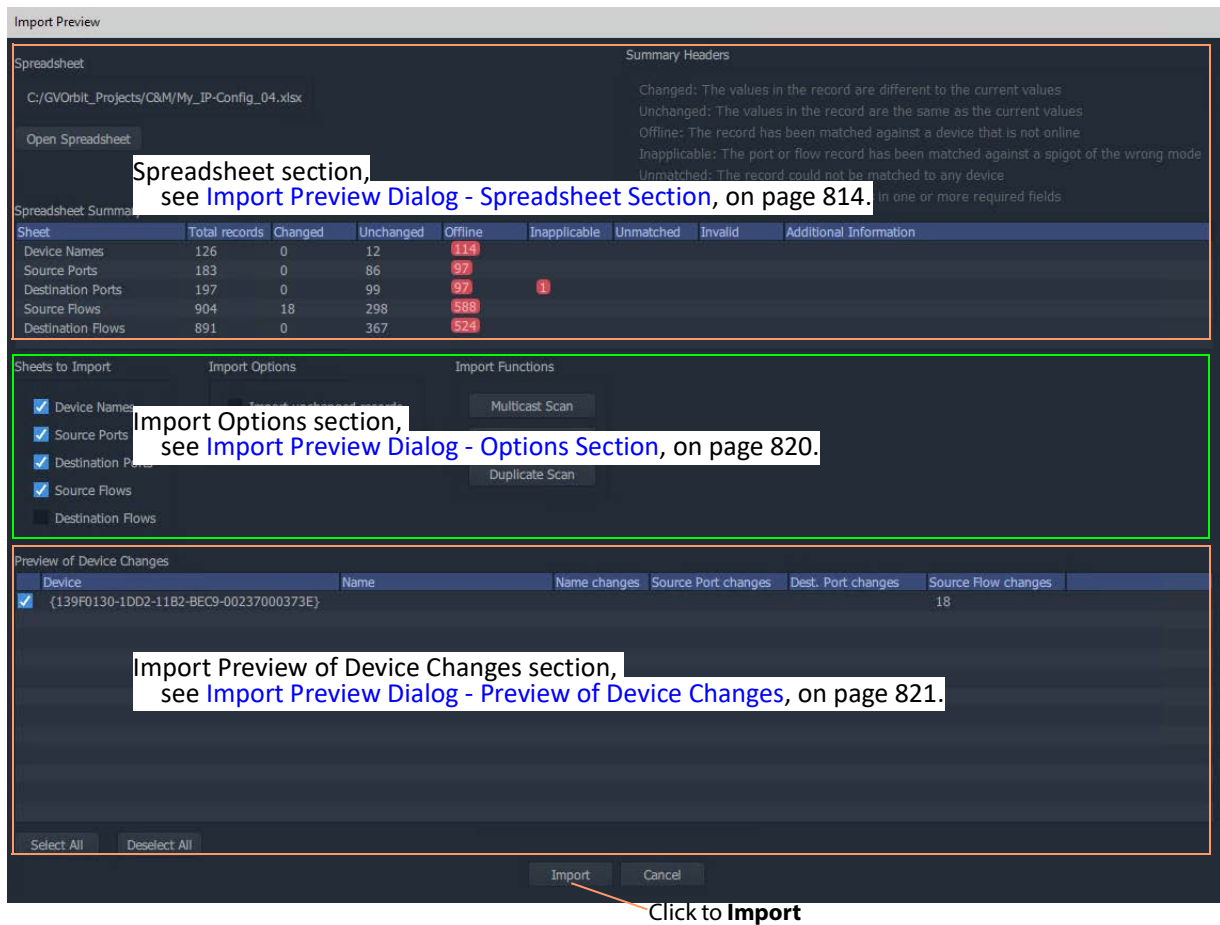
Fig. 18-18: Import Preview Dialog Anatomy

Import Preview Dialog - Spreadsheet Section

The **Spreadsheet** section of the **Import Preview** dialog contains:

- the facility to open the spreadsheet for editing; and
- a spreadsheet summary, which summarizes information present in the worksheets of the selected spreadsheet.

Any issues with or differences in the selected spreadsheet compared to the current settings in the **IP Configuration** tool are indicated in the dialog. This provides a useful means of checking:

1 if the selected spreadsheet is the correct one before importing;

2 if there are any issues with the spreadsheet; and

3 any difference the spreadsheet contains compared to the currently-open **IP Configuration** of the open C&M project.

The **Spreadsheet** section of the dialog is shown in Figure 18-19 and it is described in Table 2.

Selected spreadsheet file path and file name.

Click **Open Spreadsheet** to open the file in a spreadsheet editor (for example in Microsoft Excel).

Spreadsheet Summary of selected file, see Table 2.

Explanation of 'Spreadsheet Summary' column headings. See Table 2.
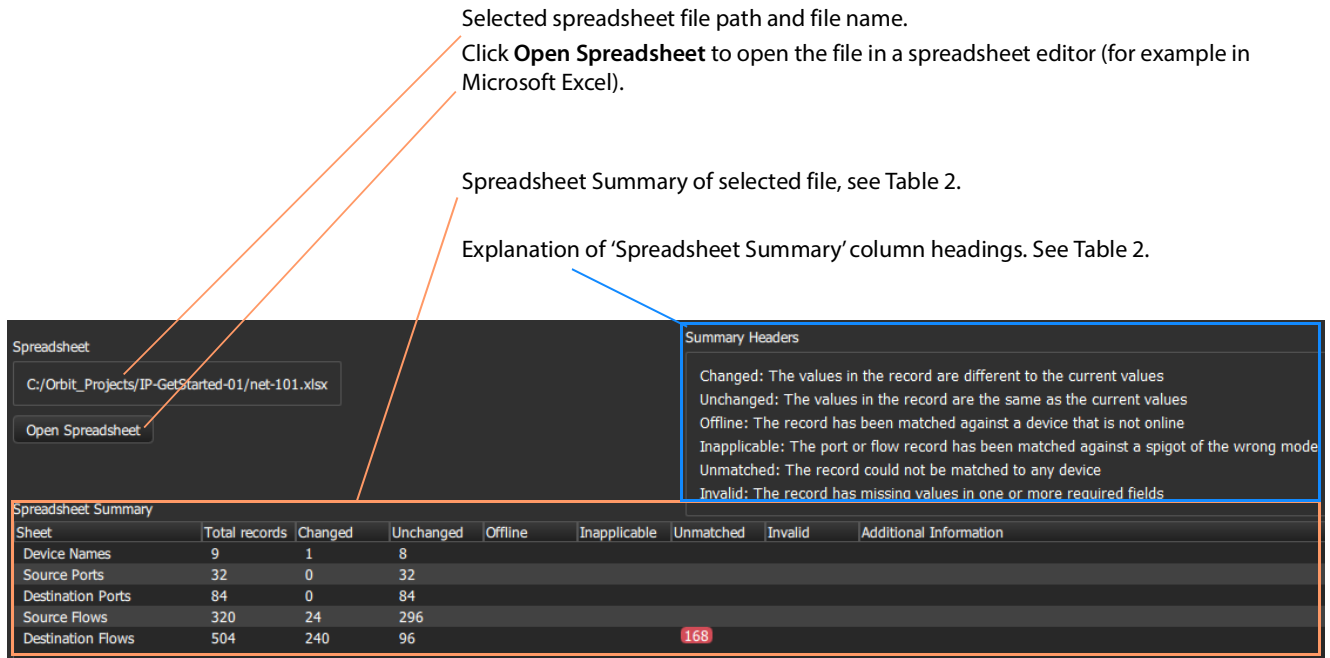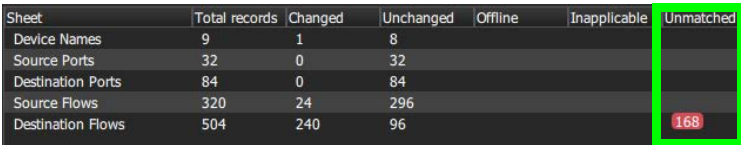
Fig. 18-19: Import Preview Dialog - Spreadsheet Information

Table 2: Spreadsheet Summary - Column Headings

Column Heading	Description
Sheet	Name of a worksheet in the spreadsheet file.
Total Records	Number of row items in the worksheet.
Changed	Number of row items that are different to current values.
Unchanged	Number of row items that are the same as current values.
Offline	Number of row items that match to a device that is off-line.

Table 2: Spreadsheet Summary - Column Headings (continued)

Column Heading	Description
Inapplicable	Number of row items that are inconsistent with the currently open GV Orbit project **IP Configuration**: • For a spigot row item: 　　Spigot is set to the wrong mode, or it is a phantom. **Note:** A phantom spigot has an entry in the routing system's working port table but does not exist on the device. • For a flow row item: 　　Parent spigot is the wrong mode or its parent device is not on-line. For example, a Grass Valley IQMIX IP modular card may have been re-configured to have a different number of inputs and outputs (or number of destinations and sources).
Unmatched	Number of row items not matched to any device. This means that either: • an item does not have a counterpart in the currently-open C&M project **IP Configuration**; or • an item is not found in the open project. For example: • a device may be temporarily off-line; or • on a live routing system, the current routes to/from destination/source spigots will differ from any "snapshot" captured in a spreadsheet.
Invalid	Number of row items that are malformed. Malformed items have missing values in one or more required fields.
Additional Information	Provides additional information about work sheets.

Example Spreadsheet Summary Issues:

The 'Spreadsheet Summary' in the **Import Preview** dialog can indicate several issues with the form and the content of a spreadsheet-to-be-imported compared to the currently-open **IP Configuration**. Some example spreadsheet issues are presented here.

Figure 18-20 shows an example 'Spreadsheet Summary'. Each red item is caused by an issue in the selected spreadsheet, shown in Figure 18-21 to Figure 18-26.

One unmatched issue on the Device Names worksheet, see Figure 18-23a.

Two unmatched issues for Source Ports, see Figure 18-23b.

Three unmatched issues for Destination Ports, see Figure 18-23c.

Four unmatched issues for Source Flows, see Figure 18-23d.

Five 'inappropriate' issues for Destination Ports, see Figure 18-23e.

261 unmatched issues for Destination Ports - because the currently open **IP Configuration** is for a live IP routing system and routes have been changed.

Six 'invalid' issues for Destination Ports, see Figure 18-23f.

Fig. 18-20: Example Spreadsheet Summary

New device row item

Fig. 18-21: Example Spreadsheet Issues - a) An Unmatched New Device.

1	GUID	IP Address	Device Name	Spigot Index	Port Number	Port Name
2	{139F0130-1DD2-11B2-BEC9-00237000C123}	10.101.10.113	MY NEW DEVICE	1	500	
3	{139F0130-1DD2-11B2-BEC9-00237000C123}	10.101.10.113	MY NEW DEVICE	2	501	
4	{139F0130-1DD2-11B2-BEC9-00237000C49E}	10.100.10.15		1		
5	{139F0130-1DD2-11B2-BEC9-00237000C49E}	10.100.10.15		2		
6	{139F0130-1DD2-11B2-BEC9-00237000C49E}	10.100.10.15		3		
7	{139F0130-1DD2-11B2-BEC9-00237000C49E}	10.100.10.15		4		
8	{139F2840-1DD2-11B2-896E-00237000C47B}	10.100.10.45		1		
9	{139F2840-1DD2-11B2-896E-00237000C47B}	10.100.10.45		2		
10	{139F2840-1DD2-11B2-896E-00237000C47B}	10.100.10.45		3		
11	{139F2840-1DD2-11B2-896E-00237000C47B}	10.100.10.45		4		
12	{13A060C0-1DD2-11B2-AECE-00237000C478}	10.100.10.55		1		

Device Names | **Source Ports** | Destination Ports | Source Flows | Destination Flows | ⊕

New source port rows

Fig. 18-22: Example Spreadsheet Issues - b) Two Unmatched New Source Ports.

1	GUID	IP Address	Device Name	Spigot Index	Port Number	Port Name
2	{139F0130-1DD2-11B2-BEC9-00237000C123}	10.101.10.113	MY NEW DEVICE	1	500	MY PORT NAN
3	{139F0130-1DD2-11B2-BEC9-00237000C123}	10.101.10.113	MY NEW DEVICE	2	501	MY PORT NAN
4	{139F0130-1DD2-11B2-BEC9-00237000C123}	10.101.10.113	MY NEW DEVICE	3	502	MY PORT NAN
5	{139F0130-1DD2-11B2-BEC9-00237000C49E}	10.100.10.15		5		
6	{139F0130-1DD2-11B2-BEC9-00237000C49E}	10.100.10.15		6		
7	{139F0130-1DD2-11B2-BEC9-00237000C49E}	10.100.10.15		7		
8	{139F0130-1DD2-11B2-BEC9-00237000C49E}	10.100.10.15		8		
9	{139F0130-1DD2-11B2-BEC9-00237000C49E}	10.100.10.15		9		
10	{139F0130-1DD2-11B2-BEC9-00237000C49E}	10.100.10.15		10		
11	{139F0130-1DD2-11B2-BEC9-00237000C49E}	10.100.10.15		11		
12	{139F0130-1DD2-11B2-BEC9-00237000C49E}	10.100.10.15		12		

Device Names | Source Ports | **Destination Ports** | Source Flows | Destination Flows | ⊕

New destination port rows

Fig. 18-23: Example Spreadsheet Issues - c) Three Unmatched New Destination Ports.

1	GUID	IP Address	Device Name	Spigot Index	Flow Index
2	{139F0130-1DD2-11B2-BEC9-00237000C123}	10.101.10.113	MY NEW DEVICE	1	
3	{139F0130-1DD2-11B2-BEC9-00237000C123}	10.101.10.113	MY NEW DEVICE	1	
4	{139F0130-1DD2-11B2-BEC9-00237000C123}	10.101.10.113	MY NEW DEVICE	1	
5	{139F0130-1DD2-11B2-BEC9-00237000C123}	10.101.10.113	MY NEW DEVICE	1	
6	{139F0130-1DD2-11B2-BEC9-00237000C49E}	10.100.10.15		1	1
7	{139F0130-1DD2-11B2-BEC9-00237000C49E}	10.100.10.15		1	1
8	{139F0130-1DD2-11B2-BEC9-00237000C49E}	10.100.10.15		1	2
9	{139F0130-1DD2-11B2-BEC9-00237000C49E}	10.100.10.15		1	2
10	{139F0130-1DD2-11B2-BEC9-00237000C49E}	10.100.10.15		1	3
11	{139F0130-1DD2-11B2-BEC9-00237000C49E}	10.100.10.15		1	3
12	{139F0130-1DD2-11B2-BEC9-00237000C49E}	10.100.10.15		1	4

Device Names | Source Ports | Destination Ports | **Source Flows** | Destination Flows | ⊕

New source flow rows

Fig. 18-24: Example Spreadsheet Issues - d) Four Unmatched New Source Flows.

The spigot index used here for a **Destination** spigot index is actually the index for a **Source** spigot on the device.

Fig. 18-25: Example Spreadsheet Issues - e) Five Inappropriate Destination Flow Row Items.

Row items are invalid - each does not have a GUID nor an IP Address entry.

Fig. 18-26: Example Spreadsheet Issues - f) Six Invalid Destination Flow Row Items.

Import Preview Dialog - Options Section

Select the worksheets of the
spreadsheet to import

Import Options

Import Functions
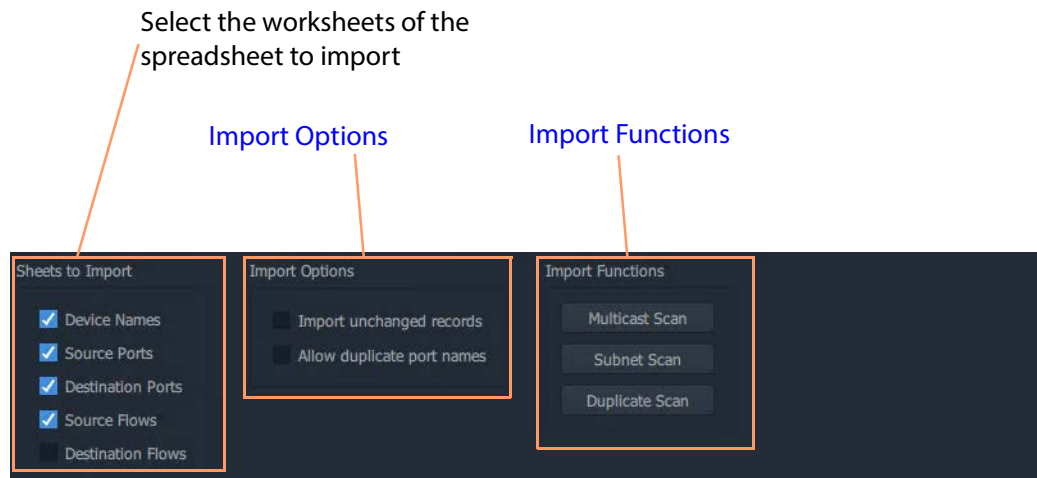
Fig. 18-27: Import Preview Dialog - Options Section

Import Options

Import unchanged records:
- Select - Import and apply *all* spreadsheet records when importing the spreadsheet. (This forces an **IP Configuration** into a known state.)
- Deselect - Import and apply only changed records.

Allow Duplicate Port Names:
- Select - Allow duplicate port names to be imported.
- Deselect - Imports with duplicate port names are now allowed.

See Allowing Duplicate Port Names on Import, on page 822.

> IMPORTANT With **Allow Duplicate Port Names** selected in the **Import Preview** dialog, duplicate Port Name values are allowed when importing. However, you should take care that such duplicate value entries will not impact their system.

Import Functions

Click on an item to perform a checking action:

Multicast Scan

Click to generate a full listing of the multicast groups comprising the IP flows in the **IP Configuration**. The check results are shown in a dialog.
For more information, refer to the *Orbit for IP Routing* user manual.

Subnet Scan

Click to check that device IP addresses are on specified network subnets. The check results are shown in a dialog.
For more information, refer to the *Orbit for IP Routing* user manual.

Duplicate Scan

Click to check for duplicate IP addresses, device names, port numbers/names etc. This check is automatically done before importing. The check results are shown in a dialog. See Import Data Validation - Duplicate Scan, on page 811.

Import Preview Dialog - Preview of Device Changes

The **Import Preview** dialog indicates the nature of changes that would occur in the **IP Configuration** if the spreadsheet were to be imported.

Full previewed list of changed settings items, see Table 3.
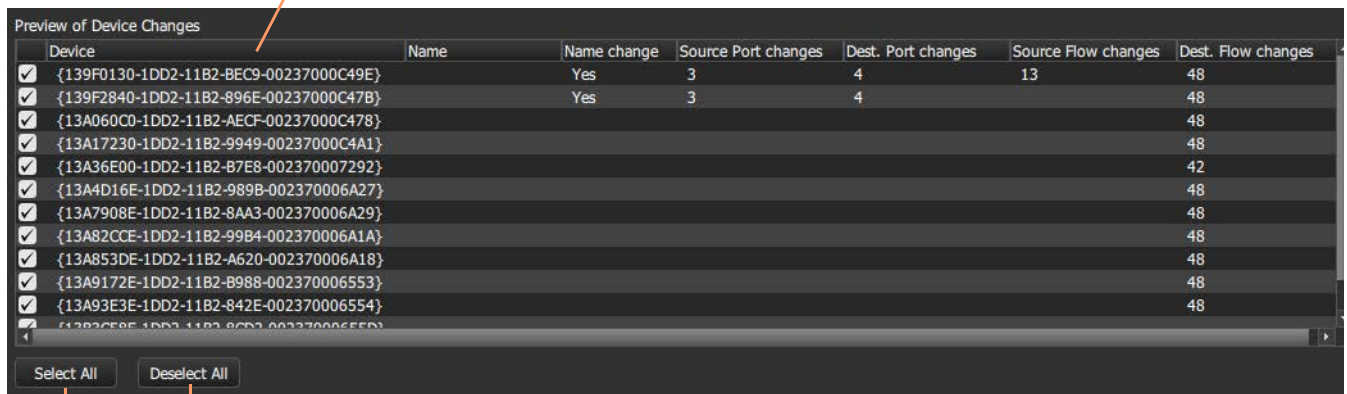
Click **Deselect All** to deselect all preview items.

Click **Select All** to select all preview items.

Fig. 18-28: Import Preview Dialog - Preview of Device Changes

Table 3: Preview of Device Changes - Column Headings

Import Preview Column Headings	Description
(First column) ☑ ☐	Check box. • Select - to select an item for importing. • Deselect - to deselect an item for importing.
Device	Device GUID.
Name	Device name.
Name change	'Yes' - Device name has changed.

Table 3: Preview of Device Changes - Column Headings (continued)

Import Preview Column Headings	Description
Source Port changes	'NN' - number of source ports that have settings changes, where NN is an integer number.
Dest Port changes	'NN' - number of destination ports that have settings changes, where NN is an integer number.
Source Flow changes	'NN' - number of source flows that have settings changes, where NN is an integer number.
Dest Flow changes	'NN' - number of destination flows that have settings changes, where NN is an integer number.

Allowing Duplicate Port Names on Import

For Port Names, it is possible to override the checking and perform an import with duplicate Port Names, if required.

To allow duplicate Port Names when importing spreadsheet data:

1 First, clear other issues that there might be from the duplicate scan.

This should leave only a duplicate 'Port Name(s) alert' in the **Spreadsheet Duplicate Scan** dialog that results from known Port Name duplicates that you want to allow.

2 Close the **Spreadsheet Duplicate Scan** dialog.

Then, in the **Import Preview** dialog:

3 Select the **Allow Duplicate Port Names** option.

The **Import** button should become ungrayed-out. See Figure 18-29.

4 Click **Import** to begin the import.

> IMPORTANT   With **Allow Duplicate Port Names** selected in the Import
> Preview dialog, duplicate Port Name values are allowed when
> importing. However, you should take care that such duplicate value
> entries will not impact their system.
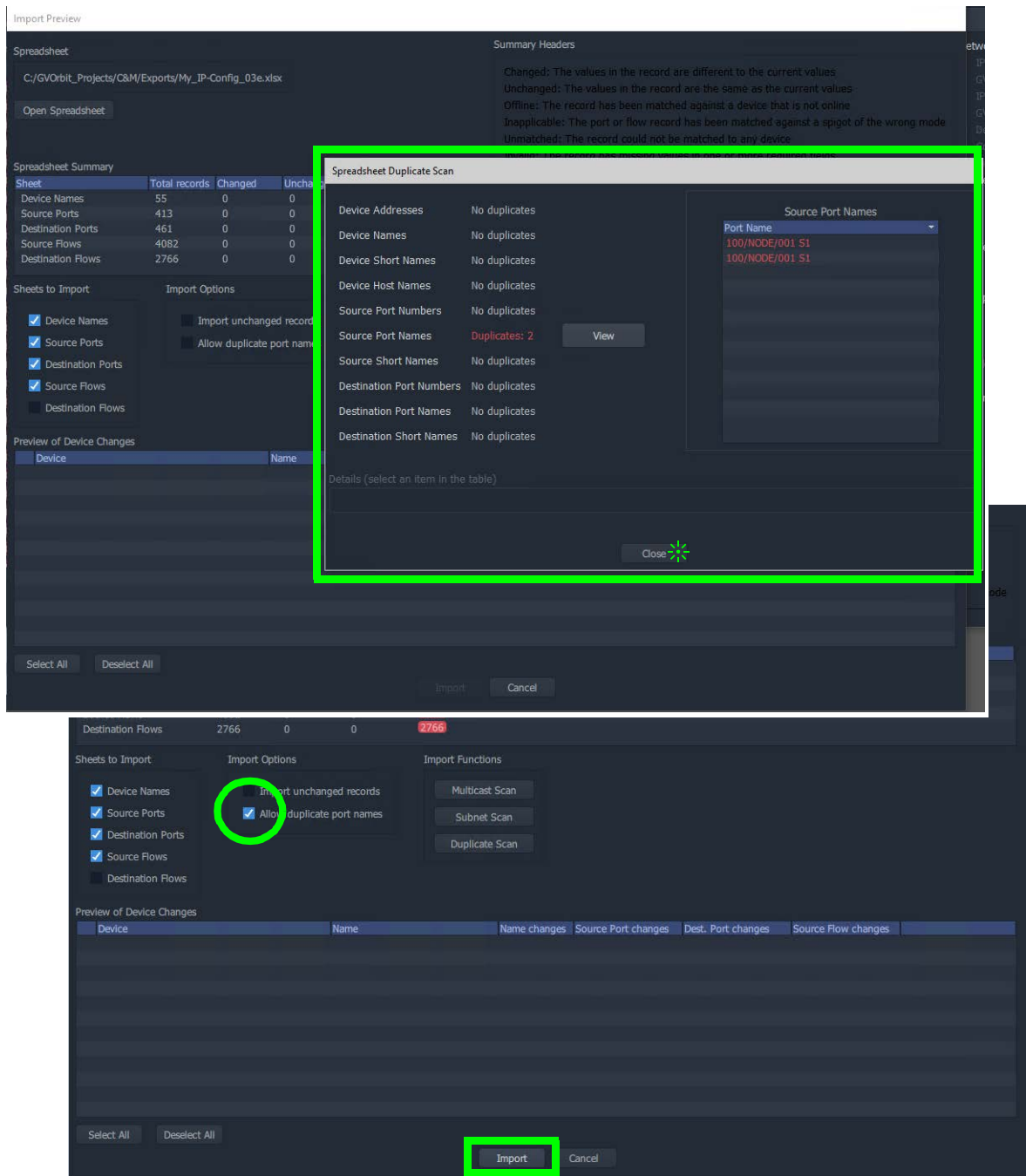
Fig. 18-29: Allowing Duplicate Port Names when Importing from a Spreadsheet

Getting Started with Spreadsheet Import

The **IP Configuration** spreadsheet can be created from scratch. However, when getting started, it is often easier to first export a spreadsheet from the **IP Configuration** tool in GV Orbit Client. This 'starting' **IP Configuration** should have discovered all of the devices in the GV Orbit system. The resulting exported spreadsheet will then contain all of the discovered devices in the GV Orbit system.

The spreadsheet should be edited to add router port numbers, device and source port names, multicast address details etc. Finally, the spreadsheet is imported into the **IP Configuration** tool of GV Orbit Client, and its information is validated and then is passed to the rest of the GV Orbit system.

This section describes:

- Step 1: Exporting a Spreadsheet, on page 824.
- Step 2: Editing a Spreadsheet, on page 826.
- Step 3: Importing a Spreadsheet, on page 829.

See Appendix B, IP Configuration Spreadsheet Appendix, on page 839, for more information on the spreadsheet.

> **Note:** The 'Export' and 'Import' facility can be used to take a snapshot of settings and restore settings.

Step 1: Exporting a Spreadsheet

To export a spreadsheet which contains all discovered devices, in the **Devices** tab: See also IP Configuration of End Point Devices and Spreadsheet Import, on page 75.

1 Ensure that the filter text field is empty (see Figure 18-30).

Filter text field

Listed devices
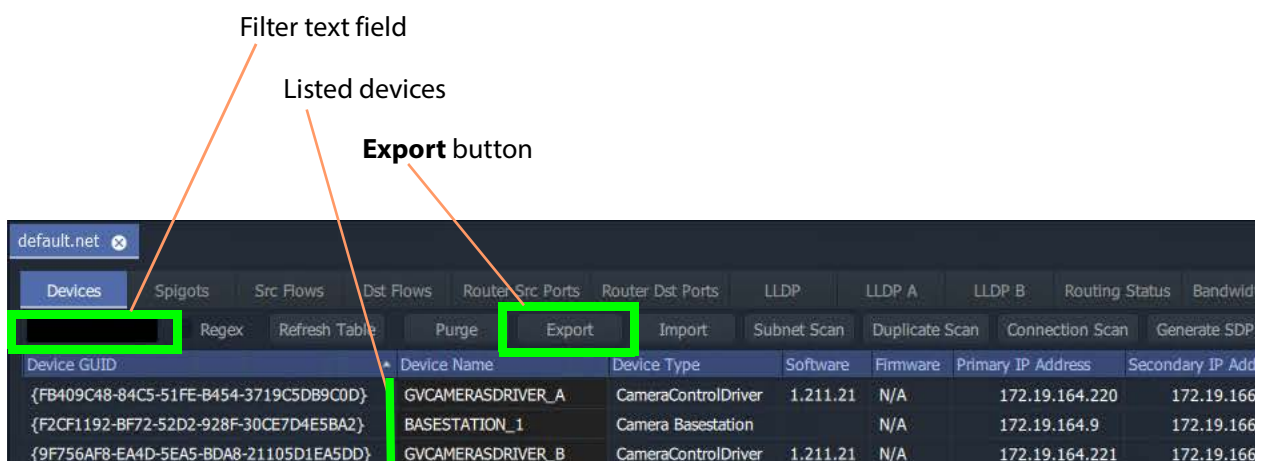
Export button

Fig. 18-30: Devices Tab - Export Button

2 Check that all devices are listed in the tab.

3 Click the **Export** button.

A small dialog window appears.
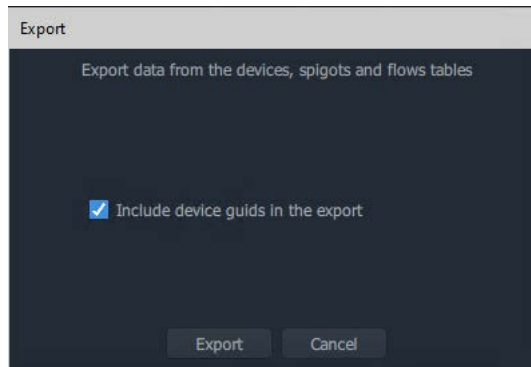
Fig. 18-31: Export Dialog

4 Select 'Include device GUIDs'.

5 Click **Export**.

6 Select a filename and location to save the spreadsheet in,
and click **Save**'

An exported spreadsheet is created
and a confirmation dialog is shown which lists how many records have been saved:
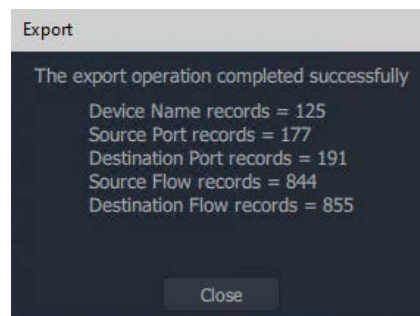
Fig. 18-32: Export Dialog (Export Completed)

7 Click **Close**.

The blank settings of the new project have been exported to a spreadsheet file (extension
.xlsx).

Spreadsheet Format

See Appendix B, IP Configuration Spreadsheet Appendix, on page 839 for more information on the spreadsheet.

	A	B	C	D	E
1	GUID	IP Address	Device Name	Short Name	Host Name
2	{00000000-0000-0000-0000-200000000000}	172.168.100.52	100/NODE/001	Shorty3	Hosty3
3	{00000000-0000-0000-0000-300000000000}	172.168.100.53	100/NODE/002	Shorty4	Hosty4
4	{00000000-0000-0000-0009-000000000000}	172.168.100.69	100/NODE/003	Shorty19	Hosty19
5	{00000000-0000-0000-0008-000000000000}	172.168.100.68	100/NODE/011	Shorty18	Hosty18
6	{00000000-0000-0000-0000-400000000000}	172.168.100.54	100/NODE/021	Shorty5	Hosty5
7	{00000000-0000-0000-0000-500000000000}	172.168.100.55	100/NODE/022	Shorty6	Hosty6
8	{00000000-0000-0000-0000-600000000000}	172.168.100.56	100/NODE/023	Shorty7	Hosty7
9	{00000000-0000-0000-0000-700000000000}	172.168.100.57	100/NODE/024	Shorty8	Hosty8
10	{00000000-0000-0000-0000-800000000000}	172.168.100.58	100/NODE/025	Shorty9	Hosty9
11	{00000000-0000-0000-0000-900000000000}	172.168.100.59	100/NODE/041	Shorty10	Hosty10
12	{00000000-0000-0000-0001-000000000000}	172.168.100.61	100/NODE/042	Shorty11	Hosty11
13	{00000000-0000-0000-0002-000000000000}	172.168.100.62	100/NODE/043	Shorty12	Hosty12
14	{00000000-0000-0000-0003-000000000000}	172.168.100.63	100/NODE/044	Shorty13	Hosty13
15	{00000000-0000-0000-0004-000000000000}	172.168.100.64	100/NODE/045	Shorty14	Hosty14
16	{00000000-0000-0000-0005-000000000000}	172.168.100.65	100/NODE/046	Shorty15	Hosty15
17	{00000000-0000-0000-0006-000000000000}	172.168.100.66	100/NODE/047	Shorty16	Hosty16
18	{00000000-0000-0000-0007-000000000000}	172.168.100.67	100/NODE/048	Shorty17	Hosty17
19	{00000000-0000-1000-0000-100000000000}	172.168.200.51	100/NODE/061		

Device Names | Source Ports | Destination Ports | Source Flows | Destination Flows

Fig. 18-33: IP Configuration Spreadsheet

Step 2: Editing a Spreadsheet

The worksheets in the spreadsheet file comprise:

- Device Names
- Source Ports
- Destination Ports
- Source Flows
- Destination Flows

Instructions on editing the spreadsheet to set up initial device information follow. Worksheets must be edited to:

- set up friendly device names, short names and host names (see Device Names Worksheet);
- set up an optional device descriptions (see Device Names Worksheet);
- set up user-defined traditional router port numbers and names (see Source Ports Worksheet and Destination Ports Worksheet);
- set up all possible potential sources (source flows) (see Source Flows Worksheet); and
- clear any existing routes, if required (see Destination Flows Worksheet (Clear Routes).

Device Names Worksheet

On the 'Device Names' worksheet, for each device:

1 Enter a friendly name in the **Device Name** column.

2 Enter a short, friendly device name in the **Short Name** column.

3 Enter a host name in the **Host Name** column.

4 Enter a description in the **Description** column.

	A	B	C	D	E	F
1	GUID	IP Address	Device Name	Short Name	Host Name	Description
2	{00000000-0000-0000-0000-200000000000}	172.168.100.52	100/NODE/001			
3	{00000000-0000-0000-0000-300000000000}	172.168.100.53	MyDeviceName	MyShort	HostName	DescriptiveTextHere...
4	{00000000-0000-0000-0009-000000000000}	172.168.100.69	100/NODE/003			
5	{00000000-0000-0000-0008-000000000000}	172.168.100.68	100/NODE/011			
6	{00000000-0000-0000-0000-400000000000}	172.168.100.54	100/NODE/021			
7	{00000000-0000-0000-0000-500000000000}	172.168.100.55	100/NODE/022			
8	{00000000-0000-0000-0000-600000000000}	172.168.100.56	100/NODE/023			
9	{00000000-0000-0000-0000-700000000000}	172.168.100.57	100/NODE/024			
10	{00000000-0000-0000-0000-800000000000}	172.168.100.58	100/NODE/025			
11	{00000000-0000-0000-0000-900000000000}	172.168.100.59	100/NODE/041			
12	{00000000-0000-0000-0001-000000000000}	172.168.100.61	100/NODE/042			

Device Names | Source Ports | Destination Ports | Source Flows | Destination Flows

Fig. 18-34: Enter Device Name

Source Ports Worksheet

On the 'Source Ports' worksheet, for each source port (device source spigot):

1 Enter the (traditional) router source port number in the **Port Number** column.

2 Enter the (traditional) router source port name in the **Port Name** column.

3 Enter a short source port name in the **Short Name** column.

> **Note:** A **Short Name** must be unique and not be more than 8 characters long. Short names that are longer than 8 characters are truncated upon import and then are checked if there is a duplicate with other truncated short names.

A	B	C	D	E	F	G
GUID	IP Address	Device Name	Spigot Index	Port Number	Port Name	Short Name
{00000000-0000-0000-0000-200000000000}	172.168.100.52	100/NODE/001	1	1001	100/NODE/001 S1	1S1
{00000000-0000-0000-0000-200000000000}	172.168.100.52	100/NODE/001	2	2000	100/NODE/001 S2	2S2
{00000000-0000-0000-0000-200000000000}	172.168.100.52	100/NODE/001	3	3	100/NODE/001 S3	3S3
{00000000-0000-0000-0000-200000000000}	172.168.100.52	100/NODE/001	4	4	100/NODE/001 S4	4S4
{00000000-0000-0000-0000-200000000000}	172.168.100.52	100/NODE/001	5	5	100/NODE/001 S5	5S5
{00000000-0000-0000-0000-200000000000}	172.168.100.52	100/NODE/001	6	6	100/NODE/001 S6	6S6
{00000000-0000-0000-0000-200000000000}	172.168.100.52	100/NODE/001	7	7	100/NODE/001 S7	7S7
{00000000-0000-0000-0000-200000000000}	172.168.100.52	100/NODE/001	8	8	100/NODE/001 S8	8S8
{00000000-0000-0000-0000-200000000000}	172.168.100.52	100/NODE/001	9	9	100/NODE/001 S9	9S9
{00000000-0000-0000-0000-200000000000}	172.168.100.52	100/NODE/001	10	10	100/NODE/001 S1	ZZ
{00000000-0000-0000-0000-200000000000}	172.168.100.52	100/NODE/001	11	11	100/NODE/001 S11	11S11

Device Names | Source Ports | Destination Ports | Source Flows | Destination Flows

Fig. 18-35: Enter Source Ports (Source Spigots) Details

Destination Ports Worksheet

On the 'Destination Ports' worksheet, for each source port (device source spigot):

1 Enter the (traditional) router destination port number in the **Port Number** column.

2 Enter the (traditional) router destination port name in the **Port Name** column.

3 Enter a short destination port name in the **Short Name** column.

> **Note:** A **Short Name** must be unique and not be more than 8 characters long. Short names that are longer than 8 characters are truncated upon import and then are checked if there is a duplicate with other truncated short names.

Fig. 18-36: Enter Destination Port (Spigot) Details

Source Flows Worksheet

On the 'Source Flows' worksheet, configure each source flow, edit the following columns:

1 **Flow Enabled** - Enter 'Y' to enable the source flow.

2 **Multicast Address** - Enter a multicast group IP address.

3 **Dst RTP Port** - Enter an IP port number.
(To define which IP port a source flow should use at a *destination* spigot.)

4 **Src RTP Port** - Enter an IP port number.
(To define which IP port a source flow should use at its *source* spigot.)

Fig. 18-37: Enter Source Flow Details

Destination Flows Worksheet (Clear Routes)

For the initial setting up of the spreadsheet, all routes can be cleared with the spreadsheet. On the 'Destination Flows' worksheet, configure each destination flow:

1 In the **Flow Type** column, enter 'None'.

2 Delete all entries in the following columns:
- **Flow Enabled**,
- **Multicast Address**,
- **Source Address**,
- **Dst RTP Port**; and
- **Src RTP Port** columns.

See Figure 18-38.

This will stop flows to all destinations, by clearing all routes.

Fig. 18-38: Destination Flows Worksheet AFTER editing.

Save

Spreadsheet editing is now finished.

1 Save the spreadsheet file.

Step 3: Importing a Spreadsheet

The spreadsheet contains **IP Configuration** data. It is automatically validated when being imported into the GV Orbit Client. The data is used by the **IP Configuration** tool and automatically passed on to the GV Orbit Control application for use in its routing.

> CAUTION
> Importing a spreadsheet into the IP Configuration is a potentially disruptive operation.
> This is because it may affect all existing devices and routes.
> To try and prevent unintentional importing and disruption, GV Orbit Client alerts you to the risk of the operation and presents an overt, prompting authorization step to go through.

The importing is presented below in the following steps:

- Step 3a: Import Preview, on page 830.
- Step 3b: Clearing Any Import Issues, on page 832.
- Step 3c: Import the Spreadsheet, on page 832.

Step 3a: Import Preview

To import the spreadsheet into the **IP Configuration** tool:

1 Select the **Devices** tab and click the **Import** button. See also IP Configuration of End Point Devices and Spreadsheet Import, on page 75.
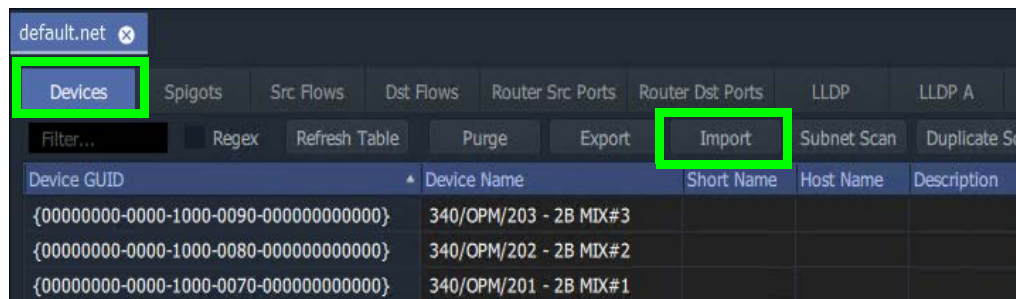
Fig. 18-39: Devices Tab Import Button

2 Select the required spreadsheet file to import and click **Open**.

The spreadsheet is opened and its contents are initially read and compared to the current data values in the IP Configuration tool automatically. Some preliminary data checks are done, checking for the uniqueness of spreadsheet values.
Note: The importing operation is NOT done yet.

An **Import Preview** dialog (see Figure 18-40) is then shown and if there are any issues found from the data checks, then a **Spreadsheet Duplicate Scan** dialog is also shown (see Figure 18-41), which reports any issues found from the data checking.

> **Note:** The preliminary data value checking that is carried out upon spreadsheet import is insensitive to case. For example, the duplicate checking will warn you that 'MVinput' is the same as 'MVINPUT'.

If there are issues, then the **Import** button in the **Import Preview** dialog is grayed out, preventing imports. This will be un-grayed out when issues are cleared.

(See Import Preview Dialog and Spreadsheet Duplicate Scan Dialog, on page 809, for

more information about the dialog.)

> **Note:** For information on the import data validation, see Import Preview Dialog and Spreadsheet Duplicate Scan Dialog, on page 809 and Import Data Validation - Duplicate Scan, on page 811.
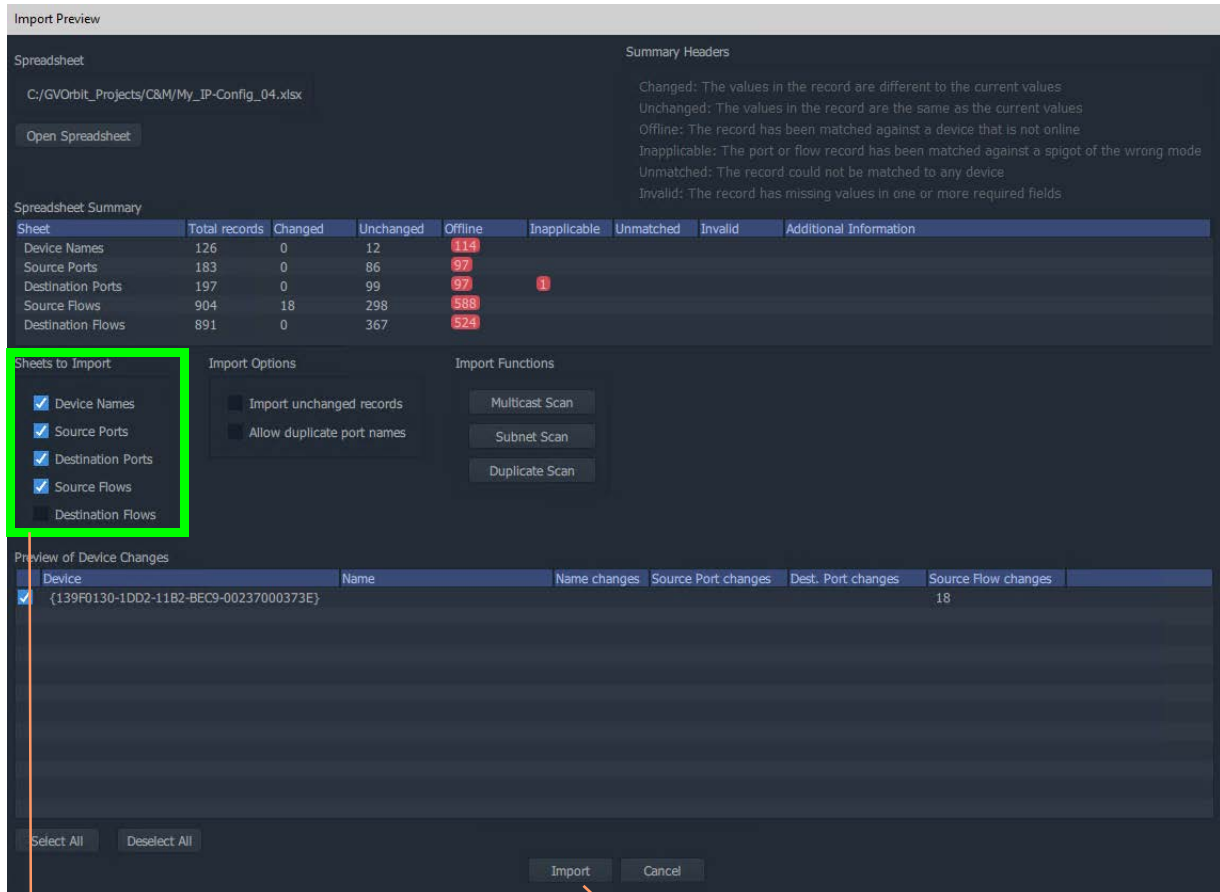
'Sheets to Import' section,
select *all* options for 'Getting Going' for the
first time.

Note: The **Import** button will be grayed out if there are any import issues (presented in the pop-up **Spreadsheet Duplicate Scan** dialog).

Fig. 18-40: Import Preview Dialog

Step 3b: Clearing Any Import Issues

Note: This dialog is shown *before* any importing of spreadsheet information, and it warns of any potential import issues that there are.
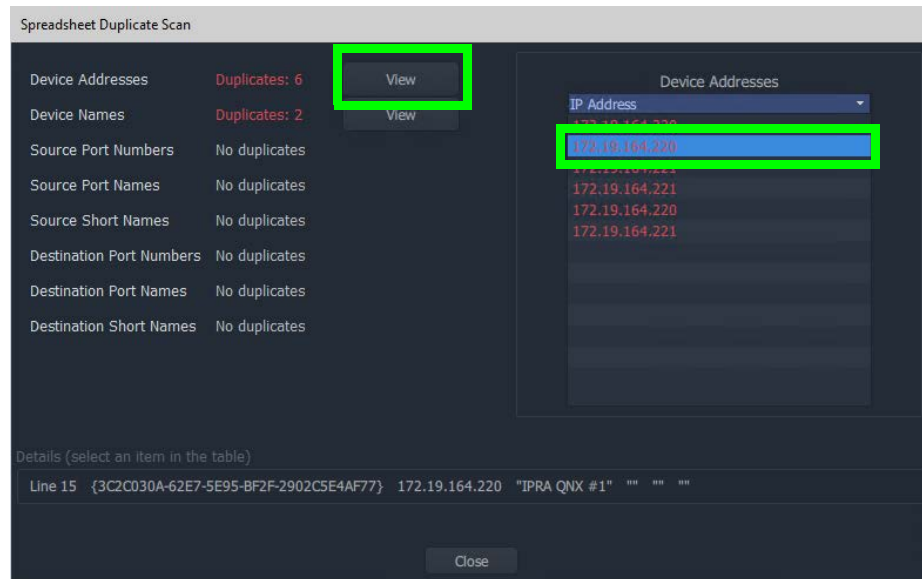
Fig. 18-41: Spreadsheet Duplicate Scan Dialog.

If there are any issues shown in the **Spreadsheet Duplicate Scan** dialog, then:

1 Inspect each issue in the dialog.

2 Re-visit the spreadsheet and correct any issues.

   (See Spreadsheet Duplication Scan Dialog, on page 811, and Resolving Duplicate Issues, on page 812.)

Finally:

3 **Close** the **Spreadsheet Duplicate Scan** dialog and **Cancel** the **Import Preview** dialog.

   This aborts the import.

4 Re-import the spreadsheet.

   Note: The default behavior on importing new values from a spreadsheet is to not allow duplicate values. For user cases where duplicate Port Names are required for some reason, there is a mechanism for getting round this. See Before Allowing Duplicate Port Names in an Import, on page 813.

Step 3c: Import the Spreadsheet

The **Import** button on the **Import Preview** dialog is:

• Grayed out when there are reported or unaccounted for import duplicate issues.

• Not grayed out when there are no issues or all issues are accounted for.

To import:

1   In the 'Sheets to Import' section of the **Import Preview** dialog,
    select the import options required.
    When 'Getting Going' for the first time, select *all* options.

2   Click **Import**.

    The importing of the spreadsheet information begins.

3   A **High Risk Alert** dialog is shown when importing a spreadsheet.
    See Figure 18-42a, b and c.

> IMPORTANT
> Importing is a potentially disruptive operation to any current IP routing
> being done by GV Orbit.
> When 'getting started' for the first time, no routing should be currently
> happening, it is alright to continue.

a) High risk operation alert message

b) Enter user project password

c) Authorization successful, press 'Next'
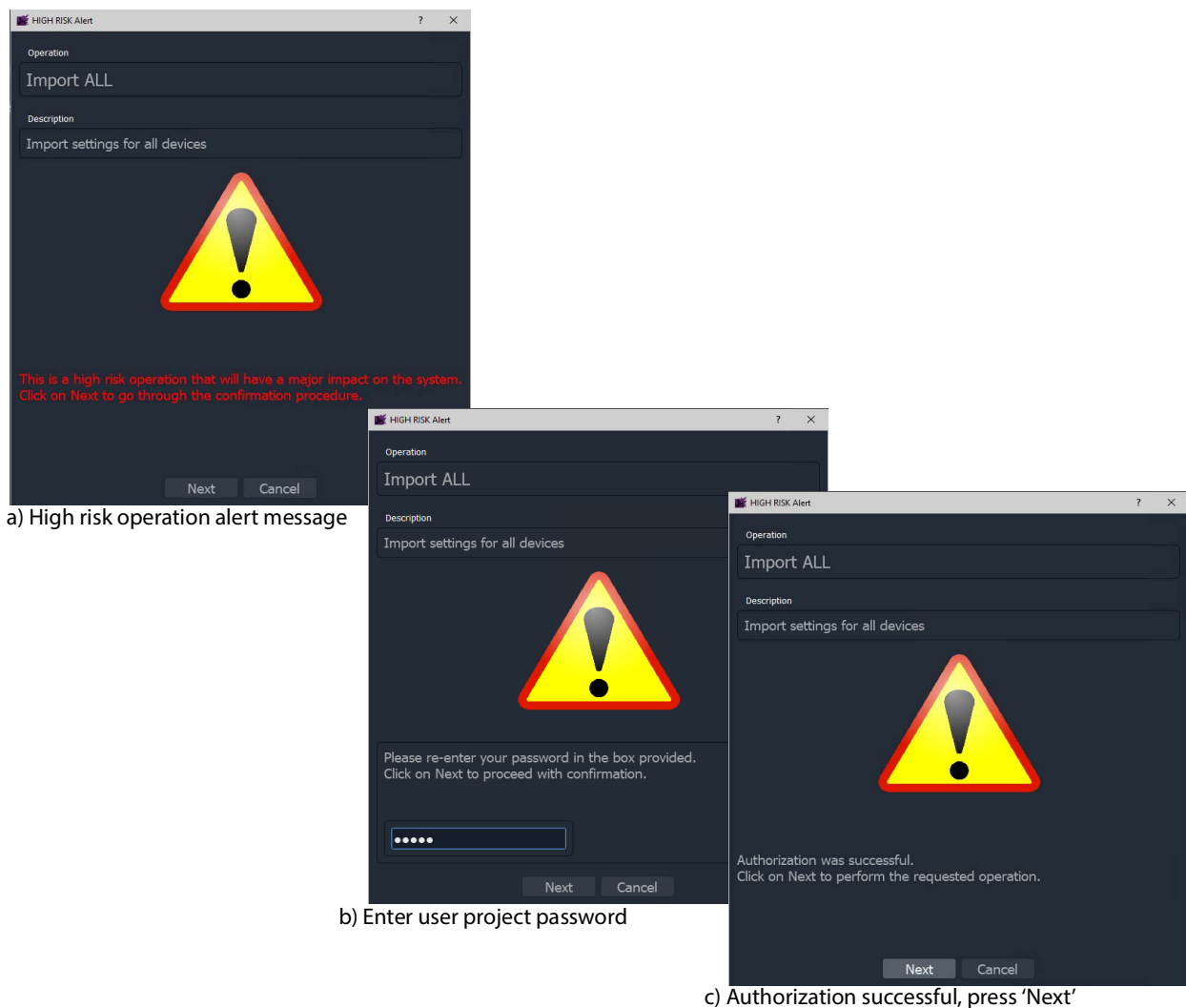
Fig. 18-42: HIGH RISK Alert and Authorization:
a) HIGH RISK Alert;   b) Enter User Password;   c) Authorization Successful.

4 Follow the on-screen instructions on the HIGH RISK dialogs to authorize the importing.

To abort the importing process, click **Cancel** on the HIGH RISK dialog.
To continue, press **Next** on the dialog.

Entry of the user password is required.
after which, to begin importing, press **Next** in the dialog. (Pressing **Cancel** aborts.)

The importing proceeds.

5 When the importing is complete,
an **Import** summary dialog shows a summary of what configuration settings have been restored.
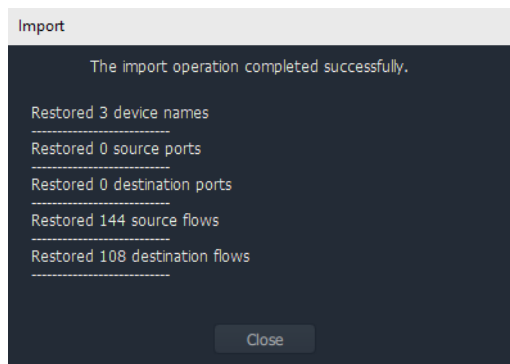
Fig. 18-43: Import Summary

6 Click **OK**.

The configuration in the spreadsheet has been imported into the **IP Configuration** tool in GV Orbit Client. The information is made available to GV Orbit Control for routing.

After import, in the **IP Configuration** tool:

- Devices will adopt the newly-set device names.
- Device ports will be mapped to the newly-defined router port numbers, with new port names.
- Device source spigots will be able to send out flows.
- Device destination spigots will be ready to receive flows.
- No flows will be routed.

> CAUTION
> Importing a spreadsheet into the **IP Configuration** is a potentially disruptive operation.
> This is because it may affect all existing devices and routes.
> To try and prevent unintentional importing and disruption, GV Orbit Client alerts you to the risk of the operation and presents an overt, prompting authorization step to go through.

> **Note:** Only settings for on-line devices are initially compared and then imported.

A

Routing Behaviours/Bindings Appendix

GV Orbit C&M projects contain C&M project screens and XY Panel screens (see Chapter 13, Routing Control - XY Routing Panel, on page 591) which use on-screen widgets and 'behind-the-scenes' GV Orbit Client Behaviours and Bindings.

Routing type Behaviours and Bindings may be used with on-screen Button widgets etc. on XY Panel screens or soft control panels to synthesize a custom router control panel.

These Routing Behaviours and Bindings are listed in Table A-1 and Table A-2 respectively.

> **Note:**
> It is recommended that an XY panel screen created through the XY Wizard is used as the basis of a custom routing panel. This may be edited in GV Orbit and customized as required.

Routing Behaviours

Table A-1: Routing Behaviours

Behavior	Parameters	Description
	Name, (RollCall) Address, +...	When triggered on an GV Orbit C&M project XY panel screen...
BPX	Source, Destination	Routes a defined Source to a defined Destination. (BPX, button per crosspoint)
Cancel	Mode	Cancels any selected Destination(s) and pre-selected Source(s).
Destination	Destination, Level	Provides access to information about a Destination, including its name, port number and the currently-routed Source.
Destination Button	Index, Destination, Mode	Enables a button to act like a Destination selection button.
Destination Level Button	Index	Enables a button to act like a Destination Level selection button.
Dialpad	Index, Sources, Clear, Delete	Enables a button widget to act like a Dial Pad button.
Dialup Tally	Sources	Allows the currently active Dialup value to be displayed (on a panel screen).

Table A-1: Routing Behaviours (continued)

Behavior	Parameters	Description
	Name, (RollCall) Address, +...	When triggered on an GV Orbit C&M project XY panel screen...
Filter	Sources	Applies a filter to the router Sources or Destinations.
Load Panel	Target	Opens the GV Orbit Client Routing Panel in the client window or on a monitor display.
Page	Page Sources, Page Offset	Switches between router panel pages
Page Index	Page Sources, Index	Switches to a specific page index,
Page Tally	Page Sources	Allows the current page value to be displayed (on a panel screen).
Panel Lock	Mode	Toggles panel lock/unlock.
Protect	-	Protects a selected Destination.
Redo Button	-	Re-makes a route, used to implement a **Redo** button. (When placed on a panel schematic, enables **Redo** mode.)
Salvo	Salvo	Executes a salvo.
Source Button	Index, Source, Mode	Selects a Source.
Source Level Button	Index	Enables a button to act like a Source Level selection button.
Take	Mode	Router Take: Makes a route, used to implement a **Take** button. (When placed on a panel schematic, enables **Take** mode.)
Undo Button	Undo Requires Take, Undo Timeout	Undoes a route, used to implement an **Undo** button. (When placed on a panel schematic, enables **Undo** mode.)

Routing Bindings

Table A-2: Routing Bindings

Binding	Parameters	Description
	Name, +...	Binding binds a...
Panel Lock	Source Behaviour, Locked Caption, Unlocked Caption	...Widget to Panel Lock function.
Router Button	Source Behaviour, Normal Style, Preset Style, Routed Style	...Routing Behaviour to a Button.

IP Configuration Spreadsheet Appendix

IP Configuration Spreadsheet Appendix

Introduction

This appendix outlines the format of the IP Configuration spreadsheet used by GV Orbit Client.

Certain IP addresses are reserved by GV Orbit Control and cannot be used. Refer to the Release Notes for more information. See Related Documentation, on page 19.

> **Note:** It is recommended that an exported spreadsheet from your system is used as the basis for entering settings for your system.

All IP endpoint settings (device name, spigot and flow settings etc.) of an GV Orbit Client IP routing network configuration (**IP Configuration**) may be exported (saved) to a file or imported from a file. The file is a spreadsheet file and it may be created off-line from scratch; or an exported spreadsheet may be used and edited off-line (which is easier).

The exported file is in a spreadsheet format and can:

- be edited;
- provide a 'template' spreadsheet;
- be used during system set up;
- be the primary source of information;
- be the Orbit project backup mechanism.

Import and Export Buttons

Exporting or importing is done in the **Devices** tab of the **IP Configuration** tool in GV Orbit Client. See also IP Configuration of End Point Devices and Spreadsheet Import, on page 75.

- Clicking on the **Export** or on the **Import** buttons in the tab's tool bar.

Fig. B-1: Devices Tab - Import and Export Buttons

Exported Spreadsheet File

Fig. B-2: IP Configuration Spreadsheet

The exported file is in an MS Office spreadsheet format (file extension .xlsx).
There are five tabbed work sheets in the file:

- Device Names Work Sheet
- Source Ports and Destination Ports Worksheets
- Source Flows and Destination Flows Worksheets

Each worksheet contains two sorts of data columns:

- **Key Field** columns - these list parameters which define a **Device**, a **Spigot** or a **Flow**. These fields simply report existing settings and *should not be changed*.
- **Value Field** columns - these hold user-defined values that *may be changed in the spreadsheet*.

Thus, each worksheet row has **Key Fields** and **Value Fields**.

Device Names Work Sheet

Each row represents a **Device**. A **Device** is defined either by the device GUID or by the device IP address; the IP address can be either the primary (fabric A) or secondary (fabric B) address. If both the GUID and the IP address are present then the GUID is used to identify the device.

Key field columns   Value Field columns

	A	B	C
1	GUID	IP Address	Device Name
2	{13A4D16E-1DD2-11B2-989B-0023700022F5}		AMD4010-02
3	{2E55E058-BEE1-4897-829E-85D5155E5E22}		Andrew Parr - Audio Live
4	{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1
5	{7AF93376-4D15-4727-8E88-54E9F754756A}		Cisco DCM
6	{00000000-0000-4000-0000-000000000000}		DEVICE4KTEST
7	{13A71B5E-1DD2-11B2-8E4C-0023700036B6}		EDGE25-01
8	{139986CE-1DD2-11B2-92A5-0023700022B8}		EDGE40-6-01
9	{FB409C48-84C5-51FE-B454-3719C5DB9C0D}	172.19.164.220	GVCAMERASDRIVER_A
10	{9F756AF8-EA4D-5EA5-BDA8-21105D1EA5DD}	172.19.164.221	GVCAMERASDRIVER_B
11	{13A060C0-1DD2-11B2-AECF-002370009176}		IPIL50
12	{139D2C70-1DD2-11B2-AACF-002370008F10}		IPO10
13	{167F687C-1DD2-11B2-9089-002370003505}		IPOD10

Each row represents a **Device**

Fig. B-3: Device Names Worksheet Example

In the Spreadsheet:

In the spreadsheet, the following fields are key value fields:

- **Device Name** (max 63 characters).
- **Short Name** (max 15 characters).
- **Host Name** (max 63 characters).
- **Description** (max 255 characters).

In the IP Configuration Tool:

In the **IP Configuration** tool, you can edit the following columns in the tool:

- **Device Name**.
- **Short Name**.
- **Host Name**.
- **Description**.

Source Ports and Destination Ports Worksheets

These two worksheets are similar. Each row represents a spigot on a device defined by the device GUID, or by the device IP address, or by the device name. On the device, a spigot is defined by a spigot number, **Spigot Index**.
If the GUID is present, it is used in preference to either the IP address or device name.
If the IP address is present, it is used in preference to the device name.

Key field columns   Value field columns

	GUID	IP Address	Device Name	Spigot Index	Port Number	Port Name	Short Name
2	{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	1			
3	{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	2			
4	{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	3			
5	{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	4			
6	{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	7	165	BASESTATION_1 S5	
7	{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	8	166	BASESTATION_1 S6	
8	{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	9	167	BASESTATION_1 S7	
9	{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	10	168	BASESTATION_1 S8	
10	{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		1			
11	{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		2			

Each row represents a **Source Spigot**

Fig. B-4: Source Ports Worksheet Example

Key field columns   Value field columns

	GUID	IP Address	Device Name	Spigot Index	Port Number	Port Name	Short Name
2	{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	11			
3	{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	12			
4	{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	13			
5	{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	14			
6	{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	15			
7	dfff5748-03b5-11e9-b6d7-00190f2dd0e2		PRISM	1			
8	{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		9			
9	{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		10			
10	{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		11			
11	{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		12			

Each row represents a **Destination Spigot**

Fig. B-5: Destination Ports Worksheet Example

In the Spreadsheet:

In the spreadsheet, the following fields are key value fields:
- **Port Number** (integer).
- **Port Name** (max 63 characters).
- **Short Name** (max 9 characters, but 8 characters for an IPRA routing-controlled system).

In the IP Configuration Tool:

In the **IP Configuration** tool, you can edit the following columns in the tool:
- **Port Name**.
- **Short Name**.
- **Port Number**.

Source Flows and Destination Flows Worksheets

These two worksheets are similar.

Each row represents an IP flow on a device defined by the device GUID, or by the device IP address, or by the device name. On the device, a spigot is defined by a spigot number, **Spigot Index**.
If the GUID is present, it is used in preference to either the IP address or device name.
If the IP address is present, it is used in preference to the device name.

> **Note:** **Flow Index** is for information only - created at **Export** and ignored during **Import**.
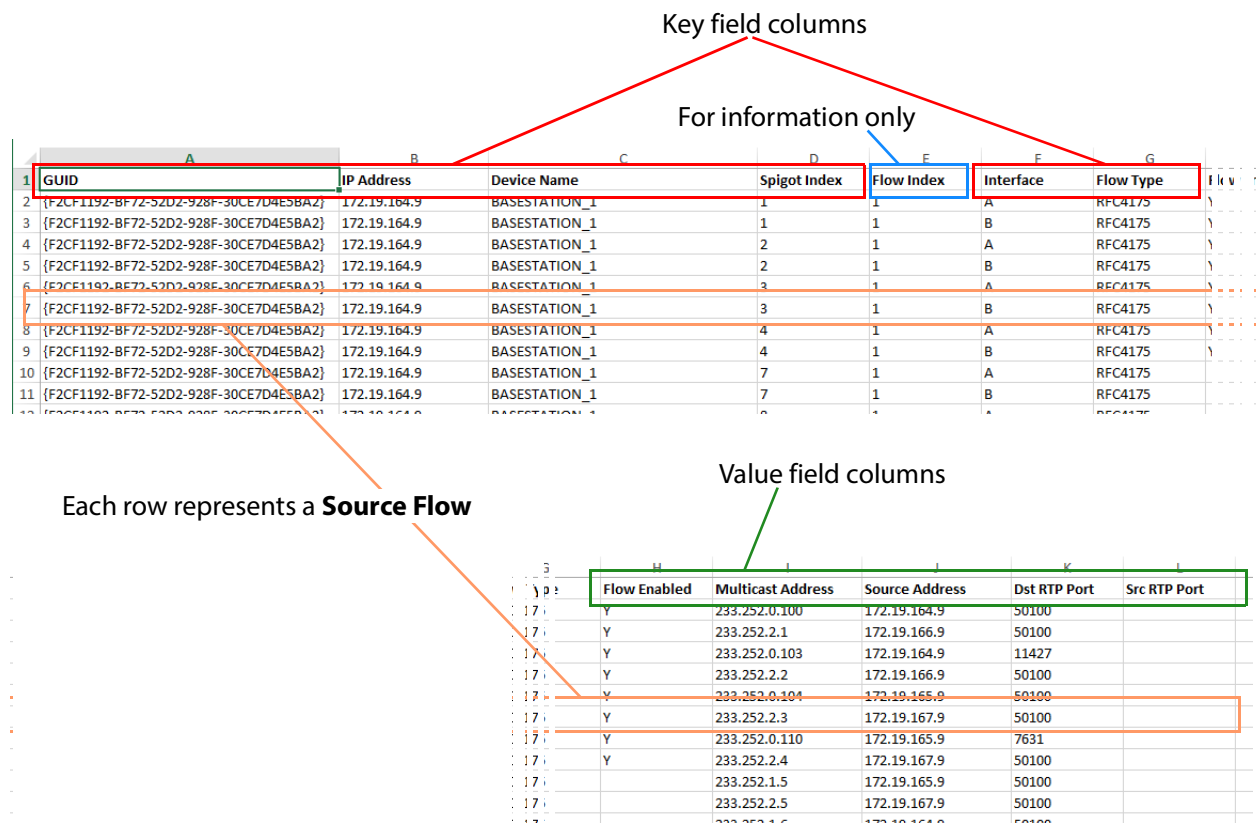
Fig. B-6: Source Flows Worksheet Example

Key field columns

For information only

	A	B	C	D	E	F	G	
1	GUID	IP Address	Device Name	Spigot Index	Flow Index	Interface	Flow Type	Flow E
2	{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	11	1	A	None	
3	{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	12	1	A	RFC4175	Y
4	{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	13	1	A	RFC4175	Y
5	{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	14	1	A	None	
6	{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	15	1	A	None	
7	dfff5748-03b5-11e9-b6d7-00190f2dd0e2		PRISM	1	1	A	None	
8	dfff5748-03b5-11e9-b6d7-00190f2dd0e2		PRISM	1	1	B	None	
9	{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		9	1	A	RFC4175	Y
10	{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		9	1	B	None	
11	{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		9	2	A	PCM	Y
12	{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		9	2	B	None	

Each row represents a **Destination Flow**

Value field columns

H	I	J	K	L
Flow Enabled	Multicast Address	Source Address	Dst RTP Port	Src RTP Port
Y				
Y				
Y	238.0.1.1	192.168.0.0	1234	
	239.20.1.200	192.168.14.14	1400	
Y	238.0.1.2	192.168.0.0	1234	

Fig. B-7: Destination Flows Worksheet Example

In the Spreadsheet:

In the spreadsheet, the following fields are key value fields.

- **Flow Enabled**.
- **Multicast Address**.
- **Source Address**.
- **Dst RTP Port**.
- **Src RTP Port**.

In the IP Configuration Tool:

In the **IP Configuration** tool, you can edit the following columns in each tab of the tool:

- **Flow Enabled**.
- **Multicast Group Address**.
- **Source IP Address**.
- **Dest RTP Port**.
- **Source RTP Port**.

Example Spreadsheet

Fig. B-8: Device Names Worksheet

Fig. B-9: Source Ports Worksheet

GUID	IP Address	Device Name	Spigot Index	Port Number	Port Name	Short Name
{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	11			
{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	12			
{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	13			
{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	14			
{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	15			
dfff5748-03b5-11e9-b6d7-00190f2dd0e2		PRISM	1			
{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		9			
{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		10			
{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		11			
{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		12			
{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		13			
{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		14			
{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		15			
{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		16			
{1399D4EE-1DD2-11B2-A7F1-002370005E08}	192.168.14.100		9			
{1399D4EE-1DD2-11B2-A7F1-002370005E08}	192.168.14.100		10			
{1399D4EE-1DD2-11B2-A7F1-002370005E08}	192.168.14.100		11			
{1399D4EE-1DD2-11B2-A7F1-002370005E08}	192.168.14.100		12			
{1399D4EE-1DD2-11B2-A7F1-002370005E08}	192.168.14.100		13			
{1399D4EE-1DD2-11B2-A7F1-002370005E08}	192.168.14.100		14			
{1399D4EE-1DD2-11B2-A7F1-002370005E08}	192.168.14.100		15			
{1399D4EE-1DD2-11B2-A7F1-002370005E08}	192.168.14.100		16			
{139A4A1E-1DD2-11B2-9FBF-002370006085}	192.168.6.1		1			
{139A4A1E-1DD2-11B2-9FBF-002370006085}	192.168.6.1		2			
{139A4A1E-1DD2-11B2-9FBF-002370006085}	192.168.6.1		3			
{139A4A1E-1DD2-11B2-9FBF-002370006085}	192.168.6.1		4			
{139A4A1E-1DD2-11B2-9FBF-002370006085}	192.168.6.1		5			
{139A4A1E-1DD2-11B2-9FBF-002370006085}	192.168.6.1		6			
{139A4A1E-1DD2-11B2-9FBF-002370006085}	192.168.6.1		7			
{139A4A1E-1DD2-11B2-9FBF-002370006085}	192.168.6.1		8			
{139A4A1E-1DD2-11B2-9FBF-002370006085}	192.168.6.1		9			
{139A4A1E-1DD2-11B2-9FBF-002370006085}	192.168.6.1		10			
{139A4A1E-1DD2-11B2-9FBF-002370006085}	192.168.6.1		11			
{139A4A1E-1DD2-11B2-9FBF-002370006085}	192.168.6.1		12			
{139A4A1E-1DD2-11B2-9FBF-002370006085}	192.168.6.1		13			

Device Names | Source Ports | **Destination Ports** | Source Flows | Destination Flows

Fig. B-10: Destination Ports Worksheet

GUID	IP Address	Device Name	Spigot Index	Flow Index	Interface	Flow Type	Flow Enabled	Multicast Address	Source Address	Dst RTP Port	Src RTP Port
{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	1	1	A	RFC4175	Y	233.252.0.100	172.19.164.9	50100	
{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	1	1	B	RFC4175	Y	233.252.2.1	172.19.166.9	50100	
{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	2	1	A	RFC4175	Y	233.252.0.103	172.19.164.9	11427	
{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	2	1	B	RFC4175	Y	233.252.2.2	172.19.166.9	50100	
{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	3	1	A	RFC4175	Y	233.252.0.104	172.19.165.9	50100	
{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	3	1	B	RFC4175	Y	233.252.2.3	172.19.167.9	50100	
{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	4	1	A	RFC4175	Y	233.252.0.110	172.19.165.9	7631	
{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	4	1	B	RFC4175	Y	233.252.2.4	172.19.167.9	50100	
{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	7	1	A	RFC4175		233.252.1.5	172.19.165.9	50100	
{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	7	1	B	RFC4175		233.252.2.5	172.19.167.9	50100	
{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	8	1	A	RFC4175		233.252.1.6	172.19.164.9	50100	
{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	8	1	B	RFC4175		233.252.2.6	172.19.166.9	50100	
{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	9	1	A	PCM		233.254.1.1	172.19.164.9	50104	
{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	9	1	B	PCM		233.254.3.1	172.19.166.9	50104	
{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	10	1	A	PCM		233.254.1.2	172.19.164.9	50104	
{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	10	1	B	PCM		233.254.3.2	172.19.166.9	50104	
{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		1	1	A	2022-6		239.20.1.100	192.168.14.14	1400	
{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		1	1	B	2022-6		239.20.1.200	192.168.14.14		
{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		1	2	A	RFC4175					
{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		1	2	B	RFC4175	Y	239.20.2.200	192.168.14.14	1400	
{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		1	3	A	PCM					
{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		1	3	B	PCM	Y	239.20.3.200	192.168.14.14	1400	
{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		1	4	A	PCM					
{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		1	4	B	PCM					
{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		1	5	A	PCM					
{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		1	5	B	PCM					
{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		1	6	A	PCM					
{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		1	6	B	PCM					
{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		1	7	A	Meta					
{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		1	7	B	Meta					
{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		2	1	A	2022-6		239.20.1.100	192.168.14.14	1400	
{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		2	1	B	2022-6		239.20.1.200	192.168.14.14	1400	
{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		2	2	A	RFC4175					
{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		2	2	B	RFC4175					
{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		2	3	A	PCM					

Device Names | Source Ports | Destination Ports | **Source Flows** | Destination Flows

Fig. B-11: Source Flows Worksheet

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	GUID	IP Address	Device Name	Spigot Index	Flow Index	Interface	Flow Type	Flow Enabled	Multicast Address	Source Address	Dst RTP Port	Src RTP Port		
2	{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	11	1	A	None							
3	{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	12	1	A	RFC4175	Y						
4	{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	13	1	A	RFC4175	Y						
5	{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	14	1	A	None							
6	{F2CF1192-BF72-52D2-928F-30CE7D4E5BA2}	172.19.164.9	BASESTATION_1	15	1	A	None							
7	dfff5748-03b5-11e9-b6d7-00190f2dd0e2		PRISM	1	1	A	None							
8	dfff5748-03b5-11e9-b6d7-00190f2dd0e2		PRISM	1	1	B	None							
9	{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		9	1	A	RFC4175	Y	238.0.1.1	192.168.0.0	1234			
10	{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		9	1	B	None		239.20.1.200	192.168.14.14	1400			
11	{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		9	2	A	PCM	Y	238.0.1.2	192.168.0.0	1234			
12	{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		9	2	B	None							
13	{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		9	3	A	PCM	Y	238.1.1.2	192.168.0.0	1234			
14	{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		9	3	B	None							
15	{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		9	4	A	PCM	Y	238.2.1.2	192.168.0.0	1234			
16	{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		9	4	B	None							
17	{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		9	5	A	PCM	Y	238.3.1.2	192.168.0.0	1234			
18	{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		9	5	B	None							
19	{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		9	6	A	None							
20	{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		9	6	B	None							
21	{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		10	1	A	RFC4175	Y	238.0.2.1	192.168.0.0	1234			
22	{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		10	1	B	None		239.20.1.200	192.168.14.14	1402			
23	{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		10	2	A	PCM	Y	238.0.2.2	192.168.0.0	1234			
24	{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		10	2	B	None							
25	{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		10	3	A	None							
26	{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		10	3	B	None							
27	{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		10	4	A	None							
28	{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		10	4	B	None							
29	{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		10	5	A	None							
30	{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		10	5	B	None							
31	{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		10	6	A	None							
32	{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		10	6	B	None							
33	{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		11	1	A	RFC4175	Y	238.0.3.1	192.168.0.0	1234			
34	{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		11	1	B	None		239.20.1.200	192.168.14.14	1404			
35	{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		11	2	A	PCM	Y	238.0.3.2	192.168.0.0	1234			
36	{1399119E-1DD2-11B2-9488-002370006695}	192.168.9.100		11	2	B	None							

Device Names | Source Ports | Destination Ports | Source Flows | **Destination Flows** | ⊕

Fig. B-12: Destination Flows Worksheet

Network Device Advance Control (NDAC) NP0017

The following Network Device Advance Control (NDAC) NP0017 commands are supported.

General commands

CommandId	Name	Handling
0x0000 300A	Execute System Salvo	Triggers a salvo created in GV Orbit Control by referring to it by the "external ID" of the salvo.
0x0000 310E	Register For Data Changes	Registers the client for changes to the labels within GV Orbit Control and notifies it with a '0x0000 310C Notify Mnemonic Change' when some labels are changed in GV Orbit Control.

Device-based support

Note: We recommend to northbound control systems to use Device-base commands as gaps are properly supported.

The following set of NP0017 device-based commands for support of crosspoints and labels have been implemented in the NDAC.

CommandId	Name	Handling
0x0000 3000	Take Source To Destination	Performs a crosspoint change
0x0000 3002	Lock, Protect and Release Device	User Id of command taken into account, when performing operation. Apply LPR state on a specific input device and level, see "lock protect release level on device" command (0x00003002). See also Setting a User ID for Lock, Protect, and Release with NDAC NP0016 / NP0017 Northbound Interfaces, on page 487.
0x0000 3004	Register for Changes to Device	Registers the client for changes to the port and notifies it with a '0x0000 300B Device Status Changed' when the crosspoint changes in GV Orbit Control.
0x0000 3006	Get Destination Status	Returns the current crosspoint status.
0x0000 3008	Get Device LPR Status	Returns the output's current lock/protect/release status. If a user has an "external ID" value configured it is returned, otherwise 0 is returned.

CommandId	Name	Handling
0x0000 3012	Get Mnemonics	Allows client to retrieve the mnemonics for 'all devices', 'levels', 'sources', 'destinations' and 'categories'. Limited to 8 first characters of the "Short name" property. Categories are not supported.
0x0000 3016	Device All Levels Take	Performs a take between a source and destination on all the available levels.
0x0000 3017	Get Simple Device Status	Provides the input connected to a destination device. Returns all levels including sub-levels of composite levels.
0x0000 3018	Get Device Levels	Returns the levels associated to a device. • Returns all levels including sub-levels of composite levels. • Returns the levels with the right device id.
0x0000 3022	Get Extended Mnemonics	Returns associated device mnemonics. Only types 1,2,3 and 4 are handled. No limit on name length. This returns no category information.
0x0000 302B	Get Contents For Category	This returns no category information.
0x8000 300B	Device Output Changed Response	This is a response message sent back by clients after GV Orbit Control sends out a 0x0000 300B. GV Orbit Control simply ignores these messages.

Details about device id and level numbers

- The *Device ID* fields used in the device-based commands are 1-based values. Meaning that *Source Device ID* 1 in a command matches the logical source with external id 1 in GV Orbit Control.
- The *Virtual Level ID* field used in the device-based commands are 1-based values. Meaning that *Virtual Level ID* 1 in a command matches the logical level with ID 1 (SDI) in GV Orbit Control.

Port-based support

GV Orbit Control supports the following set of NP0017 port-based commands in the NDAC.

CommandId	Name	Handling
0x0000 3001	Take Input To Output	Performs a crosspoint change
0x0000 3003	Lock, Protect and Release Port	User Id of command taken into account, when performing operation. Apply LPR state on a specific input port and level, supports NP0017 "lock protect release port" command (0x00003003). See also Setting a User ID for Lock, Protect, and Release with NDAC NP0016 / NP0017 Northbound Interfaces, on page 487.
0x0000 3005	Register for Changes to Port	Registers the client for changes to the port and notifies it with a '0x0000 300C Physical Port Changed' when the crosspoint changes in GV Orbit Control.

CommandId	Name	Handling
0x0000 3007	Get Physical Crosspoint Status	Returns the current crosspoint status.
0x0000 3009	Get Physical LPR Status	Returns the output's current lock/protect/release status. If a user has an "external ID" value configured it is returned, otherwise 0 is returned.
0x0000 3014	Get Physical Level Dimensions	Returns the logical level ids and size for the area being controlled.
0x0000 3015	Get Mnemonic For Ports	Returns the first 8 characters of 'Short name' property for the requested input or output port.
0x0000 3025	Get Extended Mnemonics For Ports	Returns the full 'Short name' property for the requested input or output port. Not limited in length.
0x8000 300C	Physical crosspoint status response.	This is a response message sent back by clients after GV Orbit Control sends out a 0x0000 300C. GV Orbit Control simply ignores these messages.

Details about port and level numbers

- The *Input Port* and *Output Port* fields used in the port-based commands are 0-based values. Meaning that *Input Port* 0 in a command matches the logical source with external id 1 in GV Orbit Control.
- The port numbers (external Id values) should be sequential in GV Orbit Control. That is, port-based commands do not work properly if there are gaps in the external IDs.
- The *Physical Level ID* field used in the port-based commands are 1-based values. Meaning that *Physical Level ID* 1 in a command matches the logical level with ID 1 (SDI) in GV Orbit Control.

User ID and Lock, Protect, and Release

User ID is a concept found in some protocols such as NP0016 and NP0017. It allows a northbound controller to identify the user which is performing lock/protect or take operations. In turn GV Orbit Control, will try to match the provided user ID to one of its users by looking up the **External Id** parameter value and perform the operations internally using it.

See also Setting a User ID for Lock, Protect, and Release with NDAC NP0016 / NP0017 Northbound Interfaces, on page 487.

NOTE: GVG NP and Probel SW-P-08 protocols do not have user ID concepts, so all their operations are performed as the GV Orbit Control *admin* user.

GV Orbit Control user external id configuration

NP0016 and NP0017 protocols provide the user ID for various operations. The user ID is defined as an unsigned integer value from 0 to 4294967295 but it's recommended to NOT use values beyond 2147483647 to avoid any conversion or any special handling of users ID in GV Orbit Control systems. If the recommendation cannot be applied, please contact

Grass Valley support for further details on how to configure those values in GV Orbit Control systems. See Grass Valley Technical Support, on page 862.

User IDs used by Northbound Control Systems

NDAC Client	User ID
iControl - NP0017 device based	0 An iControl system property can be configured to change this.
iControl - NP0017 port based	0
iControl - NP0016	61441 (0xF001)
GV Orbit Routing service - NP0017 device based	0 or **Control External Id** parameter; see above.
Image Video - NP0017 device based	0

Troubleshooting

For troubleshooting, GV Orbit Control has **GV Orbit Control** *audit.logs* found on GV Orbit Admin web interface under **Log Files** that show the user name and its external ID, the northbound interface (for example, NP0017), type of commands (Device-based, Port-based, etc.) and if the command was received from a panel. Refer to **Log Files Task** in the *GV Orbit Admin Guide*. See Related Documentation, on page 7.

How to...

How to configure iControl or Kaleido to control GV Orbit Control using NP0017 device-id-based driver

1 Add and configure a physical router:

   a Add the physical router in router manager or Xedit.

   b Select the 'NVEP NV9000 - Device Takes (NP0017)' router protocol.

   c Set the Connection type to: TCP/IP

   d Enter the GV Orbit Control controller IP address.

   e Set the TCP/IP port to 9193 + 'external id'. For example: if the area 'external id' in GV Orbit Control is '0' use port 9193, if area 'external id' in GV Orbit Control is '1' use port 9194.

   f Add a physical level.

   g Configure its size and enter any number in the 'Level or frame ID' field. Kaleido and iControl only do all 'level takes'.

     The matrix size should be at least the 'amount of sources of the topology with the most sources' X 'amount of destinations of the topology with the most destinations' as shown in the GV Orbit Control Alias Editor of the area. If you intend to remove/add sources or destinations in GV Orbit Control you should make the router size bigger as 'NP0017 ID' aren't reused.

2 Create a logical router:

    a Set the size and add the logical level.

      The logical level can be a subset of all the physical inputs or outputs in GV Orbit Control. That way you can control only certain sources or destinations.

    b Select the physical levels configured.

    c Perform the auto-map of sources and destinations.

    d Save.

3 Control GV Orbit Control using router matrix.

How to configure iTX to control GV Orbit Control using NP0017 device-id-based driver

- Create a router in iTX and select the 'NV9000' driver.

How to configure NV9000 to control GV Orbit Control using NP0017 device-id-based driver

- NV9000 doesn't support this mode of communication with a router controller.

How to configure iControl or Kaleido to control GV Orbit Control using NP0017 port-based driver

1 Add and configure a physical router:

    a Add the physical router in router manager or Xedit.

    b Select the 'NVEP NV9000 - Port Takes (NP0017)' router protocol.

    c Set the Connection type to: TCP/IP

    d Enter the GV Orbit Control controller IP address.

    e Set the TCP/IP port to 9193 + 'external id'. For example: if the area 'external id' in GV Orbit Control is '0' use port 9193, if area 'external id' in GV Orbit Control is '1' use port 9194.

    f Add a physical level.

    g Configure its size and enter '1' in the 'Level or frame ID' field.

      The matrix size should be the total amount of source and destination 'External IDs' within the GV Orbit Control Alias Editor of the area.

    h Add other levels as needed.

2 Create a logical router:

    a Set the size and add the logical level.

      The logical level can be a subset of all the physical inputs or outputs in GV Orbit Control. That way you can control only certain sources or destinations.

    b Select the physical levels configured.

    c Perform the auto-map of sources and destinations.

    d Save.

3 Control GV Orbit Control using router matrix.

How to configure NV9000 to control GV Orbit Control using NP0017 port based driver

1 Configure the 'area id' in GV Orbit Control to '0'.

2 Access the SE-Utilities application.

3 Add a router:

a Go to Configuration > Routers and click the 'Add router' button.

b Enter a name for the router.

c Select 'NV Control System Ethernet' as the protocol

d Click next.

e Add a Physical Level and configure the level '#' value to match the GV Orbit Control logical level 'external Id' from within Area.

f Enter '0' for the 'Input Start' and 'Output Start'.

g Enter the number of GV Orbit Control inputs - 1 in 'Input End'

h Enter the number of GV Orbit Control outputs - 1 in the 'Output End'

4 Add a level set:

a Go to Configuration > Level Sets and click the 'add level set' button.

b Enter a name for the level set.

c Select a 'Virtual Level' value for 'display index' 1.

d Select a Physical level from the pull down.

5 Add devices:

a Go to Configuration > Devices and click 'Add Device' button.

b Enter a mnemonic, select a level set and optionally enter a description.

c Click the 'Next' button.

d In the 'Device Level Detail' section enter the input or output numbers used by the Device.

e Repeat to add more devices.

6 Apply the DB to the controller:

a Go to System Management and select the NV9000 controller.

b Click the 'Write configuration to NV9000' button.

c Once the copying is done, click the 'Restart controller 1' button.

7 Control GV Orbit Control using SE-Utilities:

a Go to System Management > NV9000 controller > Routers and select the router representing GV Orbit Control.

There is a bug in SE-Utilities when output 0 is used. It's status isn't displayed in the 'Connections' table. If you wish to view the status of output 0, you can change the 'Starting Output' value to 0 instead of 1, but you will loose the status of the last output. The 'Display Count' value cannot be higher than the last output number of the physical level, which is one less than the output count when using 0-based values.

b You can perform takes by using 0-based input and output values.
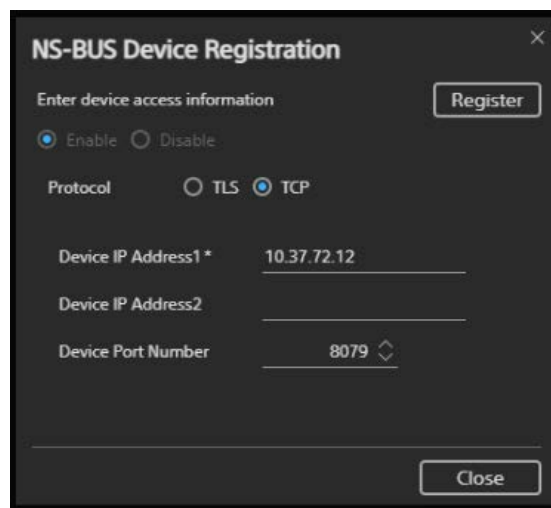
Northbound Control through Sony LSM (NS-BUS Router Matrix protocol)

GV Orbit Control system's northbound interface has the ability to control crosspoints through Sony LSM (NS-BUS router matrix protocol).

With this integration, logical sources/destinations from GV Orbit Control systems, including those created for NMOS devices, are now available northbound to be used by Sony panels and commands received through *NS-BUS router matrix protocol* are handled.

LSM does not allow the configuration of the TCP port to which it connects to on an NS-BUS router device and uses 9720 by default. Because of this limitation, only one area of GV Orbit Control systems can be controlled. GV Orbit Control systems allow control of the area with the lowest external ID through the NS-BUS protocol.

When adding a GV Orbit Control system as an NS-BUS Device in the LSM configuration, the selected Protocol must be TCP and the Device Port Number value must be 8079. Device IP Address1 field should be the Virtual IP address of the GV Orbit Control system. Device IP Address2 field must be empty.

See Configuring a Controller Group, on page 179 for the Virtual IP address of the GV Orbit Control system.

3G Proxy	An ST-2110 video IP stream representing another video signal in a production system. The proxy has the same video and audio content as the signal it represents. The proxy's video standard is '3G'.
Alarm	An indication that a component or device or module or unit within a facility is not operating at normal established parameters.
Alarm Acknowledgment	An on-line, live action to notify other users that new alarms were raised in a facility. This is usually manually done by a user and is usually followed by actions to resolve cause of the alarms in question. Alarms in the system will flash when raised, or be in some alert state, until they are acknowledged.
Client	Computer software that accesses services made available by a server. The server itself resides on a different piece of computer hardware. The client can be downloaded from the server on a local computer.
Client Domain	A GVOP Domain used by the GV Orbit Client to interact with devices and services in a GV Orbit system.
Cluster	Multiple devices grouped or merged together to increase the capacity of inputs, outputs, or processing power.
Clustered Multiviewer Project, **Clustered MV Project**	A GV Orbit project type which defines one or more video walls served by a cluster of multiviewer devices.
Domain	A group of devices on a network that are administered as a unit with common rules and procedures.
Dynamic Destination Assignment	A mode of operation of a Clustered Multiviewer project where video wall tiles are automatically assigned a router destination when a Room Layout changes, based on the needs of the currently-shown Room Layout. Dynamic assignment can apply to all tiles, or a sub-set of tiles on the video wall.
Fabric	A combination of hardware and software that forms a network.
Fabric A & Fabric B	Two identical network systems that form an IP media network with a redundant network topology.
GV Orbit Client	Graphical client user application in a GV Orbit configuration, control and monitoring system. A user can run various projects in a client and can configure devices, control routing, and monitor systems. Graphical soft control and monitoring user panels can be designed and run. Graphical video walls can be designed for multiviewers.

GV Orchestration Protocol, GVOP	The main messaging protocol used in GV Orbit configuration, control and monitoring systems.
GVOP Domain	A GV Orbit system employs GVOP Domains to segregate internal communications. The various GV Orbit services, system devices, and GV Orbit Client applications all communicate with one another; communications may be segregated by using GVOP Domains.
GVOP Domain ID	A GV Orbit system employs GVOP Domains specified with a Domain ID number (1 to 252).
Head, Head Display Output, Multiviewer Output	A multiviewer output to be shown on a monitor display. The MV-821-IP multiviewer has up to 12 Head Display Outputs and offers these as signals on rear physical connectors and as full ST-2110 video IP streams.
Home Page	First page (also known as 'current home' or 'default home') that is displayed by default when a site is opened, or by clicking a dedicated home button, in a site or panel. This page is usually set by you at configuration time.
Log Server Domain	A GV Orbit Domain used by the Log Server Service to collect RollCall-protocol device logging data.
Log Server Service	A GV Orbit service which collects and collates logging information from RollCall-protocol devices for the GV Orbit system. The service typically provides logging data to the GV Orbit Monitoring Service.
MapView	A control and monitoring GV Orbit project (C&M project) that contains custom screens to enable you to control and monitor a system.
Media IP Network	A high-capacity network dedicated to carrying high bit rate media.
Monitor Layout	The grid of tiles on a monitor of a video wall and the tiles populated on the grid. This refers to video walls designed with the Room Editor tool in GV Orbit Client. 'Monitor Layout' is analogous to 'Wall Layout' for video walls designed with the Wall Editor tool.
Monitor Wall, Video Wall	One or more monitor display screens arranged and configured to form one larger screen area.
Multiviewer	A device that consolidates multiple video sources onto one or more head display outputs for ultimate display on monitor screens.
Multiviewer Input	A video source routed into a multiviewer.
Multiviewer Output	A multiviewer head display output. See 'Head'.
Multiviewer Cluster, MV Cluster	A cluster of multiviewer devices configured together and all acting together to serve one or more video walls. A cluster contains one or more MV-8 Series multiviewer devices.
MV Cluster Manager Service	A GV Orbit service which enables a user to configure a cluster of MV-8 series multiviewers as a single multiviewing system, rather than as separate, individual multiviewer devices.
MV-8 Series Multiviewer	A Grass Valley multiviewer series which includes router-integrated devices (for example, MV-831) and stand-alone devices (for example, MV-821-IP IP

multiviewer). All MV-8 Series multiviewers share the same core multiviewer functionality.

Network Map A tree view representation of system devices and services.

Network View A window that displays a network map. Various device operations can be carried out from this view, such as opening device configuration screens and device alarm history views.

NP0017 An established Grass Valley dedicated router control protocol.

PiP 'Picture-in-Picture' and another word for a multiviewer video wall Tile.

Overall Alarm A type of virtual alarm that indicates the overall condition of a device or service. It is based on the combined state of constituent alarms and is often generated automatically by a monitoring system.

Relay Service A GV Orbit service which passes selected GVOP data between two GVOP Domains. For example, to an MV-821 multiviewer Domain.

Room A video wall comprising one or more monitors - for example, in a production room of a broadcast facility or OB truck. A Room is served by a cluster of multiviewers. A 'Room' is designed in the 'Room Editor' tool.

Room file,
.room file A data file used by a GV Orbit Clustered MV project and which contains the definition of a Room video wall. This cannot be edited outside of GV Orbit Client. The Room file is usually referred to as the Room.

Room Design A design for a Room, a video wall, including monitor arrangement, tile layouts, source and destination assignments. A 'Room Design' is stored in a 'Room File' in a 'Clustered MV' project.

Room Editor An editing facility in GV Orbit Client enabling a video wall to be designed and edited in a GV Orbit Clustered MV project.

Room Layout The grid of tiles on an entire video wall and the tiles populated on the grid. This refers to video walls designed with the Room Editor tool in GV orbit Client.

Routing Domain A GVOP Domain used by the 'Routing Service' for routing control messages in a GV Orbit system.

Routing Service A GV Orbit service which provides a translation between dedicated routing protocols and the GV Orbit router controller for GV Orbit clients and other services. The service enables the state of all routes and routing levels to be saved as a snapshot. The service allows routes to be made from the GV Orbit Client and source and destination names to be known by GV Orbit Client.

Scaler An image re-sizing 'engine'. Several are found within a multiviewer. For example, the MV-8 Series of multiviewers contains 48 'Scalers', one per multiviewer input.

Spigot A logical connector on an IP media network. A spigot which sources (originates, transmits) an IP stream is a source spigot. One which receives an IP stream is a destination spigot.

Stream A flow of data, video, audio or metadata which arrives at or leaves a device through one of its ports.

Tally	A 'Tally' refers to a state of a production system. For example: "On Air", "Iso", or "Preview".
Tally Routing	The identity or label of the actual source that is routed to a destination (routed source).
Tile, **PiP**	(Multiviewer video wall context:) A rectangular area on a video wall screen, usually displaying video inputs and other supporting information. For example, a tile (or PiP) may display a video picture with audio bars and other related label and status information, including Tally information. Other information may be displayed in tiles. For example: time; images; or text.
Tile Grid	The arrangement of tiles on a monitor of a video wall. A tile grid specifies the position of tiles. A tile grid is then populated with tiles of the required type/ configuration. The default is a video tile.
Topology	The logical or physical arrangement of the various devices within a broadcast facility.
Video Wall, **Monitor Wall**	One or more monitor display screens arranged and configured to form one larger screen area.
Wall,	A 'Wall' is the name given to a monitor wall that has been designed in the Wall Editor tool of GV Orbit Client (or Orbit Client). '
Wall Editor	An editing facility in GV Orbit Client (and in Orbit Client) enabling a video wall to be designed and edited in a GV Orbit multiviewer project. The video wall is served by a single multiviewer.
Wall Layout	The grid of tiles on a monitor of a video wall and the tiles populated on the grid. Typically, this refers to video walls designed with the Wall Editor tool.
Widget	A graphical element that displays information or let a user interact with various tasks of a control system.

Grass Valley Technical Support

For technical assistance, contact our international support center, at
1-800-547-8949 (US and Canada) or +1 530 478 4148.

To obtain a local phone number for the support center nearest you, please consult the
Contact Us section of Grass Valley's website (www.grassvalley.com).

An on-line form for e-mail contact is also available from the website.

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