grass valley
A BELDEN BRAND

MV-8 SERIES MULTIVIEWER

FOR MV-8X0/8X1 MULTIVIEWERS

User Manual

RMY3 MV8-UM

Issue 1 Revision 3 2020 April 14, 15:31

www.grassvalley.com

Patent Information

This product may be protected by one or more patents.

For further information, please visit: www.grassvalley.com/patents/

Copyright and Trademark Notice

Belden, Belden Sending All The Right Signals, and the Belden logo are trademarks or registered trademarks of Belden Inc. or its affiliated companies in the United States and other jurisdictions. Grass Valley and MV-8 Series Multiviewer are trademarks or registered trademarks of Grass Valley Canada. Belden Inc., Grass Valley Canada, and other parties may also have trademark rights in other terms used herein.

Terms and Conditions

Please read the following terms and conditions carefully. By using MV-8 Series Multiviewer documentation, you agree to the following terms and conditions.

Grass Valley hereby grants permission and license to owners of MV-8 Series Multiviewers to use their product manuals for their own internal business use. Manuals for Grass Valley products may not be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, for any purpose unless specifically authorized in writing by Grass Valley.

A Grass Valley manual may have been revised to reflect changes made to the product during its manufacturing life. Thus, different versions of a manual may exist for any given product. Care should be taken to ensure that one obtains the proper manual version for a specific product serial number.

Information in this document is subject to change without notice and does not represent a commitment on the part of Grass Valley.

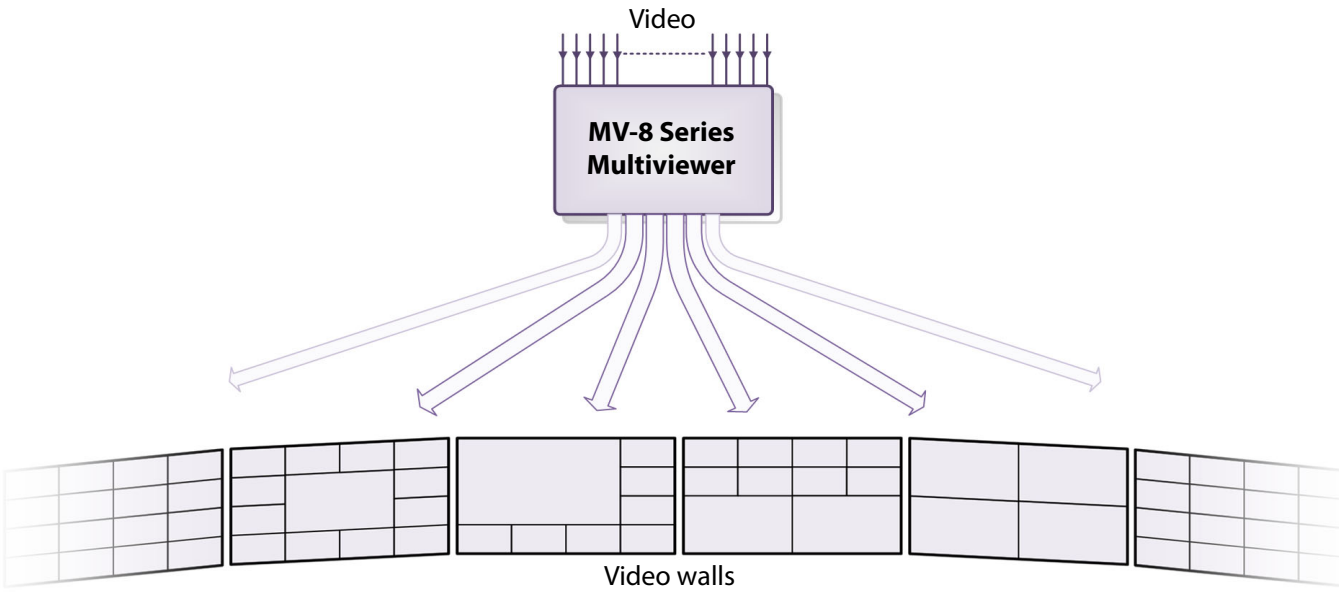
Warranty information is available from the Legal Terms and Conditions section of Grass Valley's website (www.grassvalley.com).

Title	MV-8 Series Multiviewer User Manual	
Part Number	RMY3 MV8-UM	
Revision	Issue 1 Revision 3	2020 April 14, 15:31

About this Manual

Thank you for purchasing a Grass Valley multiviewer product which contains an MV-8 Series Multiviewer. This user manual describes how to configure and operate the MV-8 Series Multiviewer within an MV-8X0/8X1 Multiviewer product.

If you have any questions regarding the installation and setup of your product, please contact Grass Valley Customer Support.



Related Documents

The following Grass Valley manuals are related documents:

Related Document		Description
User Manual:	Orbit - Introduction	A general introduction to Orbit and its applications.
User Manual:	Orbit for Multiviewers	Describes multiviewer-specific details of Orbit.
User Manuals:	MV-800 Multiviewer, MV-820 Multiviewer, MV-821 Multiviewer, MV-830 Multiviewer, MV-840/850 Multiviewer.	Describes physical and format-specific details of MV-8X0/8X1 Multiviewer products.
User Manual:	RollCall V4 Suite & RollCall Lite	Describes RollCall Suite of software control and monitoring tools.
User Manual:	RollCall Control Panel	Describes RollCall Control Panel software.

Table of Contents

1 Product Overview

The MV-8 Series Multiviewer is the multiviewer "engine" within the Grass Valley MV-8X0/8X1 Multiviewer product range. Various video input and video wall output signal types are supported by the product range.

This user manual describes the MV-8X0/8X1 Multiviewer product range's common core multiviewer features and includes the features of V3.0 MV-8 Series Multiviewer software. (For descriptions of each specific MV-8X0/8X1 Multiviewer product, please refer to its corresponding user manual.)

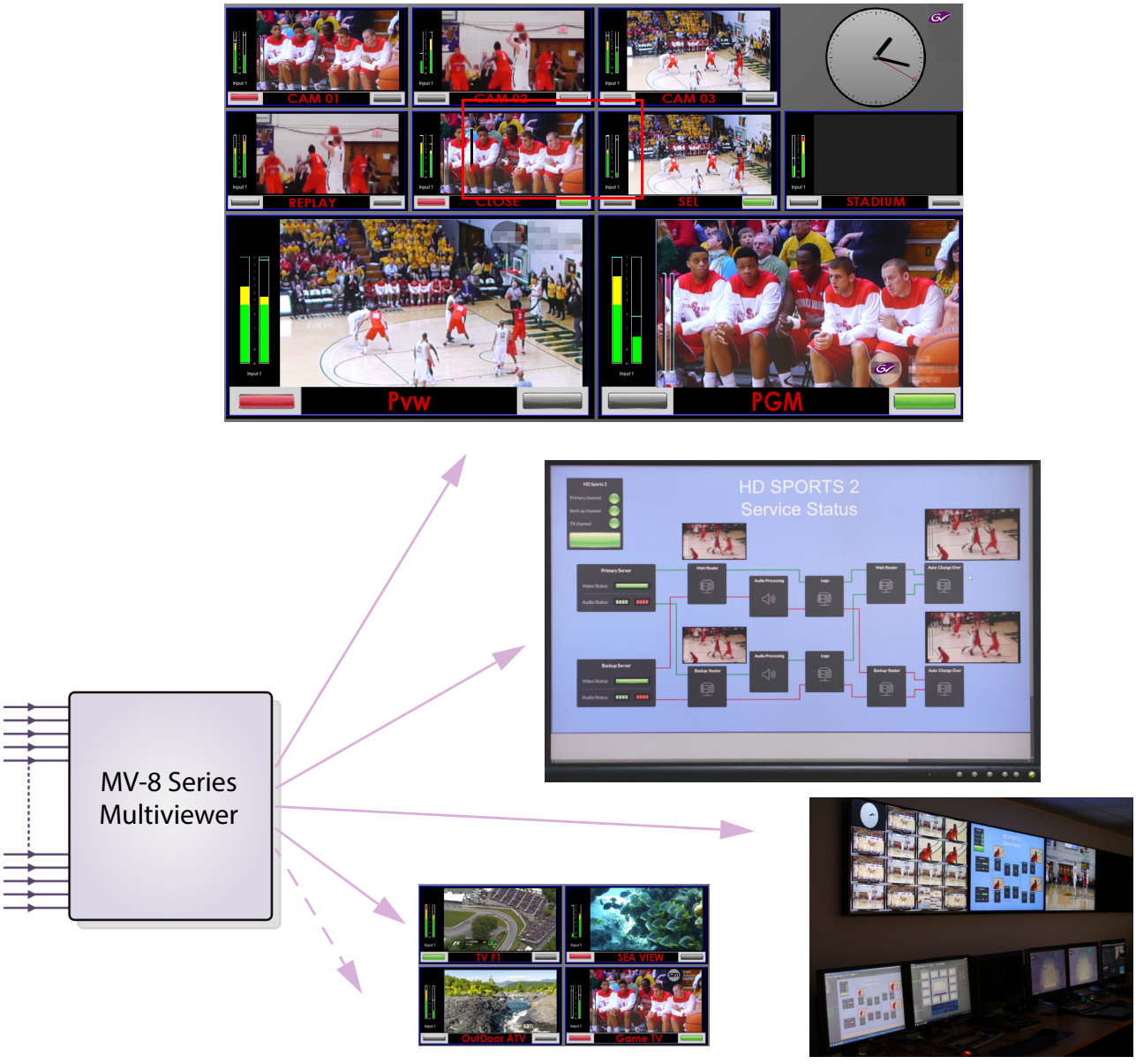


Fig. 1-1: MV-8 Series Multiviewer

An MV-8 Series Multiviewer can provide up to 12 multiviewer head display outputs, displaying video tiles from 48 video inputs. Video wall layouts from multi-channel quad-splits to flexible multi-tile screens are available.

Features of MV-8 Series Multiviewer

An MV-8 Series Multiviewer is found in MV-8X0/8X1 Multiviewer products and for all product-specific information, please refer to the respective product user manual (for example, MV-821 User Manual).

Video Inputs:

- 48 multiviewer video inputs.
- HDR support per input and output.
- Media biometrics support per input.

Up to 12 head display outputs:

- 3G 1080p or HD 720p head display outputs with embedded audio.
- 4K UHD support with four head display outputs used together as quad-link.
- Four head display outputs on a baseline MV-8 Series Multiviewer model.
  More head display outputs enabled with licenses.
- Video walls designed with the GV Orbit Client software tool.

Screen layout flexibility:

- Additionally display web pages, automation play lists, device status screens etc.
- Display status and alarms from external devices.
- Drag and Drop objects onto the screen layout and tailor custom on-screen functionality.
- Adjustable layering, transparencies and fine-positioning.

Flexible alarm capability:

- Monitoring of video, audio and metadata, with alarm notifications.
- Intelligent monitoring of external devices, with configurable on-screen alarms.
- Control and acknowledgment of alarms from hardware- and soft-panels.

H.264 Streaming out of MV-8 Series Multiviewer 'Input-copies':

- Extend and expand monitoring with this licensed option.
- MV-8 Series Multiviewer inputs may be scaled and compressed to create H.264-encoded copies which can then be streamed out over an IP connection.
  Note: An MV-8X1 unit requires a 'H.264 stream' license.
- Viewable on a desktop PC with Grass Valley's GV Orbit software or older Orbit Client software.

New in MV-8 Series Multiviewer Software

V3.2

New features in software V3.2 include:

★Input-copy - scaled/compressed H.264 streams for monitoring (See H.264 Input-Copy Streams, on page 47.)

★High dynamic range (HDR) input/output support. (See HDR Support, on page 63.)

Earlier Versions

Features in software V3.0 include:

High dynamic range (HDR) input support. (See HDR Support, on page 63.)

Media Biometrics Generators on a per input basis. (See Media Biometrics Support, on page 65.)

CC.608 extended data services (XDS) support. (See Extended Data Services Support, on page 67.)

User-defined names for multiviewer video walls/layouts. (See Layout Control Screen, on page 29.)

Embedded audio on multiviewer head display outputs. (See Output Embedded Audio Support, on page 71.)

SNMP Community Strings user-definable. (See SNMP Community Strings box, on page 22.)

Order Codes

Table 1-1: Order Codes MV-8 Series Multiviewer

Order Code	Description
Products:	For specific MV-8X0/MV-8X1 product order codes/licenses, refer to the corresponding multiviewer user manual.
Licenses:	A license comprises a code to enable more functionality.
Head outputs:	Enables more multiviewer head display outputs (output 5 onwards). **Note:** SFPs for extra head display outputs must be ordered separately.
MV-8XX-OP56 ‡	License to enable outputs 5 and 6.
MV-8XX-OP78 ‡	License to enable outputs 7 and 8.
MV-8XX-OP910 ‡	License to enable outputs 9 and 10.
MV-8XX-OP112 ‡	License to enable outputs 11 and 12.
Input-Copies:	
MV-8X1-H264	Enables H.264 streaming out of scaled, H.264-encoded multiviewer input-copies. ('H.264 Stream' license.) **Note:** This is a factory-installed option on MV-821.
‡ See the corresponding MV-8X0/8X1 Multiviewer product user manual for the respective output license name.	

Software Compatibility

Table 1-2: Software Compatibility

Software	Version
MV-8 Series Multiviewer	3.0.13 or later
RollCall Control Panel	4.19.0 or later
Orbit Client	3.1.15 or later
GV Orbit Client	4.0.0 or later

MV-8 Series Multiviewer Architecture

The MV-8 Series Multiviewer is found in the MV-8X0/8X1 Multiviewer range, which covers a multiplicity of products, including multiviewers that are integrated into routers, in standalone boxes, and/or have video IP input capabilities. Figure 1-2 identifies the MV-8 Series Multiviewer "engines" found in MV-8X0/8X1 Multiviewer functional block diagrams.

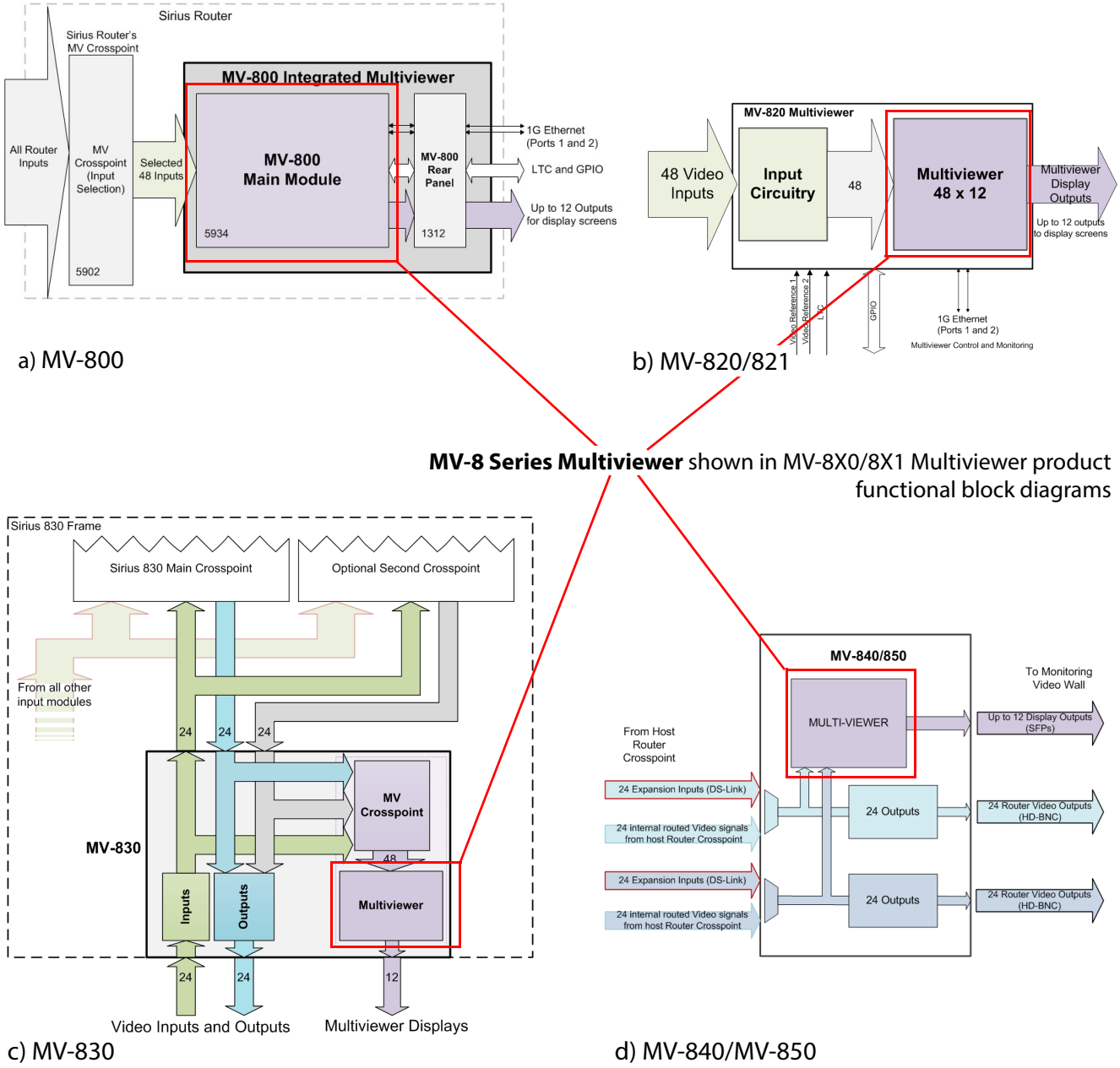


Fig. 1-2: MV-8 Series Multiviewers in MV-8X0/8X1 Multiviewer Products:
a) MV-800.
b) MV-820/821.
c) MV-830.
d) MV-840/850.

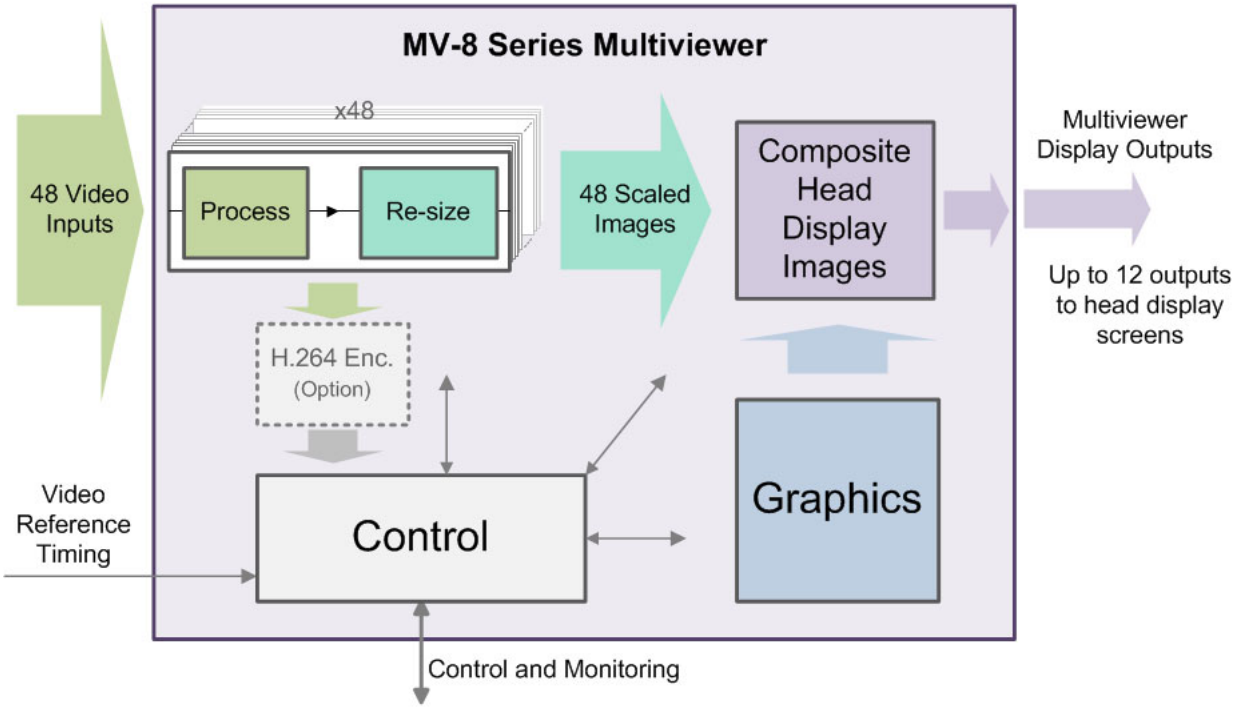


Fig. 1-3: Block Diagram of MV-8 Series Multiviewer

Figure 1-3 shows a simplified block diagram of the MV-8 Series Multiviewer. The main inputs and outputs of the MV-8 Series Multiviewer come from or go to the MV-8X0/MV-8X1 product and comprise:

- 48 Video Inputs.
- Video Reference Timing.
- Up to 12 Multiviewer Head Display Outputs.
- Control and Monitoring.

Each video input is processed and then re-sized. There is one re-sizer (scaler) per input.

Each multiviewer head display image is composited from re-sized video images, rendered graphical images and text.

Note:	Each one of the 48 *re-sized* (scaled) inputs may appear any number of times on any head display output but *with the same re-sizing.*

Input Processing

Each video input undergoes the same processing. Processing includes:

- Status.
- HDR input support.
- Media biometrics.

Additionally, a copy of each video input can be sent to an H.264 scaler/encoder on the MV-8X0/MV-8X1 product and H.264-encoded, scaled-down copies of the video inputs are available as video streams.

Note: An MV-8X1 requires a 'H.264 stream' license, for example, MV-821-H264.

Note: Licensing for MV-821 products involves factory-fitted H.264 encoder modules.

HDR Input Support

The MV-8 Series Multiviewer supports HDR video inputs. Each multiviewer input has a selectable video dynamic range converter (HDR to SDR) which can handle different opto-electrical transfer functions (OETFs) and color space for HDR video inputs.

(See HDR Support, on page 63.)

Media Biometrics on Inputs

The MV-8 Series Multiviewer supports media biometrics on video inputs for media assurance. Each multiviewer input has a media biometrics generator which generates signatures for the input video and for the input audio. The media biometrics generators are fully compatible with Grass Valley's Media Assurance SigMA platform.

(See Media Biometrics Support, on page 65.)

Control and Monitoring

The control and monitoring interface is connected to one or more Ethernet network interfaces on the MV-8X0/MV-8X1 product. It is used for:

- control and monitoring;
- software upgrades and licensing;
- all RollCall messaging; and
- pushing/pulling video wall designs (Orbit multiviewer projects).

MV-8 Series Multiviewer Set up

Getting Started

For getting started instructions for MV-8 Series Multiviewers, see Getting Started, on page 73.

Hardware Installation:

Hardware installation is described in the user manual for the respective MV-8X0/MV-8X1 product.

Multiviewer:

Initial multiviewer configuration and set up is done via Grass Valley's RollCall Control Panel application and the multiviewer's control screens (see Control Screens (RollCall Templates), on page 11).

Video Wall:

Video wall design and management is done via the GV Orbit Client application software using an Orbit multiviewer project.

Video Wall Design with GV Orbit

The layout and style of video walls are designed with the GV Orbit Client software application: Wall designs are stored as individual projects (GV Orbit multiviewer projects), which are then pushed to an MV-8X0/MV-8X1 unit, for use by the MV-8 Series Multiviewer 'engine' inside.

Multiple wall layout designs may be generated and stored on a PC. Different wall designs can then be pushed to the multiviewer unit for various multiviewer applications.

There are two operating modes for the GV Orbit Client software when used for multiviewer projects:

- **Design Mode** - GV Orbit 'Design Mode' enables wall designs to be generated and pushed to each multiviewer.
- **Run Mode** - In GV Orbit's 'Run Mode', live video streams may be monitored and alarms can be monitored on a PC.
  (**Note:** Such streaming from an MV-8X1 unit requires a 'H.264 stream' license.)

Note:	If using the older Grass Valley Orbit application (rather than the newer Grass Valley 'GV Orbit' application), then Orbit requires an MV-800-DT license to be able to view live video streams in Run Mode.

GV Orbit Projects

The GV Orbit project home screen shows a 'Project Name', which is treated as an identifier by GV Orbit. The name may be changed with the 'Edit Name' control in the home screen.

Projects with the same name are considered to be the same and GV Orbit warns the user if there are any differences between a project in GV Orbit and the same-named project on a multiviewer device. Such differences must be resolved.

Note:	Use a different and unique GV Orbit project name for each multiviewer. Rename a default project that has been pulled from a multiviewer.

Terminology

See Multiviewer Terminology, on page 165 for some multiviewer terminology and its meaning.

2 Booting and Splash Screen

Booting and Splash Screen

An MV-8 Series Multiviewer shows a splash screen on its outputs while booting (starting up).

Booting Up

The MV-8 Series Multiviewer boots up after power is applied to the MV-8X0/MV-8X1 unit or after a system reset (for example, a system reset instigated from RollCall Control Panel).

Booting takes about 1 to 2 minutes to complete. Approximately 1 minute after starting to boot up, each of the multiviewer's head display outputs presents a gray start-up splash screen, see Figure 2-1.

Note: Initially, the first few lines of text appear, followed by the remaining lines of text.

Fig. 2-1: MV-8 Series Multiviewer Multiviewer Gray Start-up Splash Screen Example

Table 2-1: Module Boot-up Time

Operation	Duration
Multiviewer Boot-up	Up to 2 minutes
Note: If the MV-8X0/MV-8X1 product's front main module does not have a flashing "CPU Heartbeat" LED when it has finished booting, contact Grass Valley Support.	

When the MV-8 Series Multiviewer has finished starting up, the start-up splash screen goes away (and the green CPU Heartbeat LED on the front main module begins to flash). The multiviewer has booted up and the head display outputs show multiviewer video walls belonging to the GV Orbit (or Orbit) multiviewer project being used by the multiviewer.

The Start-up Splash Screen

The start-up splash screen shows some MV-8 Series Multiviewer and MV-8X0/MV-8X1 product information about the multiviewer unit, see Figure 2-2.

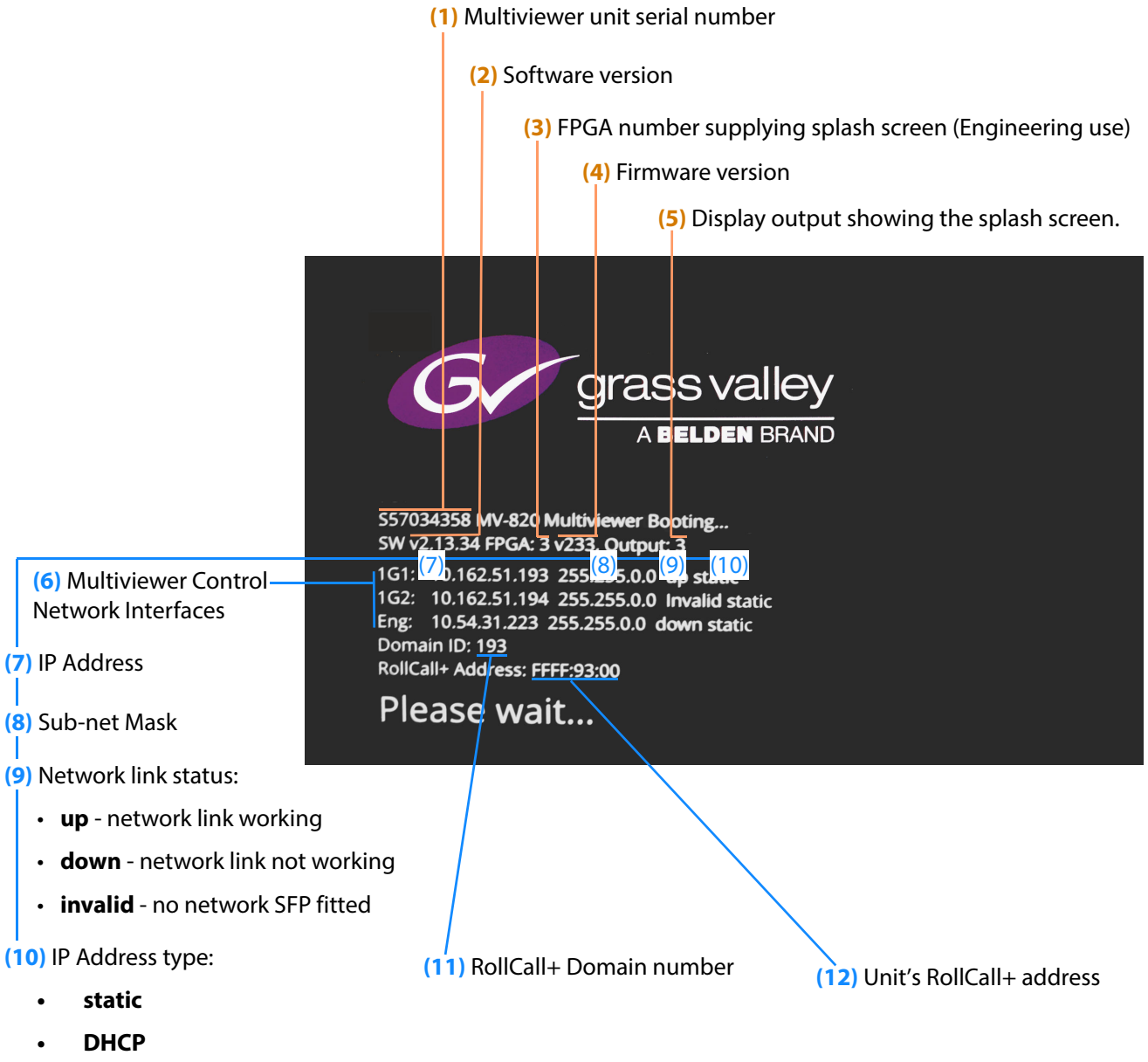


Fig. 2-2: Example Start-up Splash Screen Information

Note:	Use the '1G1' multiviewer network interface when performing the initial unit configuration with Grass Valley RollCall Control Panel.

Note:	The 'Eng' interface is a reserved internal IP network interface, do not use this IP address.

3 Control Screens (RollCall Templates)

Control Screens (RollCall Templates)

This section describes the control screens (RollCall templates) of an MV-8 Series Multiviewer.

Following initial configuration of the multiviewer, the control screen may then be used to configure and control various operational multiviewer items, including:

- selection of video wall layouts;
- monitoring alarm status;
- acknowledging alarms; and
- control of timer widgets on the video wall.

Control Screen Banner

Several MV-8 Series Multiviewer control screens are available. The upper, 'banner' section of each control screen is the same, see Figure 3-1.

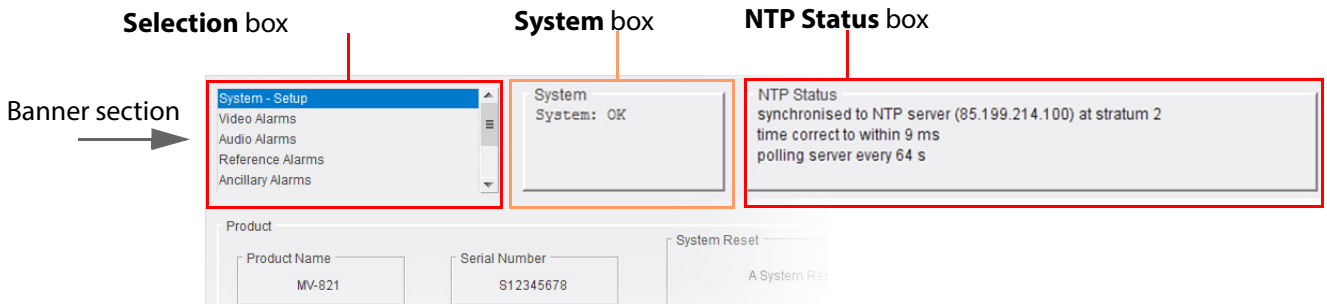


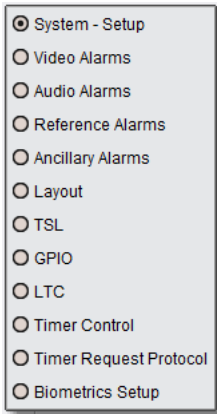
Fig. 3-1: Control Screen Upper 'Banner' Section

Control Screen Selection

MV-8 Series Multiviewer control screens may be selected from the **Selection** box in any control screen:

- System - Setup: See System-Setup Control Screen on page 15
- Video Alarms: See Video Alarms Control Screen on page 23
- Audio Alarms: See Audio Alarms Control Screen on page 24
- Reference Alarms: See Reference Alarms Control Screen on page 26
- Ancillary Alarms: See Ancillary Alarms Control Screen on page 27
- Layout: See Layout Control Screen on page 29
- TSL: See TSL Control Screen on page 33
- GPIO: See GPIO Control Screen on page 34
- LTC: See LTC Control Screen on page 35
- Timer Control: See Timer Control Screen on page 37
- Timer Request Protocol: See Timer Request Protocol Control Screen on page 38
- Media Biometrics: See Biometrics Setup Control Screen on page 39
- HDR Setup: See HDR Setup Control Screen on page 41
- Audio Codec Selection: See Audio Codec Select Control Screen on page 44

A control screen may be accessed quickly from any of the control screens by right-clicking anywhere in a control screen and then selecting a control screen name in the full list that appears.



Right-click on a control screen to see this list; then click on a control screen name to access the control screen.

Fig. 3-2: Full List of MV-8 Series Multiviewer Control Screens

System Box

A control screen's **System box** (see Figure 3-1) displays the multiviewer system status at the top of each control screen:

- **OK** - the multiviewer is working correctly.
- **Fail** - the multiviewer has a problem.
- **Restart Required** - the MV-8 Series Multiviewer requires a restart. (This is indicated for some configuration changes which require a restart before the change takes effect.)

NTP Status Box

A control screen's **NTP Status box** (see Figure 3-1) displays the status of the multiviewer's network time (network time protocol, NTP) at the top of each control screen.

Settings Changes and System Reset

Settings changes can be done at any time. But settings changes done in the **System-Setup** control screen *will* need a 'System Reset'.

Settings changes outside of the **System-Setup** control screen do not require a system reset to be carried out. These settings include:

- **Video alarms** - See Video Alarms Control Screen on page 23
- **Audio alarms** - See Audio Alarms Control Screen on page 24
- **Reference alarms** - See Ancillary Alarms Control Screen on page 27
- **Ancillary data alarms** - See Ancillary Alarms Control Screen on page 27
- **Layout settings** - See Layout Control Screen on page 29
- **TSL settings** - See TSL Control Screen on page 33
- **GPIO settings** - See GPIO Control Screen on page 34
- **LTC settings** - See LTC Control Screen on page 35
- **Video wall timer control** - See Timer Control Screen on page 37
- **Timer Request Protocol** - See Timer Request Protocol Control Screen on page 38
- **Media Biometrics** - See Biometrics Setup Control Screen on page 39

CAUTION

Some **System-Setup** control screen changes may affect the MV-8X0/8X1 Multiviewer unit's network operation.

IMPORTANT

A **System Reset** of the multiviewer is required after settings changes are made in the RollCall **System-Setup** control screen.

Such a reset will affect all MV-8X0/8X1 Multiviewer product's connections, including the multiviewer outputs. See "System Reset" box, on page 17.

When the MV-8 Series Multiviewer has re-booted, the new settings will be adopted.

System-Setup Control Screen

Note: The multiviewer must be **System Reset** for any saved setting changes to take effect, "System Reset" box, on page 17.

The **System-Setup** control screen (see Figure 3-3) comprises various information boxes which display basic information about the multiviewer, for example, system status, product name and software version. It is also used to setup the following system details:

- Networking.
- NTP servers.
- Router controller addresses.
- RollCall settings.
- Multiviewer monitor output format.
- Multiviewer name.
- Multiviewer Input H.264 streaming out.
- SNMP settings.

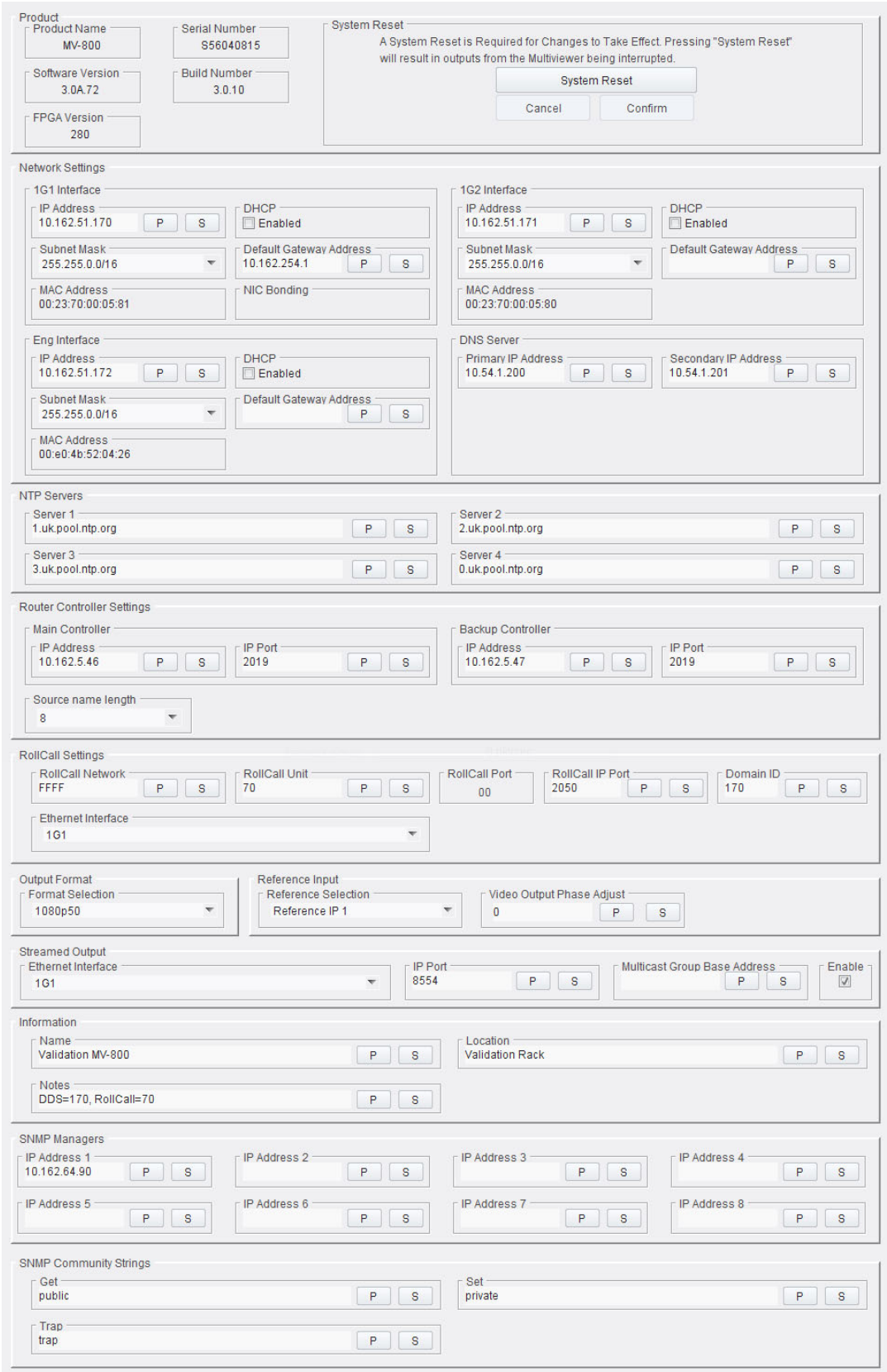


Fig. 3-3: Multiviewer System-Setup Control Screen

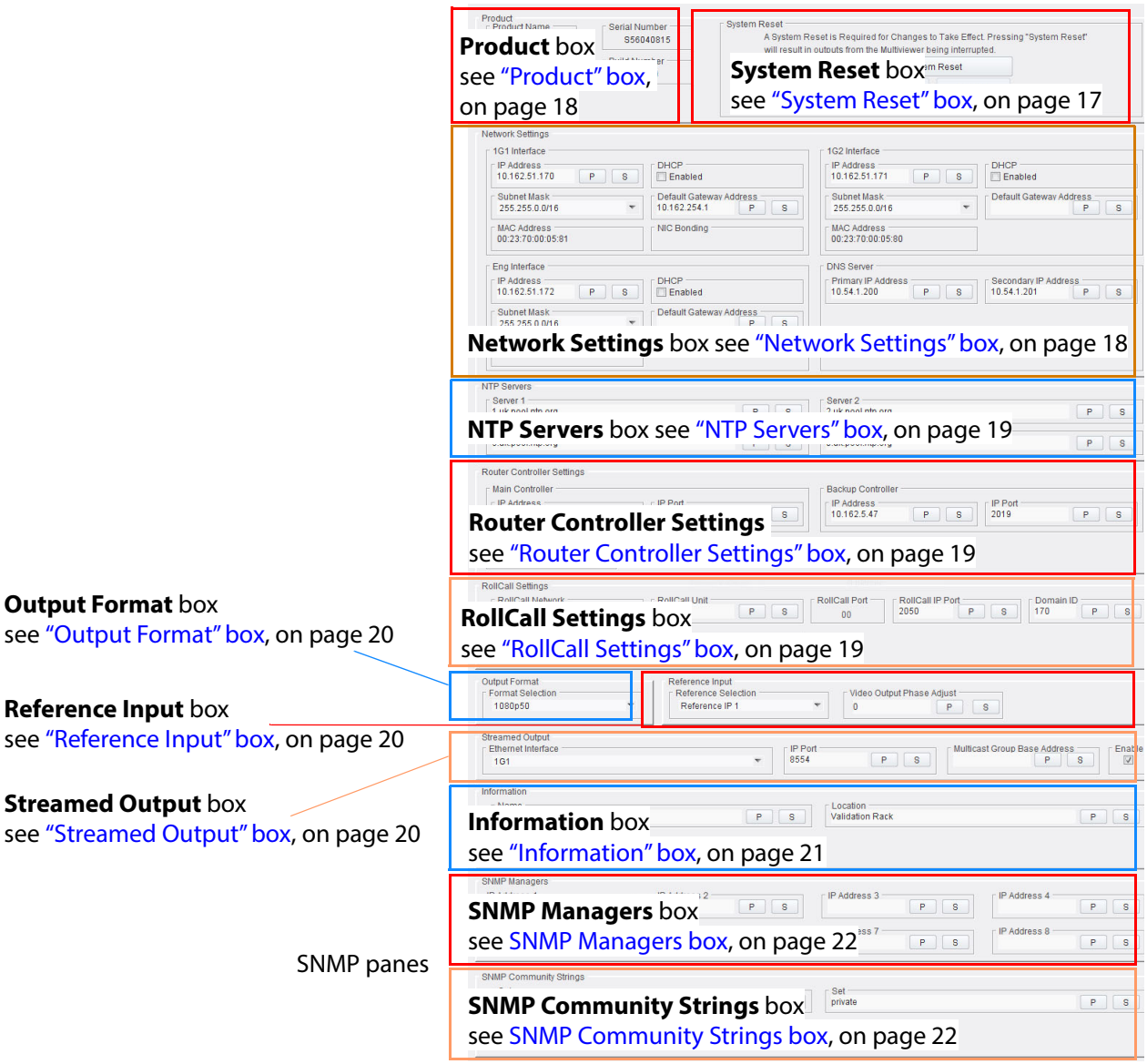


Fig. 3-4: System-Setup Control Screen Boxes

"System Reset" box

This box contains a **System Reset** button which resets (reboots) the MV-8 Series Multiviewer Multiviewer. This is used to make any **System-Setup** control screen configuration setting changes take effect. Performing a system reset makes the multiviewer use the new settings.

A system reset reboots the multiviewer by effectively powering it down and then powering it back up: This will interrupt and produce a picture disturbance on all MV-8 Series Multiviewer multiviewer outputs.

IMPORTANT A system reset of the multiviewer will affect all outputs.

Once all changes in the **System-Setup** control screen have been done, carry out a system reset:

1 Click on the **System Reset** button.

2 Then click on the **Confirm** button to perform a system reset.
Or click the **Cancel** button to abort the system reset.

See Booting and Splash Screen, on page 9, for more information on module booting.

"Product" box

Displays multiviewer details:

- **Product** - The name of the MV-8X0/8X1 Multiviewer product containing the MV-8 Series Multiviewer.
- **Serial Number** - The serial number of the product.
- **Software Version** - The currently installed software version number.
- **Build Number** - The currently installed software build number.
- **FPGA Version** - The currently installed FPGA firmware version number.

"Network Settings" box

The Network Settings area of the **System - Setup** control screen shows the MAC addresses and any network interface bonding status of each of the MV-8 Series Multiviewer IP network interfaces and is used to set the network details for each of the MV-8 Series Multiviewer IP interfaces.

Network interfaces covered:

- 2-off 1G Ethernet interfaces ("1G1","1G2").
  (MV-8 Series Multiviewer default IP addresses are given the respective MV-8X0/8X1 Multiviewer product user manual.)
- 1-off "Eng" Interface", default IP address 10.54.31.224.
  (Reserved for Grass Valley engineering use.)

Note:	**"S" and "P" buttons -** After entering information in each text box, always click on the adjacent "**S"** button or press "**return"** to locally save the new setting. Do this for each text box. (Note: Clicking on the "**P"** button will return the setting to its preset default value). "**S**" - Locally save new setting value (or press "return"). "**P**" - Locally save default setting value.

Enter all the network interface details in the text boxes:

- **IP Address** - Set the interface IP Address.
- **Subnet Mask** - Set the interface Subnet Mask.
- **Default Gateway Address** - Set the interface Gateway address.
- **MAC address** - Displays the IP interface MAC address.
- **DHCP** - **Enabled** check box:
  - Select to automatically set the IP address details from the network DHCP server.
  - Leave box deselected to use the entered IP address settings.
- **DNS Server** - Set the primary and secondary DNS server IP addresses.

Note:	The IP address details are only used when the corresponding "DHCP Enabled" box is deselected.

Note:	At the next **System Reset**, the MV-8 Series Multiviewer will adopt all the locally saved settings.

"NTP Servers" box

Up to four NTP (Network Time Protocol) server URLs or IP addresses can be configured. The NTP servers are used to synchronize clocks displayed on multiviewer video walls with the specified NTP server.

> Note: "S" and "P" buttons - After entering information in each text box, always click on the adjacent "S" button or press "return" to locally save the new setting. Do this for each text box. (Note: Clicking on the "P" button will return the setting to its preset default value).

- **NTP Server Address** - Enter the NTP server address in the text box and click on the **S** button to save the new setting. Do this for each address entered.

"Router Controller Settings" box

A Grass Valley router frame may provide input video to a multiviewer; the router will have a main router controller and possibly a backup controller. The IP address and IP port details of both router controllers are set up in this box: Port details must correspond to port settings in the router configuration.

This allows a multiviewer to display source tallies for the video inputs being displayed by the multiviewer and also to control router crosspoints when necessary.

> Note: "S" and "P" buttons - After entering information in each text box, always click on the adjacent "S" button or press "return" to locally save the new setting. Do this for each text box. (Note: Clicking on the "P" button will return the setting to its preset default value).

For the main router controller and for the backup controller, enter

- **IP Address** - Set the router controller IP address.
- **IP Port** - Use the default controller IP port number, unless the port has been changed on the router controller.
  Click on the **P** button to return the setting to its default value, if required.

Enter the source name length (number of characters):

- 4, 8, 12, 16 or 32.

"RollCall Settings" box

The RollCall settings are used to allow Orbit Client software applications to control the MV-8 Series Multiviewer and should normally be changed if you have multiple MV-8 Series Multiviewer units on the same RollCall network.

> Note: "S" and "P" buttons - After entering information in each text box, always click on the adjacent "S" button or press "return" to locally save the new setting. Do this for each text box. (Note: Clicking on the "P" button will return the setting to its preset default value).

- **RollCall Network** - Displays the RollCall address, which may not be changed. It is not an IP network address.

> Note: A RollCall address has the form: NNNN:UU:PP
>
> where:
> NNNN is the RollCall network number.
> UU is the RollCall unit number.
> PP is the multiviewer input number (01, 02 etc).

- **RollCall Unit** - Set the RollCall unit number. The unit number must be unique for each Multiviewer being configured. The initial default value is "01".
- **RollCall Port** - Displays the RollCall port number.
- **RollCall IP Port** - IP port number used by RollCall messages. This can usually be left to its displayed value.
- **Domain ID** - RollCall+ uses the concept of domains to partition a RollCall network. Only those RollCall-enabled devices on the same RollCall+ Domain can communicate with one another. A domain is uniquely identified with a **Domain ID** number. **Domain ID** is also used by Orbit software when connecting to an MV-8 Series Multiviewer.
  - The **Domain ID** can typically be left at its default value, 100. (This default value is reserved for multiviewer RollCall traffic.)
  - To reset the **Domain ID** to the default value of 100 click on the **P** button.
  - To set the **Domain ID**, enter the Domain ID number in the text box and click the **S** button to locally save the new setting.
- **Ethernet Interface** - Set which multiviewer IP interface to use for RollCall messages. The selected interface must be connected to the network.

"Output Format" box

MV-8 Series Multiviewer multiviewer head display outputs can be 1080p or 720p.

The **Output Format** setting sets the format and frame rate for *all* of the multiviewer head display outputs. All outputs share the same format and timing.

Note:	When changing output format, an Orbit multiviewer project change is required.

Note:	When driving a 4K monitor, each MV-8 Series Multiviewer multiviewer head display output drives one quadrant of the 4K monitor. Some 4K monitors have four 1080p inputs, so they can be fed from four MV-8 Series Multiviewer 1080p outputs. If this is not the case, a separate adapter must be used to convert four MV-8 Series Multiviewer multiviewer head display outputs to a single 4K signal suitable for the monitor.

"Reference Input" box

Set which router/unit reference input is used by the MV-8 Series Multiviewer to synchronize its head display outputs to. Select reference source from the drop down list. Settings choices are:

- Reference IP 1. (Rear panel analog reference input 1.)
- Reference IP 2. (Rear panel analog reference input 2.)
- Reference IP 3. (Rear panel analog reference input 3, on router-integrated multiviewers.)
- Reference IP 4. (Rear panel analog reference input 4, on router-integrated multiviewers.)
- Free Run.

Note: On the MV-820/821-IP products, there is only one rear analog reference input.

"Streamed Output" box

The **Streamed Output** settings box contains details about the 'H.264 streaming' out of multiviewer video input-copies. (This is a licensable codec option on MV-8X1 multiviewer units - 'H.264 stream' license option - and with factory-fitted hardware being required for the MV-821.)

Multiviewer video inputs are scaled-down (to standard definition size) and streamed out as multicast H.264-compressed copies of each input, one RTSP stream per multiviewer video input.

- **Ethernet Interface** - Select Ethernet interface, port 1 (1G1) or port 2 (1G2).
  This setting must be the same as the **RollCall Ethernet Interface** setting in the RollCall box of the **System-Setup** control screen.
- **IP Port** - Typically, use the default value.
- **Multicast Group Base Address** - The base IP address for multicast **Streamed Output**.
  Enter an IPv4 IP address in the range: 232.0.0.0 to 232.255.255.207.
  Click "S" to save a new setting.

  If left blank, then a multicast base address will be chosen randomly from the range 232.0.0.0 to 232.255.255.207.

  (See Multicast Group Addresses, on page 21 for more details about the base address and multicast addresses used.)
- **Enable** - Check box. Select to enable streaming out of the H.264 input-copies.

Multicast Group Addresses

The multicast group addresses used for **Streamed Output** will be sequential, starting at the set base address. There is one H.264-encoded input-copy stream per multiviewer video input.
For example:
input 1 stream uses 232.0.0.0;
input 2 stream uses 232.0.0.1;
input 3 stream uses 232.0.0.2; and so on up to
input 48 stream uses 232.0.0.47.

A **Multicast Group Base Address** configured on the **System-Setup** control screen must be within the allowed IPv4 range (232.0.0.0 to 232.255.255.207).

If the **Multicast Group Base Address** field on the **System-Setup** control screen is left blank, then a base address is automatically randomly chosen from the IP address allowed range 232.0.0.0 to 232.255.255.207.

Note:	A **Multicast Group Base Address** in the range 232.0.0.0 to 232.255.255.207 will use the 'Source-Specific Multicast' assigned local host address block, 232/8, for the multicast addresses.

Define a **Multicast Group Base Address** for:

- An installation which requires particular multicast IP addresses to be used.
- Installations with more than one MV-8 Series Multiviewer device on the network.

Note:	If there is more than one MV-8XX device is on the network, then it is recommended that specific **Multicast Base Addresses** are set up in the control screen of each MV-8XX device. Explanation: If **Multicast Group Base Address** is left blank, then it is automatically randomly chosen. In this case, there is a small chance that different multiviewers may use some or all of the same multicast addresses for H.264 streamed outputs.

"Information" box

This box contains text fields which can be set up by the user, enabling the user to enter name, location and notes about their multiviewer unit.

To enter/modify text in the text box, type directly into the editable text field and click the **S** button. To return to the default text, click the **P** button.

Note:	"S" and "P" buttons - After entering information in each text box, always click on the adjacent "S" button or press "return" to locally save the new setting. Do this for each text box. (Note: Clicking on the "P" button will return the setting to its preset default value).

- **Name** - A meaningful name may be given to the multiviewer unit, making it easier to identify.
  Maximum 32 characters.
  Remember to press **S** or press **return** to save the name locally.
- **Location** - Multiviewer location details may be entered, to make it easier for the user to locate the multiviewer.
  Maximum 64 characters.
  Remember to press **S** or press **return** to save the name locally.
- **Notes** - Extra user information about the multiviewer may be entered.
  Up to 64 characters can be displayed in the notes field.
  Remember to press **S** or press **return** to save the name locally.

SNMP Managers box

This box contains IP addresses of all SNMP manager devices.
Enter each IP address.

SNMP Community Strings box

This box lists the SNMP community strings for SNMP Get, Set and Trap message types.
Enter the strings for each SNMP message type

System Reset to Implement Settings Changes

After all **System-Setup** control screen settings changes have been made, an MV-8 Series Multiviewer System Reset is required. See "System Reset" box, on page 17.

Video Alarms Control Screen

The **Video Alarms** control screen allows the user to:

- See the state of alarms related to the video picture for each MV-8 Series Multiviewer input
- Acknowledge alarms.

Note:	Alarms can be viewed and acknowledged on this control screen. Multiviewer alarms are set up with the Orbit Client software application.

The MV-8 Series Multiviewer input video number is selected by the **Video Input Selection** drop-down menu box. See Figure 3-5.

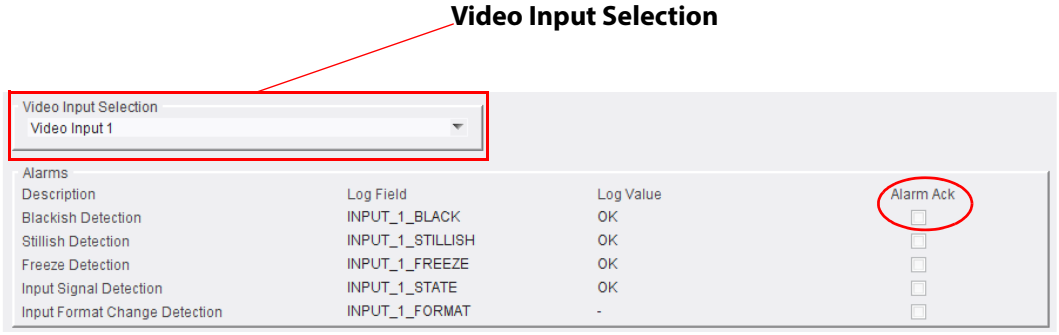


Fig. 3-5: Video Alarms Control Screen

To acknowledge an alarm, select the corresponding **Alarm Ack** check box on the right-hand side of the control screen.

Table 3-1: Video Alarms

Alarm	Description
Blackish Detection	Active when the video picture is detected to be black or nearly black.
Stillish Detection	Active when the video picture is detected to have no motion present.
Freeze Detection	Active when the video picture is frozen.
Input Signal Detection	Active when no input signal is detected.
Input Format Change Detected	Active when a change of video format is detected at an input. For example, from 1080p to 720p.

Audio Alarms Control Screen

The **Audio Alarms** control screen allows the user to:

- See the state of alarms related to embedded audio channels accompanying the video picture for each multiviewer input.
- Acknowledge alarms.

Note: Alarms can be viewed and acknowledged on this control screen.

Multiviewer alarms are set up with the Orbit Client software application.

Figure 3-6 on page 25 shows the **Audio Alarms** control screen.

The video input number is selected by the **Video Input Selection** drop-down menu box.

There are 32 audio channels per video input, i.e. 16 stereo pairs.
Audio channels, or channel pairs, are selected with the **Audio Channel Selection** pull-down box, in groups of eight (i.e. channels "1 to 8", "9 to 16", "17 to 24" and "25 to 32").

To acknowledge an alarm, select the corresponding **Alarm Ack** check box on the right-hand side of the control screen.

Audio alarms may operate on a per audio channel or channel-pair basis.

Table 3-2: Audio Alarms

Alarm	Channel or Channel-pair	Description
Audio Level	per channel	The following audio level conditions are detected: Silence and Over range.
AC3 Presence	per channel	Checks for the presence of AC3 encoded compressed audio data. Use this if AC3 audio data is expected on the channel.
Dolby E Presence	per *channel-pair*	Checks for presence of Dolby E encoded compressed audio data. Use this if Dolby E audio data is expected on the channel-pair
PCM Presence	per *channel-pair*	Checks for the presence of PCM encoded (uncompressed) audio data. Use this if PCM audio data is expected on the channel-pair.
DialNorm Under	per *channel-pair*	Checks audio normalization levels.
Dolby E Config Changed	per *channel-pair*	Checks for a change in Dolby E configuration.

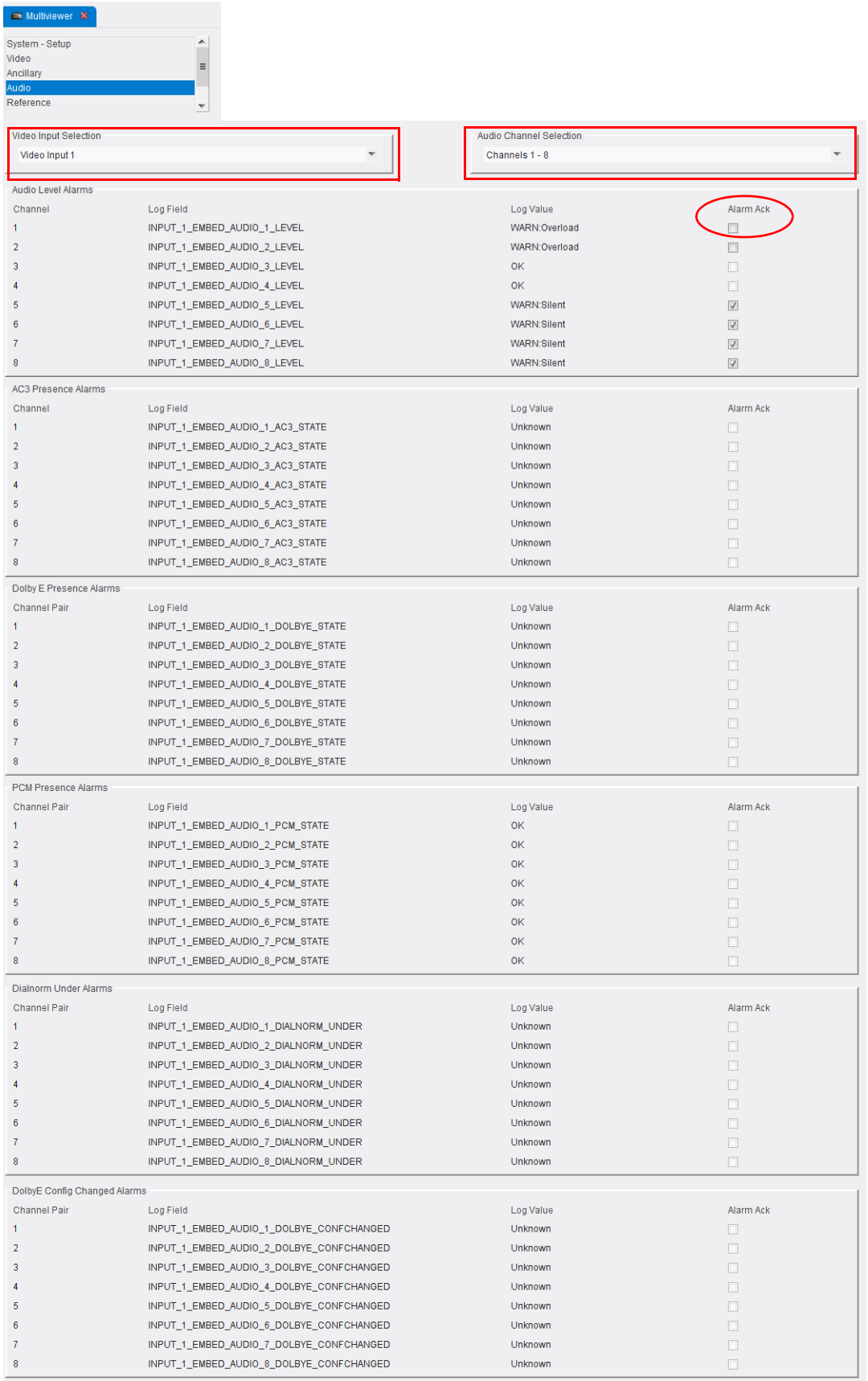


Fig. 3-6: Audio Alarms Control Screen

Reference Alarms Control Screen

The **Reference Alarms** control screen allows the user to see the state of and to acknowledge MV-8 Series Multiviewer alarms relating to loss of input reference and to genlock source.

To acknowledge an alarm, select the corresponding **Alarm Ack** check box on the right-hand side of the control screen.

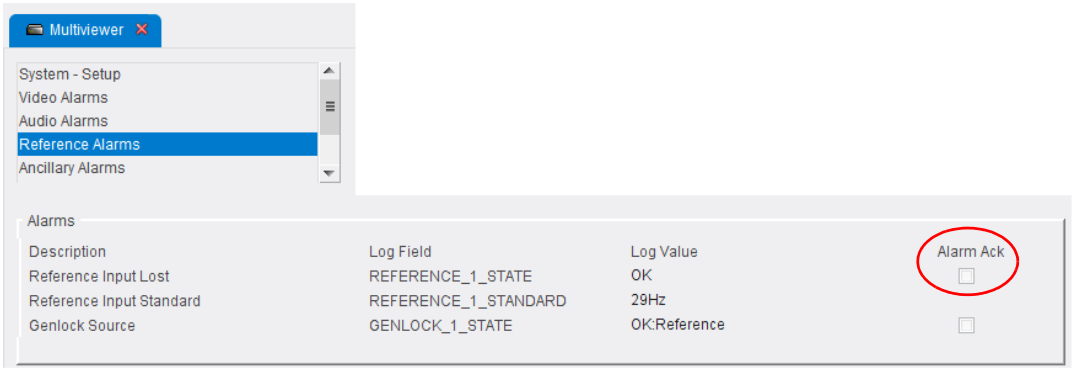


Fig. 3-7: Reference Alarms Control Screen

Note:	Alarms can be viewed and acknowledged on this control screen. Multiviewer alarms are set up with the Orbit Client software application.

Note:	To see the 'Reference Input Lost' (REFERENCE_1_STATE) and the 'Genlock Source' (GENLOCK_1_STATE) alarm states in the **Reference Alarms** control screen, the corresponding 'Unit Alarms' in the Orbit multiviewer project running on the multiviewer must be enabled. Otherwise, the alarms' states are shown as: '-'

Ancillary Alarms Control Screen

The **Ancillary Alarms** control screen allows the user to see the state of alarms and to acknowledge alarms related to the ancillary data for each multiviewer input.

All alarms sourced by the multiviewer can be monitored by GV Orbit and are available to a RollCall LogServer.

1. Select Video Input channel being shown.

2. Acknowledge an alarm by selecting the corresponding **Alarm Ack** check box on the right-hand side of the control screen.

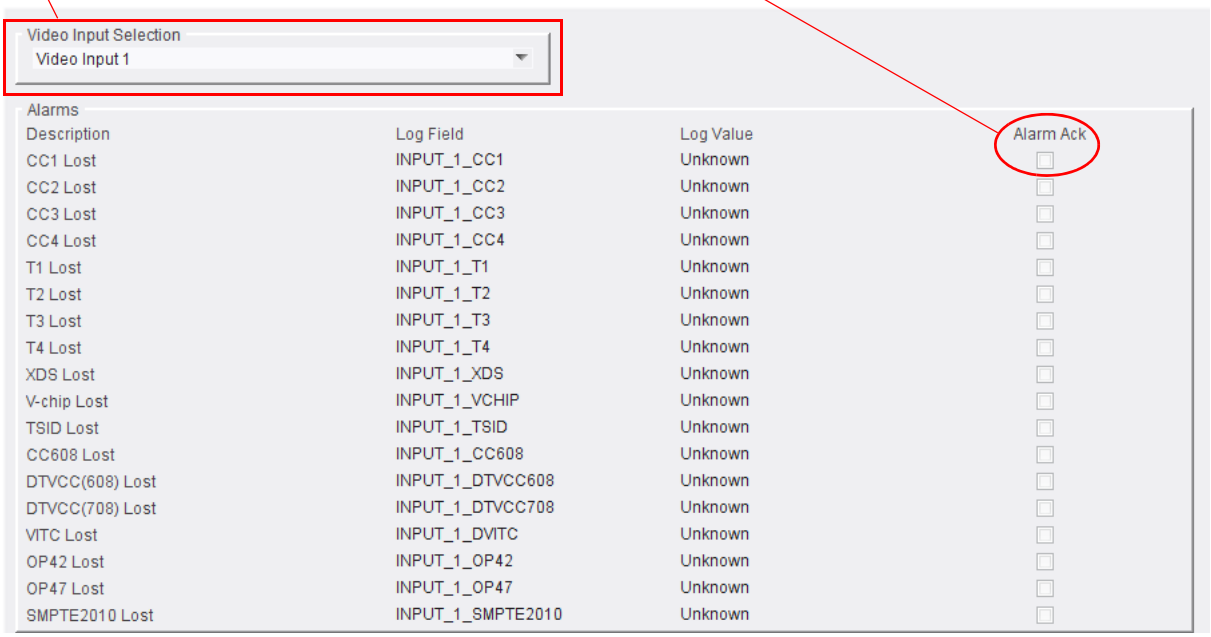


Fig. 3-8: Ancillary Alarms Control Screen

Table 3-3: Ancillary Data Alarms

Video Alarm	Description
CC1 Lost, CC2 Lost, CC3 Lost, CC4 Lost	Loss of Closed Caption data
T1 Lost, T2 Lost, T3 Lost, T4 Lost	Loss of Teletext data.
XDS Lost	Loss of Extended Data Service information.
V-Chip Lost	Loss of V Chip content rating information.
TSID Lost	Loss of Transport Stream ID information.
CC608 Lost	Loss of Closed Caption EIA 608 information.
DTVCC(608) Lost	Loss of DTV Closed Caption EIA 608 data.
DTVCC(708) Lost	Loss of DTV Closed Caption EIA 708 data.
VITC Lost	Loss of Vertical Interval Time Code information.
OP42 Lost	Loss of OP42 Closed Caption information.
OP47 Lost	Loss of OP47 Closed Caption/Subtitling information.
SMPTE2010 Lost	Loss of SMPTE 2010 data.

Note:
Alarms can be viewed and acknowledged on this control screen.

Multiviewer alarms are set up with the Orbit Client software application.

Layout Control Screen

Video walls are designed with the Orbit Client software tool. A wall may have one or more layout (alternative layouts) which may be selected.

The **Layout** control screen allows the user to select which wall layout to apply to each video wall on one or more multiviewer head display outputs. (Alternatively, a Grass Valley soft-panel or hard-panel may also select wall layout, via the RollCall protocol)
Additionally, the on-screen transition type between one wall layout and the next can be set up.

The layouts are all contained within an Orbit multiviewer project which is pushed to the multiviewer unit.

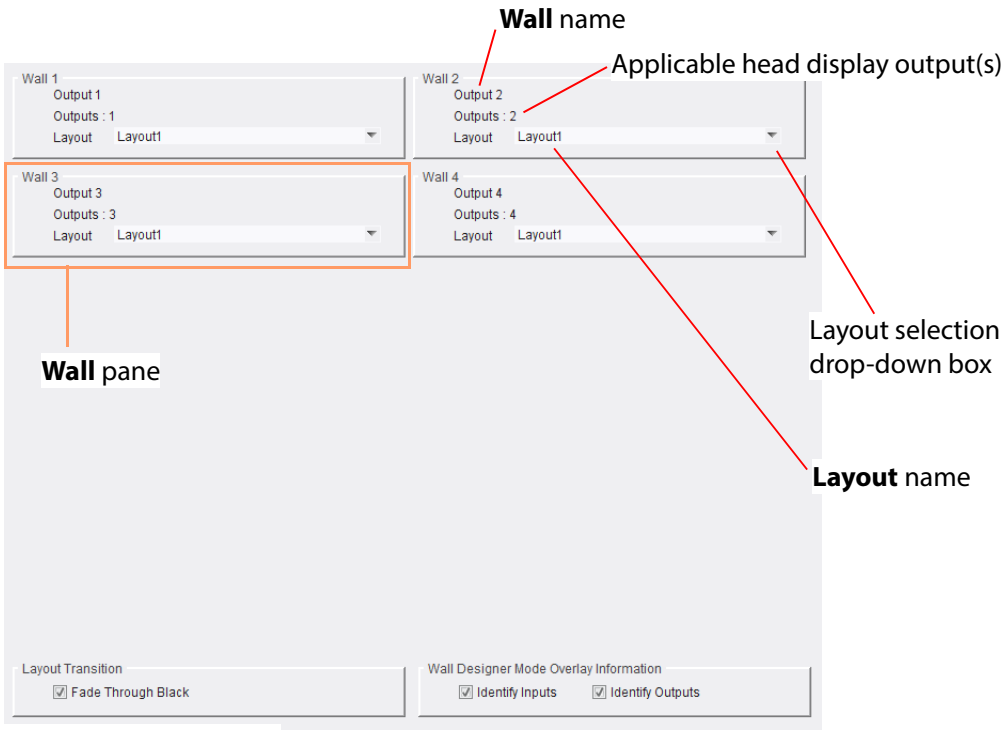
The control screen also enables an output overlay feature to be enabled, which show information about the multiviewer inputs on the output screen and about the head display outputs themselves.

In an Orbit multiviewer project:

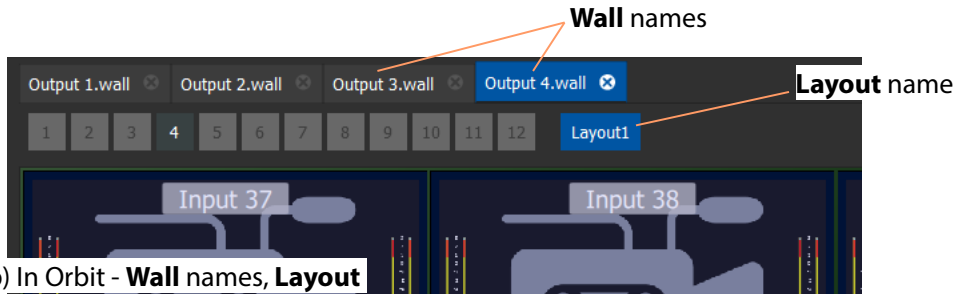
- Each video wall has a name property in the Orbit Client, set to "Wall 1", "Wall 2" etc. by default.
  The wall name may be edited in Orbit Client by the user. It is shown on the **Layout** control screen.
- Each wall layout has a name property in Orbit Client, set to "Layout1", "Layout2" etc. by default.
  This layout name is editable in Orbit Client by the user. It is also reflected on the **Layout** control screen.

Note:	These names are case-sensitive.

On the **Layout** control screen, there is a **Wall** pane per video wall defined in the Orbit project. See Figure 3-9.



a) **Layout** Control Screen



b) In Orbit - **Wall** names, **Layout**

Fig. 3-9: Layout Control Screen: a) Layout Control Screen; b) In Orbit.

Table 3-4: Wall Pane Settings

Wall 1 ... up to Wall 12	Description
Wall N:	Wall number, as defined in the Orbit multiviewer project. (1 ... up to 12.)
Wall name	Wall name, as defined in the Orbit multiviewer project.
Outputs	Head display output number(s) associated with the wall.
Layout	Drop-down box. Select the wall layout to use from the drop-down list.

Table 3-5: Layout Transition Settings

Setting	Description
Layout Transition:	

Table 3-5: Layout Transition Settings (continued)

Setting	Description
Fade Through Black	Check box. Controls the type of on-screen transition seen when changing between wall layouts. • Select for fade down to black, then fade up to new layout. • Deselect for a cut from current to new wall layout.

Overlays

Overlays can be enabled on the head display outputs which show information about multiviewer inputs in video tiles on multiviewer outputs and about the head display outputs themselves.

In particular, the **Output Overlay** feature briefly shows extensive information after the **Output Overlay** feature is enabled. This includes IP addresses of the MV-8X0/8X1 Multiviewer.

Table 3-6: Overlay Settings

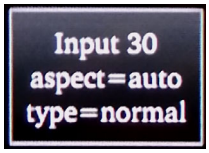
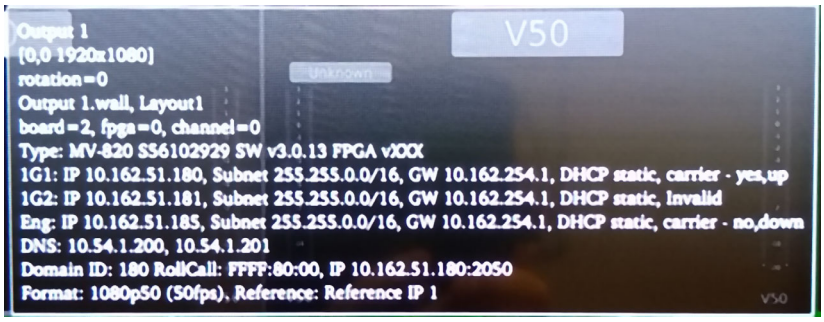
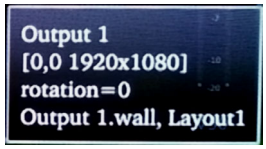
Setting	Description
Wall Designer Mode Overlay Information:	
	Controls the display of overlay information on each multiviewer head display output. See Figure 3-10. (Multiviewer software 2.16.16 or later.)
Identify Inputs	Check box. Select to display overlay information which identifies each video input on each video tile on the head display output screen. 
Identify Outputs	Check box. Select to display overlay information which identifies each head display output screen (1 ... up to 12). The overlay appears in the bottom right-hand side of each output. • Immediately after this **Identify Output** feature is enabled, the overlay information shown about the outputs is extensive. 

Table 3-6: Overlay Settings (continued)

Setting	Description
	• After 20 seconds, the overlay then reverts to showing only brief output information, as shown in Figure 3-10. 

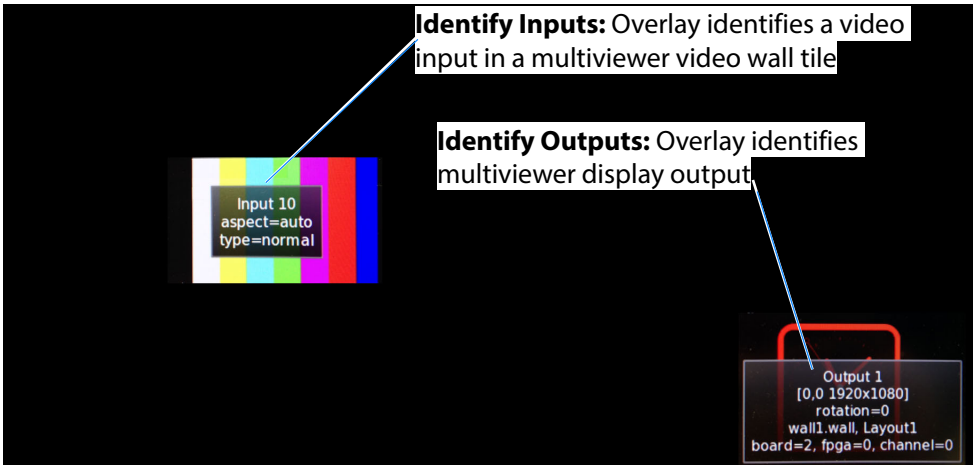


Fig. 3-10: Multiviewer Head Display Output with Example Input and Output Overlays

TSL Control Screen

The **TSL** control screen allows the user to select settings related to MV-8 Series Multiviewer support of the TSL protocol.

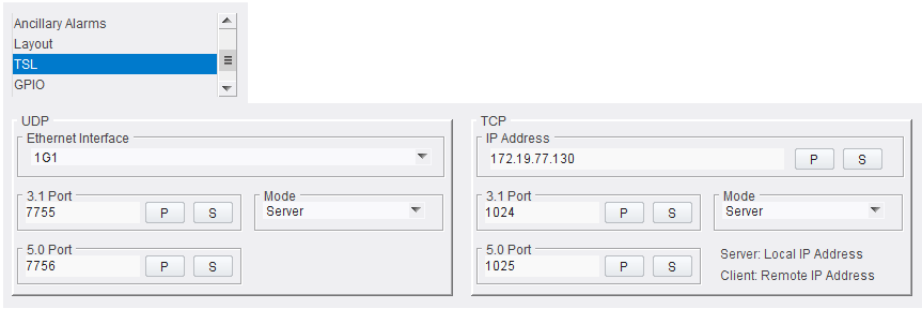


Fig. 3-11: TSL Control Screen

TSL protocol is supported in TSL Server Mode or TSL Client Mode, see Multiviewer Video Wall, on page 95, Figure 10-5 on page 101.

For two types of Ethernet protocols (UDP and TCP), the user can separately set up IP address and network port information.

Table 3-7: TSL Mode Settings

Setting		Description
UDP:		
	Ethernet Interface	Drop-down box. Select port 1 (1G1) or port 2 (1G2).
	3.1 Port	Text box. Network port to receive TSL 3.1 messages on. Enter the network port number.
	5.0 Port	Text box. Network port to receive TSL 5.0 messages on. Enter the network port number.
	Mode	Drop-down box. Select 'Server' mode, or 'Disabled'.
TCP:		
	IP Address	Text box. In Server Mode: Enter local IP address of the MV-8 Series Multiviewer. In Client Mode: Enter IP address of TSL Controller.
	3.1 Port	Text box. Network port to receive TSL 3.1 messages on. Enter the network port number.
	5.0 Port	Text box. Network port to receive TSL 5.0 messages on. Enter the network port number.
	Mode	Drop-down box. Select 'Server' mode, 'Client' mode or 'Disabled'.

Remember to press the **S** button.

GPIO Control Screen

The **GPIO** control screen allows the user to set up settings related to the MV-8 Series Multiviewer unit's GPIO interface.

There are four GPIO ports, 1 to 4, on a MV-8X0/8X1 Multiviewer product. For connector pinouts, see the respective MV-8X0/MV-8X1 product user manual.

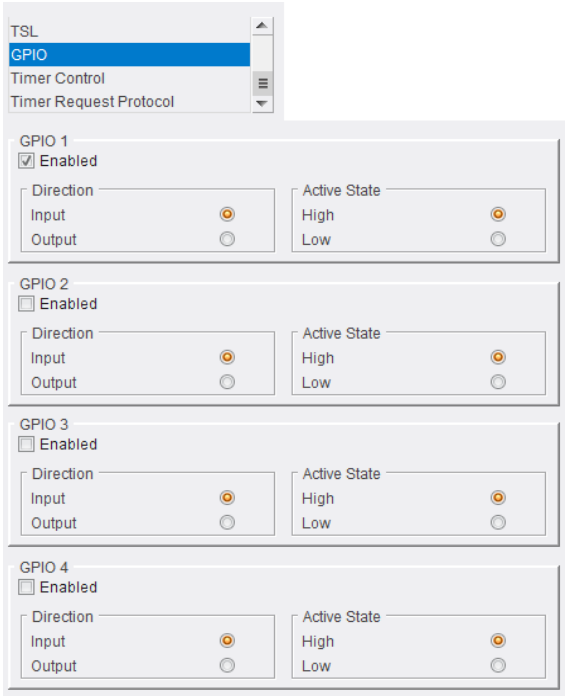


Fig. 3-12: GPIO Control Screen

Table 3-8: GPIO port Settings.

Setting	Description
GPIO 1 to GPIO 4:	
Enabled	Check box. Select to enable the GPIO port on the MV-8 Series Multiviewer unit.
Direction	Radio buttons. Select the GPIO port to be an input or an output.
Input	Selected: GPIO port is an input.
Output	Selected: GPIO port is an output.
Active State	Radio buttons. Select the active state of the GPIO port.
High	Selected: Active state of the port is a high voltage.
Low	Selected: Active state of the port is a low voltage.

LTC Control Screen

The **LTC** control screen allows a user to select an LTC source for the MV-8 Series Multiviewer multiviewer.

Note: This control screen is not applicable to *standalone* multiviewer products (which are not integrated into a router frame).

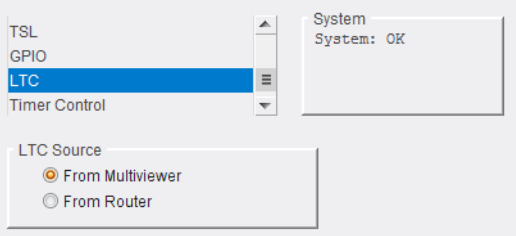


Fig. 3-13: LTC Control Screen

The following LTC sources may be selected:

- From Multiviewer.
- From Router.

See Table 3-9.

Table 3-9: LTC Source Radio Button Options

Setting	Description
LTC Source	Radio buttons to select source of LTC for MV-8 Series Multiviewer.
From Multiviewer	When selected, use the LTC signal applied to the multiviewer module rear panel.
From Router	When selected, use the LTC information from the host router frame. See **Note 1**.
Note 1:	The host router's controller configuration must have **EmbeddedTimecodeEnable** set to '*True*'. This is set in the Grass Valley WorkBench router configuration tool. Configuration item = Controller > Devices > LocalRouterDevice > LocalRouterConfig > EmbeddedTimecodeEnable See Figure 3-14.

(WorkBench tool screenshot)

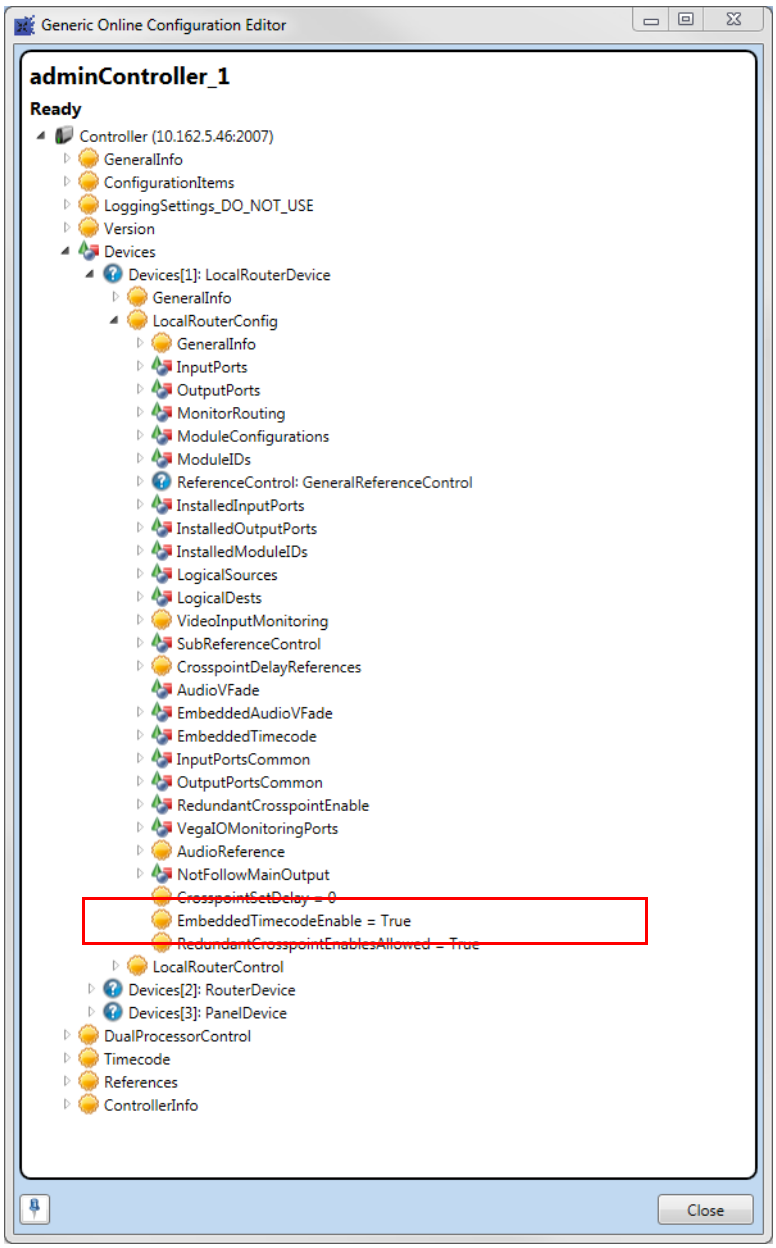


Fig. 3-14: EmbeddedTimecodeEnable Router Controller LTC Source Configuration Item

Timer Control Screen

The **Timer Control** screen allows a user to set up timers used in widgets on a video wall and then remotely control the timers. Timers may also then be remotely started or stopped controlled with RollCall soft-panels or hard-panels.

Note:	All **Timer** widget styling and configuration of trigger points etc. are set through the Orbit application.

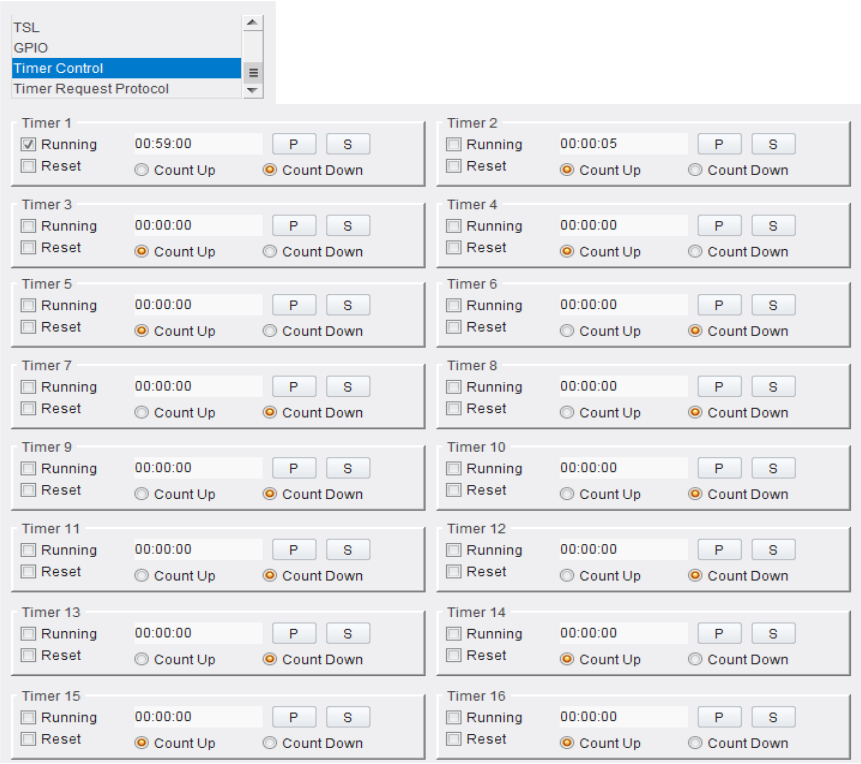


Fig. 3-15: Timer Control Screen

Table 3-10: Timer Control Settings

Setting	Description
Timer 1 to Timer 16:	
Running	Check box. Select to start the timer. Deselect to stop.
Reset	Check box. Select to reset the timer. The check box automatically is deselected when the timer has reset.
Text box	Enter the timer's target time. Target time format: HH:MM:SS For example, 12:30:00 Note: When the target time is changed, the timer is reset.
Count Up	Radio button. Select to reset the timer and count up.
Count Down	Radio button. Select to reset the timer and count down.

Remember to press the **S** button.

Timer Request Protocol Control Screen

The **Timer Request Protocol** control screen allows a user to define the IP address of an "eTimer" server device and the IP port number to use.
The protocol used is the Plura™ timer request protocol.

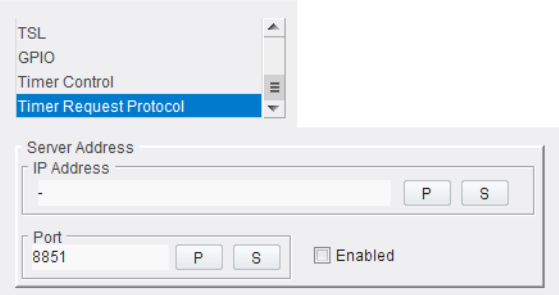


Fig. 3-16: Timer Request Protocol Control Screen

Table 3-11: Timer Request Protocol Settings

Setting	Description
IP Address	Enter IP Address of an 'eTimer' server device.
Port	Enter IP port number to use for Timer Request Protocol messages.
Enabled	Check box. Select to enable use of Timer Request Protocol messages.

Remember to press the **S** button when changing the IP Address settings.

Note:	"S" and "P" buttons - After entering information in each text box, always click on the adjacent "S" button or press "return" to locally save the new setting. Do this for each text box. (Note: Clicking on the "P" button will return the setting to its preset default value). "S" - Locally save new setting value (or press "return"). "P" - Locally save default setting value.

Note:	Configuring a **Timer Widget** for eTimer: A **Timer** widget is configured on a video wall tile with the Orbit Client application. It can be configured to be connected to an eTimer service.

Biometrics Setup Control Screen

The **Biometrics Setup** control screen sets up the multiviewer's media biometric generators (MBGs) on a per multiviewer input basis. Each of the 48 inputs has an MBG which can produce a video and audio signature from the media at the corresponding input.

Each multiviewer input's MBG is separately configurable and is assigned a name on a per input basis which is user-editable. The name identifies a signature when it is checked and verified (media assurance).

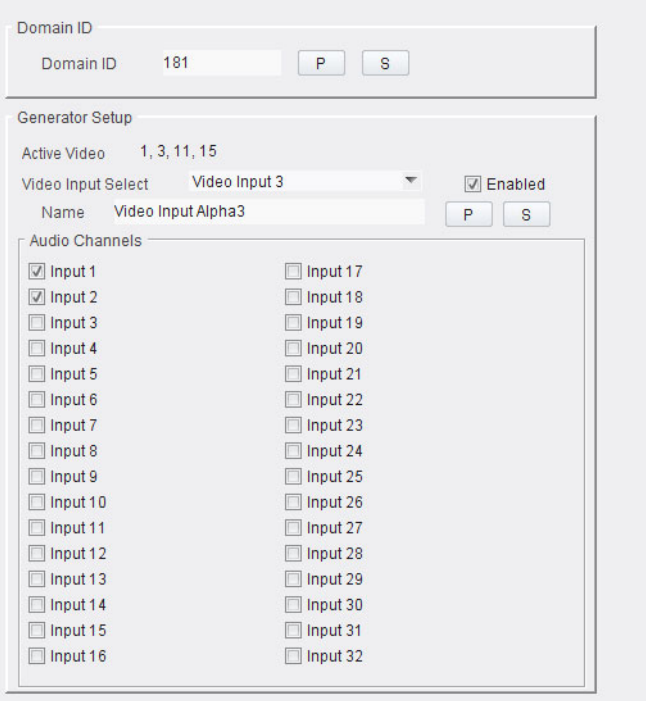


Fig. 3-17: Media Biometrics Control Screen

Table 3-12: Media Biometrics Settings

Setting	Description
Domain ID	RollCall domain ID for media biometrics signature messages.
Domain ID	Text box. Enter RollCall+ domain ID. Press **S** to save value. **Note 1:** Set the **Domain ID** to be the same as the one used by the media assurance system, for example Grass Valley SigMA. **Note 2:** Use a *different* **Domain ID** value from the **RollCall Settings** domain ID, set up in the **System-Setup** Control Screen. (See "RollCall Settings" box on page 19.)
Generator Setup	
Active Video	Displays which video inputs have media biometrics generators (MBGs) enabled.
Video Input Select	Check box. Select the video input to configure.

Table 3-12: Media Biometrics Settings (continued)

Setting	Description
Enabled	Check box. Select to enable the MBG at the selected input.
Name	Text box. Name for the media biometrics generator (MBG) at the selected input. Defaults to the video input name, e.g. 'Video Input 6'. The name is user editable. Enter a unique name for the MBG if required. Press **S** to save the value. **Note:** A name identifies a signature's video input source, useful in a media assurance system.
Audio Channels	Check boxes for audio channels 1 to 32. Select the audio channel signatures required.

Note: "S" and "P" buttons - After entering information in each text box, always click on the adjacent "S" button or press "return" to locally save the new setting. Do this for each text box. (Note: Clicking on the "P" button will return the setting to its preset default value).

"S" - Locally save new setting value (or press "return").

"P" - Locally save default setting value.

HDR Setup Control Screen

The **HDR Setup** control screen sets up the multiviewer's HDR/SDR conversions on a per multiviewer video input or per head display output basis. Each of the 48 inputs has a HDR-SDR conversion block which can convert an HDR input into an internal SDR signal. Each of the 12 head display outputs has an SDR-HDR conversion block which can convert a the internal SDR output signal to HDR for output.

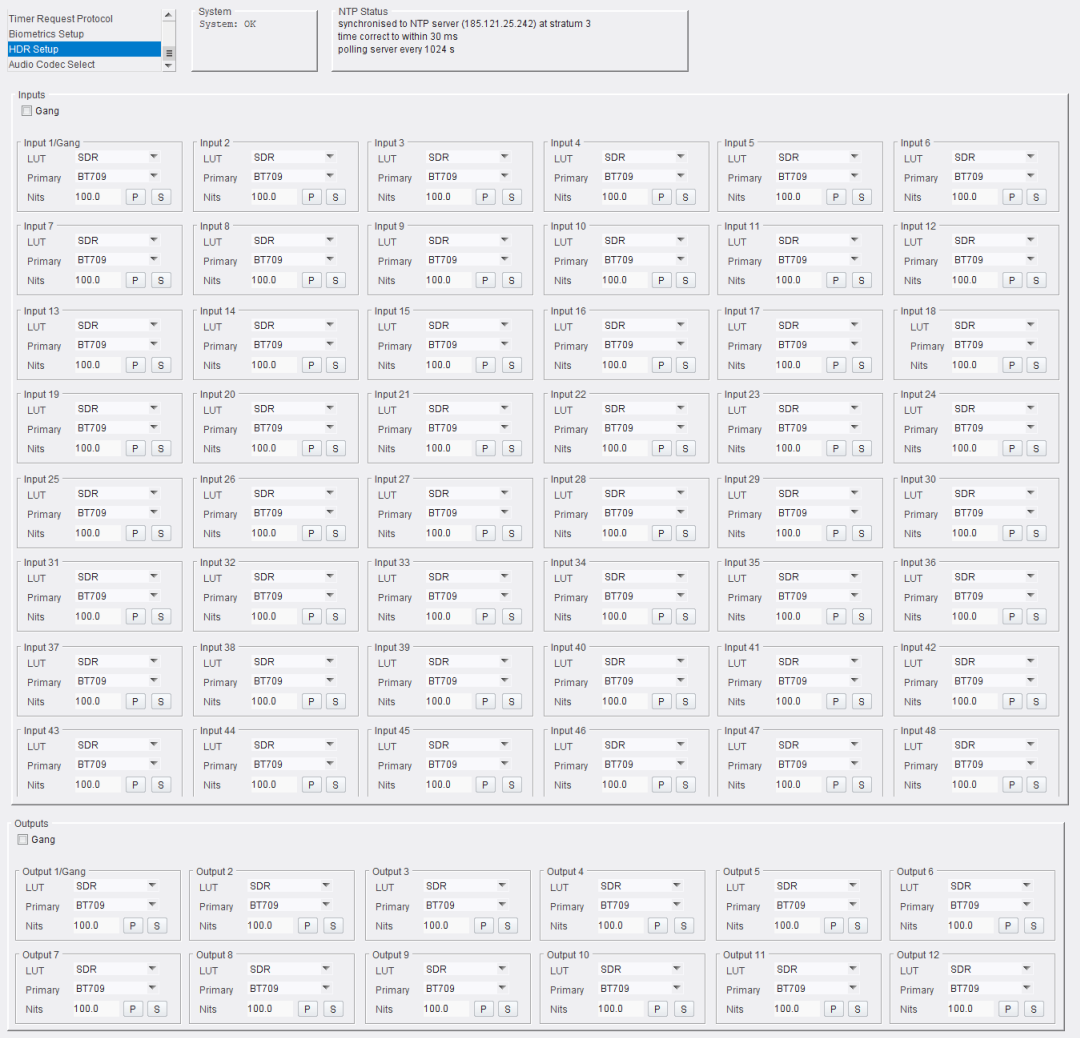
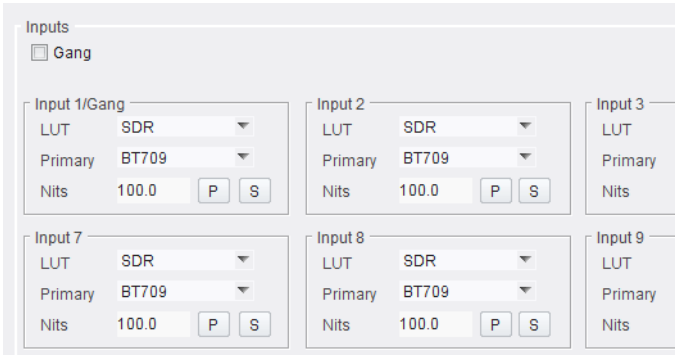


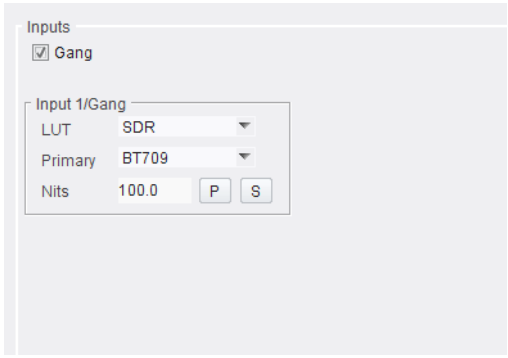
Fig. 3-18: HDR Setup Control Screen

Each of the 48 video inputs may be set up individually or all together (ganged). See Figure 3-19a and b.

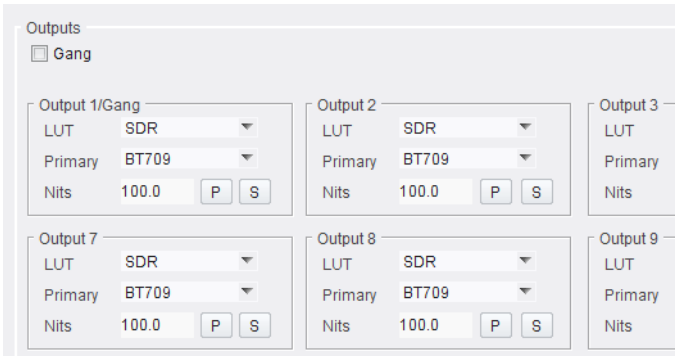
Each of the 12 head display outputs may be set up individually or all together (ganged). See Figure 3-19c and d.



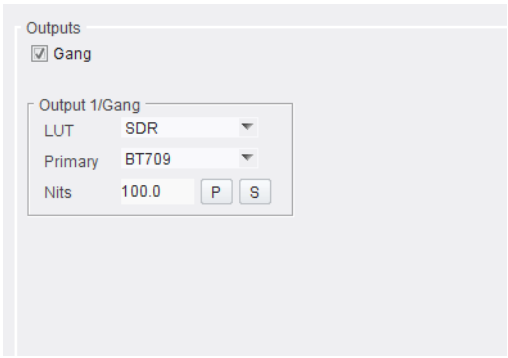
a) Video Input HDR Settings



b) Video Input HDR Settings (Ganged)



c) Head Display Output HDR Settings



d) Output HDR Settings (Ganged)

Fig. 3-19: HDR Setup Controls:
a) Video Inputs.
b) Ganged.
c) Head Display Outputs.
d) Ganged.

Table 3-13: HDR Setup Settings

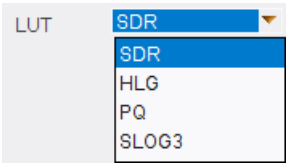
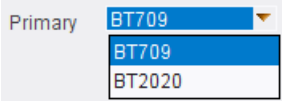
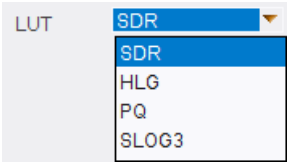
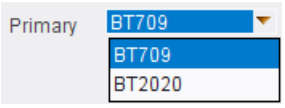
Setting	Description
Inputs:	Configure settings for each input here.
Gang	Check box. Select to setup up HDR on all inputs together.
LUT	Drop-down box. Select dynamic range of video input. 
Primary	Drop-down box. Select the color space of the video input. 

Table 3-13: HDR Setup Settings (continued)

Setting	Description
Nits	Text box. Enter the Nits value for the HDR to SDR conversion. See Nits, on page 64, for information about this setting.
Outputs:	Configure settings for each output here.
Gang	Check box. Select to setup up HDR on all outputs together.
LUT	Drop-down box. Select required dynamic range of head display output. 
Primary	Drop-down box. Select the required color space of the head display output. 
Nits	Text box. Enter the Nits value for the SDR to HDR conversion. See Nits, on page 64, for information about this setting.

Note: "S" and "P" buttons - After entering information in each text box, always click on the adjacent "S" button or press "return" to locally save the new setting. Do this for each text box. (Note: Clicking on the "P" button will return the setting to its preset default value).

"S" - Locally save new setting value (or press "return").

"P" - Locally save default setting value.

Audio Codec Select Control Screen

The **Audio Codec Select** control screen selects optional audio channel(s) to be compressed for each 'input-copy' RTSP stream. The audio stream and the corresponding input video H.264-compressed stream are wrapped into a RTSP stream. (Requires the 'H264 stream' license.)

This feature applies to *MV-8X1 multiviewer products* only.

For each of the 48 video inputs, a mono audio channel can be selected from the first 8 stereo audio pairs. This can be the left- or right-audio channel of the pair, or a stereo down-mix.

Fig. 3-20: Audio Codec Select Control Screen

Note:
A mono audio can be set up for each multiviewer video input. Settings are for the 48 inputs. They do not reflect any quad-link input associations that might be applied in the multiviewer.

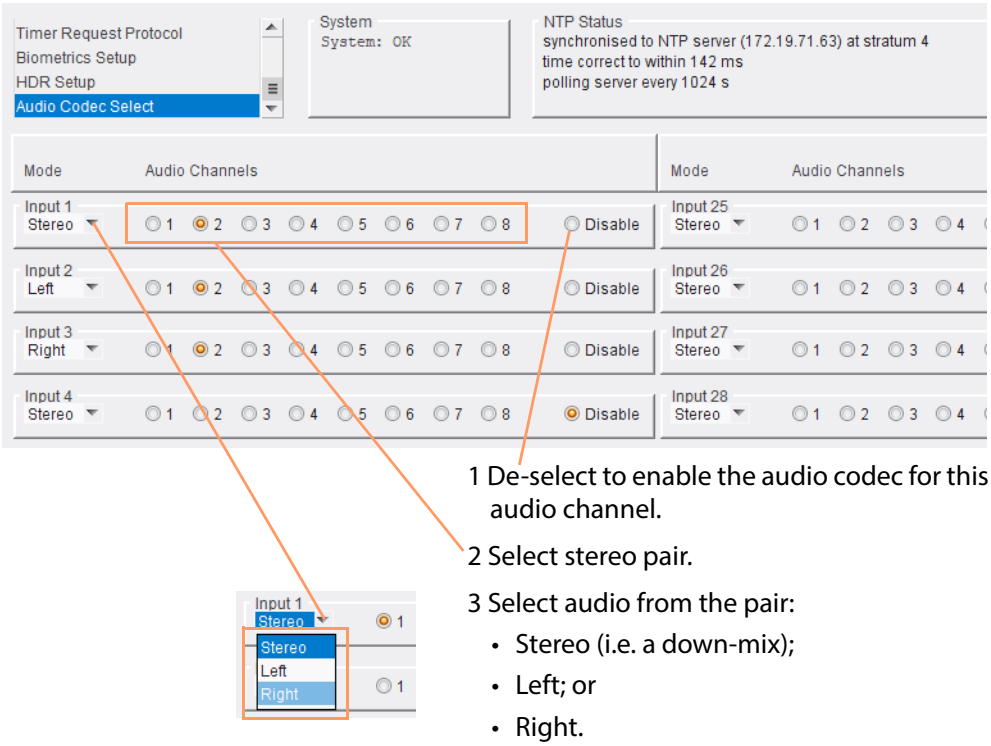


Fig. 3-21: Audio Channel Selection

4 H.264 Input-Copy Streams

Section contents:

H.264 Input-Copy Streams

This chapter describes an MV-8 Series Multiviewer's H.264 'input-copy' feature.

Note:
An MV-8X1 multiviewer requires a 'H.264 stream' license. For example, license 'MV-821-H264'.
A MV-821 multiviewer requires a factory-fitted hardware option.

Introduction

The MV-8 Series Multiviewer supports sending out H.264-compressed copies of video inputs on a control network interface for displaying on a PC screen as a simple confidence monitor facility using Grass Valley's GV Orbit Client application (product: GV Orbit Lite).

Each MV-8 Series Multiviewer video input image is scaled-down and compressed to create an H.264-encoded 'input-copy' stream. For each input, an audio channel can also be selected and compressed into an accompanying audio stream. The image and audio streams are transmitted on a control network interface of the multiviewer unit. They are transmitted as an RTSP stream and may be viewed on a PC for thumbnail/confidence monitoring applications.

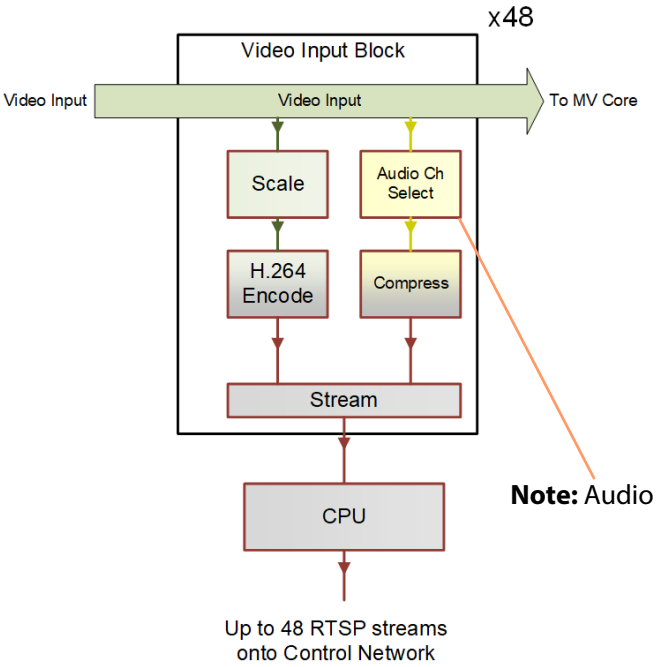


Fig. 4-1: Multiviewer Video Input-Copy RTSP Streams

Each RTSP stream is a wrapper for:

- an H.264-compressed image stream; and
- an optional (compressed) mono audio channel selected from audio channels of the video input. (MV-8X1 multiviewers only.)

Note:
MV-8 Series multiviewers can potentially source an RTSP 'Input-Copy' H.264 video stream for each multiviewer video input.
In practice, in order to minimize image artifacts for real-world video signals, it is recommended a maximum of 30 streams is sourced from any one multiviewer.

Control Settings

The following 'Input-Copy' stream settings are defined on the **System - Setup** control screen, see System-Setup Control Screen, "Streamed Output" box, on page 20:

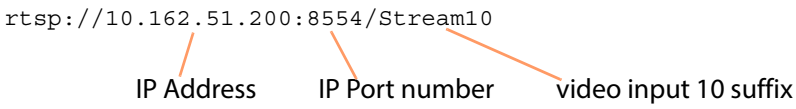
- Ethernet interface to use.
- IP port number.
- Specific Multicast Group Base Address, if required.
- Global-enable of all streams.

Audio channel selection is done in the Audio Codec Select Control Screen, on page 44. For each video input, a single mono audio channel can be selected to be either:

- any left- or right-audio channel; or
- a down-mix of any stereo pair.

Stream URLs

Each stream has the same stem URL and video inputs 1 to 48 have suffices '/Stream1' to '/Stream48' respectively.
For example:



Stream IP Ports

An **IP Port** number is defined in the System-Setup Control Screen, "Streamed Output" box, on page 20. For example, 8554. The IP Port number used for H.264 'input-copy' streams is *different between* MV-8X0 and MV-8X1 devices:

- **For MV-8X0 multiviewers** - The defined IP port number is used for all 48 streams.
  For example, 8554.
- **For MV-8X1 multiviewers** - The defined IP port number is used for the first 12 streams; for the next 12 streams, the IP Port number used is incremented by one; and so on.
  For example:

Streams	IP Port
1 - 12	8554
13 - 24	8555
25 - 36	8556
37 - 48	8557

Viewing H.264 Input-Copy Streams

Media Player Example

To view an H.264 'input-copy' stream in a media player:

Step 1: Prepare Multiviewer

1 License the MV-8X1 multiviewer device for H264 streaming.

2 Apply video inputs to the multiviewer unit.

In the multiviewer's **System-Setup** control screen, in the **Streamed Output** section:

3 Select the **Ethernet Interface** to use for the streams.

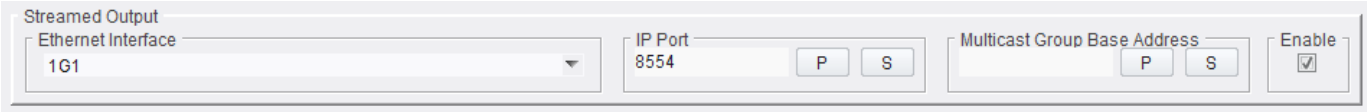


Fig. 4-2: Streamed Output Settings

4 Leave **IP Port** number at its default (8554),
unless the port number needs to change for some reason.

5 Leave the **Multicast Group Base** address blank,
unless a specific base address is required.

6 Select **Enable**.

All H.264 stream outputting is enabled.

> Note:
> H.264 'input-copy' streams are only sent when a device is receiving the RTSP stream.

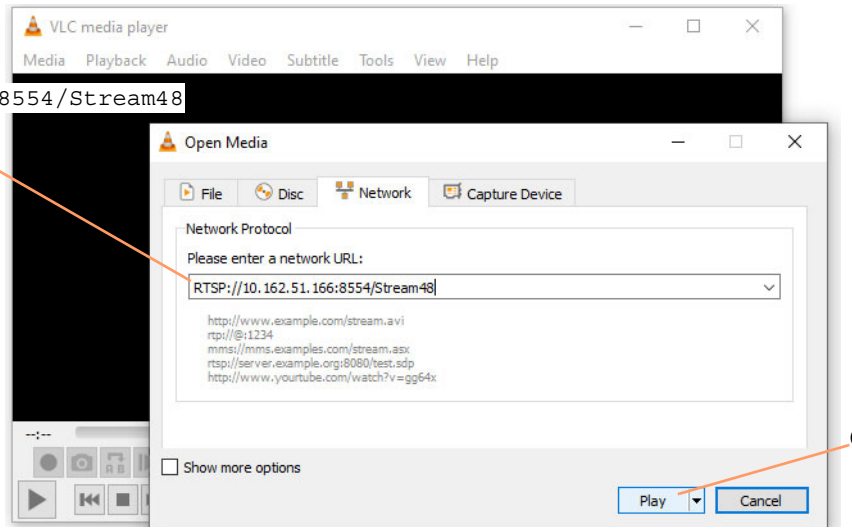
All multiviewer RTSP H.264 'Input-Copy' streams are now ready to be sent out. A stream is only sent out when another device/application (for example, a media player) has opened the RTSP stream for viewing.

Step 2: View in a Media Player

1 Open the media player of choice. VLC is used in this example.

2 Open the RTSP media stream on the network.

Enter URL of stream.
For example,
`RTSP://10.162.51.166:8554/Stream48`



Click **Play**.

Fig. 4-3: Open Media Stream

3 Click **Play**.

The media is shown in the player window.

Fig. 4-4: Playing H.264 'Input-Copy' Stream

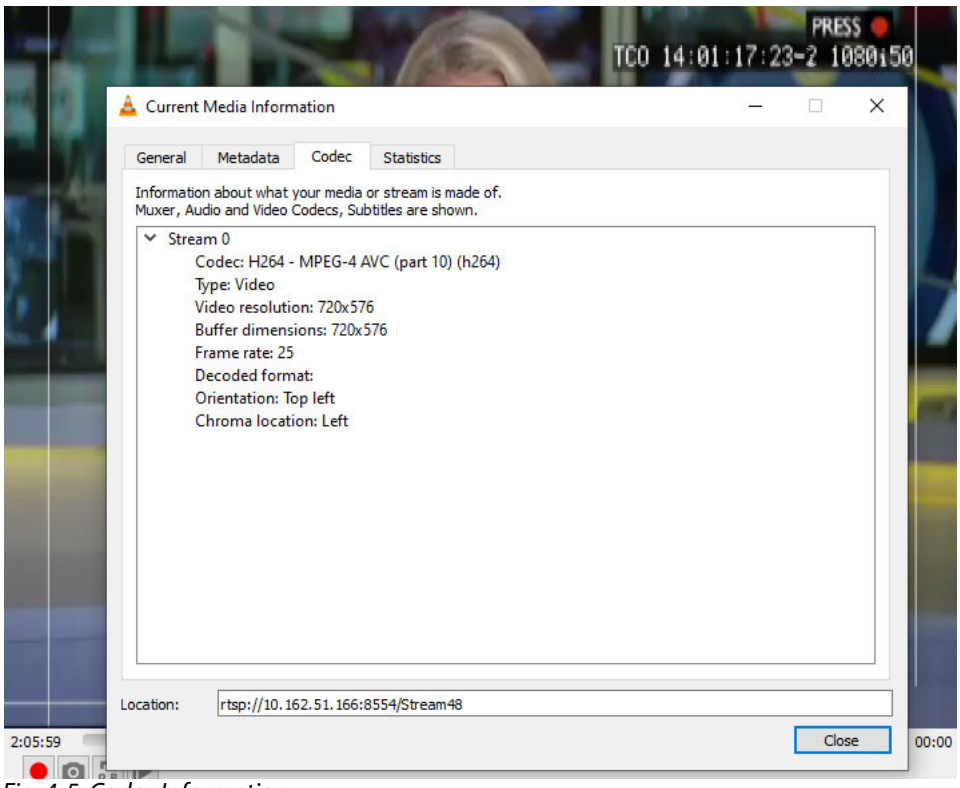


Fig. 4-5: Codec Information

GV Orbit Client Examples

To view an H.264 'input-copy' stream in a video tile in GV Orbit Client, a video tile on a GV Orbit screen needs setting up to show streamed video from some URL.

For this, the following must be known:

- IP address of the multiviewer.
- The IP port number(s) it is using for its H.264 'input-copy' streams.

The client PC being used must have network access to the RTSP stream source device.

Set up A Multiviewer

See Step 1: Prepare Multiviewer, on page 50 to set up a multiviewer for 'Input-Copy' streaming.

GV Orbit Custom User Panel Example

This example will describe how to view an H.264 'Input-Copy' stream on a custom user panel. This is for a GV Orbit Professional or Enterprise user. To run a GV Orbit custom user panel, a GV Orbit system is required with a GV Orbit server:

1 Open GV Orbit Client.

2 Create a new 'C&M' project.

3 Create a new screen.

This will be the custom user panel.

Note: The GV Orbit Client should be in 'Design Mode' (see tool bar icon in Figure 4-6).

4 Click once on the **Video Stream** widget icon at the bottom of the screen, see Figure 4-6.

Then move the cursor to bring a **Video Stream** widget onto the custom user panel. Position the widget on the panel and click once to release it.

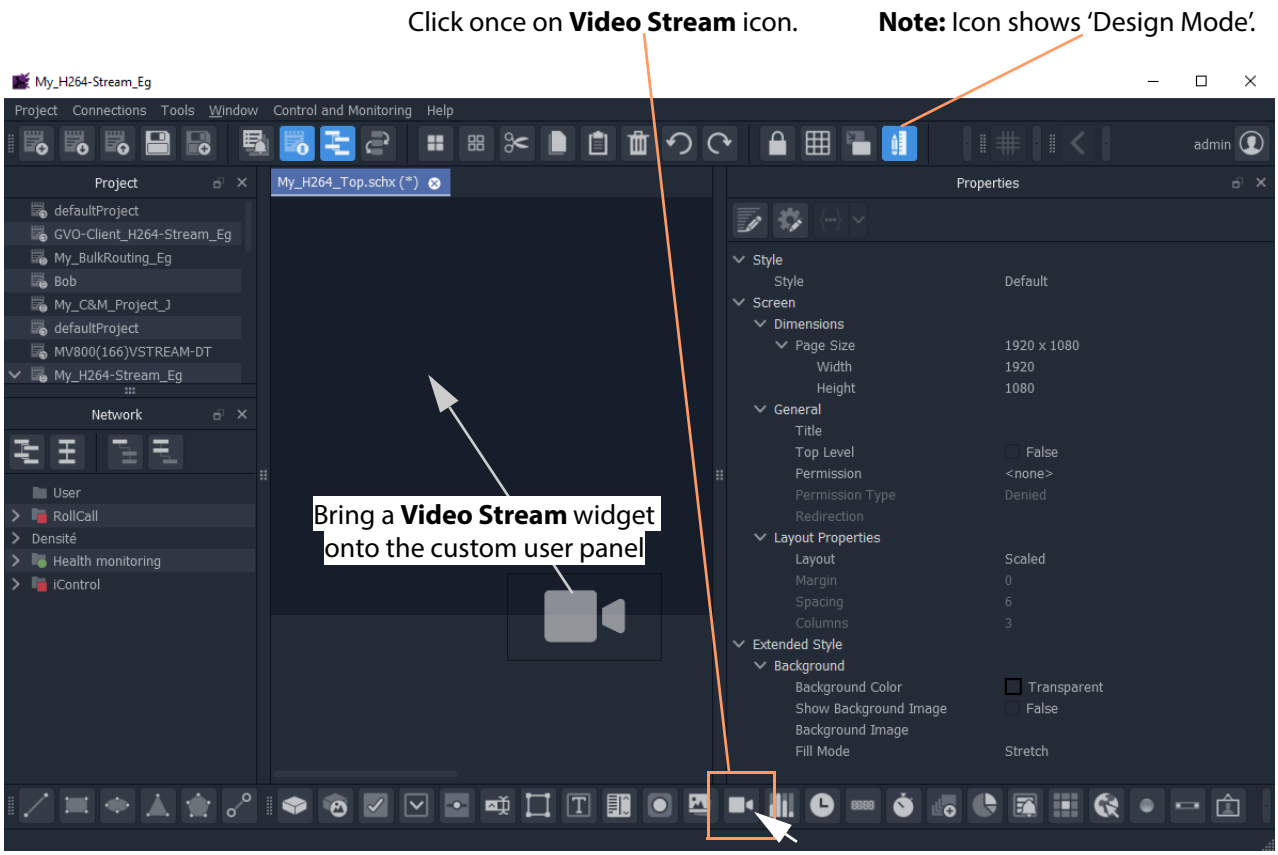


Fig. 4-6: Adding Video Stream Widget

5 Select the widget on the panel and edit the **Video > Source Path** widget property: Enter the RTSP stream URL. (See Figure 4-7.)

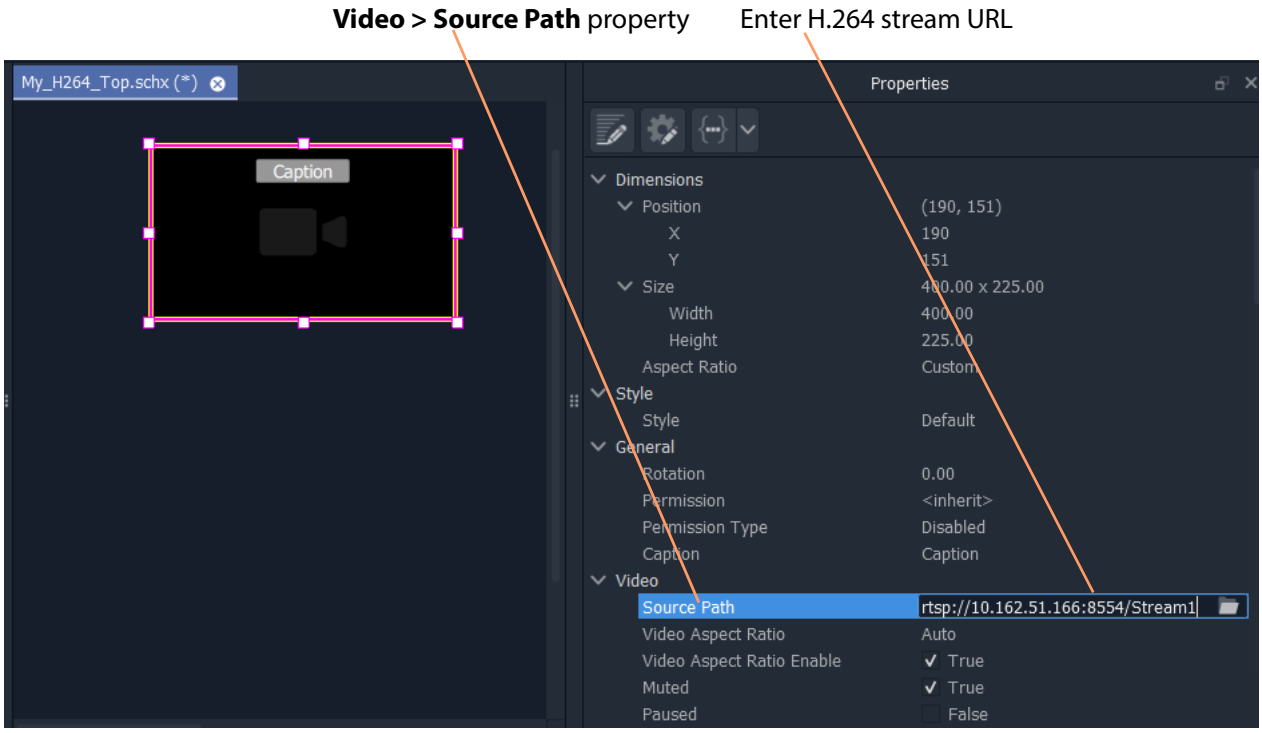


*Fig. 4-7: Enter URL for **Video > Source** Path Property*

6 Click the 'Run Mode/Design Mode' tool bar icon. See Figure 4-8.

The custom user panel is run and video appears as a live thumbnail image in the widget. See Figure 4-8.

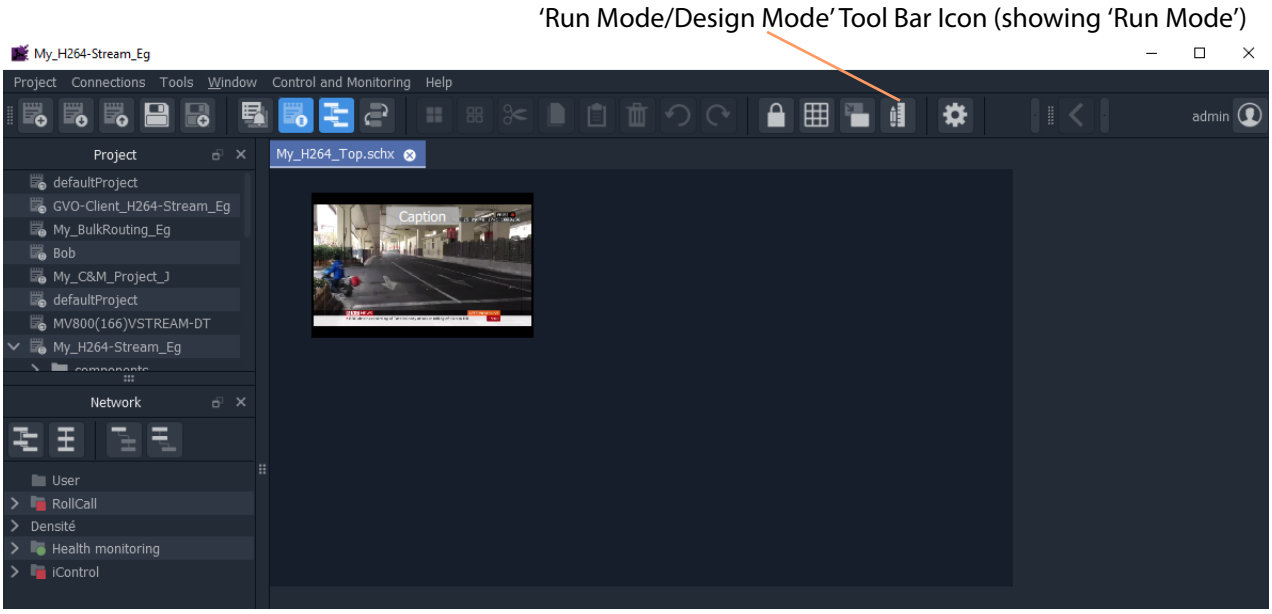


Fig. 4-8: Run Custom User Panel

GV Orbit Lite Example

For GV Orbit Lite product users, there is just the GV Orbit Client tool, no GV Orbit server nor C&M project. The example uses just the GV Orbit Client tool and is also applicable to the GV Orbit Professional and Enterprise products.

The example below will build a small desktop video wall and configure one tile to show an H.264 stream.

Step 1: A Simple Desktop Video Wall

1 Run GV Orbit Client and create a **New Project**, a multiviewer project.

Fig. 4-9: Creating a New Multiviewer project

2 Click **Next**.

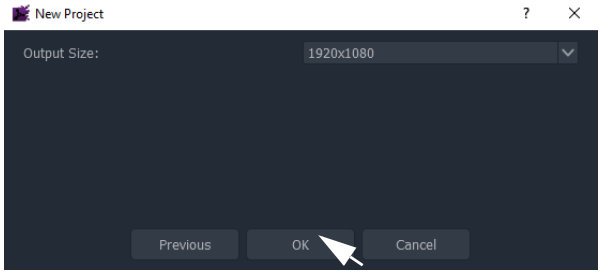


Fig. 4-10: Creating a New Multiviewer project

3 Select 'Output Size' 1920x1080.
And click **OK**.

4 Click the **Walls** icon and click **New Wall**. See Figure 4-11.

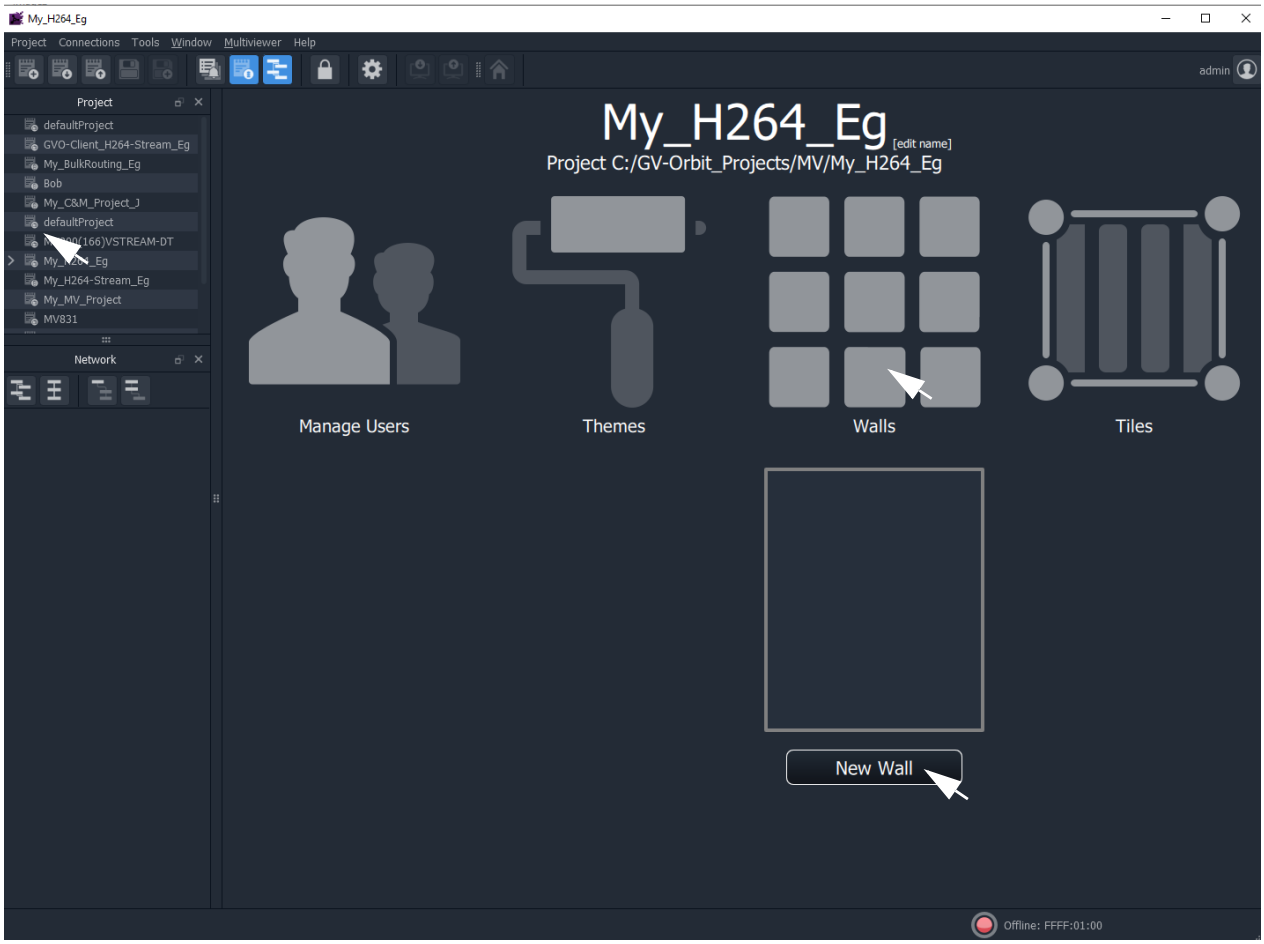


Fig. 4-11: Creating a New Wall

5 Enter a **Name** for the new wall.
Click **OK**.

A new video Wall is shown.

6 Click the **Run Mode/Design Mode** tool bar icon to set GV Orbit Client into 'Design Mode'.
(**Note:** Clicking this icon toggles between the two modes.)

The new video wall is shown in the **Wall Editor**. See Figure 4-12.

Run Mode/Design Mode icon, showing GV Orbit Client in 'Design Mode'.

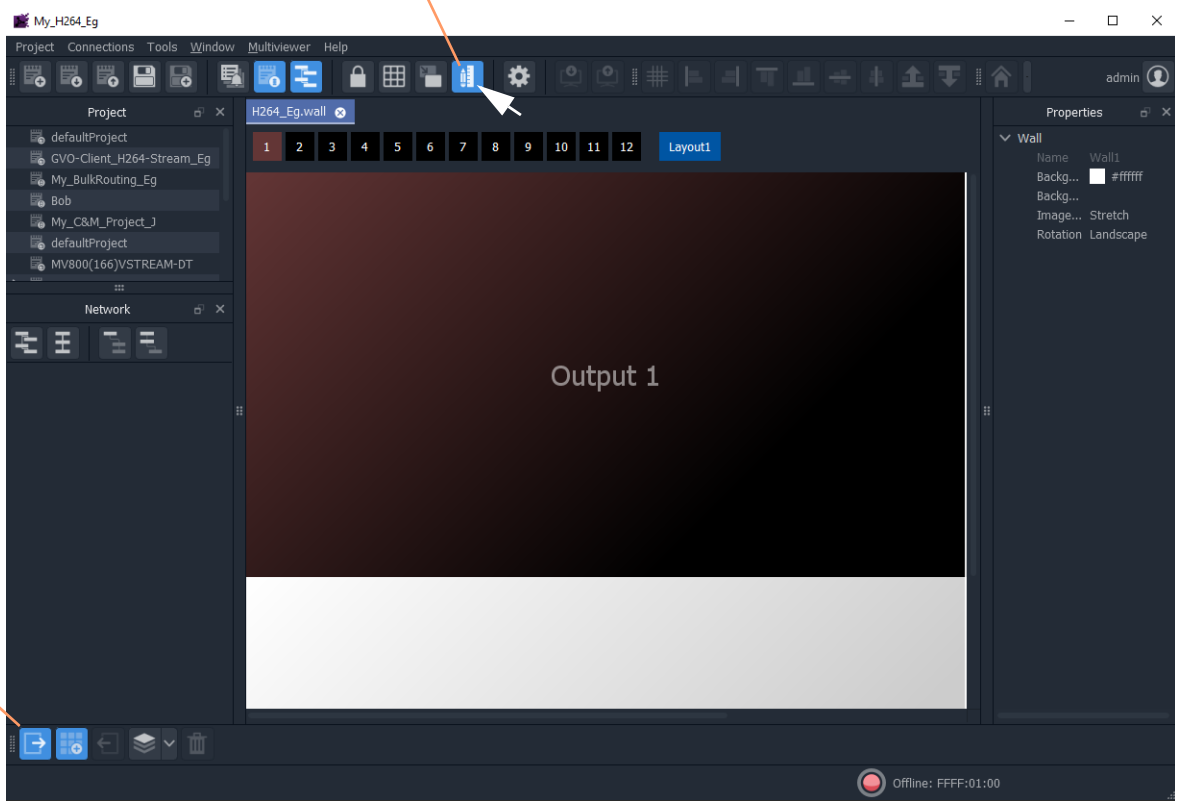


Fig. 4-12: New Wall in Wall Editor

7 Click the 'Assign Outputs to Wall' button ( ) in the bottom right-hand corner.

8 Click on the 3x3 Grid to populate the new video wall with a 3x3 grid.

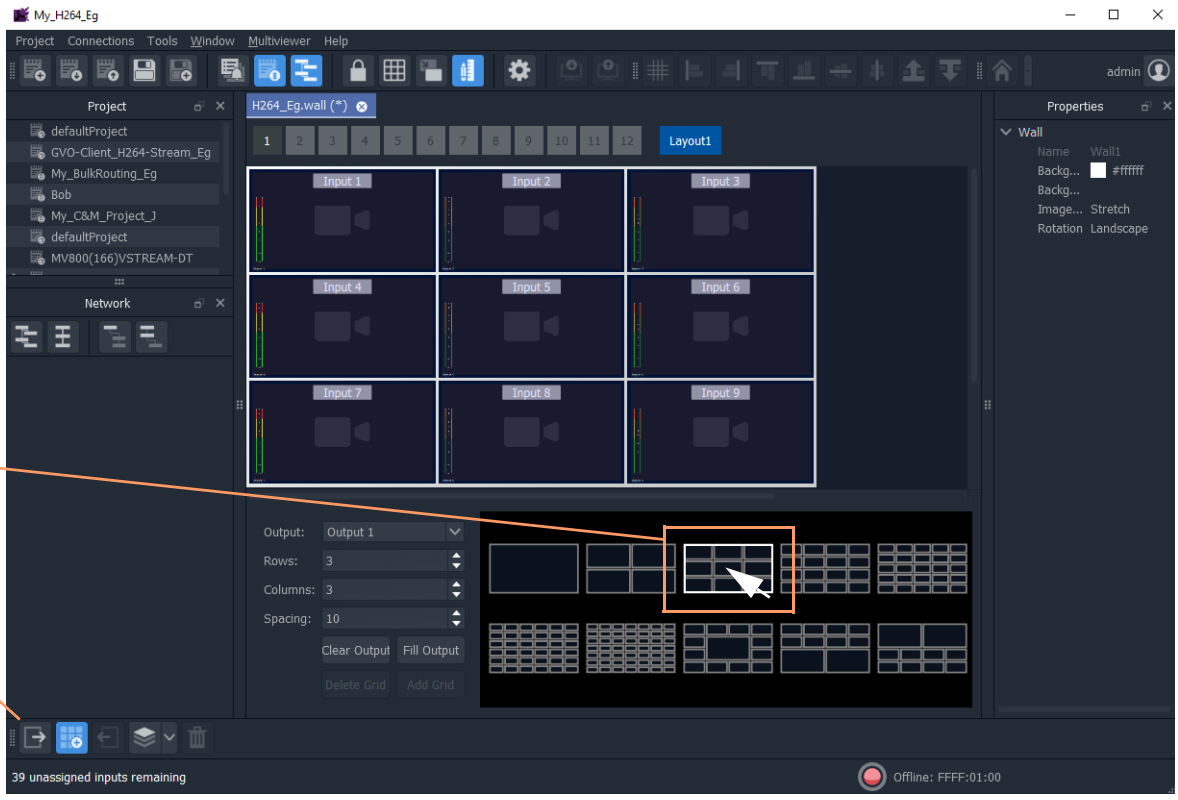


Fig. 4-13: Setting a 3x3 Grid in Wall Editor

9 Select a video tile on the **Wall**.

10 Find the **Streaming Video** property and set it to 'True'.

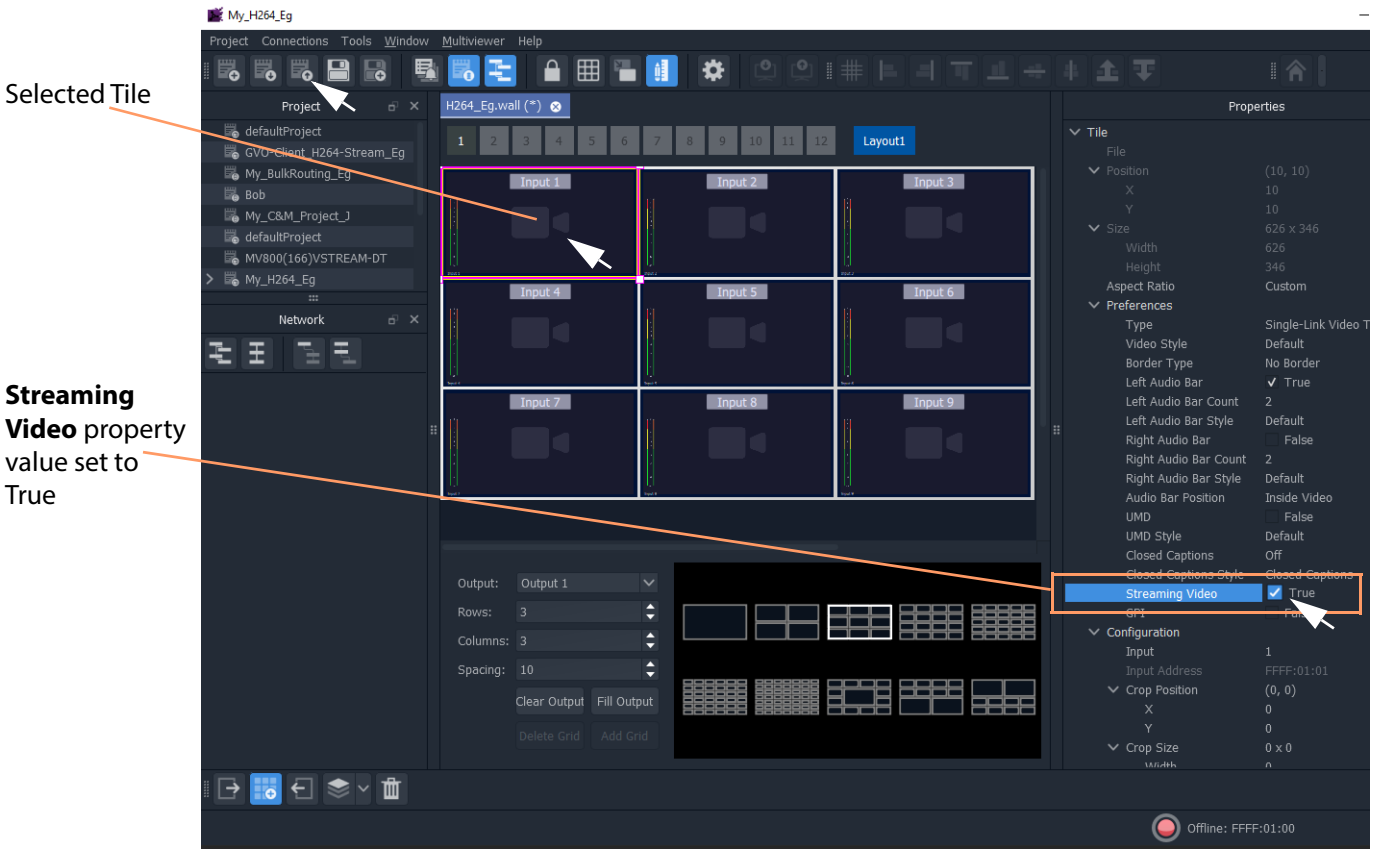


Fig. 4-14: Streaming Video True

11 Click the **Save Project** icon in the tool bar ( ) to save the **Wall** design.

The basic preparation of a simple desktop video wall is done and is now saved. One video tile on the wall has been set up for displaying RTSP 'Input-Copy' video stream.

Step 2: Point GV Orbit Client at a Multiviewer

To point the GV Orbit Client multiviewer project at a multiviewer unit:

12 Click **Multiviewer -> Properties** in the main menu.

The **Properties** dialog is shown. See Figure 4-15.

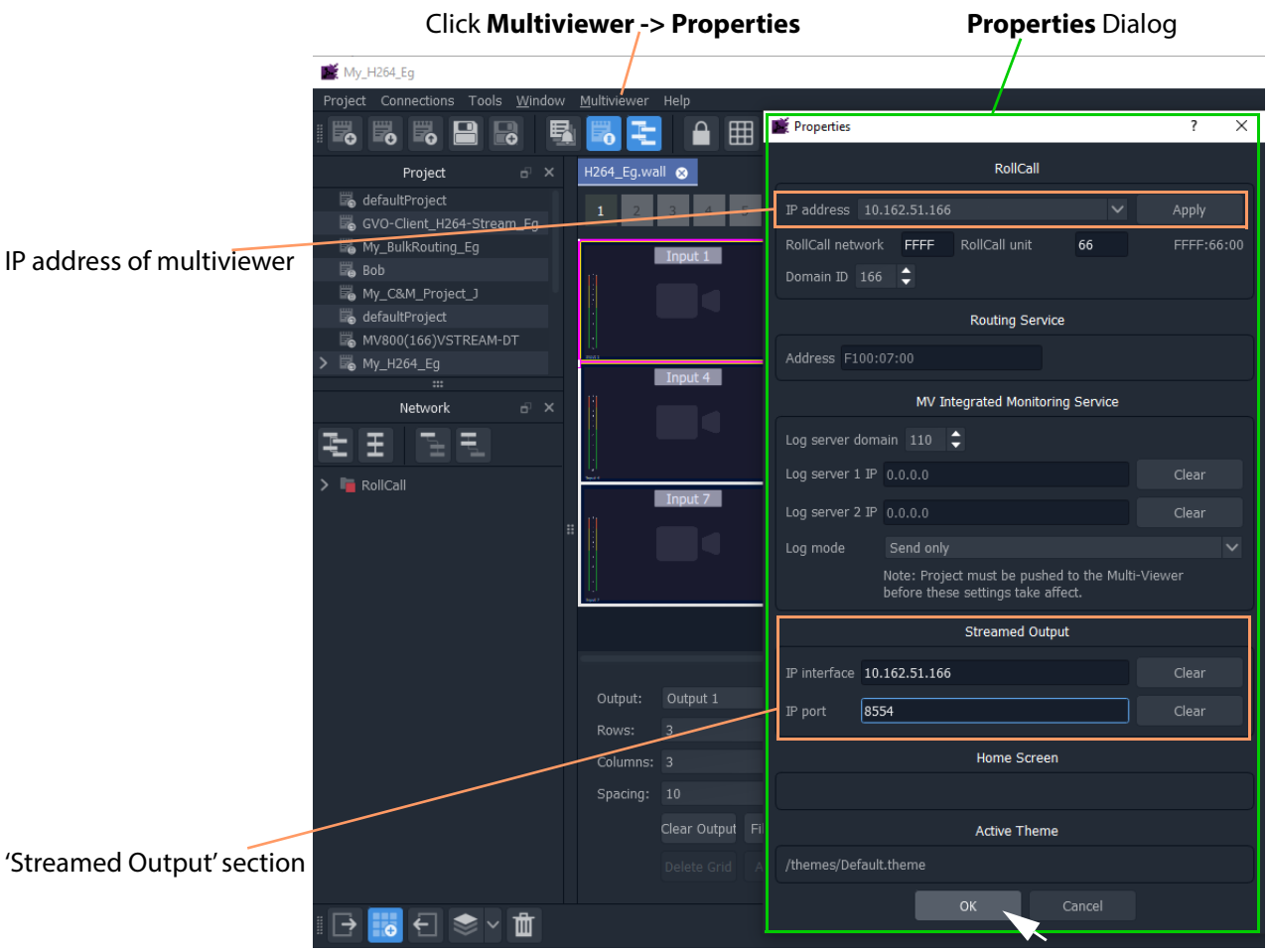


Fig. 4-15: Properties Dialog

In the **Properties** dialog:

13 Enter the IP address of a multiviewer sourcing H.264 'Input-Copy' streams.

14 Click **Apply**.

A connection is made to the multiviewer device and this is indicated at the bottom of the GV Orbit Client screen. See Figure 4-16.

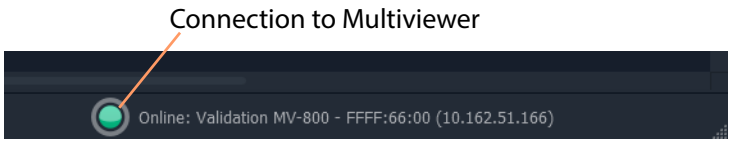


Fig. 4-16: Properties Dialog

Some further multiviewer settings are then filled out automatically in the dialog. (E.g. RollCall Network, Domain ID and Routing Service address.)

15 In the 'Streamed Output' section of the **Properties** dialog (see Figure 4-15):

1 Enter the IP address of the network interface used by the multiviewer for the H.264 Input-Copy streams.

2 Enter the IP port number used by the multiviewer for the H.264 Input-Copy streams.

16 Click **OK**.

A dialog pops up advising that the 'Streamed Output' changes mean the **Wall** editor will need to be closed (so any *unsaved* Wall design needs saving first).

Note: The **Wall** design has already been saved in the steps above. If it had not been, then the new **Wall** design would be lost.

Pop-up

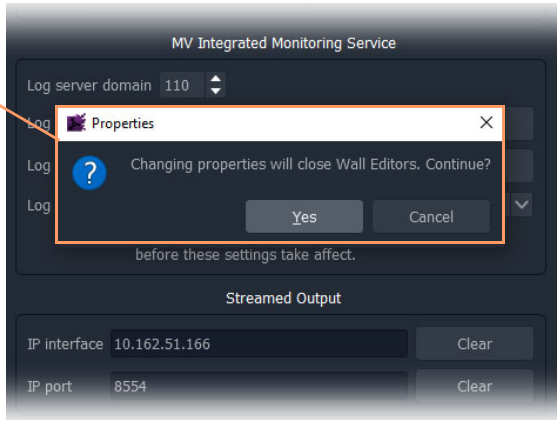


Fig. 4-17: Properties Dialog Pop-up

17 Click **Yes**.

The **Wall Editor** is closed and the multiviewer property settings are applied to the GV Orbit project and the multiviewer 'Input-Copy' stream URLs are formed.

Step 3: View the Video Wall

Re-Open the Wall:

18 Click on the **Walls** icon
and select the new wall design in the list.

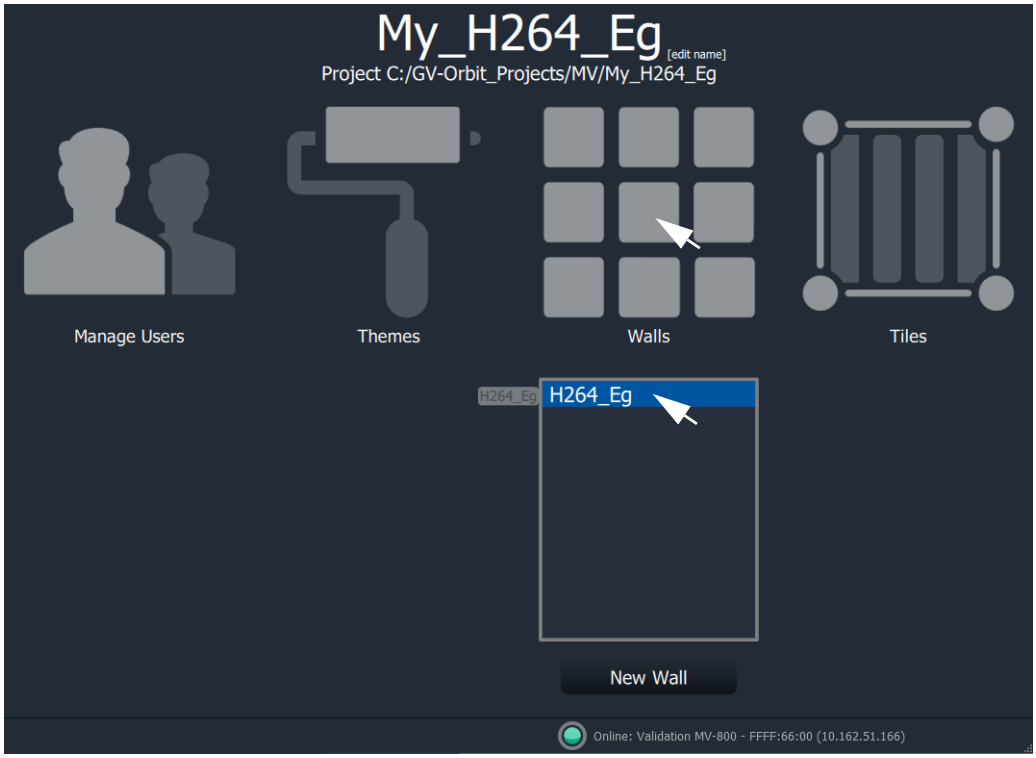


Fig. 4-18: Re-Open Wall

The wall design is opened in 'Run Mode'. One video tile shows video from a RTSP video stream. See Figure 4-19.

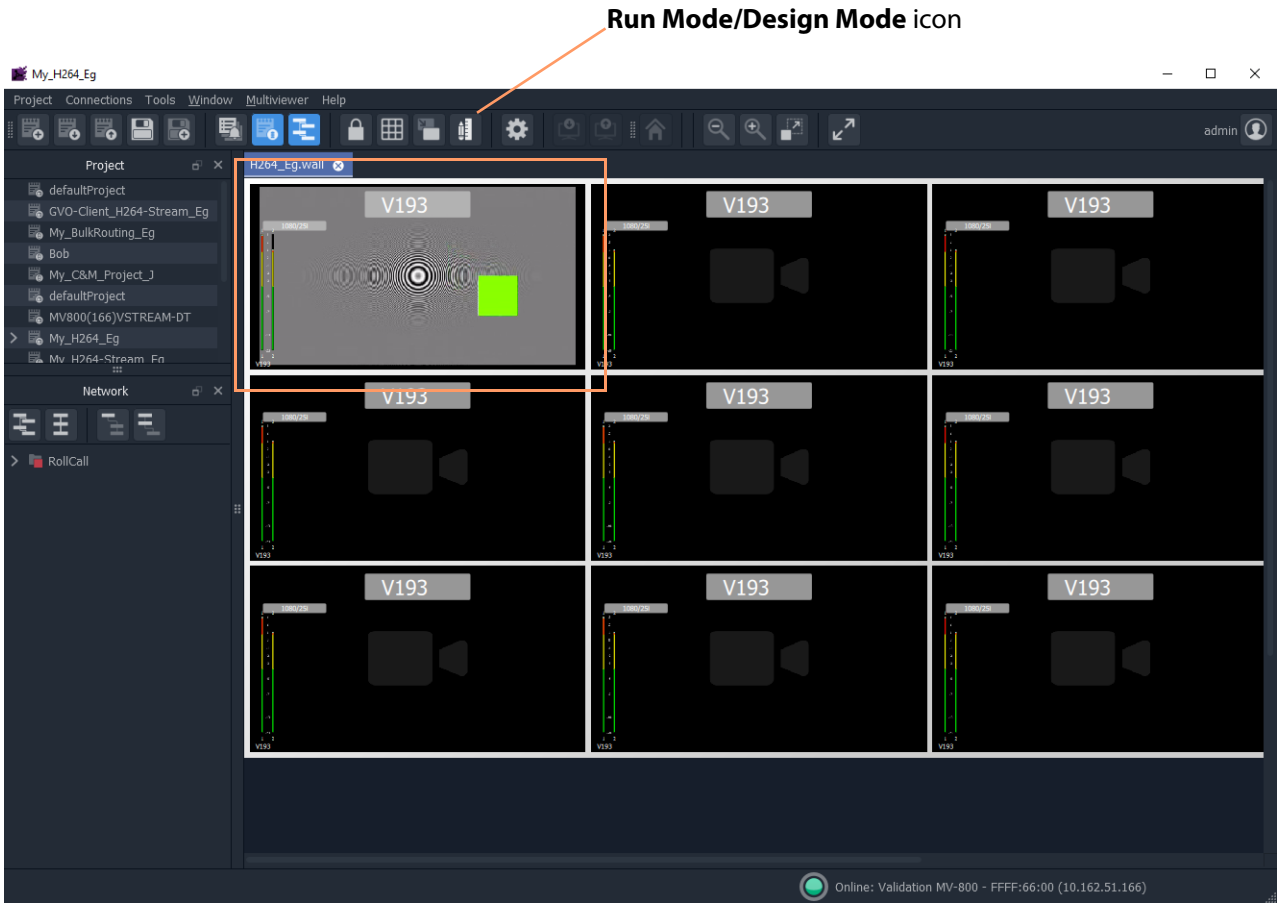


Fig. 4-19: Wall Running and Showing a Video Stream

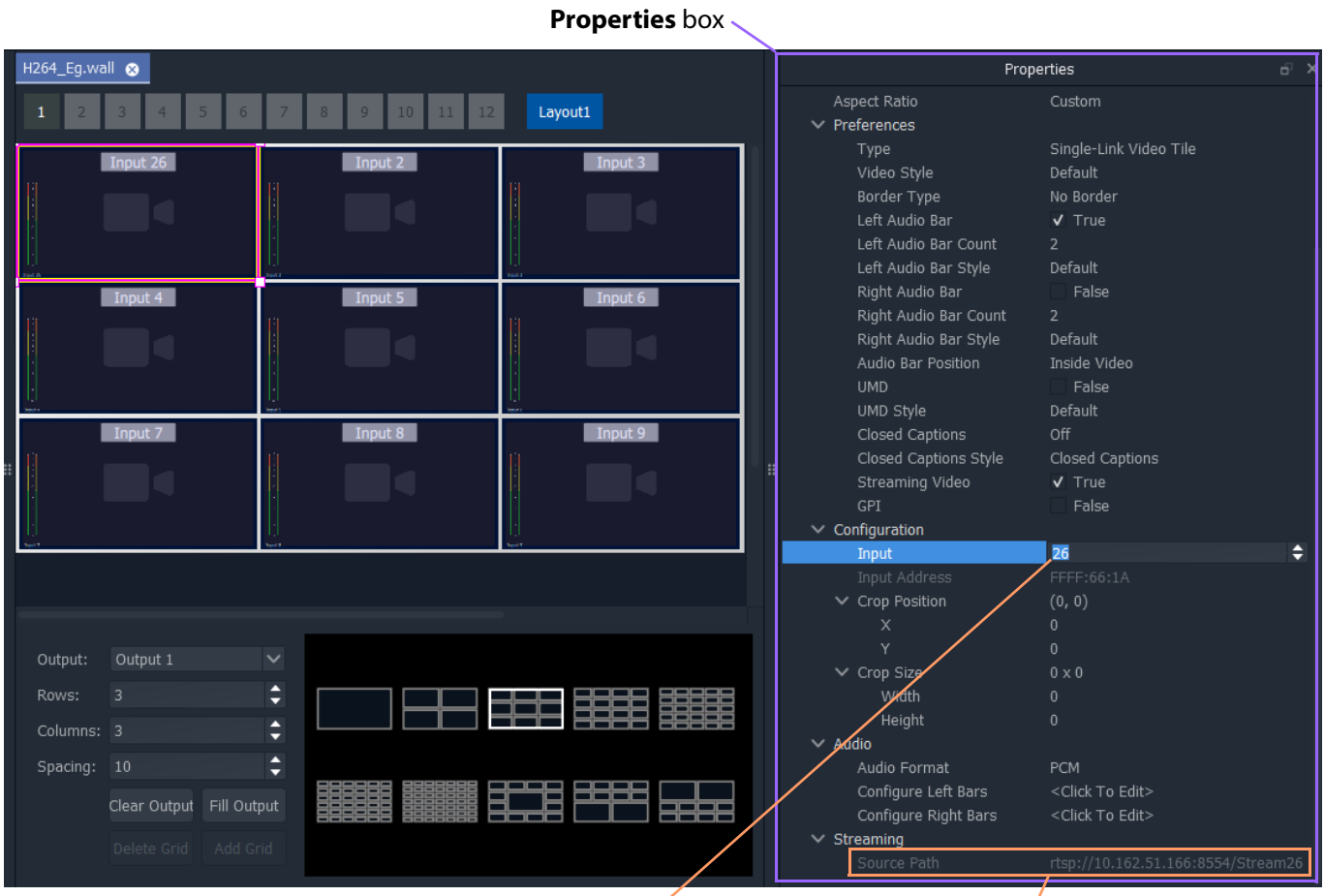
To change the video input being shown by the video tile:

19 Click the **Run Mode/Design Mode** icon to stop running the wall and show it in the **Wall Editor**.

20 Select the video tile.

21 Change the **Configuration -> Input** property in the **Properties** box to select another video input. See Figure 4-20a.

The resulting video stream path is filled out from the video input number selected and the IP address/IP port information. See Figure 4-20b.



Note: RTSP video stream path is shown for an MV-8X0 multiviewer. An MV-8X1 multiviewer uses one of four IP port numbers, depending on the multiviewer video input (see Stream IP Ports, on page 49).

Fig. 4-20: Select a Video Input:
a) Select video input to show on video tile.
b) Resulting RTSP video stream path.

22 Click the **Save Project** icon in the tool bar ( ) to save the **Wall** design.

23 Click the **Run Mode/Design Mode** icon to start running the wall. The newly-selected video is now shown on the screen. See Figure 4-21.

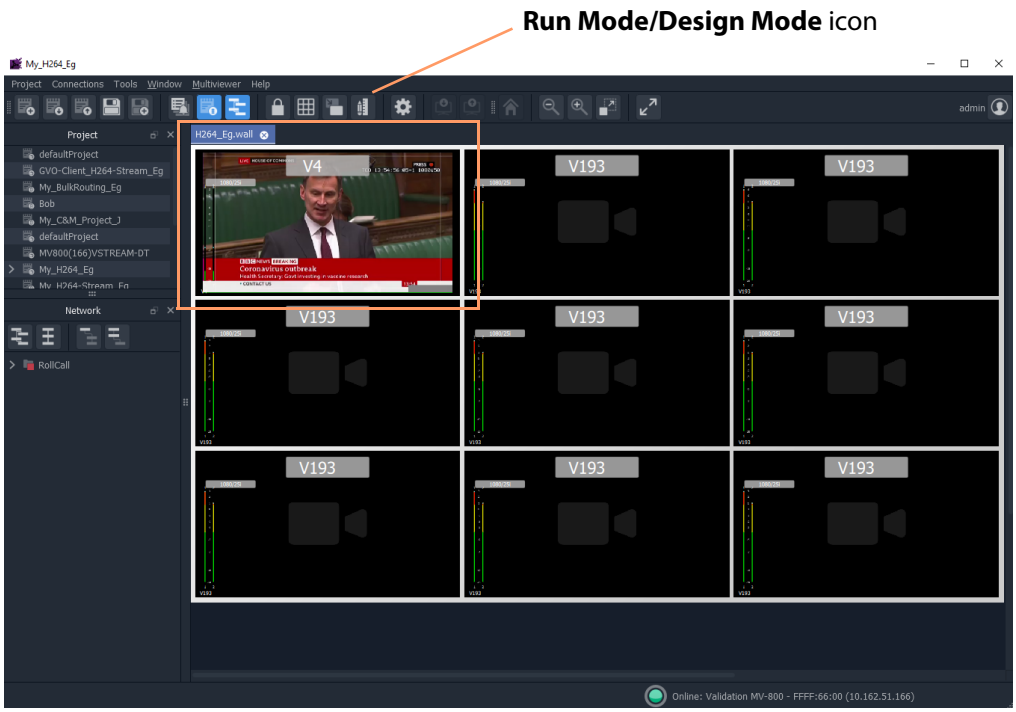


Fig. 4-21: Wall Running and Showing a New Video Stream

5 HDR Support

Section contents:

HDR Support

The HDR support at MV-8 Series Multiviewer inputs and outputs is described in this section.

Note: For information about high dynamic range video, refer to the 'HDR - A Guide to High Dynamic Range Operation for Live Broadcast Applications' white paper on the Grass Valley web site (search on 'HDR').

Introduction

An MV-8 Series multiviewer operates with standard dynamic range (SDR) signals internally and supports HDR at its video inputs and head display outputs.

Each multiviewer input supports HDR video input signals: Each input has a dynamic range converter which operates on the 10-bit luminance/chrominance values of the input video signal and converts from HDR to internal SDR values. The video signal is then re-sized and displayed by the multiviewer core etc.

Each multiviewer head display output supports HDR video output signals: Each output has a dynamic range converter which operates on the 10-bit luminance/chrominance values of the head display output video signal and converts from internal SDR to HDR values.

Note:
The HDR conversions available on each input and output of the MV-8 Series multiviewer efficiently handle video images with an increased luminance range., enabling a multiviewer to operate in a mixed SDR and HDR environment.

Note:
Use specialist test and measuring equipment to analyze and monitor the dynamic range, color gamut and color primaries of a source video signal.

Dynamic Range Conversions

Dynamic range conversions use a look-up table (LUT) approach to convert the internal SDR to/from the following HDR standards:

- Hybrid-Log-Gamma (HLG).
- Perceptual Quantizer (PQ), SMPTE ST2084.
- Sony Slog3.

As part of the HDR to/from SDR conversions, a user-controlled setting (Nits) determines either a) how much of the extra dynamic range in an HDR input signal is used in a corresponding internal SDR signal; or b) how much of the extra dynamic range in an HDR output signal is used for showing the (SDR) multiviewer head display output image.

Additionally, the processing can use the BT.709 color space (as used in SDR) or convert to/from the BT.2020 color space (typically used in HDR).

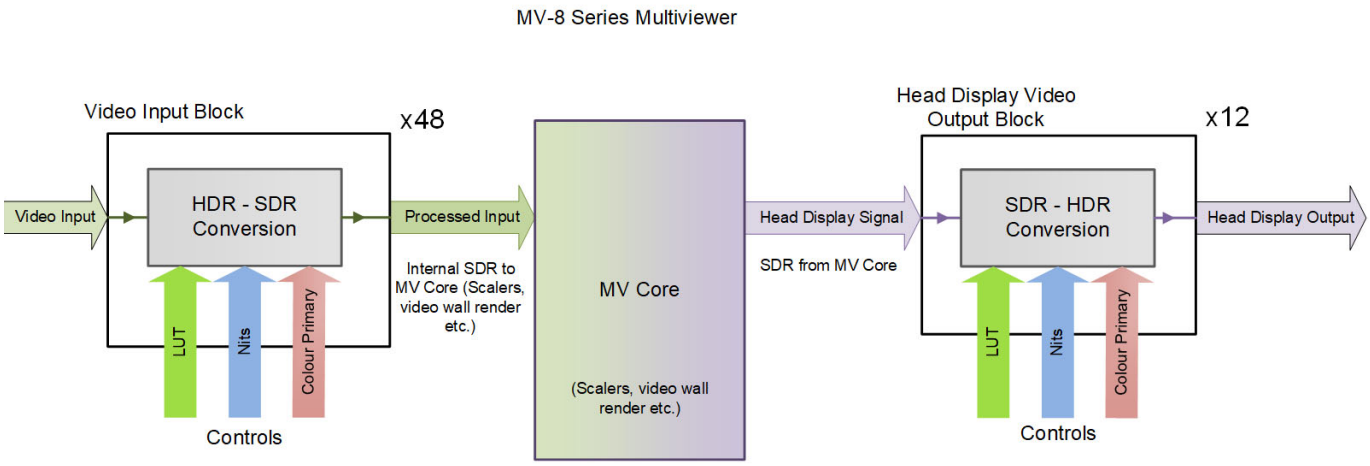


Fig. 5-1: Multiviewer Video Input HDR to SDR Processing

> Note: **Video Input Alarms:**
> The MV-8 Series Multiviewer contains various input alarms (configured with GV Orbit) which look at the video input. For a 'video black' alarm and an HDR input, for example, a 'video black' detector looks directly at the HDR video input data values (and *not* at any processed, SDR values).
> All alarm configuration settings must be set accordingly.

Control Settings

HDR processing on each multiviewer video input or output is set up in the multiviewer's RollCall template (control screen). See HDR Setup Control Screen, on page 41.

Nits

The **Nits** control sets how much of the extra dynamic range of an HDR input signal is used when it is converted to SDR internally for the MV-8 Series Multiviewer. And vice versa for the HDR conversion at the head display outputs.

- The nominal **Nits** value is 100 nits for a normal SDR monitor image.
- For the multiviewer video input HDR conversion:
  - Video values outside the **Nits** range are clipped to their limit in the RGB color space.
  - setting the **Nits** to a higher value results in a darker picture, which may be useful for a brighter monitor.

6 Media Biometrics Support

The integrated media biometrics support at multiviewer inputs is described in this section.

Note:	For information about media biometrics, refer to the 'Media Biometrics - Analysis, Detection & Reporting Solution for Media Workflows' data sheet on the Grass Valley web site (search on 'media biometrics').

Each multiviewer input supports media biometrics with a media biometrics generator (MBG), which produces a low data-rate signature for the respective input video and audio. Up to 48 signatures can be generated.

Setting up of an MV-8 Series Multiviewer is done via a RollCall template, or control screen, (see Biometrics Setup Control Screen, on page 39). Multiviewer inputs can have media biometrics generation enabled on a per input basis. Audio channels on each input can be individually selected for biometric signature generation. Each input's MBG can be individually named for subsequent easier signature identification.

Signature data for all enabled multiviewer inputs is transmitted onto a selected RollCall domain via a 'control' Ethernet interface of the MV-8X0/8X1 Multiviewer unit. The signature data is compatible with Grass Valley's SigMA media assurance solution.

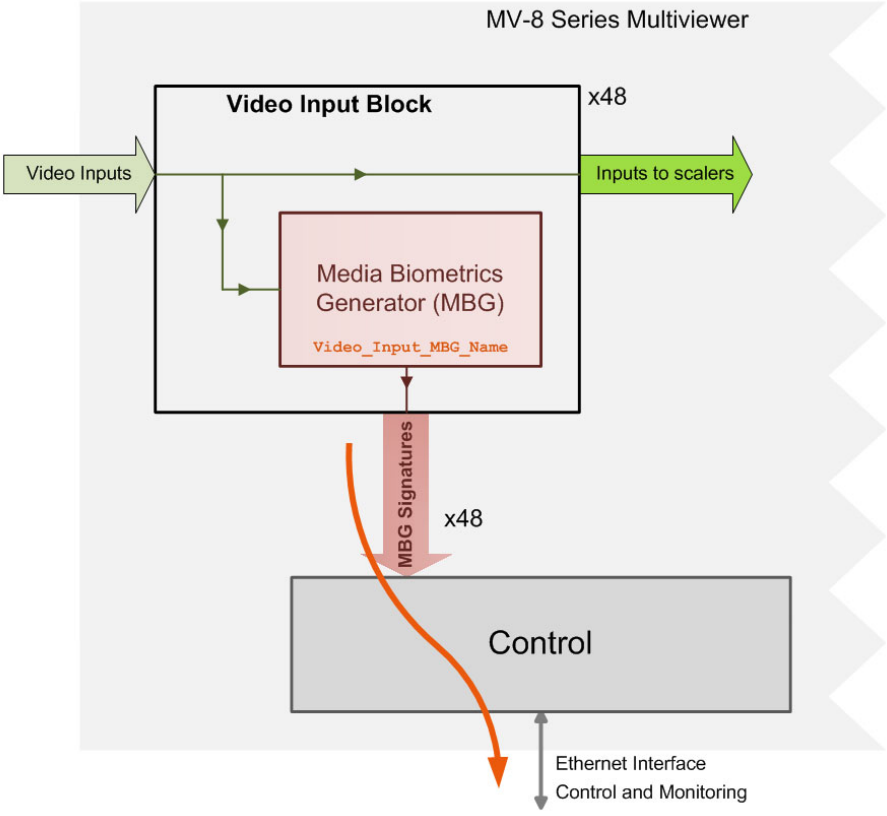


Fig. 6-1: Multiviewer Media Biometric Generators (MBGs)

7 Extended Data Services Support

The extended data services (XDS) support in the MV-8 Series Multiviewer is described in this section.

Note:	For full information about all extended data services, refer to the CEA-608-B specification.

The MV-8 Series Multiviewer provides access to some of the XDS data on each of its video inputs.

XDS data is extracted from each input and is available externally via RollCall commands. Additionally, the data is available internally and XDS data can be used or displayed by the multiviewer's video wall(s).

XDS Data and RollCall Commands

Details of the XDS data types supported and the RollCall command numbers used are found in XDS Data Types Supported, on page 123.

On-Screen Example

This example shows how to access some XDS data on a video input and then display it on a multiviewer video wall. This is done by editing the Orbit multiviewer project and cause it to read various RollCall commands.

(The complete list of RollCall commands numbers to access XDS data types is in appendix XDS Data Types Supported, on page 123.)

Assumptions

- An MV-8X0/8X1 Multiviewer is running with a known Orbit multiviewer project in a house system.
- Multiviewer video input 1 carries XDS data.

Procedure

To display XDS data on the video wall:

1 Open the Orbit multiviewer project.

2 Create a new empty tile.

3 Add two **Label** widgets.

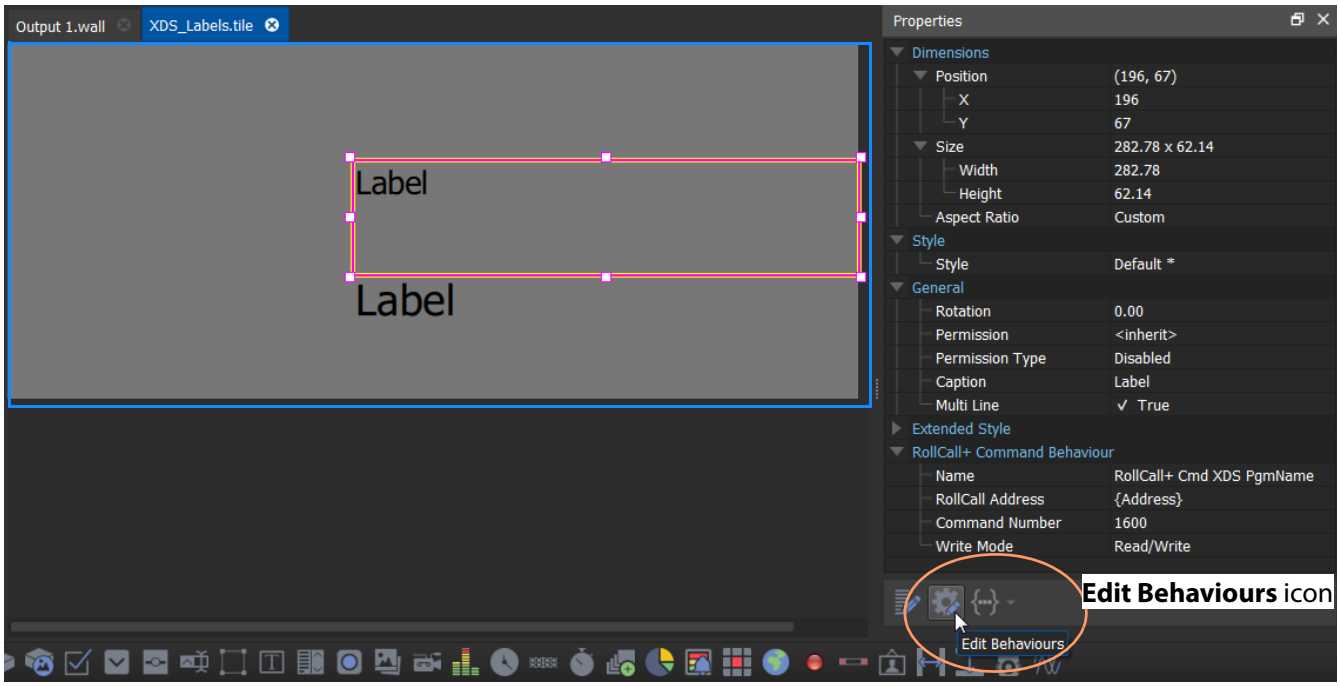


Fig. 7-1: 'XDS Labels' on New Tile

4 Select one **Label** and click the **Edit Behaviours** icon (see Figure 7-1) to open the 'Behaviours and Bindings' graphical editor.

5 Add a **RollCall+ Command** Behaviour to the editor. See Figure 7-2.

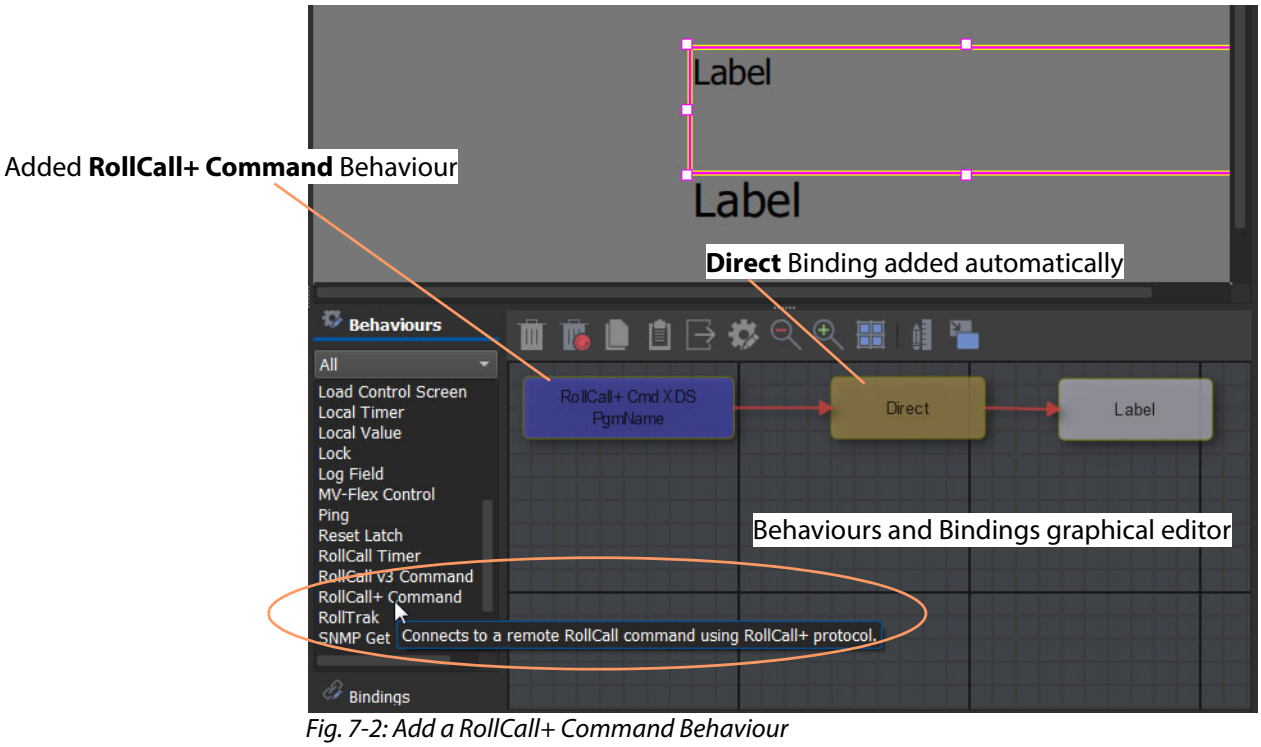


Fig. 7-2: Add a RollCall+ Command Behaviour

6 Double-click on the added RollCall+ Behaviour in the graphical editor to edit the Behaviour properties.

7 Set the **Command Number** property to '1600'.
(This is the V Chip Label, see to Appendix B XDS Data Types Supported, Program Name (Title) (V Chip Label), on page 124.)

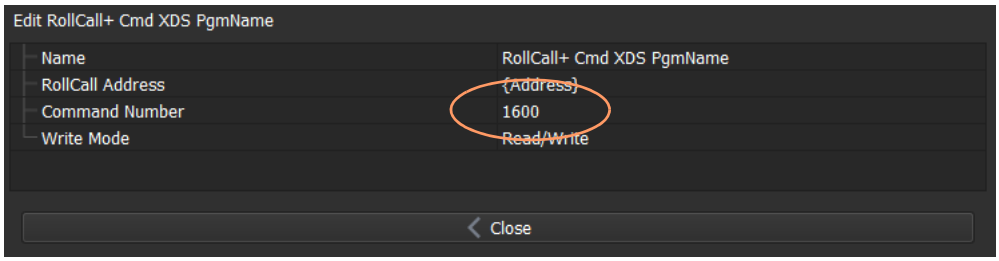


Fig. 7-3: Edit Behaviour Properties - Command Number

8 Click **Close**.

9 Repeat for the other **Label**, but set its **Command Number** to '1650'.
(This is the V Chip Rating, see to Appendix B XDS Data Types Supported, Content Advisory (V Chip Rating), on page 124.)

10 Click **Close**.

This has set up access to XDS 'Program Name' (V Chip Label) and XDS 'Content Advisory' (V Chip Rating) data values from multiviewer input 1 and set up two on-screen **Label** widgets for on-screen display of the values.

For clarity in this example:

11 Further comments may be added onto the tile using labels, as shown in Figure 7-4.

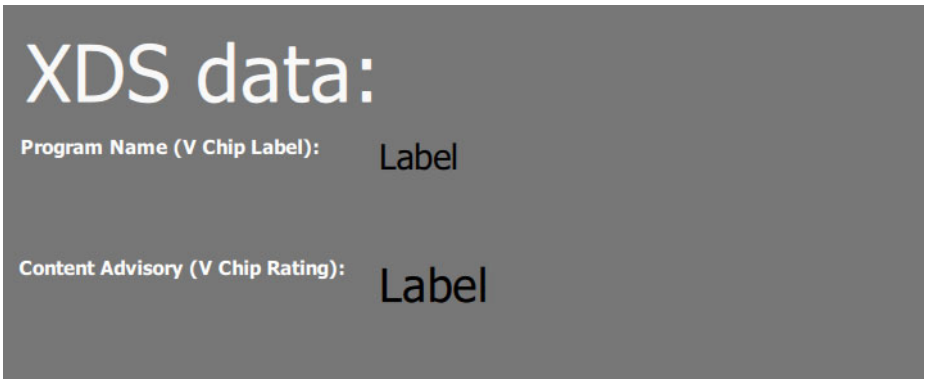


Fig. 7-4: Comment Labels Added to the Tile

12 Click **Save** in the main tool bar to save the tile changes.

13 Close the tile tab.

14 Open a **Wall** and drag on the new tile. See Figure 7-5.

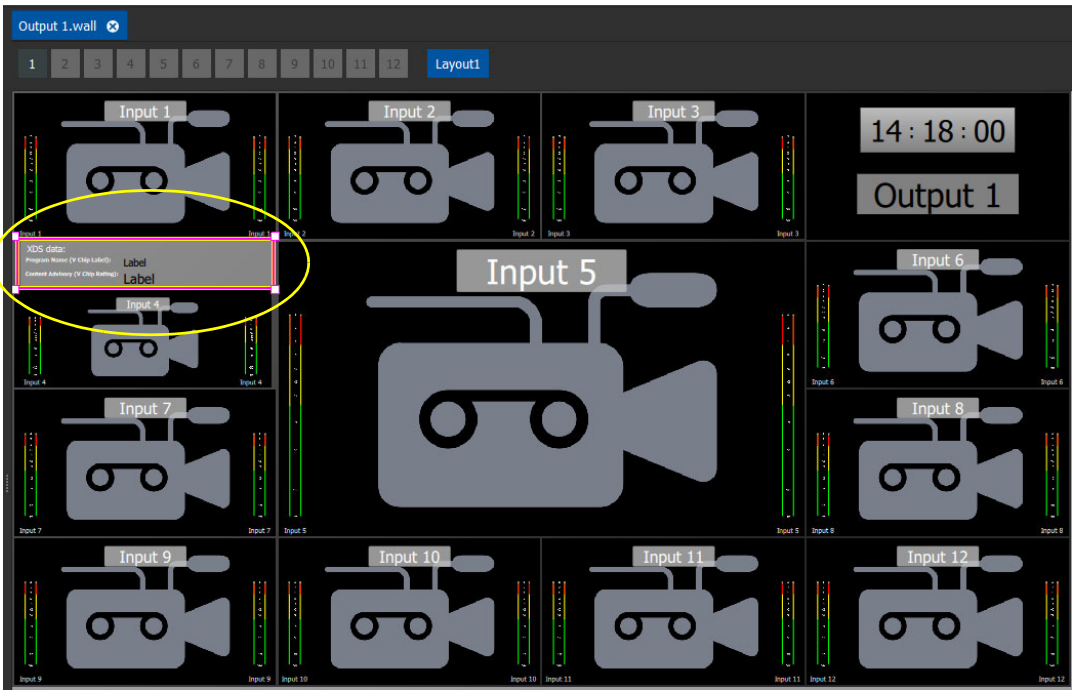


Fig. 7-5: XDS Labels Tile on Wall

15 Click **Save**.

16 Click **Save Project**.

17 Click the **Push** icon in the main tool bar to push the project to the MV-8X0/MV-8X1.

The multiviewer unit deploys the project and the XDS data on video input 1 is shown on-screen. See Figure 7-6.

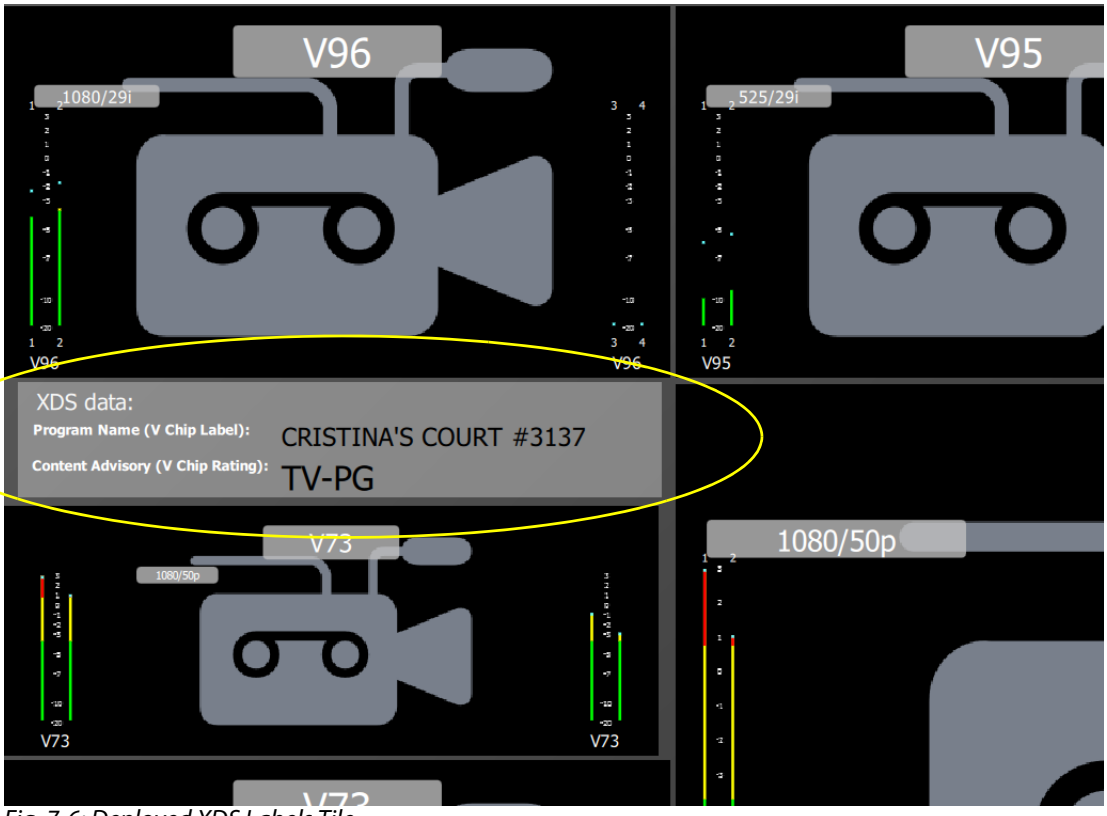


Fig. 7-6: Deployed XDS Labels Tile

8 Output Embedded Audio Support

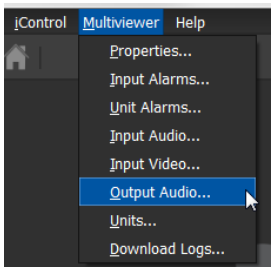
The MV-8 Series Multiviewer supports embedded audio on its head display outputs.

Orbit and Output Embedded Audio

The output embedded audio channels are configured in Orbit; stereo audio pairs from any multiviewer video input can be selected for each output:

1 Open an Orbit multiviewer project.

2 Click on **Multiviewer > Output Audio** in the main menu bar.



The **Output Audio** dialog is shown, see Figure 8-1.

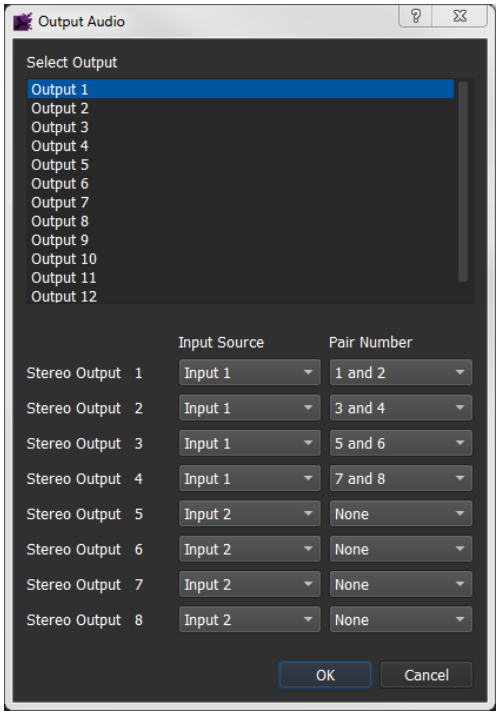
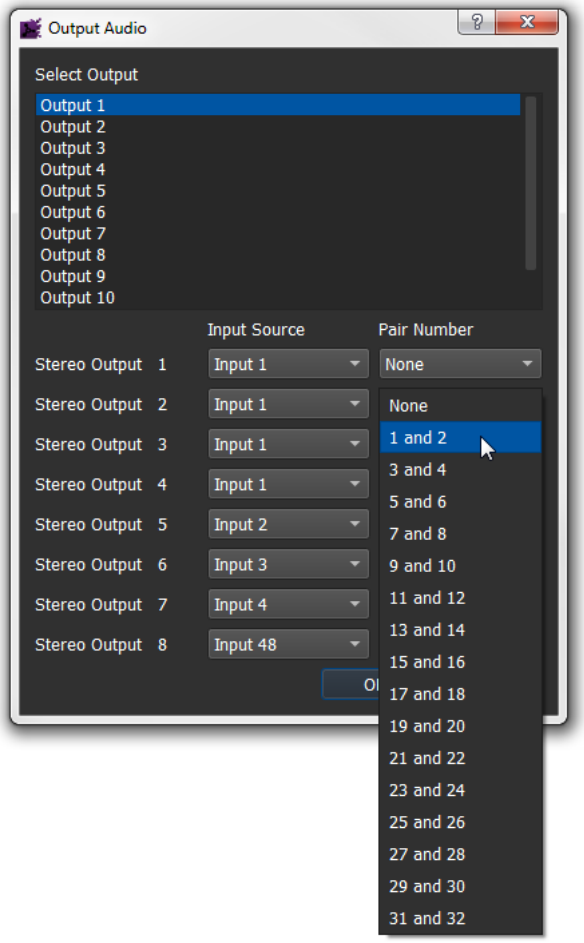


Fig. 8-1: Output Audio Dialog

3 Set up the audio stereo pair channels for embedding into each multiviewer head display output. See Table 8-1.

Table 8-1: Output Audio Dialog Settings

Setting	Description
Select Output	To select which multiviewer head display output to configure, click on an output name in the list (Output 1 to Output 12).
Stereo Output 1 to **Stereo Output 8**	For each audio stereo pair (1 to 8), select the following:
Input Source	Drop-down box. Select the multiviewer video input (Input 1 to Input 48) required to source the audio for the selected output.
Pair Number	Drop-down box. Select which audio stereo pair to use from the input source. 

4 When all embedded output audio stereo pairs are configured, click **OK**.

5 Click **Save Project**.

6 **Push** the project to the multiviewer unit for the output audio settings to take effect.

9 Getting Started

Getting Started

This chapter describes configuring basic system information for an MV-8 Series Multiviewer in and MV-8X0/8X1 Multiviewer product.

Introduction

MV-8 Series Multiviewer configuration is typically performed once after installation of the product and is done using Grass Valley's RollCall Control Panel tool.

Note:	RollCall Control Panel: The RollCall Control Panel tool is part of the RollCall Suite. (For installation instructions, see the "RollCall V4 Suite & RollCall Lite" manual.) Install the RollCall Control Panel software on your computer. See the 'RollCall Control Panel User Manual' and contact Grass Valley Support for information. Use RollCall Control Panel software version listed in Software Versions, on page 122.

Following an initial configuration step with RollCall Control Panel, the control screens (RollCall templates) may then be used to further configure and control various operational multiviewer items, including:

- selection of video wall layouts;
- monitoring alarm status;
- acknowledging alarms; and
- control of timer widgets on the video wall.

This section describes how to get started with an MV-8 Series Multiviewer multiviewer. These instructions are applicable to all MV-8 Series Multiviewers.

Default IP Addresses

Typically, a new MV-8X0/8X1 Multiviewer product will be using default IP addresses on Ethernet interfaces, which includes one or more 'control and monitoring' interface.

Note:	See the corresponding MV-8X0/8X1 Multiviewer product user manual for Ethernet interface descriptions and default IP addresses.

Hardware Installation

Note:	Refer to the corresponding MV-8X0/8X1 Multiviewer user manual for details about unpacking the product, the unit's rear connections and hardware installation.

Step 1: Initial RollCall Control Panel Connection and Unit Configuration

Items required:

- A laptop, or some computer, with an RJ45 Ethernet port and with Grass Valley RollCall Control Panel installed.
- A 'direct' CAT 5 Ethernet cable.
  (**Note:** Depending on the computer's network interface, a normal cable may suffice.)

Initial MV-8X0/8X1 Multiviewer connection and configuration should be carried out on a separate IT network, separate from any house IT network. The initial configuration sets up MV-8X0/8X1 Multiviewer product IP addresses and communication settings.

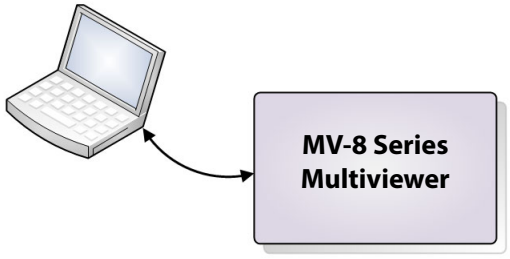


Fig. 9-1: Initial Configuration, separate from House System

Note:	Default IP Address on Ethernet control interface: Typically, a new MV-8X0/8X1 Multiviewer product has two multiviewer Ethernet control interfaces and will be using a default IP address, detailed in the respective MV-8X0/8X1 Multiviewer product user manual.

Step 1.1: Prepare Computer

To prepare a computer for initial connection:

1 Select which computer Ethernet RJ45 port to use
and set the port to a fixed IP address on the same network sub-net as the MV-8 Series Multiviewer.

(For example, use 10.54.31.200 for the computer port when connecting to a multiviewer default IP address of 10.54.31.221.
Note: Multiviewer default IP addresses are listed in the 'Specification' appendix of each MV-8X0/8X1 Multiviewer product user manual.)

2 Disable any WiFi connections on the computer.
(These may interfere with the wired RJ45 port.)

3 Directly connect the computer RJ45 port to the chosen multiviewer control Ethernet port of the MV-8X0/8X1 Multiviewer product using the 'direct' Ethernet cable.

Step 1.2: RollCall Control Panel Connection

When connecting RollCall Control Panel for the first initial MV-8 Series Multiviewer configuration, the computer should be connected directly to the MV-8X0/8X1 Multiviewer.

If connecting RollCall Control Panel for *further* unit configuration, connect to the unit in your house system network.

Note:	Refer to the corresponding product user manual for the MV-8X0/8X1 Multiviewer product for details of rear panel Ethernet connections.

To connect RollCall Control Panel to the MV-8 Series Multiviewer:

1 With the computer connected to the 1G Ethernet port of the MV-8X0/8X1 Multiviewer, open the RollCall Control Panel application from:

`Start > All Programs > SAM > RollCall > Control Panel`

The RollCall application starts and the initial RollCall Control Panel template is displayed.

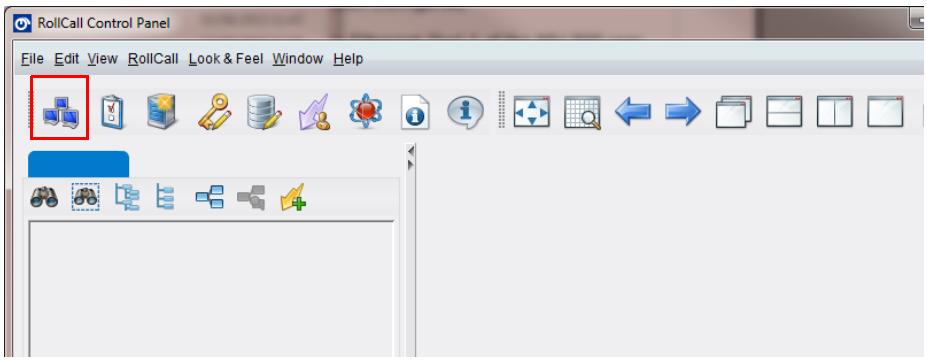


Fig. 9-2: RollCall Control Panel Initial Screen

2 Click on the **Build Network** icon in the RollCall tool bar to display the **Build Network** dialog. See Figure 9-3.

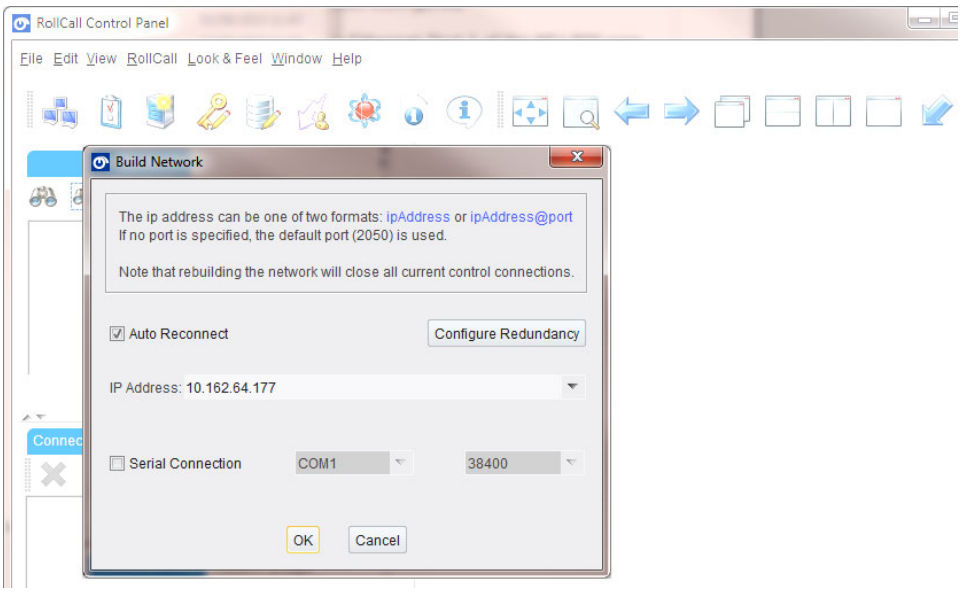


Fig. 9-3: Build Network Dialog

3 Enter your MV-8X0/8X1 Multiviewer 'MV control' IP address into the 'IP Address' text box and click **OK** to connect to the MV-8X0/8X1 Multiviewer product.

Note:	Default IP addresses for the network interface ports are detailed in the respective MV-8X0/8X1 Multiviewer user manual.

Note:	The IP addresses of MV-8 Series Multiviewer control Ethernet interfaces (used during initial multiviewer configuration) can be found by: • Enabling the **Output Overlay** feature on head display outputs (see Layout Control Screen, on page 29, and Overlays, on page 31) to show IP address information briefly on the outputs. Or • Restart the multiviewer product by re-applying power, causing a MV-8 Series Multiviewer reboot. IP address information is shown in the monitor splash screen, Booting and Splash Screen, on page 9 and its Figure 2-1 on page 9.

4 After a short period displaying the message "Connecting", RollCall Control Panel will connect to the MV-8X0/8X1 Multiviewer.

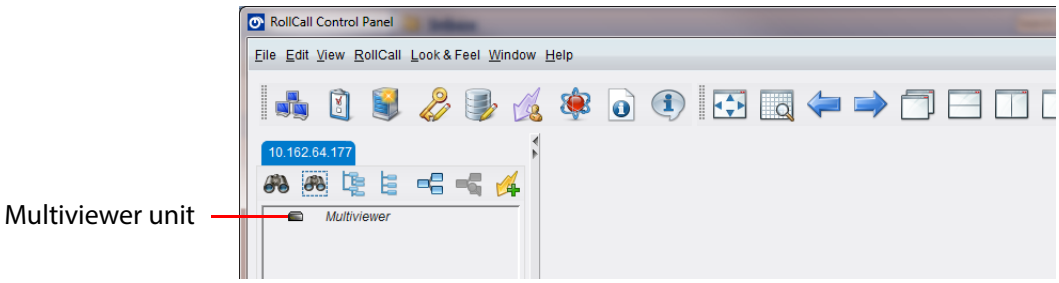


Fig. 9-4: Connected to MV-8X0/8X1 Multiviewer

5 In RollCall Control Panel, double-click on an MV-8X0/8X1 Multiviewer product icon or name in the left-hand pane.
(**Note:** The MV-820-IP shows one multiviewer block and four Video IP blocks in the left-hand pane. Connect to the multiviewer block in this case.)

Control screen settings are downloaded.

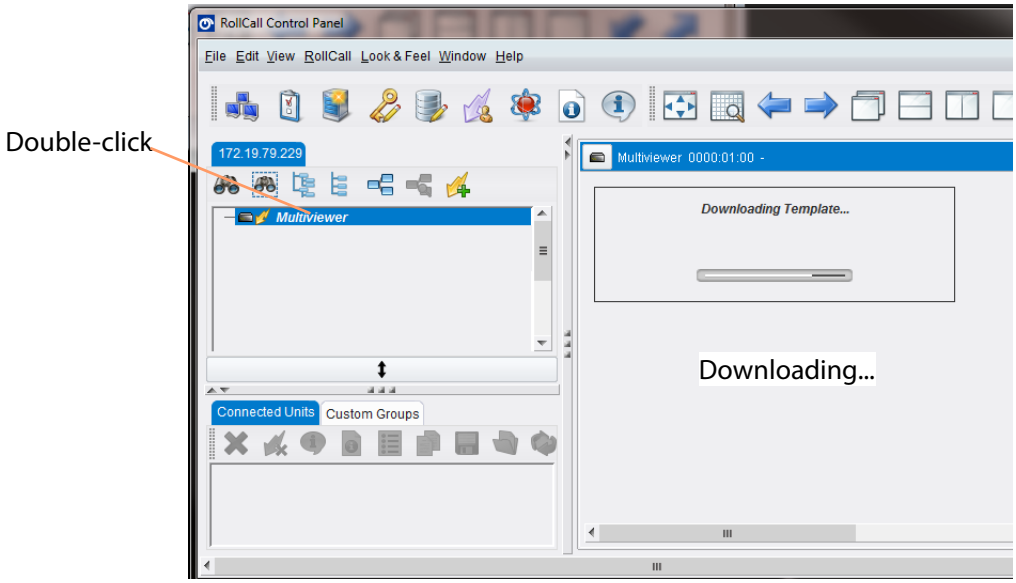


Fig. 9-5: Control Screen Downloading

6 The MV-8 Series Multiviewer control screens are automatically downloaded and then displayed in the pane on the right. See Figure 9-6.

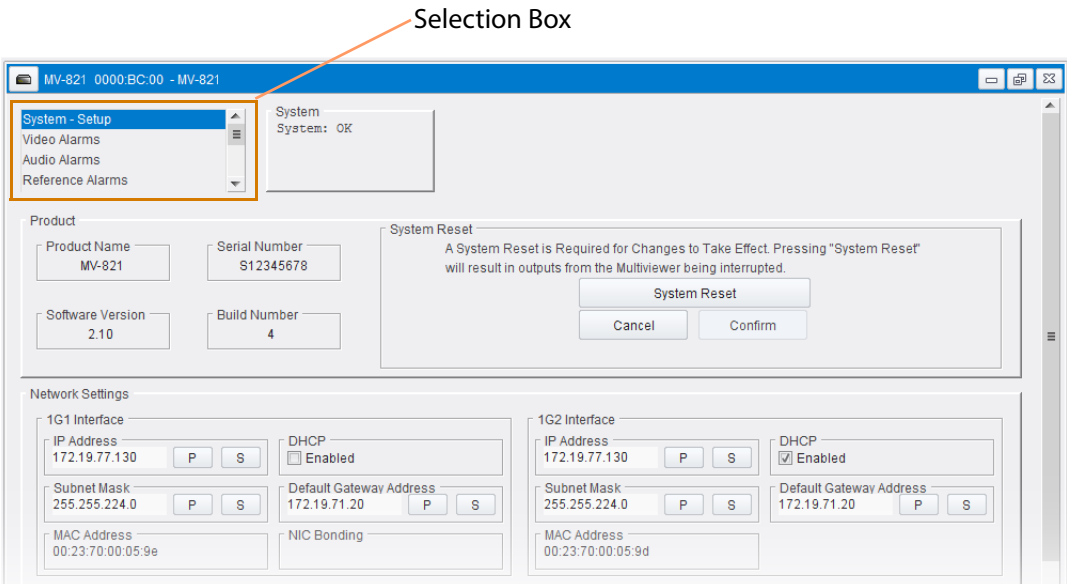


Fig. 9-6: MV-8 Series Multiviewer RollCall Control Screens

RollCall Control Panel has now connected to the unit.

For initial configuration, see Step 1.3: Initial Multiviewer Unit Configuration, on page 79.

Step 1.3: Initial Multiviewer Unit Configuration

(Initial configuration should be carried out on a separate IT network, separate from any house IT network.)

This initial configuration sets up an MV-8X0/8X1 Multiviewer unit's IP addresses and communication settings:

1 Select the **System-Setup** control screen in the upper Selection box.

2 Change the settings in the **System-Setup** control screen.

a) Under **Network Setting**,
set up the Ethernet interface IP network settings relevant to your house network.

b) Under **RollCall Settings**, set up:
Unit number (must be unique for each unit). and
Domain ID (typically the same for each unit).

Once all setting changes in the **System-Setup** control screen have been done:

3 Click on the **System Reset** button at the top of the **System-Setup** control screen (see "System Reset" box, on page 17).
Then click **Confirm** to perform a system reset.

IMPORTANT

A **System Reset** of the multiviewer is required before saved settings changes in the **System-Setup** control screen take effect.

Such a reset will affect all MV-8X0/8X1 Multiviewer connections, including the multiviewer monitor outputs. See "System Reset" box, on page 17.

When the MV-8X0/8X1 Multiviewer unit has re-booted, the new settings will be adopted. The MV-8X0/8X1 Multiviewer can then be connected to your house IT network.

Step 2: Further Unit Configuration

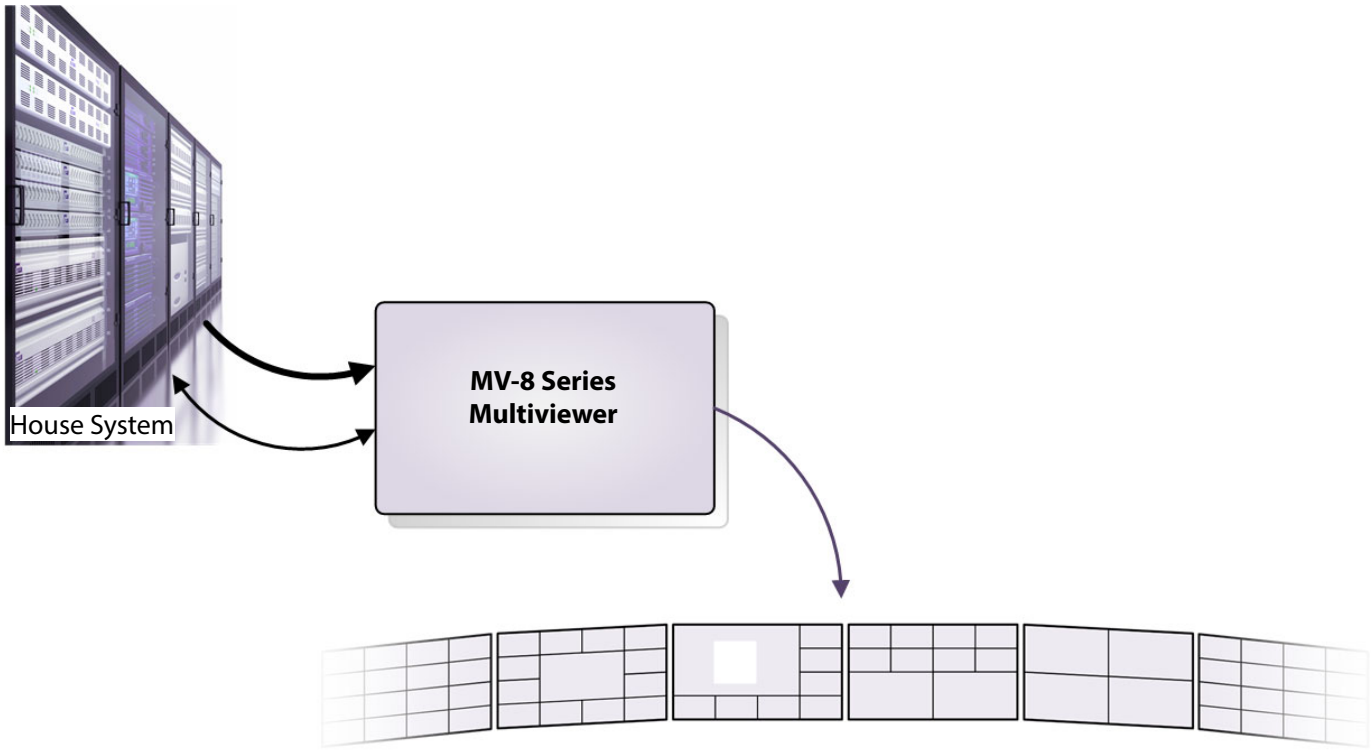


Fig. 9-7: Further Configuration - Multiviewer Connected to House System

Step 2.1: Connecting into House System

Following initial configuration, the MV-8X0/8X1 Multiviewer unit can then be connected to your house system, including IT network connections and video input/output connections.

Refer to the corresponding MV-8X0/8X1 Multiviewer user manual for details about unit connections and connecting up the unit.

IMPORTANT **Ethernet connection:**

Check the logical and physical connection of all 'control and monitoring' Ethernet ports on the MV-8X0/8X1 Multiviewer product's rear panel. This is required for optimum MV-8 Series Multiviewer performance.

Explanation:

An MV-8X0/8X1 Multiviewer product typically has more than one control Ethernet port - for example "1G1" and "1G2".
However, if a port is disconnected, its IP address can still be "seen" through the other port. This means the MV-8 Series Multiviewer can still *appear* to be operating normally even with one or more unconnected control network ports. But there is a performance penalty for operating with such an unconnected network port.

Further configuration can be done via control screens (RollCall templates), as required. Control screens for the MV-8 Series Multiviewer are describe in Control Screens (RollCall Templates), on page 11.

Default Video Wall

By default, after booting up, a new MV-8 Series Multiviewer will display each of the 48 multiviewer video inputs on a default video wall layout. This done on four multiviewer head display outputs (Output 1 to 4), see Figure 9-8.

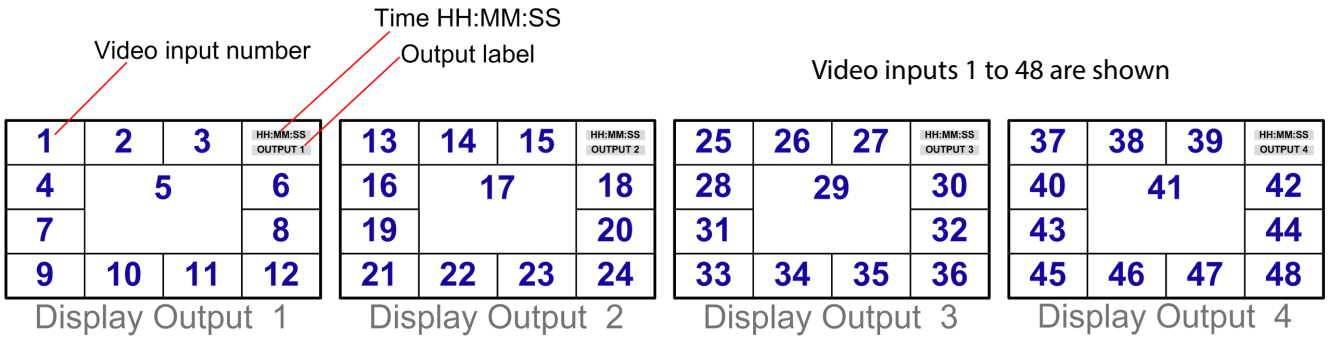


Fig. 9-8: MV-8 Series Multiviewer Default Video Wall on Multiviewer Head Display Outputs 1 to 4

Identifying Display Outputs and Video Inputs

To help with getting started and with unit system set up, the multiviewer can be configured to identify its inputs and outputs with an overlay on each multiviewer head display output. It can do this regardless of whether a video input is being supplied.

1 View the **Layout** control screen. (See Layout Control Screen, on page 29.)

2 Use the controls to turn on/off the display of overlay information to identify:

- multiviewer inputs; and/or
- head display outputs.

See Figure 9-9.

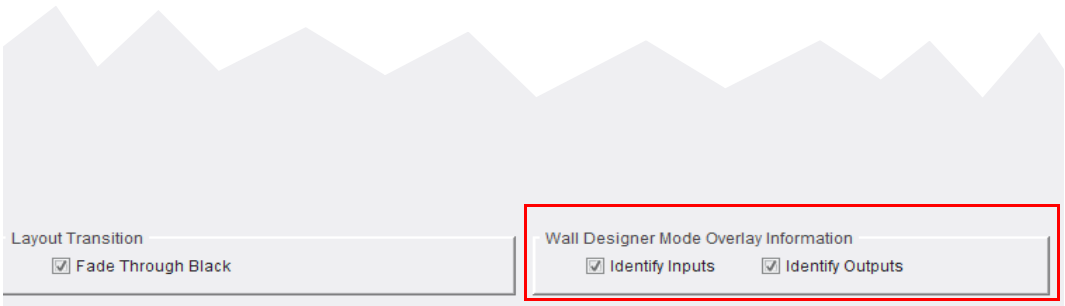


Fig. 9-9: Layout Control Screen - Multiviewer Display Output Overlays

Step 2.2: Further Unit Configuration

Further settings changes can be done at any time. All further MV-8 Series Multiviewer configuration settings can then be set up with RollCall Control Panel. However, settings changes done in the **System-Setup** control screen *will* need a System Reset. See Settings Changes and System Reset, on page 13.

CAUTION

Some **System-Setup** control screen changes may affect the MV-8X0/8X1 Multiviewer unit's network operation.

IMPORTANT

A **System Reset** of the multiviewer is required after settings changes in the RollCall **System-Setup** control screen.

Such a reset will affect all MV-8X0/8X1 Multiviewer product's connections, including the multiviewer outputs. See "System Reset" box, on page 17.

When the MV-8X0/8X1 Multiviewer has re-booted, the new settings will be adopted.

Note: **MV-820-IP:** To configure the IP inputs of an MV-820-IP, refer to the MV-820 Multiviewer user manual. Specific IP input configuration instructions are found in the 'Getting Started' chapter.

Note: **MV-821-IP:** To configure the IP inputs of an MV-821-IP, refer to the MV-821 Multiviewer user manual. Specific IP input configuration instructions are found in the 'Getting Started' chapter.

Step 3: Orbit Multiviewer Project

After the MV-8 Series Multiviewer unit is configured, the default Orbit multiviewer project may be pulled from the unit, modified and pushed back to the unit. This section demonstrates how to make a simple and visible change to the video wall.

Note:	For full instruction on creating video walls etc., please refer to Orbit documentation.

The section contains:

Introduction

This section will:

- Get the Orbit multiviewer project from the MV-8X0/8X1 Multiviewer unit (= the default MV-8 Series Multiviewer Orbit project for a new, factory unit).
- Make a simple, visible change to the video wall.
- Push the amended project back to the unit.
- See changed project working on-screen.

And finally, it describes how to:

- Pull a project from a MV-8X0/8X1 Multiviewer unit.

Assumptions

This section assumes that:

- The MV-8X0/8X1 Multiviewer is:
  - running;
  - connected to a control Ethernet network; and
  - receiving/sending video IP streams.
- IP addresses of the MV-8X0/8X1 Multiviewer Ethernet interfaces are known.
- Orbit is installed on a client computer connected to the control network. (**Note:** Access to an Orbit license is not required for basic Orbit operation.)

STEP 3.1: Pull the Orbit Multiviewer Project from the Unit

To get the MV-8X0/8X1 Multiviewer unit's Orbit multiviewer project:

1 Run Orbit and click **File > New project**,

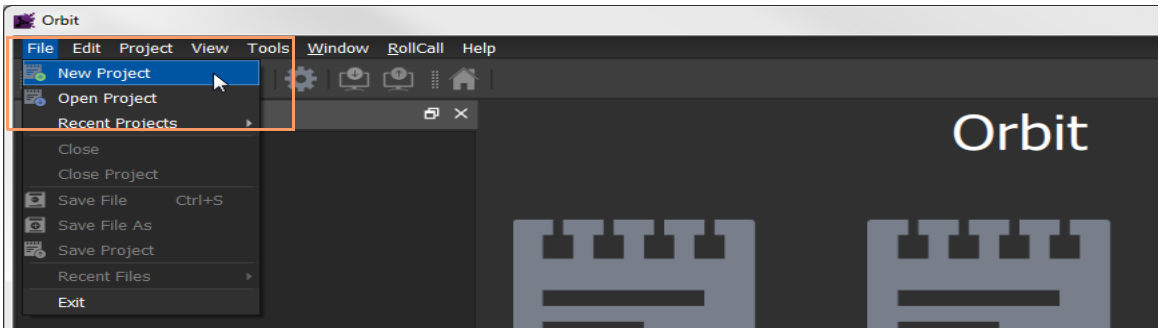


Fig. 9-10: Orbit File > New Project

2 Select **Connected Multiviewer Project**.

3 Browse *into* a new, empty folder and click **Choose**.

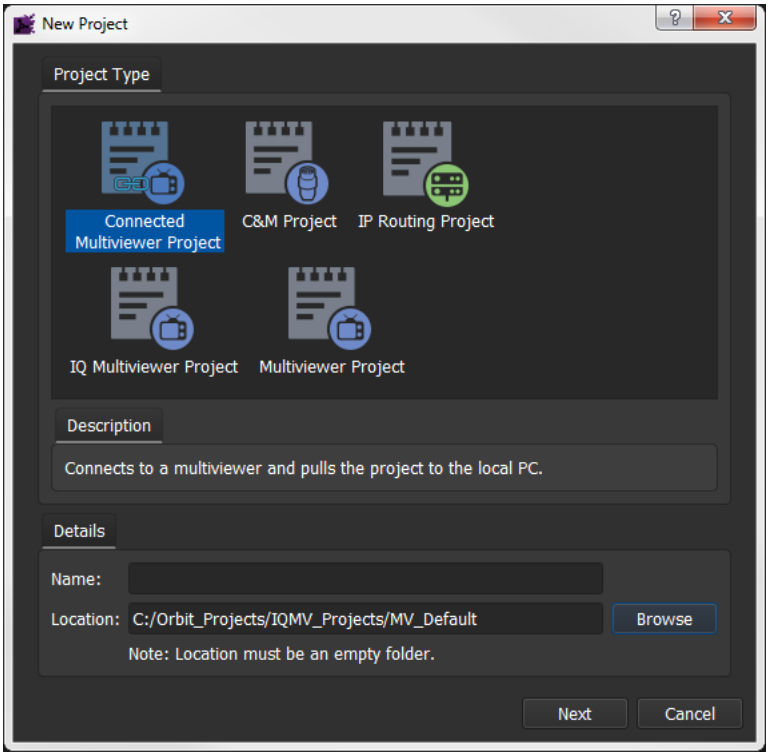


Fig. 9-11: New Project Dialog - Connected Multiviewer Project

4 Click **Next**.
All accessible multiviewer devices are auto-discovered and listed.

Note:	Auto-discovery of multiviewer devices relies on RollCall+ data packets being present on the network. Ensure these are supported by the house network system. Contact Grass Valley customer support for further information.

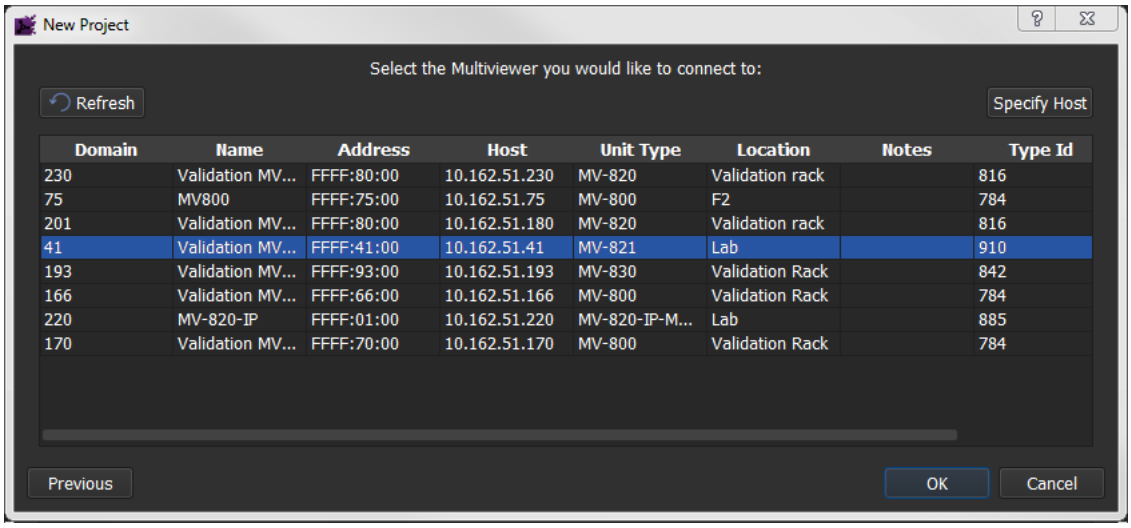


Fig. 9-12: New Project Dialog - Multiviewer List

5 Select a device in the list and click **OK**.

To enter device details manually, if a device is not listed, then:

6 Click **Specify Host** and enter the device's RollCall **domain** number and **IP address**.

7 Click **Refresh**.

8 Select the device in the new list and click **OK**.

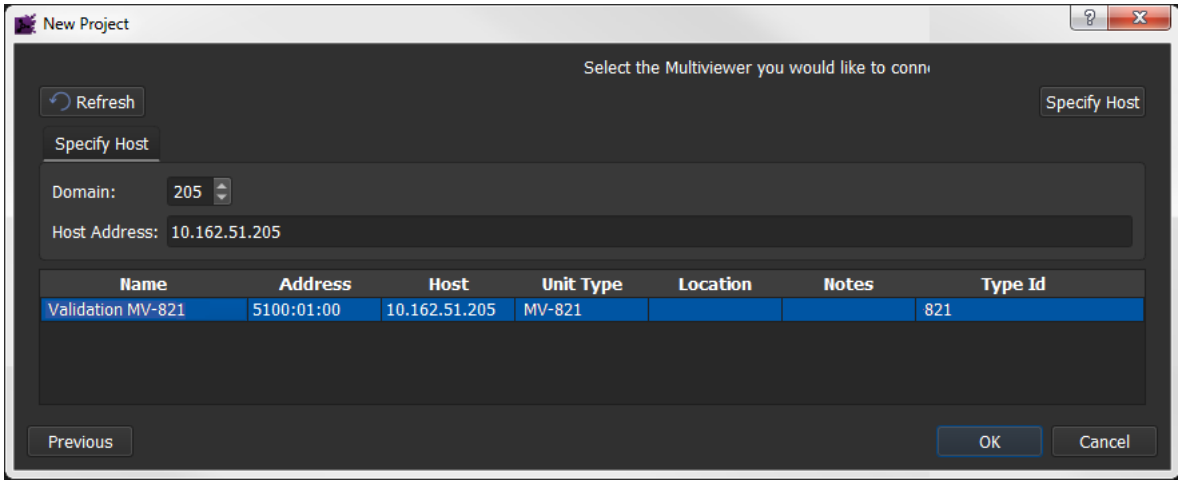


Fig. 9-13: New Project Dialog - Multiviewer List

Orbit connects to the device and pulls the Orbit multiviewer list from the device.

9 At the login dialog, enter the appropriate project **Username** and **Password**.
Note: For a default project on a new, factory unit, this is 'admin' and 'admin'.

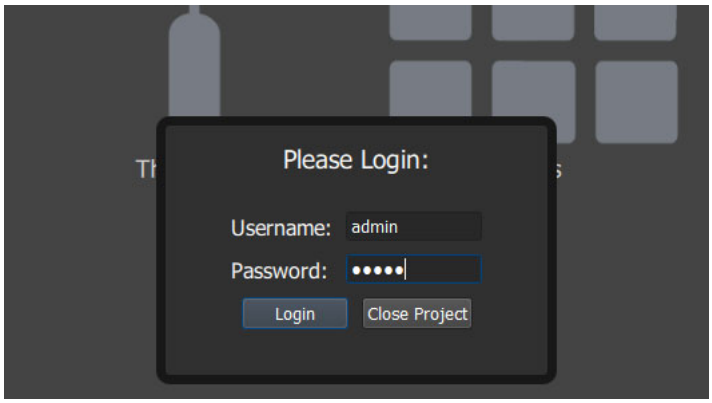


Fig. 9-14: Login Dialog

10 Click **Login**.

A new Orbit project has been created from the connected multiviewer and opened in Orbit.

Note:	For information about setting up and changing passwords for an Orbit project and also about managing Orbit users, see the 'Orbit Introduction' user manual, 'Manage Users' section.

Save Project icon

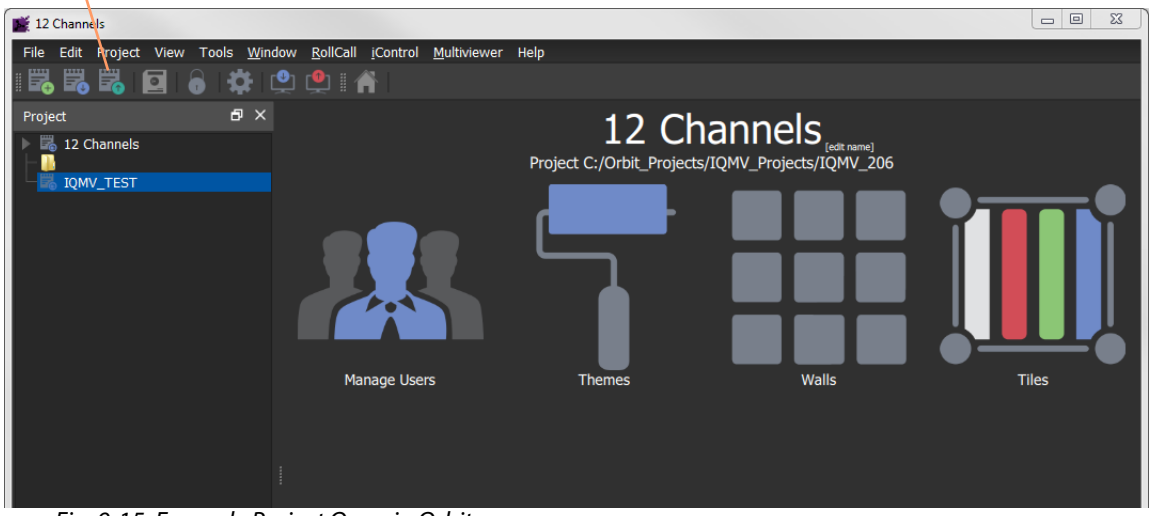


Fig. 9-15: Example Project Open in Orbit

To save the project on the local computer in the previously-specified folder:

11 Click **File > Save Project** in the main menu,
or click the **Save Project** icon in the main tool bar.

STEP 3.2: Quick Edit of Project

To make a visible change to the project:

1 Click the large **Walls** icon and select a wall item in the list, for example, 'Output 1'. See Figure 9-18.

The selected wall is opened in a Wall Editor. See Figure 9-19.

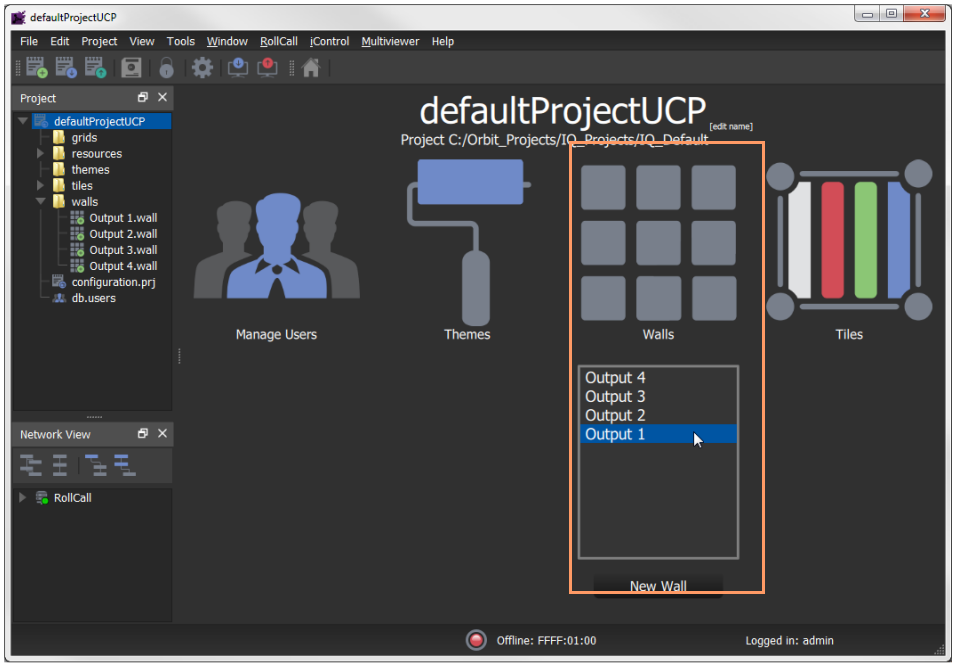


Fig. 9-16: Project Open in Orbit

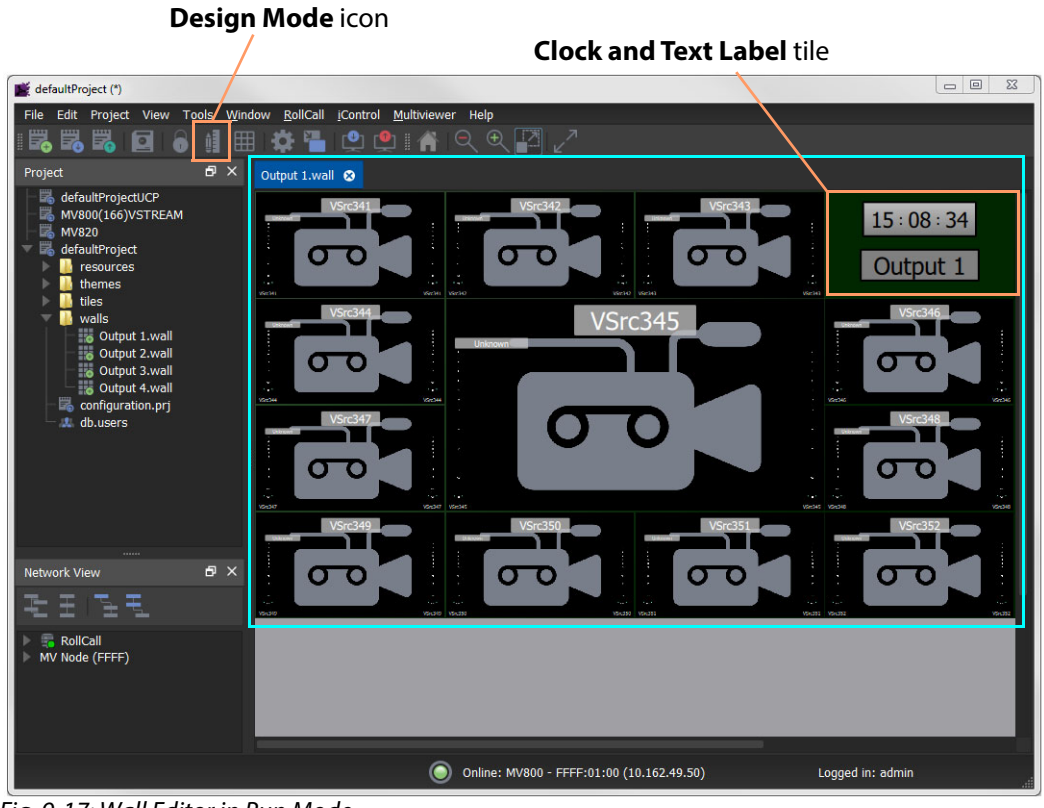


Fig. 9-17: Wall Editor in Run Mode

Figure 9-17 shows the Orbit **Wall Editor** in **Run Mode**. To perform edits to the multiviewer video wall, the **Wall Editor** must be in **Design Mode**.

To change from **Run Mode** to **Design Mode**:

2 Click the **Design Mode** icon in the main menu.(See Figure 9-17.)
Orbit enters **Design Mode**. See Figure 9-18.

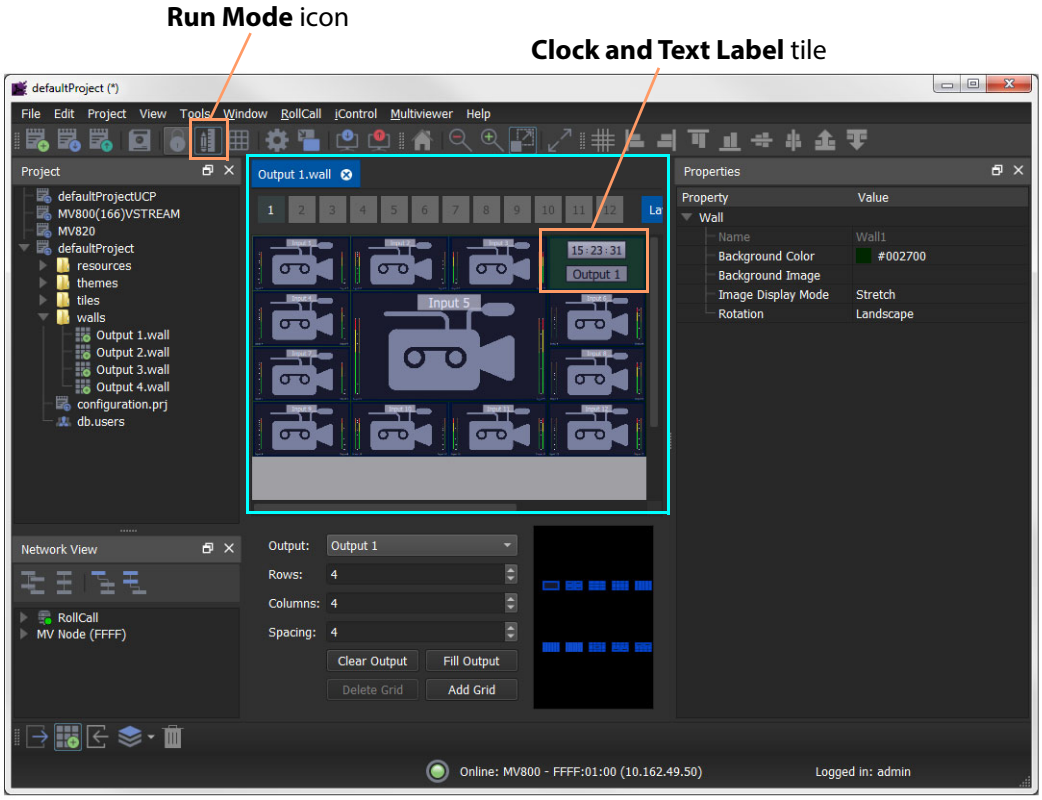


Fig. 9-18: Wall Editor in Design Mode

Note:	Clicking on the **Design Mode/ Run Mode** icon toggles between modes.

3 Double-click on the **Clock and Text Label** tile**.**
The tile is opened in the **Tile Editor**. See Figure 9-19.

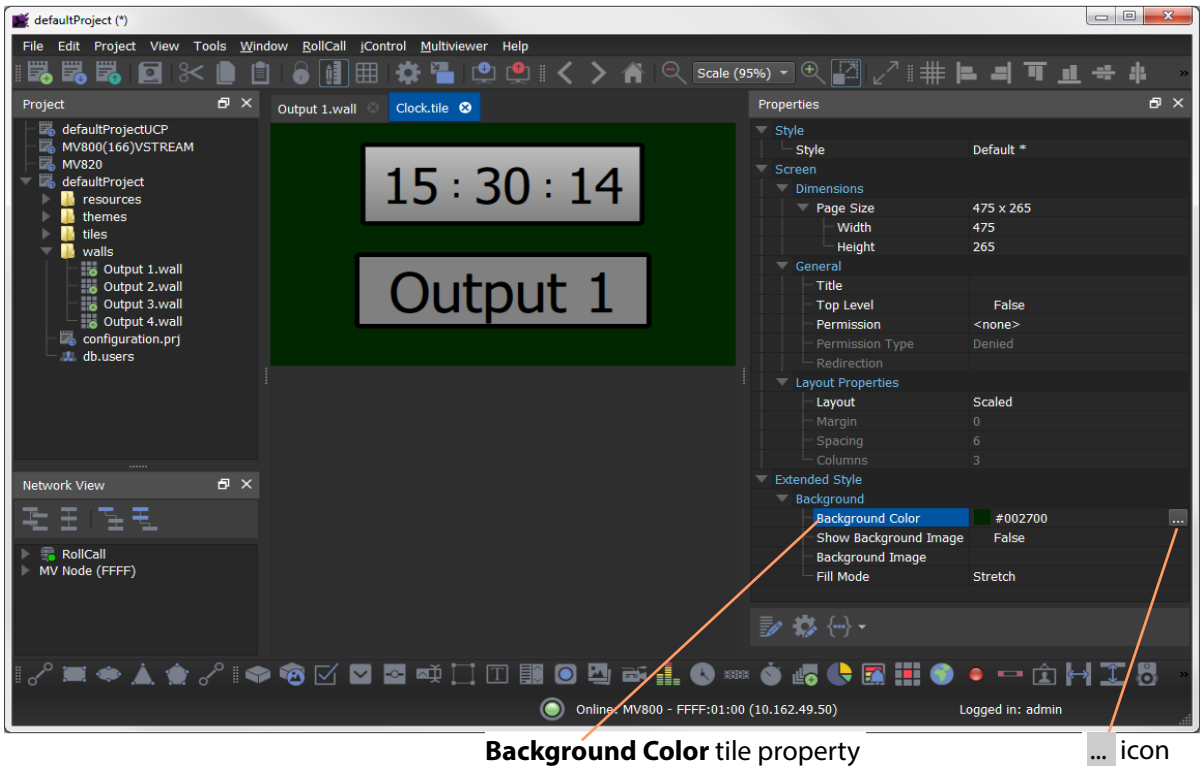


Fig. 9-19: Tile Editor

To make a change to the tile:

4 Click on the tile background.

5 In the **Properties** box, select the 'Extended Style > Background Color' property.

6 Click on the ... icon to show the **Background Color** dialog. See Figure 9-20 on page 89.

7 Select a color and click **OK**.

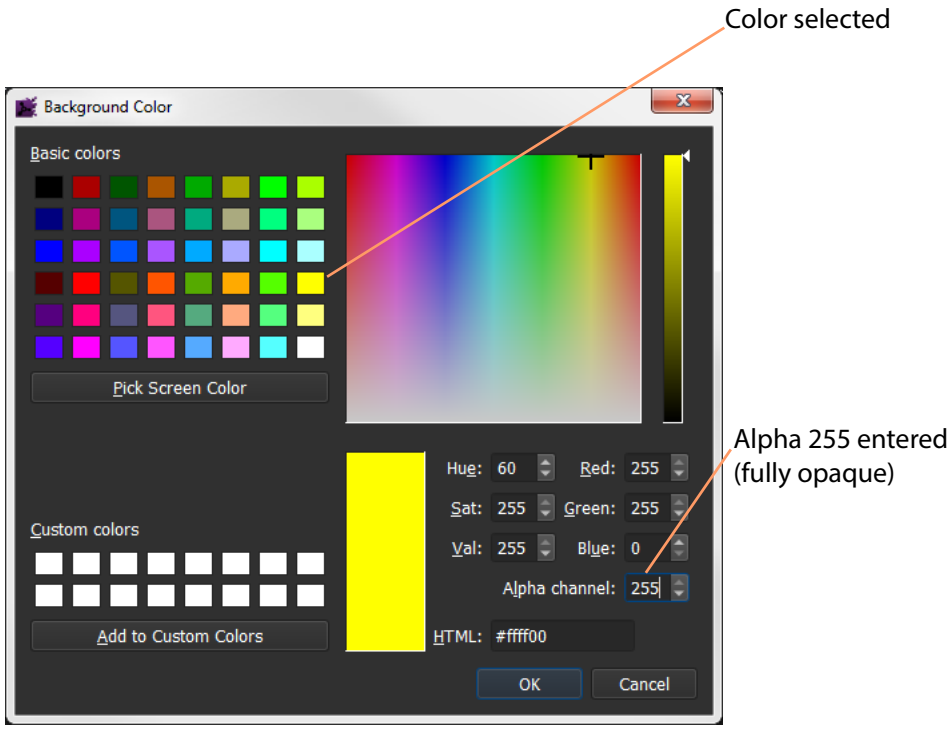


Fig. 9-20: Color Picked

8 Click the **Save File** icon in the main tool bar to save the tile change.

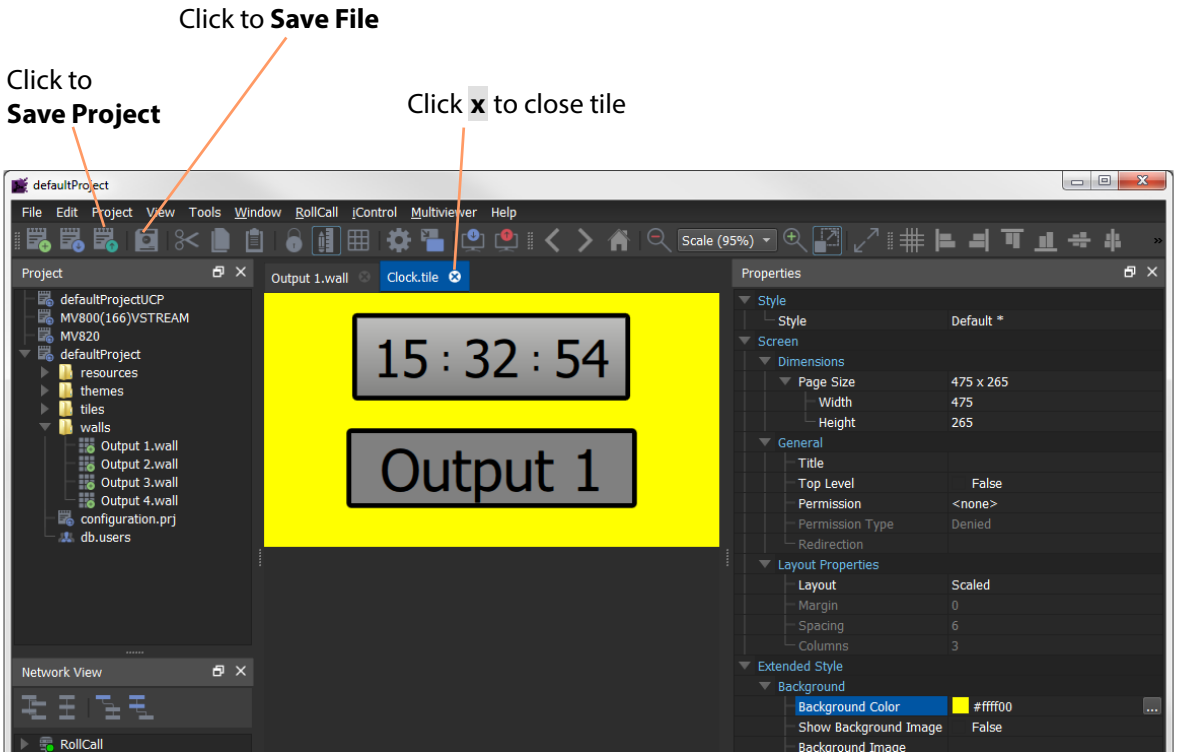


Fig. 9-21: Tile with New Background Color

9 Click on the **x** on the tile tab to close the tile.

10 Click on the **Save Project** icon in the main tool bar to save all changes.

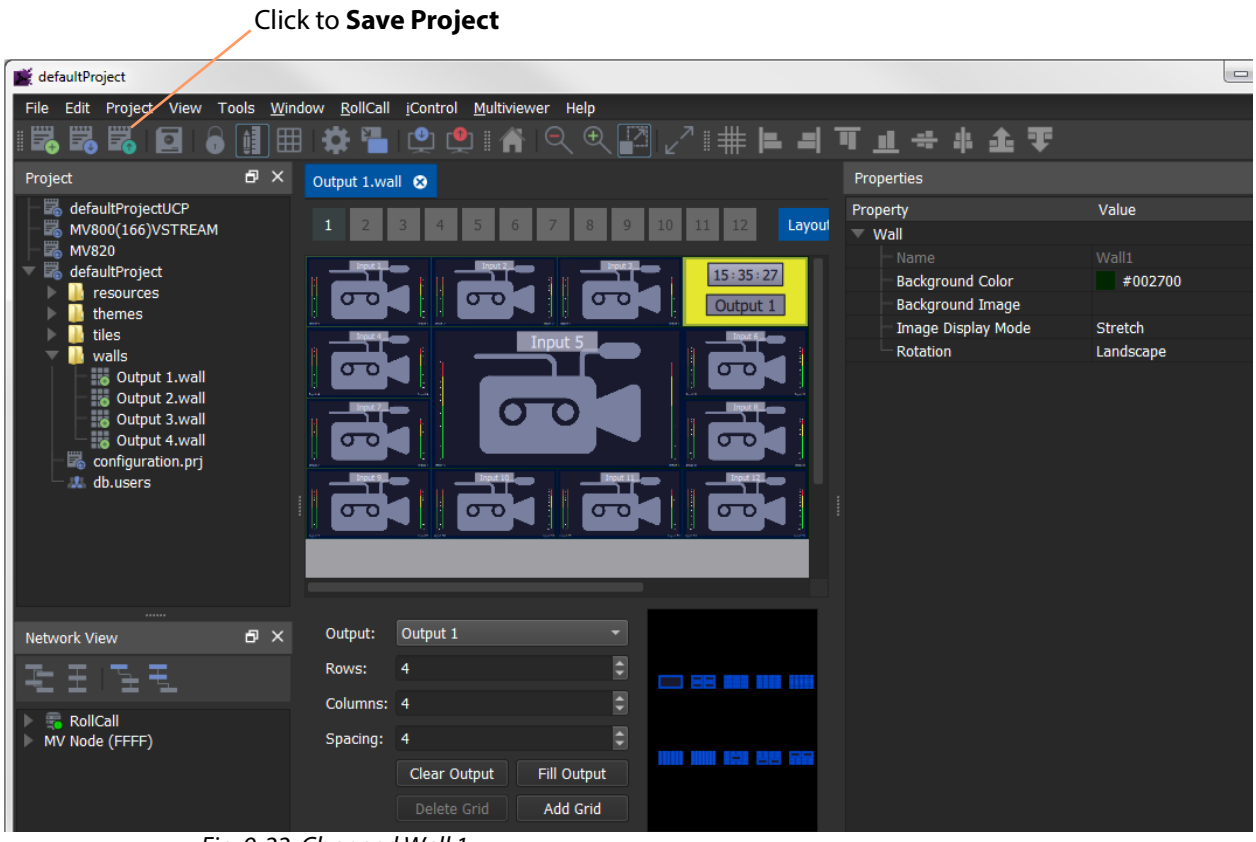


Fig. 9-22: Changed Wall 1

STEP 3.3: Push a Project from Orbit to a Unit

To push a project from Orbit onto a multiviewer:

1 Open a project in Orbit and click **Multiviewer > Properties**.

2 Orbit projects store which multiviewer unit they came from.
If the multiviewer details are correct, then proceed;
however, if the details require changing, enter the target device's:

- IP address;
- RollCall network number and unit number; and
- Domain ID.

Click **OK**.

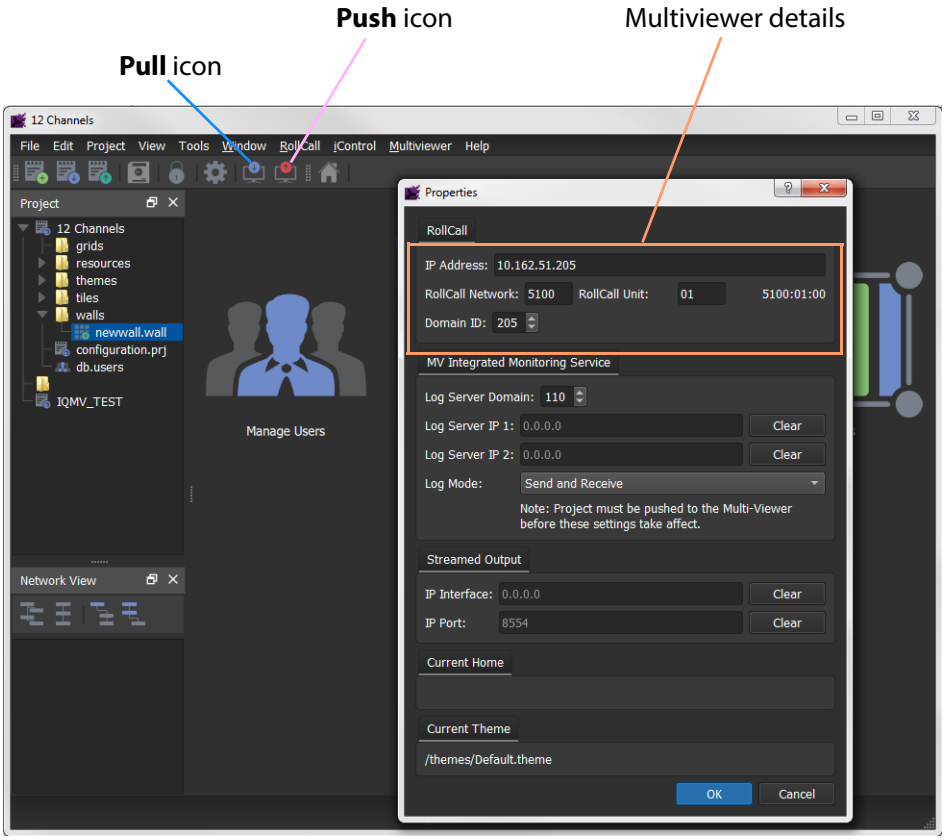


Fig. 9-23: Pull/Push Icons and Multiviewer > Properties Dialog

To push a project from Orbit to the device:

3 Click the **Push** icon in the main menu.

4 Select the project in the **Choose Projects** dialog (see Figure 9-24) and click **OK**.
The project is pushed to the device.

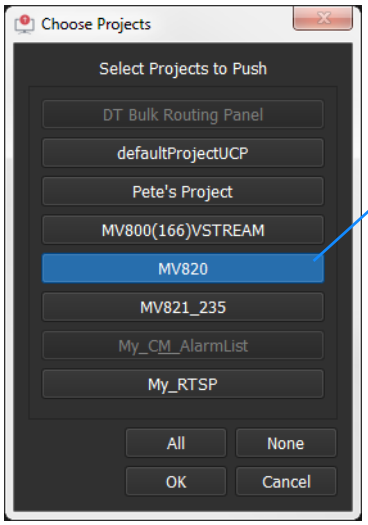
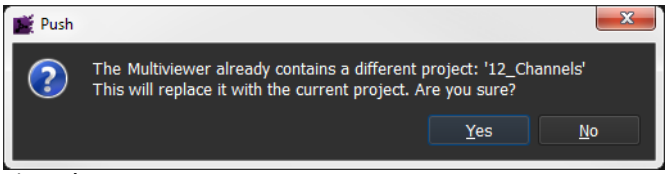


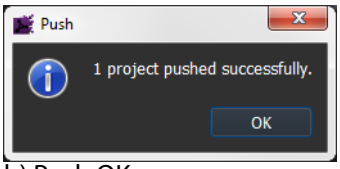
Fig. 9-24: Choose Projects Dialog

If the MV-8X0/8X1 Multiviewer unit already has a project of the same name, then a dialog is shown (see Figure 9-25a). Click 'Yes' to overwrite with the project from Orbit.

When the push is complete a 'pushed successfully' message is shown. See Figure 9-25b.



a) Push Message



b) Push OK.

Fig. 9-25: Push Messages

The project is now running on the target MV-8 Series Multiviewer. The edited tile background color is changed.

Pull a Project into Orbit from a Unit

This may be useful when 'getting started': To pull a project into Orbit from a MV-8X0/8X1 Multiviewer unit:

1 Open a multiviewer project in Orbit and click **Multiviewer > Properties**.

2 If the multiviewer details require changing, enter the target device's:

- IP address;
- RollCall network number and unit number; and
- Domain ID.

Click **OK**.

3 Click the **Pull** icon in the main menu.

4 Select the project in the **Choose Projects** dialog (see Figure 9-26) and click **OK**.
The project is pulled from the device.

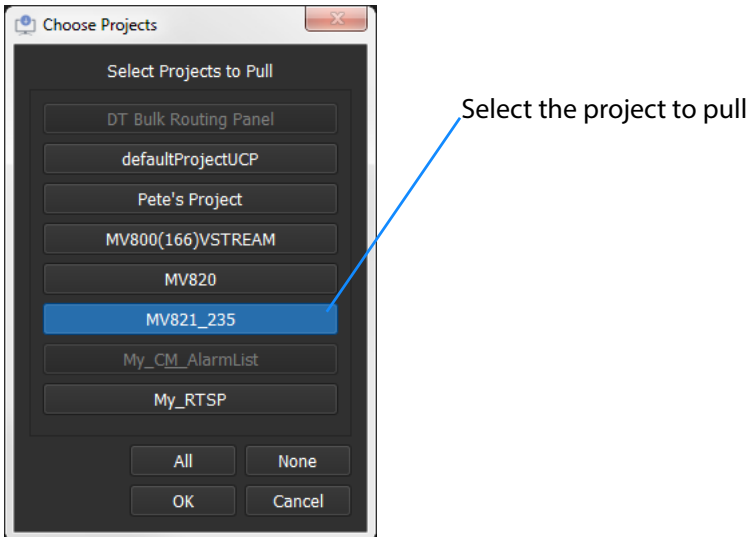


Fig. 9-26: Choose Projects Dialog

5 When the pull is complete a 'pulled successfully' message is shown. See Figure 9-27.

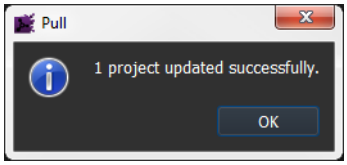


Fig. 9-27: Pull Message

The Orbit project of the same name in as the one pulled from the device has now been updated. It is now the same as that on the device.

10 Multiviewer Video Wall

Section contents:

Multiviewer Video Wall

Multiviewer video wall layouts are designed and managed with the Orbit Client application.

Please refer to the published Orbit documentation for instruction about how to use Orbit in multiviewer applications.

This manual assumes the reader is familiar with the Orbit software and only outline information is given.

Basic Video Wall

Multiviewer video wall layouts are designed with the Orbit Client application and are called 'Orbit projects'. These multiviewer projects can be pushed to a multiviewer to be deployed and the video wall can be viewed on monitor displays.

The form and appearance of a video wall design on a multiviewer device may be changed through layouts and themes.

Procedure:

The procedure for video wall design and deployment is similar for Grass Valley's MV-8 Series of multiviewers. For Orbit instruction and details on using Orbit for multiviewer wall layouts, see the published "Orbit - Introduction" and "Orbit for Multiviewers" user manuals. A 'basic video wall' is described in the Orbit documentation and includes:

- **Initial Screen** Orbit Initial screen.
- **New Project** Creating a new project:
  Multiviewer Project
  Connected Multiviewer Project
- **Existing Project** Opening an existing project.
- **Recent Projects** Opening a recent Orbit project.
- **Project Home Screen** The Orbit project home screen.
- **Basic Wall** Using Orbit to create a basic video wall layout for an MV-8 Series Multiviewer.
- **Wall Layouts** Demonstration of different wall layouts within the same Orbit multiviewer project.
- **Wall Themes** Demonstration of applying different themes to the same wall layout.

Configuring Alarms

Alarms can be configured on multiviewer inputs and for the multiviewer unit itself. Alarms are set up using the Orbit Client software. When a multiviewer project is open in Orbit, Alarms can be set up via the Multiviewer menu bar item.

Unit Alarms

Unit alarms are not related to any one multiviewer input. The configuration dialog is accessed in the following way:

1 Click **Multiviewer > Unit Alarms**.
A dialog box, Figure 10-1, shows the possible unit alarms, see Table 10-1:.

2 Click on an alarm name in the **Select Alarm** box, to select an alarm.
The corresponding properties are shown.

3 Unit alarm properties are described in Table 10-2:.

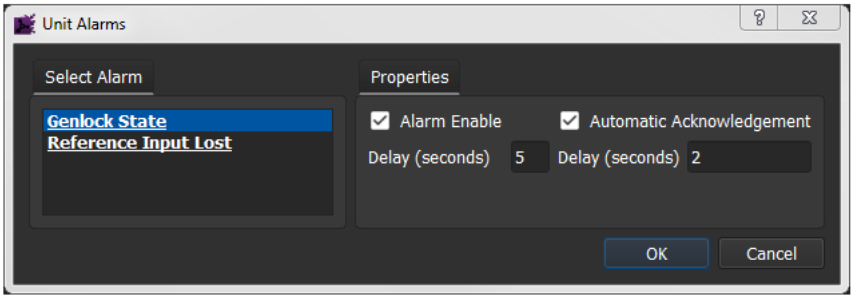


Fig. 10-1: Orbit - Multiviewer Units Alarms

Table 10-1: Unit Alarms

Alarm	Description
Genlock State	Detects unlocked multiviewer genlock.
Reference Input Lost	Detects a lost reference signal.

Table 10-2: Unit Alarms Properties

Alarm Property	Description
Alarm Enable	Check box. Select to enable the alarm.
Delay (seconds)	Text box. The time in seconds from when a fault is detected to when the alarm is displayed on the multiviewer video wall. Set a small delay to prevent transient alarms being displayed, filtering out transient alarms.
Automatic Acknowledgment	Check box. Select to enable automatic acknowledgment by the multiviewer system. Deselect to manually acknowledge the alarm. Alarms will have to be acknowledged by the user, to stop an alarm flashing.
Delay (seconds)	text box. The time in seconds from when the alarm occurs to when it is automatically acknowledged by the multiviewer system. Set a delay here to allow an alarm to flash and be displayed for a short time before being automatically acknowledged.

Note:	Each alarm has its own 'Alarm Enable' and 'Automatic Acknowledge' properties.

Input Alarms

Various alarms can be set up for each multiviewer input. It is possible to set up alarms on one input and then to copy those alarm settings to other inputs.

Setting Up Alarms on One Input

1 Click **Multiviewer > Input Alarms**.
The **Alarms** window is shown.

2 Set **Selected Input** to 'Input 1'.
Select the **Alarm** tab.

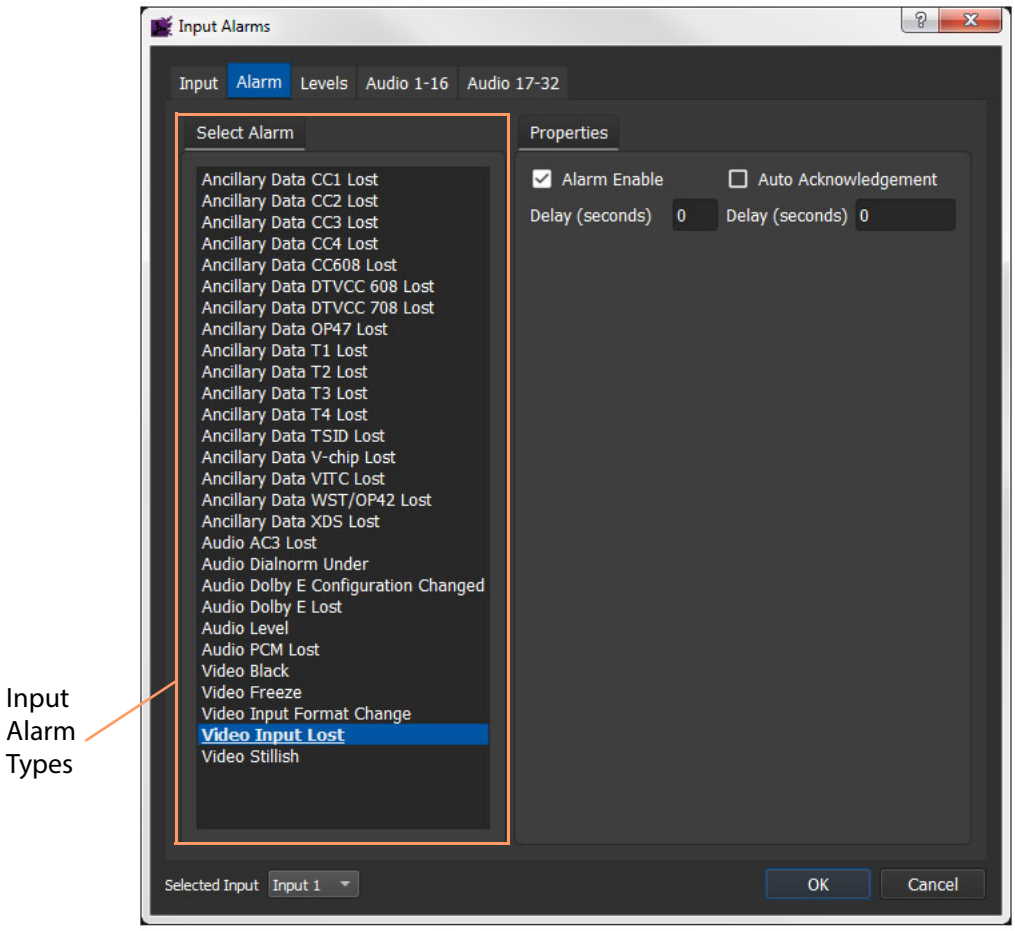


Fig. 10-2: Orbit - Multiviewer Alarms window, Alarm tab.

Figure 10-2 lists the input alarm types.

3 Click on the **Video Input Lost** alarm name to select it.
The alarm properties appear in the Properties box.

4 Select **Alarm Enable**.
The alarm name (Video Input Lost) is shown **underlined and bold** in the list of alarm types, indicating the alarm is enabled on the selected input.

Note:	Each alarm has its own 'Alarm Enable' and 'Automatic Acknowledge' properties.

Note:	Some alarms have further settings and parameters; this is indicated by text in the properties box. For example, for the Audio Level alarm, the properties box text indicates that configuring of levels and channel alarms is done in separate tabs.

5 Select the **Audio Level** alarm.
Select **Alarm Enable**.

6 Click on the **Levels** tab.
The Levels tab allows setting up of some audio levels. See Figure 10-3.

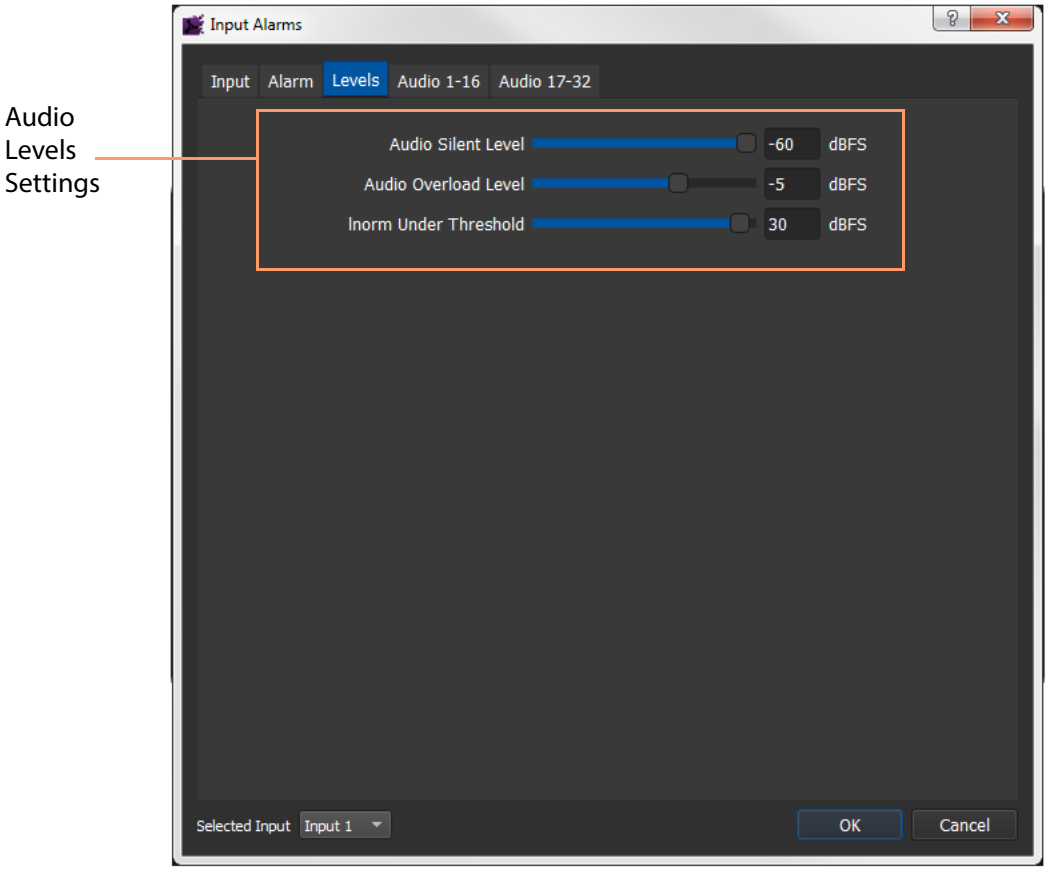


Fig. 10-3: Orbit - Multiviewer Input Alarms window, Levels tab.

7 Click on the **Audio 1-16** tab or the **Audio 17-32** tab.
The **Audio Channels** tabs (**Audio 1-16** and **Audio 17-32**) allow various audio alarms to be enabled on individual audio channels (audio channels 1 to 32 inclusive) relating to the multiviewer video input selected. See Figure 10-4.

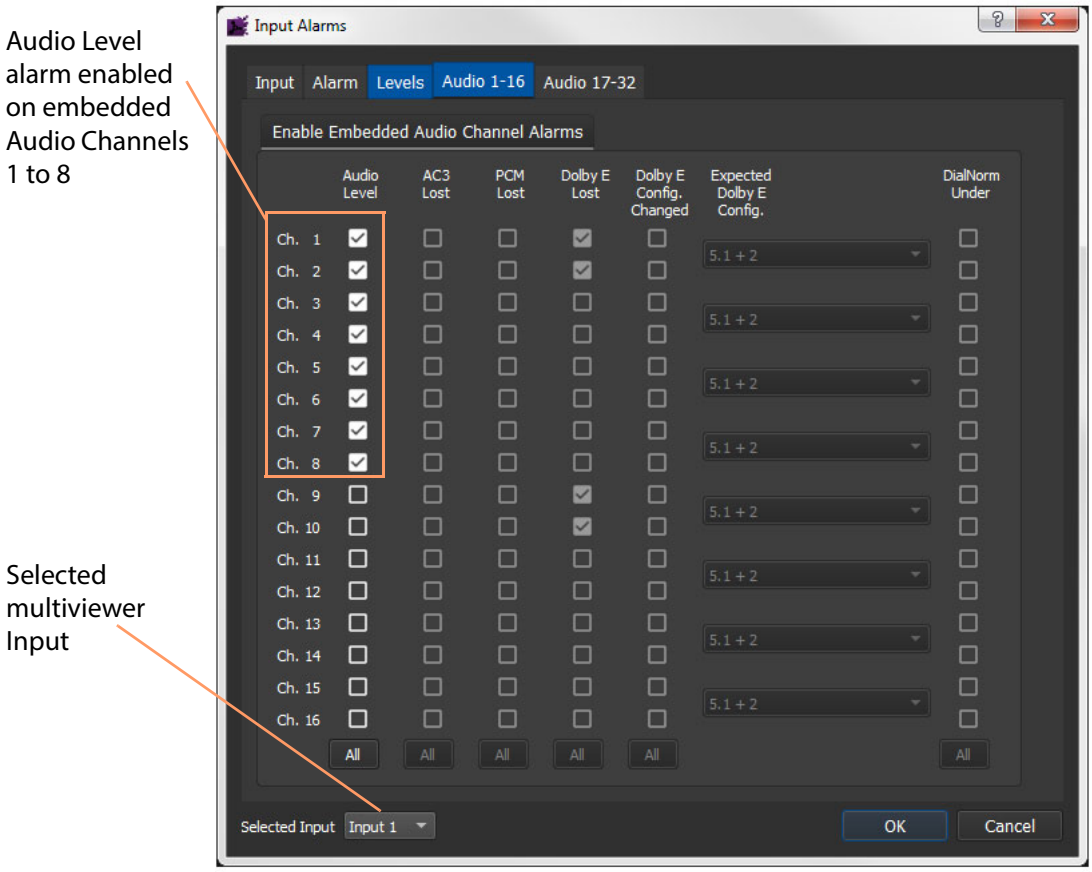


Fig. 10-4: Orbit - Multiviewer Alarms window, 'Audio 1 - 16' tab.

Alarms have now been set up for Multiviewer Input 1 (the **Selected Input**).

Copying Alarms Settings from Selected Input to All Inputs

To copy the alarm settings of the **Selected Input** to all other channels:

1 Click on the **Input** tab.
The **Input** tab screen is shown.

2 Click **Copy All**.
The alarm settings of Input 1 have been applied to all multiviewer inputs.

3 Click **OK**.
The **Alarm**s window closes.

4 Click the **File > Save Project**, to save the Orbit project so far.

TSL Support

TSL Protocol Tally Settings

TSL protocols are used widely throughout the industry for communication between a TSL Tally controller and Under Monitor Displays (UMD's). The protocol enables tally lamp control and text label data to be carried to each UMD device.

A TSL Tally controller handles the tally data in a video system and provides TSL Tally control information to each UMD.The MV-8 Series Multiviewer supports two TSL protocols: TSL 3.1 and TSL 5.0. Initial TSL support settings are described here.

Setting up the multiviewer to work with a TSL tally-based system involves the following steps:

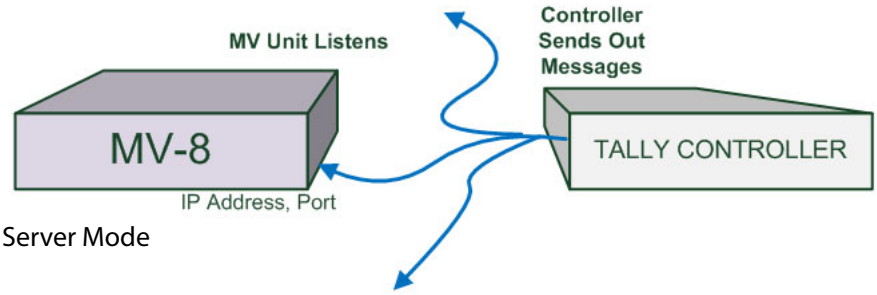
- Specify how the multiviewer gets the TSL Tally message information.
  See Step 1: Specifying Multiviewer TSL Tally Mode, on page 101.
- Specify index parameters for each UMD on the video wall.
  See Step 2: Specifying Index Parameters for each UMD in Orbit, on page 102.

Step 1: Specifying Multiviewer TSL Tally Mode

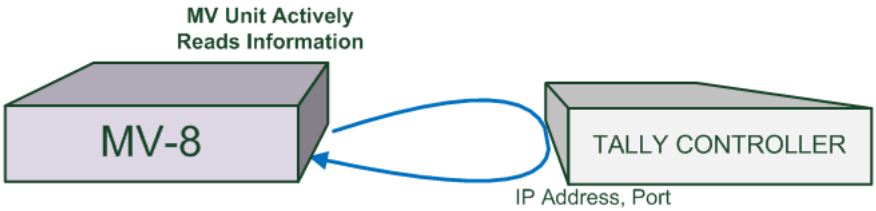
The multiviewer may get its TSL Tally information in one of two modes:

a) **Server Mode** - MV-8 Series Multiviewer listens for Tally messages.
Specify the MV-8X0/8X1 Multiviewer IP address and network port to receive Tally messages on.

b) **Client Mode** - MV-8 Series Multiviewer reads Tally messages from a Tally controller.
Specify the IP address and network port number of the Tally controller.



a) Server Mode



b) Client Mode

Fig. 10-5: TSL Protocol Operating Modes:
a) Server Mode
b) Client Mode

The Grass Valley RollCall Control Panel application is used to configure the settings for a MV-8 Series Multiviewer in the RollCall TSL control screen; see TSL Control Screen, on page 33.

Step 2: Specifying Index Parameters for each UMD in Orbit

Use the Orbit Client application to set the properties of each UMD in a video tile on the video wall layout. The properties differ between TSL Protocol 3.1 and 5.0.

The style of the UMD widget can be selected with the **Preferences > UMD Style** property.

The index parameters used by each UMD are specifiable in the UMD properties. Values can be set manually or values can be automatically assigned as part of assigning inputs to video tiles. (Refer to Orbit documentation.)

Orbit UMD Properties - TSL Protocol Version 3.1

TSL Protocol 3.1 is the original TSL protocol for sending data over a serial comms connection or via Ethernet. The multiviewer supports an Ethernet connection. Each multiviewer monitor screen is addressed with a Display address. Each UMD widget is associated with a video tile in Orbit and must have its **3.1 Display Address** property set up.

1. Select **Video Tile** and the video tile properties are shown.

2. Set **Preferences > UMD** to 'True' and UMD properties are shown below. (Expand this property item if required.)

3. Set **UMD > UMD Protocol** to 'Version 3.1' and **UMD > 3.1 Display Address** property is shown.

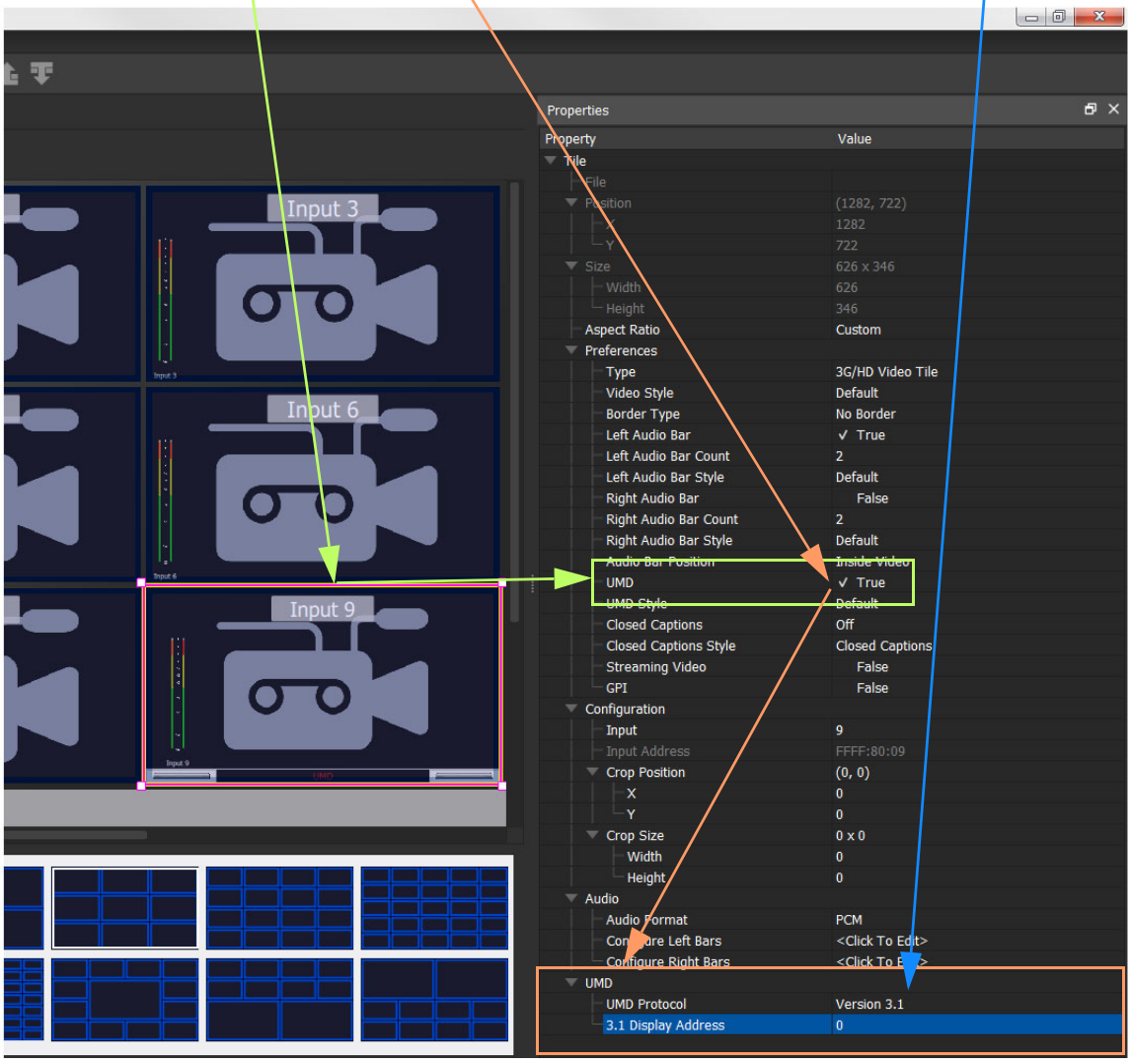


Fig. 10-6: Orbit Video Tile - UMD Widget TSL 3.1 Properties

Orbit UMD Properties - TSL Protocol Version 5.0

TSL Protocol 5.0 is a 16-bit protocol, introduced to handle multiviewer display devices over Ethernet. It supports ASCII or Unicode character sets, and data is sent as UDP or TCP/IP over Ethernet.

Each multiviewer monitor screen is addressed by a Screen Index and each UMD within it by a Display Index. Each UMD widget associated with a video tile must have two parameters set up:

- **5.0 Screen Index** - Index number (address) of each display monitor.
  (16-bit, $FFFF reserved. 0 = not used.)
- **5.0 Display Index** - Index number for each UMD in a display.
  (16-bit, $FFFF reserved. 0-based.)

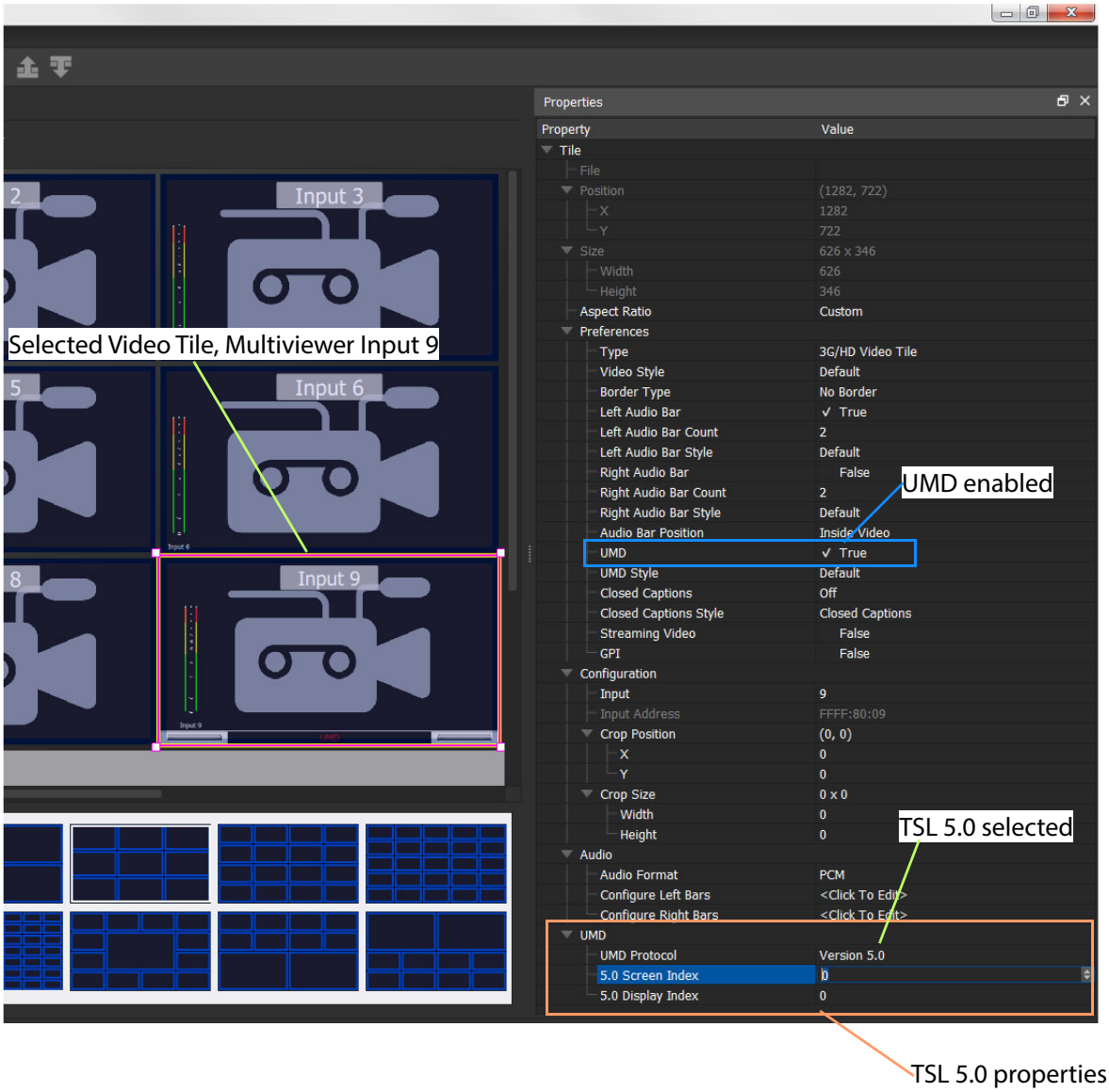


Fig. 10-7: Orbit Video Tile - UMD Widget TSL 5.0 Properties

11 Maintenance

Maintenance

This section describes various software maintenance operations for the MV-8 Series Multiviewer. These operations are carried out via the control interface of the MV-8 Series Multiviewer. Refer to the respective MV-8X0/8X1 Multiviewer user manuals for details about the control Ethernet interface to use.

Information about an MV-8 Series Multiviewer's software version, serial number etc. is displayed on the RollCall **System - Setup** control screen.

Licensing

Licenses give access to additional MV-8 Series Multiviewer features (for example, extra head display outputs for an MV-8 Series Multiviewer, or 12G video input capability for an MV-821 unit).

Note: For a 'H.264 stream' license on MV-821 multiviewers, factory-fitted codec modules are required.

License Files

The license files for the MV-8 Series Multiviewer are supplied upon purchasing a license from Grass Valley. They are small .zip files.

The license key within the file is tied to the **Serial Number** of a the main card in an MV-8X0/8X1 Multiviewer unit, as reported by RollCall.

License Installation Procedure

The process of adding a license to an MV-8 Series Multiviewer follows the standard process for a hardware module with licenses administered by Grass Valley RollCall.

For more details, please see the Grass Valley 'RollCall Control Panel User Manual' or the Grass Valley 'RollMechanic Operator's Manual'.

For RollCall Control Panel, MV-8 Series Multiviewer license installation is a two-stage process:

- Stage 1: Add License to RollCall Control Panel, on page 106.
- Stage 2: Install License on the MV-8 Series Multiviewer, on page 107.

These are described in the sub-sections below and are applicable to licensing an MV-8 Series Multiviewer (or to licensing an MV-820-IP/MV-821-IP product's video IP block).

Stage 1: Add License to RollCall Control Panel

The example below uses Grass Valley RollCall Control Panel. See Software Versions, on page 122, for the minimum version of RollCall Control Panel to use for the multiviewer device being licensed.

1 Run the RollCall Control Panel software.

2 Connect to a MV-8 Series Multiviewer on a MV-8X0/8X1 Multiviewer product unit.

(Click the  icon and enter the IP address in the Build Network dialog. Click OK.)

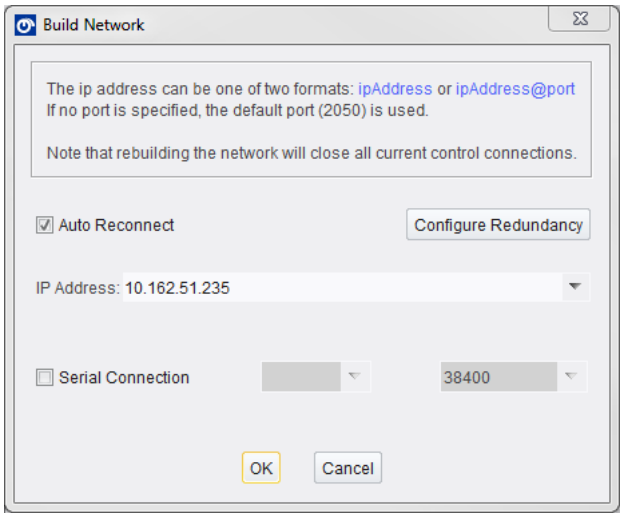


Fig. 11-1: Build Network Dialog in RollCall Control Panel Tool

3 Click the **Edit Licenses** icon  or click **Edit > Licenses**.
The **License Viewer** window is displayed.

4 Click on the **Multiviewer Licenses** tab.
Available licenses in your RollCall Control Panel tool are listed.

To import your license:

5 Click **Import Licenses**.
Navigate to the license zip file and **select** the license file name.
Click **OK**.
The license is imported into RollCall Control Panel and is added to the listed licenses.
See Figure 11-6.

The license is now added to RollCall Control Panel.

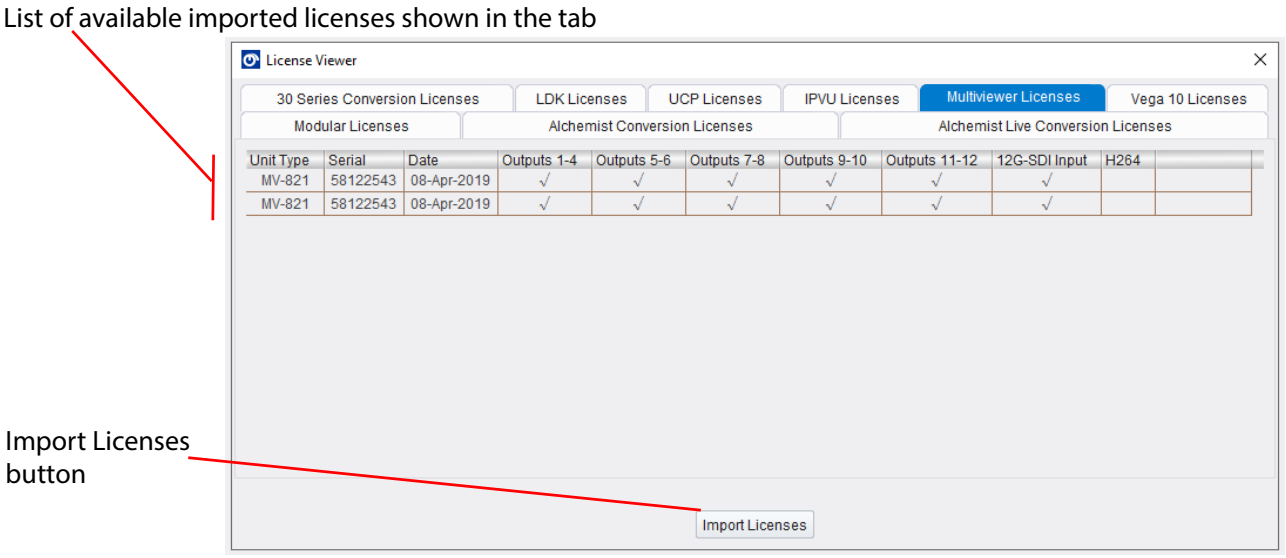


Fig. 11-2: Example License Viewer Dialog (An image for MV-821 is shown)

Stage 2: Install License on the MV-8 Series Multiviewer

Once the required license is imported into RollCall Control Panel, the next stage is to install the license on the device (MV-8 Series Multiviewer, or MV-8X0/8X1 Multiviewer video IP block etc.).

1 Right-click on the connected Multiviewer block in the left-hand pane of the RollCall Control Panel screen.
Click **Unit License**.

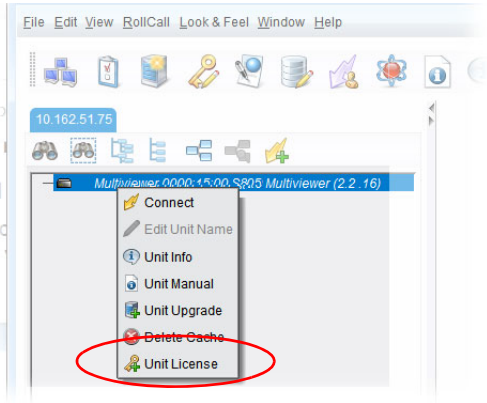


Fig. 11-3: Right-Click Menu - Unit License

2 The **Unit License** window shows current licenses and available licenses. See Figure 11-4.

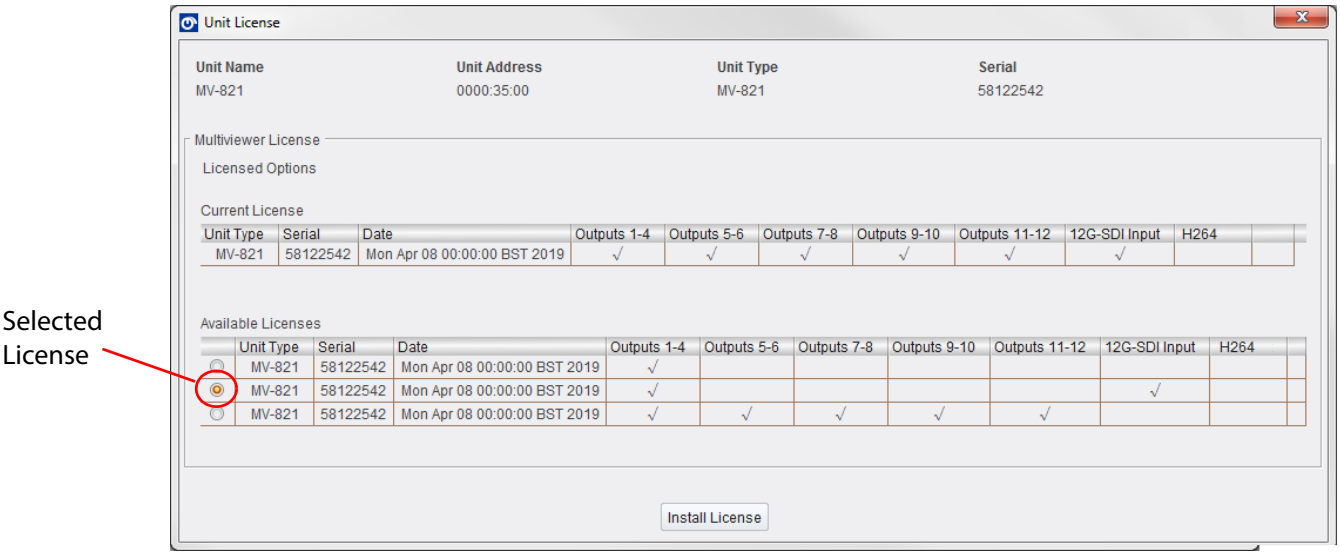


Fig. 11-4: Unit License Dialog - Selected License (An image for MV-821 is shown)

3 Select the available license to be installed.

4 Click the **Install License** button.

5 An **Install License** dialog appears, click **Yes** to install the license.
The license is installed on the multiviewer and the multiviewer restarts (reboots).
Click **OK**.

6 Rebooting takes approximately 4 minutes.
While the unit is rebooting, RollCall Control Panel will lose connection with it.

When the multiviewer finishes rebooting, it is operating with the newly-installed license.

Software Upgrade Package

IMPORTANT
Before carrying out an MV-8 Series Multiviewer software upgrade, please ask Grass Valley support for advice and inform Grass Valley support of the software versions you have for:

- MV-8 Series Multiviewer on your MV-8X0/8X1 Multiviewer product.
- Any other Grass Valley MV-8X0/8X1 Multiviewers.
- Orbit Client software application.
- GV Orbit Client software application.

A software upgrade package from Grass Valley is supplied by Grass Valley Support and comprises a set of data and installer files, typically approximately 500M bytes in size. The package is associated with a MV-8 Series Multiviewer software version number, for example, 3.1.4, and may contain a software upgrade for one or more devices.

Software Upgrade Procedure

The MV-8 Series Multiviewer (or for an MV-820-IP video IP block) software upgrading process follows the standard process for module upgrades with Grass Valley RollCall Control Panel. For more details, please see the Grass Valley RollCall Control Panel User Manual or the Grass Valley RollMechanic Operator's Manual.

For RollCall Control panel, upgrade installation is a two-stage process:

- **Stage 1:** Add the upgrade package to RollCall Control Panel.
  See Stage 1: Add Upgrade Package to RollCall on page 109.
- **Stage 2:** Install the upgrade on the MV-8 Series Multiviewer.
  See Stage 2: Install the Upgrade on the MV-8 Series Multiviewer on page 111.

These are described in the sub-sections below.

Note: MV-8 Series Multiviewer software *downgrades* may also be carried out with the same procedure.

Stage 1: Add Upgrade Package to RollCall

This stage is applicable to upgrading an MV-8 Series Multiviewer (or to upgrading an MV-820-IP/MV-821-IP product's video IP block).

The example below uses Grass Valley RollCall Control Panel. See Software Versions, on page 122, for the minimum version of RollCall Control Panel to use for the multiviewer device being licensed.

1 Run the RollCall Control Panel software.
2 Connect to the multiviewer block as required.
3 Click the **Import New Upgrade** icon, see Figure 11-5.
The **RollCall Upgrade Packages** window is displayed.

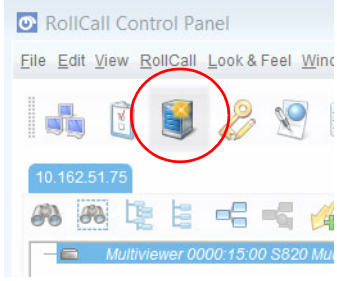


Fig. 11-5: Import New Upgrade Icon

4 Click the **Import Upgrade Package** button.

5 Navigate into the folder containing the upgrade package.
Click on the .zip file name (see Figure 11-6).
Click **OK**.

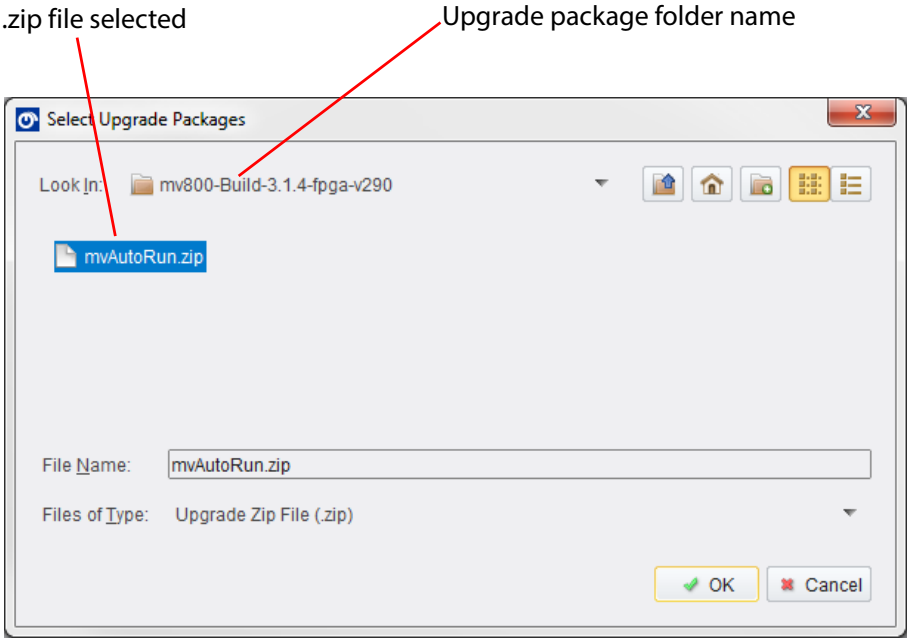


Fig. 11-6: Select Upgrade Package Window

6 A progress bar at the bottom of the **RollCall Upgrade Packages** window shows the upgrade package import progress.
Import completion is reported in the **Import Log** pane. See Figure 11-7.

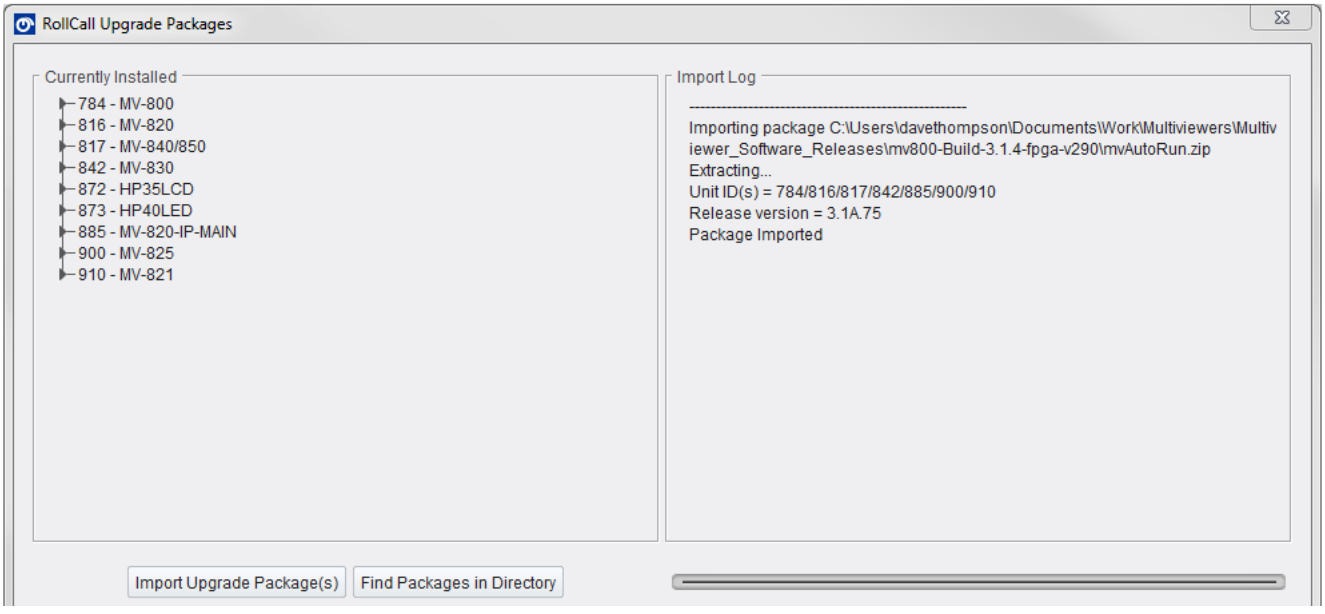


Fig. 11-7: Example RollCall Upgrade Packages Window - Import Log and Currently Installed Panes

The upgrade package has been added to RollCall Control Panel. Any new licenses imported with the package are shown in the 'Currently Installed' panel of the **RollCall Update Packages** window.

7 Close the dialog.

Stage 2: Install the Upgrade on the MV-8 Series Multiviewer

This stage is applicable to an MV-8 Series Multiviewer in an MV-8 Series Multiviewer unit (or to an MV-820-IP's video IP block).

The instructions below describe the upgrade procedure with RollCall Control Panel. When set going below, the upgrade sequence of events on the unit is:

- File(s) downloaded to the multiviewer unit.
- Software upgraded and the unit restarts itself.
- Programmable logic (FPGA firmware) upgraded (*if required by the upgrade package used).*
- Upgrade complete.

Instructions

To upgrade:

1 Right-click on the connected unit name in the RollCall Control Panel window. See Figure 11-8.

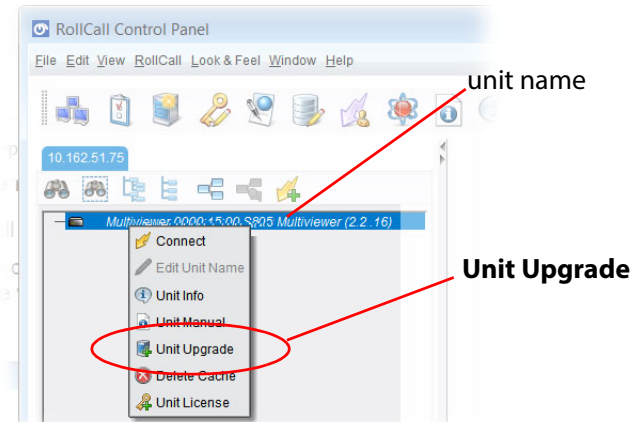


Fig. 11-8: Right-Click Menu

2 Click **Unit Upgrade** in the drop-down menu.
RollCall's **Unit Upgrade** window is displayed.

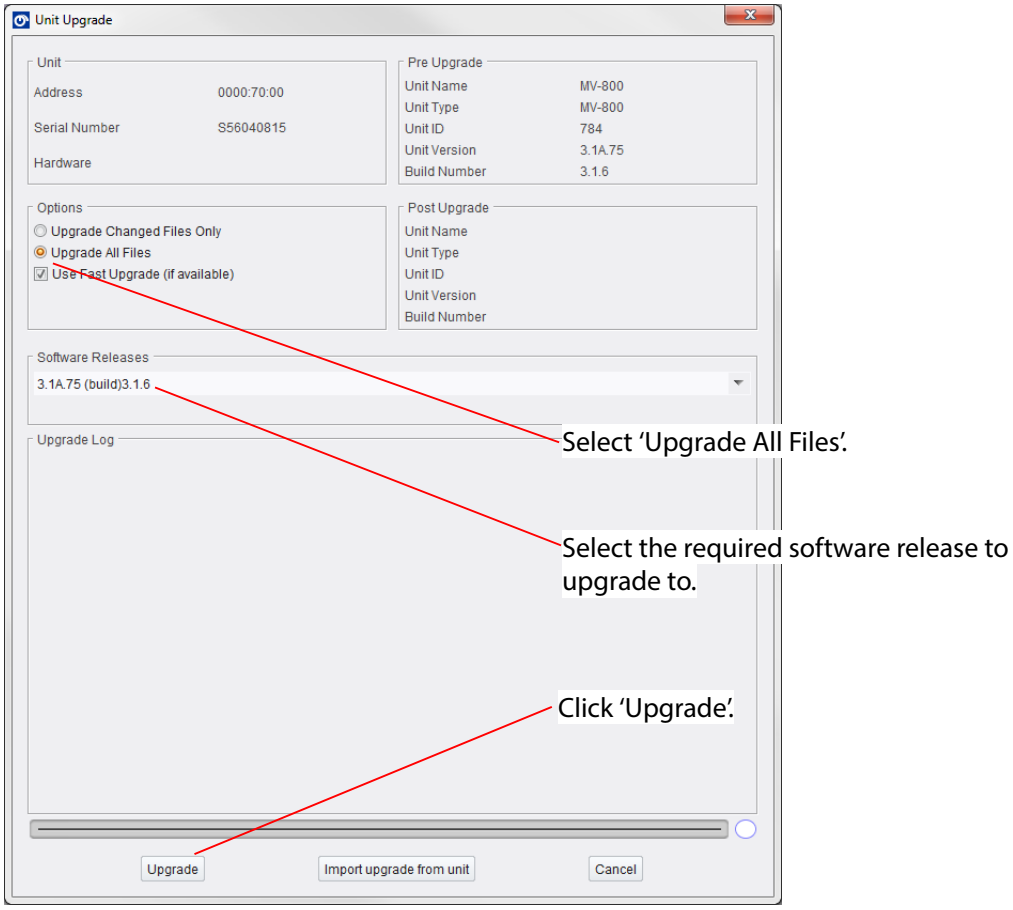


Fig. 11-9: Unit Upgrade Widow

3 Select the **Upgrade All Files** radio button.

4 In the **Software Releases** pull-down menu, select the **Software Release** required to upgrade to.

5 Click **Upgrade**.

6 Click **OK** to upgrade.
A **Unit Upgrade** dialog is shown.

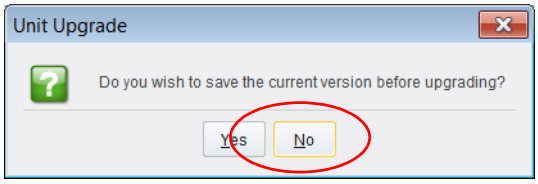


Fig. 11-10: Unit Upgrade Dialog - Click NO

7 Click **No** in response to the question in the dialog (Figure 11-10).

Note: (Figure 11-10) "*Do you wish to save the current version before upgrading?*"
The MV-8 Series Multiviewer does not support saving of current software version.
Click **No** in response to the message box shown in Figure 11-10.

The upgrading begins...

8 The upgrade file is then automatically sent to the MV-8 Series Multiviewer.
The MV-8 Series Multiviewer unit then starts to install the upgrade package onto itself.

Note: Unit software and potentially the unit's programmable logic circuitry is upgraded. This depends on the upgrade package.

9 During the upgrade installation, the unit may restart one or more times and disconnect itself from RollCall Control Panel.

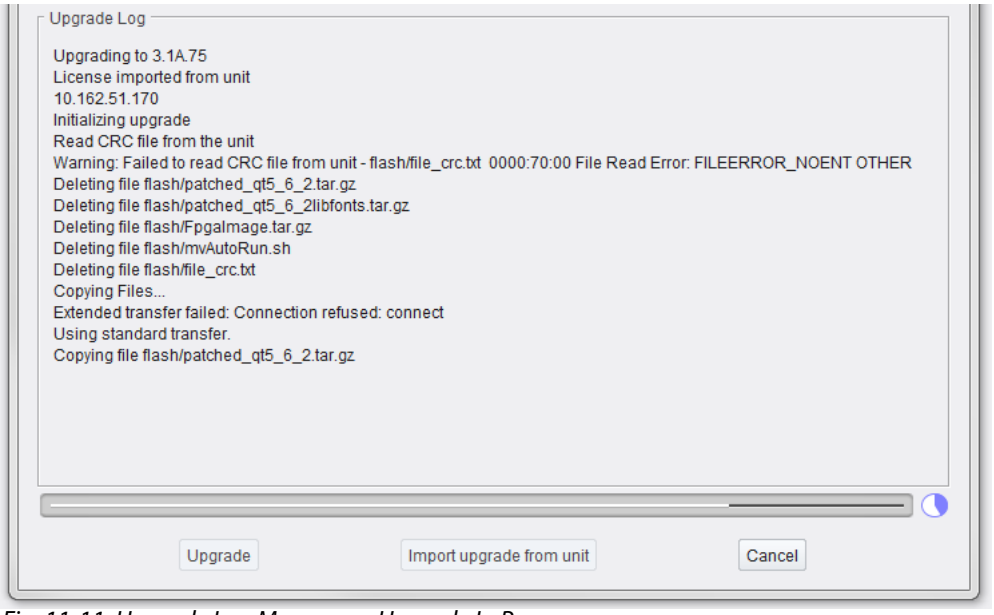


Fig. 11-11: Upgrade Log Messages - Upgrade In Progress

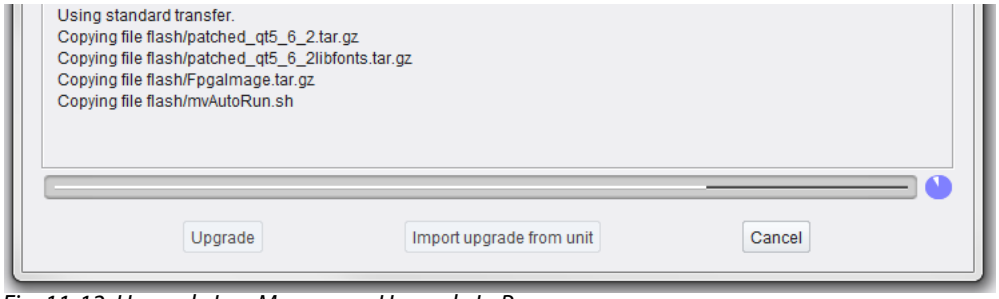


Fig. 11-12: Upgrade Log Messages - Upgrade In Progress

During the unit upgrade process,
the multiviewer output screens may sometimes be blank or may briefly show some unit information similar to the start up splash screens. Information messages shown on such screens includes:

- **Upgrading to vM.M.M** (for example, "Upgrading to V3.1.6")
  Please wait...
- **MV-8XX Multiviewer Booting...** (for example, "Upgrading to V3.1.6")
  Please wait...
- **Programming FPGAs. From FPGA vMMM to vNNN.** (for example, "v280 to v290")
  "Please wait 16 minutes..."
- **Snnnnnnnn MV-8xx Multiviewer booting...** (see Booting and Splash Screen, on page 9, Figure 2-1)

10 While the software upgrade is finalizing (see Figure 11-13),
if the MV-8 Series Multiviewer's programmable logic (FPGA) requires upgrading as part of this upgrade package, then this FPGA upgrade is done.
It approximately takes a *further* 16 minutes to complete an FPGA upgrade.

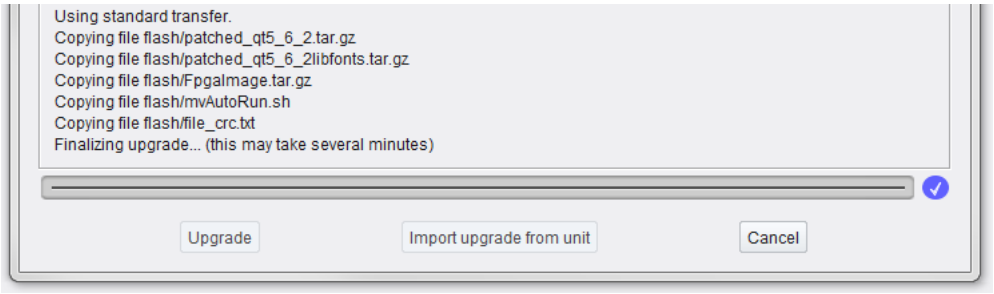


Fig. 11-13: Upgrade Log Messages - In Progress ("Finalizing upgrade" message: Wait)

IMPORTANT
Wait for the MV-8X0/8X1 Multiviewer unit to fully finish installing the upgrade file:

The unit can take approximately 15 to 20 minutes to install its upgrade package, depending of whether any of the unit's programmable logic also needs upgrading as part of the upgrade package.

IMPORTANT
Wait. The unit is only fully ready for use:

- after software upgrade; and
- after any FPGA upgrade; and
- after it has restarted (i.e. after a reboot, see Booting and Splash Screen, on page 9) and is showing its head display outputs as a video wall layout.

11 An 'Upgrade Complete' message finally appears in the Update Log pane of RollCall Control Panel when the upgrade is done. See Figure 11-14 for typical **Update Log** messages.

IMPORTANT
For MV-8 Series Multiviewer software versions earlier than 2.8.17:

Wait for the unit being upgraded to be ready for use.
And ignore "Upgrade Complete" messages in RollCall Control Panel's **Unit Upgrade** window (the message **does not** indicate that the unit's upgrade is complete).

For MV-8 Series Multiviewer software versions 2.8.17 onwards:

The "Upgrade Complete" message in RollCall Control Panel's **Unit Upgrade** window does indicate that the unit has been upgraded.

Click **OK**.

IMPORTANT:

For early Multiviewer software versions ***before* 2.8.17, ignore** any "Upgrade Complete" messages in RollCall Control Panel's **Unit Upgrade** window and await unit full start-up.

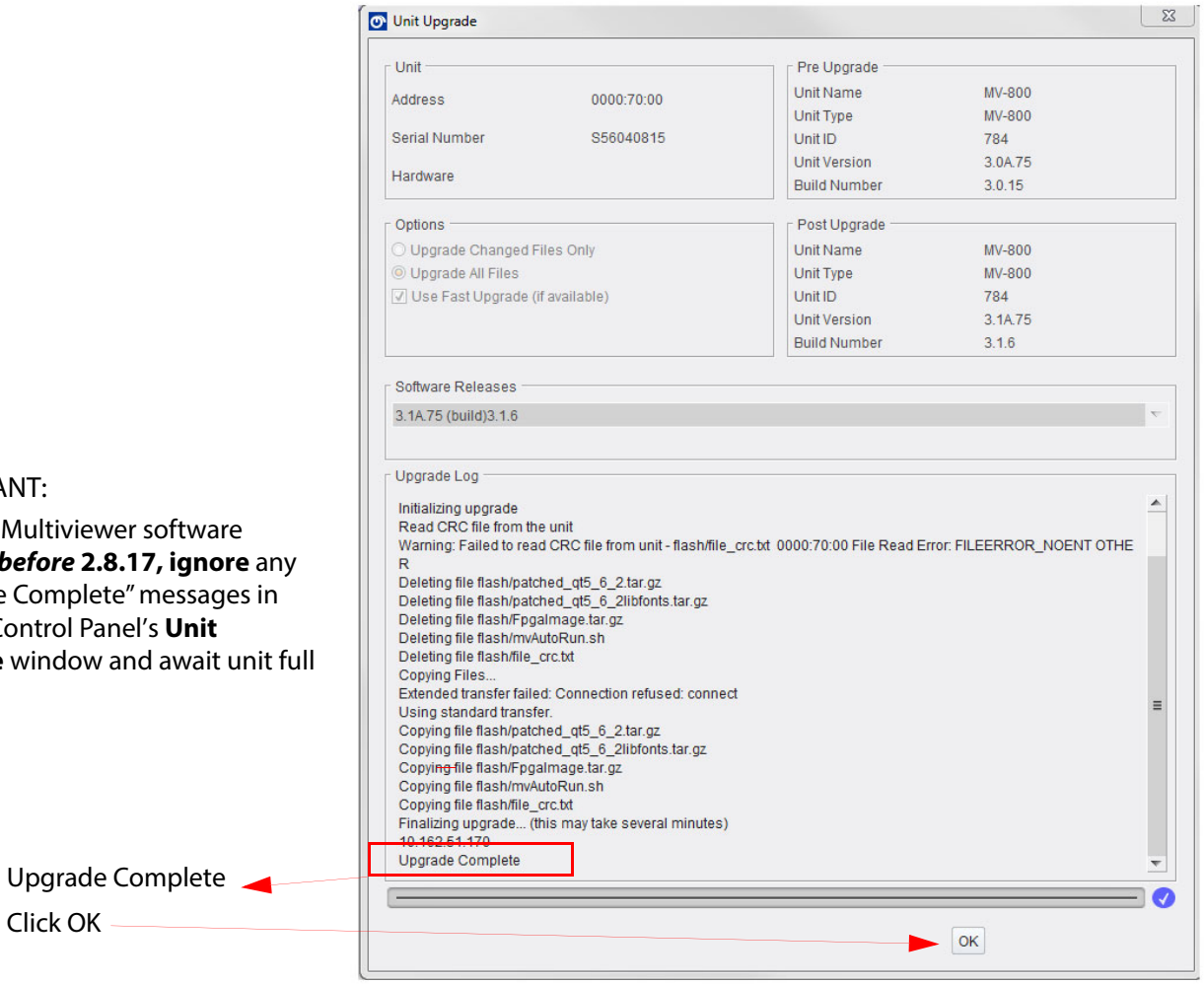


Fig. 11-14: Typical Upgrade Log Messages - Upgrade Complete

When the MV-8 Series Multiviewer has rebooted:

12 The unit's multiviewer head display outputs re-show a video wall layout.

13 Grass Valley RollCall Control Panel may be reconnected to the unit.
The control screen for the MV-8 Series Multiviewer shows the upgraded software version.

14 Check that the MV-8X0/8X1 Multiviewer product's front module has a flashing green CPU Heartbeat LED. (Refer to the corresponding MV-8X0/8X1 Multiviewer user manual for LED information.) This means the multiviewer unit restarted and is running.
If this is not the case, contact Grass Valley Support.

A

MV-8 Series Multiviewer Specification

MV-8 Series Multiviewer Specification

Video Inputs

Video Inputs	
Inputs	48-off 'up-to-12G' SDI, dependent on product and license applied. Up to 32 embedded audio channels per input. **Note:** ASI inputs are *not* supported by MV-8 Series Multiviewers. 'Loss of signal' is reported for ASI inputs.
High Dynamic Range Inputs	
HDR	Optional HDR to SDR conversion. Opto-electrical Transfer Functions (OETFs) supported: • PQ to SDR • HLG to SDR • Slog3 to SDR • None (SDR-to-SDR)
Color Space	Conversion to color spaces for inputs. Conversion: • From BT.2020 color space to BT.709. • None.
Media Biometrics	Media biometric generator per input, analyzing input video and audio.

Outputs

Head Display Outputs	
Head Display Outputs	4 to 12 enabled video outputs. • Outputs 1 to 4 on enabled as standard on MV-8 Series Multiviewer. • Outputs 5 to 12 enabled with MV-8 Series Multiviewer output licenses.
Embedded Audio	16 channels of embedded audio per output. Audio channel pairs selectable from multiviewer input embedded audio.
Reference	Head Display Outputs locked to: • External Reference; or • Internal Reference (i.e. free running).
Video Standard	Video Standard on head display outputs: • 3G 1080p, or HD 720p • 50, 59.94 & 60 frames/s.
Delay	Latency: • Interlaced inputs: 1 input field + 1 to 3 output frames. • Progressive inputs: 1 input frame + 1 to 3 output frames.
H.264 Streaming Out of Video Inputs	
Output Streams	Up to 48-off H.264 streams, scaled copies of the multiviewer inputs. (On MV-821 multiviewers, this is a 'H.264 stream' licensed feature, also requiring factory-fitted hardware codec modules.) Each multiviewer input is H.264 encoded to create streamed copies of the 48 inputs. **Note:** The H.264 streams do not function for the following slower-frame-rate HD standards: • 1080p30 (and slower frame rates); and • 720p30 (and slower frame rates).
Ethernet Port	Streamed out over multiviewer's control and monitoring Ethernet port. Refer to respective MV-8X0/8X1 Multiviewer product user manual for Ethernet interface details. (These H.264 streams can be viewed on desktop PCs using GV Orbit Client, or via the Orbit client with the Orbit MV-800-DT license option if using the Orbit client). User applications include: confidence monitoring, compliance monitoring.)

Multiviewer Monitoring and Alarms

Monitoring and Alarms	
Video:	
Input:	Monitoring of multiviewer video input: • Media Biometrics. • XDS. Support for HDR inputs.
On-Screen Monitoring:	Fully flexible layouts: • Any object can be any size, in any position. • Adjustable layering and transparency of objects over video or other objects or background. • Display up to 48 video tiles on a single screen. • Any router input can be assigned to any screen. • WSS/AFD flags.
Alarms:	• Video Input signal loss • Video black • Picture freeze or still • Video Input format change.
Audio:	
On-Screen Monitoring:	• Metering of AES embedded audio: • VU, extended VU, DIN, BBC, and Nordic scales • Up to 32 audio channels per video signal • Bars outside or overlaid on picture • Audio meter scales on/off • Programmable color & alarm thresholds

Alarms:	• Loss of:
	  • AC3 encoded audio data,
	  • Dolby E encoded audio data.
	• DialNorm under preset threshold.
	• Dolby E configuration change.
	• Audio Level:
	  • Loss of audio.
	  • Audio level low/high.

Metadata and Control Monitoring:	
On-Screen Monitoring:	• Closed Caption & Subtitle detection • V chip detection • Display UMD router source names via General Remote protocol SW-P-08 over IP

Monitoring and Alarms	
Alarms:	Loss of: • Teletext. • Closed Caption (CC). • TS ID. • V-chip. • VITC. • Extended Data Services (XDS).
Alarm Control:	Controls and features for: • Configurable alarms trigger delays • Alarm acknowledge/clear/previous fault indication (border color or tally alarm box) • Alarm acknowledge from hardware or soft panels via Rollcall interface • Layout recalls from hardware or soft panels, on-screen message boxes via Rollcall • Alarm auto-clear after configurable period of time.

Video Wall Screen Display

Screen Display	
Screen Design	Facilities: • Drag and drop objects on screen • Configurable grid • Snap to grid • Object grouping and re-sizing • Fixed/adjustable video tile aspect ratios

Screen Display	
Closed Captions	Support for displaying closed caption information. In an Orbit multiviewer video wall design, use an Orbit 'Closed Caption' Behaviour to access closed caption information from MV-8 multiviewer video inputs. 'Closed captions' are supported for EIA-608 "line 21" and for EIA-708 in compatibility-byte mode. Page numbers to use: • CC1 - page 101 • CC2 - page 102 • CC3 - page 103 • CC4 - page 104 • WST - page 888 • OP42 - page 801 (typically) • OP47 - page 801 (typically) **Note:** For SD video input sources, the vertical blanking interval (VBI) is used: For 625/25: • VITC is detected on line 19; • OP42/WST on line 21; and • WSS on line 23. For 525/29: • VITC is detected on line 14; and • Rec. 608 on line 21. For HD/3G video input sources, the ancillary data (ANC) is used and there is no line number restriction.
Time code	Time code: • Display time code extracted from video and from multiviewer time code input
Time	Time: • Multiple clock display – lock to NTP, VITC or LTC, with time zone offsets • Generate real-time clocks and timers with count up/down capability
Miscellaneous	Control direct from mouse on screen. TSL tally display. Graphics / Images: • Add graphics files to display labels and channel logos, etc • Programmable background color or image

Software Versions

Tool	Version
RollCall Control Panel	4.20.5 or later
Orbit Client	3.1.15 or later
GV Orbit	1.0.0 or later
GV Orbit Client	4.0.0 or later
MV-8 Series Multiviewer	3.2.22 or later

Note: For future releases:

Please refer to software release notes for compatibility information.

B XDS Data Types Supported

XDS Data Types Supported

Table B-1: XDS Data Types Supported

XDS Type	XDS Class	(Hexa decimal)	Data Description	RollCall Command Number
Program Identification Number (Scheduled Start Time)				
	Current	01	MM/DD hh:mm Where: MM = Month (1 - 12) DD = Date (1 - 31) hh = Hours (0 - 23) mm = Minutes (0 - 59)	1800 - 1847
Length / Time-in-Show				
	Current	02	This carries two items of relevant data: Program length: hh:mm Where: hh = Hours (0 - 63) mm = Minutes (0 - 59)	1850 - 1897

Table B-1: XDS Data Types Supported (continued)

XDS Type	XDS Class	(Hexa decimal)	Data Description	RollCall Command Number
			Elapsed time: hh:mm:ss Where: hh = Hours (0 - 63) mm = Minutes (0 - 59) ss = Seconds (0 - 59)	1900 - 1947
Program Name (Title) (V Chip Label)				
	Current	03	A character string, up to 32 characters in length.	1600 - 1647
Program Type				
	Current	04	A list of up to 32 character strings. Each string represents a descriptive name for the program content. For example, "Education", "Comedy", "Travel" etc. For a list of names see the CEA-608-B specification.	2000 - 2047
Content Advisory (V Chip Rating)				
	Current	05	A short indication of the program rating. The string produced for each category depends on the region/rating system used. For full information, see the CEA-608-B specification.	1650 - 1697
Program Description				
	Current	10 - 17	A list of 8 strings separated by new lines.	1750 - 1797
Network Name (Affiliation)				
	Channel Information	01	A string of up to 32 characters.	1950 - 1997
Call Letters (Station ID) and Native Channel				
	Channel Information	02	This carries two items of relevant data:	
			Station ID. Consists of a 4 character string.	2100 - 2147
			Native channel. Consists of a 2 character string.	2150 - 2197

Table B-1: XDS Data Types Supported (continued)

XDS Type	XDS Class	(Hexa decimal)	Data Description	RollCall Command Number
Time of Day				
	Miscellaneous	01	WWW DD/MM/YYYY hh:mm Where: WWW = Day of the week (Sunday to Saturday) DD = Date (1 - 31) MM = Month (1 - 12) YYYY = Year (1990 - 2053) hh = Hours (0 - 23) mm = Minutes (0 - 59)	2050 - 2097
Local Time Zone				
	Miscellaneous	04	Two-character string: hh Where: hh = Hours (0 - 23)	2200 - 2247

C SNMP Support

SNMP Support

Introduction

The MV-8 Series Multiviewer supports Simple Network Management Protocol (SNMP). The MV-8 Series Multiviewer Management Information.

The MV-8 Series Multiviewer System-Setup control screen has some SNMP settings. (See System-Setup Control Screen, on page 15, SNMP Managers box, on page 22, and SNMP Community Strings box, on page 22.)

Up to 8 SNMP managers can be configured to receive trap messages from the MV-8 Series Multiviewer. Once configured, a trap message will be sent to each manager whenever there is a change of alarm state.

MIB Files

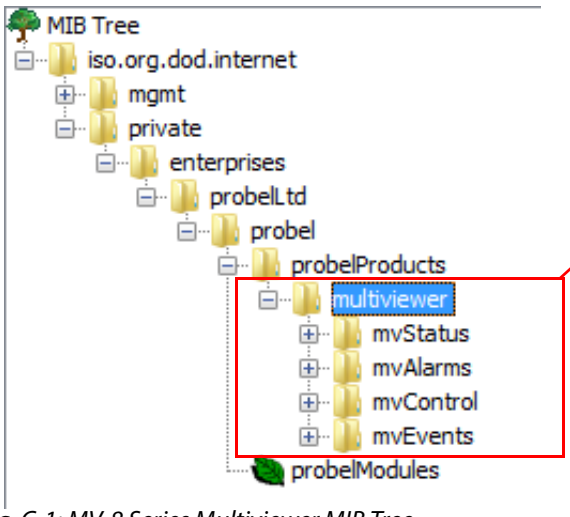
Management Information Base (MIB) files provide a graphical representation of the SNMP device to the user via a MIB browser tool. The following MIB files are required by an SNMP browser:

- PROBEL-COMMON.mib
- Multiviewer.mib

Note:	Contact Grass Valley Customer Support for the MIB files. https://www.grassvalley.com/contact/support/

MV-8 Series Multiviewer MIB

The MV-8 Series Multiviewer MIB is 'Multiviewer.mib', which has four main sections, see Figure C-1.



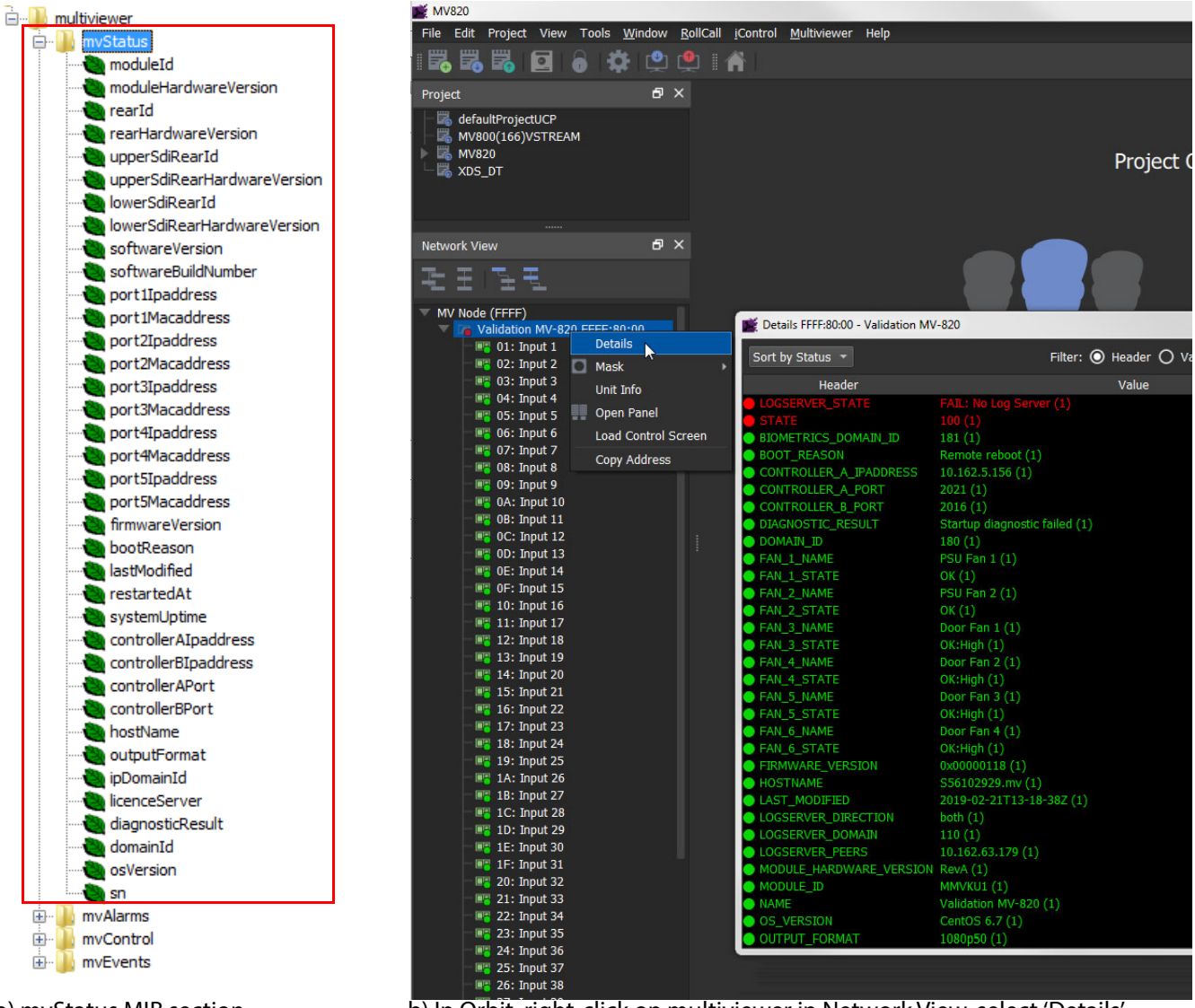
The multiviewer MIB tree comprises:

- mvStatus, on page 129
- mvAlarms, on page 130
- mvControl, on page 131
- mvEvents, on page 132

Fig. C-1: MV-8 Series Multiviewer MIB Tree

mvStatus

The **mvStatus** section displays the overall status of the MV-8 Series Multiviewer, providing the similar information to that accessible in Orbit by right-clicking on the multiviewer name in the Network View and selecting 'Details'. See Figure C-2.



a) mvStatus MIB section

b) In Orbit, right-click on multiviewer in Network View, select 'Details'.

Fig. C-2: mvStatus MIB Tree

mvAlarms

The **mvAlarms** section comprises two sub-sections: unitAlarms and inputAlarms. It displays the alarm states of the MV-8 Series Multiviewer. See Figure C-3.

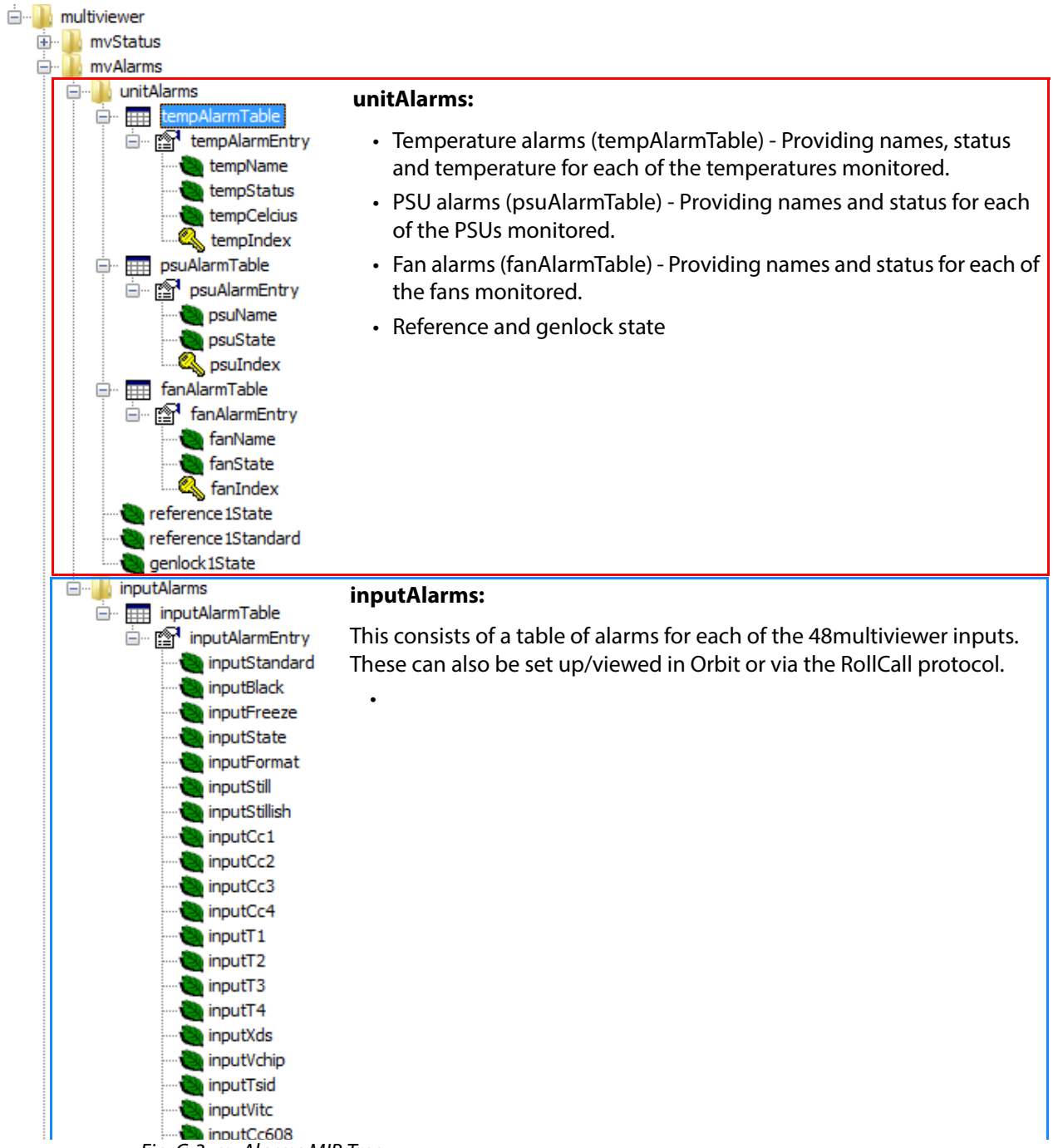


Fig. C-3: mvAlarms MIB Tree

mvControl

The **mvControl** section contains a 'wallLayoutTable', which allows control and interrogation of the video wall layout currently selected for each video wall. It allows the currently-selected layout to be changed on each of the walls. See Figure C-4.

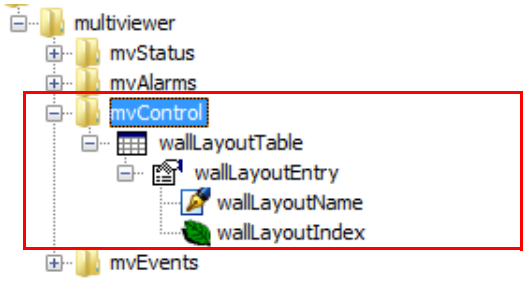


Fig. C-4: mvControl MIB Tree

mvEvents

The **mvEvents** section lists the available SNMP traps that may be sent. See Figure C-5.

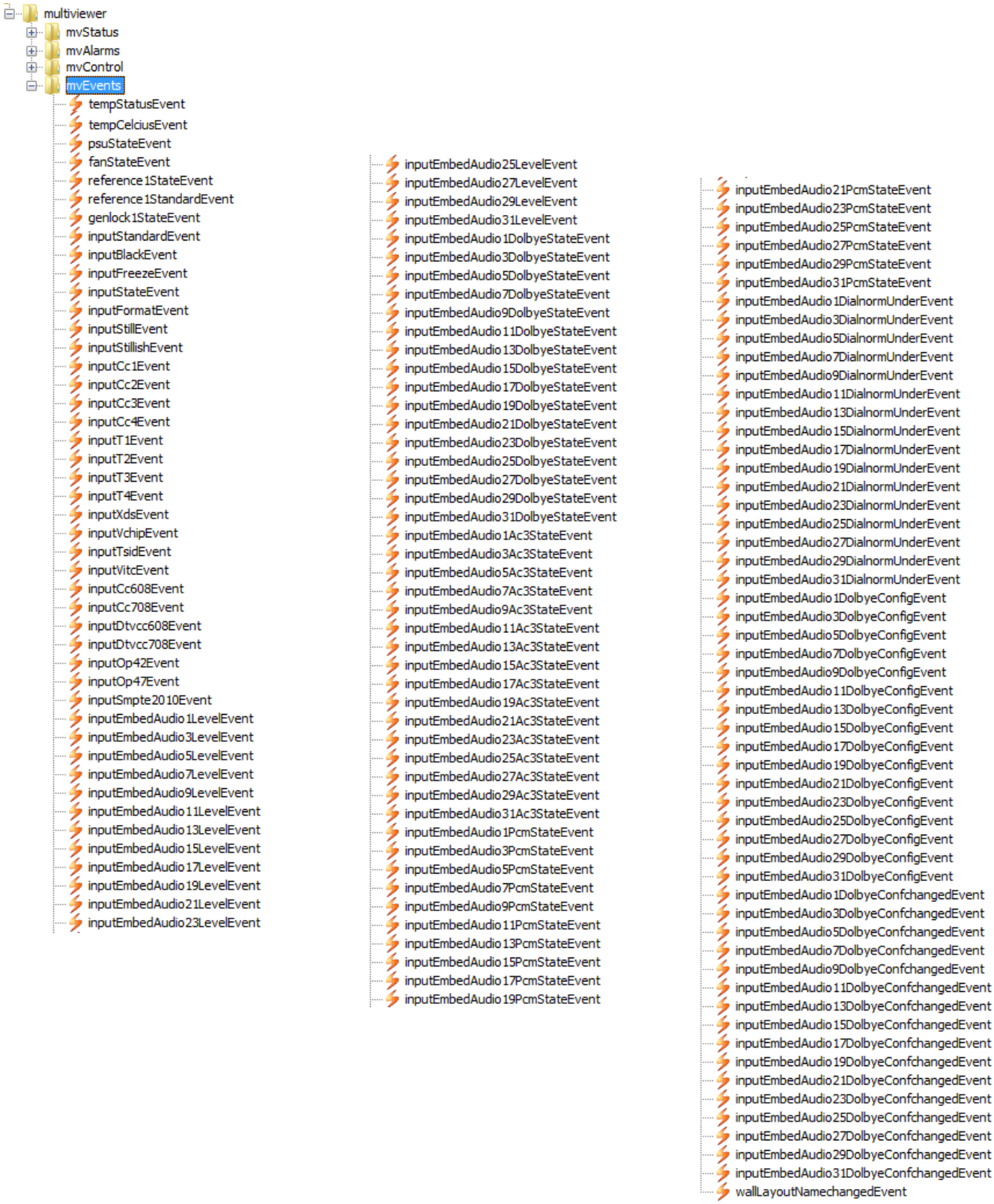


Fig. C-5: mvEvents MIB Tree

D MV-800-DT Option

Appendix contains:

MV-800-DT Option

This section describes the MV-800-DT license option used with the older Orbit Client software tool to view MV-8 Series multiviewer H.264 video streams.

Note:	The older 'Orbit' Client software does not have native support for viewing MV-8 Series H.264 video streams. However, the newer 'GV Orbit' Client does have native support and no license option is required.

Overview of MV-800-DT Orbit Option

Note:	This section applies if using the older 'Orbit' Client application to view MV-8 Series H.264 video streams. If using the newer 'GV Orbit' Client application, then this section does not apply.

The MV-800-DT desktop multiviewer provides live video wall capabilities to a PC, extending the capabilities of an MV-8X0/8X1 Multiviewer. It can be used with the Orbit Client software. The MV-800-DT is a licensed feature of Orbit and is issued by a license server software application, typically running on a separate PC.

An MV-8X0/8X1 Multiviewer can produce H.264, scaled streamed versions of each of its 48 multiviewer inputs. The input video is scaled to SD video size, H.264-compressed, streamed and multicast from a designated MV-8X0 network port.

Note:	For some multiviewer units, H.264 streaming needs a multiviewer 'H.264 stream' license.
Note:	MV-821 multiviewer units require factory-fitted codec hardware modules.

These H.264 streams can be viewed on an Orbit MV-800-DT video wall on a PC. These can be displayed with the same or with a different video wall layout as the MV-8X0/MV-8X1 unit. Streams from one or more MV-8X0/MV-8X1 units can be viewed. Live information on an MV-800-DT video wall includes video, audio levels and alarms.

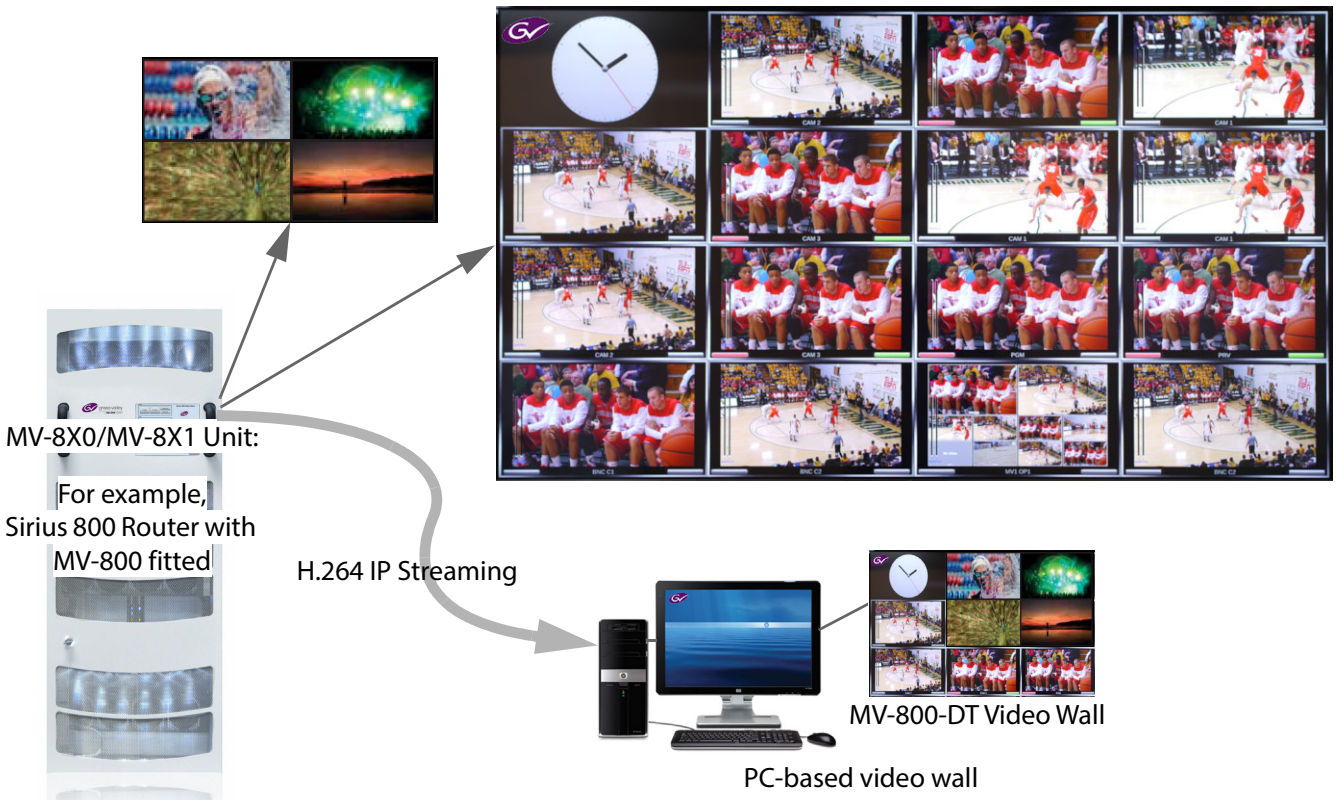


Fig. D-6: MV-800-DT Multiviewer PC-based Video Wall

One or more MV-8X0/8X1 Multiviewer can provide H.264 streams to one or more MV-800-DT video wall. "One-to-Many" and "Many-to-One" video wall topologies are possible, see Figure D-7, and Figure D-8 shows other flexible MV-800-DT possibilities.

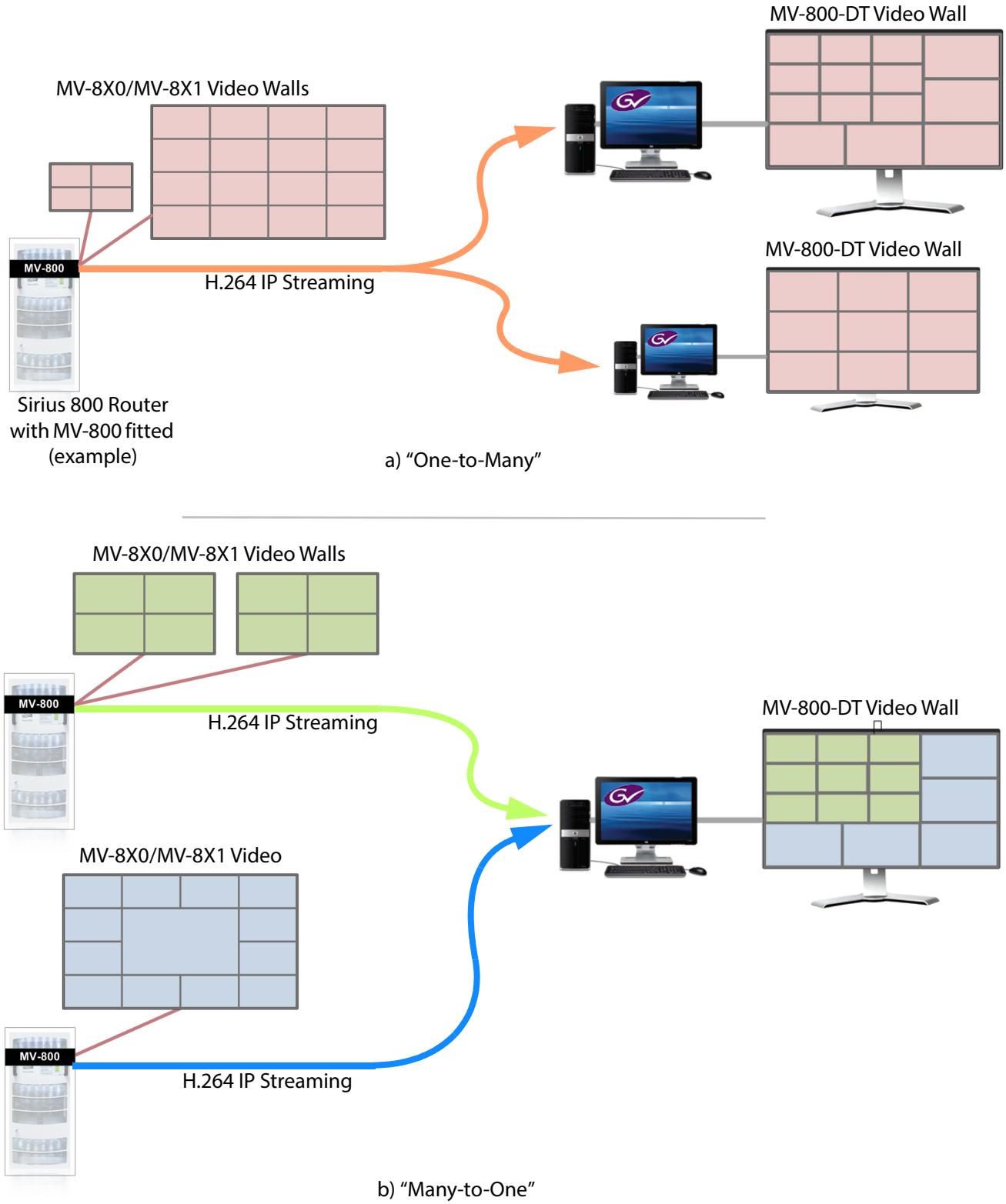


Fig. D-7: MV-800-DT Multiviewer Video Wall Topologies, a) "One-to-Many"; b) "Many-to-One"

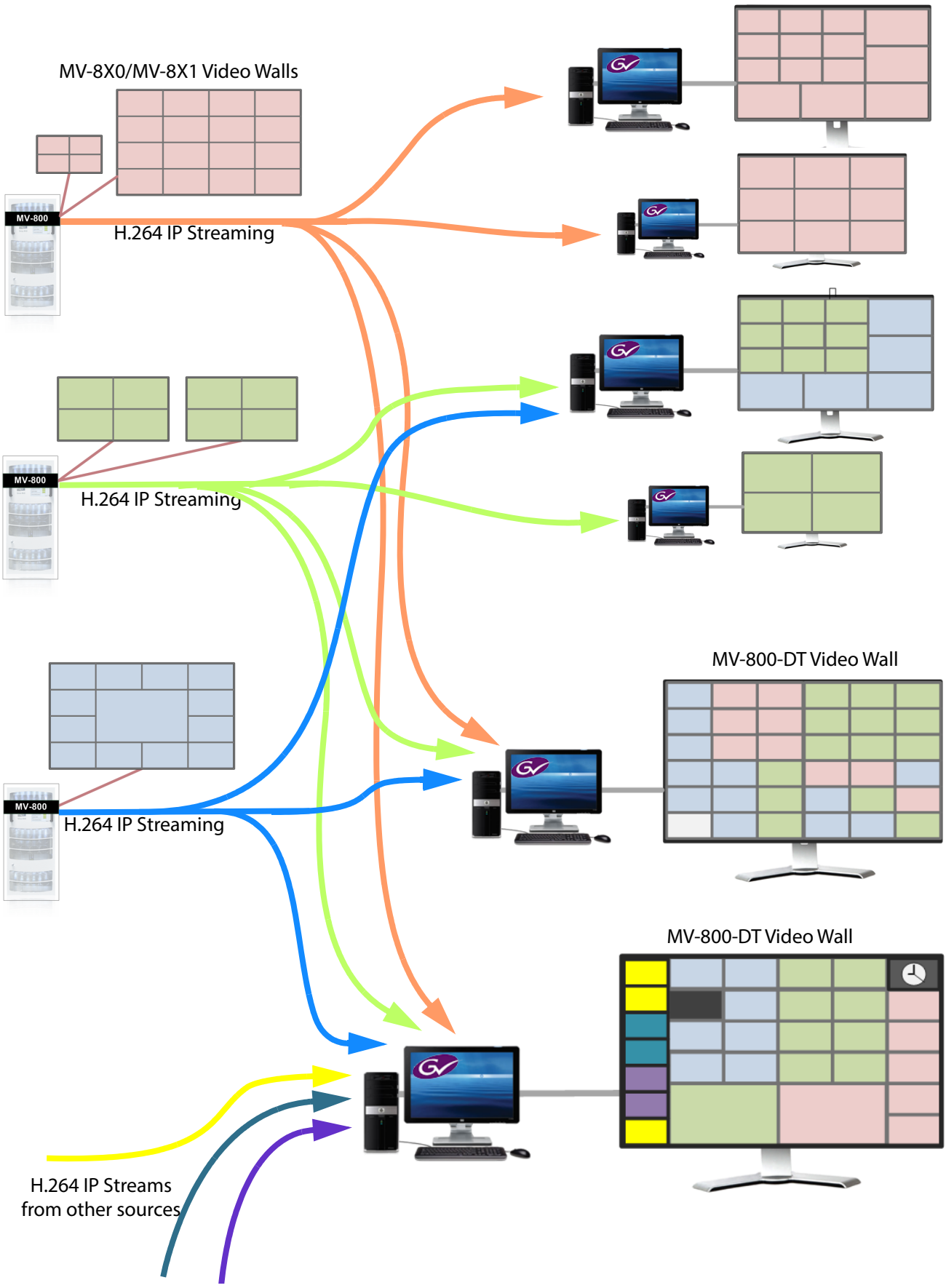


Fig. D-8: MV-800-DT Multiviewer Video Wall Topology Possibilities

Orbit Software Installation for Multiviewer Applications

One Orbit Client software application is for multiviewer video wall configuration. The Orbit software is installed on a PC in order to:

- Configure Orbit-enabled Grass Valley products.
  For example, configuring video wall layouts for an MV-8X0/8X1 Multiviewer.
- Display H.264 IP streams on a PC-based video wall with an MV-800-DT license.
  For example, displaying H.264 IP streams from an MV-8X0/8X1 Multiviewer.

For full information about installing and using Orbit for multiviewer applications, please see the published Orbit manuals:

- 'Orbit Introduction' user manual; and
- 'Orbit for Multiviewers' user manual.

System Requirements

Assuming that an MV-8X0/8X1 Multiviewer unit is already configured and up-and-running, the MV-800-DT system typically uses three PC's performing different roles, although just one PC could be used for all roles:

1 A **Wall Design PC** - used to design video walls with Orbit software.

2 A **Video Wall PC** - used for the PC-based video wall with Orbit software using the MV-800-DT license.

3 A **License Host PC** - used to act as a license server.

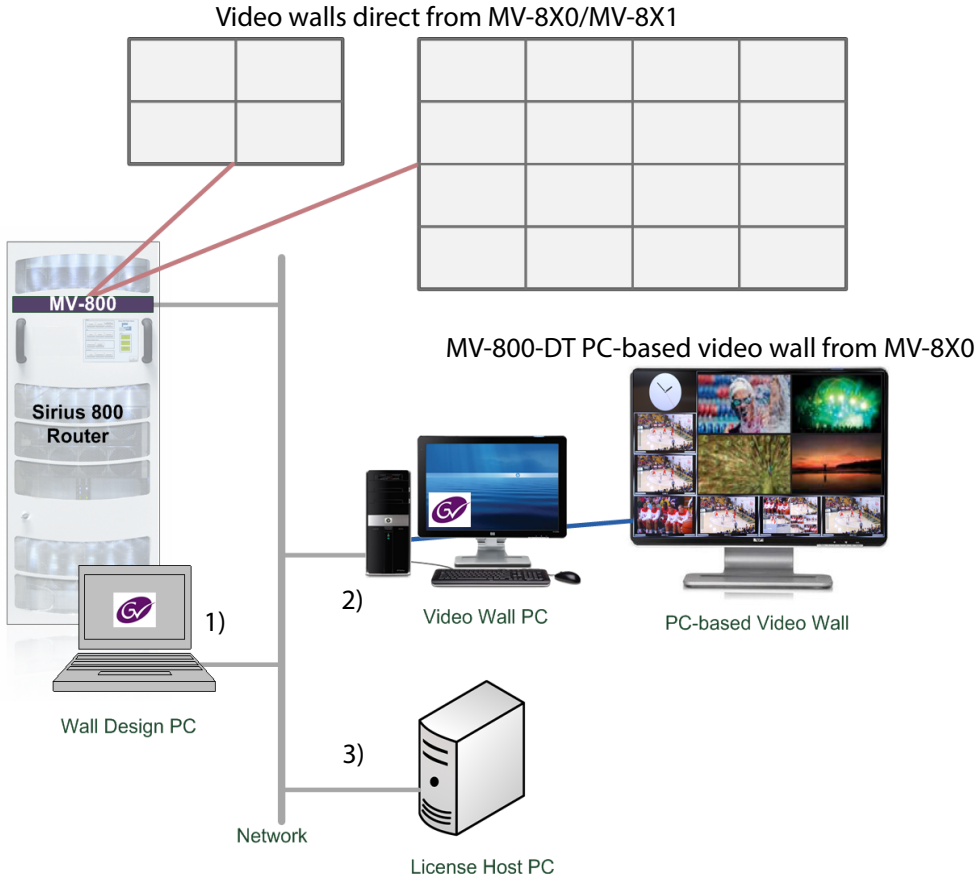


Fig. D-9: MV-800-DT Multiviewer Video Wall

Video Wall PC:

The system requirements for the Video Wall PC are given in Table D-1:.

Table D-1: Minimum System Requirements for a MV-800-DT system PC

System Component	Requirement
CPU	Intel i7
RAM	32GB
Graphics Card	Nvidia K620 GPU
Network Interface	1G Ethernet
OS	64 bit, Windows 7

Installation

These instructions will get the MV-800-DT option up-and-running. There are several stages to getting a MV-800-DT option working and these stages are listed below and are described in the indicated sub-sections.

License Server Preparation

Prepare the license server on the License Host PC:

1.	**License Server**	Install license server tools on a host PC. See License Installation for Orbit, *Install License Server* on page 155.
2.	**Lock Code**	Get a **Lock Code** for the license host PC. See License Installation for Orbit, *Lock Code for License Host PC* on page 158.
3.	**Procure Option**	Procure an MV-800-DT option from Grass Valley via a purchase order. Note: The option license supplied by Grass Valley is a small text file, which may contain one or more MV-800-DT licenses. Store file in a safe place.
4.	**Install License**	Add the MV-800-DT option license file to the license server running on the license host PC. See License Installation for Orbit, *Add Orbit License to License Server* on page 160.

The license server is now prepared.

Configuration Stages

Configure the MV-8 Series Multiviewer:

5.	**Configure MV-8X0**	Configure a MV-8X0/8X1 Multiviewer unit with Grass Valley RollCall Control Panel. See *Configure Multiviewer for MV-800-DT* on page 141.

Note: An MV-8X0/8X1 Multiviewer is configured to use the same Ethernet port for streaming out H.264-encoded multiviewer inputs and for general RollCall control and status messages.

Now set up the Video Wall PC:

6. (**H.264 Stream video player - for *early* Orbit versions only)**

   Only install a H.264 streaming video player if using Orbit versions *earlier than* Orbit v2.5.16. (Later Orbit versions include such a video player.)

   To install the VLC streaming video player on the Video Wall PC:

   See *VLC Video Stream Player Installation* on page 163.

7.	**Orbit**	Install Orbit Client software on the Video Wall PC. See *Orbit Software Installation for Multiviewer Applications* on page 137.
8.	**Multiviewer Project**	Modify an Orbit multiviewer video wall project for running on the Video Wall PC. See *Configure Orbit Project for MV-800-DT* on page 143. And: See *Video Wall and Video Sources* on page 148.

This completes the installation and preparation.

PC Video Wall

To see the PC-based video wall:

9.	**Desktop Video Wall**	Run the Orbit Client on the Video Wall PC. See *Launching Orbit Video Wall* on page 152.

Configure Multiviewer for MV-800-DT

This sub-section describes the configuration of a multiviewer product for the MV-800-DT option.

Note:	Refer to *Getting Started* on page 73, for information about connecting to a unit and its initial configuring.

Note:	Configuration in this sub-section is done via the multiviewer product's RollCall templates (control screens). This sub-section uses the Grass Valley **RollCall Control Panel** tool to view and edit these control screens. However, **Orbit Client 3.0** onwards may also be used to view and edit control screens.

Run the Grass Valley RollCall Control Panel application on a PC:

1 Connect to a MV-8 Series Multiviewer to view control screens.
Go to the **System-Setup** screen and locate the **Streamed Output** box. See Figure D-10.

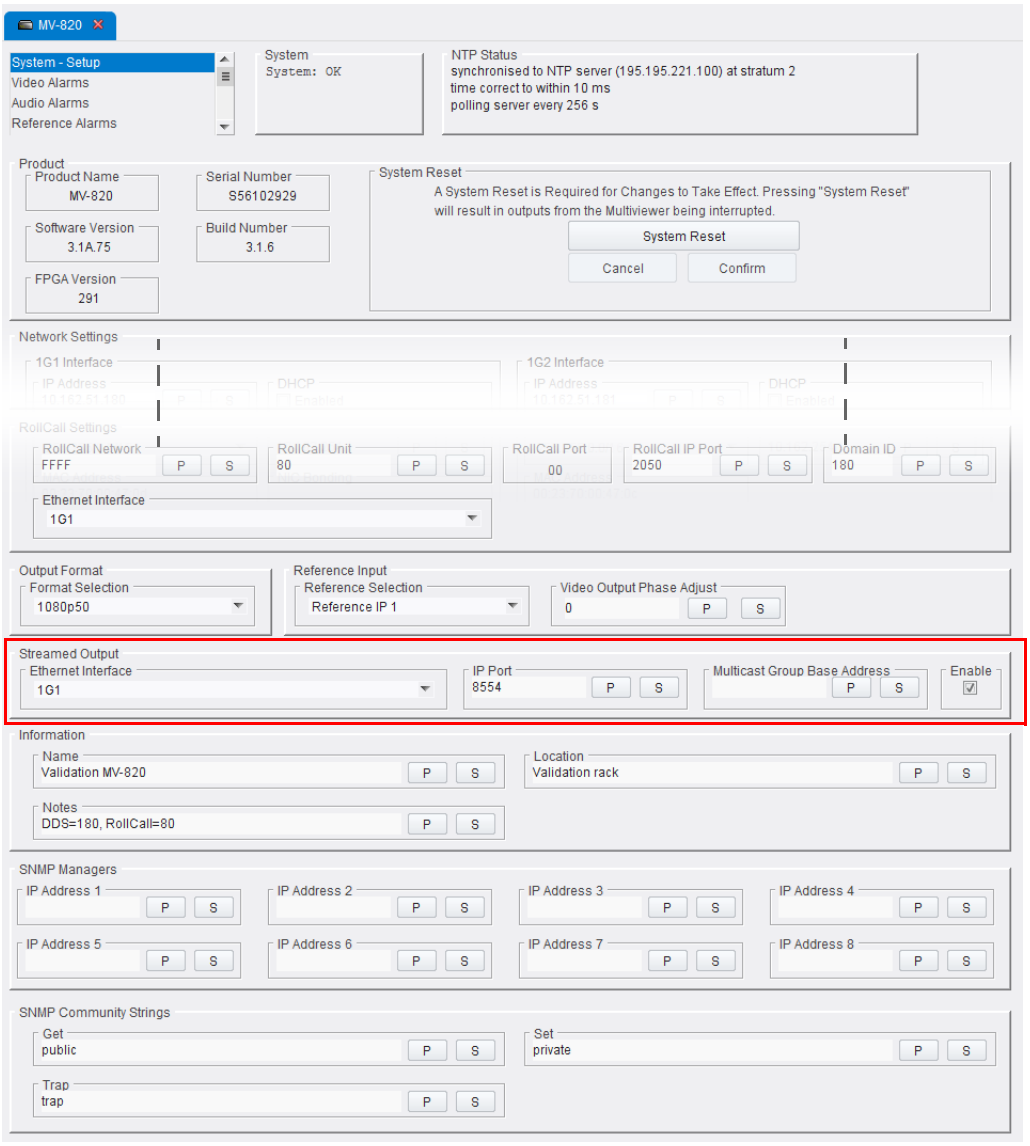


Fig. D-10: System-Setup - Streamed Output box

In the **Streamed Output** box:

2 Set **Ethernet Interface** to be the same as 'Ethernet Interface' in the RollCall Settings box, above in the same window.

3 Enable H.264 streaming output by selecting the **Enable** check box.

4 Leave the **IP Port** setting alone.
(It is a predefined port number and is used for the RTSP control protocol used for the streaming out of the H.264-encoded multiviewer inputs.)

5 Leave the **Multicast Group Base Address** box blank.
The H.264 streamed outputs will then use a set of IP multicast addresses using a suitable randomly-chosen base address from the 232/8 address block. (See *Multicast Group Addresses* on page 21 for details.)

Note: If a particular multicast address range is required for the H.264 streamed outputs, then enter a **Multicast Group Base Address** in the box and click "S" to save this new setting. This may be the case if more than one multiviewer device is on the network.

The MV-8 Series Multiviewer network interface port setting is now set up for H.264 multicast IP streaming out of multiviewer inputs (i.e. H.264-encoded).

All changes in the **System-Setup** screen should have now been made.

A system reset is required for the multiviewer:

6 Click on the **System Reset** button at the top of the System-Setup screen.
Then click on the **Confirm** button to perform a system reset.
The MV-8 Series Multiviewer unit is restarted and the new settings will be adopted.

LAN System Set Up

In the LAN system network configuration:

1 Ensure that the following are enabled on the LAN between the multiviewer device and MV-800-DT video wall PC.

- The RTSP port on the multiviewer's IP address.
- The multicast address range.

Note: **Multicast IP Port Numbers:**

Each multiviewer input is H.264-encoded and streamed out on its own multicast IP address with the RTP protocol, video data and control data (e.g. quality, statistics) use different IP port numbers on the respective IP address.

IP port numbers used on the respective multicast IP addresses for multiviewer inputs are:

- Input 1: video data=18888; RTP control data = 18889.
- Input 2: video data=18890; RTP = 18891.
- Input 3: video data=18892; RTP = 18893.
- ...
- Input 48: video data=18982; RTP = 18983.

Configure Orbit Project for MV-800-DT

In this section, an Orbit multiviewer project is modified to use an MV-800-DT option. This project will be run with Orbit on the Video Wall PC. Carry out these steps on the Video Wall PC.

A project can be modified from an existing MV-8 Series Multiviewer Orbit project, or it can be a new and separate project. Modifying an existing project enables video walls from an existing MV-8 Series Multiviewer to be shown on the Video Wall PC

Using a new and separate project (or a heavily modified existing project) means that selected video inputs can be shown on the Video Wall PC. By selecting fewer displayed video inputs, larger video tiles are possible on the Video Wall PC. Additionally, a separate project can show H.264 streams from more than one MV-8 Series Multiviewer source, or from some other source.

Orbit Project

1 Pull a multiviewer project from an MV-8 Series Multiviewer or create a new Orbit project.

Modifications to a Orbit project:

2 Open the project in Orbit.

3 Click **Multiviewer > Properties**.
The **Multiviewer Properties** window is displayed, see Figure D-11.

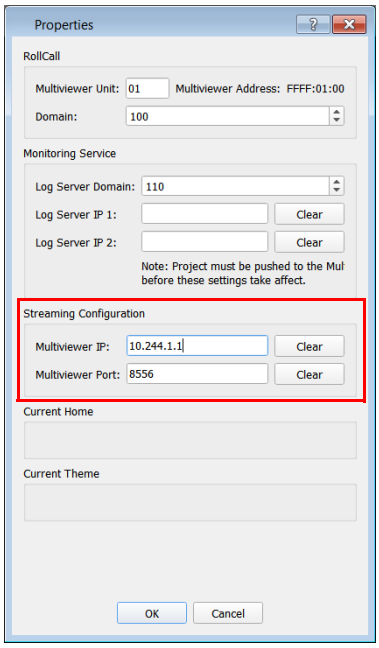


Fig. D-11: Multiviewer Properties window - Streaming Configuration box

4 Set the **Streaming Configuration** box **Multiviewer IP** and **Multiviewer Port** to be the same as the RollCall Settings in the System-Setup screen of RollCall Control Panel for the MV-8 Series Multiviewer that will be sourcing the H.264 IP streams.
Click **OK**.

Note: The **Multiviewer IP** and **Multiviewer Port** values are used by Orbit to form the video source URL's for video wall 'auto-tiles'.

If a different URL is required on an auto tile, it may be converted to a custom tile.
And the video H.264 streaming URL of a Custom Tile may be specified.

Orbit License Option Settings

1 Click **Tools > Options**.
The **Options** window is displayed.

2 Select the **Licen...** tab. (**Tools > Options > Licen...**)
The **License** tab is displayed, see Figure D-12.

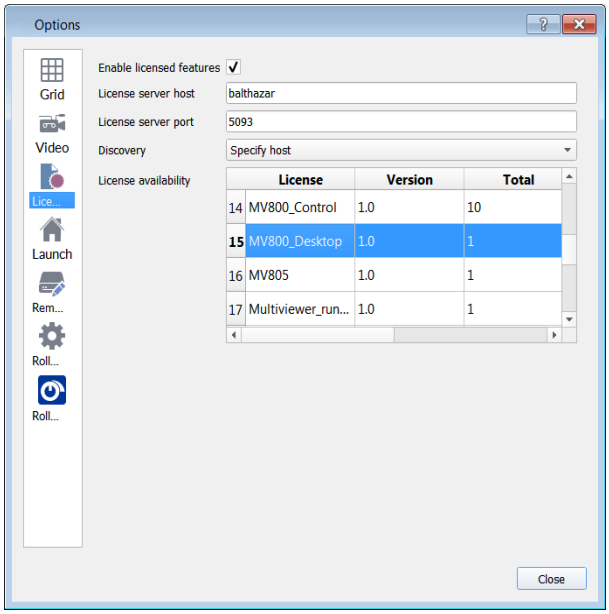


Fig. D-12: Tools > Options, License tab

3 Select **Enable licensed features**.

4 Enter the name of the license host PC in the **License server host** text box.

5 Do not change the **License server port** setting.

6 Click **Close**.

7 Click **File > Save Project**.
Click **File > Exit** to close Orbit.

Restart Orbit with these new License server settings.

8 Restart Orbit.
Re-open the same project to continue modifying the Orbit project for MV-800-DT.

Orbit Video Option Settings

1 Click **Tools > Options**.
The Options window is displayed.

2 Select the **Video** tab. (**Tools > Options > Video**)
The **Video** tab is displayed, see Figure D-13.

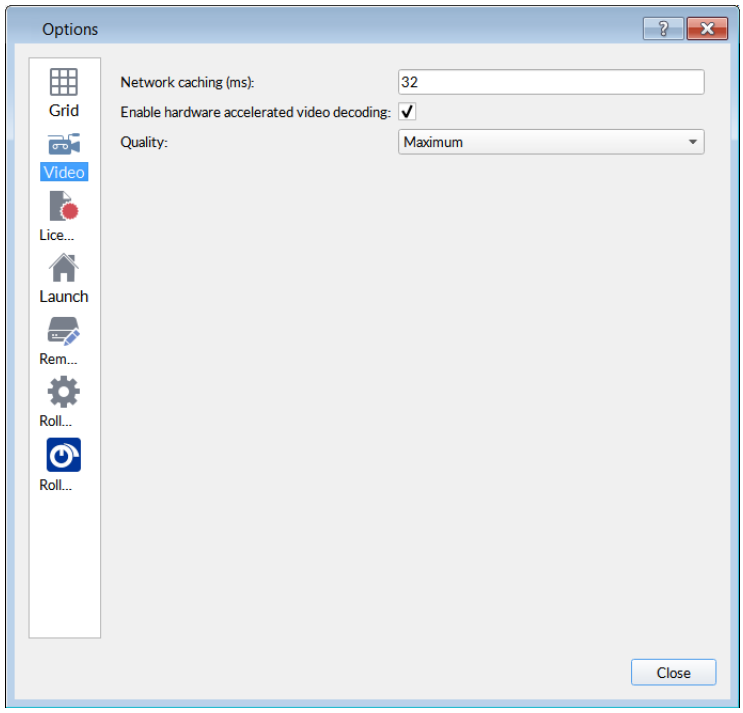


Fig. D-13: Video tab

3 Set **Network caching** (ms) to a value between 32 and 1000.

Note:	**Network caching** is the time delay until video rendering begins (i.e. the amount of network data to buffer up). The value depends on the number of video tiles being rendered on the PC-based video wall and the IT network used by the video H.264 streaming. Increase this value if the network cannot sustain data delivery to the Orbit Client.

4 Select **Enable hardware accelerated video decoding**.
This enables Orbit to use the Video Wall PC's graphics card (GPU) to accelerate video rendering.

Note:	Use of hardware acceleration is recommended.

5 Set **Quality** to 'Maximum'.
Other settings ('High', 'Low') will act to reduce the PC loading on the Video Wall PC - the quality of the rendered video on the Video Wall will be reduced.

Note:	The **Quality** setting offers a rendered video quality trade-off to the user. PC loading can be reduced at the expense of reduced video quality on the PC-based video wall.

Orbit Launch Option Settings

1 Select the **Launch** tab. (**Tools > Options > Launch**)
The **Launch** tab is displayed, see Figure D-14.

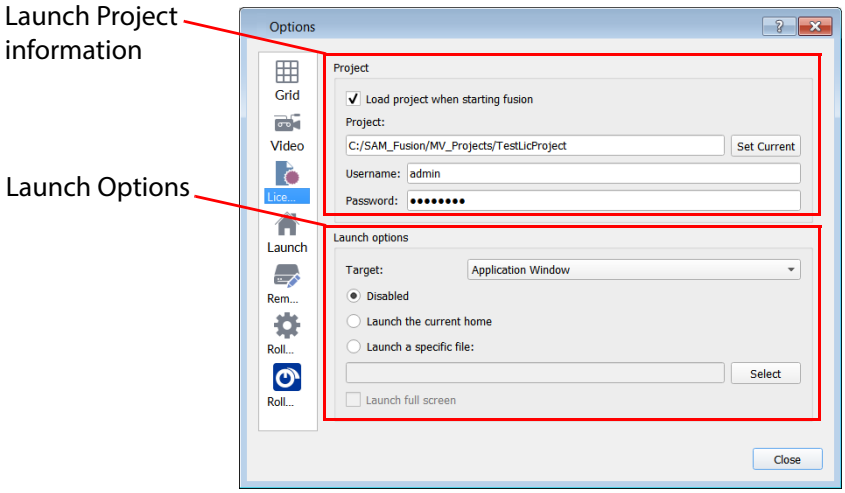


Fig. D-14: Launch tab

2 Select **Load project when starting Orbit**.

Note:	With **Load project when starting Orbit** check box de-selected, the Orbit application starts normally with no project open.

3 Set the **Project** text box to path to the required project. (Click **Set Current** to set it to the current project.)

4 Fill out the user name and password to use to login at launch for this project.

5 In the **Target** drop-down box, select the target screen on which to view the video wall.

Note:	**Target** drop-down box options for where to view the live video wall at launch are: • **Application window** - The Orbit application window. • **Screen 1** - PC monitor screen 1 *. • **Screen 2** - PC monitor screen 2 *. * Upon selecting either **Screen 1** or **Screen 2**, a helpful screen-identifying flash-message is overlaid on the corresponding screen for a second, 'Screen 1' or 'Screen 2'. See Figure D-15.

Fig. D-15: Target Screen Identifying Flash-Message

6 In the **Target** radio buttons,
click **Launch a specific file**.
In the drop-down box, select the required (project) file to be displayed at launch. This will typically be a video wall, i.e. a '.wall' file from the Project Pane.

Note: **Target** radio buttons are:

- **Disabled** - No launch.
- Launch the current home - A defined page is shown at launch (defined by clicking Project > Set Home.)
- **Launch a specific file** - a file is specified, usually this is a Orbit project's '.wall' file, the video wall required.

7 Click **Close**.

8 Click **File > Save Project**.

To set up an Orbit video wall to display video H.264 streams, see *Video Wall and Video Sources* on page 148.

Video Wall and Video Sources

In this section, a Orbit multiviewer project's video wall is modified for showing streamed multiviewer inputs on a Video Wall PC.

A URL of each video H.264 stream must be defined for each video tile showing (H.264) streaming video. The mechanism for doing this depends on whether the tile is a video auto-tile or custom tile; this is covered below:

Auto-Tile

1 Open the project with Orbit.

2 Open the required video wall and **single-click** on a video auto-tile.
The video tile is selected and its properties are shown in the Properties box, on the right-hand side, see Figure D-16.

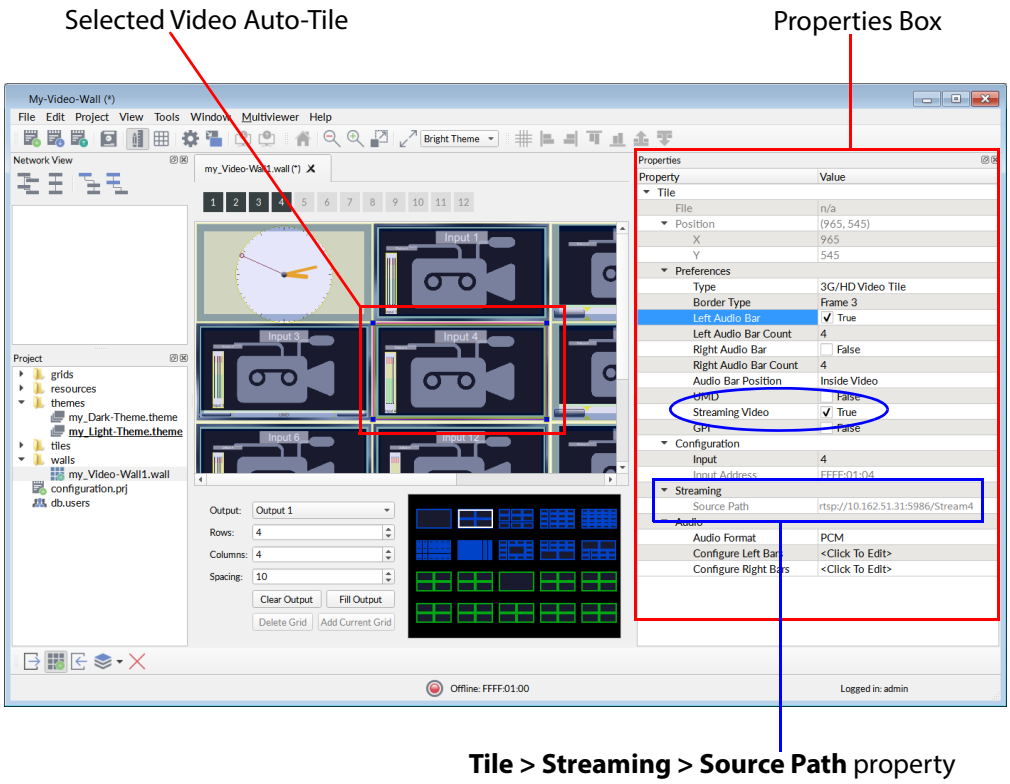


Fig. D-16: Selected Video Auto-Tile Properties

3 Select the **Tile > Preferences > Streaming Video** property.

The **Tile > Streaming > Source Path** property is then shown in the Properties box, see Figure D-16.

Note: The displayed source path is automatically generated by Orbit from information in the **Multiviewer > Properties** window, see Figure D-17.

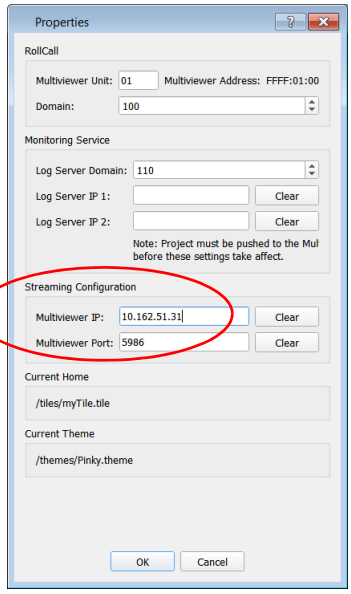


Fig. D-17: Multiviewer > Properties, Streaming Configuration

Note: Source path example,
Tile > Streaming > Source Path property:

rtsp://10.162.51.31:5986/Stream48

Where:

- **rtsp:** - Real time streaming protocol prefix. Protocol is used for establishing and controlling media sessions between two network ports.
- **10.162.51.31** - IP address of unit sending the video stream, **Multiviewer IP**.
- **5986** - IP port number of the unit sending the video stream, **Multiviewer Port**.
- **Stream48** - Video H.264 stream name, formed from the Multiviewer input feeding the video tile, **Input 48**.

The **Source Path** property is a URL formed automatically by Orbit for a video **Auto-Tile**.

If the URL needs to be customized:

- A user variable may be set up for the IP address of the sourcing multiviewer device.
- A video **Custom Tile** needs forming from a video **Auto-Tile** and its tile properties edited.

Create a User Variable

The tile's **Source Path** property value may be set to use a user variable in Orbit:

1 Select **Project > Edit Variables** in the main menu.

The Properties dialog is shown.

2 Create a new variable, for example 'MV IP', and set its value to be the IP address of the multiviewer sourcing the H.264 IP streams. See Figure D-18.

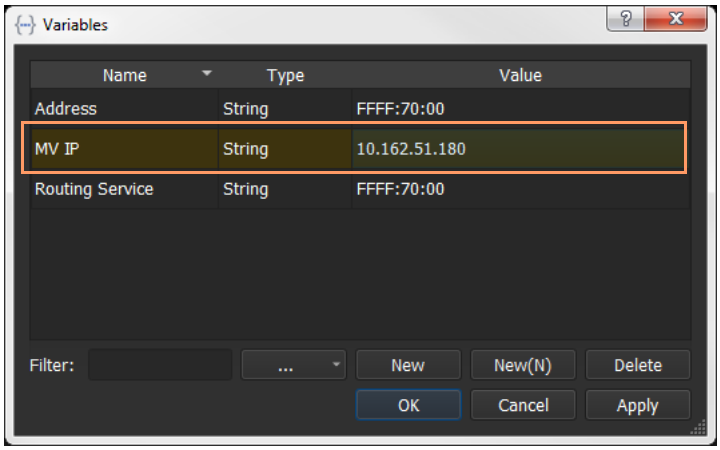


Fig. D-18: Properties Dialog with New Variable Defined

3 Click **OK**.

The variable name may be used throughout the Orbit project, including in Source Path property values.

Custom Tile

1 Open the project with Orbit.

2 Open the required video wall and double-click on a video custom tile or on a video auto-tile.
The tile is opened in the **Tile Editor**, see Figure D-19.

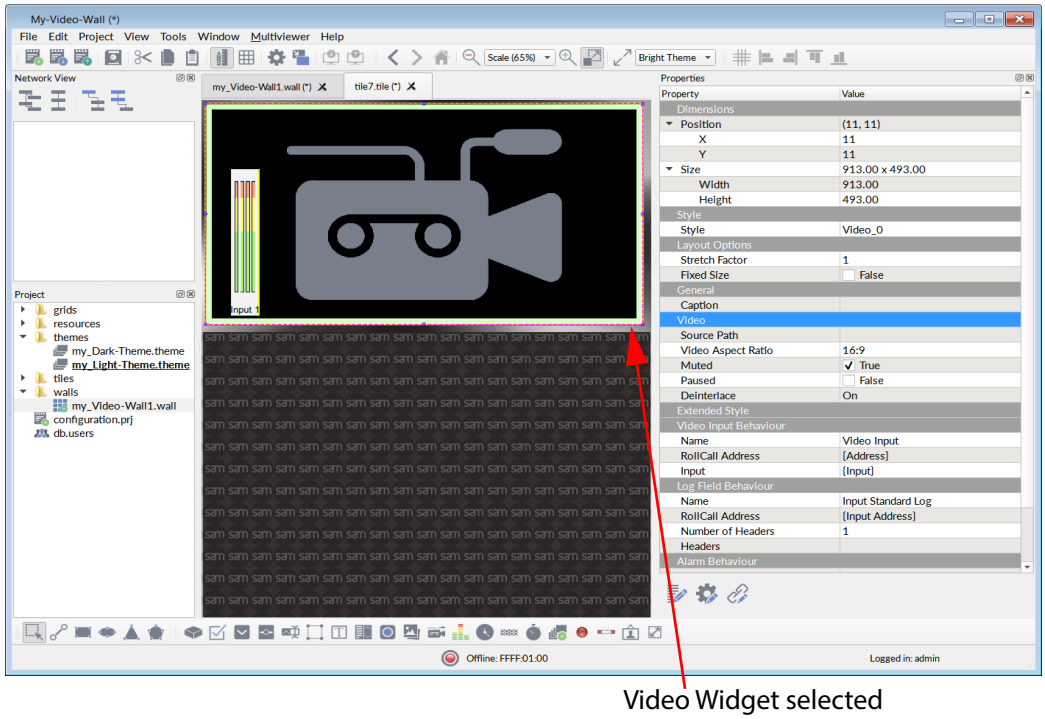


Fig. D-19: Tile Editor - Video Widget Properties

IMPORTANT
Any **Auto-Tile** edited in the **Tile Editor** becomes a **Custom Tile**.

3 Click on the video widget to select it.
The video widget properties are shown on the right-hand side. See Figure D-19.

4 The **Video > Source Path** property shows the URL of the video H.264 stream.
This text box is editable.

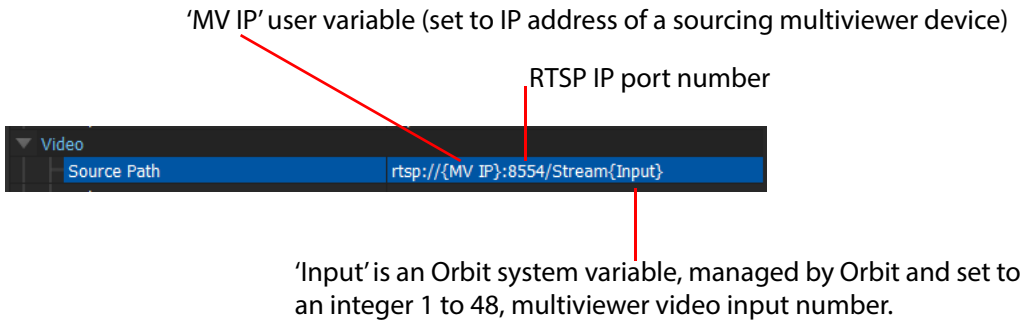


Fig. D-20: Video > Source Path Property URL Value

Note: A variable is used by enclosing the variable name in curly braces, {VarName}. The variable's value is substituted by Orbit when the project runs.

- **{MV IP}** - The user variable value is substituted by Orbit - in this case, the sourcing multiviewer's IP address.
- **{Input}** - A video input number is assigned by Orbit when the custom tile is placed into a wall and the project run. More than one such tile may be placed. Orbit then assigns video input numbers to all instances of the 'Input' system variable.

Note: The system variable 'Input' is enumerated and expanded by Orbit. Any tile or widget properties containing the '{Input}' construct will be auto-numbered from 1 to 48.

Thus, "Stream{Input}" will be expanded to be: "Stream1", "Stream2", ... "Stream48".

5 Click **File > Save** to save changes.

Other tile properties:

6 Select the **Video > Muted** property.

Note: Audio is muted in the video H.264 streams.

7 If the source video is progressive, then set the **Video > Deinterlace** property to 'off'.

8 Click **File > Save** to save changes.

9 Click **File > Save Project**.
Click **File > Exit** to close Orbit.

The project will be used by Orbit on the Video Wall PC to show a live video wall on the PC monitor screen.

To launch Orbit, see *Launching Orbit Video Wall* on page 152.

Launching Orbit Video Wall

All steps in the installation and preparation should now be done (described in *Installation* on page 139) and Orbit is now configured to open a project and display a live video wall at launch (start-up). (Orbit launch options are described in *Orbit Launch Option Settings* on page 146.)

Running Orbit

Run Orbit on the Video Wall PC.

The Orbit application then:

- Starts up.
- Opens the preset Orbit project and logs in.
- Gets an MV-800-DT license from the license server.
- Displays a video wall on the PC monitor screen.

Note: The normal 'user name' and 'password' login steps when opening a Orbit project are not presented at Orbit launch. These have already been set up within Orbit.

Note: The Video Wall PC running Orbit requires to access the MV-800-DT license from the License Host PC. The Video Wall PC and the License Host PC must be able to see each other on the network.

If communication with the license host PC fails, a license check message appears.

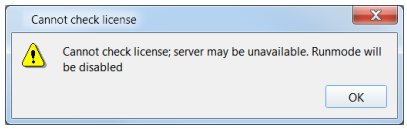


Figure D-21 shows a full-screen video wall seen on one of the Video Wall PC's monitors.

Fig. D-21: Full-screen Live Video Wall (Layout 1)

Figure D-22 shows a live video wall (in this case a second wall layout, Layout 2) being shown in a tab screen within the Orbit application window. Figure D-23 shows the same video wall undocked.

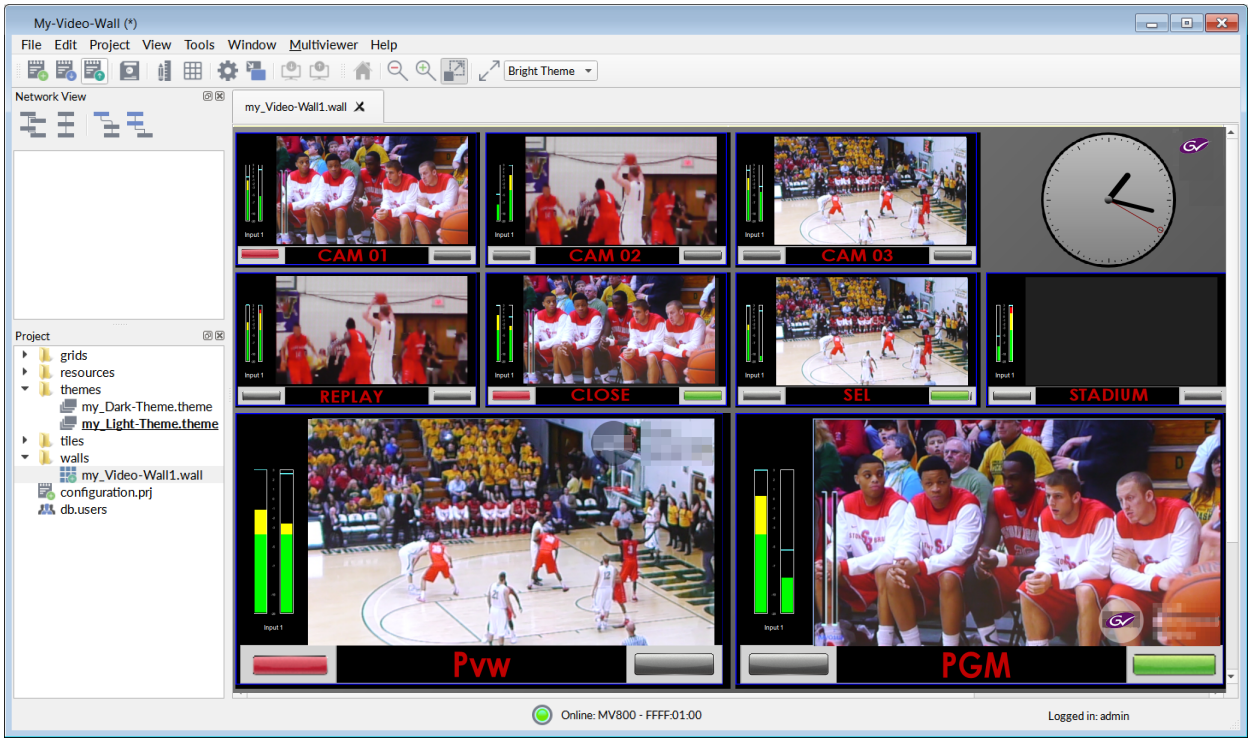


Fig. D-22: Full-screen Live Video Wall - Layout 2, docked in the Orbit Application window

Fig. D-23: Full-screen Live Video Wall - Layout 2, in an undocked window

Orbit Window Controls

Right-clicking in the live video wall area produces a context menu, see Fig. D-24:.

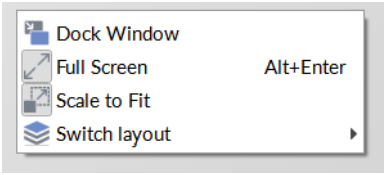


Fig. D-24: Right-Click in Live Video Wall - Context Menu

Table D-2: Right-Click Live Video Wall - Context Menu Items

Alarm	Description
Dock Window	Restores a video wall window to a tab screen in the Orbit window.
Full Screen	Toggles between viewing a wall full-screen and in docked or undocked window (a separate window or as a Orbit tab screen). **Alt+Enter** Pressing the 'Alt' key with the 'Enter' key does the same
Scale to Fit	Scale a video wall image to fit the Orbit window. Not used when full-screen.
Switch Layout	Change between wall layouts.

Switching into Design Mode

Orbit has been configured to launch in 'Run-Mode' for displaying live video walls with the MV-800-DT license.

Click the **Run-Mode/Design-Mode** icon in the Orbit main tool bar, see Fig. D-25:, to change into 'Design Mode'. Wall editing may be done in 'Design Mode'.

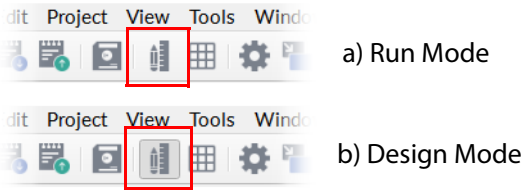


Fig. D-25: Run-Mode/Design-Mode icon

Clicking the icon toggles between the two modes of Orbit operation.

License Installation for Orbit

Appendix contains:

License Installation for Orbit

This section describes installation of some software applications etc. required for an Orbit license. For example, to get the MV-800-DT option working for the Orbit Client software tool. The installation and preparation steps covered are:

- License server installation.
- Lock Code generation.
- Adding the license.

Install License Server

The license server application should be installed on a license server host PC. The PC must be on the same network as the PC generating the PC-based video wall and any MV-8X0/8X1 Multiviewer units producing live video input streams and data.

The license server application used is the same as that used for some other Grass Valley products, for example Alchemist XF. If such a license server already exists on the network, then no further action is needed to install one. Otherwise, a license server application must be installed by following the steps below.

To get the licensing tool installer files onto the license host PC, either:

- Copy across part of a Orbit installation folder from another PC onto the license host PC, C:\Program Files\...\Orbit\LicensingTools.

or, alternatively,

- Install Orbit on the license host PC,
see “Add Orbit License to License Server” on page 160.

Then:

1. On the license host PC, go to the C:\Program Files\...\Orbit\LicensingTools\Setup sub-folder.

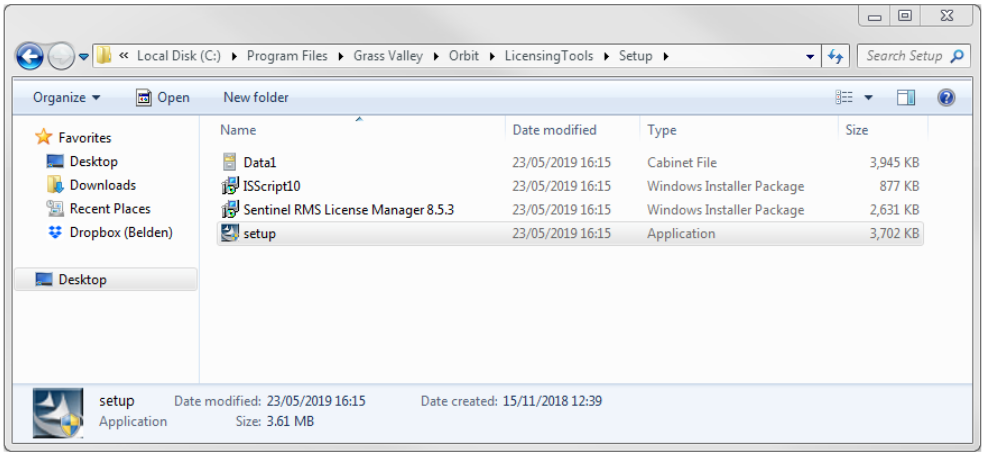


Fig. E-26: Licensing Tools 'setup.exe'

2. Run **setup.exe**.
   The licensing tools installation begins and an initial screen is shown.

Fig. E-27: Licensing Tools Setup Initial Screen

3. Click **Next** at the initial screen.
4. Read and accept the License Agreement.
   Click **Next**.
5. At the Customer Information screen, enter the information.
   Click **Next**.
6. At the Destination Folder screen, select the default installation folder.
   Click **Next**.
7. At the Setup type screen, select the **Complete** setup type.
   Click **Next**.

8. At the System Firewall Settings screen, select the text box for "Unblock the system firewall for the Sentinel RMS License Manager".
   Click **Next**.
   The 'Ready to Install the Program' screen appears, see Figure E-28.

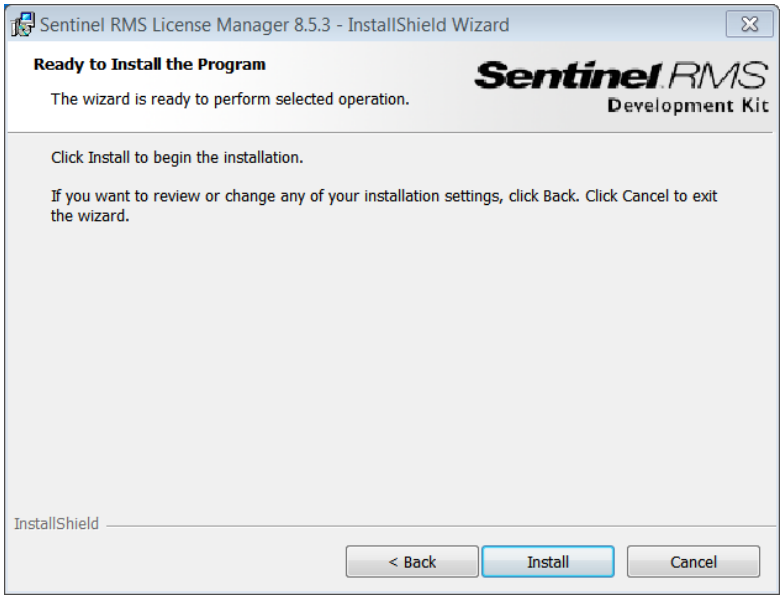


Fig. E-28: Licensing Tools - Ready screen

9. Click **Install**.
   Installation begins and a progress bar is shown.
   The install complete screen is shown when installation is done.

Fig. E-29: Licensing Tools - Complete screen

10. Click **Finish**.
    Licensing Tools installation is now finished.
11. Restart the license host PC.

The licensing tools are installed on the license host PC. The licensing tools are run as a service when the license host PC is restarted.

Lock Code for License Host PC

A Lock Code is required to be generated from your license host PC. This is a kind of fingerprint of your machine, which ensures your license will be served by the license server.

The Lock Code must be supplied to Grass Valley when ordering an Orbit license, for example for the MV-800-DT option.

The Lock Code generation is described in this sub-section.

Note: The Lock Code is case-sensitive and must be supplied to Grass Valley exactly as it appears after these Lock Code generation steps.

The Lock Code generating utility is found in a Orbit installation folder. To get the utility onto the license server PC, either:

- Install Orbit on the license host PC.

or

- Copy across the Orbit installation folder from another PC.
  C:\Program Files\Grass Valley\Orbit...

Then:

1. On the license server PC,
   go to C:\Program Files\...\Orbit\LicensingTools.
2. Run the file 'wechoid.exe'.
   A Lock Code generation window appears entitled 'Wechoid'. See Figure E-30.

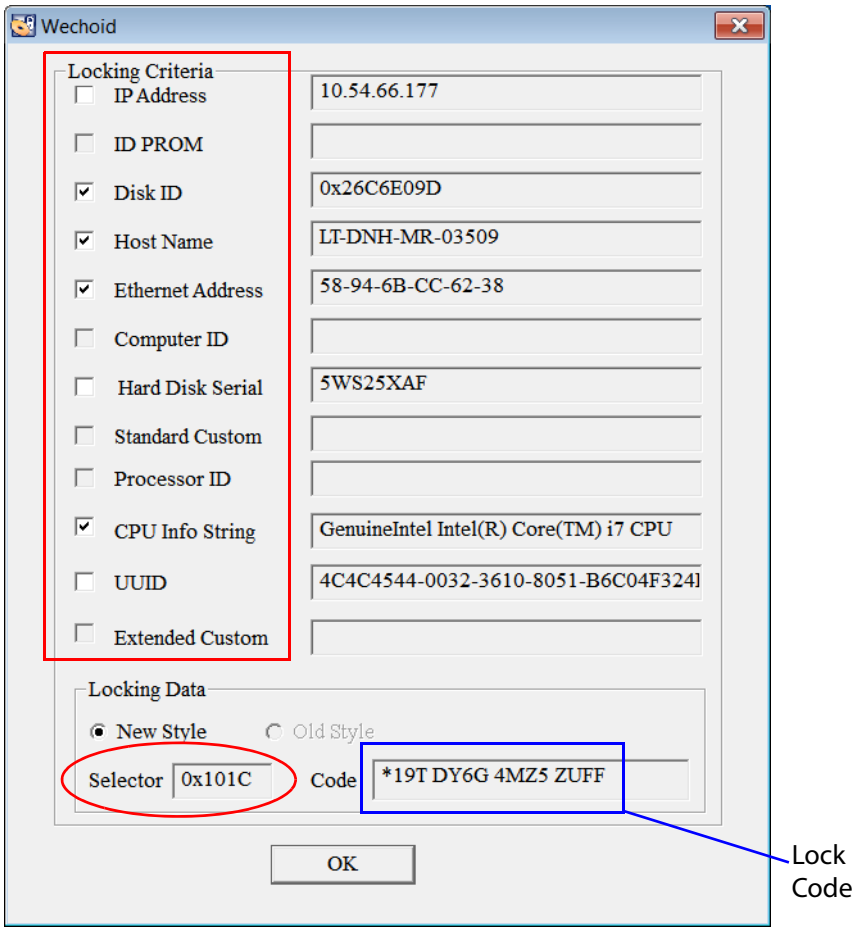


Fig. E-30: Lock Code 'Wechoid' window

3. Select and deselect the various left-hand side **Locking Criteria** check boxes so that they are the same as in Figure E-30.
4. Check that the value in the **Selector** text box is the same as that in Figure E-30.
5. The value in the **Code** text box is the **Lock Code** for your host PC.
   Record the **Lock Code** for sending to Grass Valley.

Note:	The **Lock Code** is case-sensitive and must be supplied to Grass Valley *exactly* as it appears in your Wechoid window on the license host PC. Take a screen shot of your Wechoid window with the Windows snipping tool or similar.

6. Keep the record of your **Lock Code** safe.
   Close the Wechoid window.

Supply the **Lock Code** to Grass Valley with your Orbit option purchase order.

Add Orbit License to License Server

This section deals with adding the license file to the license server.

On the license host PC:

1. Go to
   C:\Program Files\Grass Valley\Orbit\LicensingTools.

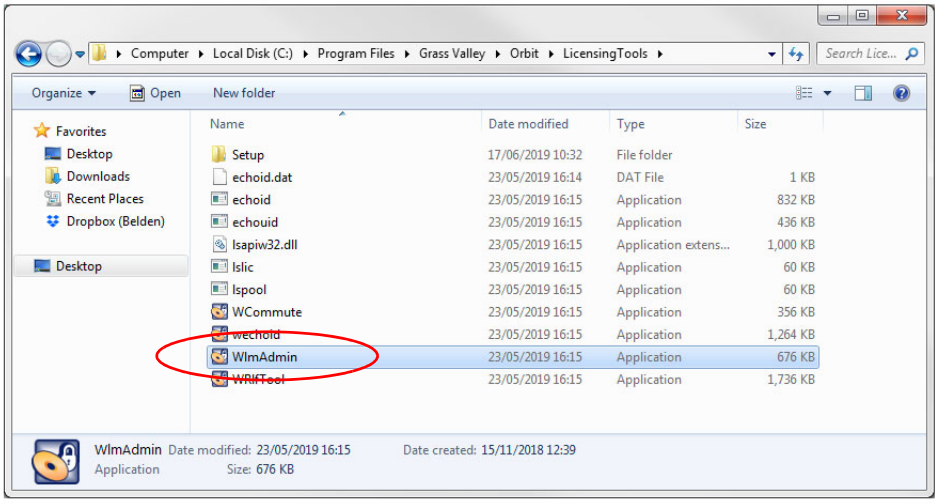


Fig. E-31: Run 'WlmAdmin.exe'

2. Run 'WlmAdmin.exe', the license administration tools.
   The WlmAdmin window appears, see Figure E-32.

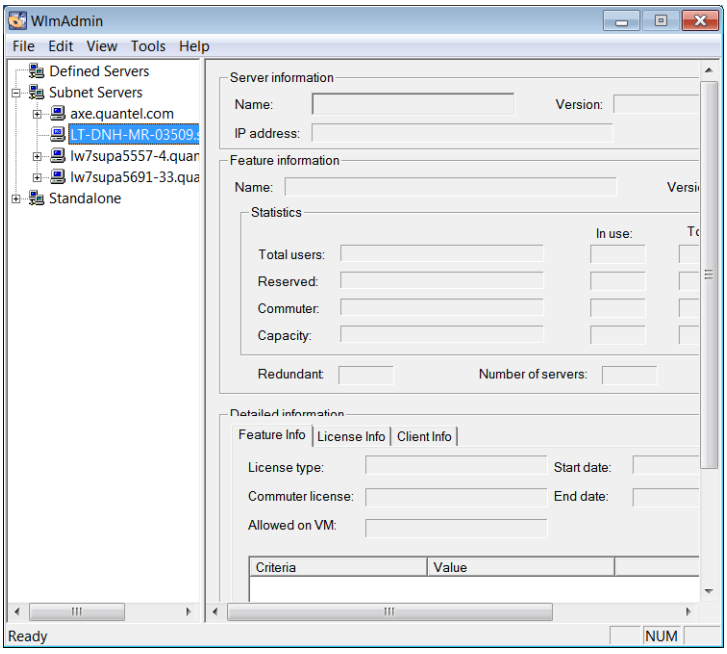


Fig. E-32: WlmAdmin Window

3. Expand the 'Subnet Servers' tree view item and locate the license host PC.

4. Right-click on the license host PC item
   and click on **Add Feature > From a File > To Server and its File**, see Figure E-33.

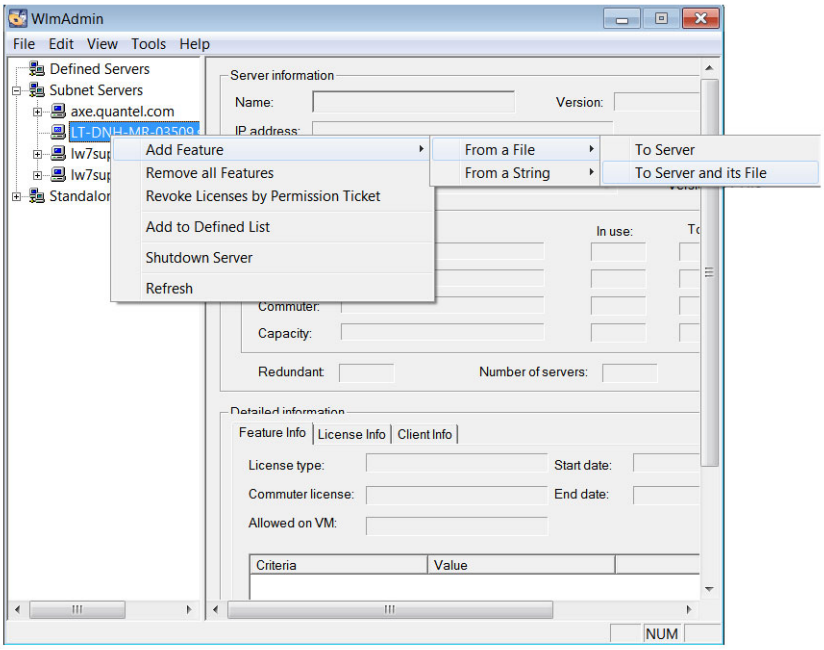


Fig. E-33: Add Feature

5. Browse to your license file and click **Open**.
   The license file is read and the licensed feature is added to the license server.
   An acknowledging message is displayed, see Figure E-34.

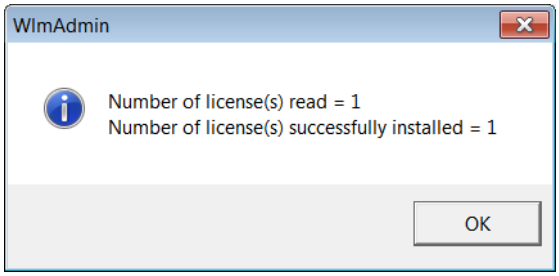


Fig. E-34: WlmAdmin License Read message

6. Click **OK**.
   The license file contents have been read and the licensed feature has been added.

The Orbit license has now been added to the license server.

In the WlmAdmin window, license feature information may be seen by expanding the license host PC in the tree view. Beneath the license server PC name, the newly-added license name appears; for example, see Figure E-35.

Close the license tools window, WlmAdmin, when done; the license service continues to run.

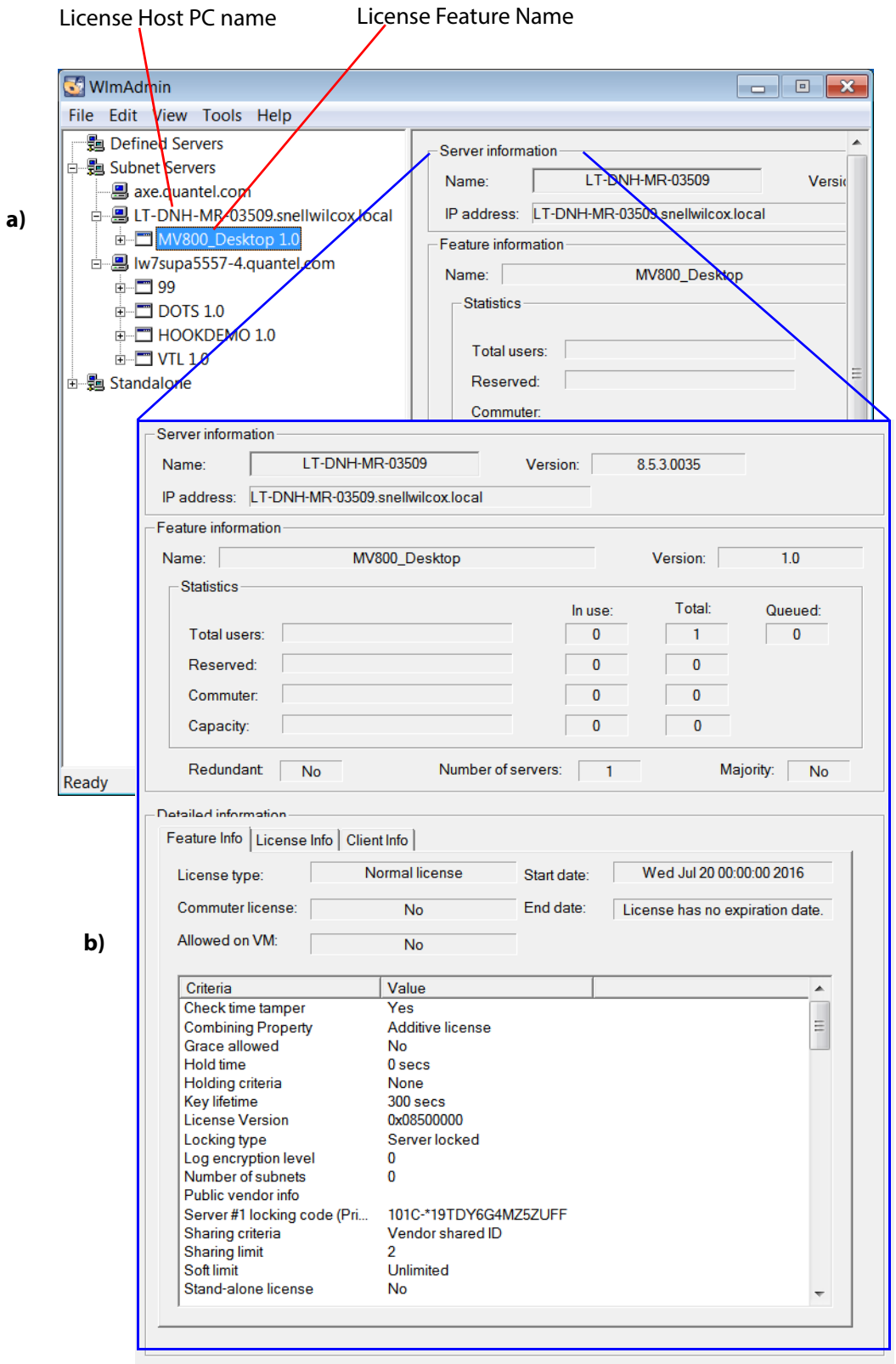


Fig. E-35: WlmAdmin License Information
a) License Feature Name in expanded tree view.
b) License Server and Feature Information in right-hand pane.

VLC Video Stream Player Installation

IMPORTANT

Information in this appendix *only* applies if using an **Orbit Client** software **version *earlier than* v2.5.16**.

This appendix *does not* apply for Orbit version v2.5.16 onwards, because Orbit has a video H.264 stream player already built in.

Grass Valley recommend upgrading to the latest Orbit version.

This section describes installation of the VLC video stream player used to view the H.264 video streams on the 'video wall' PC from MV-8 Series Multiviewers with early versions of the Orbit Client software tool (earlier than Orbit v2.5.16).

Later Orbit versions include a streaming video player and do not require any separate installation of the VLC player.

Introduction

For early Orbit versions, a VLC streaming video player is required to be running on the Video Wall PC. VLC is a free and open source cross-platform multimedia player from VideoLAN, which plays various streaming protocols and is compatible with the H.264 streamed multiviewer inputs from an MV-8 Series Multiviewer.

System Component	Requirement
VLC streaming video player	64-bit

Install

The video stream player used is the 64-bit VLC player from VideoLAN (*www.videolan.org*).

1. Download the 64-bit VLC installer from http://www.videolan.org/vlc/download-windows.html

Note: Download and install the 64-bit installer for Windows, *not the 32-bit installer*.
The correct downloaded installer file name will have the form '**vlc-N.N.N-win64.exe**', where N.N.N is the vlc software version number.

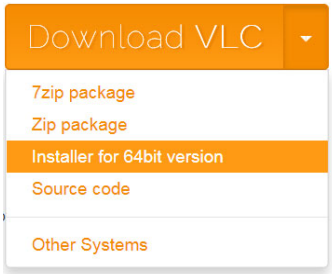


Fig. F-36: VLC Installer 64-bit Download

2. Run the VLC 64-bit installer.
   The VLC media player Setup Wizard begins.
3. Read the license agreement and click **Next**.
4. Click **Next** on the following screen.
5. You are invited to choose an Install Location. Use the default location on your PC. Click **Install.**
   Installation begins and a progress bar is shown.

Note:	It is possible to specify your own VLC install location instead of the default. In this case, *after installation*, create a system environment variable VLC_PLUGIN_PATH and set this to the install folder path. (Example: VLC_PLUGIN_PATH C:\Program Files\VideoLAN\VLC)

6. A completion screen is shown when VLC is installed. See Fig. F-37:.
   Click **Finish**.
   The VLC player starts up. Click **Continue** at the splash screen.

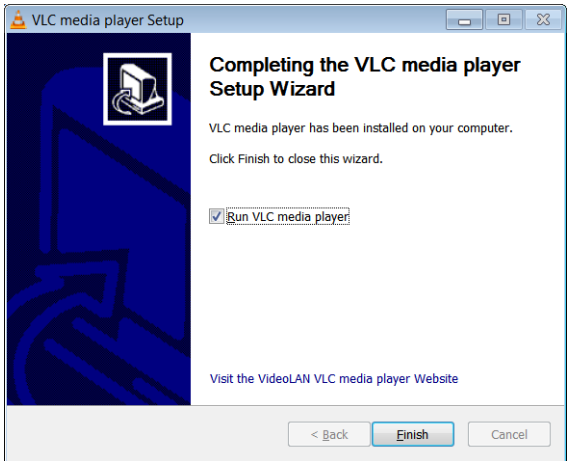


Fig. F-37: MV-800-DT Multiviewer Video Wall

7. Close the VLC player.
   The VLC player is installed.

G Multiviewer Terminology

This section describes some of the multiviewer terminology used in the manual and should be read alongside the example dual-screen video wall illustration shown in Figure G-1 on page 166.

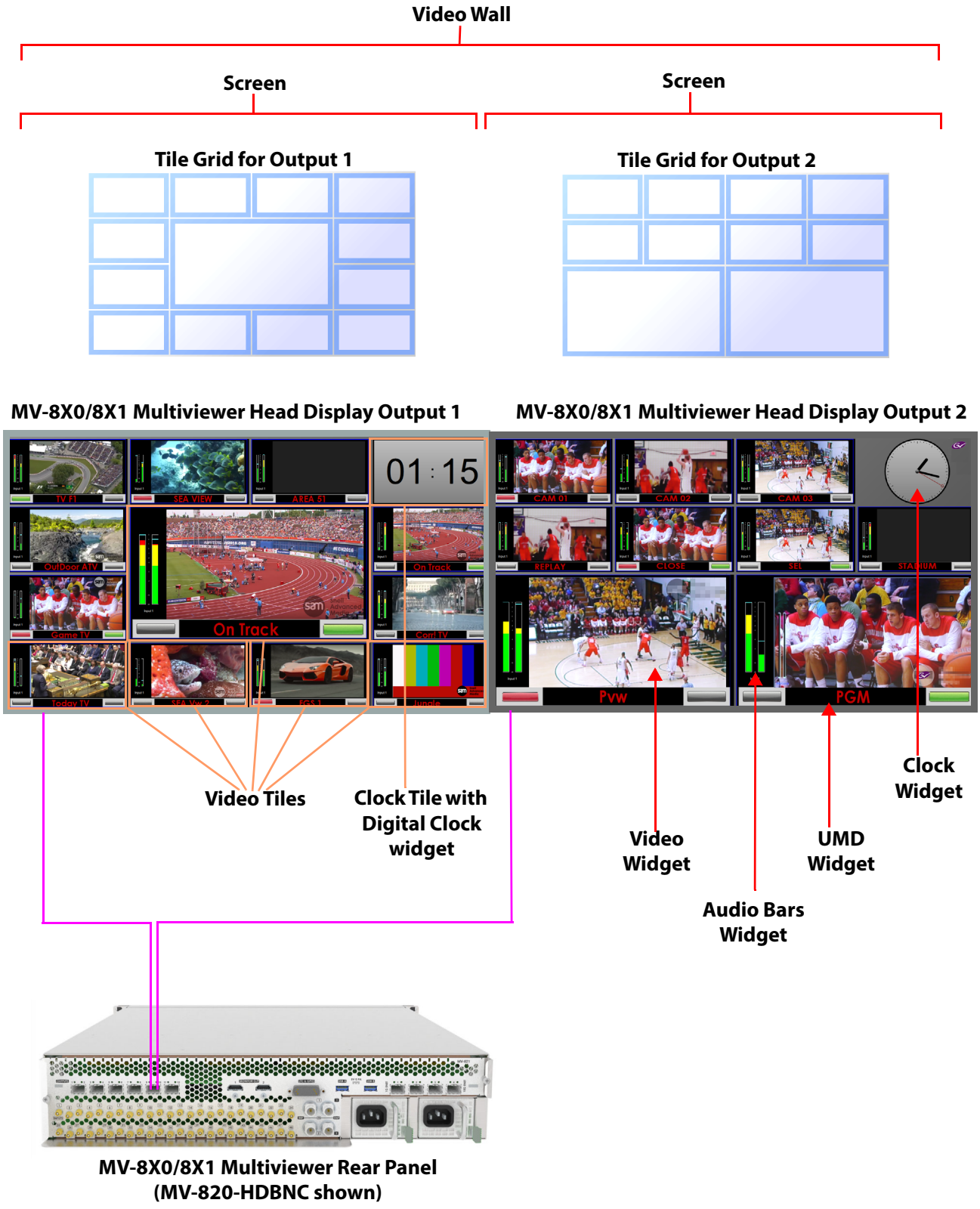


Fig. G-1: Example Video Wall of Two Monitor Display Screens

Table G-1: Definition of Terms

Term	Definition
Wall, Video Wall	One or more monitor display screens configured to form one large screen.
Screen	Display area of one individual monitor/display device.
Theme	The style and appearance of the video wall and its screen elements. A Theme is a set of widget styles which can be applied to a project. Each widget may have one or more specific styles. Using themes, a video wall may be tailored to conform to a house style.
Style	Each Widget can have several appearances, styles. Styles are changes to a widget's appearance and do not affect its function. Styles can be grouped under themes.
Tile	A rectangular area on a video wall screen, usually displaying video inputs and other supporting information. For example, a tile may display a video picture with audio level and other related status information. Other information may be displayed in tiles, for example, time, images, labels and/or text.
Tile Grid	A multiviewer video wall screen is divided up into rectangular areas; various sizes and arrangements are possible. A tile grid can be used in the Grass Valley Orbit tool for quick-positioning of tile arrangements on a wall.
Fine Grid	A fine grid on a Grass Valley Orbit screen is used for the fine-positioning of graphical elements. For example, for positioning Tiles on a wall or Widgets on a tile.
Widget	On-screen graphical elements used to display information on tiles. There are one or more widgets on a tile. Displayed information includes: Audio sound level, Time, Text labels. Widget types include: Audio bars, Clocks, Images, Labels, Lines, Tally LEDs, Timers, UMD's, Video and Web sources.
Head Display Output	A 1080P or 720P output from the MV-8 Series Multiviewer. There are up to 12 head display outputs. On the MV-8X0/8X1 Multiviewer product, this can be SDI (Coax or Fiber) or HDMI, or video-over-IP depending on the product version. Each head display output is then typically connected to a monitor display that forms all or part of a multiviewer video wall.
Video Input	One of 48 video inputs to the MV-8 Series Multiviewer in the MV-8X0/8X1 Multiviewer product.

Quick Start New MV-8 Series MV with GV Orbit

This section describes a set of quick start steps to exercise a new MV-8 series multiviewer device from GV Orbit Client. This includes:

- Pulling a multiviewer project.
- Renaming the project.
- Editing the project:
  - a simple visible change; and
  - applying an alarm.
- Pushing the project back to the multiviewer; and
- Seeing alarms on-screen.

New MV-8 Series Multiviewer Video Wall (Default)

A default video tile-grid is shown on head **Display Outputs 1** to **4**. All 48 video input signals monitored by the multiviewer are shown. Additionally, 'HH:MM:SS' time and 'display output number' are also shown.

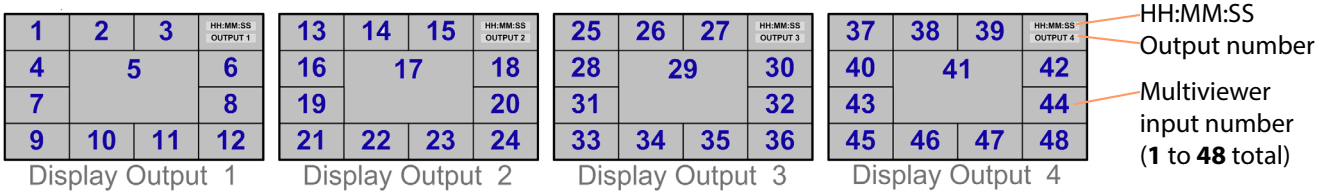


Fig. H-1: Default Multiviewer Video Wall (New MV-8 Series Multiviewer)

Edit Video Wall Layout and Configure Alarms

See the *Grass Valley web site* for GV Orbit and MV-8 Series Multiviewer user manuals.

Perform the following steps to check basic functionality for multiviewer with GV Orbit Client, including editing the video wall and setting an alarm:

Step 1: View MV-8 Series Multiviewer Settings

1 Run GV Orbit Client (v4.0 or later) on a PC.

2 Click **RollCall Control Screen** and enter the new MV-8 Series Multiviewer's IP address.

3 Click **OK**.

The MV-8 Series Multiviewer control screens are opened in a tab.

4 On the multiviewer's **System-Setup** control screen, take a note of the MV-8 Series Multiviewer's:

- 1G1 Interface **IP address;** and
- RollCall Settings **Domain ID**.

5 Close the control screen tab.

Step 2: Pull Default Layout from New MV-8 Series Multiviewer

1 Click **New Project** and select "Connected Multiviewer Project".

2 Browse into a new and empty PC folder, where project data will be stored.
Click **Choose**. Click **Next**.

A list of devices available to GV Orbit is shown.

3 Select the new multiviewer from the displayed list.
Click **OK**.

A login screen is shown.

4 Enter **username** and **password** of the project (default = admin, admin).

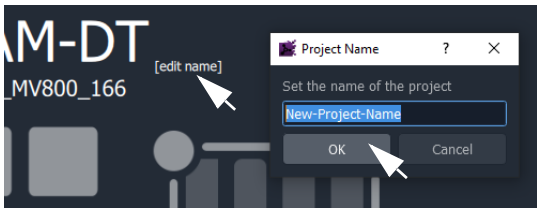
5 Click **Login**.

The project data is pulled from the device and a **Project Home** screen is shown.

GV Orbit Project Screen

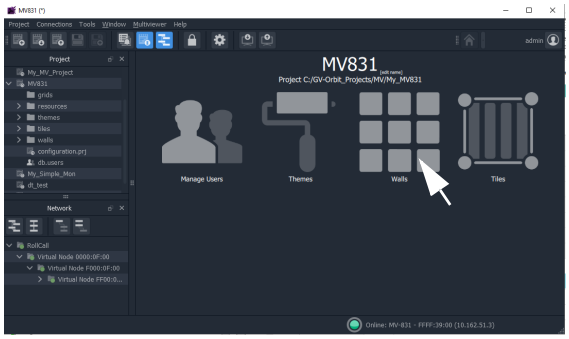
6 Click **Edit Name,** rename the project, and click **OK**.

(This will avoid over-writing the default project on the multiviewer later.)



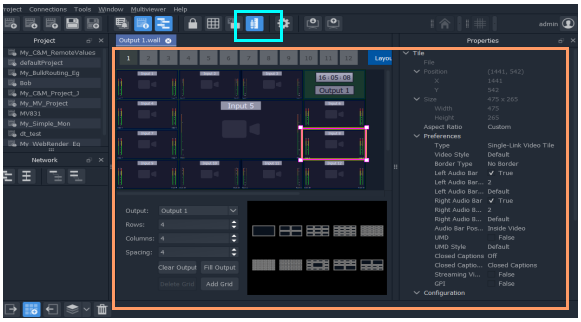
7 Click the **Walls** icon and select a wall item in the drop-down list (e.g. Wall1).

The wall is shown in Run mode.



8 Click the  icon to enter 'Design Mode'.

The icon turns blue and the **Wall Editor** screen is shown.



Step 3: Make Changes to the Wall

A Visible Change

1 Click on a video wall tile, to select it.

Tile Properties are shown on the right-hand side.

2 Change property **Preferences > Type** to **Analogue Clock**.

The selected tile changes to a round clock face.

3 Click **Project > Save File** in the main menu to save this change.

Enable an Alarm

To enable a 'Video Input Lost' alarm:

4 Click **Multiviewer > Input Alarms** in the main menu.

A dialog is shown with tabs. On the:

- ***Input Tab*** **-** Set **Selected Input** to **Input 1**.
- ***Alarm Tab*** **-** Scroll down **Select Alarm** box and select **Video Input Lost**.
  Select **Alarm Enable**.
- ***Input Tab*** **-** Click **Copy All**.

5 Click **OK**.

6 Click **Project > Save File**.

The **Video Input Lost** alarm is enabled on all the multiviewer's 48-input multiviewer inputs.

Step 4: Push the Modified Project back to the Multiviewer

1 Click **Project > Push**.

2 Ensure the project name is selected and click **OK**.

The MV-8 Series Multiviewer adopts the new wall layout:
An analogue clock is shown.

Step 5: Visible Alarm Warnings

To provoke a 'Video Input Lost' alarm:

1 Disconnect a signal going to the 48-input multiviewer (for example, Input 25).
I.e. disconnect signal at the MV-8 Series Multiviewer's **Video Input** connector.

Video loss is detected at the 48-input multiviewer input.
A slow-flashing, red rectangular border appears around the corresponding video wall tile.

Alarms may also be seen in the GV Orbit Client's **Network** window and in the **Alarm Summary** window for the multiviewer:

2 In the **Network** window,
locate and expand the MV-8 Series Multiviewer item.

3 Right-click on a sub-item of the multiviewer item (for example, the red **Input 25** 'sub-item') and select **Alarms** in drop-down menu.

An **Alarm Summary** window shows the 48-input multiviewer's **Input 25** status. See Figure H-2.

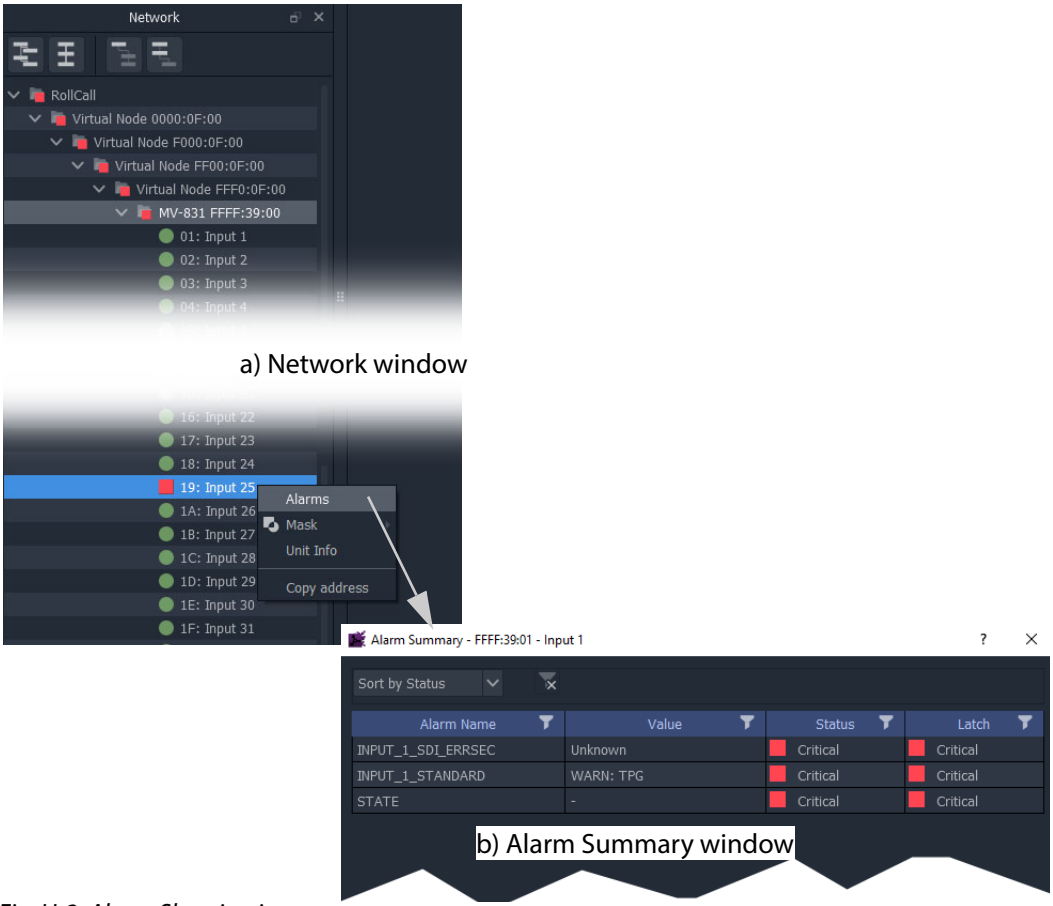


Fig. H-2: Alarm Showing in:
a) Network Window.
b) Alarm Summary Window.

User Notes:

Contact Us

Grass Valley Technical Support

For details of our Regional Customer Support Offices please visit the Grass Valley web site and navigate to Support/Customer Support Contacts.

https://www.grassvalley.com/contact/support/

Customers with a support contract should call their personalized number, which can be found in their contract, and be ready to provide their contract number and details.

Corporate Head Office

Grass Valley

3499 Douglas-B.-Floreani

St-Laurent, Quebec H4S 2C6

Canada

Telephone:+1 514 333 1772

Fax:+1 514 333 9828

www.grassvalley.com