grass valley
A BELDEN BRAND

ITX OUTPUT SERVER 2

NEXT GENERATION VIDEO ENGINE

Channel Configuration Guide

v2.7

2015-09-08

www.grassvalley.com

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 USA, LLC, Miranda, iTX, Output Server 2, Output Server 1, TX Play, TX Play 2, MediaCache, MediaCache 2, Vertigo XG, XG Inside and iTX Desktop Client are trademarks or registered trademarks of Grass Valley USA, LLC. Belden Inc., Grass Valley USA, LLC, 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 iTX documentation, you agree to the following terms and conditions.

Grass Valley hereby grants permission and license to owners of iTXs 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 in the Support section of the Grass Valley Web site (www.grassvalley.com).

Title	Output Server 2 Channel Configuration Guide
Version	v2.7
Revision	2015-09-08, 11:01

Table of Contents

1 About Output Server 2

Output Server 2 is Grass Valley's next generation video playout engine. It has improved standards compliance, more flexibility and greater stability than our previous video engine and forms the backbone of the iTX system.

This guide describes the features and functionality of Output Server 2 (OS2), the differences between Output Server 2 and its predecessor, Output Server 1 (OS1) and the features and underlying principles of Output Server 2. It also explains how to install or upgrade to Output Server 2, how to create and configure channels using Output Server 2 and day-to-day operational and maintenance information for Output Server 2 systems.

Summary

About the Output Server 2 Services

Output Server 2 is a combination of services that work together to form the video engine that is responsible for the playout of a television channel.

The core services that make up the Output Server 2 system are:

- **TXPlay 2** - schedule automation controller

  An instance of the TXPlay 2 service runs for every channel in the iTX system. Each one allows users to interact with and control the playout of each channel's schedule playlist.

  Additional instances of TXPlay 2 can be run that act as "edit channels", which can be used for off-air schedule manipulation. A special instance can also be run in "live channel" mode, which can send alternative playout commands for ad hoc operations.

- **Output Server 2 service** - playout communication and command interface

  An instance of the Output Server 2 service runs for every channel in the iTX system. Each one provides the communications interface for receiving playout commands for the channel, either from TXPlay 2 or directly via specific iTX Desktop components. The Output Server 2 service also performs media transfers for caching operations, as instructed by the Media Cache 2 service.

  Supporting Output Server 2 is the File Processing Pipeline media application framework plugin, which performs all video, audio and ancillary data processing operations. The operations have been separated into two processes to allow the video engine to be reinitialized without the overhead of also re-initializing the network communications, allowing faster recovery from video/audio processing issues.

- **I/O Device Controller** - AJA video/audio I/O card interface

  The I/O Device Controller service manages the configuration of the ports on the playout server's video and audio input/output card(s). It receives this configuration from TXPlay 2 on start up and then interfaces between the video/audio I/O card and the Output Server 2 service. It is also used to specify the input reference signal, frame rate family and the output timing for the channel.

  Only one instance of the I/O Device Controller is required per playout server.

- **Media Cache 2** - file caching mechanism

  The Media Cache 2 service manages all caching operations required for playout from the local machine. It also provides a channel view so that the current file caching queue can be monitored from within iTX Desktop. The actual media transfer is performed by the Output Server 2 service, which can throttle the transfer speed dynamically to ensure reliable playout.

  A single media cache can be shared by multiple channels running on the same playout server.

These services, along with any other components installed on your playout server are launched and managed by another application, called the Server Controller. This means to start all of these services, you only need to start the Server Controller. See Configuring Server Controller for Output Server 2 Components on page 71.

Output Server 2 integrates with the current iTX framework, allowing you to easily upgrade your existing channels. Whilst Output Server 2 supersedes the previous video engine, Output Server 1 is still supported and it is even possible to run both video engines in the same iTX system. See Transitioning to Output Server 2 on page 18.

Comparison Charts - Output Server 1 and Output Server 2

The tables below detail the differences between the hardware, features and configuration the Output Server 1 and Output Server 2 services support.

Supported video/audio I/O cards

Feature	Output Server 1	Output Server 2
AJA Kona 3G	Supported	Supported from iTX v2.6
AJA Corvid LP	Supported	Supported
Dual AJA Corvid LP	Supported	Supported from iTX v2.7
AJA Corvid 44	Not supported	Supported from iTX v2.6
AJA Corvid 88	Not supported	Supported from iTX v2.6

Note:
- Although iTX 2.x supports the Kona 3G video/audio I/O card, it does not support the Kona 3 card.

Supported Playout Types

Feature	Output Server 1	Output Server 2
Single channel	Supported	Supported
Simulcast with a single video/audio I/O card	Not supported	Supported from iTX v2.6
Simulcast with dual video/audio I/O cards	Not supported	Not supported
Dual channel with a single video/audio I/O card	Not supported	Supported from iTX v2.6
Dual channel with dual video/audio I/O cards	Supported	Supported from iTX v2.7
Dual live input with a single video/audio I/O card	Not supported	Supported from iTX v2.7
Dual live input with dual video/audio I/O cards	Not supported	Supported from iTX v2.7

Supported Playout Features and Configuration

Feature	Output Server 1	Output Server 2
Dedicated video/audio I/O card service (I/O Device Controller)	Not available	Available from iTX v2.6
On-air update: Active Format Description (AFD) change	Not supported	Supported
On-air update: Duration change	Not supported	Supported
Cross conversion: 50hz to 59hz standards	Permitted	Not permitted
Cross conversion: Same family of standards. For example: • 1080i50 <-> 750p50 <-> 625 • 1080i59 <-> 720p59 <-> 525	Supported	Supported
Cue to first frame	Optional	Default
Interlaced NTSC SD media - field interpretation	User controlled	User controlled or automatically detected (global setting)
Split break sequence returns	Return event with an End - Time Mode	Return event with an End + Time Mode
Regional channels with split break and opt-out breaks	Supported	Not supported

Supported Audio Features and Configuration

Feature	Output Server 1	Output Server 2
Dolby E and D per stream configuration	Not supported	Supported
XG Inside: Full audio processing (audio flows from OS2 to XG and back to OS2)	Not supported	Supported
Output Server audio configuration: Output group definitions	Optional	Mandatory

Supported SCTE104 Features and Configuration

Feature	Output Server 1	Output Server 2
VANC splice commands	Supported	Supported
Multiple operations within Multiple Operation Messages	Supported	Supported
Segmentation commands to identify local and national avail inserts)	Supported	Supported
DTMF descriptor data request operations	Supported	Supported

System Maintenance Features and Configuration

Feature	Output Server 1	Output Server 2
Dedicated video/audio I/O card service (I/O Device Controller)	Not available	Available from iTX v2.6
System message logs	All messages in a single CSV file	Separate log files per service See Log File Locations on page 74
Output Server playout configuration	iTX Desktop (in Engineering layout)	Output Server 2 user interface. See Output Server 2 Channel Configuration on page 33
Live routing configuration	iTX Desktop (in Engineering layout)	I/O Device Controller user interface and iTX Desktop (in Engineering layout). See About Video Signal Routing on page 48.

About iTX Channel Playout Types

A playout type defines which input and output ports on the video/audio I/O card are active and require cabling. This dictates what kind of channel can be operated on the playout server. For example, the input and output ports required to operate a single channel are different to those required to operate dual channels. iTX Output Server 2 supports the following different types of playout.

Single Channel Playout

Single channel playout means the channel has a single input and a single output. This playout type can be used for main channels and backup channels running on their own playout servers.

Dual Channel Playout

Dual channel playout means there are two independent channels running on a single playout server, each with its own inputs and outputs. This can be used to run a main channel and the backup of another channel on a single playout server (providing it is equipped with a compatible video/audio I/O card).

Dual Live Input

Dual live Input means the channel has two live input sources, but a single output. In an Output Server 2 system, both live inputs can be connected to and played out from a single playout server (providing it is equipped with a compatible video/audio I/O card).

Within ITX Desktop, the two live inputs appear on a single channel as program A and program B (PGM A and PGM B on the timeline). This allows you to switch between back-to-back live events using the internal iTX Master Control plugin. See Viewing Live Event Inputs on Channel Control Layouts on page 70.

Dual live input also allows for live-to-live cross fade transitions and picture-in-picture (PiP) effects, where one input is used for the main display and the other is used for a smaller frame with the main display.

The iTX Simulcast Playout also supports the use of Dual Live Inputs, which is configured as part of the standard simulcast playout. See Simulcast Playout below.

Simulcast Playout

For simulcast playout, two channels share two inputs, but have independent outputs on the playout server (providing it is equipped with a compatible video/audio I/O card). A typical use case for a simulcast system is to generate HD and SD transmissions from a single schedule that is loaded on to the main channel. Because the main and simulcast channels have different requirements for the resolution, aspect ratio control (ARC) and audio output, the two channels are configured independently.

To transmit appropriate branding for a simulcast channel, iTX allows you to configure event substitution rules. Using these rules, iTX is able to swap assets such as logos and CGs based on their names in the main channel's schedule before they go to air.

iTX manages the broadcasting of main and simulcast channels using a system of networked instances of TXPlay 2, known as a leader/follower network. The main channel in any iTX system is identified as a leader channel. When a simulcast channel and its corresponding backup channels are added to the iTX system, they are designated as followers.

When TXPlay 2 is set to a simulcast playout type, iTX also supports dual live inputs for simulcast. As each live feed in a dual live input channel is connected to different input, when operating dual live inputs for simulcast, the leader channel selects which input it is going to use and informs the follower/s to use the same input.

For more information about the leader/follower model, see About Leader/Follower Channel Communication, on page 6.

Playout Type Support

iTX supports AJA Kona 3G (K3G), Corvid LP (CLP), Corvid 44 (C44) and Corvid 88 (C88) video/audio I/O cards. The table below shows which playout types are available to each model of AJA video/audio I/O card:

Playout Type	K3G	1x CLP	2x CLP	C44	C88	Comment
Single channel	✓	✓	✓	✓	✓	Default for all models of video/audio I/O card. Use for stand alone main or backup channels.
Dual channel			✓	✓	✓	Select to configure two channels running on the same playout server (i.e. channel A main and channel B backup).
Simulcast				✓	✓	Select if you are configuring a simulcast channel on a separate playout server or you are configuring a main channel and a simulcast on the same playout server.
Dual live			✓	✓	✓	Select if you are configuring a single channel with two inputs and one output.

About Leader/Follower Channel Communication

Output Server 1 communicates between a main channel and its backup using a master/slave model. The two channels share the same configuration, schedule, assets and iTX Desktop controls, and changes to any of these on the main channel (the master) are also sent to the backup channel (the slave). The backup also checks the database every 30 seconds and changes to the schedule on the main channel cause a schedule restore on the backup channel. This results in a delay of up to 30 seconds between schedule changes on the main and backup.

Master/slave operation relies on the status of a single router crosspoint (destination) to determine which channel should act as the master. In the event of a failover, the backup channel takes over the transmission of the scheduled programming.

Output Server 2 uses a leader/follower model for channel communication. This means the main channel is the leader and its backup channel is the follower; in a simulcast system, the

simulcast channel and its backup channel are also followers. This is known as a leader/follower network. When the iTX Desktop operator performs a manual control, schedule change or changes an asset, the leader channel passes these changes on to its followers and they respond instantaneously. This ensures the channels in the leader/follower network are always in sync with each other, regardless of the number of followers.

Failovers are controlled in the same way as the master/slave model, however, iTX can only promote main and backup channels to be leader channels; simulcast and simulcast backup channels can only be followers.

Known limitations of Output Server 2

Output Server 2 has the following known limitations:

- Automatic Loudness Control (ALC) is currently not supported and set to `Off` by default in the Output Server 2 Configuration panel. Support for this feature is scheduled for a future release.
- Output Server 2 does not currently support regional sub-channels. This functionality will be added in a future release.
- Output Server 2 does not currently support news flash. This functionality will be added in a future release.
- Raw audio mode is not supported for MPEG audio codecs.
- When using Dolby E (Auto) output, Dolby Metadata is not supported.
- Squeeze effects are not supported for CGs or logos in either Output Server 2 or Output Server 1.
- Output Server 2 does not allow both split breaks and opt-out breaks to be used together in regional channel playout.

2 Preparing for Output Server 2

This chapter discusses the hardware and software prerequisites for operating an Output Server 2 iTX system, including the additional licenses that may be required. It also provides an overview of the installation process for new iTX systems and upgrades from Output Server 1.

Summary

Process Overview - Output Server 2 Installation and Channel Configuration

The process of installing Output Server 2 and configuring a channel consists of the following actions:

1 Install the required licenses and drivers.

See Prerequisites and Compatibility Requirements on page 10.

2 Install the Output Server 2 module on your playout server.

See Installing Output Server 2 on page 13

> Note: If you have purchased an iTX Playout Appliance 2 it will come pre-installed with Output Server 2.

3 Add your first channel, followed by any subsequent channels.

See Adding Channels to an ITX Playout Server on page 23.

4 Start Server Controller to launch Output Server 2 and its related services.

See Starting Output Server 2 on page 69.

5 Configure the channel for playout. This comprises of the following steps:

- Set a Reference source and Frame Rate Family, and adjust the output timing (if required).
- Configure the Active Format Description Insertion Lines.
- Configure the timecode settings.
- Select the channel to use for XG Inside graphics.
- Configure channel delay, if required.
- Configure Nielsen Watermarking, if required.
- Configure Dolby metadata.

- Configure audio upmixing, if required.
- Configure a channel to process SCTE104 messages.
- Configure a basic subtitle playout.
- Route the channel sources to matrix destinations.
- Configure the channel communication setup.
- Configure the audio output for Output Server 2.
- If you have a simulcast channel, define an Event Substitution Rule.

See Output Server 2 Channel Configuration on page 33.

Upgrading from Output Server 1 to Output Server 2

iTX allows broadcasters to transition from an Output Server 1 system to an Output Server 2 system by running both video engines in parallel within the same iTX system during the upgrade. This is known as a “mixed Output Server system” and is only recommended during the upgrade and testing process, and not for prolonged day-to-day operation.

See Transitioning to Output Server 2 on page 18.

Prerequisites and Compatibility Requirements

Output Server 2 has both hardware and software prerequisites that must be met before the module is installed.

Required Software and Driver Versions

Software	Requirement
AJA video/audio I/O video card driver version	Output Server 2 requires AJA video card driver version 12.1.0.107 to be installed via Windows Device Manager before installing or upgrading iTX. If you have previously installed Output Server 1, the version 7.4.0.49 AJA drivers must be uninstalled and deleted from Device Manager before installing the latest drivers. IMPORTANT: Do not use drivers that are supplied with your AJA video/audio I/O card or any that have been downloaded from the AJA website. The required drivers for iTX are specially supplied by AJA and are included with the iTX Suite in the `Drivers` folder.
Framework component version	Your playout server and framework server must be running the same version of their respective iTX components for Output Server 2 to function.
Vertigo Suite version	If you are using Vertigo XG graphics, Output Server 2 requires Vertigo Suite 5.0 SP1 or later. If you have purchased the Vertigo Suite and require the installation software, contact Grass Valley Product Support. For more details visit: http://www.grassvalley.com/support/contact.

Required System Configuration

Feature	Requirement
Dual channel playout	To transmit dual channel or simulcast broadcasts, your playout server needs the following: • An AJA Corvid 44 or Corvid 88 video/audio I/O card. • The I/O Device Controller service (available from iTX v2.6 onwards).
Simulcast playout	
Vertigo XG Inside	When XG Inside is enabled, Remote Desktop must be disabled on the playout server.

License Requirements

The modules that make up the iTX system are individually licensed and add-on components (such as XG Inside) require their own license to function.

Depending on your system architecture, the following licenses may be required to operate Output Server 2:

Component/feature	Required license
Video playback on Output Server 2 via the File Processing Pipeline plugin	File Processing Pipeline for OS2
Vertigo XG Inside graphics	iTX Integrated XG graphics

Licenses are stored in `.lic` files and require a Grass Valley license dongle to be inserted into a USB port on the playout server. For more information about purchasing software licenses and the Grass Valley license dongle, please contact: itxlicensing@grassvalley.com.

To install the iTX license file:

1. Open the **iTX License** folder shortcut located on the Windows desktop.
2. Place a copy of the `.lic` file in the **Inbox** shared folder of the iTX Framework Server where the Media Watcher resides.

   The license file is automatically ingested by the Media Watcher service, at which point the file disappears from the Inbox folder.

When TXPlay 2 starts it checks that the required licenses have been installed. The status of the licenses can be checked by running diagnostics on TXPlay 2.

3 Installing a New Output Server 2 System

This chapter discusses how to perform a new installation of Output Server 2 on your playout server, including how to configure your iTX domain and create a shared folder to use as a media cache.

For information on upgrading from Output Server 1 or a previous version of Output Server 2 refer to About Output Server 2 Upgrades, on page 17.

If you have a Grass Valley Appliance Server 2 playout server, it will be pre-installed with an earlier version of Output Server 2, which will need to be upgraded to the current version. See About Output Server 2 Upgrades on page 17.

Summary

Installing Output Server 2

Output Server 2 and its related services need to be installed on a playout server, equipped with a compatible video/audio I/O card. Of these services, the Media Cache 2 and TXPlay 2 services require user input before the installation is complete.

For more information on which video/audio I/O cards are supported and the services that make up an Output Server 2 system, see About Output Server 2, on page 1.

To perform a new installation of Output Server 2:

1. Access and open the iTX Installer.
2. Right-click the **Setup.exe** file and select **Run as administrator.**
   The iTX **Select Software to Install** window appears.
3. Expand the **Playout** section
4. Check **Output Server 2.**
5. Click **OK**.
   The **Select Software to Install** window closes.
6. On the **iTX Installer** window, click **CONTINUE**.
   The selected components will install on your playout server.
7. During the installation, the **iTX Domain Configuration** dialog appears. Enter the name of the required iTX Domain and Locator Service details, as described in Configuring ITX Domain and Locator Service Details, below.

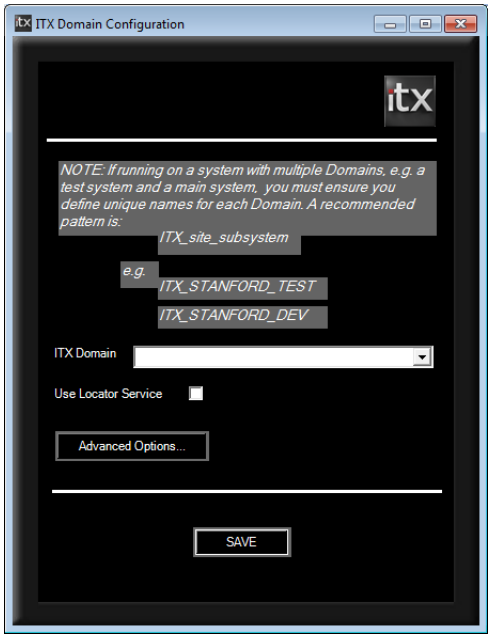
Configuring ITX Domain and Locator Service Details

iTX services and clients (including iTX Desktops) on the same TCP/IP network can interact with each other if they are in the same iTX domain. An iTX domain is identified by a domain name assigned to machines on which iTX software runs. In general, iTX services and clients belong to the same iTX domain if they run on machines that have the same iTX domain name.

As part of a new Output Server 2 installation you are required to enter the details of the iTX domain to which the playout server and its channels belong, including the IP addresses of any Locator Services in the same domain.

To configure the required iTX Domain and Locator Service Details:

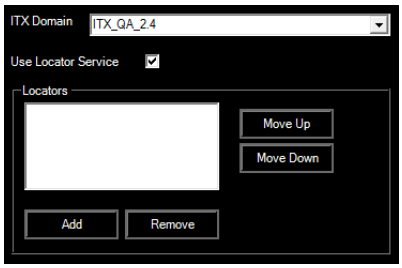
1 During the installation of Output Server 2, the **iTX Domain Configuration** window appears.



2 In the **ITX Domain** field, type in the name of the required iTX domain.

3 If you have a Locator Service operating in the same domain, check **Use Locator Service**.

A **Locators** section appears.



4 Click **Add**.

An **Add Locator** dialog appears.

5 In the blank field, enter the IP address for your Locator Service.

6 Click **OK**.

7 If you have a group of load balanced Locator Services for the domain, you can enter additional IP addresses, then reorder them using the **Move Up** and **Move Down** buttons.

The order of Locator Services in the list determines the order in which iTX selects them to handle connection requests. A service that requires connection details contacts the Locator Service at the top of the list, if this one is busy, it contacts the next in the list and so on.

8 The **Advanced Options** button opens an additional dialog, containing a range of settings that should only be modified by Grass Valley engineers.

9 Click **Save**.

The iTX Domain Configuration dialog closes and the installation continues.

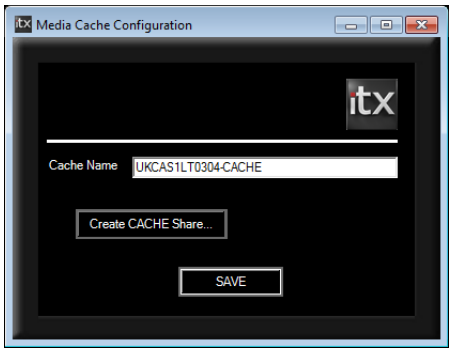
10 Before the installation completes, the **Media Cache Configuration** dialog appears. Enter the cache name and location, as described in Creating and Sharing a Media Cache Folder, below.

Creating and Sharing a Media Cache Folder

As part of a new Output Server 2 installation, you are required to create a folder on your playout server to use as the caching location for media as it transitions from your media store to playout.

To configure the Media Cache for your playout server:

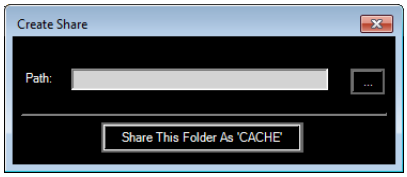
1 During the installation of Output Server 2, the **Media Cache Configuration** dialog appears.



2 By default, the **Cache Name** field will be populated with the playout server's Windows Computer Name followed by the suffix `-CACHE`.

You may enter a name of your choice, but you must ensure the name does not match any channel names in your iTX system. The name must also include the `-CACHE` suffix.

3 Click **Create CACHE Share**. The **Create Share** dialog appears.



4 Click the **Browse** button. The **Browse For Folder** dialog appears.

5 Select a location to create the caching folder (e.g. `Computer > C:`).

6 Click **Make New Folder** and enter the name `Cache`.

7 Click **OK**.

The **Browse For Folder** dialog closes and you are returned to the **Create Share** dialog.

8 Click **Share This Folder as 'CACHE'**.

9 Click the **Close** button. The **Create Share** dialog disappears, retaining your selection and you are returned to the **Media Cache Configuration** dialog.

10 Click **SAVE** to confirm your media cache configuration.

The installation continues.

11 After creating a media cache folder, the **iTX Channel Config** dialog for TXPlay2 appears. At this point you should add any channels that you require on this playout server. See Adding Channels to an ITX Playout Server on page 23.

12 Apply any additional configuration that is required for your channel. See Output Server 2 Channel Configuration on page 33 for more information.

4 About Output Server 2 Upgrades

This chapter discusses how to update from Output Server 1 to Output Server 2. During an upgrade, there are additional precautions and procedures to take into consideration compared to a new installation. This includes how best to transition from Output Server 1 to Output Server 2. This chapter also discusses how to update an existing Output Server 2 system to the latest version.

For information on performing a new installation of Output Server 2 refer to Installing a New Output Server 2 System, on page 13.

Summary

Upgrading from Output Server 1 to Output Server 2

On upgrade from Output Server 1 to Output Server 2, iTX migrates configuration information from the old system to the new. However, there are some occasions where you are required to confirm the configuration on the new system.

Guidelines for Transitioning from OS1 to OS2

During the transition from Output Server 1 to Output Server 2, it may be necessary to temporarily operate with some channels on Output Server 2 and some still on Output Server 1. This is known as a mixed Output Server system.

Below are some guidelines for operating a mixed Output Server system during this transition.

- You cannot run Output Server 1 and Output Server 2 on the same playout server. This is because each service requires different AJA video/audio I/O card drivers.
- During the transition, it is recommended that an Output Server 2 playout server is setup as the backup to an Output Server 1 playout server, rather than the other way around.
- Main/backup setup for a mixed Output Server system is configured in the same way as a standard main/backup setup. See About Video Signal Routing on page 48 and Configuring the Channel Communication Setup, on page 52.
- Within iTX Desktop, some functionality and configuration options are different when operating Output Server 2 and Output Server 1 channels. iTX Desktop v2.5 onwards can detect which version of Output Server the selected channel is running on and alters what options are displayed accordingly. Do not attempt to configure or operate an Output Server 2 channel from iTX Desktop v2.4.11 or earlier.

Transitioning to Output Server 2

The steps below provide a high level overview of the process for transitioning from Output Server 1 to Output Server 2.

To transition to Output Server 2:

1. Make sure main channel (legacy master) is routed to the transmission system.
2. Decommission the backup channel (legacy slave).
3. As near as possible, there must be parity between the configuration of the Output Server 1 and Output Server 2 playout servers. Apply any configuration changes to the Output Server 1 master that are required to bring it into line with the Output Server 2 backup (e.g. configuring enhanced SCTE 104).

   See Operating a Mixed Output Server System, on page 19.
4. Upgrade the backup channel to Output Server 2 and perform the required configuration.

   See Upgrading to the Output Server 2 Service on page 20.
5. Start **Server Controller** on the Output Server 2 backup and confirm the following configuration:
   - On the instance of I/O Device Controller for the channel, check the **Reference** input is correct.

     See Setting a Reference Source and Frame Rate Family on page 33.
   - On the instance of Output Server 2 for the channel, check that the **Resolution** is correct.
   - Apply any other configuration, as required. Backup channels should mirror the configuration of their main, although when running a mixed Output Server system some differences in configuration may be required.

     See Operating a Mixed Output Server System, on page 19 for differences in configuration.

     See Output Server 2 Channel Configuration on page 33 for more information on channel configuration.
6. Run the Output Server 1 and Output Server 2 channels in parallel until you are satisfied with the stability of the system.
7. When you are ready to upgrade the main channel to Output Server 2, route the Output Server 2 backup to air.
8. Failover the Output Server 1 main, so the channel plays out from the Output Server 2 backup.
9. Upgrade the main channel to Output Server 2 and perform the required configuration.
10. Route new main channel to the transmission system..
11. Failover the backup, so the channel plays out from the new main (Output Server 2) playout server.

Operating a Mixed Output Server System

When running a mixed Output Server system, consider the following differences in behavior between the two video engines:

Feature	Comment
Cue and commit timings	The timing for cueing and committing events was redesigned for Output Server 2 and it does not mirror Output Server 1. The differences are visible on the schedule grid when viewing an Output Server 1 main and Output Server 2 backup side by side. These differences do not affect when items are played out to air.
Playout timing	Output Server 2's playout is frame accurate, which means a scheduled item may playout earlier on the Output Server 2 backup channel compared to the Output Server 1 main, but the difference should be marginal.
Live pass-through delay	The live pass-through delay was redesigned for Output Server 2 and is different to Output Server 1. It may be possible to synchronize the live pass-through for an Output Server 1 main and an Output Server 2 backup by altering the delay on both channels. For information on changing the output buffer and time delay on Output Server 1, see the *iTX System Administration Guide*. For information on changing the Channel Delay on Output Server 2, see Configuring Channel Delay, on page 38.
Audio output types	On Output Server 2, the `PCM (Auto)` audio output type will assign 16 channels to the track, even if not all of the channels are required. Any unused channels will be automatically set to mute. See Configuring Audio Output for Output Server 2 on page 53 for more information.
SCTE 104	Output Server 2 only supports enhanced SCTE 104. Therefore, the Output Server 1 main will also need to be configured to use enhanced SCTE 104. For more information on enhanced SCTE 104 configuration for Output Server 1, see the *iTX System Administration Guide*. For more information on SCTE 104 configuration for Output Server 2, see See Configuring a Channel to Process SCTE104 Messages on page 41.
NTSC SD field order	Output Server 1 and Output Server 2 handle the field order for NTSC SD assets in different ways. Output Server 1 often required user intervention to reverse the field order on a per-asset basis, while Output Server 2 is able to interpret this information from the media itself. This can cause problems when trying to playout assets that have been altered on a mixed Output Server system. See Honoring NTSC SD Field Orders on page 76 for more information.

Upgrading to the Output Server 2 Service

Before upgrading a playout server to Output Server 2, Output Server 1 must be uninstalled. This can be done as part of the upgrade process.

The iTX installer will convert the current channel configuration from Output Server 1 to Output Server 2. However, the channel name is not migrated as that information is stored in different locations on each service. To support the I/O Device Controller (which was not present for Output Server 1), you need to select your required playout type. Therefore, during the upgrade the iTX Channel Config dialog appears so that these details can be entered. It is also possible to make changes to the channel details, as required.

For more information on the iTX Channel Config dialog, including adding channels, see Adding Channels to an ITX Playout Server, on page 23.

To upgrade a playout server to Output Server 2:

1. Download and extract the required version of the iTX Suite.
2. Access and open the iTX Installer.
3. Right-click the **Setup.exe** file and select **Run as administrator.**

   The **iTX Installer** appears.
4. Click **SELECT SOFTWARE.**

   The **Select Software to Install** window appears.
5. Expand the **Playout** section
6. Uncheck **Output Server 1**.

   This will uninstall Output Server 1 as Output Server 2 is installed.
7. Check **Output Server 2.**
8. Click **OK**.

   The **Select Software to Install** window closes.
9. On the **iTX Installer** window, click **CONTINUE**.

   The new and updated software will install.
10. During the upgrade you may be asked to confirm your media cache configuration.
    - For information on configuring the media cache, see See Creating and Sharing a Media Cache Folder on page 13.
    - If no changes to the media cache configuration are required, click **Save**.
11. Before the upgrade completes, the iTX Channel Config dialog for TXPlay 2 appears.

    To confirm your channel details:
    a. Select your required **Playout Type**.

       For main or backup channels running on their own playout server, the **Playout Type** can be set to a single channel type. If another playout type is required, select it from the drop down list.
    b. In the **Root Name** field, re-enter the base channel name**.**
    c. Confirm the following fields are correct, as required:
       - **Channel Name**
       - **Backup** (This must be checked for backup channel upgrades)
       - **Simulcast** (if present)

- **Plugin**
- **Edit channel** (if present)
- **Live channel** (if present)
- **Integrated XG**
- **Use Dedicate Softel Driver**

Note: The combination of these fields that is available is determined by the selected playout type.

12 Click **SAVE**.

The **iTX Channel Config** window closes.

13 Complete the installation of any other iTX modules you have selected, as described in the *iTX System Administrator Guide*.

14 Apply any additional configuration that is required for your playout server. See Output Server 2 Channel Configuration on page 33 for more information.

Upgrading an Existing Output Server 2 System

Each release of Output Server 2 introduces new functionality, which means during certain updates you may be required to confirm parts of your current installation.

Upgrading from v2.5 Output Server 2 to v2.6 or Later

Since the first release of Output Server 2 in iTX v2.5, additional playout types and the I/O Device Controller have been introduced. As such, during an upgrade from iTX v2.5 you are asked to confirm your basic channel configuration and required playout type.

To upgrade from v2.5 Output Server 2 to v2.6 or later:

1 Download and extract the required version of the iTX Suite.

2 Access and open the iTX Installer.

3 Right-click the **Setup.exe** file and select **Run as administrator.**

The **iTX Installer** appears listing all of the new modules and those that will be updated.

4 Click **CONTINUE**.

The updated software will install.

5 During the upgrade you may be asked to confirm your media cache configuration.

- For information on configuring the media cache, see See Creating and Sharing a Media Cache Folder on page 13.
- If no changes to the media cache configuration are required, click **Save**.

6 Before the upgrade completes, the iTX Channel Config dialog for TXPlay 2 appears.

To confirm your channel details:

a Select your required **Playout Type**.

For main or backup channels running on their own playout server, the **Playout Type** can be set to a single channel type. If another playout type is required, select it from the drop down list.

b In the **Root Name** field, re-enter the base channel name**.**

c Confirm the following fields are correct, as required:

- **Channel Name**
- **Backup** (This must be checked for backup channel upgrades)
- **Simulcast** (if present)
- **Plugin**
- **Edit channel** (if present)
- **Live channel** (if present)
- **Integrated XG**
- **Use Dedicate Softel Driver**

Note: The combination of these fields that is available is determined by the selected playout type.

7 Click **SAVE**.

The **iTX Channel Config** window closes.

8 Complete the installation of any other iTX modules you have selected, as described in the *iTX System Administrator Guide*.

9 Apply any additional configuration that is required for your playout server. See Output Server 2 Channel Configuration on page 33 for more information.

Upgrading from v2.6 Output Server 2 to v2.7 or Later

Upgrading from iTX v2.6 to the latest release of Output Server 2 follows the standard iTX upgrade procedure.

To upgrade from iTX v2.6 to the latest release of Output Server 2:

1 Download and extract the required version of the iTX Suite.

2 Access and open the iTX Installer.

3 Right-click the **Setup.exe** file and select **Run as administrator.**

The **iTX Installer** appears listing all of the new modules and those that will be updated.

4 Click **CONTINUE**.

The updated software will install.

5 When the upgrade has completed, click **FINISH**.

The iTX Installer closes.

6 Apply any additional configuration that is required for your playout server. See Output Server 2 Channel Configuration on page 33 for more information.

5 Adding Channels to an ITX Playout Server

This chapter explains how to add each type of channel to an iTX system, via the iTX Channel Config dialog for TXPlay 2, and the basic rules for ensuring your combination of channels and playout servers provide a solid resilience model.

For detailed information on setting up an iTX system, refer to the *iTX System Administration Guide*.

Summary

Channel Resiliency Guidelines

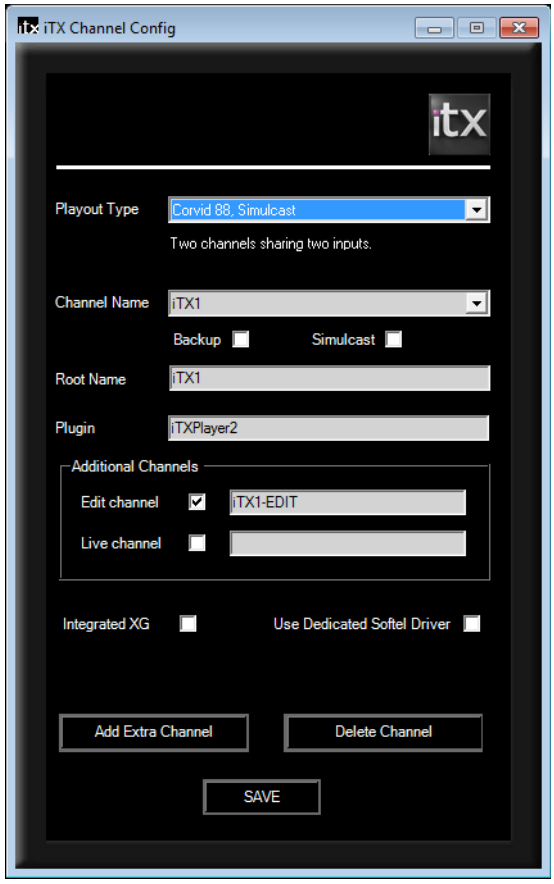
When adding channels to an iTX system consider the following guidelines:

- Backup channels should be kept on separate playout servers from their main channels.
- If your playout servers have Corvid 44 or 88 video/audio I/O cards, a dual channel playout type can be used transmit the main for one channel and backup for a different channel. For example:
  - Playout Server 1 runs channel A main and channel B backup.
  - Playout Server 2 runs channel B main and channel A backup.
- A simulcast channel does not provide redundancy for a main channel. If a main channel fails, its simulcast follower also fails. Therefore, it is acceptable to run a main channel and its simulcast channel on the same playout server.

About the iTX Channel Config Dialog

The basic details for the channel (or channels) you want to run on a playout server are created using TXPlay 2's **iTX Channel Config** dialog. From here you can define the channel name, playout type, channel type and whether or not to use Vertigo XG graphics or the legacy Softel subtitle drivers.

This dialog appears during the installation of Output Server 2 and can also be accessed independently using the TXPlay 2 Config shortcut on your playout server's Windows desktop.



The table below describes the features of the iTX Channel Config dialog:

Field	Description
Playout Type	This drop-down list contains the available playout types for the video/audio I/O card currently installed in the playout server. The available types can include any of the following: • Single channel • Dual channel • Simulcast • Dual live • Simulcast The playout type you select here determines what other fields and options are displayed.
Channel Name	This drop-down list contains the full names of all of the channels that have been added to the playout server. This includes any suffixes that are applied when **Backup** or **Simulcast** are checked.
Backup	Checking this option identifies the channel as a backup channel and adds the suffix `-BACKUP` to the name in the **Channel Name** drop-down list.
Simulcast	Checking this option identifies the channel as a simulcast channel and adds the suffix `-SIM` to the name in the **Channel Name** drop-down list. This option is only available if a simulcast playout type is selected.
Root Name	This field is used to enter the user defined channel name. When entering names the following rules must be followed: • Each channel name must be unique. • You cannot enter hyphens or minus symbols (-). • Backup and Simulcast channels must have the same name as their main channel (followed by the appropriate suffix). Note: An alias for the Root Name can be created in iTX Desktop to provide a user friendly channel name within the Channel Control layouts. For more information see the *iTX System Administration Guide*.
Plugin	The contents of this field defaults to `ITXPlayer2`. **Do not change the contents of this field.**
Additional Channels • Edit channel	Check this option to create an edit channel alongside the current channel. Edit channels can be used for off air schedule management.
Additional Channels • Live channel	Check this option if you need to play out ad hoc schedule events using the Live Control on iTX Desktop
Integrated XG	Check this option if the playout server features integrated Grass Valley Vertigo XG graphics solution (often called XG Inside). For more information about configuring XG Inside, see the *Vertigo XG Inside User Manual*.
Use Dedicated Softel Driver	By default, Output Server 2 uses a legacy driver for Softel subtitles. Check this option to enable the updated driver.

Field	Description
Add Extra Channel	If you have selected a playout type that supports multiple channels on a single playout server (such as dual channel or simulcast), click **Add Extra Channel** to create the additional channels.
Delete Channel	Deletes the currently selected channel.
Save	Any changes you make to a channel are only applied when you click **Save**. This includes channel deletions.

Creating an Initial Channel During Installation

During a new installation of Playout Server 2, TXPlay 2's iTX Channel Config dialog appears so that you can create your first channel. Whether this is a main, backup or simulcast channel depends on how you wish to configure your iTX system.

To create an initial channel during installation:

1 Before the installation of Output Server 2 completes, the **ITX Channel Config** dialog for **TXPlay 2 Config** appears.

2 On the **Playout Type** drop-down list, select the required playout type.

For the main channel in any iTX system, the default single channel Playout Type can be used. If another playout type is required, select it from the drop down list.

3 In the **Root Name** field, enter the a name to identify the channel.

4 Check the following fields, as required:

- **Backup**
- **Simulcast** (if present)
- **Edit channel** (if present)
- **Live channel** (if present)
- **Integrated XG**
- **Use Dedicate Softel Driver**

> Note: The fields that are available are determined by the selected Playout Type.

5 Click **SAVE**.

The **iTX Channel Config** window closes.

6 Configure Output Server 2 for your channel.

See Output Server 2 Channel Configuration on page 33 for more information.

Adding a Backup Channel to an iTX System

If you are creating a main/backup setup, you need to add the backup channel on a separate playout server from the main channel. This ensures the backup channel is unaffected in the event of the main channel failing.

To add a backup channel on its own playout server:

1 If is it not currently running, start **TXPlay 2 Config** by double-clicking on the **TXPlay 2 Config** icon on the Windows desktop.

The **iTX Channel Config** dialog appears.

2 The **Playout Type** drop-down list will default to a single channel type. For a backup channel in a typical main/backup setup a single channel type is recommended.

3 In the **Root Name** field, enter the same channel name as the main channel.

4 Check **Backup**.

The **Channel Name** field now displays the contents of the **Root Name** field, followed by `-BACKUP`, e.g. `ITX1-BACKUP`.

5 Check the following fields, as required:

- **Edit channel**
- **Live channel**
- **Integrated XG**
- **Use Dedicate Softel Driver**

6 Click **SAVE**. The **iTX Channel Config** window closes.

7 If you are adding a backup channel as part of an installation, complete the installation as normal.

8 Backup channels should be configured in exactly the same way as their main channel. See Output Server 2 Channel Configuration on page 33 for more information.

Adding a Simulcast Channel to an iTX System

A simulcast channel can be created for any existing channel, providing the playout server has a compatible video/audio I/O card installed. For more information see Playout Type Support, on page 6.

> Note: The steps below describe the process for creating a simulcast channel on its own playout server. To add a simulcast channel to a playout server that already has a channel configured on it, see Adding Extra Channels to a Playout Server, on page 29.

To add a simulcast channel to its own playout server:

1 If is it not currently running, start **TXPlay 2 Config** by double-clicking on the **TXPlay 2 Config** icon on the Windows Desktop.

The **ITX Channel Config** dialog appears.

2 On the **Playout Type** drop-down list, select a simulcast playout type (e.g. `Corvid 44, Simulcast`).

3 In the **Root Name** field, enter the same channel name as the main channel.

4 Check **Simulcast**.

The **Channel Name** field now displays the contents of the **Root Name** field, followed by `-SIM`, e.g. `ITX1-SIM`.

5 Check the following fields, as required:

- **Integrated XG**
- **Use Dedicate Softel Driver**

6 Click **SAVE**.

The **iTX Channel Config** window closes.

7 If you are adding a simulcast channel as part of an installation, complete the installation as normal.

8 The configuration of a simulcast channel should match their main channel, with the following differences:

- Set the main channel to a HD resolution (e.g. 1080i) and the simulcast channel to an SD resolution (e.g. 625).

  See Selecting the Channel Resolution and Frame Rate on page 35.

- Configure the aspect ratio to the requirements of the main and simulcast channels independently. For example, being HD, the main channel may need an aspect ratio of 16:9, while the simulcast channel, which is SD, may only need an aspect ratio of 4:3.

  For more information see the *iTX System Administration Guide*.

- On the simulcast channel, define event substitution rules to swap HD logos, stills and CGs for their SD counterparts.

  See About Event Substitution Rules for Simulcast Channels on page 55.

- Configure the audio output to the requirements of the main and simulcast channels independently. For example, the main channel may use Dolby E 5.1, while the SD channel may only use PCM 5.1.

  See Configuring Audio Output for Output Server 2 on page 53.

Adding a Simulcast Backup Channel to an iTX System

If you have a backup channel for your main channel, as well as a simulcast channel, it is recommended that you also add channel that is a backup of the simulcast channel.

> Note: The steps below describe the process for creating a simulcast backup channel on its own playout server. To add a simulcast backup channel to a playout server that already has a channel configured on it, see Adding Extra Channels to a Playout Server, on page 29.

To add a simulcast backup channel to its own playout server:

1 If is it not currently running, start **TXPlay 2 Config** by double-clicking on the **TXPlay 2 Config** icon on the Windows Desktop.

The **ITX Channel Config** dialog appears.

2 On the **Playout Type** drop-down list, select a simulcast playout type (e.g. `Corvid 44, Simulcast`).

3 In the **Root Name** field, enter the same channel name as the main channel.

4 Check **Backup**.

The **Channel Name** field now displays the contents of the **Root Name** field, followed by `-BACKUP`, e.g. `ITX1-BACKUP`.

5 Check **Simulcast**.

The **Channel Name** field now displays the contents of the **Root Name** field, followed by `-BACKUP-SIM`, e.g. `ITX1-BACKUP-SIM`.

6 Check the following fields, as required:

- **Integrated XG**
- **Use Dedicate Softel Driver**

7 Click **SAVE**. The **iTX Channel Config** window closes.

8 If you are adding a simulcast backup channel as part of an installation, complete the installation as normal.

9 Simulcast backup channels should be configured in exactly the same way as the simulcast channel. See Output Server 2 Channel Configuration on page 33 for more information.

Adding Extra Channels to a Playout Server

If are going to operate multiple channels from a single playout server (i.e. a simulcast channel on the same playout server as the main channel), the extra channel can be added to your iTX system from the iTX Channel Config dialog in TXPlay 2 Config.

To add an extra channel to a single playout server:

1 If is it not currently running, start **TXPlay 2 Config** by double-clicking on the **TXPlay 2 Config** icon on the Windows Desktop.

The **ITX Channel Config** dialog appears.

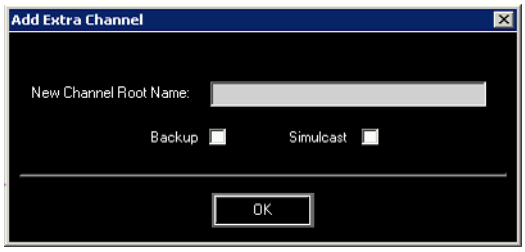
2 From the Playout Type drop-down list, select one of the following types:

- `Corvid 44, Simulcast`
- `Corvid 44, Dual Channel`
- `Corvid 88, Simulcast`
- `Corvid 88, Dual Channel`
- `Corvid LP + Corvid LP, Dual Channel`

The **Add Extra Channel** button appears at the bottom of the dialog.

3 Click **Add Extra Channel**.

The **Add Extra Channel** dialog appears.



4 In the **New Channel Root Name** field, type the basic name for the extra channel, as per the rules defined in About the iTX Channel Config Dialog, on page 24.

5 Define the channel's function:

a If you are creating a backup channel, check **Backup**.

b If you are creating a simulcast channel, check **Simulcast**.

c If you are creating a simulcast backup channel, check both **Backup** and **Simulcast**.

6 Click **OK**.

The **Add Extra Channel** dialog closes.

7 On the **iTX Channel Config** dialog, the following details are displayed:

- The **Root Name** field will display the name of the new channel.
- The **Channel Name** drop-down menu will now include the new channel name with the appropriate suffixes (e.g. `-BACKUP` for a backup channel, `-SIM` for a Simulcast channel or both).

You can select each channel from the **Channel Name** drop-down list and configure them individually, as required.

8 Click **SAVE**.

The **iTX Channel Config** window closes.

9 If you are adding a channel as part of an installation, complete the installation as normal.

10 Apply any playout configuration that is required for your playout server. See Output Server 2 Channel Configuration on page 33 for more information.

Creating a Dual Channel iTX System

iTX allows for two different channels to operate on a single playout server (for example channel A main and channel B backup), providing it is installed with a compatible audio/video I/O card. For more information see Playout Type Support, on page 6.

To create a dual channel system on a single playout server:

1 If is it not currently running, start **TXPlay 2 Config** by double-clicking on the **TXPlay 2 Config** icon on the Windows Desktop.

The **ITX Channel Config** dialog appears.

2 From the Playout Type drop-down list, select one of the following types:

- `Corvid 44, Dual Channel`
- `Corvid 88, Dual Channel`
- `Corvid LP + Corvid LP, Dual Channel`

3 Add the first channel, as described in Creating an Initial Channel During Installation, on page 26.

4 Click **Add Extra Channel**. The **Add Extra Channel** dialog appears.

5 Fill-in the **Add Extra Channel** dialog, as described in Adding Extra Channels to a Playout Server, on page 29.

6 Apply any playout configuration that is required for your playout server. See Output Server 2 Channel Configuration on page 33 for more information.

Creating a Dual Live Channel

A dual live channel has two live inputs into a single playout server, which are then played out via a single output. For this, the playout server must be installed with a compatible audio/video I/O card. For more information see Playout Type Support, on page 6.

To create a dual live channel:

1. If is it not currently running, start **TXPlay 2 Config** by double-clicking on the **TXPlay 2 Config** icon on the Windows Desktop.

   The **ITX Channel Config** dialog appears.
2. From the Playout Type drop-down list, select one of the following types:
   - `Corvid 44, Dual Live`
   - `Corvid 88, Dual Live`
   - `Corvid LP + Corvid LP, Dual Live`
3. Create the channel, as described in Creating an Initial Channel During Installation, on page 26.
4. Apply any playout configuration that is required for your playout server. See Output Server 2 Channel Configuration on page 33 for more information.
5. Configure the routing so the channel has two live inputs. See About Video Signal Routing on page 48..
6. From the Asset layout in iTX Desktop, create a live asset. This can then be scheduled for playout on the channel. For more information see the *iTX Desktop Operator* guide.

6 Output Server 2 Channel Configuration

Once Output Server 2 has been installed and you have defined your channels, each channel must be configured to your specific requirements. Channel configuration tasks are performed using both the Output Server 2 user interface and the iTX Desktop application.

Note:
- **Automatic Loudness Control (ALC)** is not supported in iTX v2.7. This field should be set to **Off** (the default setting).

Summary

Setting a Reference Source and Frame Rate Family

Before configuring Output Server 2, you should confirm your I/O Device Controller is using the correct reference source and, if required, frame rate family. You set the reference source and frame rate family from the **Configuration** panel of the I/O Device Controller user interface.

Note: The Reference and Frame Rate Family for the channel must be specified from the I/O Device Controller user interface *before* a Resolution can be selected in the Channel tab of the Output Server 2 user interface.

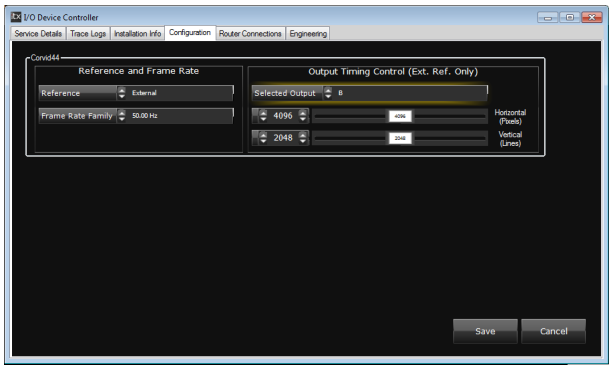
To set the reference source and frame rate family:

1 On the playout server running the Output Server 2 system, expand the **I/O Device Controller**.

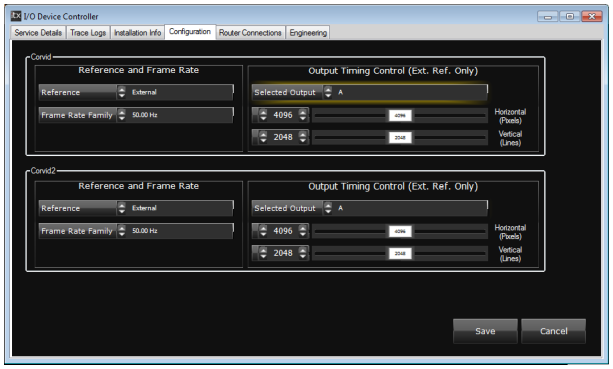
The I/O Device Controller user interface appears.

2 Click the **Configuration** tab.

The **Configuration** panel appears.



If your playout server is equipped with dual Corvid LP video/audio I/O cards, there is a separate Reference, Frame Rate and Output Timing Control section for each card:



3 If you are using an external reference input:

a From the **Reference** drop-down list select `External`.

When the external reference input is connected to your video/audio I/O card, the frame rate family is locked to that of the reference.

b Continue with Adjusting Output Timing, on page 35.

4 If you do not have an external reference:

a From the **Reference** drop-down list select, `Freerun`.

b From the **Frame Rate Family** drop-down list, select a frame rate (e.g. `50.00 Hz`).

This determines the resolution you can set in the **Channel** tab of the Output Server 2 **Configuration** user interface. See Selecting the Channel Resolution and Frame Rate on page 35 for more information.

5 Click **Save** to store your changes.

Adjusting Output Timing

If you are using an external reference but the video input signal and time reference signal are not synchronized, you can compensate by adjusting the horizontal and vertical output timing for each output on the video/audio I/O card(s). This is done using the controls in the **Output Timing Control (Ext. Ref. Only)** section and monitoring the results on a waveform analyzer.

To adjust the output timing:

On the playout server running the Output Server 2 system, expand the **I/O Device Controller**. The I/O Device Controller user interface appears.

1 Click the **Configuration** tab.

The **Configuration** panel appears.

2 Click **Selected Output** and select the output to be adjusted (either `A` or `B`).

3 To set the horizontal output timing value in pixels, enter a value into the box or use the slider on the **Horizontal (Pixels)** field.

4 To set the vertical output timing value in lines, enter a value into the box or use the slider on the **Vertical (Lines)** field.

5 Use a waveform analyzer to ensure the signals are synchronized,

6 Repeat step 2 to step 5 for each output on the playout server.

For example, for a Corvid 44 in simulcast mode, set the timing for outputs A and B. For a dual Corvid LP system in dual channel mode, set Corvid 1 output A and Corvid 2 output A.

7 Click **Save** to store your changes.

Selecting the Channel Resolution and Frame Rate

The resolution and frame rate for a channel is configured from the **Channel** tab of the Output Server 2 user interface.

> Note: If you are *not* using an external reference input on your video/audio I/O card, you must set the Reference and Frame Rate Family for the playout server. Without a reference and frame rate family, the Output Server 2 service starts up in an error state. See Viewing the Output Server 2 Engineering Panel on page 75.

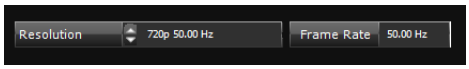
To configure the Resolution and Frame Rate for an Output Server 2 channel:

1 On the playout server, expand the instance of **Output Server 2** for the channel to be configured (e.g. `ITX1 Output Server 2`).

The Output Server 2 user interface appears.

2 Go to **Configuration** > **Channel** tab.

The channel configuration options appear. The **Resolution** and **Frame Rate** controls are on the top left of the window.



3 Specify the **Resolution** (e.g. 720p) for the channel using the drop-down list.

4 The **Frame Rate** is read only and is determined by the **Frame Rate Family** setting I/O Device Controller configuration and cannot be changed from Output Server 2.

5 Click **Save** to store your changes and automatically reboot the Output Server 2 service.

Alternatively, wait until you have finished making changes in other areas of the Configuration panel, then click **Save**.

Configuring Active Format Description Insertion Lines

Information about what area of a 16:9 HD video image should be preserved when it is downscaled to 4:3 SD is defined by Active Format Description (AFD) codes. These AFD codes are carried in the baseband signal coming into the video/audio I/O card and then interpreted by viewers' televisions and set top boxes to display the required frame for each item in the schedule. The standards for AFD are defined by the Society of Motion Picture and Television Engineers (SMPTE) and Output Server 2 supports SMPTE Standards 2016 and RP186 AFD codes.

You configure the lines on which AFD codes are inserted for each SMPTE standard from the **Channel** tab of the Output Server 2 user interface.

To configure AFD insertion lines for an Output Server 2 channel:

1 On the playout server, expand the instance of **Output Server 2** for the channel to be configured (e.g. `ITX1 Output Server 2`).

The Output Server 2 user interface appears.

2 Go to **Configuration** > **Channel** tab.

The channel configuration options appear. The AFD options are on the middle left of the window.

3 The values for the AFD insertion lines are determined by the selected **Resolution**. The default is typically the switch line +2 for all formats.

To change the default values, enter the new values into the following fields:

- **AFD S2016 Insertion Line**
- **AFD RP186 Insertion Line**

4 Click **Save** to store your changes and automatically reboot the Output Server 2 service.

Alternatively, wait until you have finished making changes in other areas of the Configuration panel, then click **Save**.

Configuring Timecode Settings (VITC, ATC, LTC, DVITC)

So that media can be identified, synchronized and edited, timecodes are added to the ancillary data space of the television signal as media metadata. The way that timecodes are encoded and processed is different for SD and HD media and there are several formats, both current and legacy, for encoding timecodes.

iTX supports VITC (Vertical Interval Timecode) times for SD media and ATC (ancillary timecode) timecodes for HD media. Both are configured from the **Channel** tab of the Output Server 2 user interface.

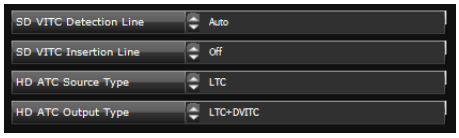
To configure timecode settings for an Output Server 2 channel:

1 On the playout server, expand the instance of **Output Server 2** for the channel to be configured (e.g. `ITX1 Output Server 2`).

The Output Server 2 user interface appears.

2 Go to **Configuration** > **Channel** tab.

The channel configuration options appear. The timecode options are grouped together on the middle left of the window.



3 If the channel broadcasts SD content and you are using a VITC (Vertical Interval Timecode) generator, select the line numbers to use for VITC timecodes.

   a For **SD VITC Detection Line**, select the line number to indicate the presence of timecode information to downstream devices.

   b For **SD VITC Insertion Line**, select the line number on which the timecode information is placed.

4 If the channel broadcasts HD content, for **HD ATC Source Type**, use the drop-down list to select the source input for ancillary timecodes. The options are:

   - `LTC` for linear timecode sources.
   - `DVITC` for Digital Vertical Interval Timecode sources.

5 The **HD ATC Output Type** field defaults to `LTC+DVITC`. Currently, this is the only available setting.

6 Click **Save** to store your changes and automatically reboot the Output Server 2 service.

Alternatively, wait until you have finished making changes in other areas of the Configuration panel, then click **Save**.

Viewing the XG Inside Status

If you have XG Inside and multiple channels configured on the same playout server, you can view which XG Inside channel has been assigned to an instance of Output Server 2 from the **Channel** tab of the Output Server 2 user interface.

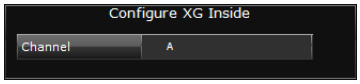
To view the XG Inside channel status:

1 On the playout server, expand the instance of **Output Server 2** for the channel to be configured (e.g. `ITX1 Output Server 2`).

The Output Server 2 user interface appears.

2 Go to **Configuration** > **Channel** tab.

The channel configuration options appear. The XG Inside status is displayed in the top right corner of the window.



If this area is grayed out it means you do not have the necessary software installed on your playout server.

For more information about configuring Vertigo XG Inside, see the *Vertigo XG Inside User Guide*.

Configuring Channel Delay

A channel delay may be needed to adjust the output timing for transitions, such as when switching the output of a national channel into and out of regional sub-channels. For accurate transitions, the internal processing may need adjusting to take account of the throughput time of a live source. This is configured from the **Channel** tab of the Output Server 2 user interface.

To configure the channel delay for an Output Server 2 channel:

1 On the playout server, expand the instance of **Output Server 2** for the channel to be configured (e.g. `ITX1 Output Server 2`).

The Output Server 2 user interface appears.

2 Go to **Configuration** > **Channel** tab.

The channel configuration options appear. The channel delay options are on the bottom left of the window.

3 To set the **Channel Delay seconds:ms,** enter a value in seconds and milliseconds or use the slider.

4 Click **Save** to store your changes and automatically reboot the Output Server 2 service.

Alternatively, wait until you have finished making changes in other areas of the Configuration panel, then click **Save**.

Configuring Nielsen Watermarking

The Nielsen watermark is an inaudible cue tone in the audio stream of the channel output signal. In the USA and Canada, the Nielsen watermark is detected by devices that provide information for television audience measuring.

Both Nielsen watermarking version 2 (N2) and version 4 (NW) are supported. Either format can be inserted individually or both can be inserted simultaneously into the data stream.

> Note: Unlike N2 watermarking, NW processing does not support the overwriting of audio codes that are present in the stream before the watermarking process begins. Instead, the watermark engine leaves space for a second (and possibly a third) Final Distributor Service ID in the program band.

To configure Nielsen Watermarking on audio output:

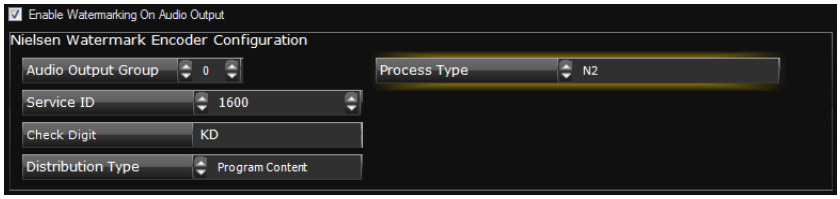
1 On the playout server, expand the instance of **Output Server 2** for the channel to be configured (e.g. `ITX1 Output Server 2`).

The Output Server 2 user interface appears.

2 Go to **Configuration** > **Watermark** tab.

3 Check **Enable Watermarking On Audio Output**.

The Nielsen Watermark Encoder Configuration panel appears.



4 In the **Audio Output Group** field, enter the output group to which you want to apply the watermark.

5 In the **Process Type** field, select one of the following:

- **N2**
- **NW**
- **Both**

6 In **Service ID** field, enter the Nielsen channel ID number.

7 In the **Check Digit** field, enter the two-letter Nielsen check digit.

8 In the **Distribution Type** field, select one of the following:

- **Program Content**
- **Final Distributor**
- **Unknown Distribution**

9 Click **Save** to store your changes and automatically reboot the Output Server 2 service.

Alternatively, wait until you have finished making changes in other areas of the Configuration panel, then click **Save**.

Configuring Dolby Metadata

Dolby metadata can be configured for Dolby E and Dolby D output groups using the **Dolby Metadata** tab. During configuration, you can set specific values for each parameter and set a resolution rule.

Setting the **Rule** field to **Manual Value** applies the set value as the constant default.

Setting the **Rule** field to **Decoders, then manual value** applies a conditional setting such that if the Dolby decoder provides a setting for that metadata parameter, then the decoder's setting takes precedent over the set value.

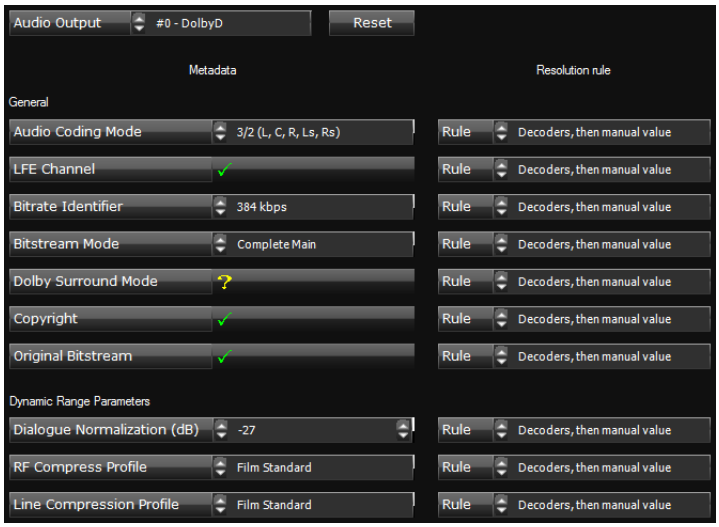
To configure metadata for Dolby E and/or Dolby D output groups:

1 On the playout server, expand the instance of **Output Server 2** for the channel to be configured (e.g. `ITX1 Output Server 2`).

The Output Server 2 user interface appears.

2 Go to **Configuration** > **Dolby Metadata** tab.

The Dolby metadata configuration options appear.



3 Select a Dolby output group from the **Audio Output** field.

> Note: Clicking **Reset** reverts the values to the default profile, as defined by the type of Dolby output chosen in iTX Desktop (e.g. Dolby D 2.0, Dolby E 5.1)

4 Review and/or set the metadata parameters that are listed in the **Metadata** column.

Hovering over the metadata setting field displays a brief description of the metadata parameter.

5 For each metadata parameter, set the associated **Rule** field to either:

- **Manual Value**
- **Decoders, then Manual value**.

6 Click **Save** to apply and store the metadata parameter settings.

Alternatively, wait until you have finished making changes in other areas of the Configuration panel, then click **Save**.

Configuring Audio Upmixing

The Upmixing tab is only required for channels where the audio input needs to be upmixed to a 5.1 group before being output. For example a stereo input being upmixed to Dolby 5.1.

To enable and configure audio upmixing:

1 On the playout server, expand the instance of **Output Server 2** for the channel to be configured (e.g. `ITX1 Output Server 2`).

The Output Server 2 user interface appears.

2 Go to **Configuration** > **Upmixing** tab.

The upmixing configuration options appear.

3 Select a Dolby output group from the **Audio Output** field.

The parameters for the upmix are only visible when a 5.1 audio group is selected (e.g `DolbyE 5.1`, `DolbyD 5.1`, `PCM 5.1`)

> Note: Clicking **Reset** reverts the values to the default profile, as defined by the type of Dolby output chosen in iTX Desktop (e.g. Dolby D 2.0, Dolby E 5.1)

4 Click **Upmixing Enabled**.

The red cross changes to a green check and the remaining options become editable.

5 In the **Stereo (L/R) Channels Level** field, enter the stereo input volume level in decibels.

The minimum value is -24 dB, the maximum is 6 dB and the default is -6 dB. Alternatively set the level to `Mute`.

6 In the **Stereo Width** field, enter a value from 0 to 31. The default is 27.

7 In the **Center (C) Channel Level** field, enter the center input volume level in decibels.

The minimum value is -24 dB, the maximum is 6 dB and the default is 1 dB. Alternatively set the level to `Mute`.

8 In the **LFE Level** field, enter the low-frequency effects input volume level in decibels.

The minimum value is -24 dB, the maximum is 6 dB and the default is -10 dB.

Alternatively set the level to `Mute`.

9 In the **LFE Filter** field, enter a value in hertz for low-frequency effects.

The default is 80Hz for 50Hz video formats and 66.7Hz for 59Hz video formats.

10 Click the **Surround Mode** field.

The **Select Item** dialog appears.

11 Select the required surround mode. The options are:

- `Speech` (default)
- `Standard`
- `Movie`

12 In the **Surround (Ls/Rs) Channels Level** field, enter the surround sound input volume level in decibels.

The minimum value is -24 dB, the maximum is 6 dB and the default is -5 dB. Alternatively set the level to `Mute`.

13 In the **Surround Delay (ms)** field, enter the required delay in milliseconds. The default is 16.

14 Click **Save** to apply and store the upmixing settings.

Alternatively, wait until you have finished making changes in other areas of the Configuration panel, then click **Save**.

Configuring a Channel to Process SCTE104 Messages

The video signal to the video/audio I/O card in the playout server can contain SCTE 104 messages (also known as digital cue tones). iTX can detect such messages and respond to them to start the playout of a sequence that is on hold in a schedule or end a sequence iTX is currently playing. SCTE refer to the time space provided by broadcasters to trigger these sequences as the “avail”. Output Server 2 gives users the ability to enable and disable individual SCTE 104 features independently, depending on their requirements.

There are two sides to configuring SCTE104: the features you want to use need to be configured in the **SCTE104** tab on the Output Server 2 **Configuration** panel, while the message types need to be configured via one of two different plugins in the iTX Desktop:

- The legacy **VANC** plugin
- The enhanced **SCTE104** plugin

The differences between these plugins are explained below.

About the VANC plugin

The VANC plugin is the legacy SCTE104 solution, which supports the following features:

- The ability to react to inbound splice request commands sent in a Multiple Operation Message, providing they are the only command in the Multiple Operation Message.
- Pass-through of splice request commands to downstream services. Any unsupported commands are stripped from the message.
- Insertion of outbound splice commands.

About the SCTE104 plugin

The SCTE104 plugin supports the following enhanced features:

- The ability to react to inbound Multiple Operation Messages containing more than one command, including:
  - Splice request commands.
  - Local and National Avail Insert Commands, either individually or both in the same Multiple Operation Message.
  - Legacy DTMF triggers.
- Enhanced message pass-through, which provides the following additional functionality:
  - All inbound SCTE104 messages can be either passed through or blocked.
  - When pass-through is enabled, iTX allows for the passing of "NULL" SCTE messages for heartbeating to downstream services.
  - The ability to enable or disable pass-through for all commands within a Multiple Operation Message.

  Splice commands received outside of a configured available window are unchanged.
- Insertion of outbound Multiple Operation Messages containing the following additional commands:
  - Local and National Avail Insert Commands, either individually or both in the same Multiple Operation Message.
  - Legacy DTMF triggers.

Configuring SCTE104 Features

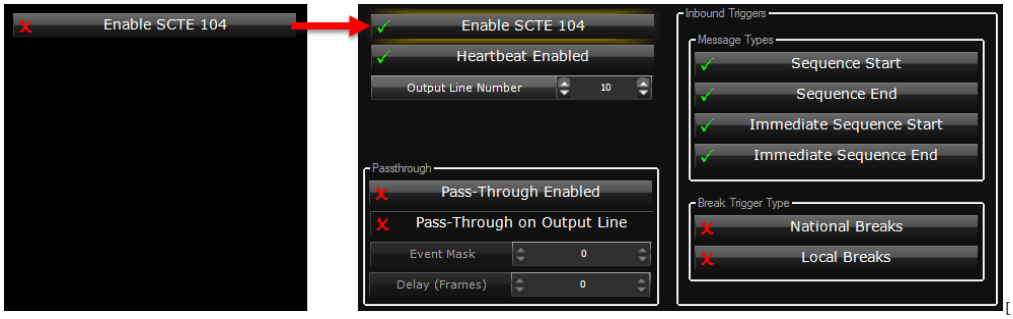
To configure SCTE104 features for Output Server 2:

1 On the playout server, expand the instance of **Output Server 2** for the channel to be configured (e.g. `ITX1 Output Server 2`).

The Output Server 2 user interface appears.

2 Check **Enable SCTE 104**.

As well as enabling SCTE104 signals, checking this options makes the additional SCTE104 features appear.



3 To enable the passing of null SCTE messages for heartbeating to downstream services, click **Heartbeat Enabled.**

This option is only supported by the SCTE104 plugin.

4 In the **Output Line Number** field, enter the vertical ancillary (VANC) line number on which to output SCTE messages.

5 To enable pass-through to downsteam services, check **Pass-Through Enabled**.

This option is only supported by the SCTE104 plugin.

6 To have incoming messages passed through on the selected output line number, check **Pass-Through on Output Line.**

7 To perform partial or full replacement of splice event inbound SCTE messages, enter a value in **Event Mask**.

The mask configuration allows for bit level "OR" masking. For example:

Incoming message (hex):	`0x00005c7e`
Inputted Event Mask string (dec):	`1073741824`
Actual Event Mask (hex):	`0x40000000`
Output (hex):	`0x40005c7e`

This option is only supported by the SCTE104 plugin.

8 To set the delay TXPlay 2 allows before it responds to Start Sequence and End Sequence messages, enter a value in **Delay (Frames)**.

9 Enable the required **Inbound Triggers** by checking any of the following options:

- If you want the channel to process `spliceStart_normal` insert commands, enable **Sequence Start**.
- If you want the channel to process `spliceEnd_normal` insert commands, enable **Sequence End**.
- If you want the channel to process `spliceStart_immediate` insert commands, enable **Immediate Sequence Start**.

  These commands can be used to start a sequence early, but their usage is not recommended by SCTE 35 [1] and may result in inaccurate splices.

- If you want the channel to process `spliceEnd_immediate` insert commands, enable **Immediate Sequence End**.

  These commands can be used to terminate a sequence early, but must include the correct event ID for the sequence that is to be canceled.

All message types can be enabled at once, if required.

10 Enable the required **Break Trigger Types** by enabling or disabling the following options:

- **National Breaks**
- **Local Breaks**

The table below describes the effects from various combinations of these two options:

Combination	Result
	iTX will trigger in all cases, i.e. when it receives Multiple Operation Messages with: • Only a `splice_request_data` command (legacy SCTE104) • Both a `splice_request_data` and a `segmentation_descriptor_request` (for either local or national breaks). NOTE: If you are only using the legacy VANC plugin, both break trigger types must be disabled.
National Breaks enabled **Local Breaks** disabled	iTX will only trigger if a Multiple Operation Message is received with a `splice_request_data` and a `segmentation_descriptor_request` with the `segmentation_type_id` set to National (value 0x32).
National Breaks disabled **Local Breaks** enabled	iTX will only trigger if a Multiple Operation Message is received with a `splice_request_data` and a `segmentation_descriptor_request` with the `segmentation_type_id` set to Local (value 0x30).
National Breaks enabled **Local Breaks** enabled	iTX will only trigger if a Multiple Operation Message is received with a `splice_request_data` and a `segmentation_descriptor_request` with the `segmentation_type_id` set to Local (value 0x30) or National (value 0x32).

11 Click **Save** to store your changes and automatically reboot the Output Server 2 service.

Alternatively, wait until you have finished making changes in other areas of the Configuration panel, then click **Save**.

Configuring the SCTE104 Message Types

In addition to the configuration that has to be performed in the Output Server 2 user interface, the following configuration needs to be performed within iTX Desktop. The required configuration is dependent on whether you are using just the legacy features or both the legacy and enhanced features.

Configuring the legacy VANC plugin

For channels that will only process legacy SCTE104 messages:

- In **Engineering** > **Channel Config** > **Plugins** > **VANC** specify:
  - **Insert Type** (select `SPLICER)`
  - **Automatic System Index**
  - **Duration (Frames)**

For more information see the *iTX System Administration Guide*.

Configuring enhanced SCTE104 plugin

For channels that will process both legacy and enhanced SCTE104 features:

- In **Engineering** > **Channel Config** > **Plugins** > **SCTE104** specify:
  - **Insert Type**
  - **Automatic System Index**
  - **Duration (Frames)**

For more information see the *iTX System Administration Guide*.

Configuring sequences for SCTE104

A sequence is a small group of schedule events that iTX handles as a single event block. A typical sequence might contain a few video clip events and secondary events, with certain transitions or vision effects. As such, sequences can be used to schedule a block of advertisements or trails, triggered to start and stop by SCTE104 messages.

- For sequence control via SCTE104 messages, in the **Event Editor** for the sequence enable the **Allow External Takes**.
- For scheduled break sequences on the inbound channel:
  - In **Engineering** > **Channel Config** > **Channel Config 2**, the **Fixed Availability Windows** is used to control how the start and end times for a sequence are interpreted.

    When enabled, the **Start Window** and **End Window** times for sequences are applied as specified in the **Event Editor** for the item. The Start and End Window times include the time and date for the item.

    When disabled, the **Start Window** and **End Window** times for sequences are applied relative to the start time of the item.

    Note: Once an availability window has been set and applied it cannot be removed. If the availability window is changed, the new window will take effect, but the previous window will not be removed until the Output Server 2 service is restarted.

  - In **Event Editor** for the sequence item:
    - Specify the sequence's availability window by entering timecodes in the **Start Window** and **End Window** fields.

      How these times are interpreted is dependent on the **Fixed Availability Windows** option in **Channel Config 2**.

- If required, enable **SCTE104 LocalAd**.

  iTX inserts an SCTE 104 message to trigger the insertion of local advertisement. It does this when it plays out a sequence as a result of receiving an SCTE message containing a delay.

  Unless you require this specific functionality, you should ensure the option is not selected.

For more information on configuring availability windows see the *iTX System Administration Guide*.

For more information on working with sequences see the *iTX Desktop Operator Guide*.

Configuring Subtitle Playout

This section explains the Output Server 2 configuration required to playout subtitles, which includes defining a channel landing page, the streams, the services and the gateways. It does not cover the configuration needed to import subtitles.

IMPORTANT
- For basic closed captions or subtitles to function you must configure a minimum of one stream and one service (e.g. page 888).
- The Subtitles tab is a placeholder for future development. The following functionality is not currently supported:
  - The **Channel** section
  - Multiple language closed captions
  - Open captions

Creating a Subtitle Stream

Streams are used to carry one or more subtitle services within the video. Therefore, you must create a stream before you can create a service.

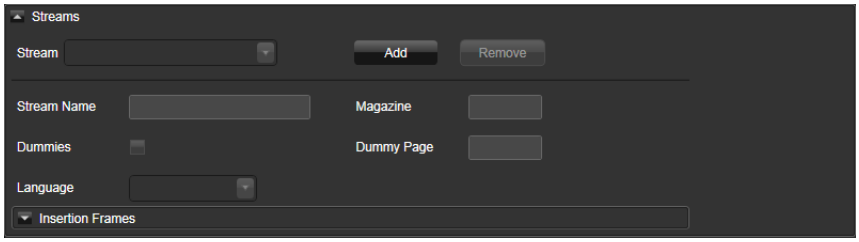
To create a stream:

1 Open the Output Server 2 user interface for the channel you want to configure, as described in Selecting the Channel Resolution and Frame Rate, on page 35.

2 Go to **Configuration** > **Subtitles** tab.

3 The Subtitles configuration options appear. By default all of the subsections are collapsed.

4 On the **Subtitles** tab, expand the **Stream** section.



5 Click **Add**.

The **Add Stream** window appears.

6 Enter the new stream name in the **Stream Name** field.

7 In the **Insertion Frames** section, check the boxes to allocate the number of video lines required for subtitle transmission.

For timely delivery of a single subtitle service, four continuous video lines will be needed.

8 Click **OK** to exit the **Add Stream** window.

9 The stream can now be configured. See Configuring a Subtitle Stream below.

Configuring a Subtitle Stream

Once you have created the stream, it must be configured.

To configure a stream:

1 On the **Subtitles** tab, expand the **Stream** section.

2 Select a stream from the **Stream** drop-down list.

3 Check the **Dummies** check box if empty Teletext data is to be sent to keep the stream active.

a Enter the page and magazine where the dummy data to be transmitted is stored.

b Select, from the **Language** drop-down list, the character set to be used for dummy data.

4 Expand the **Insertion Frames** section, if the video lines the subtitles are to be sent on needs to be changed. The video lines were specified when the stream was created.

5 Click **Save** to store your changes and automatically reboot the Output Server 2 service.

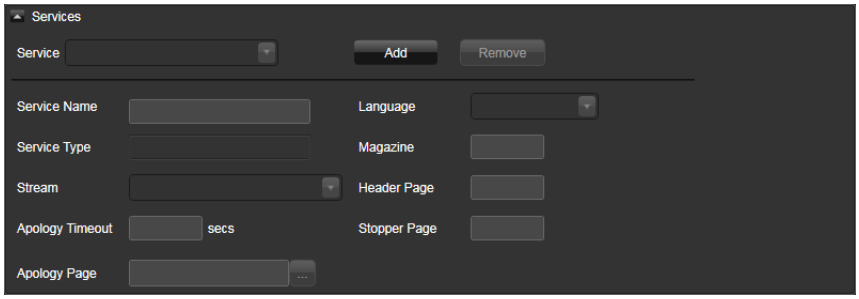
Alternatively, wait until you have finished making changes in other areas of the Configuration panel, then click **Save**.

Creating a Subtitle Service

Each closed subtitle page (e.g. page `888`) requires its own service.

To create a service:

1 On the **Subtitles** tab, expand the **Service** section.



2 Click **Add**.

The **Add Service** window appears.

3 Enter the **Name** for the service (e.g. `p888`).

4 Select a **Type** of `Teletext` (closed) from the drop-down list.

5 The service can now be allocated to a stream and configured as required. See Allocating a Subtitle Service to a Subtitle Stream below.

Allocating a Subtitle Service to a Subtitle Stream

To allocate a service to a stream:

1 On the **Subtitles** tab, expand the **Services** section.
2 Select a service from the **Service** drop-down list.
3 Select a stream to which the service is to be allocated from the **Stream** drop-down list.
4 Select the subtitle language character set to be used, from the **Language** drop-down list.
5 Complete the **Magazine** and **Header Page** fields of the Teletext page the subtitles will be displayed on.
6 Click **Save** to store your changes and automatically reboot the Output Server 2 service.
Alternatively, wait until you have finished making changes in other areas of the Configuration panel, then click **Save**.

About Video Signal Routing

IMPORTANT
- This section explains how to setup the routing for a playout server using an existing video/audio matrix router. It does not explain how to install or configure a matrix router or the supporting iTX services.
For more information on installing and configuring matrix routers, refer to the "Using iTX with a Matrix Router" section of the *iTX System Administrator Guide*.
- The guidance in this section is for an iTX playout server with live inputs, however some information is also applicable to an iTX server running the Encode service for ingest or both the Encode service and Output Server 2 service for ingest and playout.
For more information on setting up an ingest server, refer to the "Preparing Encode Server machines" section of the *iTX System Administrator Guide*.

A video/audio router (also known as a matrix router or just matrix) allows a video signal source (such as a live satellite feed) to be connected to a destination, such as a playout server. The output from the sources are connected to inputs on the router and the outputs on the router are connected to inputs on the destinations. The router then allows any source to be routed to any destination and vice versa; these connections are known as crosspoints. An iTX server can act as a source (playout server), a destination (ingest server) or both (playout with live inputs), depending on your requirements.

For example, the live feed from a satellite would be a source and a transmission system would be a destination. In between you may want an iTX server (for example, so that the satellite feed can be recorded or breaks inserted), before being sent to the transmission system. In this scenario, the live satellite feed is routed to the inputs of a playout/ingest server (acting as a destination) via the matrix router and the output from the playout/ingest

server (acting as a source) can then be routed to the transmission system via the same router.

Figure 6-1 on page 49 illustrates how source and destinations can be routed to one another, via crosspoints on the matrix router. The diagram also shows how the example above would be routed, with the live satellite feed being used as an input source to the playout/ingest server (ITX1),which is then routed to the transmission system.

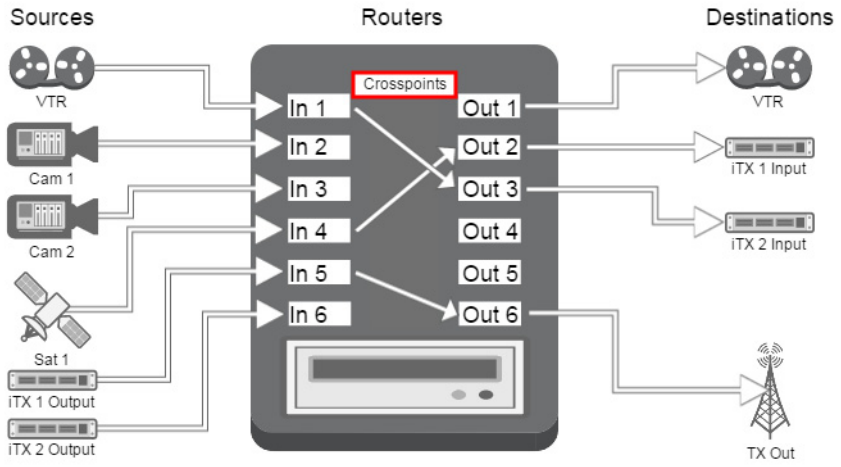


Fig. 6-1: How channel sources and destinations connect to a matrix router.

There can be multiple sources, destinations and even routers in an iTX system. To ensure a playout/ingest server is receiving and sending the correct signals, iTX needs to know the following:

- Which router to use
- The destinations (i.e. to which router outputs are the inputs on the video/audio I/O card connected)
- The channel outputs (i.e. to which router inputs are the outputs on the video/audio I/O card connected)

How a channel's routing is configured also depends on the playout type. For example, simulcast channels share an input, so the playout server acts as a single destination; dual live input requires two inputs, so the playout server acts as two destinations (i.e. two different outputs on the router connect to two different inputs on the video/audio I/O card).

The playout server's inputs are configured from within the Router Connections tab in the I/O Device Controller, while the channel outputs are configured in the Channel Config pop-up layout in iTX Desktop.

Assigning Matrix Destinations to Channel Inputs

The Router Connections tab, located in the user interface for the I/O Device Controller, is used to assign each channel input to a destination on a matrix router.

The inputs that are available correspond to the model of video/audio I/O card in your playout server and the playout type you selected in TXPlay2 Config. For example, a Corvid 44 video/audio I/O card shows the following inputs for each playout type:

Playout type	Inputs	Router configuration
Single channel	• Channel A Main Input	Single router, with a single destination
Dual channel	• Channel A Main Input • Channel B Main Input	Up to two routers, with two separate destinations
Dual live	• Channel A Main Input • Channel A Secondary Input	Up to two routers, with two separate destinations
Simulcast	• Channel A Main Input / Channel B Main Input	Single router, with a single destination

To assign matrix destinations to inputs on the I/O card:

1 On the server running the Output Server 2 system, maximize the **I/O Device Controller** service.

2 Select the **Router Connections** tab.

The routing configuration appears, with a set of controls for each active input on the video/audio I/O card.

3 For each input, use the **Matrix** field to select the matrix router (or router bridge) with the required destination.

4 For each input, use the **Destination** field to select the router destination to which the transmission system receiving the channel output is connected.

> Note: If you are using a hardwired router for testing purposes, you can only connect one destination to it and you cannot mix router systems.

The table below describes how different channel types and pairings should be routed.

Channel types	Matrix destination
Main and backup pair	Connect both channels to the same matrix and destination
Simulcast and simulcast backup pair	Connect both channels to the same matrix and destination
Main and simulcast pair	Connect both channels to the same matrix and destination
Backup and simulcast backup pair	Connect both channels to the same matrix and destination
Dual channel pair	Connect channel A main input and channel B main input to separate matrix destinations
Dual live channels	Connect channel A main input and channel A secondary input to separate matrix destinations

Channel types	Matrix destination
Dual live simulcast	Connect channel A/B main input and channel A/B secondary input to separate matrix destinations. TXPlay 2 controls which input to use at any given time.
Backups of dual channels or dual live channels.	Connect each backup to the same matrix and destination as their main channel (e.g. channel A backup should be routed to the same matrix destination as channel A).

5 Click **Save**.

6 Now configure the output for each channel from the iTX Desktop. See Assigning Matrix Sources to Channel Outputs on page 51.

Assigning Matrix Sources to Channel Outputs

As well as configuring the matrix router destinations from I/O Device Controller, you must assign the matrix router sources to channel outputs. This is performed in iTX Desktop, from the Channel Config pop-up on the Engineering layout.

To assign matrix sources to channel outputs:

1 Start the iTX Desktop on a client PC and login with an Administrator profile.

2 Open the **Engineering** layout.

3 Click **Channel Config**.

The **Channel Config** pop-up layout appears.

4 From the **View** list, select the view with the channels to be configured.

5 Select a channel to configure.

6 Click the **Channel Config 3** tab, which contains the Routing panel.

7 From the **Matrix** field, select the matrix router (or router bridge) with the required source inputs.

This must be the router to which the transmission system receiving the channel output is connected and is typically the same matrix that is configured in the Router Configuration panel of the I/O Device Controller.

8 From the **Channel Output** field, select the router source input the channel output is fed into.

9 From the **Channel Output 2** field, select any router source input you want to monitor.

This option is useful for monitoring a live video signal for a pass-through channel that is being fed into a separate playout/ingest server.

10 Click **Save** and then **Close**.

Selecting the Default Live Asset for the Channel

Where a fixed router source is used for a number of different live assets that are unknown to iTX, a default live asset can be substituted in each case without changing the unique names of the original live assets. This is performed in iTX Desktop, from the Channel Config pop-up on the Engineering layout.

To select the default live asset for the channel:

1. Start the iTX Desktop on a client PC and login with an Administrator profile.
2. Open the **Engineering** layout.
3. Click **Channel Config**.

   The **Channel Config** pop-up layout appears.
4. From the **View** list, select the view with the channels to be configured.
5. Select a channel to configure.
6. Click the **Channel Config 3** tab, which contains the Routing panel.
7. From the **Default Live Asset** field, select the name of the default live asset.
8. Click **Save** and then **Close**.

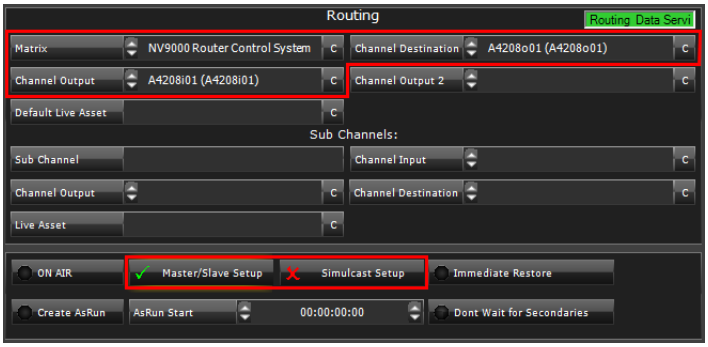
Configuring the Channel Communication Setup

In iTX Desktop you need to define the channel communication setup. This is critical for TXPlay 2 to be able to manage the leader/follower network for any channels that are in a main/backup or simulcast setup.

As well as stating which channels are in a main/backup or simulcast setup, the way in which the channels are routed is also critical to the configuration. This then allows a channel to be failed over using a downstream device equipped with a Grass Valley HCO change-over card. The way in which a pair of channels are configured depends on the channel types (i.e. the configuration for a simulcast channel is different to that for a dual live channel).

The communication setup is performed using the following options on the Channel Config pop-up, on the Engineering panel:

- Matrix selection field on the Routing panel
- Channel Destination selection field on the Routing panel
- Channel Output selection field on the Routing panel
- Master/Slave Setup button
- Simulcast Setup button



To configure the channel communication setup for a channel:

1 Start the iTX Desktop on a client PC and login with an Administrator profile.
2 Open the **Engineering** layout.
3 Click **Channel Config**.

The **Channel Config** pop-up layout appears.

4 From the **View** list, select the view with the channels to be configured.
5 Select a channel to configure.
6 Click the **Channel Config 3** tab.
7 From the **Matrix** field, select the matrix router (or router bridge) with the required sources and destinations.

This must be the router to which the transmission system receiving the channel output is connected and is typically the same matrix as was configured in the Router Configuration panel of the I/O Device Controller.

8 From the **Channel Destination** field, select an output on the matrix router that delivers the output of the main channel. This typically matches the destination that was configured in I/O Device Controller.

The table below describes how different channel types and pairings should be routed.

Channel types	Channel destination
Main and backup pair	Route both channels to the same matrix and destination
Simulcast and simulcast backup pair	Route both channels to the same matrix and destination
Main and simulcast pair	Route both channels to the same matrix and destination
Backup and simulcast backup pair	Route both channels to the same matrix and destination
Dual live channels	Route to the matrix and destination specified in I/O device Controller.

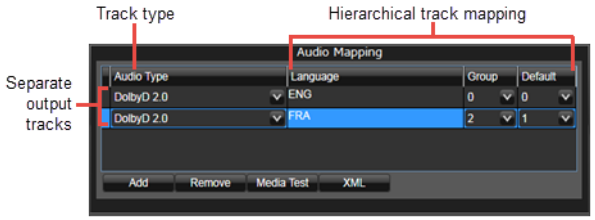
9 For a main/backup setup, use the **Channel Output** to select the router input the channel output is fed into.
10 Enable the channel communication options using the following criteria:
- For any backup channel or channel with a backup, enable **Master/Slave Setup.**
- For any simulcast channel or main channel with a simulcast channel, enable **Simulcast Setup.**
- For any channel that is part of both a main/backup setup and a simulcast setup, enable both options.

11 Click **Save** and then **Close.**

Configuring Audio Output for Output Server 2

Output Server 2 needs to be instructed how to embed audio tracks in its output signal.

This configuration is performed from within iTX Desktop, from **Engineering** layout > **Channel Config** > **Channel** tab > **Channel Config 3** tab > **Audio Mapping** panel. This panel is shown below:



The **Language**, **Group** and **Default** columns are used to map each track to a channel. The mapping is hierarchical:

1. First iTX will attempt to map the track via the selected **Language**.
2. If a language is not available, iTX will map using the **Group**.
3. If neither the Language nor the Group are available, the track will be defaulted to the group selected in the **Default** column.

> IMPORTANT
> - When configuring the audio output for a backup channel, the settings must mirror its main channel.
> - When configuring the audio output for a simulcast channel, the settings must meet the requirements of the simulcast channel, not the main channel.
> - When configuring the audio output for a simulcast backup channel, the settings must mirror the simulcast channel.

To configure the audio mapping for an Output Server 2 system:

1. Open the iTX Desktop and click the **Engineering** layout.
2. Click **Channel Config**.

   The **Channel Config** pop-up layout appears.
3. From the **View** list, select the view containing the channels to be configured. The channels associated with that view appear.
4. Click the name of the channel to be configured.
5. Click the **Channel Config 4** tab.
6. In the **Audio Mapping** section there will be a default output track, with the following settings:
   - **Audio Type** column set to `DolbyD`.
   - **Language** column with no value (blank).
   - **Group** column set to `Unset`.
   - **Default** column set to `0`.

   These settings should be changed to match the tracks in your audio input.
7. On the first track, click the **Audio Type** drop-down list and select the required type (e.g. `Dolby D 5.1`)

   When selecting an Audio Type, consider the following:
   - `PCM (Auto)` will assign 16 channels to the track, even if not all of the channels are required. Any unused channels will be automatically set to mute.
   - `Dolby D (Auto)` is the same as `Dolby D 5.1`.

- `Dolby E (Auto)` is not a recommended setting. Use either `DolbyE 5.1` or `DolbyE 5.1+2`.
- Raw for MPEG audio codecs is not supported.

8 To map the track by a language tag:
   a Click on the **Language** field.
   The **Language Selection** pop-up layout appears.
   b Select the language code(s) for the default output track.
   c Click **Add**.
   d Click **OK**.
9 To map the track by a group, click on the **Group** drop-down list and select a value.
10 Click the **Default** column and select a group value to assign to the track. This is the group that will be used in the event neither the language nor the group are available.
11 To map another track, click **Add** then repeat step 7 to step 10.
12 Click **Save** then **Close**.

About Event Substitution Rules for Simulcast Channels

When using a simulcast channel, you can define a rule to determine when logo, CG and stills events scheduled on the main channel are substituted on the simulcast channel. Only one rule can be defined and it is applied to all matching assets.

Substitutions are defined on the Simulcast Channel Config panel by the suffix of the HD asset name, the suffix of the SD asset name or both. For example, if `_HD` is entered into the **Original Suffix** field and `_SD` is entered into the **Substitution** field, an asset called `iTX-Logo_HD` would be substituted for a file called `iTX-Logo_SD` before playing out on the simulcast channel.

Note:
- If Logo or CG are selected for substitution, live logos and live captions are also be subject to the same replacement rules.
- Both the original and the substitution assets must be available on the media store for the substitutions to take place.
- If you are operating a simulcast backup channel, you must apply the same substitution rules on the simulcast backup channel as its simulcast channel it is paired with.

Cascading Logo Replacement Rules

On playout, if a scheduled logo is defined in the **Logo Setup** plugin it will be substituted for its replacement before going to air.

If you are running a Simulcast channel and the replacement logo then meets the criteria defined in the **Simulcast Replacement Rules**, a further replacement will be performed.

This provides two levels of control for logo replacement, as illustrated by Figure 6-2.

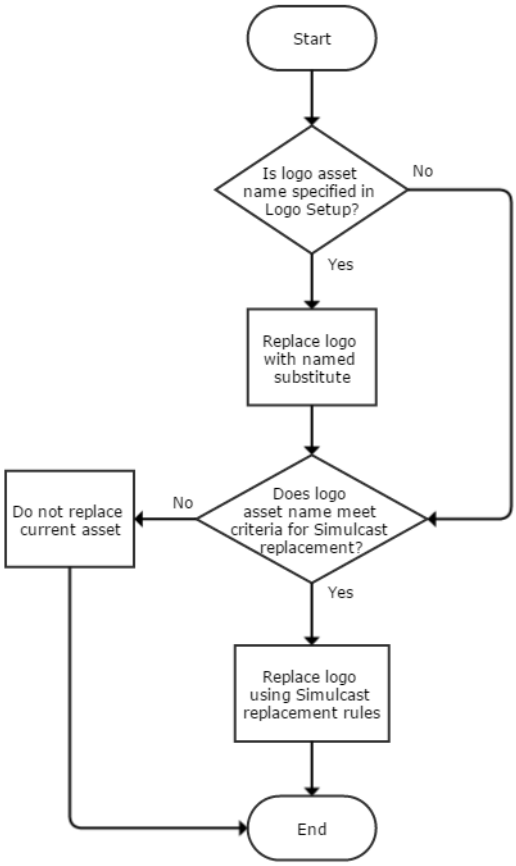


Fig. 6-2: How logo replacement rules cascade in iTX Desktop

For more information about logo replacement using the Logo Setup configuration, see the *iTX System Administration Guide*.

Defining an Event Substitution Rule for a Simulcast Channel

> IMPORTANT
> The required assets must be prepared with the appropriate suffixes prior to being scheduled.

To define an event substitution rule:

1. Open the iTX Desktop and click the **Engineering** layout.
2. Click **Channel Config**.

   The **Channel Config** pop-up layout appears.
3. From the **View** list, select the view containing the channels to be configured. The channels associated with that view appear.
4. Click the name of the channel to be configured.
5. Click the **Simulcast Channel Config** tab.

6 In the **Original Suffix** field, enter the characters used to identify HD events (e.g. _HD).

7 In the **Substitution** field, enter the characters used to identify the SD events that will be used in the substitution (e.g. _SD).

8 As you type in the **Original Suffix** or **Substitution** fields, the **For Example** text updates to demonstrate how the rules will be applied. For example:

Original Suffix text	Substitution text	For example text
(None)	(None)	AssetName *Keep as* AssetName
(None)	_SD	AssetName *Append to Make* AssetName_SD
_HD	(None)	AssetName_HD *Remove to Make* AssetName
_HD	_SD	AssetName_HD *Replace with* AssetName_SD

9 From the **Available Plugins** list, select which event types you want to substitute, then click >> to add them to the **Selected Plugins** list.

10 Click **Save**.

About GPI Devices and Simulcast Setups

As simulcast channels follow the main channel and cannot, in a leader/follower network, become leader channels, there is no requirement to configure GPI devices for simulcast or simulcast backup channels.

About Custom Aspect Ratio Control (ARC) Modes

In the Channel Config layout of iTX Desktop, the **Advanced Aspect Ratio Control** panel allows you to map a scheduled item's field values to an output aspect ratio, ARC mode and Active Field Description (AFD). For channels that are operating on Output Server 2 you can also define custom ARC modes. When defining a custom ARC, you can alter the following properties in both the input and the output picture:

- Aspect ratio (default 16:9)
- Vertical size (default 100%)
- Horizontal size (default 100%)
- Tilt position (default 0.00%)
- Pan position (default 0.00%)

Reducing the input Vertical or Horizontal percentages crops the picture equally on each side, while reducing the output Vertical or Horizontal percentages zooms the picture out equally on each side. For example, a Horizontal input value of 80% will crop 10% from the left and right sides of the picture.

It is also possible to lock the aspect ratio to the values of your choice. For example, if Horizontal is set to 100% and Vertical is set to 54.05% (creating a 1.85:1 aspect ratio), checking **Lock Aspect Ratio** means if you change a Horizontal value to 90%, the corresponding Vertical value automatically changes to 48.65%, maintaining the 1.85:1 aspect ratio.

Reducing a Vertical value also allows you to adjust the corresponding Tilt value. The Tilt range is determined by the Vertical value. For example, if a Vertical value is reduced to 90%, the Tilt range will be -5.00% to +5.00%, with 0.00% being center.

Reducing a Horizontal value allows you to adjust the corresponding Pan value. The Pan range is determined by the Horizontal value. For example, if a Horizontal value is reduced to 75%, the Pan range will be -12.50% to +12.50%, with 0.00% being center.

As the percentages are changed, preview windows automatically update to show what area of the input picture will be used and the effect on the output picture. Figure 6-3 below to Figure 6-6 on page 59 show the preview windows for some example custom ARC modes.

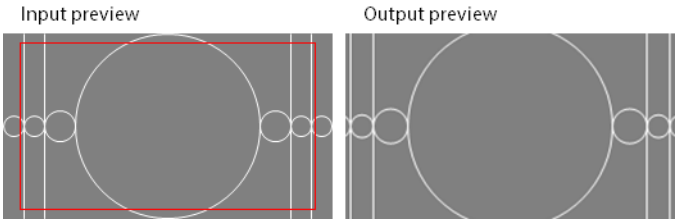


Fig. 6-3: The Input values are set to Vertical 90% and Horizontal 90%, as illustrated by the area within the red border. The Output values are set to default. The resulting output picture is cropped evenly on all sides.

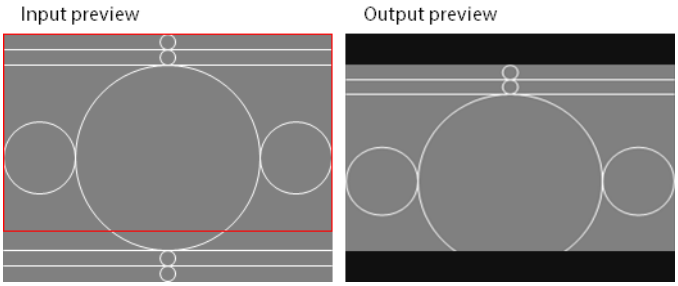


Fig. 6-4: The Input values are set to Vertical 80% and Tilt -10%, as illustrated by the area within the red border. The Output values set to default. The resulting output picture only shows the top 80% of the input picture.

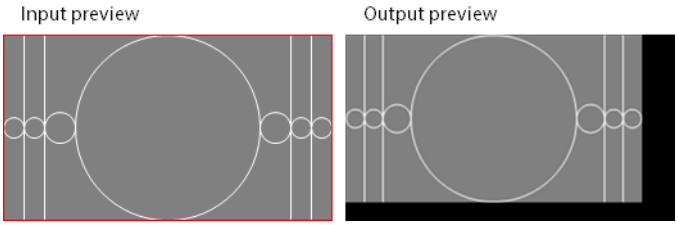


Fig. 6-5: The Input values set to default, so the whole picture is kept within the red border. The Output set to Vertical 90%, Horizontal 90%, Tilt -5% and Pan -5%. The resulting output picture is zoomed out and displayed in the top-left corner, with a border along the bottom and right.

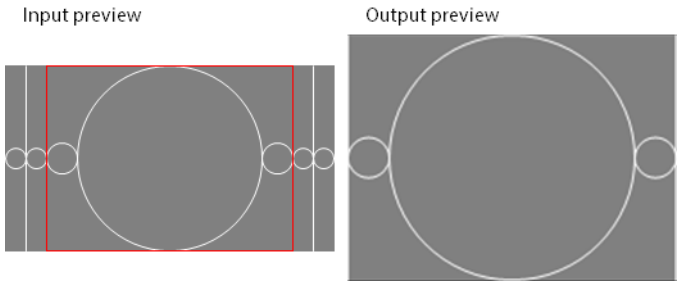


Fig. 6-6: The Input values are set to Horizontal 75%, as illustrated by the area within the red border; Output set to Aspect Ratio 4:3. The resulting output picture is horizontally cropped and displayed with a 4:3 aspect ratio.

Defining a Custom Aspect Ratio Control (ARC) Mode

Custom ARC modes are defined from the **Advanced Aspect Ratio Control - Mapping Configuration** pop-up layout, in the Channel Config layout. When you apply a custom ARC mode, it takes effect on the next asset in the schedule with AFD settings that correlate to that mode.

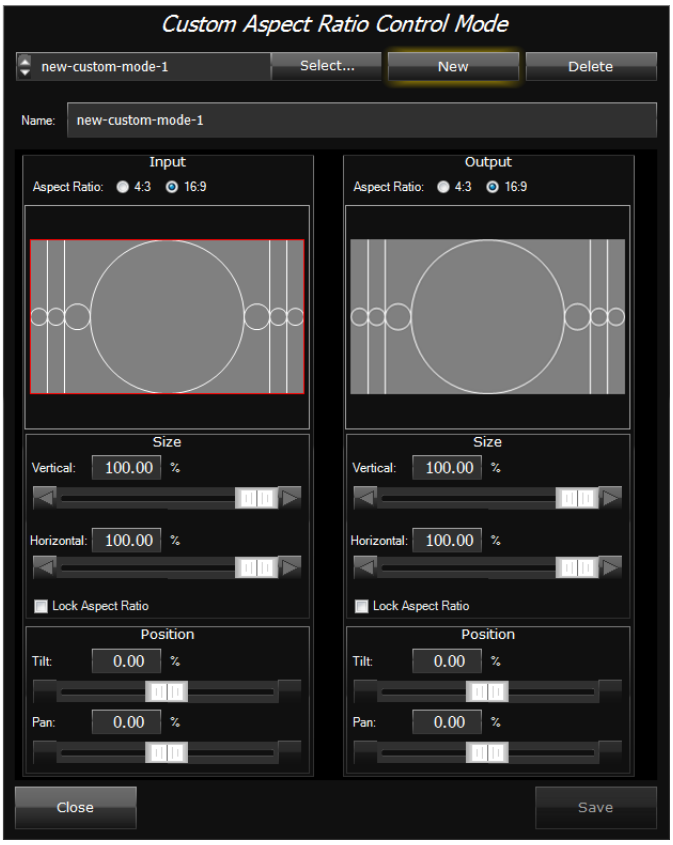
Note:

- The Advanced ARC and AFD-insertion features are only available if your system has the necessary software license. Your system may be licensed to use the functionality for both of these in one license. Configuring the settings for unlicensed functionality does not affect the output video signal.
- The mapping configuration dialog is intended to provide the maximum flexibility for the setting up of ARC operations and AFD insertion. The dialog does not prevent you from setting unsuitable configurations (for example, selecting a 4:3 aspect ratio for an HD channel).
  To prevent problems with the display of the video image, ensure the configuration settings are correct for each channel in your iTX system.
- For information on editing and deleting custom ARC, see Maintaining Custom Aspect Ratio Control (ARC) Modes, on page 77.

To access the Custom Aspect Ratio Control Mode dialog:

1. Start the iTX Desktop on a client PC and login with an Administrator profile.
2. Open the **Engineering** layout.
3. Click **Channel Config**.
   The **Channel Config** pop-up layout appears.
4. From the **View** list, select the view containing the channels to be configured. The channels associated with that view appear.
5. Click the name of the channel to be configured.
6. Click the **Channel Config 4** tab.
7. In the **Advanced Aspect Ratio Control** panel, click **Configure Mapping...**
   The **Advanced Aspect Ratio Control - Mapping Configuration** pop-up layout appears.
8. Click **Define Custom ARC Mode...**

The **Customer Aspect Ratio Control Mode** dialog appears.



9 In the **Customer Aspect Ratio Control Mode** dialog, click **New**.

A new set of default ARC values appear with the name `new-custom-mode-(n)`, where `(n)` is a unique number.

10 In the **Name** field, enter a unique name to identify the new custom mode.

11 In the **Input** section. define the area to use from the input picture:

a Select an input **Aspect Ratio** from either 16:9 (default) or 4:3.

b Configure the size of the area to use from the input picture.

- For the **Vertical** size, enter a percentage or drag the slider to crop the picture vertically.
- For the **Horizontal** size, enter a percentage or drag the slider to crop the picture horizontally.
- If you want the two percentages to move in relation to each other, check **Lock Aspect Ratio**.

c Configure the position of the area to use from the input picture:

- If the Vertical percentage has been reduced, you can adjust the **Tilt** value by entering a percentage or dragging the slider.
- If the Horizontal percentage has been reduced, you can adjust the **Pan** value by entering a percentage or dragging the slider.

As the percentages are changed, both preview windows automatically update to show the effect.

12 In the **Output** section, define the ARC for the output picture:

a Select an output **Aspect Ratio**,

b Configure the size of the output picture.

- For the **Vertical** size, enter a percentage or drag the slider to zoom out the picture vertically.
- For the **Horizontal** size, enter a percentage or drag the slider to zoom out the picture horizontally.
- If you want the two percentages to move in relation to each other, check **Lock Aspect Ratio**.

c Configure the position of the output picture:

- If the Vertical percentage has been reduced, you can adjust the **Tilt** value by entering a percentage or dragging the slider.
- If the Horizontal percentage has been reduced, you can adjust the **Pan** value by entering a percentage or dragging the slider.

As the percentages are changed, the Output preview window automatically updates to show the effect.

13 Click **Save** then **Close**.

You are returned to the **Advanced Aspect Ratio Control - Mapping Configuration** pop-up layout. From here you can assign your new custom ARC to a set of field values. See Assigning a Custom Aspect Ratio Control (ARC) Mode below.

Assigning a Custom Aspect Ratio Control (ARC) Mode

Both standard and custom ARC modes are assigned to a ARC operation in the same way.

> Note: Once an ARC mode and AFD code is mapped to a set of field values, the very next scheduled item on the channel with matching field values will playout using the new ARC mode and AFD.

To assign a custom ARC mode:

1 Open the **Advanced Aspect Ratio Control - Mapping Configuration** dialog

2 Decide which set of field values you want to remap and click the corresponding ARC Mode button.

The **ARC Mode selection** dialog appears.

3 Select your new ARC mode from the **Custom ARC modes** list then click **OK**.

On the **Advanced Aspect Ration Control - Mapping Configuration** dialog, the name of the custom ARC mode appears in the **ARC Mode** column and the corresponding **Output Aspect Ratio** field will change a display only field showing the output aspect ratio of the custom ARC mode.

4 Select your required **Active Field Description** then click **OK**.

For more information see the *iTX System Configuration Guide*.

5 On the **Channel Config** pop-up layout, click **Save** and **Close**.

The examples below show the effect on the final picture using different custom ARC input and output settings and what happens when you change both the input and the ouput settings:

Source picture (4:3)

Output changed to Horizontal 70%

Inputs changed to Vertical 80%, Tilt 10%

Inputs changed to Vertical 80%, Tilt 10% and Output changed to Horizontal 70%

A I/O Card Connection Reference

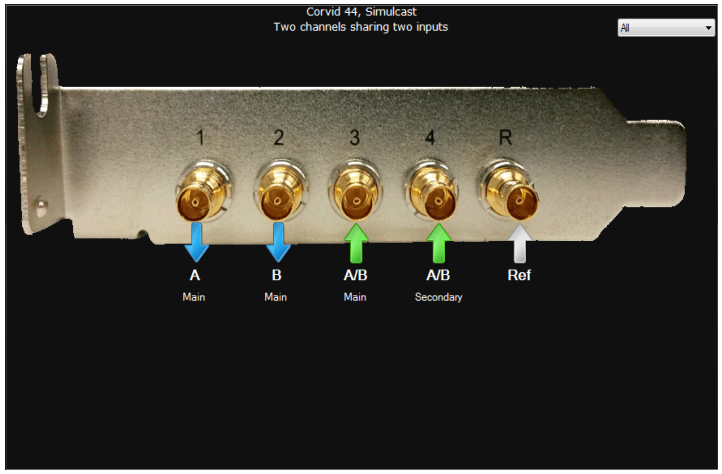
This appendix discusses the I/O Device Controller Engineering Panel, which contains the schematics for every combination of video/audio I/O card and playout type. This can be used as a reference when connecting inputs and outputs to your video/audio I/O card.

Summary

About I/O Device Controller Engineering Panel

The I/O Device Controller Engineering Panel shows your video/audio I/O cards inputs and outputs for your currently selected playout type (in TXPlay 2 Config) and whether they are the main or secondary inputs and outputs for the selected playout type.

The image below shows the Engineering panel for a Corvid 44 set to the simulcast playout type:



The Engineering panel uses the following indicators:

Indicator	Description
	Output spigot
	Input spigot
	Reference input spigot

The drop-down menu on the bottom right can be used as a filter to show different inputs and outputs individually:

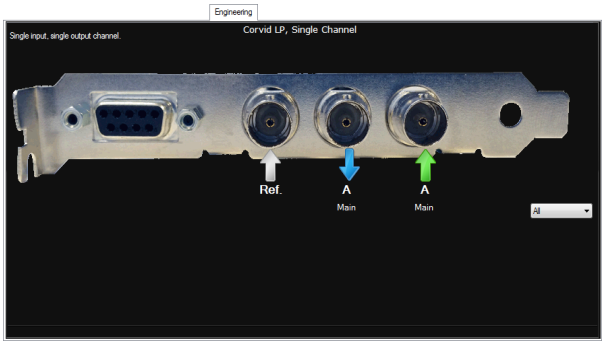
- **All**
- **None**
- **Channel A**
- **Channel B**
- **Inputs**
- **Outputs**
- **Reference**

Accessing the I/O Device Controller Engineering Panel

To access the I/O Device Controller Engineering panel:

1. On the playout server running the service, maximize the **Server Controller** application.
   If Server Controller is not running, it can usually be found in `Start>All Programs>iTX 2.0`.
2. Select the **Controlled Services** tab. All of the services running on that server are listed.
3. Double-click **I/O Device Controller**.
   The I/O Device Controller user interface appears. It includes tabs for **Service Details**, **Trace Logs**, **Installation Info**, **Configuration** and **Engineering**.
4. Click on the **Engineering** tab.
   The schematic for your video/audio I/O card appears.

Corvid LP I/O Connections



Corvid LP video/audio I/O cards only support the single channel playout type and have the following inputs and outputs:

Playout type	Port RS-422	Port R	Port 1	Port 2
Single channel	-	Ref In	Ch A Output Main	Ch A Input Main

Kona 3G I/O Connections

Kona 3G video/audio I/O cards only support the single channel playout type and have the following inputs and outputs:

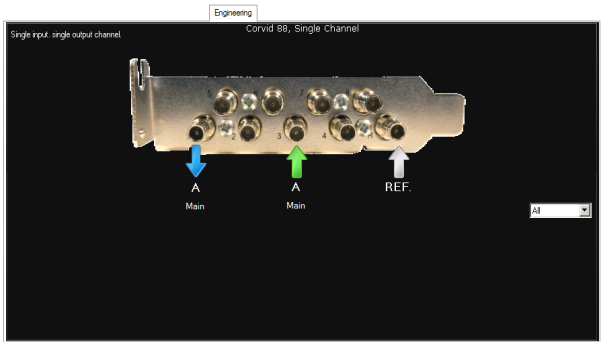
Playout Type	Port J1	HDMI	Port SDI 1	Port SDI 2	Port SDI 3	Port SDI 4
Single channel	Ref Input	-	-	Ch A Input Main	-	Ch A Output Main

Corvid 44 I/O Connections

Depending on the selected playout type, Corvid 44 video/audio I/O cards uses the following inputs and outputs:

Playout Type	Port 1	Port 2	Port 3	Port 4	Port R
Single channel	Ch A Output Main	-	Ch A Input Main	-	Ref Input
Dual channel	Ch A Output Main	Ch B Output Main	Ch A Input Main	Ch B Input Main	Ref Input
Simulcast	Ch A Output Main	Ch B Output Main	Ch A/B Input Main	Ch A/B Input Second	Ref Input
Dual Live	Ch A Output Main	-	Ch A Input Main	Ch A Input Second	Ref Input

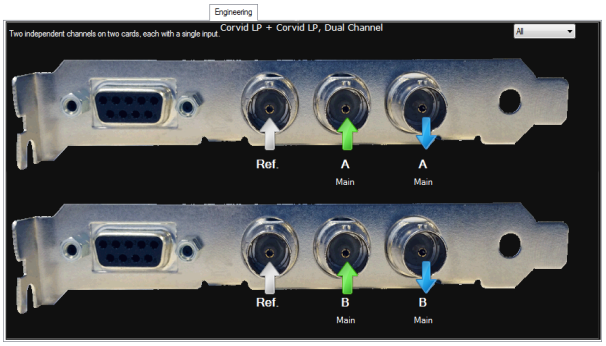
Corvid 88 I/O Connections



Depending on the selected playout type, Corvid 88 video/audio I/O cards use the following inputs and outputs:

Playout Type	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8	Port R
Single channel	Ch A Output Main	-	Ch A Input Main	-	-	-	-	-	Ref Input
Dual channel	Ch A Output Main	Ch B Output Main	Ch A Input Main	Ch A Input Second	Ch B Input Main	Ch B Input Second	-	-	Ref Input
Simulcast	Ch A Output Main	Ch B Output Main	Ch A/B Input Main	Ch A/B Input Second	-	-	-	-	Ref Input
Dual Live	Ch A Output Main	-	Ch A Input Main	Ch A Input Second	-	-	-	-	Ref Input

Corvid LP + Corvid LP I/O Connections



Depending on the selected playout type, a playout server with dual Corvid LP video/audio I/O cards use the following inputs and outputs:

Playout type	Device 0				Device 1			
	Port RS-422	Port R	Port 1	Port 2	Port RS-422	Port R	Port 1	Port 2
Single channel	-	Ref Input	Ch A Output Main	Ch A Input Main	-	-	-	-

Playout type	Device 0				Device 1			
	Port RS-422	Port R	Port 1	Port 2	Port RS-422	Port R	Port 1	Port 2
Dual channel	-	Ref Input	Ch A Output Main	Ch A Input Main	-	Ref Input	Ch B Output Main	Ch B Input Main
Dual live	-	Ref Input	Ch A Output Main	Ch A Input Main	-	-	Ch A Input Second	-

B Operating an Output Server 2 System

This appendix contains information about the day-to-day operation an Output Server 2 channel, including simulcast and dual live channel.

Summary

Starting Output Server 2

As iTX services, Output Server 2, TXPlay 2, the I/O Device Controller and Media Cache 2 are controlled by the **Server Controller** application, which is installed with any iTX component. When the Server Controller is started, all of the services installed on the playout server are started, one after another. If a service is shut down, Server Controller can restart them automatically to protect system integrity.

Through Server Controller, Output Server 2 can be configured to control the way it starts, the channels it runs and the way those channels are setup.

To start Server Controller:

- Go to **Start** > **All Programs** > **iTX 2.0** > **Server Controller**.

  The Server Controller appears and loads all of the installed services in their current configuration.

About Output Server 2 Channel Status Indicators

The table below describes the indicators that may appear on top of the Schedule Grid for an Output Server 2 system:

Indicator	Description
	In a leader/follower system, this indicator appears for the leader (main) channel.
	In a leader/follower system, this indicator appears for any of the follower channels. This includes: • Backup channels • Simulcast channels • Simulcast backup channels.
	In an simulcast system, this indicator appears on simulcast and simulcast backup channels, alongside the **Follower** label.
	In a system with a matrix router, this indicator appears when the channel output is routed to a destination to which the transmission system is connected.

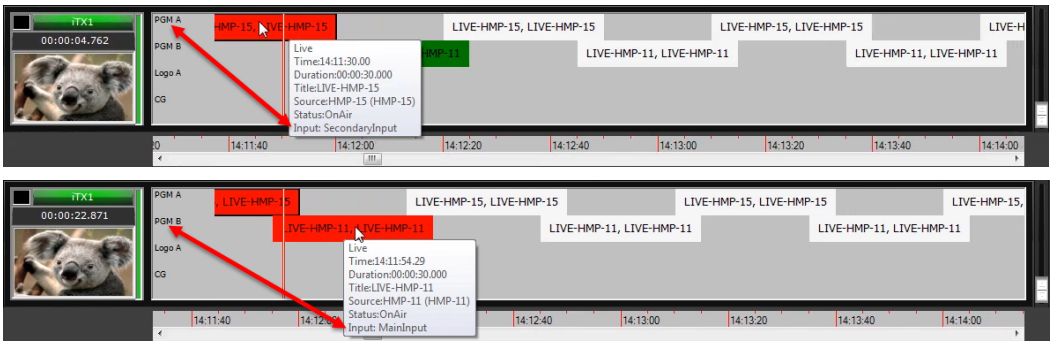
Note:
- Channel control and schedule changes cannot be performed on Follower channels.
- During transition from Output Server 1 to Output Server 2, Output Server 1 master channels will display a **Master** indicator and their Output Server 2 slave channels will display a **Follower** indicator.

Viewing Live Event Inputs on Channel Control Layouts

The input each live event is coming from can be viewed from the timeline in iTX Desktop.

To view the live event input:

- While a live event is on air, hover your mouse cursor over the event block on the timeline. The pop-up tooltip shows information about the event in focus, including its input (at the bottom).



C Maintaining an Output Server 2 System

This appendix contains information about how to maintain an Output Server 2 system. This includes the location of log files, the OS2 Engineering panel, how to downgrade from Output Server 2 back to Output Server 1 and other operation and maintenance information.

Summary

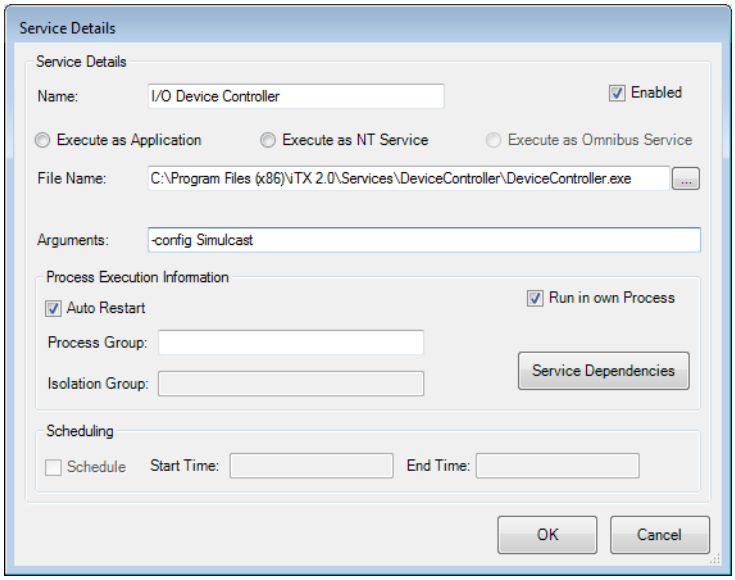
Configuring Server Controller for Output Server 2 Components

Under normal operating conditions, the Service Controller configuration for each iTX service is updated and maintained by modifying their respective configuration utility. For example, the running the TXPlay2 Config utility defines the Server Controller arguments for Output Server and I/O Device Controller. However, sometimes it is necessary to make changes to the way a service runs by changing the Server Controller configuration directly.

Server Controller Configuration for the I/O Device Controller

To edit the Server Controller configuration for I/O Device Controller:

1. From Windows, click **Start** > **All Programs** > **iTX2.0** > **Server Controller Config**. The Server Controller Configuration dialog appears.
2. Go to the **Services** tab.
3. Select the **I/O Device Controller** service then click **Edit**.
   The **Service Details** dialog appears.



4 Make sure **Enabled** is checked. This will run the instance of the service when Server Controller is started.

5 In the **Arguments** field, the following arguments are available:

Argument	Description
`-config SingleChannel`	Single input, single output channel (for all I/O cards).
`-config DualChannel`	Two independent channels, each with a single input (for Corvid 44, Corvid 88 and dual Corvid LP video/audio I/O cards only).
`-config DualLive`	Single channel with two inputs (for Corvid 44, Corvid 88 video/audio I/O and dual Corvid LP cards only).
`-config Simulcast`	Two channels sharing two inputs (for Corvid 44 and Corvid 88 video/audio I/O cards only).

6 Make sure **Auto Restart** is checked. This ensure Server Controller automatically restarts the I/O Device Controller service in the event of a failure.

Server Controller Configuration for Output Server 2

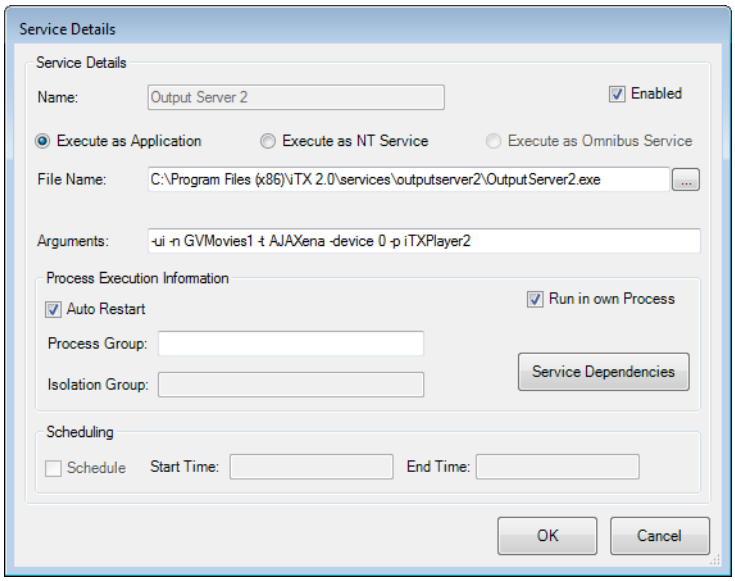
To edit the Server Controller configuration for an Output Server 2 channel:

1 From Windows, click **Start** > **All Programs** > **iTX2.0** > **Server Controller Config**. The Server Controller Configuration dialog appears.

2 Go to the **Services** tab.

3 Select the **Output Server 2** service then click **Edit**.

The **Service Details** dialog appears.



4 Make sure **Enabled** is checked. This will run the instance of the service when Server Controller is started.

5 In the **Arguments** field, the following arguments are available:

Argument	Description	Inclusion
`-ui`	Enables the user interface, which is required to access Output Server 2's Configuration and Engineering panels.	Required
`-n <Name>`	Specifies the name of the service. For example, for a channel called "GV Movies 1" you might enter: `-n GVMovies1` (no spaces) A user friendly alias for channel names can be created in iTX Desktop.	Required
`-backup`	Used to indicate an instance is a backup service.	Optional
`-t <Card type>`	Describes the type of video or audio card fitted in the host machine. For example, for an AJA Kona 3G video card: `-t AJAKona3G`	Required
`-id <Letter>`	Used to identify the inputs/outputs on the video/audio I/O card being used for the channel. For example: `-id A` or `-id B`.	Required for: • Corvid 44 • Corvid 88 • Dual Corvid LPs

Argument	Description	Inclusion
`-p <plugin name>`	Identifies the media application framework plugin to be used with Output Server 2. Valid values include: • `-p iTXPlayer2` (default value) • `-p Simulator` (use for testing only)	Default
`-ratefamily <framerate>`	Specifies the frame rate to use for the channel, overriding the valid specified in I/O Device Controller's configuration. Valid values include: • `-ratefamily 50` • `-ratefamily 59.94` • `-ratefamily 24` • `-ratefamily 23.98` Note: • If you add or change this argument you will need to reselect the Resolution from the Output Server 2 user interface.See Selecting the Channel Resolution and Frame Rate on page 35. • If the frame rate family specified in Output Server 2 does not match that of the I/O Device Controller, Output Server 2 will start up in an error state.	Optional

6 Make sure **Auto Restart** is checked. This ensure Server Controller automatically restarts the Output Server 2 service in the event of a failure.

Log File Locations

The log files for an Output Server 2 channel and its related components can be found in the following locations:

Component	Logs
Output Server 2 service	Each messages sent from TXPlay 2 to OutputServer2 is logged as an individual XML file in the following location: **C:\ITXLogs\OutputServer\YYYY-MM-DD*.xml**
VyConsoleApp for FPP	Each pooled VyConsoleApp process creates its own log file in the following location: `%APPDATA%\Miranda\VyConsoleApp_CHANNELNAME_SC_COM_POOLID.log.*`

Component	Logs
VyCOMScheduler for FPP - Engineering logs	The engineering logs are written to the following location: `%APPDATA%\Miranda\VyCOMScheduler\VyCOMScheduler_CHANNELNAME.log` This file will roll over when it reaches about 10 MiB and up to 5 rolled over files are kept.
VyCOMScheduler for FPP - Command logs	All commands that VyCOMScheduler receives are logged as executable powershell scripts. `%APPDATA%\Miranda\VyCOMScheduler\SchedulerCommandLog.ps1.*` This file will roll over when it reaches about 10 MiB and up to 5 rolled over files are kept. **Note:** These scripts must be provided when reporting an issue since it tells Grass Valley Support exactly what Output Server 2 received and when, and allows Grass Valley Support to replay the commands.

Viewing the Output Server 2 Engineering Panel

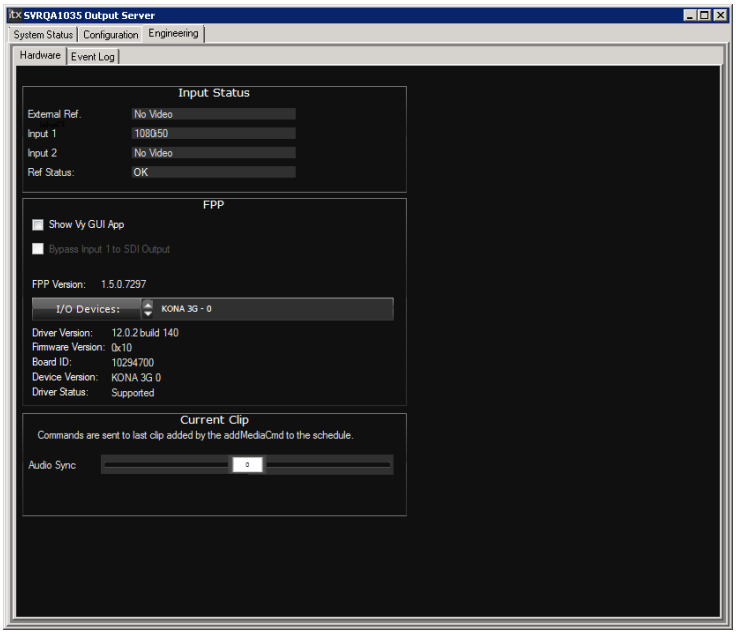
Along with the Configuration panel, Output Server 2's user interface includes an Engineering panel, which contains the following tabs:

- **Hardware**
- **Event Log**

For information on accessing the user interface, see Selecting the Channel Resolution and Frame Rate, on page 35.

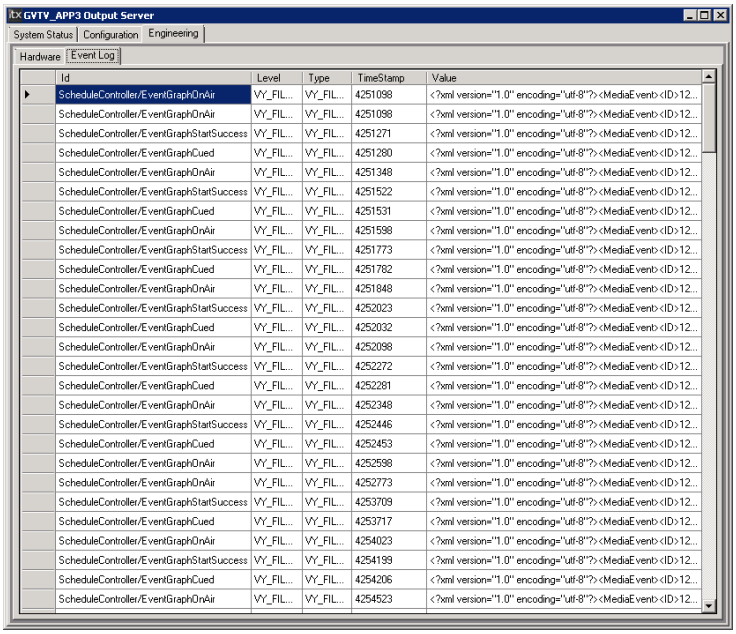
About the Hardware Tab

The Hardware tab shows the input status of the video/audio I/O card and information about the File Processing Pipeline. It also allows you to select the I/O Device and also adjust the audio synchronization for the current clip.



About the Event Log

The Event Log displays events sent from FPP to Output Server 2. This information can be used by GV Care to diagnose potential issues with either FPP or Output Server 2.



Honoring NTSC SD Field Orders

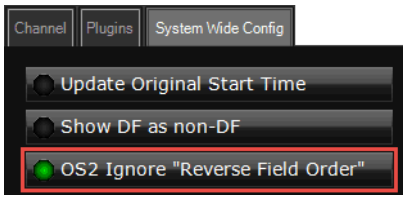
In an Output Server 1 system, the field order for NTSC SD assets often had to be reversed on a per-asset basis for video to playout as expected. This was done by checking the **Reverse Field Order** checkbox on the **Asset** tab of the **Asset** layout in **iTX Desktop.** Output Server 2 is

able to interpret the field order from the media itself. As such, Output Server 2 defaults to ignoring the Reverse Field Order checkbox and plays out the asset as the media dictates.

If you are operating a mixed Output Server system, you may not want Output Server 2 playout servers to ignore assets with reversed field orders. This can be controlled using a global configuration called **OS2 Ignore "Reverse Field Order"**. If this option is set incorrectly for you system, your NTSC SD assets it may play out incorrectly (juddering or shaking).

To configure OS2 to honor Reverse Field Order:

1 On a playout server that is running Output Server 2, start the **iTX Desktop** client.
2 Log in with a system administrator profile.
3 Open the **Engineering** layout.
4 Click **Channel Config**.
The **Channel Config** pop-up layout appears.
5 Click the **System Wide Config** tab.
6 The **OS2 Ignore "Reverse Field Order"** field is enabled (lit green) by default.



Click **OS2 Ignore "Reverse Field Order"** to disable it.
7 Click **Close**.
8 The Channel Config pop-up layout closes.

> Note: For Output Server 2, a video asset's detected field order can be seen in the **Field Order** field on the **Locations** tab in the **Asset** layout of **iTX Desktop**.

Maintaining Custom Aspect Ratio Control (ARC) Modes

Custom ARC modes are stored in the iTX database, so when one is created it is available to all channels within the same iTX domain. As such, editing or deleting a custom ARC mode affects all of the channels using it.

Editing a custom ARC mode

> Note: Custom ARC modes can be edited at any time and the very next scheduled item to be played out with matching field values will have its ARC operation and AFD code changed accordingly. This includes those in schedules on other channels that use the same custom ARC mode.

To edit a custom Aspect Ratio Control mode:

1 Open the iTX Desktop and click the **Engineering** layout.
2 Click **Channel Config**.

The **Channel Config** pop-up layout appears.

3 From the **View** list, select the view containing the channels to be configured. The channels associated with that view appear.

4 Click the name of the channel to be configured.

5 Click the **Channel Config 4** tab.

6 In the **Advanced Aspect Ratio Control** panel, click **Configure Mapping...**

The **Advanced Aspect Ratio Control - Mapping Configuration** dialog appears.

7 In the **Advanced Aspect Ratio Control - Mapping Configuration** dialog, click **Select....**

The **Select Item** dialog appears.

8 Select the ARC mode to be edited then click **OK**.

The select custom ARC mode and its settings appears.

9 Modify the Input and Output Aspect Ratio, size and position as required. For more information see About Custom Aspect Ratio Control (ARC) Modes, on page 57.

10 When you have finished making changes, click **Save**.

11 Click **Close**.

You are returned to the **Advanced Aspect Ratio Control - Mapping Configuration** dialog.

Deleting a custom ARC mode

It is possible to delete a custom ARC mode from any iTX channel. If the deleted custom ARC is still in use (either on the selected channel or any other channel), iTX will automatically restore it.

To delete a custom Aspect Ratio Control mode:

1 Open the iTX Desktop and click the **Engineering** layout.

2 Click **Channel Config**.

The **Channel Config** pop-up layout appears.

3 From the **View** list, select the view containing the channels to be configured. The channels associated with that view appear.

4 Click the name of the channel to be configured.

5 Click the **Channel Config 4** tab.

6 In the **Advanced Aspect Ratio Control** panel, click **Configure Mapping...**

The **Advanced Aspect Ratio Control - Mapping Configuration** dialog appears.

7 In the **Advanced Aspect Ratio Control - Mapping Configuration** dialog, click **Select....**

The **Select Item** dialog appears.

8 Select the ARC mode to be deleted then click **OK**.

The select custom ARC mode and its settings appears.

9 Click **Delete**.

The item is deleted with no further confirmation or prompts and the first custom ARC in the select list is displayed.

10 Click **Close.**

You are returned to the **Advanced Aspect Ratio Control - Mapping Configuration** dialog.

11 Click **OK** to close the **Advanced Aspect Ratio Control - Mapping Configuration** dialog.

About Restored Custom ARC Modes

If the custom ARC mode was assigned to a channel, it is not removed from the iTX database.

When the Advanced Aspect Ratio Control - Mapping Configuration dialog is next accessed from a channel using a deleted custom ARC, a warning will appear to say the deleted custom ARC mode has been restored.

If a new custom ARC is created with the same name as a deleted custom ARC, when the deleted one is restored, its name is appended with a dash then a number. e.g. a custom ARC mode called `example_custom_arc` would be restored as `example_custom_arc-1`.

To permanently delete a custom ARC mode, it must be unassigned on every channel that is using it before being deleted.

Deleting a Channel

Channels can be deleted from the ITX Channel Config dialog of TXPlay 2 Config.

IMPORTANT
- You must make sure you stop the instances of TXPlay 2 and Output Server 2 associated with the channel to be deleted before you begin.
- Deleting a channel from an playout server does not remove it from any views in iTX Desktop.

To delete a channel:

1 On the Windows desktop of the playout server, double-click on the **TXPlay 2 Config** icon. The **ITX Channel Config** dialog appears.

2 If there is more than one channel configured on the playout server, select the channel to be deleted from the **Channel Name** drop-down list.

3 Click **Delete Channel**.

The channel disappears from TXPlay 2 Config.

4 Click **Save** to confirm the deletion.

Downgrading from Output Server 2 to Output Server 1

It is possible to downgrade from Output Server 2, back to Output Server 1, if required. iTX stores the configuration data for both versions of the service separately, so that after rolling back to Output Server 1 you will be reverted to its own configuration settings.

IMPORTANT
- Output Server 1 does not support dual channel or simulcast broadcasting. If you require this functionality you must use Output Server 2.
- Before reinstalling Output Server 1, you must uninstall and delete the v12.1.0.107 AJA video card drivers on your playout server, then reinstall v7.4.0.49 drivers.

To downgrade from Output Server 2 back to Output Server 1:

1. Access and open the iTX Installer files.
2. Right-click the **Setup.exe** file and select **Run as administrator**.
3. Click S**ELECT SOFTWARE**.
4. Expand the **Playout** section
5. Uncheck **Output Server 2**
6. Click **OK** to return to the **iTX Installer** dialog.
7. Click **CONTINUE**. Allow Output Server 2 to uninstall completely.
8. Click **FINISH** to complete the uninstall.
9. Uninstall and delete the v12.1.0.107 AJA video card on your playout server, then reinstall v7.4.0.49. These can be found in the Drivers folder of the iTX Suite.
10. Restart the iTX Installer.
11. Click **SELECT SOFTWARE**.
12. Expand the **Playout** section
13. Check **Output Server 1.**
14. Click **OK** to return to the **iTX Installer** dialog.
15. Click **CONTINUE** to reinstall Output Server 1.
16. Finish the installation as normal.

Grass Valley Technical Support

For technical assistance, contact our international support center, at 1-800-547-8949 (US and Canada) or +1 530 478 4148.

To obtain a local phone number for the support center nearest you, please consult the Contact Us section of Grass Valley's website (www.grassvalley.com).

An online form for e-mail contact is also available from the website.

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