7847FSEDA Series
Frame Synchronizer and Distribution Amplifier
User Manual

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IMPORTANT SAFETY INSTRUCTIONS

⚡	The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated "Dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.
!	The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (Servicing) instructions in the literature accompanying the product.

- Read these instructions
- Keep these instructions.
- Heed all warnings.
- Follow all instructions.
- Do not use this apparatus near water
- Clean only with dry cloth.
- Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles and the point where they exit from the apparatus.
- Only use attachments/accessories specified by the manufacturer
- Unplug this apparatus during lightning storms or when unused for long periods of time.
- Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

WARNING TO REDUCE THE RISK OF FIRE OR ELECTRIC – SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE
WARNING DO NOT EXPOSE THIS EQUIPMENT TO DRIPPING OR SPLASHING AND ENSURE THAT NO OBJECTS FILLED WITH LIQUIDS ARE PLACED ON THE EQUIPMENT
WARNING TO COMPLETELY DISCONNECT THIS EQUIPMENT FROM THE AC MAINS, DISCONNECT THE POWER SUPPLY CORD PLUG FROM THE AC RECEPTACLE
WARNING THE MAINS PLUG OF THE POWER SUPPLY CORD SHALL REMAIN READILY OPERABLE

INFORMATION TO USERS IN EUROPE

NOTE

CISPR 22 CLASS A DIGITAL DEVICE OR PERIPHERAL

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to the European Union EMC directive. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CE	EN60065 Safety EN55103-1: 1996 Emission EN55103-2: 1996 Immunity

	EN504192 2005 Waste electrical products should not be disposed of with household waste. Contact your Local Authority for recycling advice

INFORMATION TO USERS IN THE U.S.A.

NOTE

FCC CLASS A DIGITAL DEVICE OR PERIPHERAL

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

WARNING

Changes or Modifications not expressly approved by Evertz Microsystems Ltd. could void the user's authority to operate the equipment.

Use of unshielded plugs or cables may cause radiation interference. Properly shielded interface cables with the shield connected to the chassis ground of the device must be used.

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REVISION HISTORY

<u>REVISION</u>	<u>DESCRIPTION</u>	<u>DATE</u>
0.1	Preliminary Release	Jan 2016

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1.   OVERVIEW

The 7847FSEDA-3G-F-2 and 7847FSEDA-HD-F-2 are dual path broadcast quality Frame Synchronizers and Distribution Amplifiers that support SD, HD and 3G (*[-3G] option*) video formats. The 7847FSEDA series supports one coax and one fiber optic input on a per path basis. Using a software selection process, the fiber optic or coax input signal may be utilized for subsequent module processing that feeds the program outputs (PGM OUT). Fiber inputs/outputs are supported via pluggable Evertz SFP modules (Rx: SFP3R-2, Tx: SFP3T13-2). Coax inputs are supported via HD-BNCs or DINs ([+DIN] Rear-plate ordering option). Two re-clocked DA outputs of either the Fiber or Coax input signal are present on HD-BNC/DIN outputs for connection to external elements like patch panels. Four fully processed fiber outputs and six fully processed coax outputs are presented on a per path basis.

The core processing features of the 7847FSEDA include Source Identification (Source ID) tag insertion, frame synchronization to external reference with H/V phase adjustment, feature rich video adjustment (colour correction, hue/gain/video level adjustments), image enhancement, audio channel shuffling, audio and video delay adjustments, 5.1 audio downmix processing and advanced audio & video monitoring. See Figure 1-1 for a detailed system block diagram illustrating signal flow and processing from input to output.

Additional audio processing features available on the 7847FSEDA include IntelliGain® Audio Loudness Processing [+IG2], and stereo to 5.1 up-mixing [+UMX2]. See Figure 1-2 for a system level view of the 7847FSEDA audio processing.

Source ID tags inserted by the 7847FSEDA include extensive information about the video signal and its transmission history. The 7847FSEDA supports processing of up to 16 Source ID tags. Key information elements inserted into each Source ID tag include DATE, TIME, BASE LABEL, ALIAS LABEL and USER CODE information.

The 7847FSEDA is a dual slot card. A 7800FR or 7800FR-QT can therefore support 14 paths of processing within a 3RU form factor. The 7847FSEDA shares a common rear panel with the both 7815VPDA and 7815IDA series. This allows 7847FSEDA modules to be interchanged with 7815VPDA or 7815IDA modules for additional video processing capabilities, such as frame synchronization, Up/Down/Cross conversion and IP video encoding, without requiring a change to the backplane interconnect.

These modules are SNMP capable for remote monitoring, control and configuration purposes using VistaLINK® PRO. VistaLINK® PRO control and monitoring is available when modules are used with a 7800FC in slot 1 of the 7800FR frame.

Summary of 7847FSEDA Series Features:

- Dual path Video Processor and Distribution Amplifier
- 14x paths of processing in 3RU
- Comprehensive DA functionality with 6x processed coax outputs and 4x processed fiber outputs per path
- 2x coax outputs of re-clocked fiber or coax inputs per path
- SFP module based fiber inputs (Evertz SFP3R-2) and outputs (Evertz SFP3T13-2)
- HD-BNC or DIN [+DIN] based coax inputs/outputs
- Frame synchronization to reference input with H/V phase adjustment

- Full featured video adjustment module
  - o Colour space conversion, colour correction, hue/gain/video level adjustments
- Image enhancement processing
- 16 channel audio embedding/de-embedding
- 5.1 to stereo down-mixing (LoRo/LtRt/Custom)
- VistaLINK® PRO and SNMP enabled
- Source ID tagging support
- Advanced Audio Monitoring & Alarming (Loss / Silence & Loudness Thresholds)
- Advanced Video Monitoring & Alarming (Loss / Freeze / Black & White Level Thresholds)

[+UMX2] Auto Stereo to 5.1 Upmix Processor Features:

- Auto detection of stereo (2-ch) or surround (5.1 ch) input audio
- Automatically upmixes stereo (2-ch) to surround (5.1 ch)
- Audio input mixer processing (source / gain / invert)

[+IG2] IntelliGain 16-channel Loudness Processor Features:

- Normalize loudness of audio programs to a target level
- Supports up to 16 programs and 16 channels (*per video path*)
- Relatively constant gain within a program interval to preserve audio dynamic range
- Simultaneously process multiple multi-channel programs
- User adjustable attack and release times
- Loudness algorithm based on ITU-R BS.1770-3
- Peak limiting
- LKFS calculations
- Momentary, short term and integrated loudness measurements

1.1. PRODUCT OPTIONS

This manual covers all variations and ordering options for the 7847FSEDA series platform. There are a number of different possible configurations of the 7847FSEDA. The supported product options can be easily described using the product formula below. All product configurations that satisfy the formula are valid, and are supported by the 7847FSEDA series.

$$\text{7847FSEDA \{-HD / -3G\} -F-2 [+UMX2] [+IG2]}$$

Where:
> { } = Mandatory
> [ ] = Optional
> /   = OR logic
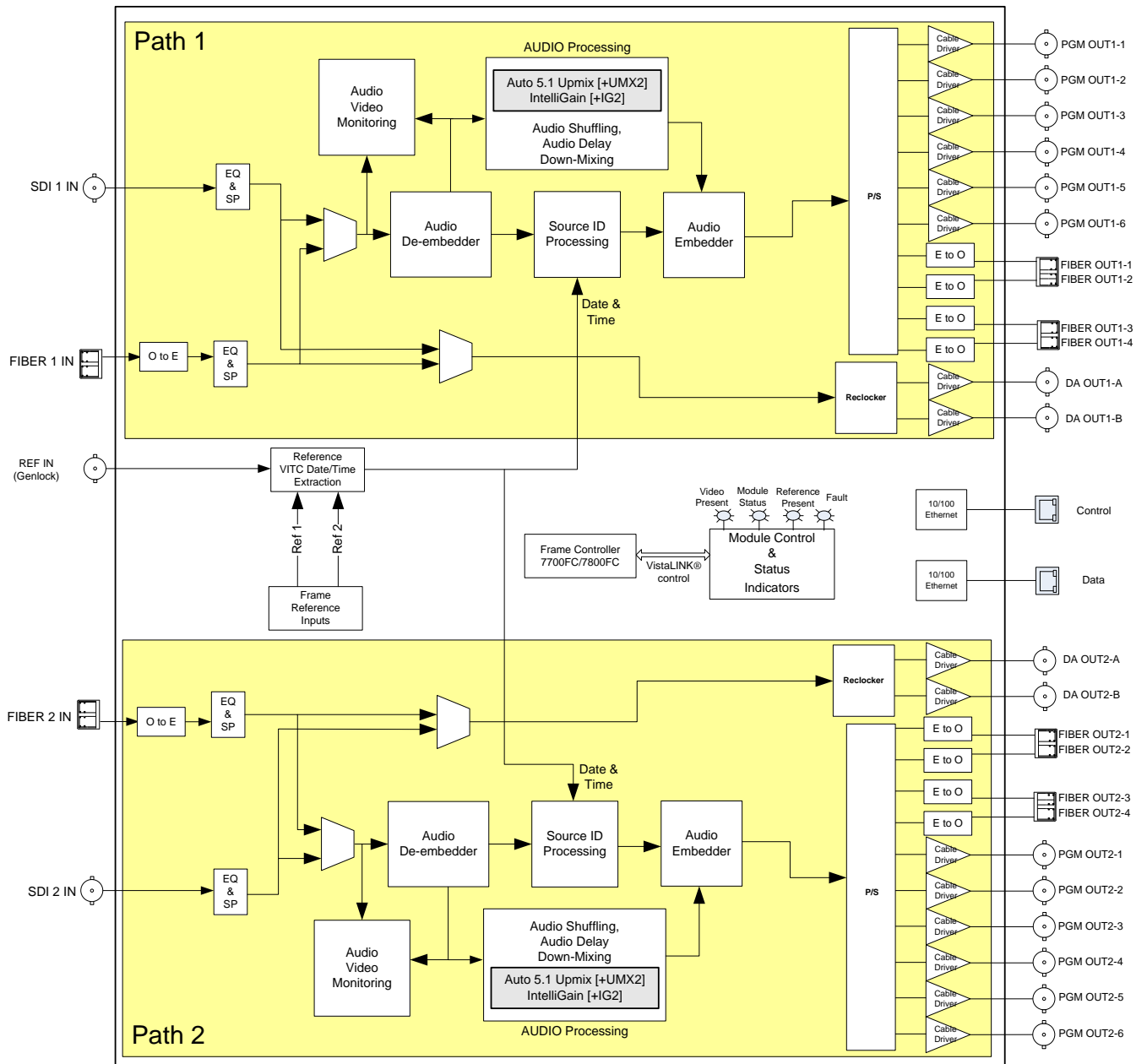
Figure 1-1: 7847FSEDA System Block Diagram
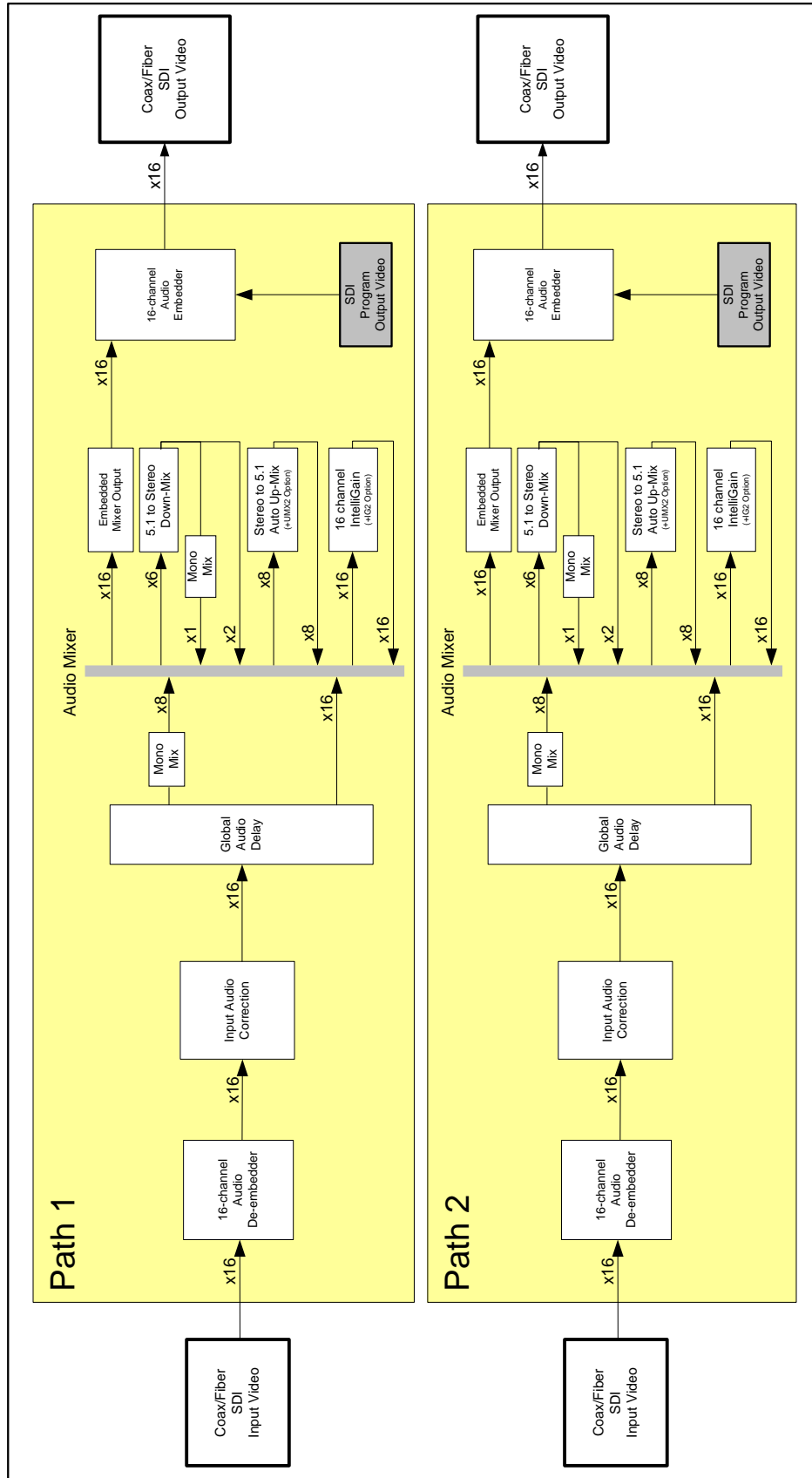
Figure 1-2: 7847FSEDA Audio Block diagram

2. GETTING STARTED

All 7847FSEDA series modules come with a companion rear plate and occupy two slots in the 7800FR frame or three slots in the 7700FR-C. If a 7847FSEDA series module is installed in a 7700FR-C without the *slot blocker* installed, the card will not power-up and the LOCAL FAULT LED will be on (See Section 6.2 for details). For information on mounting the rear plate and inserting the module into the frame see section 3 of the 7700FR manual. Refer to Figure 2-1 for 7847FSEDA series rear plate layout.

> **NOTE:** For proper operation in the 7700FR-C, the on-board *slot blocker must be* installed.

> **NOTE:** The 7847FSEDA, 7815IDA and 7815VPDA all use an identical rear-plate. This allows 7815VPDA or 7815IDA modules to be interchanged with 7847FSEDA modules for different video processing capabilities, such as Up/Down/Cross conversion and IP video encoding, without requiring a change to the backplane interconnect.
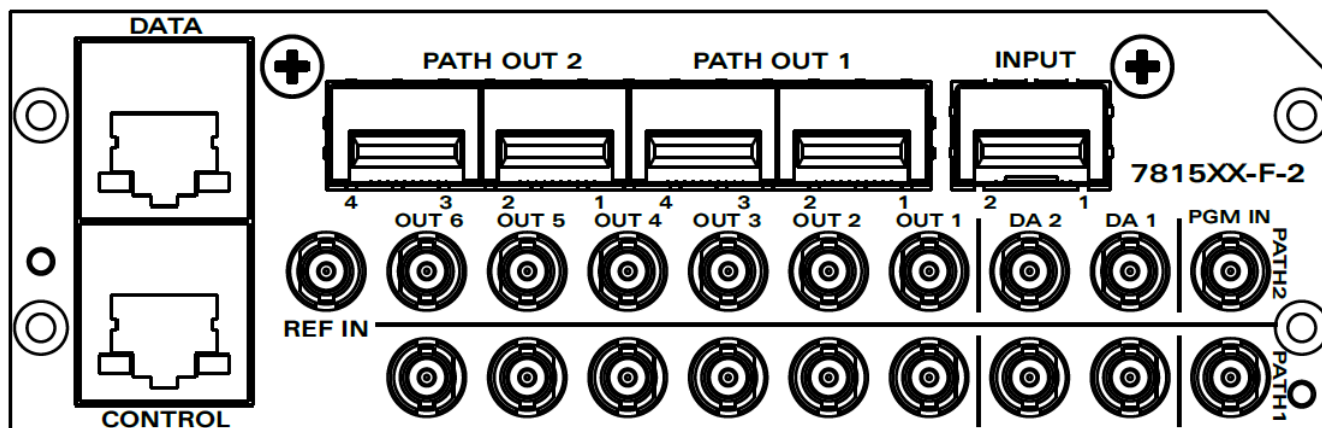
Figure 2-1: 7815XX-F-2 Rear Plate Layout

2.1.   INPUT / OUTPUT CONNECTIONS

PGM IN: Accepts a 10-bit serial digital video signal (SDI) compatible with SMPTE 259M, SMPTE 292M and SMPTE 425M. The module can be set to receive a specific video standard or set to automatically detect the supplied input video standard. PGM IN or FIBER IN can be selected for subsequent video processing.

FIBER IN: Accepts a 10-bit SDI compatible with SMPTE 259M, SMPTE 292M and SMPTE 425M. The module can be set to receive a specific video standard or set to automatically detect the supplied input video standard. PGM IN or FIBER IN can be selected for subsequent video processing.

COAX OUT (1-6):   These BNC connectors are used to output 10-bit SDI compatible with SMPTE 292M, SMPTE 259M or SMPTE 425M.

FIBER OUT (1-4):   These fiber connectors are used to output 10-bit SDI video compatible with SMPTE 292M, SMPTE 259M or SMPTE 425M.

DA OUT (1-2):   These BNC connectors are used to output reclocked 10-bit SDI input video compatible with SMPTE 292M, SMPTE 259M or SMPTE 425M.

REF IN: This BNC is for connecting a bi-level or tri-level reference. Reference format is auto-detected by the module. Reference may also be supplied via the 7700FR-G and 7800FR FRAME REFERENCE inputs. User can select the reference source to be either the card's external reference or one of the FRAME REFERENCE BNC.

2.2. ETHERNET CONNECTIONS

All 7847 series modules are designed to use either 10Base-T (10 Mbps) or 100Base-TX (100 Mbps) also known as *Fast Ethernet*, twisted pair Ethernet cabling systems. When connecting for 10Base-T systems, category 3, 4, or 5 UTP cable as well as EIA/TIA – 568-100Ω STP cable may be used. When connecting for 100Base-TX systems, category 5 UTP cable is required. To establish the network connection, plug one end of a *straight through* cable into the RJ-45 receptacle of the 7847FSEDA module and the other end into a port of the supporting hub. If you are connecting the 7847FSEDA series module directly to an Ethernet port on a computer, you will have to use a *crossover* cable.

Straight-through RJ-45 cables can be purchased or can be constructed using the pin out information in Table 2-1 for the current RJ-45 standards (AT&T 258A or EIA/TIA 258B colour coding shown). Also, refer to the notes following the table for additional wiring guide information.
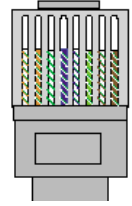
	Pin #	Signal	EIA/TIA 568A	AT&T 258A or EIA/TIA 568B	10BaseT or 100BaseT
Pin 1	1	Transmit +	White/Green	White/Orange	X
	2	Transmit –	Green/White or White	Orange/White or Orange	X
	3	Receive +	White/Orange	White/Green	X
	4	N/A	Blue/White or Blue	Blue/White or Blue	Not used (required)
	5	N/A	White/Blue	White/Blue	Not used (required)
	6	Receive –	Orange/White or Orange	Green/White or Green	X
	7	N/A	White/Brown	White/Brown	Not used (required)
	8	N/A	Brown/White or Brown	Brown/White or Brown	Not used (required)

Table 2-1: Colour Code Wiring for the Current RJ45 Standards

Note the following cabling information for this wiring guide:

- Only two pairs of wires are used in the 8-pin RJ 45 connector to carry Ethernet signals.
- Even though pins 4, 5, 7 and 8 are not used, it is mandatory that they be present in the cable.
- 10BaseT and 100BaseT use the same pins; a crossover cable made for one will work with the other.
- Pairs may be solid colours and not have a stripe.
- Category 5 cables must use Category 5 rated connectors.

The maximum cable run between the 7847FSEDA series modules and the supporting hub is 300 ft (90 m).

2.2.1. Ethernet Ports

CONTROL: This port is purposed for connection to the facilities control network. The network IP configuration can be setup for the CONTROL port in the IP tab of the VistaLINK® PRO 7847FSEDA module global configuration view. See section 5.1.3 IP for further details.

> **NOTE:** The 7847FSEDA series does not currently support SNMP configuration via the CONTROL port. A 7700FC/7800FC must be used for module configuration.

DATA: This port is purposed for connection to the facilities data network. This port is not currently used on the 7847FSEDA series.

> **NOTE:** The 7847FSEDA does not support configuration of the DATA port. It is not used on the 7847FSEDA. The DATA port is used exclusively for IP streaming encoded video. This is an available option [+SLKE2] on the 7815VPDA.

2.2.2. Ethernet Status LEDs

GREEN LED: The GREEN LED reports Link/Act activity. When it is GREEN FLASHING, traffic is present on the port (either Tx or Rx). When it is OFF, no activity is present on the port.

YELLOW LED: The YELLOW LED reports connection speed. When it is ON, a 1Gbps link has been established. When it is OFF, either a 10Mbps or 100Mbps link has been established.

3. SPECIFICATIONS

3.1. SERIAL DIGITAL VIDEO INPUT

Standard:	2.970 Gb/sec SMPTE 425M
Number of Inputs:	1(PGM IN) *per video path*
Connector:	HD BNC 1.0/ DIN
Signal Level:	1V nominal
Input Equalization:	Automatic to 80m @ 2.970 Gbs with Belden 1694 or equivalent
Return Loss:	>15 dB to 1.5 GHz
	>10 dB to 3.0 GHz

3.2. SERIAL DIGITAL VIDEO OUTPUT

Standard:	2.970 Gb/sec SMPTE 425
Number of Outputs:	6 (per video path)
Connector:	HD BNC 1.0/ DIN
Signal Level:	800mV Nominal
SD Rise/Fall Times:	740ps nominal
HD Rise/Fall Times:	200ps nominal
Return Loss:	>15 dB to 1.5 GHz
	>10 dB to 3.0 GHz

3.3. OPTICAL DIGITAL VIDEO INPUT

Module:	Evertz SFP3R-2
Number of Inputs:	2 per module
Connector:	LC/UPC
Fiber:	Compatible with Singlemode or 50/62.5µm Multimode
Operating Wavelength:	1270nm to 1610nm
Maximum Input Power:	-1dBm
Optical Sensitivity:	-21dBm at 2.97GB/s pathological Level A
	-23dBm at 2.97GB/s color bars

3.4. OPTICAL DIGITAL VIDEO OUTPUT

Module:	Evertz SFP3T13-2 (Up to 4x modules)
Number of Outputs:	2 per module
Connector:	LC/UPC
Fiber:	Compatible with Singlemode or 50/62.5µm Multimode
Optical Power:	-2dBm ± 1dBm
Operating Wavelength:	1310nm

3.5. REFERENCE VIDEO INPUT

Type:	HD Tri-Level sync, NTSC or PAL Colour Black 1 V p-p
Connector:	HD BNC/ DIN
Termination:	75 ohm *(Termination is user configurable – enable / disable)*

3.6. ELECTRICAL

Voltage: +12VDC
Power: 32 Watts
EMI/RFI: Complies with FCC regulations for class A devices.
                              Complies with EU EMC directive

3.7. PHYSICAL

Number of slots
        7800FR Frame: 2
        7700FR-C Frame: 3 (slot blocker must be installed for proper installation)

4.   STATUS LEDS

4.1.   MODULE STATUS LEDS

Figure 4-1 depicts status LEDs for the 7847FSEDA series modules. LEDs are in the same position and perform the same function as the 7815VPDA and 7815IDA series modules.
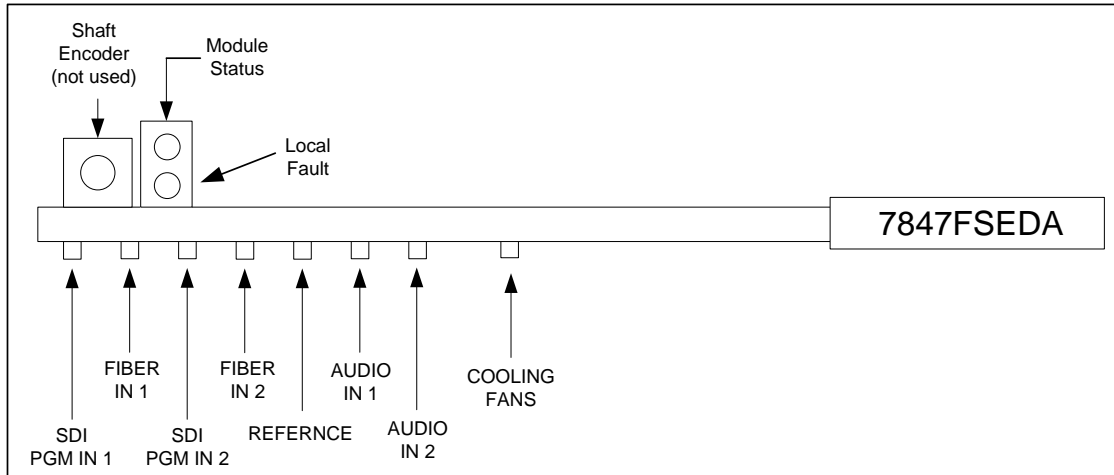
Figure 4-1: 7847FSEDA Status LEDs

MODULE STATUS:	This Green MODULE STATUS LED will be ON when the module has valid video on one of its inputs.
LOCAL FAULT:	This Red LOCAL FAULT LED will be ON when no valid video standard is detected on both input video paths.
SDI PGM IN 1:	The SDI PGM IN 1 LED will be GREEN when a valid input standard is detected on SDI PGM IN for video path 1. OFF otherwise.
FIBER IN 1:	The FIBER IN 1 LED will be GREEN when a valid input standard is detected on FIBER IN for video path 1. OFF otherwise.
SDI PGM IN 2:	The SDI PGM IN 2 LED will be GREEN when a valid input standard is detected on SDI PGM IN for video path 2. OFF otherwise.
FIBER IN 2:	The FIBER IN 2 LED will be GREEN when a valid input standard is detected on FIBER IN for video path 2. OFF otherwise.
REFERENCE:	The REFERENCE LED will be GREEN when a valid reference video standard is detected. OFF otherwise.
AUDIO IN 1:	The AUDIO IN 1 LED will be GREEN when embedded audio group 1 is present on the input video standard signal processed by video path 1. OFF otherwise.
AUDIO IN 2:	The AUDIO IN 2 LED will be GREEN when embedded audio group 1 is present on the input video standard signal processed by video path 2. OFF otherwise.
COOLING FANS	The COOLING FANS LED will be GREEN when both cooling fans are operating properly. OFF when either fan, or both fans are in error.

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5.   VISTALINK® PRO INTERFACE

The 7847FSEDA series products are controlled using VistaLINK® PRO. VistaLINK® PRO operates using Ethernet and SNMP control protocols. The 7847FSEDA series modules <u>DO NOT HAVE</u> card edge controls. As a result, 7700FC/7800FC modules must be installed in all frames that house 7847FSEDA series modules.

Within VistaLINK® PRO the 7847FSEDA series modules have a set of system configuration controls, as well as groups of controls designated for each of the two independent video processing paths. The system configuration controls can be accessed by *right-clicking* on the module in the VistaLINK® PRO hardware tree, and selecting *view configuration.* The video path configuration controls can be accessed by expanding the 7847FSEDA module sub-tree (*click on the '+' symbol beside the module name in the VistaLINK® PRO hardware tree*), then *right-clicking* on the desired video path (*Video Path 1 or Video Path 2*) and selecting *view configuration*. Figure 5-1 illustrates how a 7847FSEDA module will appear in the in the VistaLINK® PRO hardware tree.
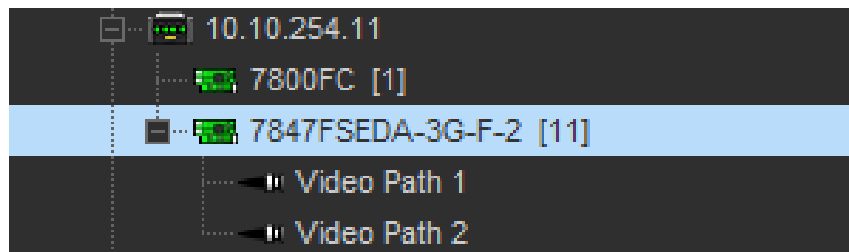
Figure 5-1: 7847FSEDA in VistaLINK® PRO Hardware Tree

NOTE: When using VistaLINK® PRO it is important to ensure that the most recent 7847FSEDA series "JAR" control file is installed. See Section 7.1 for details on how to upgrade the 7847FSEDA series VistaLINK® PRO JAR file.

5.1. SYSTEM CONFIGURATION

5.1.1. General

The General control tab reports system status monitoring and version information. This includes module temperature and active cooling fan statuses.

Figure 5-2 illustrates the layout of the general system status information in the VistaLINK® PRO global configuration view.

> **NOTE:** If any of the cooling fan statuses report a failure, the module should be powered down immediately to avoid overheating and subsequent damage to the module. Contact Evertz for further assistance in replacing the failed modules.
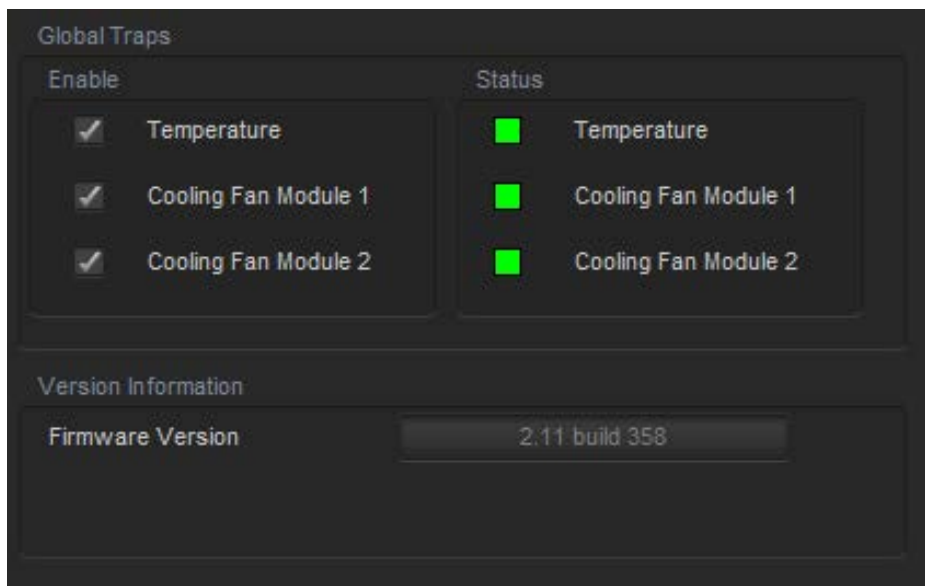
Figure 5-2: System Configuration - General Tab

To enable/disable a specific fault trap, check/uncheck the corresponding checkbox.

Global Traps
   Temperature: This trap will alarm when the temperature of the modules exceeds 78°C.

   Cooling Fan Module: These traps will alarm when there is a fan failure detected.

Version Information
   Firmware Version: Reports the active firmware version running on the main proceesing module.

5.1.2. Reference

The reference control tab contains all controls that configure the operation of the reference processing from a module level. Additional controls that are specific to each video processing path are located in the corresponding video configuration view Reference control tab.

The video reference signal can be sourced from either the modules REF input connection on the rear plate, or either of the FRAME REF inputs on the 7800FR or 7700FR-G frames.

The 7847FSEDA series supports locking to *525i/59.94Hz* and *625i/50Hz* bi-level reference signals, and *1080i/59.94Hz* and *1080i/50Hz* tri-level reference signals.

The auto-reference fail-over feature is used to automatically lock to secondary (*lower priority*) reference input signals when the main (*priority 1*) reference drops out. This improves robustness of the system, and ensures the output timing remains locked to the desired reference timing in the event of failure on the primary reference input.

Figure 5-3 illustrates the layout of the reference controls in the VistaLINK® PRO global configuration view.
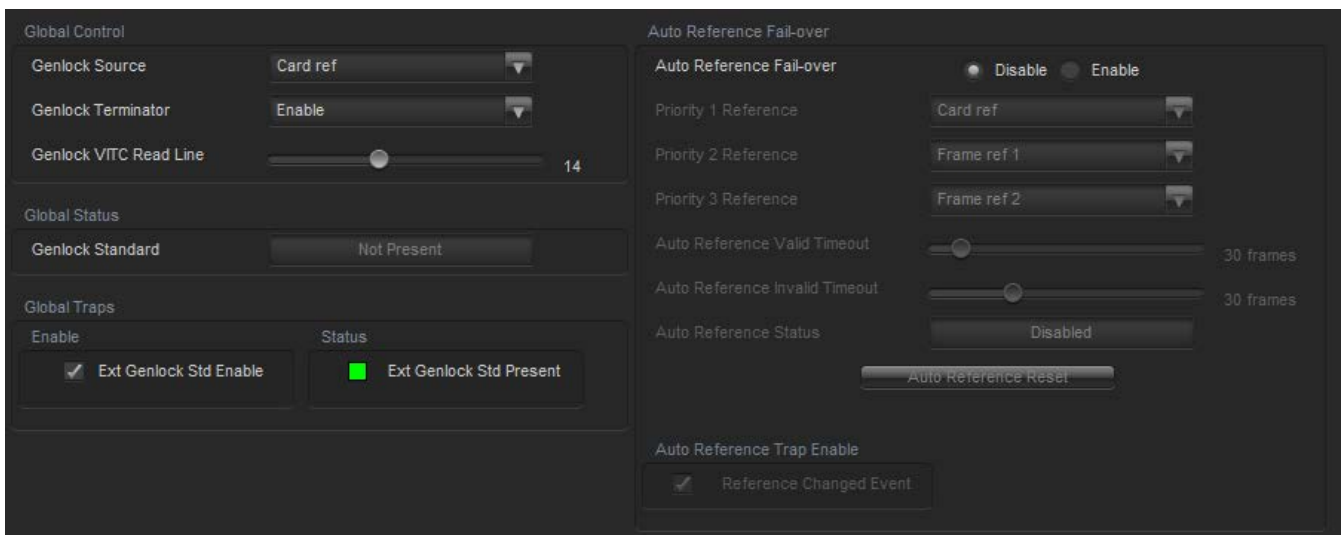
Figure 5-3: System Configuration - Reference Tab

Global Control

Genlock Source: This control is used to configure which reference input connector is selected as the Genlock input signal. When ***Card Ref*** is selected, the module will be sourced by the external reference signal applied to the module's rear panel. When ***Frame 1*** is selected, the module will lock to the external reference applied to the 7800 frame ***REF 1*** input. When ***Frame 2*** is selected, the module will be sourced by the external reference applied to the 7800 frame ***REF 2*** input.

Genlock Terminator: This control specifies if a 75 ohm termination is applied to the input reference signal.

Genlock VITC Read Line: This control specifies the line number where VITC time code will be extracted from the input reference signal.

Global Status
   Genlock Standard: This field displays if a valid video reference has been detected on the selected reference input. It reports the detected reference video standard when a valid reference is applied.

Global Traps
   External Genlock Std Present: Enabling this trap will trigger a fault when an external genlock signal is either not present or the module is unable to detect a valid supported reference video standard.

Auto Reference Fail-over
   By enabling this option the user will set enable automatic reference failover for the device in the case of a loss of reference.

   Priority 1 Reference: This control allows the user to set the main reference. If present, this reference will be used as the source to the module.

   Priority 2 Reference: This control allows the user to set the second reference in the case of a failure or loss of the priority 1 reference signal.

   Priority 3 Reference: This control allows the user to set the third reference in the case of a failure or loss of the priority 1 and 2 reference signals.

   Auto Reference Valid Timeout: This control allows the user to select the amount of time (in frames) a reference has to be valid before it is considered to be present and can be locked to.

   Auto Reference Invalid Timeout: This control allows the user to select the amount of time (in frames) a reference has to be missing before it is considered to be absent.

   Auto Reference Status: This field displays the active priority and reference source of the auto reference failover.
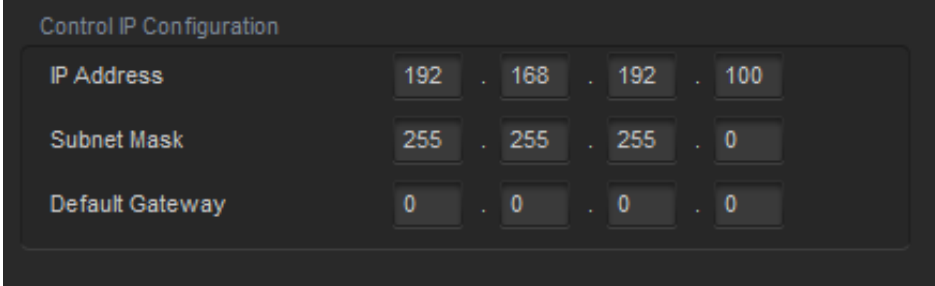
Auto Reference Trap Enable: This field allows the user to enable an event trap which will notify of any changes in the reference source.

5.1.3. IP

The IP tab presents the 7847FSEDA networking configuration controls. Figure 5-4 illustrates the IP controls as presented in the IP tab of the global configuration view.

> **NOTE:** The 7847FSEDA does not support configuration of the DATA port. It is not used on the 7847FSEDA. The DATA port is used exclusively for IP streaming encoded video. This is an available option [+SLKE2] on the 7815VPDA.

Figure 5-4: System Configuration - IP Tab

IP Address: This control allows the user to assign an IP address to the CONTROL port of the 7847FSEDA card.

Netmask Address: This control allows the user to define the Netmask/Subnet for the CONTROL port.

Gateway Address: This control allows the user to define the Gateway/Router address for the CONTROL port, which will allow the card to communicate with devices on other networks.

5.1.4. Change Product

This configuration tab provides the ability to perform product string changes. There are a number of product options on the 7847FSEDA. Product options can be added to a 7847FSEDA at any point using these configuration controls. Figure 5-5 illustrates the layout of the controls in the VistaLINK® PRO global configuration view.

> **NOTE:** A unique checksum must be generated to support a product string change on the 7847FSEDA. Please contact Evertz if you are interested in upgrading the feature set of your 7847FSEDA.
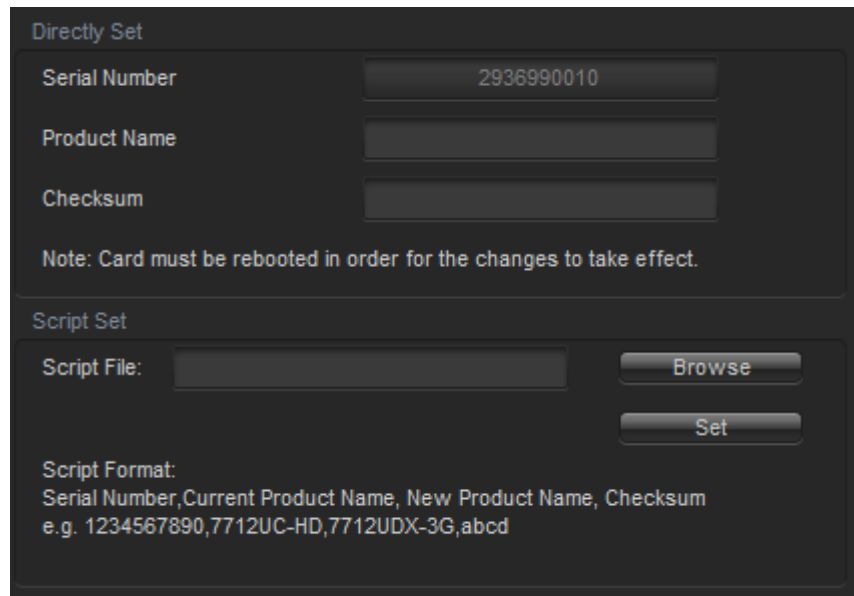
Figure 5-5: System Configuration - Change Product Tab

Directly Set
  Serial Number: The serial number is loaded by the manufacturer and is displayed here (read-only).

  Product Name: The product name entry area will be used to enter in the name of the product that the module will be upgraded to.

  Checksum: The checksum location will contain the verification code that the Evertz sales department will provide when the options have been purchased.

> **NOTE:** The Product name and the checksum NEED to be entered the exact same way as provided by the Evertz or the process will not work.

Script Set
  Script File: When upgrading multiple 7847FSEDA cards a script file can be used to make the upgrade process easier. The required format of the script file is:

    <board serial number>,<current product string>,<new product string>,<checksum>

  If using a script file for upgrading the product string, follow these steps:

  1. Browse to the location of the file on your computer
  2. Press set to send the script file to the card

5.1.5. Fiber RX

The Fiber RX tab contains all control and status related to the optical fiber SFP receiver. If the Fiber receiver SFP is not installed in the correct location on the 7847FSEDA rear-plate, the status will report 'Not detected' and 'N/A'.

Figure 5-6 illustrates the layout of the controls in the VistaLINK® PRO global configuration view.
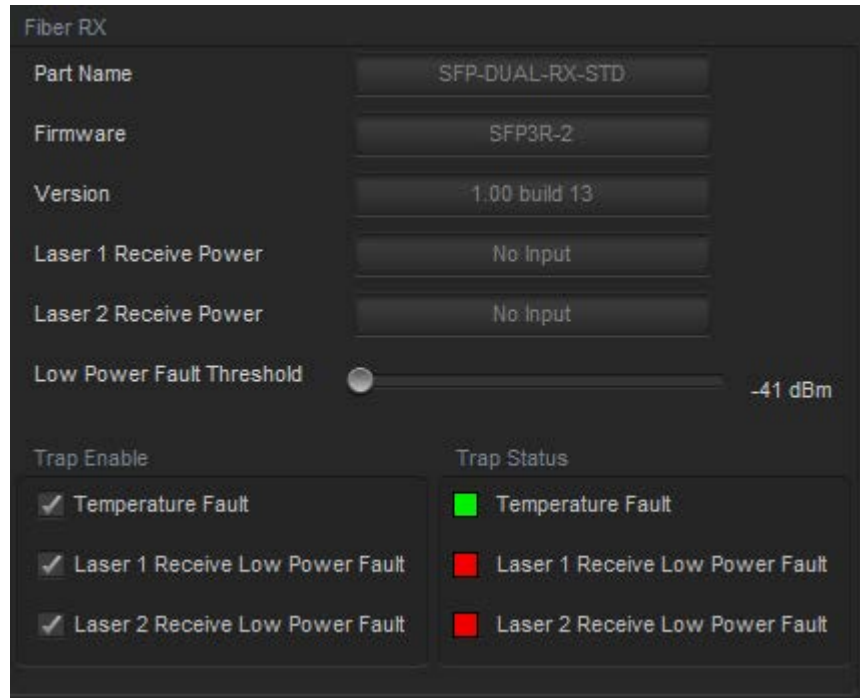
Figure 5-6: System Configuration - Fiber RX Tab

Part Name: This field displays the part name for the detected SFP fiber module.

Firmware: This field displays the current firmware type running on the SFP fiber module.

Version: This field displays the current firmware version of the SFP fiber modules.

Laser 1 Receive Power: This field reports laser 1 received power measured by the SFP in dBm.

Laser 2 Receive Power: This field reports laser 2 received power measured by the SFP in dBm.

Low Power Fault Threshold: This control allows the user to set the receive power threshold below which the low power faults will be triggered for either laser 1 and/or laser 2.

Trap Enable and Trap Status
   To enable/disable a specific fault trap, check/uncheck the corresponding checkbox.

   Temperature Fault: This trap will trigger when the receiver module exceeds 100°C.

   Laser Receive Low Power Fault: This trap will trigger when the receiver power level drops below the *Low Power Fault Threshold* specified above.

5.1.6. Fiber TX

The Fiber TX tab contains all control and status related to the optical fiber SFP transmitters. The 7847FSEDA supports up to 4 SFP modules (2 modules per video path). If the Fiber transmitter SFP is not installed in the specific location on the 7847FSEDA rear-plate, the status will report 'Not detected' and 'N/A'.

Figure 5-7 illustrates the layout of the controls in the VistaLINK® PRO global configuration view
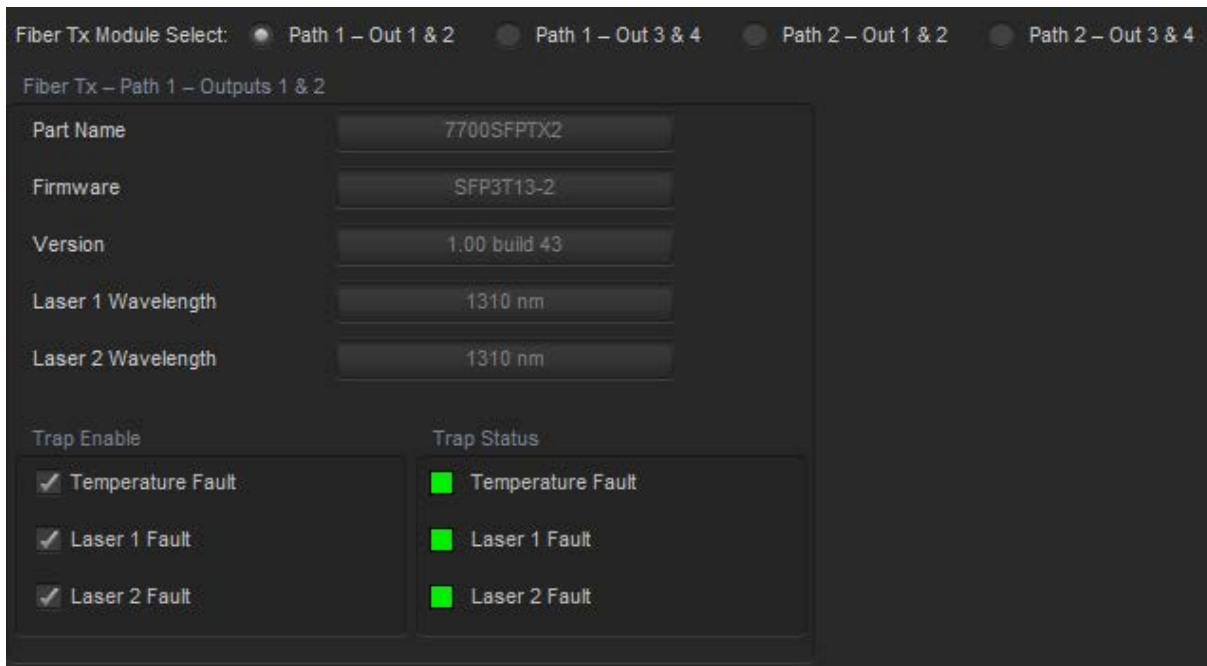
Figure 5-7: System Configuration - Fiber TX Tab

Fiber Tx Module Select: These option buttons select which fiber SFP transmitter controls to actively display.

Part Name: This field displays the part name for the detected SFP fiber module.

Firmware: This field displays the current firmware type running on the SFP fiber module.

Version: This field displays the firmware version of the SFP fiber modules.

Laser 1 Wavelength: This field reports the transmitted wavelength of laser 1 in nanometres (nm).

Laser 2 Wavelength: This field reports the transmitted wavelength of laser 2 in nanometres (nm).

Trap Enable and Trap Status
To enable a specific Fault trap, the small box beside the relevant fault and ensure that a check mark appears in the box. To disable a specific Fault Trap, click the small box beside the relevant fault and ensure that a check mark does not appear in the box.

Temperature Fault: This trap will trigger when the transmitter module exceeds 100°C.

Laser Fault: This trap will trigger when the transmitter detects a fault in either of the lasers.

5.2. VIDEO PATH CONFIGURATION

5.2.1. Video

The Video tab contains all controls related to core video configuration as well as basic monitoring information regarding the input video sourced to the 7847FSEDA. Figure 5-8 illustrates the layout of the controls in the VistaLINK® PRO configuration view.
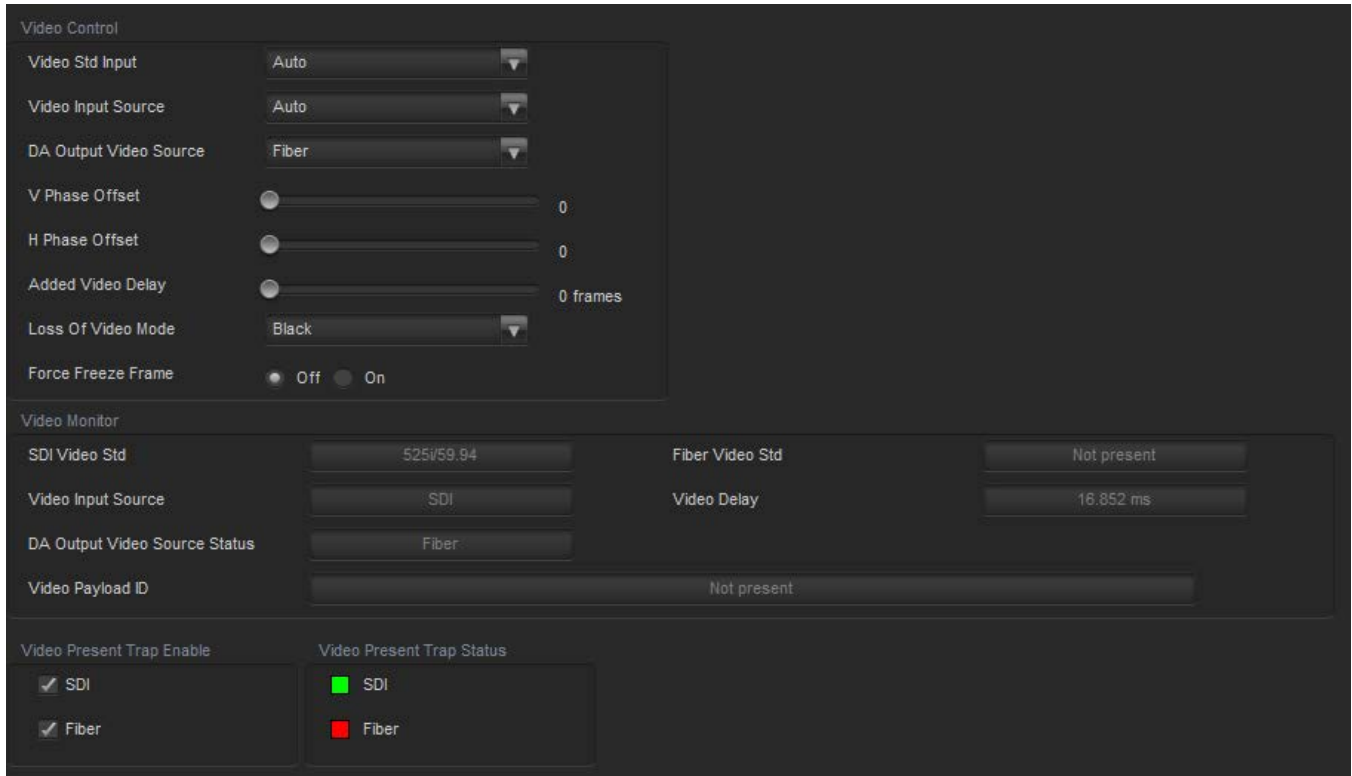
Figure 5-8: Video Path Configuration - Video Tab

Video Control
  Video Std Input: This control allows the user to select the input video standard being used.

  'Auto' mode dynamically detects the input video standard, and configures the 7847FSEDA accordingly. Otherwise, when set to a specific video standard, the 7847FSEDA will only pass the video when the expected video standard is provided on its input.

  Interlaced video rates are listed in fields per second. Progressive video rates are listed in frames per second. Table 5-1: Video - Supported Input Video Standards lists all supported input video standards.

1080i/59.94Hz	
720p/59.94Hz	
525i/59.94Hz	
1080i/50Hz	
720p/50Hz	
625i/50Hz	
1080p/59.94Hz (425M level A)	[-3G option only]
1080p/59.94Hz (425M level B)	[-3G option only]
1080p/50Hz (425M level A)	[-3G option only]
1080p/50Hz (425M level B)	[-3G option only]

Table 5-1: Video - Supported Input Video Standards

Video Input Source: This control selects whether the input video will be sourced from either the SDI input or the Fiber input. When in 'Auto' mode, the 7847FSEDA will automatically select the input video based on video presence. The SDI input is given priority over the Fiber input when both inputs are present.

Additionally, while in 'Auto' mode, Fiber can act as a backup input if the SDI input fails.

> **NOTE:** The Video Input Source control handles the routing for the program outputs ONLY. A separate control (DA Output Video Source) is used to handle the routing for the DA outputs.

DA Output Video Source: This control selects whether the DA output video will be sourced from either the SDI input or the Fiber input. When in 'Auto' mode, the 7847FSEDA will automatically select the input video based on video presence. The Fiber input is given priority over the SDI input when both inputs are present.

Additionally, while in 'Auto' mode, SDI can act as a backup input if the Fiber input fails.

> **NOTE:** The DA Output Video Source control handles the routing for the DA outputs ONLY. A separate control (Video Input Source) is used to handle the routing for the program outputs.

Vertical Phase Offset: This control allows the user to set the vertical timing of the output video with respect to the reference input set by the *Reference Select* control. There are independent V Phase Offset controls for each video path. Setting *V Phase Offset = 0* which maintains the vertical timing alignment of the output video with respect to the reference input. Increasing the value of *V Phase Offset* will delay the output video in one-line increments of the output video standard. In order to advance the vertical timing of the output video with respect to the reference, set the control to its maximum value minus the number of lines that you wish to advance the output video with respect to reference.

Horizontal Phase Offset: This control allows users to set the horizontal timing of the output video with respect to the reference input set by the *Reference Select* control. There are independent H Phase Offset controls for each video path. Setting *H Phase Offset = 0* maintains the horizontal timing alignment of the output video with respect to the reference input. Increasing the value will delay the output video in one-sample increments of the output video standard. In order to advance the horizontal timing of the output video with respect to the reference, set the control to its maximum value minus the number of samples that you wish to advance the output video with respect to reference.

Added Video Delay: This control is used to add additional frames of delay to the video. Up to an additional 12 frames of delay can be added.

> **NOTE:** The audio delay will always track the video delay. If additional frames of video delay are added, the audio delay will automatically adjust accordingly.

Loss of Video Mode: This control defines the action that will be taken when the input video is lost. Options include freezing output video on the last good frame of input video, or forcing the output video to black or blue.

Force Freeze Frame: This control allows the user to manually freeze frame the output video.

Video Monitor
The *Video Monitor* section enables the user to view the status of video related parameters. Each video status is used to report the following information:

SDI Video Standard: This field reports the currently detected video standard on the SDI input. If the module is unable to detect a valid input standard, it will report 'Not present'

Fiber Video Standard: This field reports the currently detected video standard on the Fiber input. If the module is unable to detect a valid input standard, it will report 'Not present'

Video Input Source: This field reports which input is actively sourcing the program outputs. It will report either SDI or Fiber.

DA Output Video Source Status: This field reports which input is actively sourcing the DA outputs. It will report either SDI or Fiber.

Video Payload ID: This field reports the detected video payload ID on the incoming video. The information is displayed according to SMPTE 352 descriptions.
Video Delay: This field reports the active video processing delay/latency through the module in milliseconds (ms).

Video Traps
To enable/disable a specific fault trap, check/uncheck the corresponding checkbox.

SDI Video Present: This trap will trigger when the SDI video is no longer present.

Fiber Video Present: This trap will trigger when the video is no longer present on fiber.

5.2.2. Video Monitoring

The 7847FSEDA series modules support advanced audio & video monitoring, referred to as AVM. This advanced monitoring includes metrics for detecting potential issues in the video signal.

Figure 5-9 illustrates the layout of the controls in the VistaLINK® PRO configuration view.
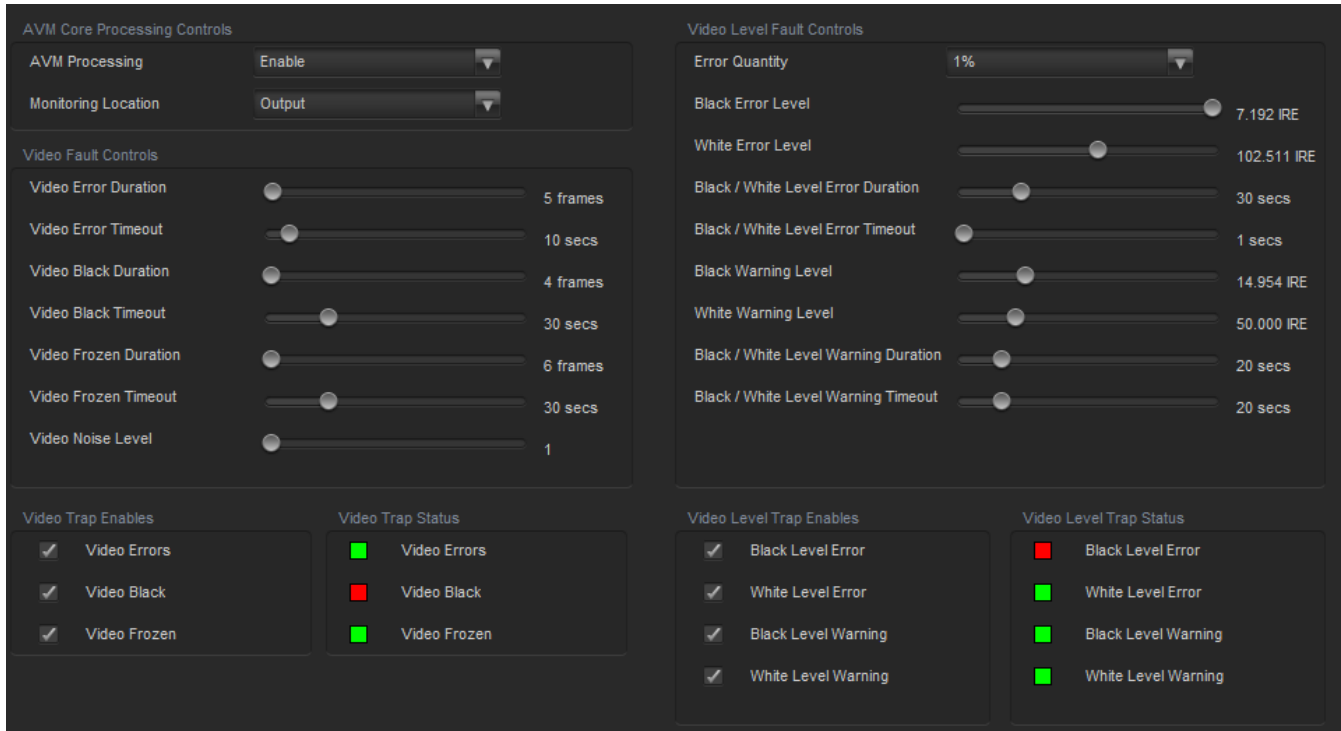
Figure 5-9: Video Path Configuration - Video Monitoring Tab

AVM Core Processing Controls

AVM Processing: This control *enables/disables* the audio/video monitoring processing. This provides a simple way of disabling AVM processing and trap alarm reporting if it is not desired.

Monitoring Location: This control specifies where the AVM processing is performed. When set to *Input*, the AVM monitoring is performed on the input audio/video signals into the device. This mode would be desirable to qualify incoming signals, and detect errors when present on the input. When set to *Output*, the AVM monitoring is performed on the output audio/video signals of the device. This mode provides the ability to not only detect errors, but also potentially correct them (i.e. black level, white level, audio silence) using the built-in audio/video processing on the module. With proper adjustment, the reported AVM error should clear without requiring adjustments on an upstream device.

Video Fault Controls

Video Error Duration: This control sets the number of consecutive video frames that must contain video errors (Line length & synchronization errors) before triggering a video errors fault condition. The value range is 0 to 900 frames in increments of 1.

Video Error Timeout: This control sets the timeout, in seconds, that must elapse to consecutive error-free video frames before the video errors fault will be cleared. The value range is from 1 to 127 seconds in increments of 1 second.

Video Black Duration: This control sets the number of consecutive video frames that must contain active picture content below 7 IRE before triggering a video black fault condition. The value range is from 4 to 9996 frames in increments of 4 video frames.

Video Black Timeout: This control sets the timeout, in seconds, that must elapse to consecutive video frames **without** active picture content below 7 IRE before the video black fault will be cleared. The value range is from 1 to 127 seconds in increments of 1 second.

Video Frozen Duration: This control sets the number of consecutive video frames that must contain video activity under the video noise level before triggering a video frozen fault condition. The value range is from 6 to 9998 frames in increments of 4 video frames.

When increasing the *Video Noise Level*, it is recommended that the *Video Frozen Duration* is increased as well. This is because the higher the picture noise level, the lower the equipment's motion sensitivity, thus long periods without significant on-screen movement are more likely to trigger a "false" freeze alarm.

Video Frozen Timeout: This control sets the timeout, in seconds, that must elapse to consecutive video frames **without** video activity under the video noise level before the video frozen fault will be cleared. The value range is from 1 to 127 seconds in increments of 1 second.

Video Noise Level: This control sets the approximate level of noise expected in the video signal feed. It is used by the video frozen detection feature to distinguish motion from background noise on top of a video feed. The value range is from 1 to 10.

As a guide, here are some signal to noise ratio comparisons:

> 1 = digital freeze (no noise on top of frozen picture)
> 10 = 40 dB SNR

Video Level Fault Controls
Error Quantity: This control sets the percentage of active picture content that must be too white (over) or too black (under) to be considered as an error. The center section of the active picture of a field of video is analyzed and a total number of pixels in error is calculated. A fault is generated when the error quantity is above this level. The following options are available: Any, 0.01%, 0.1%, 1%, 10% and 20%. A selection of *Any* will cause a fault if any video sample is over/under the set threshold.

Black Error Level: This control sets the amplitude of active picture content (in IRE) below which a pixel is considered too black. The value range is from -6.849 IRE to 7.192 IRE.

The center section of the active picture of a field of video is analyzed and a total number of pixels below this level is calculated. The field of video is considered to be **in error** when the number of pixels below the *black error level* exceeds the number of pixels (threshold) defined by the *Error Quantity* control.

White Error Level: This control sets the amplitude of active picture content (in IRE) above which a pixel is considered too white. The value range is from 94.977 IRE to 109.018 IRE.

The center section of the active picture of a field of video is analyzed and a total number of pixels above this level is calculated. The field of video is considered to be **in error** when the number of

pixels above the *white error level* exceeds the number of pixels (threshold) defined by the *Error Quantity* control.

Black/White Level Error Duration: This control sets the number of seconds of consecutive video fields/frames that must be flagged as having black/white level errors before triggering the corresponding black/white level error fault condition. The value range is from 1 to 127 seconds in increments of 1 second.

Black/White Level Error Timeout: This control sets the number of seconds of consecutive video fields/frames that **must not be flagged** as having black/white level errors before the corresponding black/white level error fault will be cleared. The value range is from 1 to 127 seconds in increments of 1 second.

Black Warning Level: This control sets the amplitude of active picture content (in IRE) below which a pixel is considered to be normal black content within the active picture. The value range is from 7.306 IRE to 38.242 IRE.

The center section of active picture of a field of video is analyzed and a total number of pixels below this level is calculated. The field of video is considered to be **in error** when the number of pixels below the Black *Warning Level* is below the number of pixels (threshold) defined by the *Error Quantity* control.

White Warning Level: This control sets the amplitude of active picture content (in IRE) above which a pixel is considered to be normal white content within the active picture. The value range is from 38.356 IRE to 94.863 IRE.

The center section of active picture of a field of video is analyzed and a total number of pixels above this level is calculated. The field of video is considered to be **in error** when the number of pixels above the W*hite Warning Level* is below the number of pixels (threshold) defined by the *Error Quantity* control.

Black/White Level Warning Duration: This control sets the number of seconds of consecutive video fields/frames that must be flagged as having black/white level warnings before triggering the corresponding black/white level warning fault condition. The value range is from 1 to 127 seconds in increments of 1 second.

Black/White Level Warning Timeout: This control sets the number of seconds of consecutive video fields/frames that **must not be flagged** as having black/white level warnings before the black/white level warning fault will be cleared. The value range is from 1 to 127 seconds in increments of 1 second.

Trap Enable and Trap Status
To enable/disable a specific fault trap, check/uncheck the corresponding checkbox.

Video Errors: This trap will **trigger** when a set of consecutive input video frames of length greater than V*ideo Error Duration* all contain video errors. This trap will **clear** when a set of consecutive input video frames of length greater than *Video Error Timeout* are video error-free.

Video Black: This trap will trigger when a set of consecutive input video frames of length greater than *Video Black Duration* all contain active picture content below 7 IRE. This trap will **clear** when a set of consecutive input video frames of length greater than *Video Black Timeout* does not contain active picture content below 7 IRE.

Video Frozen: This trap will trigger when a set of consecutive input video frames of length greater than *Video Frozen Duration* all containing video activity (*motion*) below the video noise level. This trap will **clear** when a set of consecutive input video frames of length greater than *Video Frozen Timeout* all containing video activity (motion) above the picture noise level.

Black Level Error: This trap will trigger when a set of consecutive input video frames of length greater than *Black/White Level Error Duration* all containing more pixels below the *Black Error Level* than the threshold specified by the *Error Quantity* control. This trap will **clear** when a set of consecutive input video frames of length greater than *Black/White Level Error Timeout* all containing less pixels below the *Black Error Level* than the threshold specified by the *Error Quantity* control.

White Level Error: This trap will trigger when a set of consecutive input video frames of length greater than *Black/White Level Error Duration* all containing more pixels above the *White Error Level* than the threshold specified by the *Error Quantity* control. This trap will **clear** when a set of consecutive input video frames of length greater than *Black/White Level Error Timeout* all containing less pixels above the *White Error Level* than the threshold specified by the *Error Quantity* control.

Black Level Warning: This trap will trigger when a set of consecutive input video frames of length greater than *Black/White Level Warning Duration* all containing less pixels below the *Black Warning Level* than the threshold specified by the *Error Quantity* control. This trap will **clear** when a set of consecutive input video frames of length greater than *Black/White Level Warning Timeout* all containing more pixels below the *Black Warning Level* than the threshold specified by the *Error Quantity* control.

White Level Warning: This trap will trigger when a set of consecutive input video frames of length greater than *Black/White Level Warning Duration* all containing less pixels above the *White Warning Level* than the threshold specified by the *Error Quantity* control. This trap will **clear** when a set of consecutive input video frames of length greater than *Black/White Level Warning Timeout* all containing more pixels above the *White Warning Level* than the threshold specified by the *Error Quantity* control.

5.2.3. Reference

The 7847FSEDA series supports fully independent timing on each video processing path. Each video processing path can be configured to either lock to the input video timing, or the external reference signal timing. The *Reference* tab within the video configuration provides the controls and status related to video path specific reference controls. Figure 5-10 illustrates the layout of the controls in the VistaLINK® PRO configuration view.
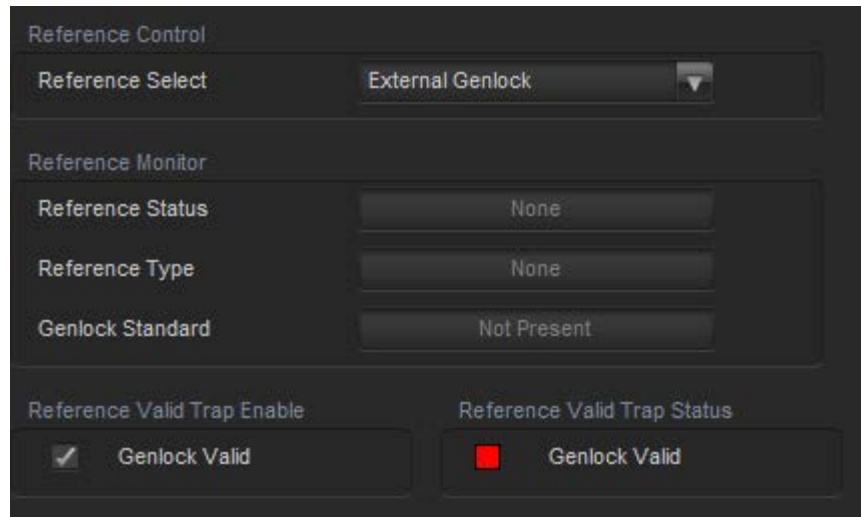
Figure 5-10: Video Path Configuration - Card Reference Tab

Reference Select: This control selects the source of timing for the video processing path. When set to *External Genlock,* the video path will lock to the reference signal when it is present and valid for the detected input video standard. If the reference signal is not present, the module will lock to an internal free-running clock. When set to *Video*, the video path will generate its timing from the detected input video signal.

Reference Monitor
  Reference Status
  The *Reference Status* reports the current source of reference for the video path. If the video path is currently locked to a reference signal, it will report the source of the reference signal as *Card ref*, *Frame ref 1*, or *Frame ref 2*. If the card is actively locked to input video, it will report *Video*. If the video path is currently free-running, it will report *None.*

  Reference Type
  The *Reference Type* reports the type of reference for the video path. If the video path is currently locked to a reference signal, it will report the type of the reference signal as either *Bi-phase* or *Tri-level.* If the card is actively locked to input video, it will report *Video*. If the video path is currently free-running, it will report *None.*

  Genlock Standard
  External Genlock Standard reports the video standard of the detected reference signal. If a signal has been detected, but the module determine the video standard, it will report *Unknown*. If no reference signal is present on the selected reference input, it will report *Not present*.

Reference Traps

To enable/disable a specific fault trap, check/uncheck the corresponding checkbox.

Genlock Valid: This trap will trigger to report an invalid Genlock/reference signal. A reference signal is considered *invalid* if it is not present, unsupported by the module or has a frame rate mismatch with the detected input video standard on the corresponding video path.

5.2.4. Video Proc

The Video Proc tab contains controls related to active picture video signal adjustment (gain / offset / hue / gamma). Figure 5-11 illustrates the layout of the controls in the VistaLINK® PRO configuration view.

Figure 5-11: Video Path Configuration – Video Proc Tab
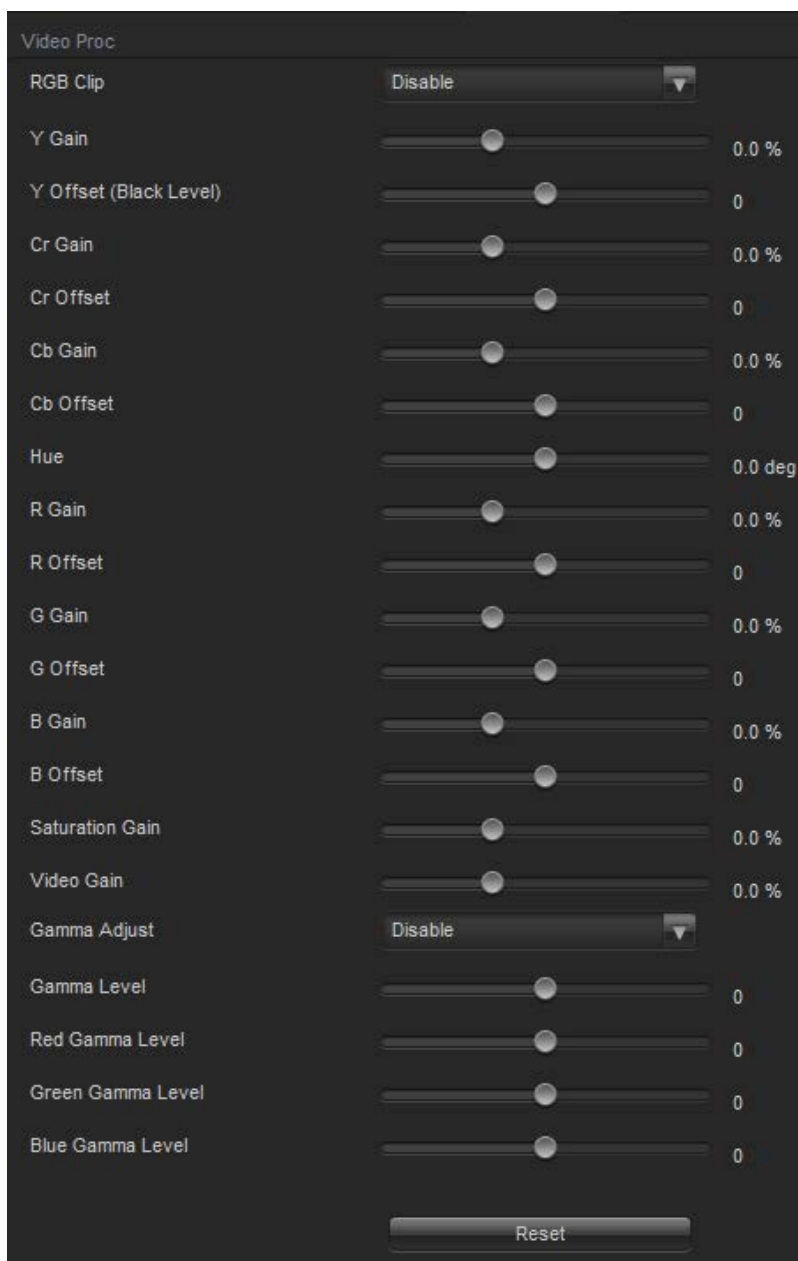
> **NOTE:** All Video Proc controls affect the video in real time. H&V frequency bands will cause hits to the video while a new filter is loaded.

Video Proc

RGB Clip: The *RGB Clip* parameter controls RGB clipping/colour legalization process. When set to *enable*, the module will clip any illegal levels of R, G, and B (individually) to their respective Black and White Levels. If disabled, then the illegal values are passed unmodified. This control is normally set to *Disable* in order to allow for Super Black or other test patterns to pass through the module.

Gain Levels: There are eight controls that set the gain of the video. With these controls, the user can adjust the gain of the 3 components in either the Y Cr Cb domain or the R G B domain over a range of 50% to 100% in 0.1% steps. Gain adjustments in the YCbCr domain are made first, followed by gain adjustments in the RGB domain. Illegal values are clipped after gain adjustments.

Y Gain:	Ranges from –50% to 100% in 0.1% increments.
Cb Gain:	Ranges from –50% to 100% in 0.1% increments.
Cr Gain:	Ranges from –50% to 100% in 0.1% increments.
R Gain:	Ranges from –50% to 100% in 0.1% increments.
G Gain:	Ranges from –50% to 100% in 0.1% increments.
B Gain:	Ranges from –50% to 100% in 0.1% increments.
Saturation Gain:	Ranges from –50% to 100% in 0.1% increments.
Video Gain:	Ranges from –50% to 100% in 0.1% increments.

DC Offsets: There are six controls that set the DC Offset of the video signal. With these controls, the user can individually adjust the DC offset of Y, Cr and Cb with a range of +/- 200 quantization levels and individually adjust the DC offset of R, G and B with a range of +/- 200 quantization levels. Offset adjustments in the YCbCr domain are made first, followed by offset adjustments in the RGB domain. Illegal values are clipped after offset adjustments.

Y Offset:	Ranges from –200 to 200 quantization levels in 1 level increments.
Cb Offset:	Ranges from –200 to 200 quantization levels in 1 level increments.
Cr Offset:	Ranges from –200 to 200 quantization levels in 1 level increments.
R Offset:	Ranges from –200 to 200 quantization levels in 1 level increments.
G Offset:	Ranges from –200 to 200 quantization levels in 1 level increments.
B Offset:	Ranges from –200 to 200 quantization levels in 1 level increments.

Hue: With this control, the user can adjust the Hue of the video signal. The hue adjustment range is from –180 to 180 degrees in 0.1 degree increments.

Gamma Adjust: The *Gamma Adjust* control enables and disables the gamma adjustment functionality of 7815 series modules. When enabled, the module will allow the user to adjust the gamma level. If disabled, then the gamma levels are set to 0.

Gamma Level: With this control, the user can adjust the overall Gamma correction factor from -128 to +127 in increments of 1.

Red, Green, Blue Gamma Levels: With these controls, the user can individually adjust the Red, Green, and Blue Gamma levels from –128 to +127 in increments of 1.

Reset Button: By pressing the *Reset* button, all Video Processing parameters in the Video Proc control tab will return to their default value.

5.2.5. Image Enhancement

The Image Enhancement tab contains controls related to active picture image enhancement adjustments. Image enhancement provides the ability to enhance/sharpen the content within the active picture by applying video processing filters. The image enhancement controls allow the user to tweak the image enhancement algorithm to their perceived acceptable level. Figure 5-12 illustrates the layout of the controls in the VistaLINK® PRO configuration view.

Figure 5-12: Video Path Configuration - Image Enhancement Tab

Image Enhancement

Image Enhancement Enable: Setting this control to *Enable* will enable the Image Enhancement video processing. Otherwise, when set to *Disable* no image enhancement will be applied.

Detail Gain: This control selects the amount of detail gain to be applied to the active picture. The range is from 0 to 127, where 0 refers to no increase in detail gain, and 127 refers to maximum increase in detail gain. Typical operating range for this control is from 0 to 50. Higher values (beyond 50) will normally distort the image beyond the range that is normally considered acceptable.

Enhancement Limit: This control selects the largest detail value to be added back into the signal. The range is from 0 to 63. Any enhancement detail that has a value larger than this value will be clipped.

Horizontal Band: This control selects the Horizontal frequency band to be enhanced. The horizontal band is adjusted in increments of 5, where 0 selects the lowest frequency band available and 20 the highest.

Vertical Intensity: This control selects the intensity of the vertical enhancement process as a ratio of the Horizontal enhancement. The range is from 0% to 100% in increments of 25%, where 0% refers to no vertical enhancement and 100% provides a vertical enhancement that is equivalent to the applied horizontal enhancement.

Luma Floor: This control selects the minimum luma value that will be enhanced. The range is from 0 to 15. Pixels with a luma value below this floor will not be enhanced.

Detail Noise Floor: This control specifies the level of image detail below which it is considered to be mostly consisting of noise. As such, the pixel associated with that detail level would not be enhanced. The range is from 0 to 15.

Reset Button: By pressing the *Reset* button, all parameters in the *Image Enhancement* tab will return to their default value.

5.2.6. Audio

The Audio tab contains controls related to core audio configuration (de-embedding, delay, and re-embedding) as well as basic monitoring information regarding the input audio sourced to the module. Figure 5-13 illustrates the layout of the controls in the VistaLINK® PRO configuration view.
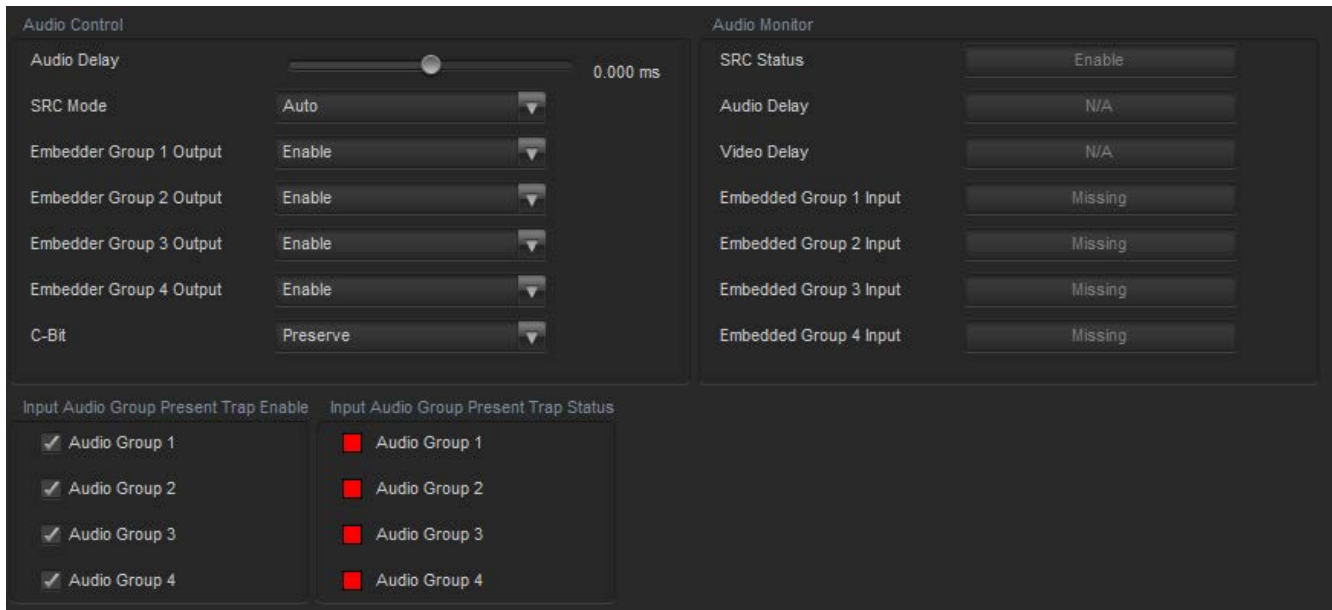
Figure 5-13: Video Path Configuration - Audio Tab

✏ **NOTE:** Any changes to the audio settings will cause a momentary interruption on the output audio.

Audio Control

Audio Delay: This control allows the user to adjust the audio delay +/- 350.00 ms. This delay is relative to the delay that the module automatically inserts to match video path delay. The audio delay can be adjusted with single sample precision.

> **NOTE:** To advance the audio relative to video (*negative delay*), the video path must first be delayed using the *Added Video Delay* control on the Video tab (See Section 5.2.1 Video).

SRC Mode: This control allows the user to adjust the operating mode of the sample rate converter (SRC). By selecting **Enable,** sample rate converters for PCM audio are enabled. By selecting **Bypass,** the sample rate converters are bypassed. By selecting **Auto,** the module will automatically detect either PCM or non-PCM audio and automatically turn on or off the SRCs as required.

> **NOTE:** All SRCs are set to bypass as soon as a source of non-PCM audio is detected within any of the 16 internally processed audio channels.

> **NOTE:** The BYPASS setting should always be used for non-PCM audio.

Embedder Group 1 – 4 Output: This control allows the user to enable or disable the insertion of the corresponding audio group into the outgoing serial digital video. By selecting **Enable,** audio embedding for the selected group will be enabled. By selecting **Disable,** audio embedding for the selected group will be disabled.

C-Bit: This control allows the user to set the C-Bit control option. By selecting **Preserve,** the option preserves/passes the C-Bit data from the audio inputs to the audio outputs. By selecting **Replace,** the C-Bit data is reauthored to default values by the module.

Audio Monitor

SRC Status: This field displays the status of the Sample Rate Converter (SRC). The SRC status will display either *enable* or *bypass*.

Audio Delay: This field displays the current active delay/latency through the audio processing path in milliseconds (*ms).*

Video Delay: Reports the active video processing delay/latency through the module in milliseconds (ms).

> **NOTE:** The audio delay will track the video delay unless the audio delay has been adjusted with respect to video delay using the *Audio Delay* control.

Embedded Group 1 Input: This field displays the presence of embedded audio group 1.

Embedded Group 2 Input: This field displays the presence of embedded audio group 2.

Embedded Group 3 Input: This field displays the presence of embedded audio group 3.

Embedded Group 4 Input: This field displays the presence of embedded audio group 4.

Audio Group Present Traps
   To enable/disable a specific fault trap, check/uncheck the corresponding checkbox.

   Audio Group <1-4>: These audio traps monitor the presence of embedded audio groups on the input video.

5.2.7. Audio Monitoring

The 7847FSEDA series modules support advanced audio & video monitoring, referred to as AVM. This advanced monitoring includes metrics for detecting potential silence or loudness in the audio signals.

Figure 5-14 illustrates the layout of the controls in the VistaLINK® PRO configuration view .
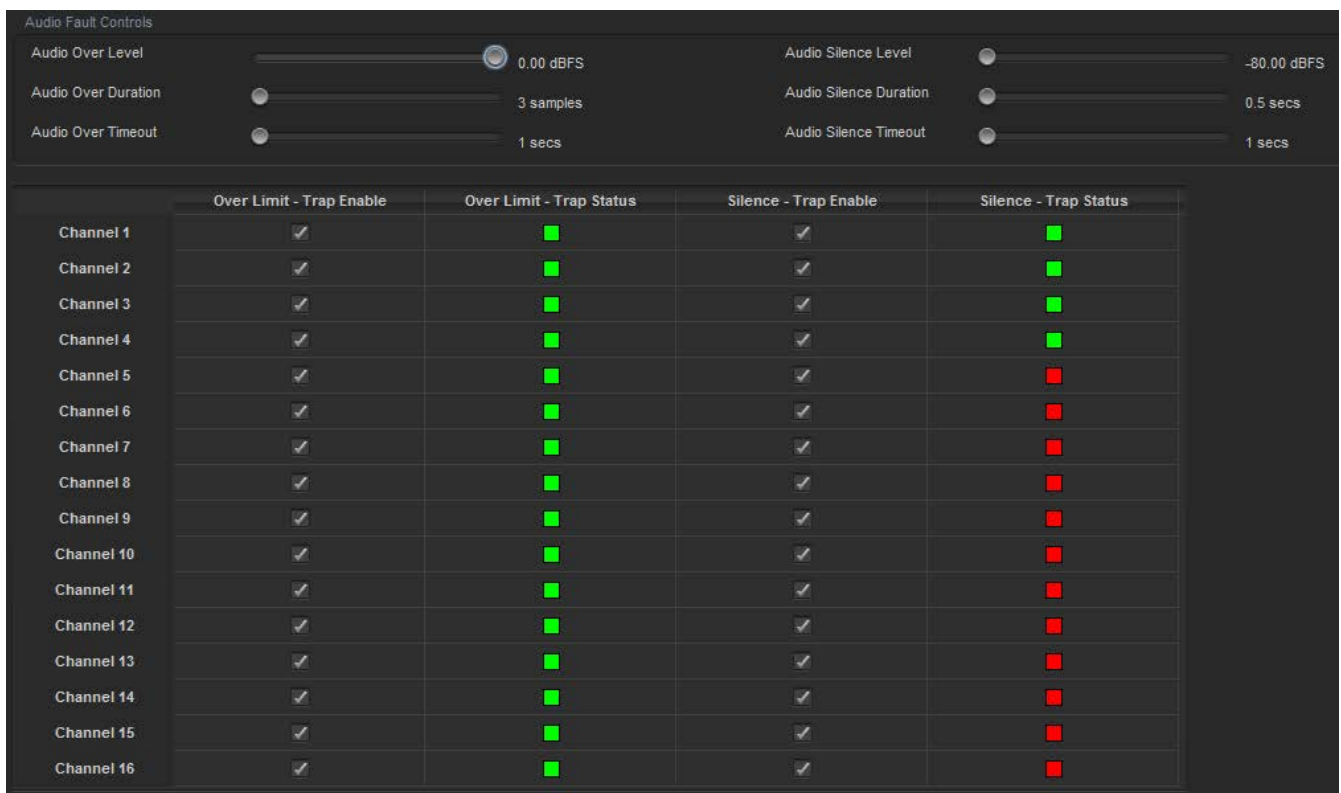

Figure 5-14: Video Path Configuration - Audio Monitoring Tab

Audio Fault Control
   Audio Over Level: This control sets the audio level threshold over which the audio is considered to be too loud. This value is expressed in dB on full scale (FS) and can even be used to detect digital clipping. The value range is from -30.00 to 0.00 dB in increments of 0.25 dB.

Audio Over Duration: This control sets the duration, in number of consecutive audio samples, that the audio must be at or above the *Audio Over level* before a fault condition exists. The value range is from 3 to 255 audio samples in one-sample increments. The audio sample rate is 48 KHz.

> **NOTE:** By setting longer *Over Duration* values, high frequency content that exceeds the loudness level may go undetected.

Audio Over Timeout: This control sets the number of seconds of consecutive audio samples that an audio channel must have an amplitude below the *Audio Over level* before the corresponding audio channel *Over Limit Fault* will be cleared. The value range is from 1 to 127 seconds in increments of 1 second. The audio sample rate is 48 KHz.

Audio Silence Level: This control sets the audio level under which the audio is considered to be silent. This value is expressed in dB full scale (FS). The value range is from -80.00 to -45.00 dB in 0.25 dB increments.

Audio Silence Duration: This control sets the duration, in seconds, that the audio must be at or below the silence level before a fault condition exists. The value range is ferom 0.5 to 127.0 seconds in 0.5 second increments.

Audio Silence Timeout: This control sets the number of seconds of consecutive audio samples that an audio channel must have an amplitude above the *Audio Silence level* before the corresponding audio channel *Silence Fault* will be cleared. The value range is from 1 to 127 seconds in increments of 1 second. The audio sample rate is 48 KHz.

Trap Enable and Trap Status

To enable/disable a specific fault trap, check/uncheck the corresponding checkbox.

Audio Over Limit Traps<1-16>: These traps will **trigger** when a set of consecutive audio samples of length greater than the *Audio Over Duration* all having an amplitude at or above the *Audio Over level*. These traps will **clear** when a set of consecutive audio samples of length greater than the *Audio Over Timeout* all having an amplitude below the *Audio Over Level*.

Audio Silence Traps <1-16>: These traps will **trigger** when a set of consecutive audio samples of length greater than the *Audio Silence Duration* all have an amplitude below the *Audio Silence level*. These traps will **clear** when a set of consecutive audio samples of length greater than the *Audio Silence Timeout* all having an amplitude above the *Audio Silence Level*.

5.2.8. Embedded AIC

The Embedded AIC (Audio Input Correction) tab contains controls for adjustment of the 16 embedded audio channels present on the input video.

This purpose of audio input correction is to apply correction to an input signal before it is routed through other audio processing modules. For instance, the same input audio channel may feed both the embedded output mixer and the down-mix mixer. Rather than having to adjust the channel in two locations, a single adjustment can be made using the audio input correction controls.

Figure 5-15 illustrates the layout of the controls in the VistaLINK® PRO configuration view.
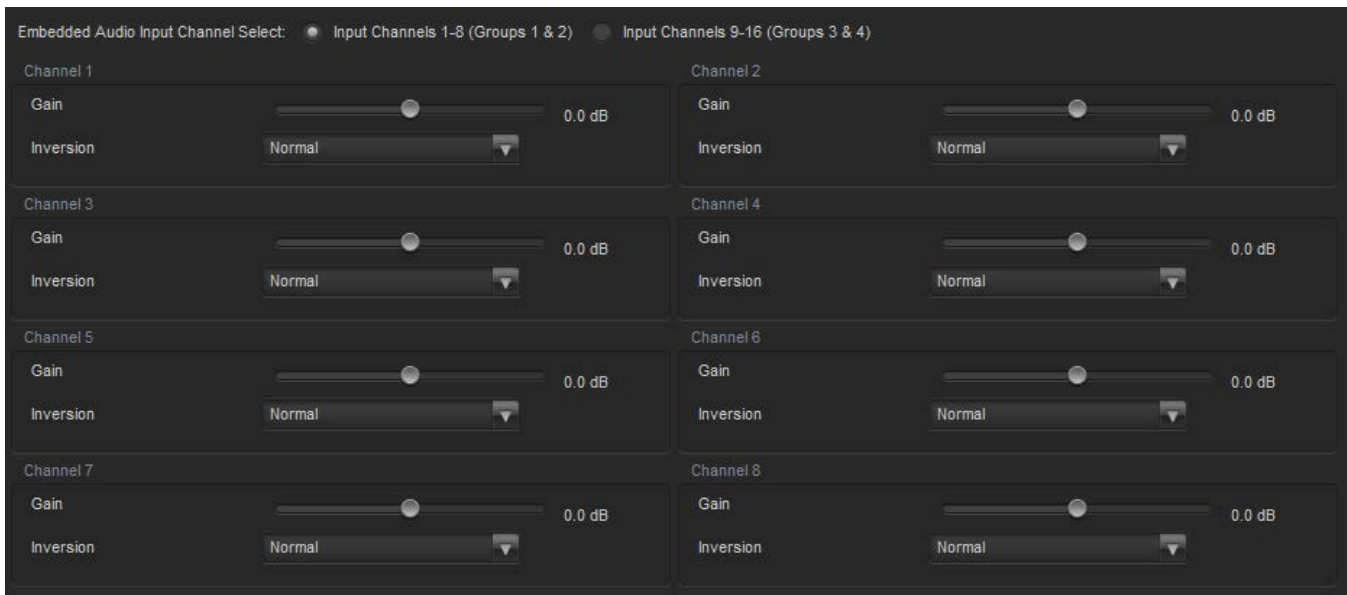
Figure 5-15: Video Path Configuration - Embedded AIC Tab

Embedded Audio Input Channel Select: This control allows the user to select *Input Channels 1-8 (Groups 1&2)* or *Input Channels 9-16 (Groups 3 & 4)*

Input Gain Controls
The *Gain* control enables the user to set the value of the gain for the selected input audio channel. The user can adjust the gain of the selected channel between -24 dB to +24 dB. Gain is adjustable be 0.1 dB increments.

Inversion Control
The *Inversion* control is used to invert the incoming audio channel. This control enables the user to invert the phase or pass the selected audio channel. By selecting *Normal,* the module will pass the audio channel through with no phase alteration. By selecting *Invert,* the module will invert the phase of the audio channel.

5.2.9. Embedded Audio Mixer

The Embedded Audio Mixer tab contains controls for audio routing, audio gain, and audio inversion for the 16 embedded audio channels present on the program output video. Each output audio channel mixer consists of two independently selectable sources (X & Y) with each source having its own gain and inversion controls. The selectable sources for the embedded audio mixers may vary based on the audio options enabled on the module. Table 5-2 lists all the selectable sources for the embedded audio mixers, and which sources are enabled by product options. Figure 5-16 illustrates the layout of these controls in the VistaLINK® PRO configuration view.

Product Option	Mixer Sources
All Products	Mute DMX channels 1-16 Mono mix DMX channels (8 pairs – 1&2, 3&4, etc.) Down mix L, R Down mix mono
Upmix [+UMX2]	Up mix L, R, C, LFE, Ls, Rs, passthru L, passthru R
IntelliGain® [+IG2]	IntelliGain 1 channels 1-8 IntelliGain 2 channels 1-8

Table 5-2: Embedded Audio Mixer - Selectable Audio Sources
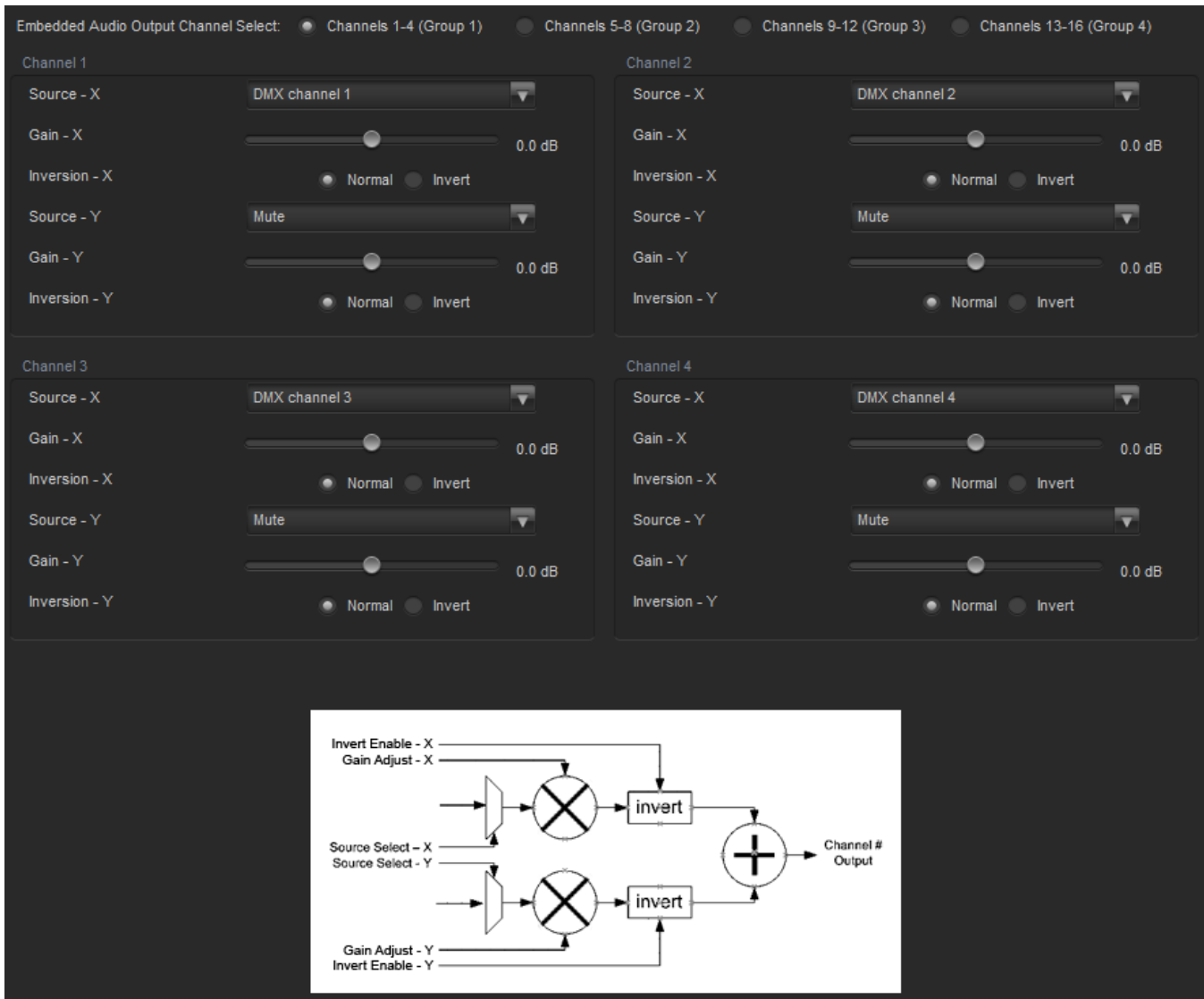
Figure 5-16: Video Path Configuration - Embedded Audio Mixer Tab

Source – X & Y: These controls allow the user to route one of the selectable mixer input audio sources to the Corresponding input (X or Y) of the embedded audio output channel mixer.

Gain – X & Y: These controls allow the user to set the value of the gain for the mixer input channel (X or Y). The user can adjust the gain of the selected mixer channel (X or Y) by adjusting the corresponding slider control. The supported range for gain adjustments is **-24dB to +24dB**. The gain can be adjusted with **0.1dB** precision.

Inversion – X & Y: These controls allow the user to invert the phase (180 degree phase shift) of the corresponding mixer input channel. By selecting *Normal,* the module will pass the mixer input audio through with no processing. By selecting *Invert,* the module will invert the phase of the mixer input audio channel (X or Y).

5.2.10. Downmix

The Downmix audio processing module provides the ability to downmix 5.1 surround sound to 2-channel (stereo) sound, or single channel (mono) sound. The Downmix audio processor can be configured to utilize common downmixing algorithms (Lo/Ro, Lt/Rt) and is also fully user configurable.

To embed the Downmix audio processing module output onto the SDI program output, it must be selected as a source for the embedded audio output mixers (See section 5.2.6 Embedded Audio Mixer)

Figure 5-17 illustrates the layout of these controls in the VistaLINK® PRO configuration view. The specific functionality of each control is described below.
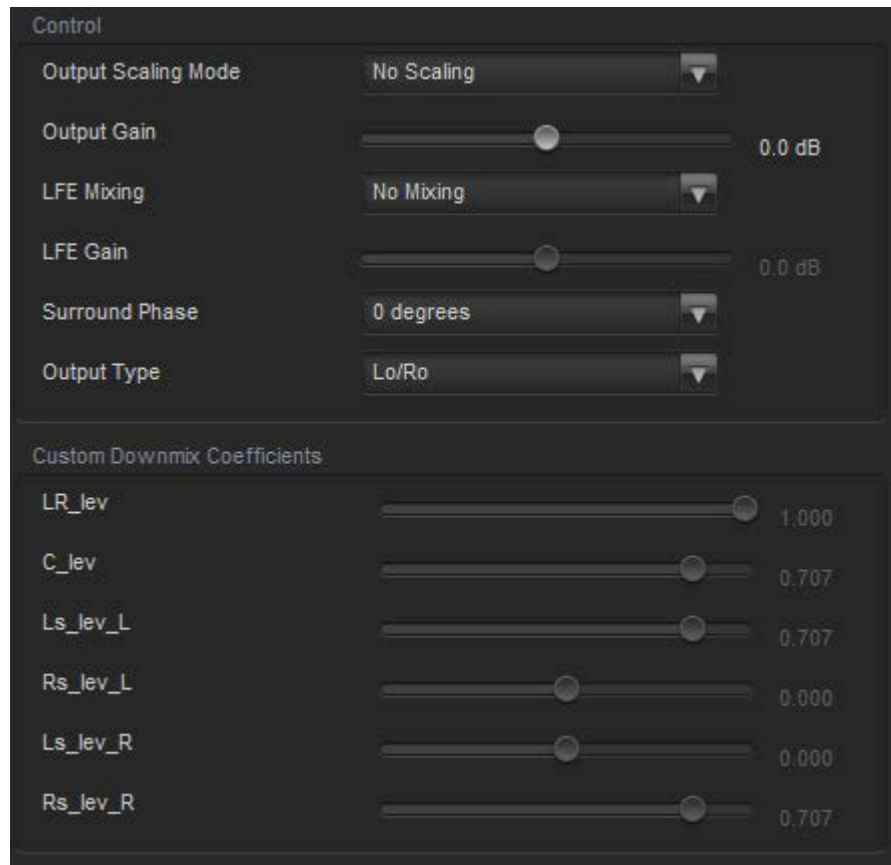
Figure 5-17: Video Path Configuration - Downmix Tab

Output Scaling Mode: This control allows the user to determine whether the down mix matrixing is normalized or not. To normalize matrix coefficients, *Overflow Scaling must be selected.* Normalization of matrix coefficients will avoid any possibility of overflow, but it tends to lower the loudness level when compared against the original 5.1 input. If no normalization is applied, the stereo down-mix usually sounds at the similar levels as the 5.1 audio inputs. But clipping may occur when the input sound level is close to 0dB FS.

Output Gain: This control allows the user to configure the output gain of the Downmix audio processing outputs (Downmix L & R). The output gain ranges from -20 dB to +20 dB in 0.1 dB increments.
LFE Mixing: This control allows the user to control whether the LFE channel is included or not in the audio down-mixing.

LFE Gain: This control allows the user to adjust the gain applied to the LFE channel. This control is in effect only when *LFE Gain* is selected for **LFE Mixing** control. The range for this value can be set from -20.0dB to 20.0dB in 0.1 dB increments.

Surround Phase: This control allows the user to choose whether no phase shift (0 degrees) or a 90 degree phase shift is applied to the surround channels before being passed to the down-mix matrix. Select 0 degree if no 90-degree phase shift is needed. It is required that surround channels are 90-degree phase shifted for Dolby Prologic I decoding, but if surround channels in the 5.1 audio input are already 90-degree phase shifted, then the user should select 0 degree to avoid double 90-degree phase shifting. Normally, the 90 degrees phase shift is applied.

Output Type: This control allows the user to set the type of audio down-mixing that will be performed. The user may select from LoRo (Left Only and Right Only), LtRt (Left Total and Right Total) Prologic I and LtRt (Left Total and Right Total) Prologic II OR may choose to perform a Custom down-mix.

Custom Downmix Coefficients

When the *Down Mix Type* is set to *Custom* the following equation will be used to generate the down-mixed audio.

$$L = (LR_{lev} \times L + C_{lev} \times C + Ls_{levL} \times Ls\{0°/90°\} + Rs_{levL} \times Rs\{0°/90°\} + lfe_{gain} \times LFE) \times gain \div norm$$

$$R = (LR_{lev} \times R + C_{lev} \times C + Ls_{levR} \times Ls\{0°/90°\} + Rs_{levR} \times Rs\{0°/90°\} + lfe_{gain} \times LFE) \times gain \div norm$$

Where lfe_{gain} is controlled by LFE Mixing and LFE Gain, $gain$ is controlled by Output Gain and $norm$ is controlled by Output Scaling Mode and where LR_{lev}, C_{lev}, Ls_{levL}, Rs_{levL}, Ls_{levR} **and** Rs_{levR} are custom specified user coefficients. These custom down-mixing coefficients are controlled using the appropriate slider bars in the *Custom Down mix Coefficients* control section in VISTALINK® PRO (see Figure 5-17).

LR_{lev}	**:**	Ranges from 1.000 to –1.000 in increments of 0.001.
C_{lev}	**:**	Ranges from 1.000 to –1.000 in increments of 0.001.
Ls_{levL}	**:**	Ranges from 1.000 to –1.000 in increments of 0.001.
Rs_{levL}	**:**	Ranges from 1.000 to –1.000 in increments of 0.001.
Ls_{levR}	**:**	Ranges from 1.000 to –1.000 in increments of 0.001.
Rs_{levR}	**:**	Ranges from 1.000 to –1.000 in increments of 0.001.

5.2.11. Downmix Mixer

The Downmix Mixer tab contains controls for audio routing, audio gain, and audio inversion for the Downmix audio processing module input channels. Each Downmix input audio channel mixer consists of two independently selectable sources (X & Y) with each source having its own gain and inversion controls. The selectable sources for the Downmix audio mixers may vary based on the audio options enabled on the module. Table 5-3 lists all the selectable sources for the Downmix audio mixers, and which sources are enabled by product options. Figure 5-18 illustrates the layout of these controls in the VistaLINK® PRO configuration view.

Product Option	Mixer Sources
All Products	Mute DMX channels 1-16 Mono mix DMX channels (8 pairs – 1&2, 3&4, etc.)
Upmix [+UMX2]	Up mix L, R, C, LFE, Ls, Rs, passthru L, passthru R
IntelliGain® [+IG2]	IntelliGain 1 channels 1-8 IntelliGain 2 channels 1-8

Table 5-3: Downmix Mixer - Selectable Audio Sources

Figure 5-18: Video Path Configuration - Downmix Mixer Tab

Downmix Input Channel Select: These option buttons allow the user to toggle between configuration of Downmix input channel mixers L, R, C and LFE, Ls, Rs.

Source – X & Y: These controls allow the user to route one of the selectable mixer input audio sources to the corresponding input (X or Y) of the Downmix input channel mixer.

Gain – X & Y: These controls allow the user to set the value of the gain for the mixer input channel (X or Y). The user can adjust the gain of the selected mixer channel (X or Y) by adjusting the corresponding slider control. The supported range for gain adjustments is **-24dB to +24dB**. The gain can be adjusted with **0.1dB** precision.

Inversion – X & Y: These controls allow the user to invert the phase (180 degree phase shift) of the corresponding mixer input channel. By selecting **Normal,** the module will pass the mixer input audio through with no processing. By selecting **Invert,** the module will invert the phase of the mixer input audio channel (X or Y).

5.2.12. Upmix [+UMX2]

The Upmix audio processing module provides the ability to upmix 2-channel (stereo) sound to 5.1 surround sound. The Upmix audio processing module is an **optional product feature**, and requires the Upmix product option **[+UMX2]** to be included in the module's product string. This feature is an upgradeable product option, and can be purchased and added to 7847FSEDA modules that do not currently have this product option. The **[+UMX2]** product option includes a dedicated Upmix audio processing module for each video processing path.

NOTE: Please contact Evertz if interested in adding the Upmix [+UMX2] product option.

When operating in *Auto* mode, the Upmix audio processor can automatically detect the presence of 5.1 surround sound on its input audio channels. If 5.1 surround sound is detected, the upmix audio processing module simply passes the audio through. If 5.1 surround is not detected, the upmix audio processing module automatically performs a 5.1 upmix of the 2-channel stereo input. This ensures the output of the upmix audio processing module is always 5.1 surround sound regardless of the state of its input audio.

The upmix audio processing module can also be forced to always upmix its input audio if automatic detection of 5.1 surround sound is not desired.

To embed the Upmix audio processing module output onto the SDI program output, it must be selected as a source for the embedded audio output mixers (See section 5.2.9 Embedded Audio Mixer)

There are a number of user controls available to configure the operation of the Upmix audio processing module. Figure 5-19 illustrates the layout of these controls in the VistaLINK® PRO configuration view. The specific functionality of each control is described below.

NOTE: The Upmix tab is only visible when [+UMX2] is included in the module's product string.
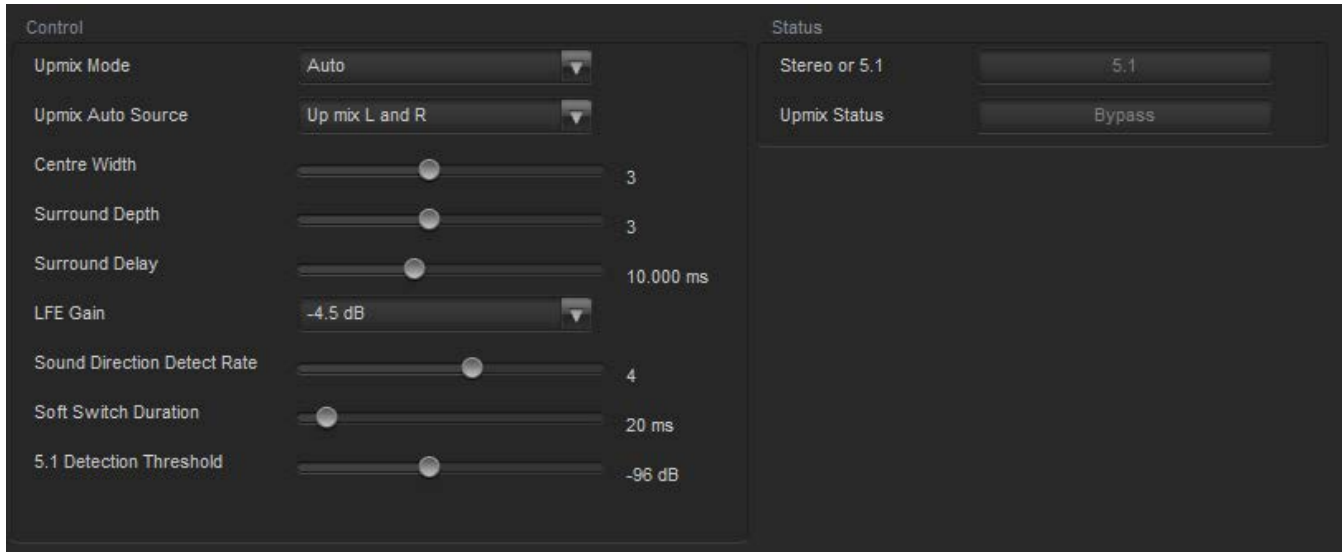
Figure 5-19: Video Path Configuration - Upmix Tab

Upmix Mode: This control allows the user to set the upmix audio processing module to automatically determine if the audio needs to be upmixed. It can automatically detect the presence of 5.1 surround sound on its inputs. When set to *Auto,* the upmix audio processing module will determine if 5.1 is present. If 5.1 is not present it will up-mix the audio to 5.1 surround sound. If 5.1 is present, it will pass the input to its output. When set to *Force,* the upmix audio processing module will always upmix the incoming audio. When set to *Disable,* the upmix audio processing module will not upmix the audio and instead just pass the input audio to its output.

Upmix Auto Source: This control allows the user to set the 2-channel (stereo) audio source when performing an upmix. When set to *Up mix L and R,* it will perform an upmix on the Up mix L and R input channels when operating in upmix mode. When set to *Up mix passthru L and R,* it will perform an upmix on the Up mix passthru L and R input channels when operating in upmix mode.

Centre Width: This control allows the user to set the width of front centre sound in the perceived sound image when listening to upmix audio processing module output. It mainly affects the perception of speech and dialogue. Narrower centre width will cause the front centre sound primarily coming from the centre speaker. Wider centre width causes the front centre sound comes from the centre, left and right speakers. The value range is 0 (minimum width) to 7 (maximum width) in increments of 1.

Surround Depth: This control allows the user to set the depth of surround sound in the perceived sound image when listening to upmix audio processing module output. More sound will be directed to the front speakers (centre, left and right speakers) if a shallower surround depth is selected. If a deeper surround depth is selected, more sound will be shifted to the surround speakers. The value range is 0 (shallowest) to 7 (deepest) in increments of 1.

Surround Delay: This control allows the user to set the amount of time that the surround sound will be delayed against other channels (in milliseconds). The proper amount of surround delay will provide a good perception of surround sound. The value range is 4.000 ms (shortest) to 20.000 ms (longest) in increments of 0.021 ms.

LFE Gain: This control allows the user to set LFE channel gain at the upmix audio processing module output. Use the drop down menu to select the appropriate amount of gain to be applied.

Mute	Mute the LFE channel in the up-mixed audio.
+ 0 dB	Apply 0 dB gain to the generated LFE channel.
-1.5 dB	Apply –1.5 dB gain to the generated LFE channel.
-3.0 dB	Apply –3.0 dB gain to the generated LFE channel.
-4.5 dB	Apply –4.5 dB gain to the generated LFE channel.
-6.0 dB	Apply –6.0 dB gain to the generated LFE channel.
-7.5 dB	Apply –7.5 dB gain to the generated LFE channel.
-9.0 dB	Apply –9.0 dB gain to the generated LFE channel.

Table 5-4: Upmix - LFE Gain Levels

Sound Direction Detect Rate: This control allows the user to set the detection rate of sound direction. The up-mixer constantly calculates the sound image that would be perceived from the stereo audio input. If the sound direction shifts in the sound image, the up-mixer changes the output sound direction accordingly by switching the amount of sound going to different speakers. If faster detection rate is selected, the sound direction switching may sound more dramatic, but may also be felt as unnatural. On the other hand, slower detection rate would sound dull and uninteresting. The value range is 0 (slowest rate) to 7 (fastest rate) in increments of 1.

Soft Switch Duration: This control allows the user to set the transition time when the upmix module switches modes from 5.1 bypass to upmix and vice versa. The duration can range from 5ms to 200 ms in increments of 1 ms.

5.1 Detection Threshold: This control allows the user to set what level of audio is declared as not present. When audio on channels C, LFE, Ls, and Rs are all below this level then 5.1 surround sound is considered to be not present, and upmix processing will be performed if necessary.

Stereo or 5.1: This status field reports the type of audio detected on the input of the audio upmix processing module.

Upmix Status: This status field reports the current operating mode (*Upmix or Bypass*) of the audio upmix processing module.

5.2.13. Upmix Mixer [+UMX2]

The Upmix Mixer tab contains controls for audio routing, audio gain, and audio inversion for the Upmix audio processing module input channels. Each Upmix input audio channel mixer consists of two independently selectable sources (X & Y) with each source having its own gain and inversion controls. The selectable sources for the Upmix audio mixers may vary based on the audio options enabled on the module. Table 5-5 lists all the selectable sources for the Upmix audio mixers, and which sources are enabled by product options. Figure 5-20 illustrates the layout of these controls in the VistaLINK® PRO configuration view.

> **NOTE:** The Upmix Mixer tab is only visible when [+UMX2] is included in the module's product string.

Product Option	Mixer Sources
All Products	Mute DMX channels 1-16 Mono mix DMX channels (8 pairs – 1&2, 3&4, etc.) Down mix L, R Down mix mono
IntelliGain® [+IG2]	IntelliGain 1 channels 1-8 IntelliGain 2 channels 1-8

Table 5-5: Upmix Mixer - Selectable Audio Sources
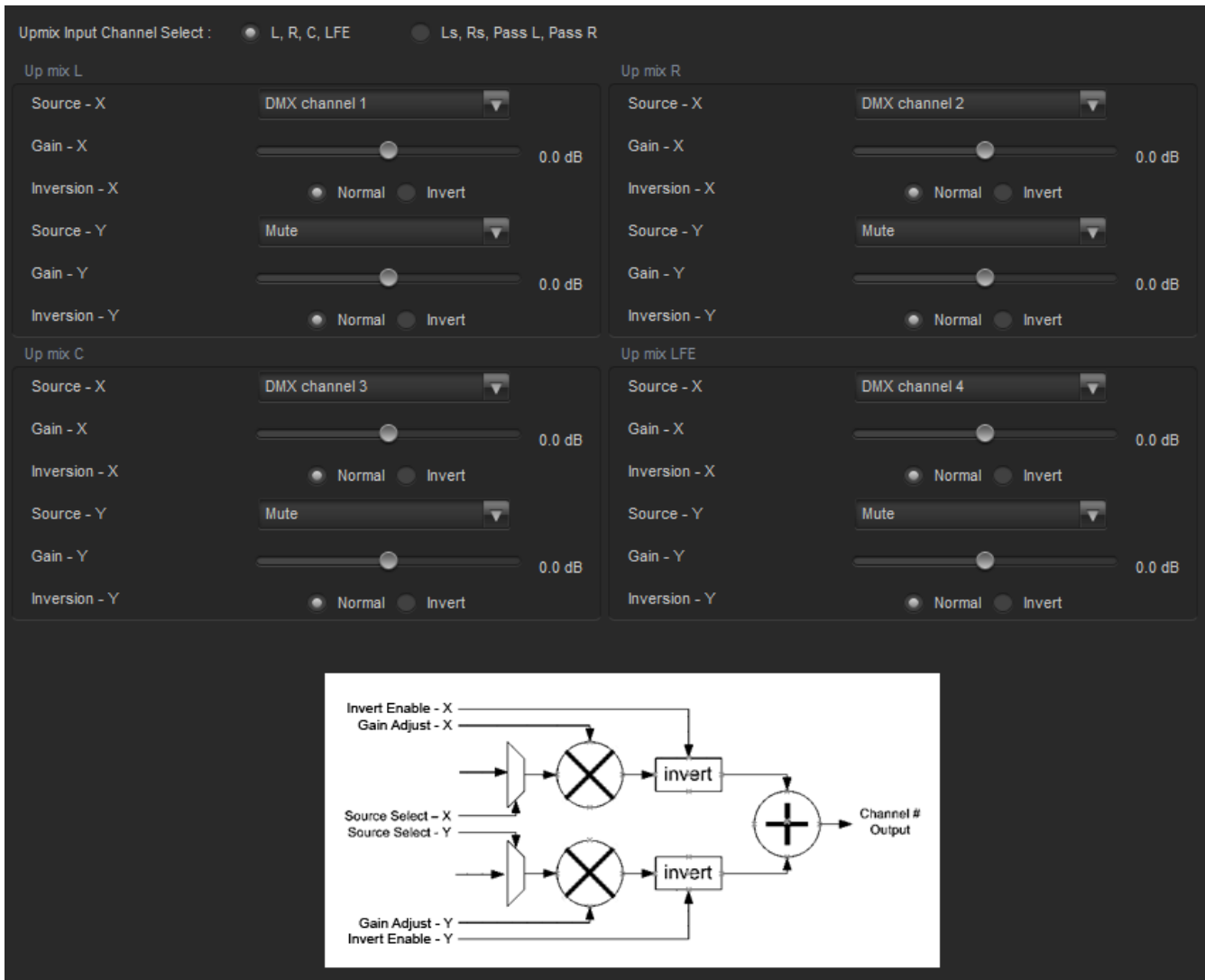
Figure 5-18: Video Path Configuration - Upmix Mixer Tab

Upmix Input Channel Select: These option buttons allow the user to toggle between configuration of Upmix input channel mixers L, R, C, LFE and Ls, Rs, Passthru L, Passthru R.

Source – X & Y: These controls allow the user to route one of the selectable mixer input audio sources to the corresponding input (X or Y) of the Upmix input channel mixer.

Gain – X & Y: These controls allow the user to set the value of the gain for the mixer input channel (X or Y). The user can adjust the gain of the selected mixer channel (X or Y) by adjusting the corresponding slider control. The supported range for gain adjustments is **-24dB to +24dB**. The gain can be adjusted with **0.1dB** precision.

Inversion – X & Y: These controls allow the user to invert the phase (180 degree phase shift) of the corresponding mixer input channel. By selecting *Normal,* the module will pass the mixer input audio through with no processing. By selecting *Invert,* the module will invert the phase of the mixer input audio channel (X or Y).

5.2.14. IntelliGain® [+IG2]

IntelliGain® is a technology developed by Evertz to control the loudness of audio programs on the fly. More specifically, it calculates the perceived loudness of the input audio and modifies the audio to ensure that the long-term average loudness level is at the target level. IntelliGain® works with mono, stereo and multi-channel audio per program and can handle up to 16 programs simultaneously. The objective loudness calculation is based on ITU Recommendation (ITU-R BS.1770-3), "Algorithms to measure audio program loudness and true-peak audio level". This recommendation provides equations for calculating loudness over mono, stereo and multi-channel audio programs. IntelliGain® constantly calculates audio program loudness. When the loudness is over the target level, it reduces the gain; and when the loudness is below the target level, it increases the gain. The gain adjustment smoothness is user-controllable by setting attack and release times.

The IntelliGain® audio processing module is an **optional product feature**, and requires the IntelliGain® product option **[+IG2]** to be included in the module's product string. This feature is an upgradeable product option, and can be purchased and added to 7847FSEDA modules that do not currently have this product option. The **[+IG2]** product option includes a dedicated 16 channel IntelliGain® audio processing module for each video processing path.

✍ **NOTE:** Please contact Evertz if interested in adding the IntelliGain® [+IG2] product option.

Features:

- Normalize loudness of audio programs to a target level
- Supports up to 16 programs and 16 channels (*per video path*)
- Relatively constant gain within a program interval to preserve audio dynamic range
- Simultaneously process multiple multi-channel programs
- User adjustable attack and release times
- Loudness algorithm based on ITU-R BS. 1770-3
- Peak limiting
- LKFS calculations
- Momentary, short term and integrated loudness measurements

5.2.14.1.IntelliGain® Mixer [+IG2]

The IntelliGain® Mixer tab contains controls for audio routing, audio gain, and audio inversion for the IntelliGain® audio processing module input channels. Each IntelliGain® input audio channel mixer consists of two independently selectable sources (X & Y) with each source having its own gain and inversion controls. The selectable sources for the IntelliGain® audio mixers may vary based on the audio options enabled on the module. Table 5-6 lists all the selectable sources for the IntelliGain® audio mixers, and which sources are enabled by product options. Figure 5-21 illustrates the layout of these controls in the VistaLINK® PRO configuration view.

✍ **NOTE:** The IntelliGain® Mixer tab is only visible when [+IG2] is included in the module's product string.

Product Option	Mixer Sources
All Products	Mute DMX channels 1-16 Mono mix DMX channels (8 pairs – 1&2, 3&4, etc.) Down mix L, R Down mix mono
Upmix [+UMX2]	Up mix L, R, C, LFE, Ls, Rs, passthru L, passthru R

Table 5-6: IntelliGain® Mixer - Selectable Audio Sources

Figure 5-19: Video Path Configuration - IntelliGain® Mixer Tab

Module & Channel Select: These option buttons allow the user to toggle between configuration of IntelliGain® Module 1 & 2 and input channel mixers 1-4 and 5-8.

Source – X & Y: These controls allow the user to route one of the selectable mixer input audio sources to the corresponding input (X or Y) of the IntelliGain® input channel mixer.

Gain – X & Y: These controls allow the user to set the value of the gain for the mixer input channel (X or Y). The user can adjust the gain of the selected mixer channel (X or Y) by adjusting the corresponding slider control. The supported range for gain adjustments is **-24dB to +24dB**. The gain can be adjusted with **0.1dB** precision.

Inversion – X & Y: These controls allow the user to invert the phase (180 degree phase shift) of the corresponding mixer input channel. By selecting **Normal,** the module will pass the mixer input audio through with no processing. By selecting **Invert,** the module will invert the phase of the mixer input audio channel (X or Y).

5.2.14.2. IntelliGain® Configuration [+IG2]

The IntelliGain® Configuration tab contains the global configuration controls for the IntelliGain audio processing module. Figure 5-22 illustrates the layout of these controls in the VistaLINK® PRO configuration view. The specific functionality of each control is provided below.
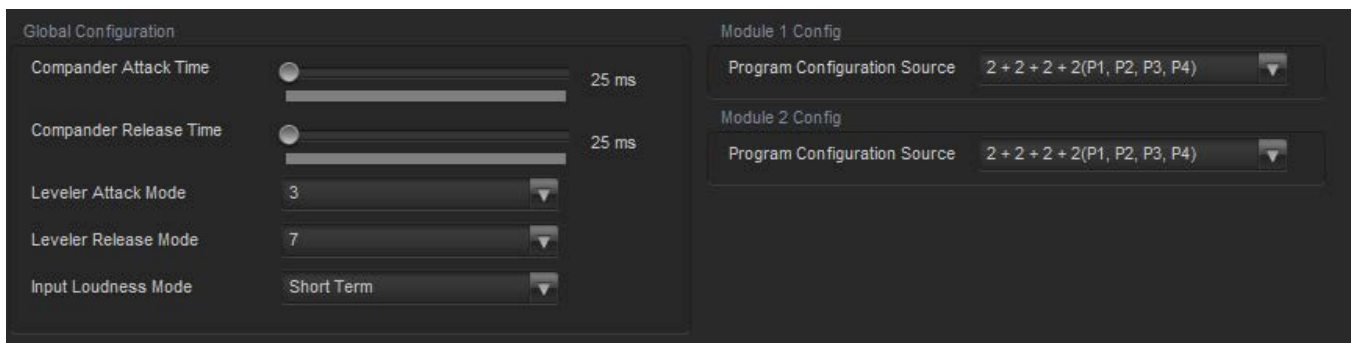
Figure 5-20: Video Path Configuration - IntelliGain® Configuration Tab

Global Configuration
   Compander Attack Time: This control allows the user to set how quickly the compander reacts to an increase in the input loudness. The value range is 10 ms to 2000 ms (2 sec).

   Compander Release Time: This control allows the user to set how quickly the compander reacts to a decrease in the input loudness. The compander release time should be greater than or equal to the *Compander Attack Time*. The value range is 10 ms to 2000 ms (2 sec).

   Leveler Attack Mode: This control allows the user to set the maximum integration time that is applied when loudness decreases during a program period. The actual integration time is content dependent. For more responsive results, set the attack time to a smaller value. The value range is 1 (most responsive) to 12 (least responsive)

   Input Loudness Mode: This control allows the user to set the window that will be used to produce the *Input Loudness.*

Program Configuration Source: This control defines how the input audio channels are grouped together into programs for the IntelliGain® audio loudness processing. Up to eight channels can be grouped together in individual programs, where each program contains its own metadata. IntelliGain® uses this parameter to configure multiple internal settings.

> **NOTE:** It is important to follow the program to channel mapping guidelines. For example, Program Configuration Source *2 + 2 + 2 + 2* defines audio program 1 mapped to input channels 1 & 2, audio program 2 mapped to input channels 7 & 8, audio program 3 mapped to input channels 3 & 4 and audio program 4 mapped to input channels 5 & 6. Program Configuration Source *2 + 2 + 2 + 2 (p1, p3, p4, p2)* has the audio program mapped sequentially.

Table 5-7 provides a list of IntelliGain® program to input audio channel mapping guidelines. For example, configuration 5.1+2, program 1 (P1) is mapped to channel CH1 to CH6 and program 2 (P2) is mapped to channel CH7 to CH8.

Program Configuration	CH 1	CH 2	CH 3	CH 4	CH 5	CH 6	CH 7	CH 8
5.1+2	P1-L	P1-R	P1-C	P1-LFE	P1-Ls	P1-Rs	P2-L	P2-R
5.1 + 1 + 1	P1-L	P1-R	P1-C	P1-LFE	P1-Ls	P1-Rs	P2-C	P3-C
4 + 4	P1-L	P1-R	P1-C	P1-S	P2-C	P2-S	P2-L	P2-R
4 + 2 + 2	P1-L	P1-R	P1-C	P1-S	P3-L	P3-R	P2-L	P2-R
4 + 2 + 1 + 1	P1-L	P1-R	P1-C	P1-S	P3-C	P4-C	P2-L	P2-R
4 + 1 + 1 + 1 + 1	P1-L	P1-R	P1-C	P1-S	P4-C	P5-C	P2-C	P3-C
2 + 2 + 2 + 2	P1-L	P1-R	P3-L	P3-R	P4-L	P4-R	P2-L	P2-R
2 + 2 + 2 + 1 + 1	P1-L	P1-R	P3-L	P3-R	P4-C	P5-C	P2-L	P2-R
2 + 2 + 1 + 1 + 1 + 1	P1-L	P1-R	P3-C	P4-C	P5-C	P6-C	P2-L	P2-R
2 + 1 + 1 + 1 + 1 + 1 + 1	P1-L	P1-R	P4-C	P5-C	P6-C	P7-C	P2-C	P3-C
1 + 1 + 1 + 1 + 1 + 1 + 1 + 1	P1-C	P2-C	P3-C	P4-C	P5-C	P6-C	P7-C	P8-C
5.1	P1-L	P1-R	P1-C	P1-LFE	P1-Ls	P1-Rs	None	None
4 + 2	P1-L	P1-R	P1-C	P1-S	None	None	P2-L	P2-R
4 + 1 + 1	P1-L	P1-R	P1-C	P1-S	None	None	P2-C	P3-C
2 + 2 + 2	P1-L	P1-R	P3-L	P3-R	None	None	P2-L	P2-R
2 + 2 + 1 + 1	P1-L	P1-R	P3-C	P4-C	None	None	P2-L	P2-R
2 + 1 + 1 + 1 + 1	P1-L	P1-R	P4-C	P5-C	None	None	P2-C	P3-C
1 + 1 + 1 + 1 + 1 + 1	P1-C	P2-C	P3-C	P4-C	P5-C	P6-C	None	None
4	P1-L	P1-R	P1-C	P1-S	None	None	None	None
2 + 2	P1-L	P1-R	None	None	None	None	P2-L	P2-R
2 + 1 + 1	P1-L	P1-R	None	None	None	None	P2-C	P3-C
1 + 1 + 1 + 1	P1-C	P2-C	P3-C	P4-C	None	None	None	None
7.1	P1-L	P1-R	P1-C	P1-LFE	P1-Ls	P1-Rs	P1-Bsl	P1-Bsr
7.1 Screen	P1-L	P1-R	P1-C	P1-LFE	P1-Ls	P1-Rs	P1-Le	P1-Re
2 + 5.1	P1-L	P1-R	P2-L	P2-R	P2-C	P2-LFE	P2-Ls	P2-Rs
1 + 1 + 5.1	P1-C	P2-C	P3-L	P3-R	P3-C	P3-LFE	P3-Ls	P3-Rs
2 + 2 + 2 + 2 (p1, p2, p3, p4)	P1-L	P1-R	P2-L	P2-R	P3-L	P3-R	P4-L	P4-R
2 + 2 + 2 + 1 + 1 (p1, p2, p3, p4, p5)	P1-L	P1-R	P2-L	P2-R	P3-L	P3-R	P4-C	P5-C
2 + 2 + 2 (p1, p2, p3)	P1-L	P1-R	P2-L	P2-R	P3-L	P3-R	None	None

Table 5-7: IntelliGain® - Relationship between IntelliGain® Audio Programs and Audio Channels

Abbreviations	Description
P	Program
CH	Channel
L	Left or left front
R	Right or right front
C	Center or mono
LFE	Low frequency effect
Ls	Left surround
Rs	Right surround
Bsl	Back surround left
Bsr	Back surround right

Table 5-8: IntelliGain$_®$ - Channel Mapping Abbreviations

5.2.14.3.IntelliGain® Program Control [+IG2]

The IntelliGain® Program Control tab contains the program configuration controls for the individual IntelliGain® audio programs. Figure 5-23 illustrates the layout of these controls in the VistaLINK® PRO configuration view. The specific functionality of each control is provided below.
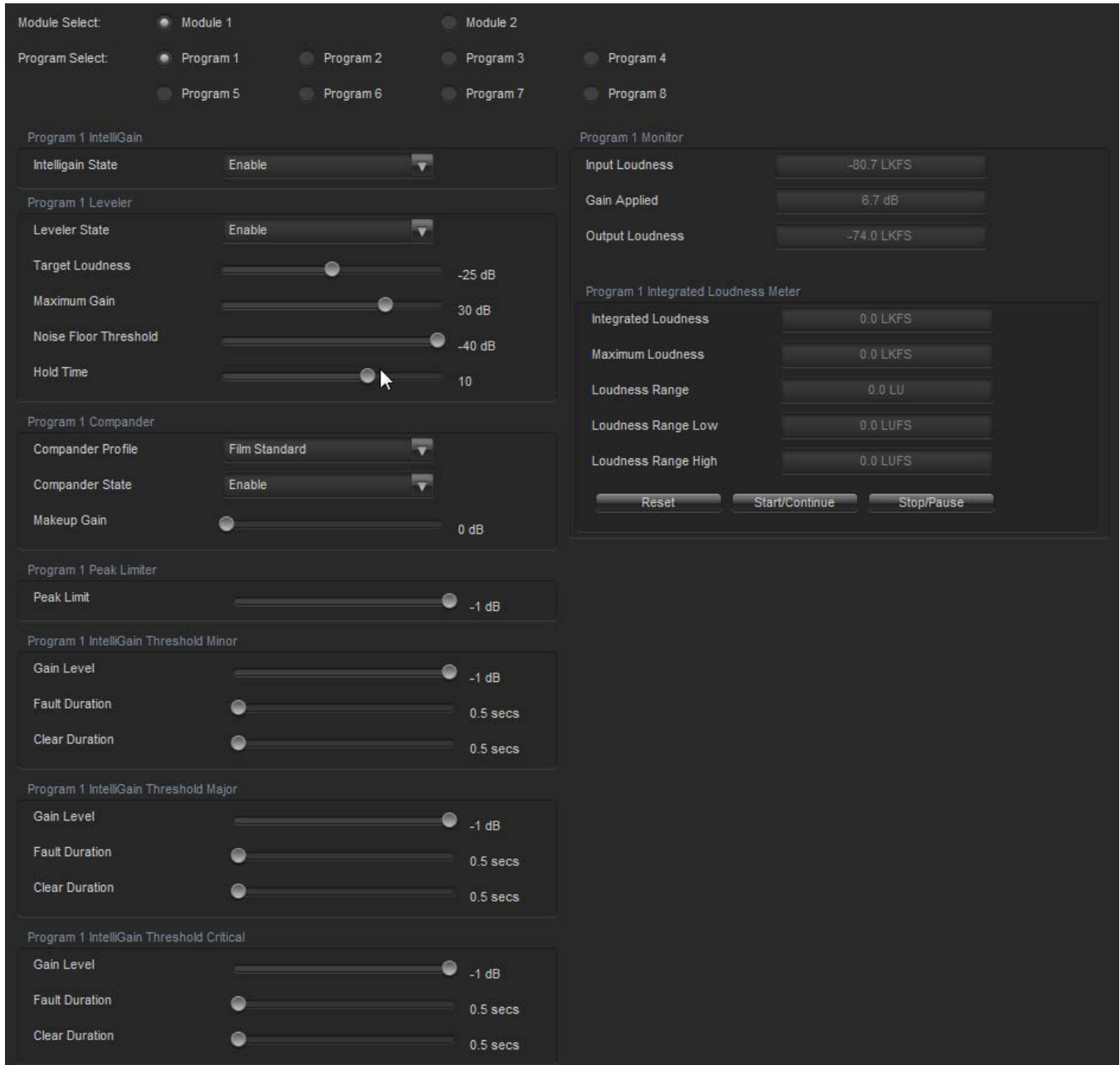

Figure 5-21: Video Path Configuration - IntelliGain® Program Control Tab

Module & Program Select: These option buttons allow the user to select the desired program for configuration.

✍ **NOTE:** Only the valid programs will be selectable for configuration. The valid programs are determined by the value of the *Program Configuration Source* control.

Program IntelliGain
IntelliGain State: This control allows the user to set the master switch for the IntelliGain™ processor, which is used for the given audio program. Select **Enable** to initiate IntelliGain processing, and select **Disable** to deactivate IntelliGain processing.

Program Leveler
Leveler State: This control allows the user to activate the IntelliGain® audio leveler. The leveler is used to level each individual audio channel to the target loudness level. Set this control to **Enable** or **Disable,** to activate or deactivate the IntelliGain® audio leveler.

Target Loudness: This control allows the user to set the target loudness level for the given audio program. The IntelliGain® processor will level the audio to this value. The value range is -35 dBFS to -15dBFS.

✍ **NOTE:** If the compander is enabled, it is desirable to set the target loudness parameter to the range (–31 dBFS to –26 dBFS) and use *Makeup Gain* control to reach the final desired target loudness level.

Maximum Gain: This control allows the user to set total amount of gain that the IntelliGain® engine will apply. For example, setting this control to 10 LKFS indicates that IntelliGain® is not to add anymore than 10 LKFS of gain to the audio program, even if the audio program requires more gain to reach the target loudness level. The value range is 0 LKFS to 40 LKFS.

Noise Floor Threshold: This control allows the user to set the audio threshold level for IntelliGain® processing. Audio levels below this value will not have IntelliGain® processing applied. The value range is -70 dBFS to -40 dBFS.

Hold Time: This control allows the user to set the hold time for the given audio program. The IntelliGain® processor will wait this period of time to add gain once the level goes below the target loudness. By selecting **Immediate,** the IntelliGain® processor will immediately process incoming audio. The user can also define the amount of time before applying processing; this range can be set from **1 – 14 seconds.** By selecting **Adaptive,** the processor will vary the hold time depending on the content for optimal sound quality.

Program Compander
Compander Profile: The compander profiles are used to define the dynamic range control of the compander. There are 5 default profiles.

   Film Standard: This profile is used to compress/expand sporting events, and movies with a large dynamic range.
               Max Boost: 6 dB (below –43 dB)
               Boost Range: –43 to –31 dB (2:1 ratio)
               Null Band Width: 5 dB (–31 to –26 dB)
               Early Cut Range: –26 to –16 dB (2:1 ratio)
               Cut Range: –16 to +4 dB (20:1 ratio)

Film Light: This profile is used to compress/expand light movies or program content such as dramas or content with less dynamic range.

> Max Boost: 6 dB (below –53 dB)
> Boost Range: –53 to –41 dB (2:1 ratio)
> Null Band Width: 20 dB (–41 to –21 dB)
> Early Cut Range: –26 to –11 dB (2:1 ratio)
> Cut Range: –11 to +4 dB (20:1 ratio)

Speech: This profile is used to compress/expand content such as news, documentaries or "talking head" type content.

> Max Boost: 15 dB (below –50 dB)
> Boost Range: –50 to –31 dB (5:1 ratio)
> Null Band Width: 5 dB (–31 to –26 dB)
> Early Cut Range: –26 to –16 dB (2:1 ratio)
> Cut Range: –16 to +4 dB (20:1 ratio)

Music Standard: This profile is used in most typical music environments such as concerts, music videos and music content with a wide dynamic range.

> Max Boost: 12 dB (below –55 dB)
> Boost Range: –55 to –31 dB (2:1 ratio)
> Null Band Width: 5 dB (–31 to –26 dB)
> Early Cut Range: –26 to –16 dB (2:1 ratio)
> Cut Range: –16 to +4 dB (20:1 ratio)

Music Light: This profile is used to compress/expand music content with a narrow dynamic range.

> Max Boost: 12 dB (below –65 dB)
> Boost Range: –65 to –41 dB (2:1 ratio)
> Null Band Width: 20 dB (–41 to –21 dB)
> Cut Range: –21 to +9 dB (2:1 ratio).

Compander State: This control allows the user to activate the on-board compressor/expander, otherwise known as the compander. The use of the compander allows audio signals with a large dynamic range to be transmitted over facilities that have a smaller dynamic range capability. The compander works by compressing or expanding the dynamic range of the audio signal.

Makeup Gain: This control allows the user to add additional gain to the audio program. This control can be used if the final desired target loudness has not been reached after IntelliGain® processing. The value range is 0 dBFS to 20 dBFS.

Program Peak Limiter
Peak Limit: This control is used within the audio program chain to provide an upper limit to peak program levels. It is sometimes referred to as a "brick-wall" limiter, as it will not allow audio to pass beyond this audio level. The value range is -15 dBFS to -1 dBFS.

Program Intelligain Threshold Minor/ Major/ Critical
Gain Level: This control allows the user to set the audio loudness threshold (dBFS) that determines if the status of the *minor/major/critical* trap. If the program audio loudness level *exceeds* the program threshold for the *fault duration*, it will trigger the corresponding *minor/major/critical* fault trap to be sent to the registered trap alarm servers. If the program audio loudness level remains *below* the program threshold for the *clear duration*, it will trigger the corresponding *minor/major/critical* fault trap to be cleared. The value range is -65 dBFS to -1 dBFS

Fault Duration: This control allows the user to define the amount of time that the program audio loudness level must exceed the *minor/major/critical* program threshold to trigger the corresponding

minor/major/critical fault trap to be sent to the registered trap alarm servers. The value range is 0.5 sec to 240 sec in increments of 0.5 secs.

Clear Duration: This control allows the user to define the amount of time that the program audio loudness level must remain below the *minor/major/critical* program threshold to trigger the corresponding *minor/major/critical* fault trap to be cleared. This control is primarily used to smooth out alarming for audio with a very wide dynamic range. The value range is 0.5 sec to 240 sec in increments of 0.5 secs.

Program Monitor
Input Loudness: This field displays the calculated audio input loudness level. This control is used for monitoring purposes only. The value is reported in dBFS.

Gain Applied: This field displays the amount of gain being applied by the IntelliGain® system. Values can be either negative, indicating a gain reduction, or positive, indicating gain is being applied. The value is reported in dBFS.

Output Loudness: This field displays the program output loudness after the IntelliGain® processing. This control is used for monitoring purposes only. It can be used to provide confidence monitoring. The value is reported in dBFS.

Program Integrated Loudness Meter
Integrated Loudness: This field will display the calculated integrated loudness audio level. This control is used for monitoring purposes only. The period of the integrated loudness measurement is defined by user interaction with the *Start/Continue* and *Stop/Pause* buttons. Once the *Stop/Pause* button is activated, the loudness of the segment(s) defined by all active periods is calculated. The integrated loudness measurement is performed using the gating function specified in *ITU-R BS.1770-2* summarized as follows:

- an absolute gating threshold at -70 LKFS is used to compute the absolute-gated loudness level
- a relative gating threshold that is 10 LU below the absolute-gated loudness level is applied
- The measurement input to which the gating threshold is applied is the loudness of 400 ms blocks with a constant overlap between consecutive gating blocks of 75%.

The value is reported in LKFS.

Maximum Loudness: This field displays the maximum calculated loudness value within the duration of the *Integrated Loudness* calculation. This control is used for monitoring purposes only. The value is reported in LKFS.

Loudness Range: This field displays the calculated loudness range within the duration of the *Integrated Loudness* calculation. The Loudness Range describes the distribution of loudness within a program and is defined as the difference between the highest and lowest loudness values within the integrated loudness period. The range excludes all loudness values in the top 5% and bottom 10% of the loudness distribution after applying a relative gating threshold of 20 LU below the absolute-gated loudness level. This control is used for monitoring purposes only. The value is reported in LU.

Loudness Range Low: This field displays the lowest calculated loudness value within the duration of the *Integrated Loudness* calculation, given the exclusions and thresholds used as described above in the calculation of the *Loudness Range*. This control is used for monitoring purposes only. The value is reported in LUFS

Loudness Range High: This field displays the highest calculated loudness value within the duration of the *Integrated Loudness* calculation, given the exclusions and thresholds used as described above in the calculation of the *Loudness Range*. This control is used for monitoring purposes only. The value is reported in LUFS

Reset: This control allows the user to flush the buffer for the *Integrated Loudness* calculation. This control should be activated each time a new *Integrated Loudness* value is to be obtained.

Start/Continue: This control allows the user to commence or resume the duration in which loudness values are being used to calculate the *Integrated Loudness* measurement.

Stop/Pause: This control allows the user to terminate or pause the duration in which loudness values are being used to calculate the *Integrated Loudness* measurement. Each time this button is activated, a new *Integrated Loudness* value will be produced.

5.2.14.4. IntelliGain® Traps [+IG2]

The IntelliGain® audio loudness processing module can provide confidence monitoring with SNMP trap alarm notification. These alarms can be enabled and disabled on an individual audio program basis using the IntelliGain™ Traps tab.

The IntelliGain Traps tab contains the IntelliGain® program trap enables, as well as corresponding trap status for each IntelliGain® audio program. Figure 5-24 illustrates the layout of these controls in the VistaLINK® PRO configuration view.

To enable or disable an SNMP alarm notification, either check or un-check the defined control.

The IntelliGain® audio loudness processing module also provides trap status information on the IntelliGain traps tab. If a trap is sent by the IntelliGain® system, the trap status box will change state indicating the current value for that trap. For example, if the trap status box is the colour green, then the trap has not been sent, and the trap is not in the alarm state. However, if the status box is the colour red, then the fault is in a current state of alarm. Once corrected, the status box will turn back to the colour green.
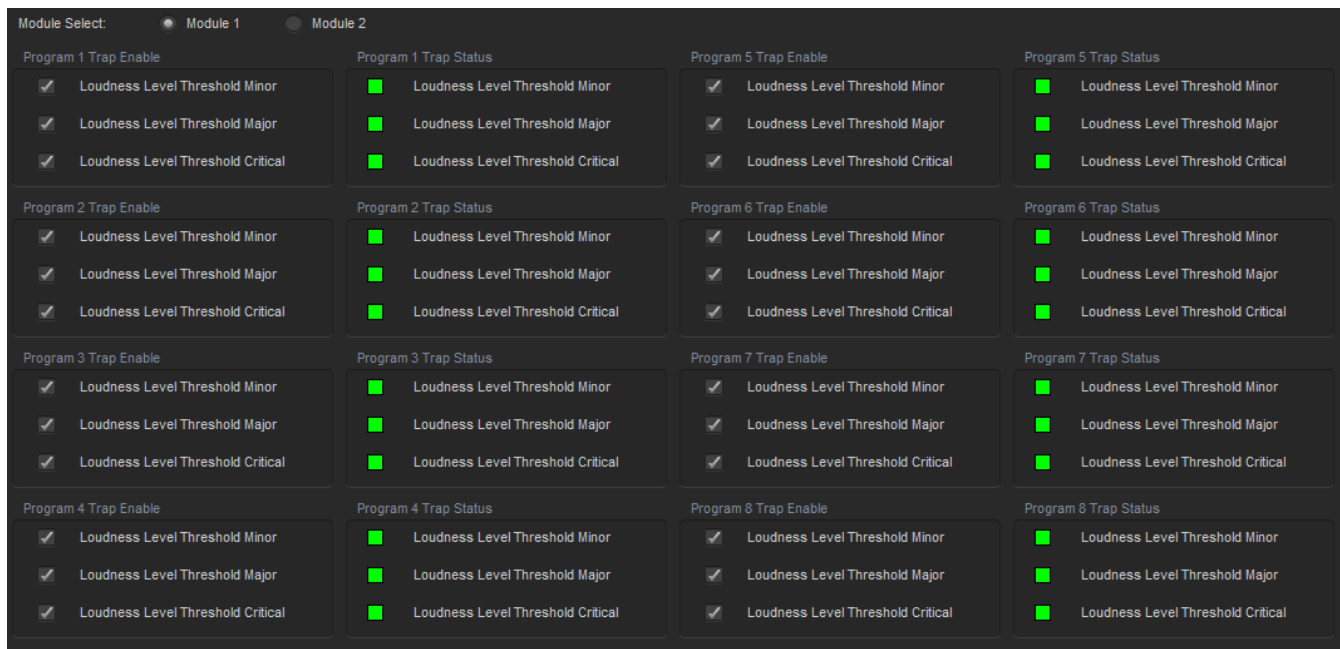
Figure 5-22: Video Path Configuration - IntelliGain® Traps Tab

5.2.15. SID (Source Identification)

Source Identification (*termed Source ID*) provides a useful method for tagging the video signal with a VANC data packet as it is processed by the module. With each module appending its own source ID tag into the VANC region; it effectively creates a history of the signal processing path taken by any video signal through the facility.

Each source ID tag VANC packet payload is 113 bytes and is defined as follows:

Element	Bytes
Version	1
SID Count & Overflow	2
Date (DDMMYY)	6
Time (HHMMSSFF)	8
Time Zone	4
Base Label	16
Alias Label	48
User Code	4
Alpha Tag	12
Serial Tag	12
Total Payload per SID tag	**113**

Table 5-9: Source ID - VANC Packet Payload

All data within the source ID packet is ASCII encoded to allow for simple decoding and monitoring of any element within the source ID packet.

The SID tab contains all controls relating to Source ID processing. It allows the user to specify the contents of the source ID VANC packet that will uniquely identify the module and act as its *fingerprint/signature* on the processed video signal. It also reports the other components of the source ID tag that are not user configurable. Figure 5-25 illustrates the layout of these controls in the VistaLINK® PRO configuration view. The specific functionality of each control is provided below.
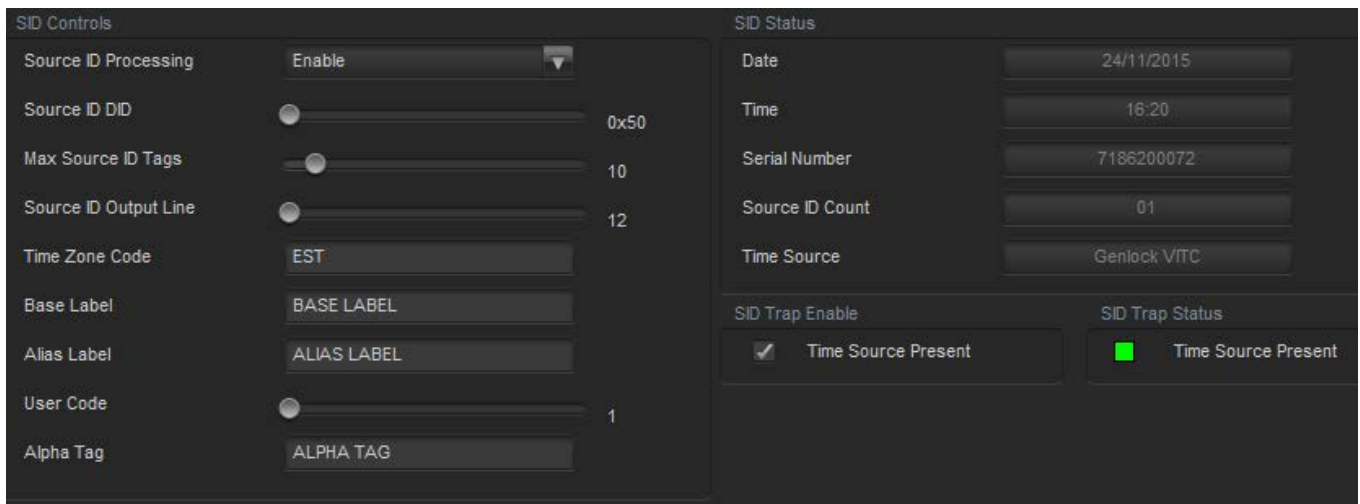

Figure 5-23: Video Path Configuration - SID Tab

SID Controls

Source ID Processing: This control allows the user to enable Source ID Processing. When set to **Enable**, all Source ID tags on the input are processed and embedded on the output video signal. Additionally, the module will also append its own Source ID tag. When set to **Disable**, no input Source ID packets will be processed, and the module will not append its own Source ID tag on the output video signal.

Source ID DID: This control allows the user to set the Data Identification (DID) value for the Source ID SMPTE-291 packets.

Max Source ID Tags: This control allows the user to set the maximum number of Source ID tags to be processed and embedded on the output video signal.

> **NOTE:** Care must be taken to properly restrict the number of Source ID packets to ensure they won't exceed the number of bytes per VANC line of the output video standard.

Source ID Output Line: This control allows the user to set the VANC output line to embed the Source ID packets.

Time Zone: This field allows the user to set the Time Zone Code for its Source ID tag. The Time Zone is a maximum of 4 characters.

Base Label: This field allows the user to set the primary identification of the module/video signal. The base label is a maximum of 16 characters.

Alias Label: This field allows the user to set additional secondary identification of the module/video signal. The alias label is 48 characters and can be used for a more detailed description of the module/video signal.

User Code: This field allows the user to set a 4 digit utility number available for user monitoring applications of Source ID. One possible use case would be to set the user code as the router input / output number. The value range is from 0000 – 9999.

Alpha Tag: This field allows the user to set a 12 character identification of the module owner.

SID Status

Date: This field reports the current system date of the module that will be embedded in the 6 character *Date* field of the Source ID tag.

Time: This field reports the current system time of the module that will be embedded in the 8 character *Time* field of the Source ID tag.

Serial Number: This field reports the Serial number of the card that will be embedded in the 12 character *Serial Tag* field of the Source ID tag.

Source ID Count: This field reports the Source ID count that will be embedded in the 2 character *SID Count & Overflow* field of the Source ID tag.

Time Source: This field reports the current source of time used by the *Time* and *Date* fields in the Source ID tag.

Trap Enable and Trap Status

To enable/disable a specific fault trap, check/uncheck the corresponding checkbox.

Time Source Present: This trap will **trigger** when the module detects a loss of the Source ID time source. This trap will **clear** when a valid source of time has been detected.

5.2.16. ANC PassThru

The ANC PassThru feature allows for the user to define specific rules for passing ANC data from input to output. There are two modes of operation for ANC PassThru: **Direct ANC PassThru** and **Mapped ANC PassThru.**

The *Direct ANC PassThru* mode of operation routes *ALL* ancillary data in both HANC & VANC frame accurately from input to output. This mode of operation is designed for the use case when the input video standard and output video standard are identical.

Additionally, Direct ANC PassThru will also support passing SD-VBI waveforms from input to output.

All packets that are processed by the module itself (For example: Source ID) are safely blocked from passing from input to output while operating in Direct ANC PassThru.

Key Functional Notes of Direct ANC PassThru:
- Only supported when Input Video Standard is identical to the Output Video Standard

- ***Direct ANC PassThru*** overrides ***Mapped ANC PassThru*** when it is enabled and Input Video Standard is identical to the Output Video Standard

- When ***Direct ANC PassThru*** is disabled or invalid, ***Mapped ANC PassThru*** rules are applied.

- Supports SD-VBI waveform pass through for SD video.

- ANC packets processed by the system *(For example: Source ID)* will be blocked from passing through to avoid duplicate entries on the output video.

The ***Mapped ANC PassThru*** mode of operation routes up to 10 unique (DID, SDID) ANC packets frame accurately from input to output. This mode of operation is designed for the use case when the input video standard and output video standard differ, or when only a subset of the ANC data on the input is desired to be passed through the module.

The Mapped ANC PassThru provides a parameter set to fully define how each ANC packet will be routed from input to output. This includes Packet Location (HANC or VANC), output line numbers and interlaced to progressive and progressive to interlaced ANC data mapping.

Key Functional Notes of Mapped ANC PassThru:
- Supported for all valid input and output video standard combinations.

- When enabled and valid, ***Direct ANC PassThru*** overrides ***Mapped ANC PassThru***.

- ANC packets processed by the system (*For example: Source ID*) will be blocked from passing through using ***Mapped ANC PassThru*** to avoid duplicate entries on the output video.

> **NOTE:** If the module is current processing the selected DID, SDID then the *Mapped ANC Packet PassThru Status* will report *blocked*.

The ANC PassThru tab contains all controls relating to ANC pass through processing. Figure 5-26 illustrates the layout of these controls in the VistaLINK® PRO configuration view. The specific functionality of each control is provided below.
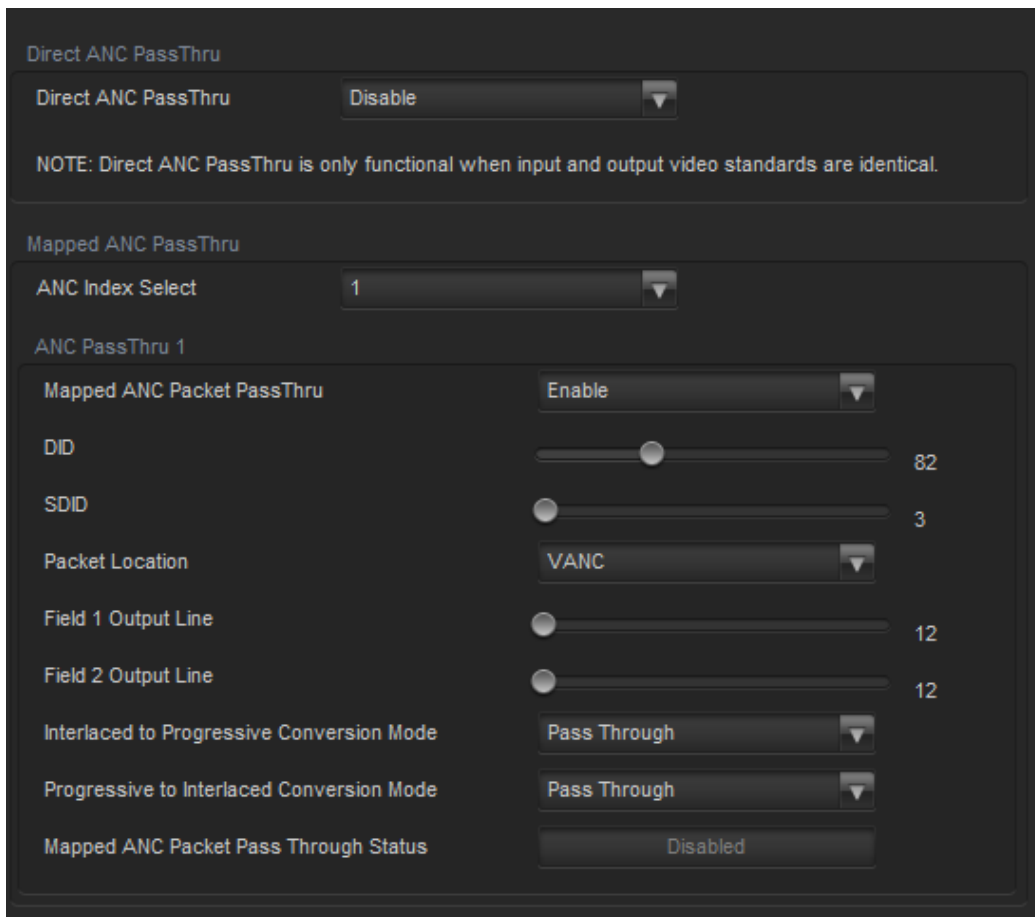
Figure 5-24: Video Path Configuration - ANC PassThru Tab

Direct ANC PassThru

Direct ANC PassThru: This control allows the user to *Enable* or *Disable* Direct ANC data passthru for ANC data that is not processed through the module to pass through without getting striped on the output video signal.

> **NOTE:** Direct AND PassThru is only functional when input and output video standards are identical.

Mapped ANC PassThru

ANC Index Select: This control allows the user to select which of the 10 *Mapped ANC PassThru* rules to configure. Each *Mapped ANC PassThru* rule contains its own unique set of control values.

ANC PassThru

Mapped ANC Packet PassThru: This control allows the user to enable / disable the *Mapped ANC PassThru* rule as defined by its controls. When set to **Enable** the *Mapped ANC PassThru* rule will be applied to route any ANC packets on the input with matching DID and SDID (*if relevant*) to the ANC of the output video. When set to Disable, the rule will not be applied, and all ANC packets on the input with matching DID and SDID (*if relevant*) will not be included in the ANC of the output video.

DID: This control allows the user to set the DID of the ANC packet to be passed through. Valid range is 0x01 to 0xFF.

SDID: This control allows the user to set the SDID of the ANC packet to be passed through. Valid range is 0x01 to 0xFF.

Packet Location: This control allows the user to specify whether the output ANC packet should be located in the HANC or VANC region. By selecting *VANC,* the incoming packets will be inserted on the VANC region of the output video. By selecting *HANC,* the incoming ANC packets will be inserted on the HANC region of the output video.

Field 1 Output Line: This control allows the user to set the field 1 output line of the ANC packet to be passed through. The valid range is video standard dependent.

Field 2 Output Line: This control allows the user to set the field 2 output line of the ANC packet to be passed through. This control is only valid for interlaced output video standards. The valid range is video standard dependent.

Interlaced to Progressive Conversion Mode: This control allows the user to determine the method of outputting the ANC packets on an interlaced to progressive conversion. By selecting *Pass Through,* the module will take an ANC packet from input field 1 and insert it onto output progressive frame 1 and an ANC packet from input field 2 and insert it onto output progressive frame 2. By selecting *Duplicate Packet,* the module will embed data from input field 1 onto both frame 1 & 2 on the output.

Progressive to Interlaced Conversion Mode: This control allows the user to determine the method of outputting the ANC packets on a progressive to interlaced conversion. By selecting *Pass Through,* the module will take an ANC packet from input progressive frame 1 and insert it onto output field 1, and an ANC packet from input progressive frame 2 and insert it onto output field 2. By selecting *Duplicate Packet,* the module will embed data from input progressive frame 1 onto both output field 1 & 2. By selecting *Field 1 Only,* the module will only embed the incoming ANC packets onto output field 1. By selecting *Field 2 Only,* the module will only embed the incoming ANC packets onto output field 2.

Mapped ANC Packet Pass Through Status: This field reports the current state of the ANC Packet PassThru rule. The possible reported status values are:

Disabled	The ANC PassThru rule is currently **Disabled**
Not Detected	The ANC packet with corresponding DID and SDID (*if relevant*) is **not detected** on the input video
Processing	The ANC packet with corresponding DID and SDID (*if relevant*) is present on the input and actively being **processed** according to the defined ANC PassThru rule
Blocked	The ANC packet with corresponding DID and SDID (*if relevant*) is present on the input and is being **blocked** from ANC PassThru processing because that same DID and SDID is being processed by another component of the module (*For example: Source ID*)

Table 5-10: ANC PassThru - Mapped ANC Packet Pass Through Status Values

5.2.17. Presets

The Presets tab provides the facilities for naming, loading, storing and triggering user defined video path presets. It also provides the facility to load default values for all video path parameters. Figure 5-27 illustrates the layout of these controls in the VistaLINK® PRO configuration view.
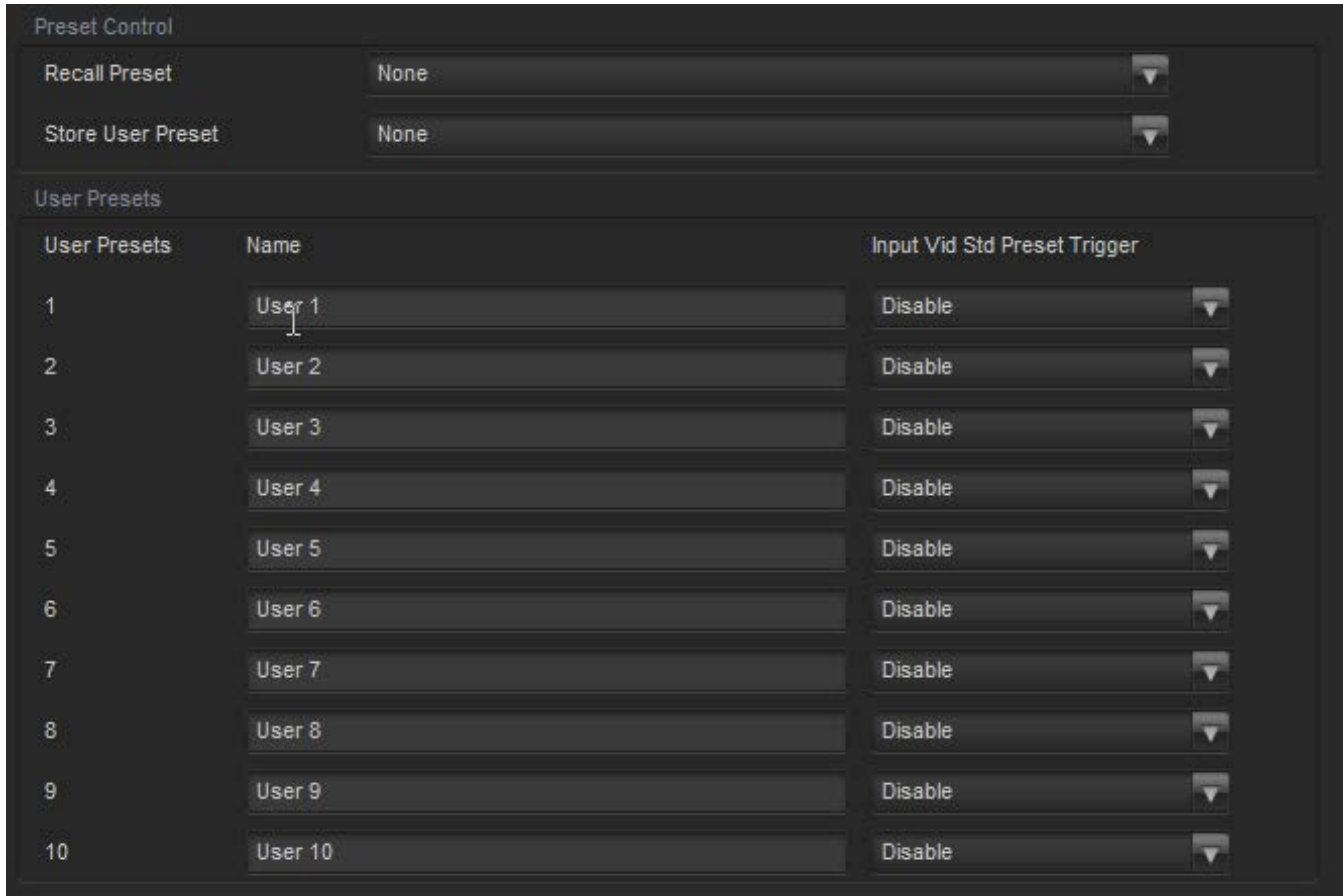

Figure 5-27: Video Path Configuration - Presets Tab

Preset Control
  Recall Preset: This control allows the user to initiate a recall of the card configuration from one of the 10 available user presets or reset the card to factory defaults.

  Store User Preset: This control is used to initiate a store of the current card video path configuration into one of the 10 available user presets. To store a card configuration to a specific preset, select the preset to which you wish to store the card settings and press the APPLY button.

User Presets
  Name: This control allows the user to provide a meaningful name to each user preset. For example, rather than simply using *User 1*, the user preset can take on a name such as *1080i/59.94 In to 525i/59.94 Out*.

Input Vid Std Preset Trigger: This control allows the user to automatically trigger the loading of a video path user preset based on the detected input video standard. For each video path user preset, The following are the selectable options:

Disable	Input video standard preset triggering is **disabled**.
1080i/59.94	When **1080i/59.94** input video is detected, recall the user preset.
720p/59.94	When **720p/59.94** input video is detected, recall the user preset.
525i/59.94	When **525i/59.94** input video is detected, recall the user preset.
1080i/50	When **1080i/50** input video is detected, recall the user preset.
720p/50	When **720p/50** input video is detected, recall the user preset.
625i/50	When **625i/50** input video is detected, recall the user preset.
1080p/59.94 (425M Level A)	When **1080p/59.94 (425M Level A)** input video is detected, recall the user preset.
1080p/59.94 (425M Level B)	When **1080p/59.94 (425M Level B)** input video is detected, recall the user preset.
1080p/50 (425M Level A)	When **1080p/50 (425M Level A)** input video is detected, recall the user preset.
1080p/50 (425M Level B)	When **1080p/50 (425M Level B)** input video is detected, recall the user preset.

Table 5-11: Presets - Input Video Standard Preset Triggers

5.2.18. SubPresets

Sub-presets provide the user the facility to load a subset of the video path configuration controls into a user preset. In most cases, there is only a small subset of the hundreds of configurable parameters that need to be changed for a user's required modes of operation of the module. By loading a sub-preset, the system will only apply the preset value for the specified parameters. This drastically reduces the system load, and significantly improves response time to a preset load. For these reasons, sub-presets are highly recommended over user presets which store all video path parameters.

A sub-preset configuration XML file must be first generated in VistaLINK® PRO. Once the XML configuration file has been generated, it can be loaded through the facilities of the SubPresets tab in the video path configuration view. Figure 5-28 illustrates the layout of these controls in the VistaLINK® PRO configuration view.
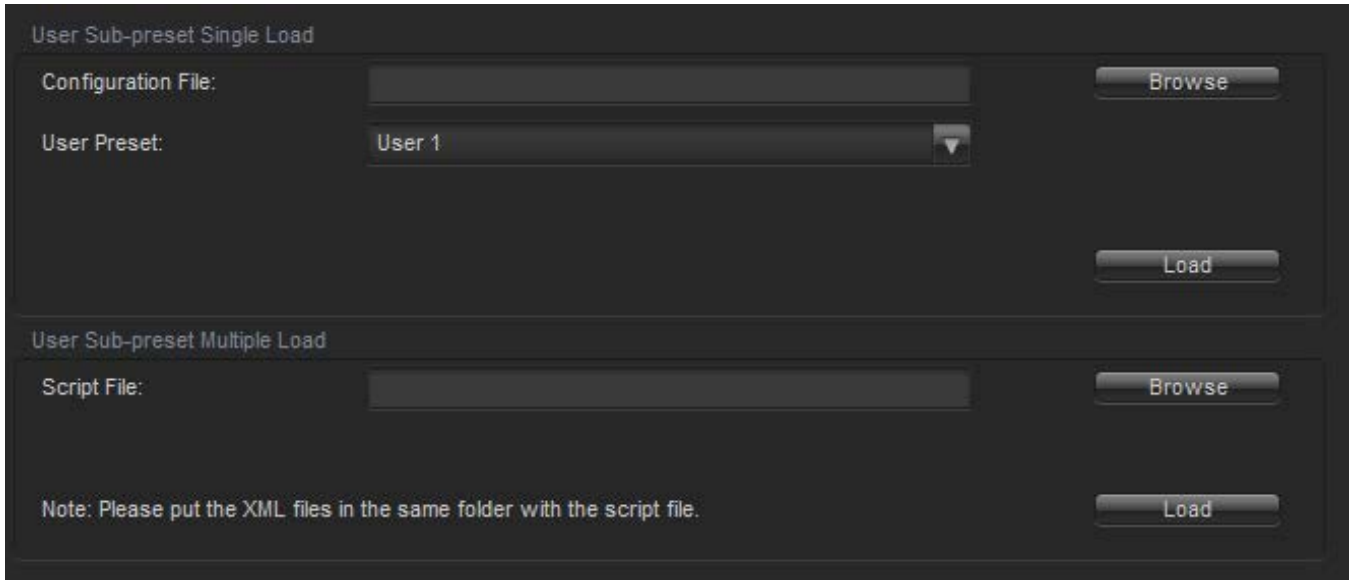
Figure 5-28: Video Path Configuration - SubPresets Tab

User Sub-preset Single Load
These controls provide the facilities to load a single sub-preset XML configuration file into a video path user preset.

Configuration File: By clicking the **Browse** button, the user can locate the sub-preset XML configuration file to be loaded.

User Preset: This control allows the user to specify which user preset to store the sub-preset configuration.

Once the proper **configuration file** has been selected, and the desired **user preset** to store the sub-preset configuration has been selected, click the **Load** button to load the sub-preset into the specified user preset.

User Sub-preset Multiple Load
These controls provide the facilities to perform multiple loads of sub-preset XML configuration files into video path user presets using scripts.

NOTE: The sub-preset loading script must be placed in the same directory as the sub-preset XML configuration files.

Script File: By clicking the **Browse** button, the user can locate the sub-preset loading script file to be executed.

Once the proper **script file** has been selected, click the **Load** button to load the multiple sub-presets into the specified user presets.

The format of each line in the sub-preset loading script must be as follows:

```
<name of sub-preset XML file>,<user preset #>
```

6.   JUMPERS

Figure 6-1 and Figure 6-2 provide the locations of the jumpers and LEDs on the 7847FSEDA series boards.
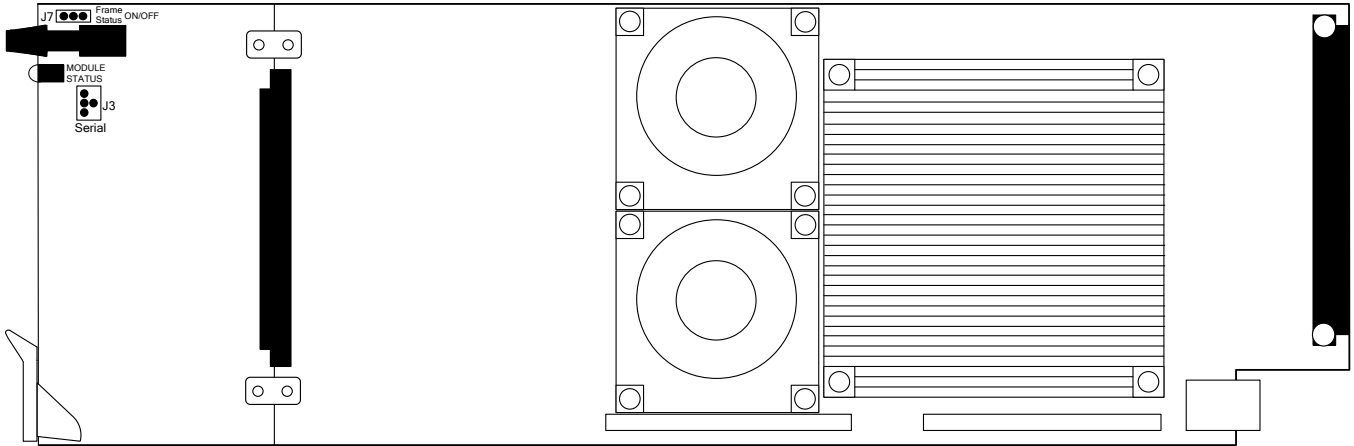

Figure 6-1: Location of Jumpers - Top View Main Module

Figure 6-2: Location of Slot Blocker - Bottom View Main Module

6.1.   LOCAL FAULT MONITORING USING THE GLOBAL FRAME STATUS

FRAME STATUS: The FRAME STATUS jumper J7 is located near the front of the main module close to the shaft encoder knob. The FRAME STATUS jumper determines whether local faults (as shown by the LOCAL FAULT LED) will be connected to the 7700FR-C or 7800FR frame's global status bus.

To monitor faults on this module with the frame status indicators (on the PS FRAME STATUS LED's and on the Frame's Fault Tally output) install this jumper in the **ON** position. (Default)

When this jumper is installed in the **OFF** position, local faults on this module will not be monitored by the frame status indicators.

6.2.   7847FSEDA Series Slot Blocker

The 7847FSEDA series of modules can be installed in either the 7700FR-C or the 7800FR frames. These modules are designed to take two slots in the Evertz 7800FR frame and three slots in the 7700FR-C.

Modules can fit into two slots in a 7800FR frame because the 7800FR allows modules to consume more power on a per slot basis than the Evertz 7700FR-C. When a 7847FSEDA series module is installed in the 7700FR-C, the module must occupy 3 slots to ensure that the frame power is managed properly. This is accomplished by installing a **Slot Blocker** on the bottom side of the board. If the **Slot Blocker** is not installed on the card and the card is inserted into the 7700FR, the card will not power-up. When installing the card in a 7800FR, the **Slot Blocker** may be removed and it will power-up and operate normally. If the **Slot Blocker** remains installed and the card is inserted into the 7800FR, the card will also power-up and operate normally, but it will unnecessarily block the usage of an additional slot in the 7800FR.
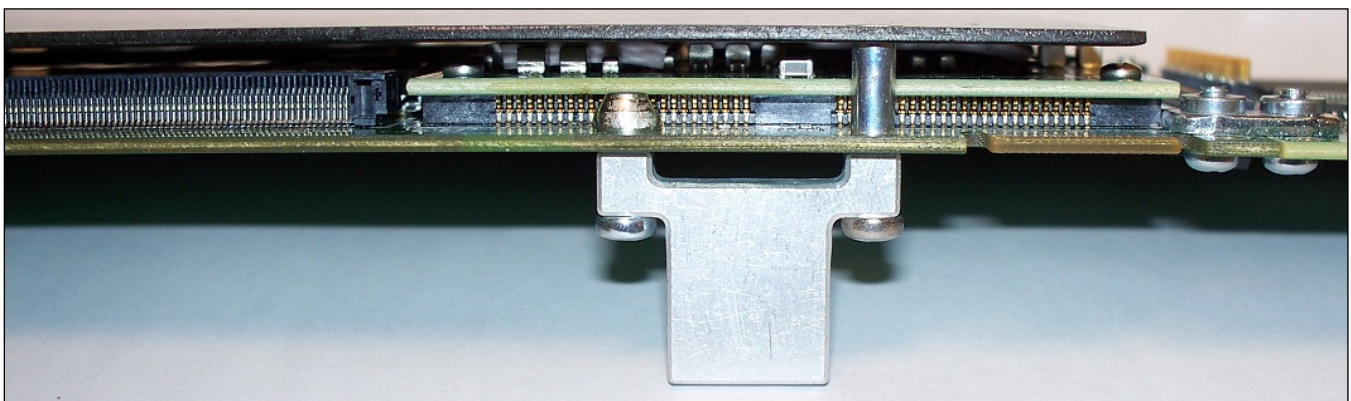

Figure 6-3: Slot Blocker

7. UPGRADE PROCEDURES

There are multiple components of the module operation that can be upgraded. These include:

- VistaLINK® PRO Product JAR upgrade
- Firmware upgrade
- Product String upgrade

This section outlines the procedures for performing these module upgrades.

> **NOTE:** If multiple components require upgrading simultaneously (*For example: VistaLINK® PRO JAR and Firmware*), it is recommended the upgrades are performed in the order presented in this section.

7.1. VISTALINK® PRO PRODUCT JAR UPGRADE

Open VISTALINK® PRO Server and navigate to *Help > Apply Update > Product.* When the window opens you want to select the latest .jar file for the 7847FSEDA, from its saved location on the computer and select **Open**.
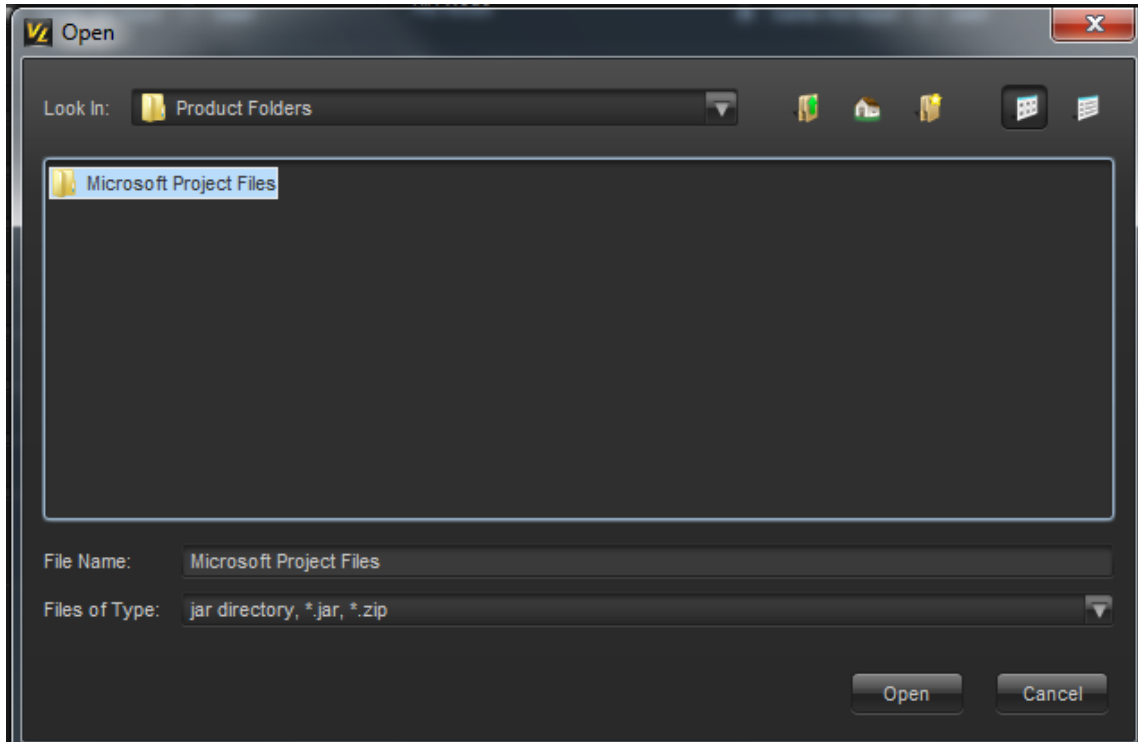
Figure 7-1: VistaLINK® PRO JAR Upgrade - Upgrade Window

At this point the VistaLINK® PRO Server will send a message asking to Restart, select **Yes**. This will apply the JAR update to the 7847FSEDA. Restart VISTALINK® PRO Server followed by VISTALINK® PRO Client.

When VISTALINK® PRO Client has re-opened, verify that the 7847FSEDA is running the correct version, to check this simply right click on the cards address in VistaLINK® PRO Client and select **Version Information**.
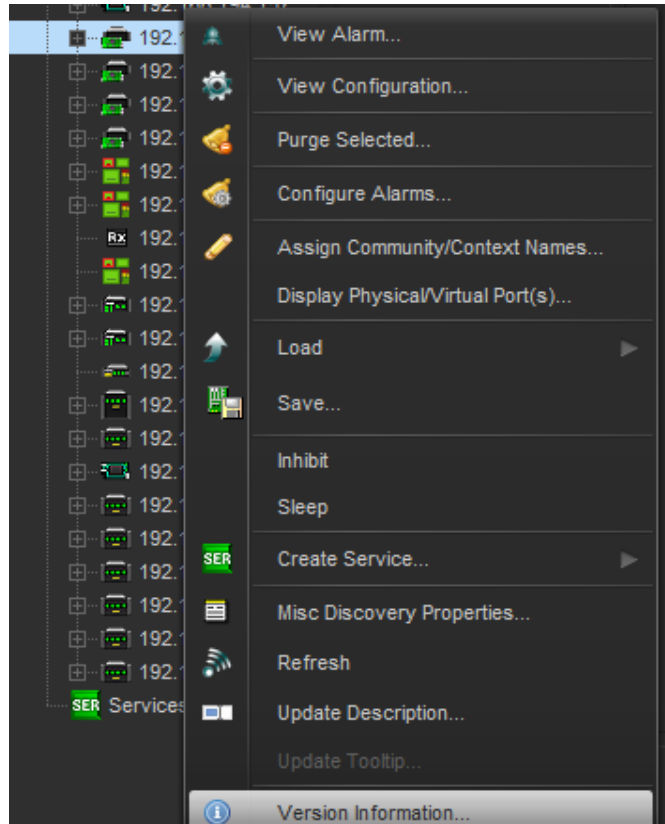
Figure 7-2: VistaLINK® PRO JAR Upgrade - Module Dropdown Menu

This will open a window that displays all of the current version information loaded onto the 7847FSEDA. Navigate the hardware tree on the left side of the version information window to select the 7847FSEDA module. The *VISTALINK® PRO Product Version* reported in the top right corner of the window should match the new version. If it does not, please contact Evertz for further assistance.
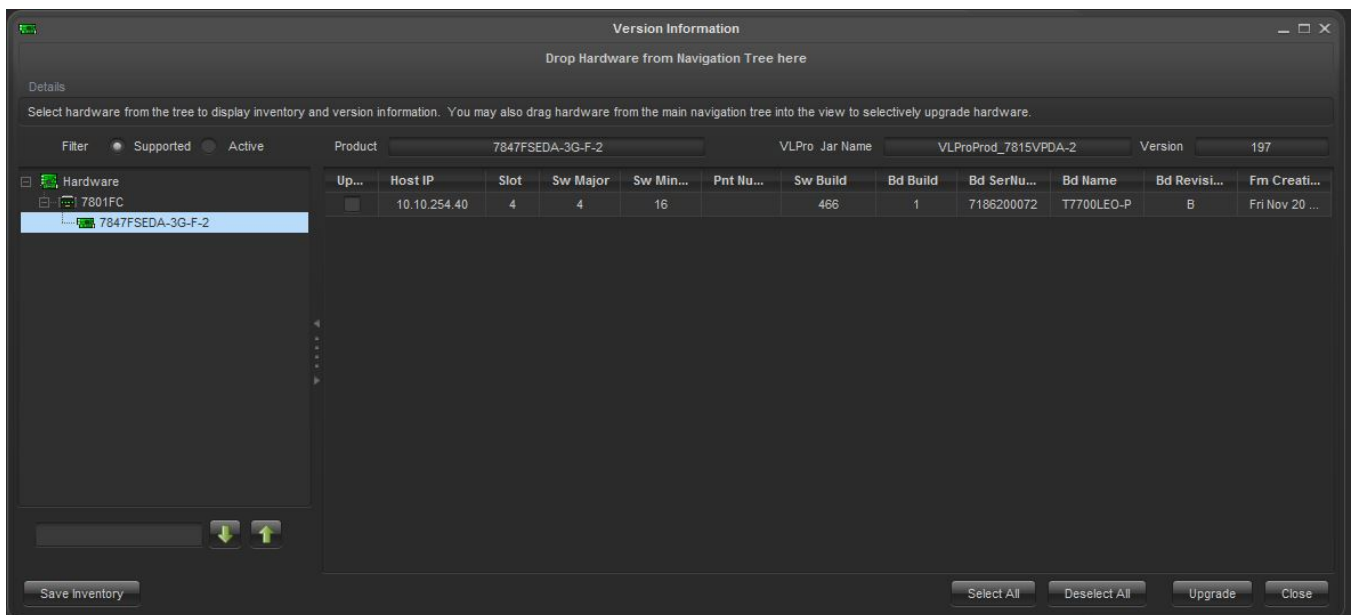

Figure 7-3: VistaLINK® PRO JAR Upgrade - Version Information Window

7.2. FIRMWARE UPGRADE

A firmware upgrade can be accomplished through VistaLINK® PRO firmware upgrade facilities. All 7847FSEDA modules within the same 7700FR/7800FR frame can be upgraded simultaneously or one-by-one. However, it is more convenient to upgrade them simultaneously.

Right click on 7700FR/7800FR frame that contains the 7847FSEDA modules, and select *Version Information*
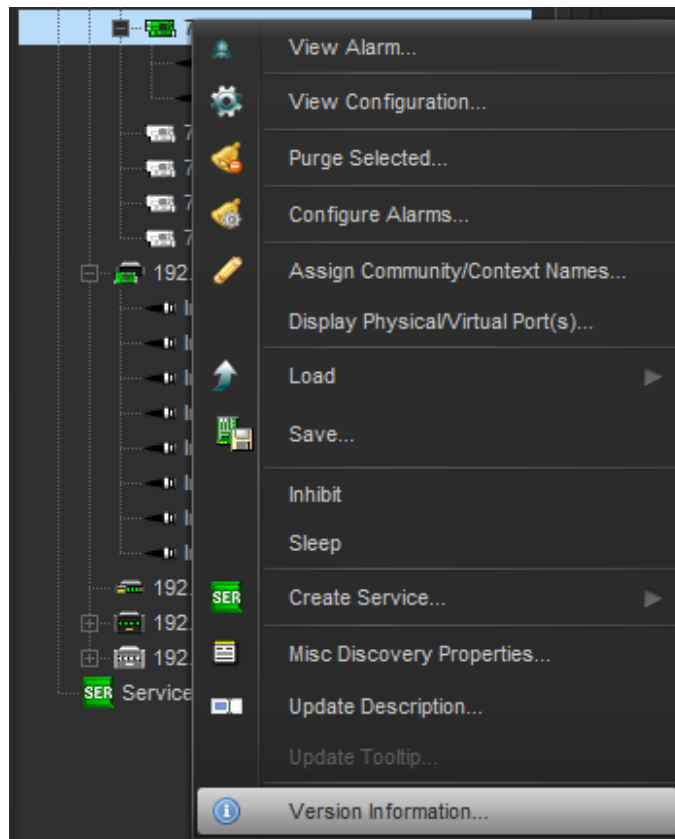

Figure 7-4: Firmware Upgrade - Version Information Selection

Navigate the hardware tree on the left side of the version information window to select the 7847FSEDA module listed (See Figure 7-3). The list on the right side of the window should populate with all 7847FSEDA modules present in the 7700FR/7800FR. Take note of the current firmware version installed on the 7847FSEDA modules. This will be used later to confirm the upgrade has completed successfully.

Check the *Upgrade* checkbox for all modules that require the firmware upgrade. Press **Upgrade** button. This will open a new *Upgrade Firmware* window. Press the **Browse** button to navigate to the firmware archive provided for upgrading the 7847FSEDA modules (**File extension is .tar.gz**). Once the correct file has been selected, press the *Start* button to begin the upgrade process.
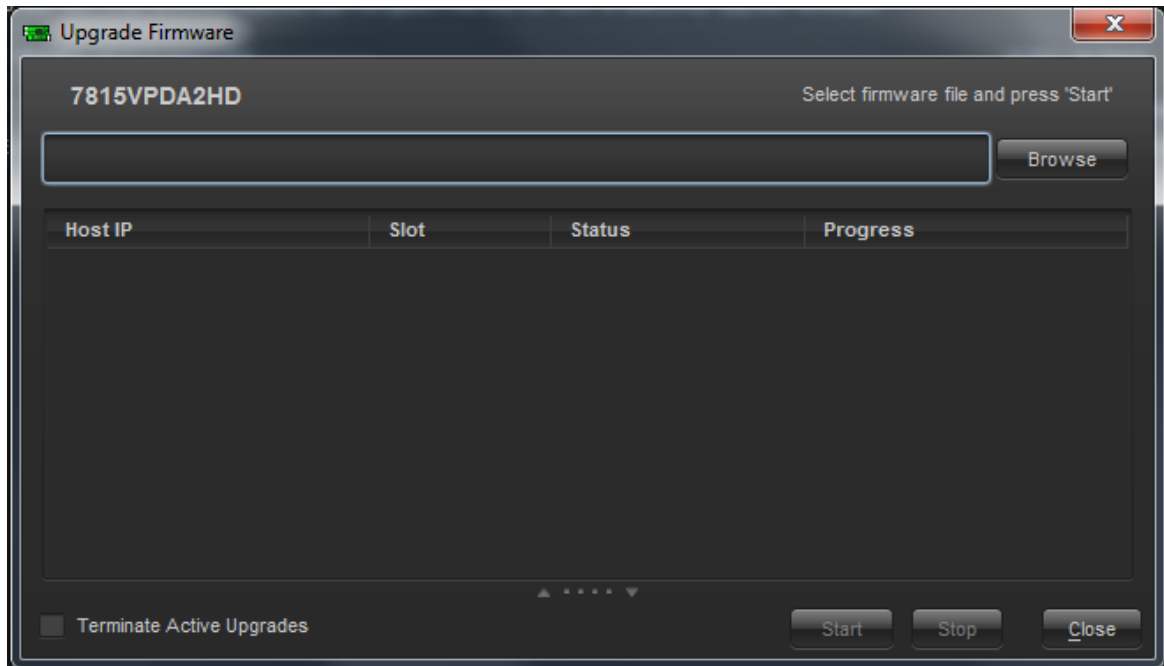
Figure 7-5: Firmware Upgrade - Version Information Window

After the firmware has been transmitted to the 7847FSEDA module successfully, the module will reboot to complete the firmware upgrade process. Close the *Upgrade Firmware* window and *Version Information* window.

Once the cards have rebooted, ensure all 7847FSEDA modules are still present in the VistaLINK® PRO hardware tree. Right click on 7700FR/7800FR frame that contains the 7847FSEDA modules, and select *Version Information*. Navigate the hardware tree on the left side of the version information window to select the 7847FSEDA module listed. The list on the right side of the window should populate with all 7847FSEDA modules present in the 7700FR/7800FR. Verify that all modules that have been upgraded are now reporting the expected firmware version.

	NOTE: If any of the 7847FSEDA modules do not properly upgrade the firmware, please power-cycle those boards and retry the procedure exclusively on the failed boards. If the issue still persists, contact Evertz for further assistance.

7.3. PRODUCT STRING UPGRADE

If a new product option has been purchased, it is necessary for the product options (*i.e. [-3G]*) to be included in the 7847FSEDA module product string. Without the correctly updated product options, the 7847FSEDA modules will not provide the additional functionality.

A unique checksum is required for each 7847FSEDA module to upgrade the product string. These values must be entered correctly into VistaLINK® PRO to successfully update the product strings.

✍ **NOTE:** Please contact Evertz to obtain the correct checksum values based on the reported 7847FSEDA module serial numbers to be updated.

Each 7847FSEDA module product string must be updated individually. To upgrade the 7847FSEDA module product strings, open VistaLINK® PRO client, navigate to the desired 7847FSEDA module in the hardware tree. Right click on the 7847FSEDA module and select *View Configuration* to open the *Global configuration* view:
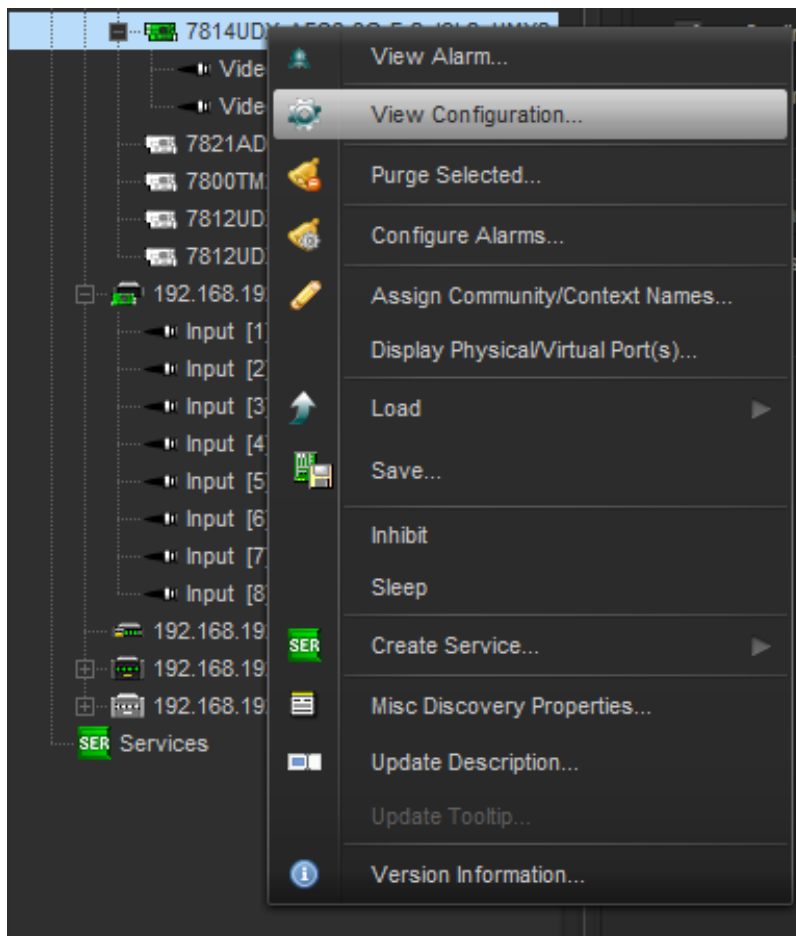

Figure 7-6: Product String Upgrade - Opening 7847FSEDA Module Configuration

Select the *Change Product* tab (see Figure 7-7).

Figure 7-7: Product String Upgrade - 7847FSEDA Global Configuration View

Enter the **new product name** in the *Product Name* text box.

> **NOTE:** Ensure the product name matches the product name specified with the provided checksum based on the 7847FSEDA module serial number in the *Serial Number* textbox.

Enter the **checksum** in the *Checksum* text box.

> **NOTE:** Ensure the checksum matches the checksum value specified according to the reported serial number in the *Serial Number* textbox.

Click the *Apply Button* (first blue arrow in top left of configuration view window) to update the 7847FSEDA module product string. If the product string upgrade is successful, the product string specified in the VistaLINK® PRO hardware tree should update with the added product options. It can take approximately 5 minutes for the product string to update in VistaLINK®PRO.

> **NOTE:** If any of the 7847FSEDA modules do not properly upgrade the product string, please power-cycle those boards and retry the procedure exclusively on the failed boards. If the issue still persists, contact Evertz for further assistance.

8.   APPENDIX A – VERSION INFORMATION

8.1.   HARDWARE OPTIONS

This manual covers the following hardware options:

- 7847FSEDA-3G-F-2
- 7847FSEDA-HD-F-2

8.2.   SOFTWARE VERSIONS

This manual has been written using the following software versions. Functionality may not be identical to the manual description if the module is operating with a different firmware or VistaLINK® PRO product JAR versions.

- VistaLINK® PRO Product JAR File Version: **197**
- Firmware Version **4.16 build 466**