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## REVISION HISTORY

<u>REVISION</u>	<u>DESCRIPTION</u>	<u>DATE</u>
0.1	Preliminary	Sep 2009
0.2	Updated specs to include <i>Additional Delay Mode</i> information	Nov 2009
0.3	Updated “Slot Blocker” section	Aug 2012
0.4	Added card edge LEDs information	Sep 2012
0.5	Added GPI information to Installation section	Oct 2012
0.6	Active Format Descriptor insertion as per SMPTE ST 2016 and Dolby metadata insertion as per SMPTE ST 2020 removed from features Added VL pro screen shots	Sep 2013
1.0	Updated entire control section to include latest changes to control set including +DMX, +UMX, +IG, +2X1 and +TTX options	Mar 2014

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Although every attempt has been made to accurately describe the features, installation and operation of this product in this manual, no warranty is granted nor liability assumed in relation to any errors or omissions unless specifically undertaken in the Evertz sales contract or order confirmation. Information contained in this manual is periodically updated and changes will be incorporated into subsequent editions. If you encounter an error, please notify Evertz Customer Service department. Evertz reserves the right, without notice or liability, to make changes in equipment design or specifications.

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## 1. OVERVIEW

The 7847FSE Frame Synchronizer is designed to re-time a SMPTE 424M (3Gb/s), SMPTE 292M (1080i/59.94, 1080i/50, 720p/60, 720p/59.94) or SMPTE259M (625i/50, 525i/59.94) input to a local composite sync signal. When necessary, frames are repeated or dropped to maintain synchronization.

The 7847FSE supports synchronization of both the video and any embedded audio present including the preservation of all vertical blanking data. When the input video is lost, this module will pass the input content, freeze the last good frame or generate black video. The frame synchronizers also have the ability to set the audio delay independently from the video delay. The frame synchronizers can adjust video parameters such as brightness, contrast, saturation and hue control. The 7847FSE enables the adjustment of audio parameters such as gain, mixing stereo pairs into monaural and the reassignment of audio channels if fully supported up to 16 channels of embedded audio.

The 7847FSE is VistaLINK<sup>®</sup> capable, offering remote monitoring, control and configuration capabilities via Simple Network Management Protocol (SNMP) giving the flexibility to manage operations, including signal monitoring and module configuration from SNMP capable control systems (Manager or NMS).

### Features:

- Synchronizes 3G, HD-SDI or SD-SDI video signals with embedded audio
- Supports additional frames of video and audio delay
- Program Video output bypass relay protected on power loss
- Programmable output phase with respect to reference input
- Freeze on last good frame, or go to black/blue on loss of video or pass input
- Synchronizes 4 groups of embedded audio
- Adjustable brightness, contrast, saturation
- Full audio processor including channel shuffling, gain and phase inversion
- Protection switching to backup input
- Card edge status LEDs
- VistaLINK<sup>®</sup> - capable, offering remote control and configuration capabilities via SNMP

### Additional features with IntelliGain<sup>®</sup> Audio and Loudness Processor (+IG) option:

- Consistent audio loudness levels within a channel and/or program
- Automatic detection and level adjust for loud commercials
- Gain control within a program interval to preserve audio dynamic range
- Artifact-free transitions between program and commercials
- Elimination of drastic volume changes during commercials and interstitials

### Additional features with +2X1 option:

- Automatic changeover for protection switching between two inputs
- Changeover can be conditional on video loss, black or freeze; and audio loss, over or under
- Provides fault monitoring for all switching conditions

### Additional features with +UMX option:

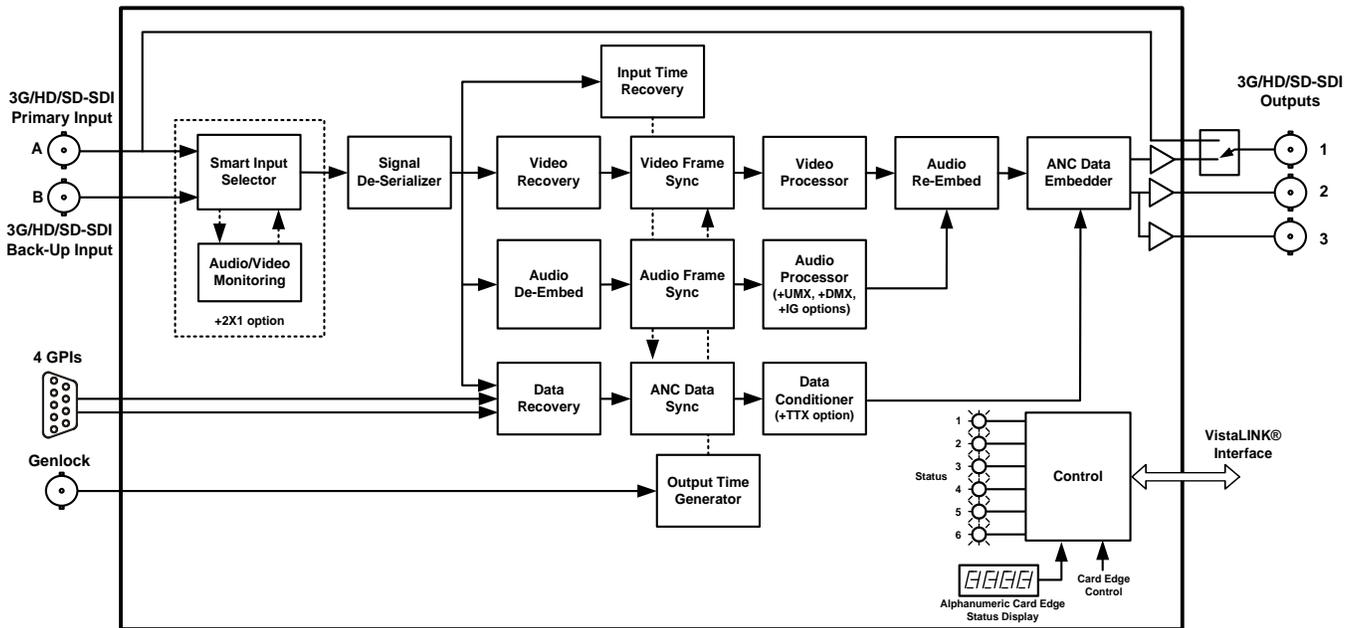
- 2-channel stereo to 5.1 surround sound upmixing

### Additional features with +DMX option:

- 5.1 to 2-channel stereo downmixing

**Additional features with +TTX option:**

- OP-42 and OP-47 World System Teletext (WST) monitoring and processing
- Automatic clear down insertion using GPIs
- Automatic packet error correction and caption substitution



**Figure 1-1: 7847FSE Frame Synchronizer Block Diagram**

## 2. INSTALLATION

The 7847FSE comes with a companion rear plate that occupies one slot in the 3RU 7800FR and 7800FR-QT frames as well as the 1RU 7801FR frame. For the 7700FR-C frame, two slots are required. If a 7847FSE module is installed in a 7700FR-C frame without the “slot blocker” installed, the card will not power-up and will show RED on its main status LED. For information on mounting the rear plate and inserting the module into the frame see section 3 of the 7700FR manual. Refer to section 6.4 of this manual for more information on the 7847FSE slot blocker. Refer to Figure 2-1 for the various rear plate layouts.

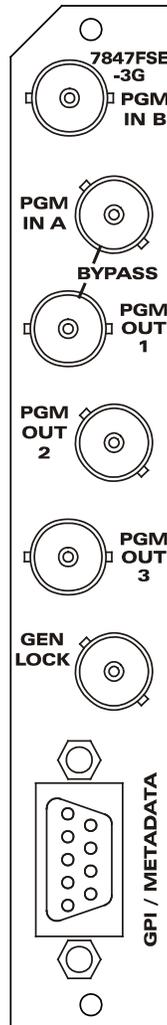


Figure 2-1: Module Rear Panels

### 2.1. 3G, HD AND SDI VIDEO INPUTS AND OUTPUTS

**PGM IN:** Input BNC connector for 10-bit serial digital video signals compatible with the SMPTE 424M (3G), SMPTE 292M (HD) or SMPTE 259M-C standard. The video standard must be set to match the input video format. There is also a video backup BNC connector that can be used to switch to an emergency backup video feed in case the primary video feed fails.

**PGM OUT:** Three output BNC connectors with serial component video in the same format as the input video. These outputs contain the input video synchronized to the **GENLOCK** input video or to the free running internal oscillator if Genlock is not present. The top output is protected by a bypass relay, which will activate in the event of power loss to the module. There is a second and third identical output that is not bypass protected.

**2.2. GENLOCK REFERENCE**

For proper synchronization of the output video, the frame synchronizer must be locked to a genlock signal.

**GENLOCK:** There is an input BNC for connecting an analog Genlock reference. The genlock signal may be tri-level sync, NTSC or PAL, and is auto-detected by the module. This input can be optionally configured as a fourth output from the 7847FSE module. In this case the genlock signal will need to be obtained from the 7800FR internal genlock frame distribution.

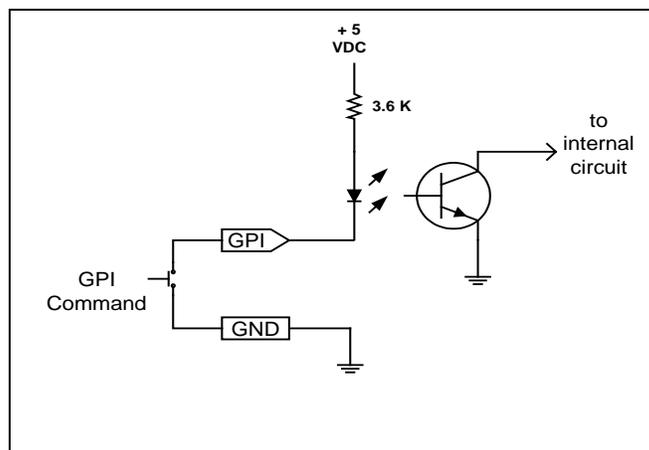
**2.3. GPI CONNECTOR**

There are 4 General Purpose Inputs (GPIs) on the 7847FSE modules. These GPIs are interfaced using a 9-pin DB connector. Table 2-1 shows the Pin-out of this connector is as follows:

DB-9 Pin	Name
1	GPI1
2	
3	
4	GPI2
5	GPI3
6	Ground
7	
8	
9	GPI4

**Table 2-1: GPI Connector Pin Out**

The GPI interface operates as follows:



**Figure 2-2: GPI Input Circuitry**

## 3. TECHNICAL DESCRIPTION

### 3.1. SPECIFICATIONS

#### 3.1.1. Serial Video Input Inputs A & B

**Standard:** SMPTE 424M (3Gb/s) 1080p (-3G models)  
SMPTE 292M (1.5Gb/s), 1080i, 1035i, 720p  
SMPTE 259M (270Mb/s) 525i, 625i

**Connector:** BNC per IEC 61169-8 Annex A

#### 3.1.2. Input Equalization

**SD:** Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable  
**HD:** Automatic to 115m @ 1.5Gb/s with Belden 1694A or equivalent cable  
**3G:** Automatic to 80m @ 3Gb/s with Belden 1694A or equivalent cable

#### 3.1.3. Return Loss

**SD:** > 15dB up to 270MHz  
**HD:** > 13dB up to 1.5GHz  
**3G:** > 10dB up to 3.0GHz

#### 3.1.4. Serial Video Outputs

**Number of Outputs:** 3 (1 output is bypass relay protected)  
**Connectors:** BNC per IEC 61169-8 Annex A  
**Signal Level:** 800mV nominal  
**DC Offset:** 0V  $\pm$ 0.5V  
**Rise and Fall Time:** 900ps nominal (SD)  
200ps nominal (HD)  
**Overshoot:** < 10% of amplitude  
**Wide Band Jitter:** < 0.2 UI

#### 3.1.5. Genlock Input

**Type:** NTSC or PAL Color Black 1V p-p, or Composite bi-level sync (525i/59.94 or 625i/50) 300mV  
HD Tri-level Sync  
**Connector:** BNC per IEC 61169-8 Annex A  
**Termination:** 75 $\Omega$  (dip-switch selectable)

#### 3.1.6. Processing Functions Video

**Black Level:**  $\pm$ 7%  
**Luminance Gain:**  $\pm$ 6dB  
**Chrominance Gain:**  $\pm$ 6dB

#### 3.1.7. Audio

**Gain:**  $\pm$ 24dB  
**Remapping:** Any input or mono mix of any L/R pair to any output

---

**3.1.8. Electrical**

**Voltage:** +12V DC

**Power:** 15W

**EMI/RFI:** Complies with FCC Part 15, Class A EU EMC Directive

**3.1.9. Physical (Number of Slots)**

**350FR:** 2

**7700FR-C:** 2

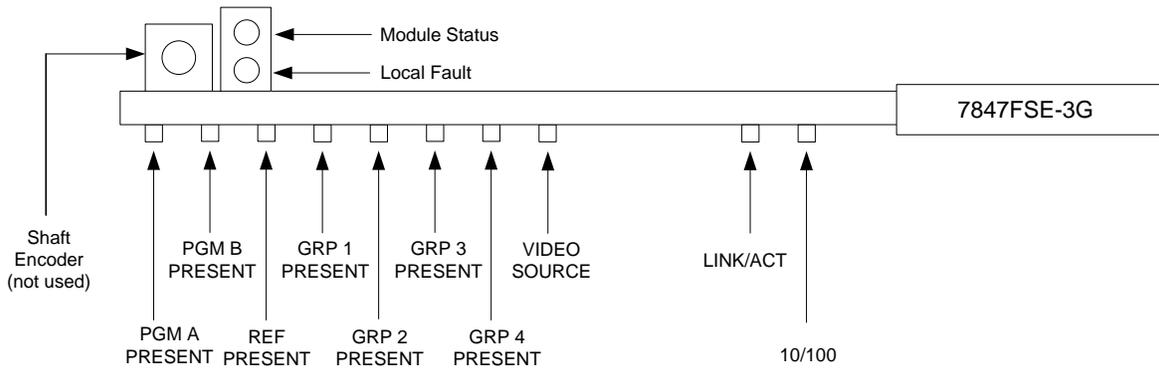
**7800FR:** 1

**7801FR:** 1

## 4. STATUS INDICATORS

### 4.1. MODULE STATUS LEDs

The 7847FSE has several LEDs mounted on the front card edge to provide the user with quick feedback on the status of the card. Figure 4-1 depicts status LEDs on the 7847FSE.



**Figure 4-1: Status LEDs**

- MODULE STATUS:** This Green LED will be On when the module is operating properly.
- LOCAL FAULT:** This Red LED will be On when an essential module input is missing or the module has another fault.
- IN PRESENT:** The IN PRESENT LED will be green when a valid input signal is present on the PGM A BNC. It will be red when missing an input signal. It will blink between red and green when an invalid input signal is presented.
- REF PRESENT:** The REF PRESENT LED will be green when a valid reference signal is present on the REF IN BNC. It will be red when missing a reference signal. It will blink between red and green when an invalid genlock signal is presented. This LED will also be red when genlocking is turned off (lock to video).
- GRP1 PRESENT:** This LED will be Green when embedded audio Group 1 is present and Red when embedded audio Group 1 is not present.
- GRP2 PRESENT:** This LED will be Green when embedded audio Group 2 is present and Red when embedded audio Group 2 is not present.
- GRP3 PRESENT:** This LED will be Green when embedded audio Group 3 is present and Red when embedded audio Group 3 is not present.
- GRP4 PRESENT:** This LED will be Green when embedded audio Group 4 is present and Red when embedded audio Group 4 is not present.
- VIDEO SOURCE:** This LED will be Green when the input video source is PGM IN A and Yellow when the input source is PGM IN B.

## 5. CONTROL

The 7847FSE is controlled using *VistaLINK*®. *VistaLINK*® operates using Ethernet and SNMP control protocols. The 7847FSE Series DOES NOT HAVE card edge controls. As a result, 7700FC or 7800FC modules must be installed in all frames that house a 7847FSE module. Refer to the Evertz website for the most recent firmware for the 7700FC or 7800FC. When using *VistaLINK*®, it is also important to ensure that the most recent 7847FSE “.JAR” control file is installed. Refer to the Evertz website for the most recent “.JAR” file. The name of the file will be “VLPROPROD\_7847FSE-3G.JAR”.

The following sections describe module controls in terms of the parameters found within the *VistaLINK*® screens for the 7847FSE Series. As additional features and options are released, additional sections will be appended to this manual to show those control screens.

### 5.1. GENERAL

The *General* tab allows the user to obtain revision information and details regarding the hardware and firmware of the module. Sections 5.1.1 to 5.1.7 describe the various parameters in detail.

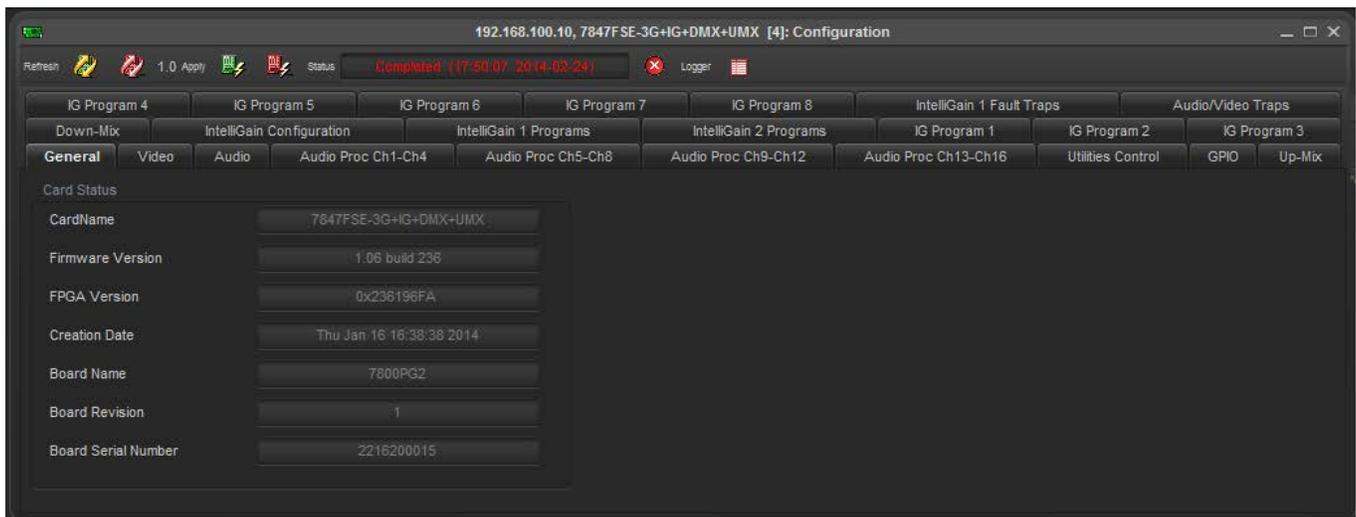


Figure 5-1 : General Tab

#### 5.1.1. CardName

The *CardName* reports the product name or product variable of the module. This name will include any options (e.g. +IG) that are included as well. If this name does not match the name of the product that was purchased then some functions may not be available for use.

#### 5.1.2. Firmware Version

The *Firmware Version* reports the version of firmware that is currently installed and running on the module. Check the Evertz website to ensure that the version of firmware is the latest that is available. If the firmware version is older then it is recommended that the module be upgraded.

**5.1.3. FPGA Version**

The *FPGA Version* reports the version of the FPGA bit file that is currently installed and running on the module.

**5.1.4. Creation Date**

The *Creation Date* reports the creation date of the firmware that is currently installed and running on the module.

**5.1.5. Board Name**

The *Board Name* reports the name of the physical module.

**5.1.6. Board Revision**

The *Board Revision* reports the revision of the physical module.

**5.1.7. Board Serial Number**

The *Board Serial Number* reports the serial number of the module.

## 5.2. VIDEO

The *Video* tab contains five sections. The *Video Control* section allows the user to configure settings that are related to the handling of video on the card as well as reference settings. The *Video Processing* section allows the user to set some basic video processing parameters. The *Video Monitor* section provides valuable information about the input video sources and the genlock input. The *2X1 Settings* section is only available with the +2X1 option and controls the switching mode for the card. The *SDI VBI Bypass Control* section is used to determine which waveforms are passed in the VBI. Sections 5.2.1 to 5.2.18 describe the various controls in detail.

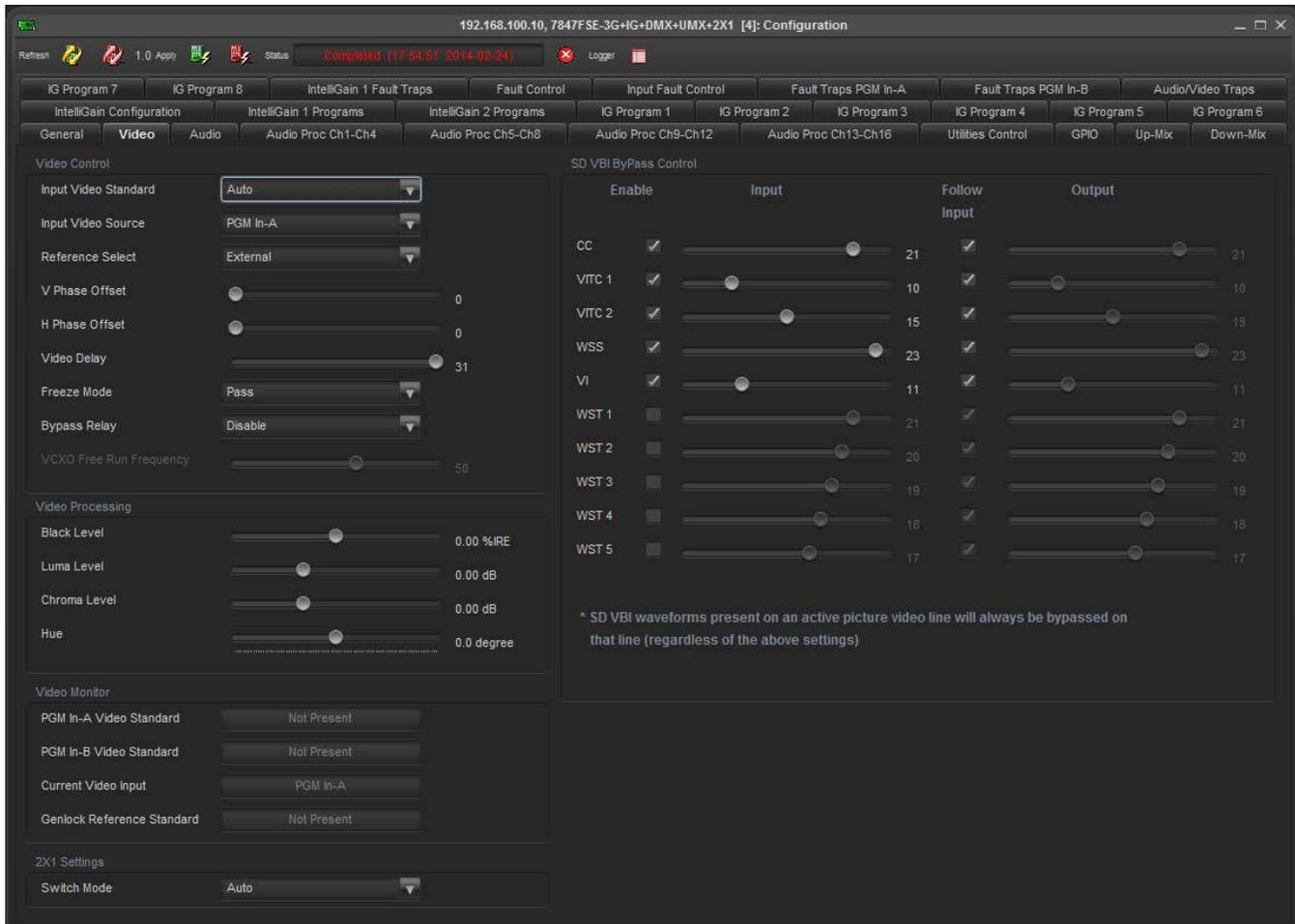


Figure 5-2 : Video Tab

### 5.2.1. Input Video Standard

The *Input Video Standard* control enables the user to set the input video standard being used. Interlaced video formats are shown with the number of fields per second. Progressive formats are shown with the number of frames per second. When the input standard is set to *Auto*, the module will auto detect the video standard. The full set of available input video standards includes:

Auto
625i/50
525i/59.94
720p/50
720p/59.94
720p/60
1035i/59.94
1035i/60
1080i/50
1080i/59.94
1080i/60
1080p/23.98sF
1080p/24sF
1080p/50 (425M level A)
1080p/59.94 (425M level A)
1080p/60 (425M level A)
1080p/50 (425M level B)
1080p/59.94 (425M level B)
1080p/60 (425M level B)
1080p/24
1080p/23.98
1080p/25
1080p/30
1080p/29.97
720p/24
720p/23.98
2048x1080p/24
2048x1080p/23.98
2048x1080p/24sF
2048x1080p/23.98sF

**Table 5-1: Input Video Standard**

### 5.2.2. Input Video Source

The *Input Video Source* control enables the user to set the source of video input for the card. The values for this control are as follows:

<b>PGM In-A</b>	Use the video connected to BNC PGM In-A as the source.
<b>PGM In-B</b>	Use the video connected to BNC PGM In-B as the source.
<b>Auto 2X1</b>	Use the output of the auto changeover as the source (+2X1 option only.)

### 5.2.3. Reference Select

The *Reference Select* control enables the user to set the source of video reference for the card. When the card is used in the 7700FR-G or the 7800FR, frame reference inputs may be used. The values for this control are as follows:

<b>External</b>	Lock to the local genlock reference.
<b>Frame Ref1</b>	Lock to Frame Ref 1 on the 7700FR-G or the 7800FR.
<b>Frame Ref2</b>	Lock to Frame Ref 2 on the 7700FR-G or the 7800FR.
<b>Video Input Source</b>	Lock to the incoming input video as defined by the <i>Input Video Source</i> control.
<b>PGM In-A</b>	Lock to the input video connected to BNC PGM In-A.
<b>PGM In-B</b>	Lock to the input video connected to BNC PGM In-B.



**Note that if the selected genlock reference disappears or is not valid, the card will lock to incoming video.**

### 5.2.4. V Phase Offset

The *V Phase Offset* control enables 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 separate settings of V phase offset for each output video type. Setting this control to 0 keeps the output video frame aligned with the reference.

Increasing the value 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 the maximum total number of lines of the output video minus the number of lines that you wish to advance the output video, (e.g. for 1080i/59.94 output video, the total number of lines is 1125, so to advance the output video 5 lines set the value to 1120.) When increasing the *V Phase Offset* value causes it to go beyond the limit of the frame buffer, the *V Phase Offset* will wrap to the beginning of the frame buffer, resulting in a change of one frame of throughput delay between the input and the output.



**Note: The slider is available for selecting *H* and *V Phase Offsets*. To increment, click on the right hand side of the slider. To decrement click on the left hand side of the slider. The slider can also be selected and dragged across the available range if gross movement is desired.**

### 5.2.5. H Phase Offset

The *H Phase Offset* control enables the user to set the horizontal timing of the output video with respect to the reference input set by the *Reference Select* control. There are separate settings of H phase offset for each output video type. Setting this control to 0 keeps the output video line aligned with the reference.

Increasing the value will delay the output video in one-sample increments. In order to advance the horizontal timing of the output video with respect to the genlock video, set the control to the maximum number of samples per line for the output video standard minus the number of samples that you wish to advance the output video, (e.g. for 1080i/59.94 input video the total number of samples per line is 2200, so to advance the output video 5 samples set the value to 2195.)

### 5.2.6. Video Delay

The *Video Delay* control enables the user to set the value of the additional video delay to be added to the signal path. The range for the delay adjustments is 0 to 31 frames. Video delay is incremented or decremented in 1 frame steps.

### 5.2.7. Freeze Mode

The *Freeze Mode* control enables the user to set the behavior of the output when the input video is not present. The output will freeze the frame with the selected value. The values for this control are as follows:

<b>Frame</b>	Output the last stored frame of video.
<b>Pass</b>	Output what is on the input even if it is bad video or noise.
<b>Black</b>	Output black.
<b>Blue</b>	Output blue.

### 5.2.8. Bypass Relay

The *Bypass Relay* control enables the user to control the behavior of the bypass relay. The values for this control are as follows:

<b>Disable</b>	Disables the relay. (Relay will still activate on a power loss.)
<b>Enable</b>	Enables the relay until it is disabled by the user.

### 5.2.9. Black Level

The *Black Level* control enables the user to set the overall black level of the video. The range for this control is from -7.31 to 7.31 %IRE in increments of 0.6.

### 5.2.10. Luma Level

The *Luma Level* control enables the user to set the overall luma level of the video. The range for this control is from -6.02 to 5.99 dB in increments of 0.03.

### 5.2.11. Chroma Level

The *Chroma Level* control enables the user to set the overall chroma level of the video. The range for this control is from -6.02 to 5.99 dB in increments of 0.03.

**5.2.12. Hue**

The *Hue* control enables the user to set the hue of the video signal. The range for this control is from -20 to 20 degrees in 0.5 degree increments.

**5.2.13. PGM IN A Video Standard**

The *PGM IN A Video Standard* parameter reports if a valid video signal is presented to PGM IN A and what standard has been detected when it is present.

**5.2.14. PGM IN B Video Standard**

The *PGM IN B Video Standard* parameter reports if a valid video signal is presented to PGM IN B and what standard has been detected when it is present.

**5.2.15. Current Video Input**

The *Current Video Input* parameter reports what input BNC has been selected to pass through the module. This parameter will also indicate if the selected BNC was selected by a GPI or the 2X1 auto changeover, (if applicable).

**5.2.16. Genlock Reference Standard**

The *Genlock Reference Standard* parameter reports if a valid video reference has been supplied to the reference source selected by the *Reference Select* control and indicates the standard that is detected.

**5.2.17. Switch Mode (+2X1 Option Only)**

The *Switch Mode* control enables the user to set the behavior of the automatic changeover. The conditions used to determine the health of each input are described in sections 5.11 and 5.12. The values for this control are as follows:

<b>Auto</b>	Switches between PGM In-A and PGM In-B depending on state of current input.
<b>PGM In-A Switch Back</b>	Behaves the same as <i>Auto</i> but always switches back to PGM In-A if it is healthy.
<b>PGM In-B Switch Back</b>	Behaves the same as <i>Auto</i> but always switches back to PGM In-B if it is healthy.

### 5.2.18. SD VBI Bypass

The *SD VBI Bypass* controls, which include CC, VITC 1, VITC 2, WSS, VI and WST 1-5, are used to allow VBI lines in SD video to pass through the module. The controls for all VBI types are managed in the same manner so for the sake of brevity only the CC control is explained.

The *Enable* checkbox allows the user to select whether CC VBI should be passed to the output. Checking this box will enable this function.

The *Input* control enables the user to set the incoming video line in which CC VBI is present. The range of this control is variable depending on the input video standard.

The *Follow Input* checkbox enables the user to set the outgoing video line to the same line as the incoming video. Checking this box will enable this function.

The *Output* control enables the user to set the outgoing video line in which CC VBI will be inserted. This control is disabled if the *Follow Input* checkbox is checked. The range of this control is variable depending on the input video standard.



**Note that the WST 1-5 controls are disabled if the +TTX option is applied to the module. See section 5.13 for details regarding the +TTX option.**

### 5.3. AUDIO

The *Audio* tab contains two sections. The *Audio Control* section allows the user to configure settings that are related to the handling of audio on the card. The *Audio Monitor* section provides valuable information about the status of the Sample Rate Converters (SRC) as well as the audio format of inputs to the card. Sections 5.3.1 to 5.3.7 describe the various controls in detail.

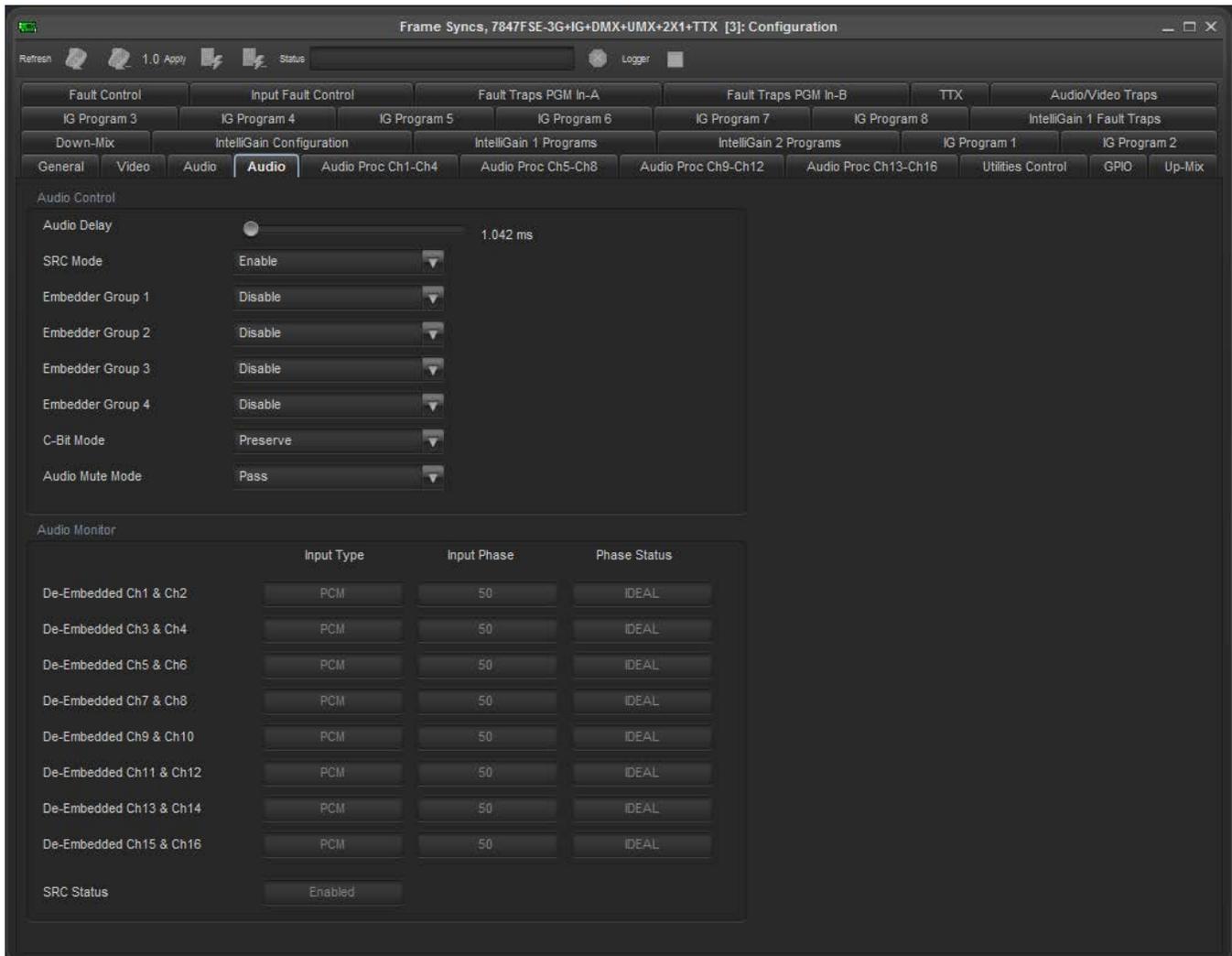


Figure 5-3 : Audio Tab

#### 5.3.1. Audio Delay

The *Audio Delay* control enables the user to set the audio delay. The range of this control is 0 to 1,000 ms in 0.0208 ms increments. (0.0208 ms is equivalent to one 48 kHz audio sample.)

### 5.3.2. SRC Mode

The *SRC Mode* control enables the user to set the mode for the sample rate converters. The values for this control are as follows:

<b>Enable</b>	Enables the sample rate converters for PCM audio.
<b>Bypass</b>	Bypasses the sample rate converters. This setting should be used for non-PCM audio (i.e. Dolby E).
<b>Auto</b>	The module will automatically detect PCM and non-PCM audio and automatically turn on/off the SRCs as required. Note that 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.

### 5.3.3. Embedder Group 1-4

The *Embedder Group* control enables the user to set the mode of the audio embedders. The module has four audio embedders that each insert one group of audio into the outgoing serial digital video. For the sake of brevity, only the control for Audio Embedder 1 is discussed in further detail. The values for this control are as follows:

<b>Disable</b>	Audio embedding for group 1 is disabled.
<b>Enable</b>	Audio embedding for group 1 is enabled.

### 5.3.4. C-Bit Mode

The *C-Bit Mode* control enables the user to set the behavior of the audio embedders when dealing with the channel status bit of AES audio. The values for this control are as follows:

<b>Preserve</b>	Preserves or passes the C-Bit settings from audio inputs to audio outputs.
<b>Replace</b>	Replace the C-Bit settings with an internal counter.

### 5.3.5. Audio Mute Mode

The *Audio Mute Mode* control enables the user to set the behavior of the audio embedders when input audio is missing. The values for this control are as follows:

<b>Pass</b>	Pass the audio inputs to audio outputs.
<b>Mute on Video Error</b>	Mute the audio outputs.

## 5.3.6. De-Embedded Ch1 & Ch2

The *De-Embedded Ch1 & Ch2* parameter reports the *Input Type*, *Input Phase* and *Phase Status* of each pair of embedded audio channels. The status for each channel pair is the same so for the sake of brevity, only the status of Ch1 & Ch 2 are described in detail.

The *Input Type* reports the type of audio on channels 1 and 2 together. The status will display the values *PCM*, *Dolby E*, *AC3* or *Not Present*.

The *Input Phase* reports the line where the Dolby E packet begins in terms of the input video standard. If the *Input Type* is not Dolby E then the status will display *N/A*.

The *Phase Status* reports the status of the Dolby E *Input Phase* measurement. The status will display the values *Ideal*, *Good*, *Bad* or *N/A*.

## 5.3.7. SRC Status

The *SRC Status* parameter displays the status of the sample rate converters. The status will display either *Enabled* or *Bypassed*.

### 5.4. AUDIO PROCESSING

The *Audio Proc* tab allows the user to configure the settings of the audio processor. There are sixteen individual output channel mixers in the 7847FSE. These output channel mixers perform audio inversion, audio gain adjustment and audio channel swapping for each of the 16 output audio channels. Using the X and Y inputs of each output channel mixer an additional level of mono-mixing is also available for each channel of output audio. Embedded audio outputs are driven with the same audio generated using these output channel mixers. Sections 5.4.1 to 5.4.6 describe the controls in detail.

For the sake of brevity, only the Audio Proc for the *Channels 1-4* control tab will be discussed in this manual. Control radial buttons for *Channels 5-8*, *Channels 9-12*, and *Channels 13-16* are identical in their operation. The controls for *Channel 1* will be described in detail, as the controls for *Channel 2*, *Channel 3* and *Channel 4* operate in an identical fashion.

NOTE: Mixer controls audio input to Audio Embedder

**Figure 5-4 : Audio Proc Ch1-Ch4 Tab**

5.4.1. Source X

The *Source X* control enables the user to route one of the 16 internally processed input audio channels to the X input of the channel mixer. The values for this control are as follows:

<b>Source X Input</b>	Mute
	De-embedder Ch 1
	De-embedder Ch 2
	De-embedder Ch 3
	De-embedder Ch 4
	De-embedder Ch 5
	De-embedder Ch 6
	De-embedder Ch 7
	De-embedder Ch 8
	De-embedder Ch 9
	De-embedder Ch 10
	De-embedder Ch 11
	De-embedder Ch 12
	De-embedder Ch 13
	De-embedder Ch 14
	De-embedder Ch 15
	De-embedder Ch 16
	IntelliGain Ch 1 <i>(only with +IG option)</i>
	IntelliGain Ch 2 <i>(only with +IG option)</i>
	IntelliGain Ch 3 <i>(only with +IG option)</i>
	IntelliGain Ch 4 <i>(only with +IG option)</i>
	IntelliGain Ch 5 <i>(only with +IG option)</i>
	IntelliGain Ch 6 <i>(only with +IG option)</i>
	IntelliGain Ch 7 <i>(only with +IG option)</i>
	IntelliGain Ch 8 <i>(only with +IG option)</i>
	Up-Mix L <i>(only with +UMX option)</i>
	Up-Mix R <i>(only with +UMX option)</i>
	Up-Mix C <i>(only with +UMX option)</i>
	Up-Mix LFE <i>(only with +UMX option)</i>
	Up-Mix Ls <i>(only with +UMX option)</i>
	Up-Mix Rs <i>(only with +UMX option)</i>
	Down-Mix L <i>(only with +DMX option)</i>
Down-Mix R <i>(only with +DMX option)</i>	
Down-Mix Mono <i>(only with +DMX option)</i>	

**Table 5-2: Source X Input**

5.4.2. Gain Adjust X

The *Gain Adjust X* control enables the user to set the value of the gain for the selected source. The user can adjust the gain of the selected source by moving the associated slider control left to decrease the value or right to increase the value. The range for the gain adjustments is -24 dB to +24 dB. Gain is incremented or decremented in 0.1 dB steps.

### 5.4.3. Invert Enable X

The *Invert Enable X* control enables the user to invert the phase or pass the selected audio channel. The values for this control are as follows:

<b>Normal</b>	Pass the audio channel through with no processing.
<b>Invert</b>	Invert the phase of the audio channel.

### 5.4.4. Source Y

The *Source Y* control enables the user to route one of the 16 internally processed input audio channels to the Y input of the channel mixer. The values for this control are as follows:

<b>Source Y Input</b>	Mute
	De-embedder Ch 1
	De-embedder Ch 2
	De-embedder Ch 3
	De-embedder Ch 4
	De-embedder Ch 5
	De-embedder Ch 6
	De-embedder Ch 7
	De-embedder Ch 8
	De-embedder Ch 9
	De-embedder Ch 10
	De-embedder Ch 11
	De-embedder Ch 12
	De-embedder Ch 13
	De-embedder Ch 14
	De-embedder Ch 15
	De-embedder Ch 16
	IntelliGain Ch 1 <i>(only with +IG option)</i>
	IntelliGain Ch 2 <i>(only with +IG option)</i>
	IntelliGain Ch 3 <i>(only with +IG option)</i>
	IntelliGain Ch 4 <i>(only with +IG option)</i>
	IntelliGain Ch 5 <i>(only with +IG option)</i>
	IntelliGain Ch 6 <i>(only with +IG option)</i>
	IntelliGain Ch 7 <i>(only with +IG option)</i>
	IntelliGain Ch 8 <i>(only with +IG option)</i>
	Up-Mix L <i>(only with +UMX option)</i>
	Up-Mix R <i>(only with +UMX option)</i>
	Up-Mix C <i>(only with +UMX option)</i>
	Up-Mix LFE <i>(only with +UMX option)</i>
	Up-Mix Ls <i>(only with +UMX option)</i>
	Up-Mix Rs <i>(only with +UMX option)</i>
	Down-Mix L <i>(only with +DMX option)</i>
Down-Mix R <i>(only with +DMX option)</i>	
Down-Mix Mono <i>(only with +DMX option)</i>	

**Table 5-3: Source Y Input**

#### 5.4.5. Gain Adjust Y

The *Gain Adjust Y* control enables the user to set the value of the gain for the selected source. The user can adjust the gain of the selected source by moving the associated slider control left to decrease the value or right increase the value. The range for the gain adjustments is -24 dB to +24 dB. Gain is adjusted in 0.1 dB increments.

#### 5.4.6. Invert Enable Y

The *Invert Enable Y* control enables the user to invert the phase or pass the selected audio channels. The values for this control are as follows:

<b>Normal</b>	Pass the audio channel through with no processing.
<b>Invert</b>	Invert the phase of the audio channel.

### 5.5. UTILITIES CONTROL

The *Utilities Control* tab contains three sections. The *Utilities Control* and *Last Loaded Preset* sections allow the user to configure settings related to the storing and recalling of presets. The 7847FSE is capable of storing and retrieving 10 user presets. The *Preset Load Triggers* section allows the user to define actions that are used to load specific presets. Sections 5.5.1 to 5.5.4 describe the various controls in detail.

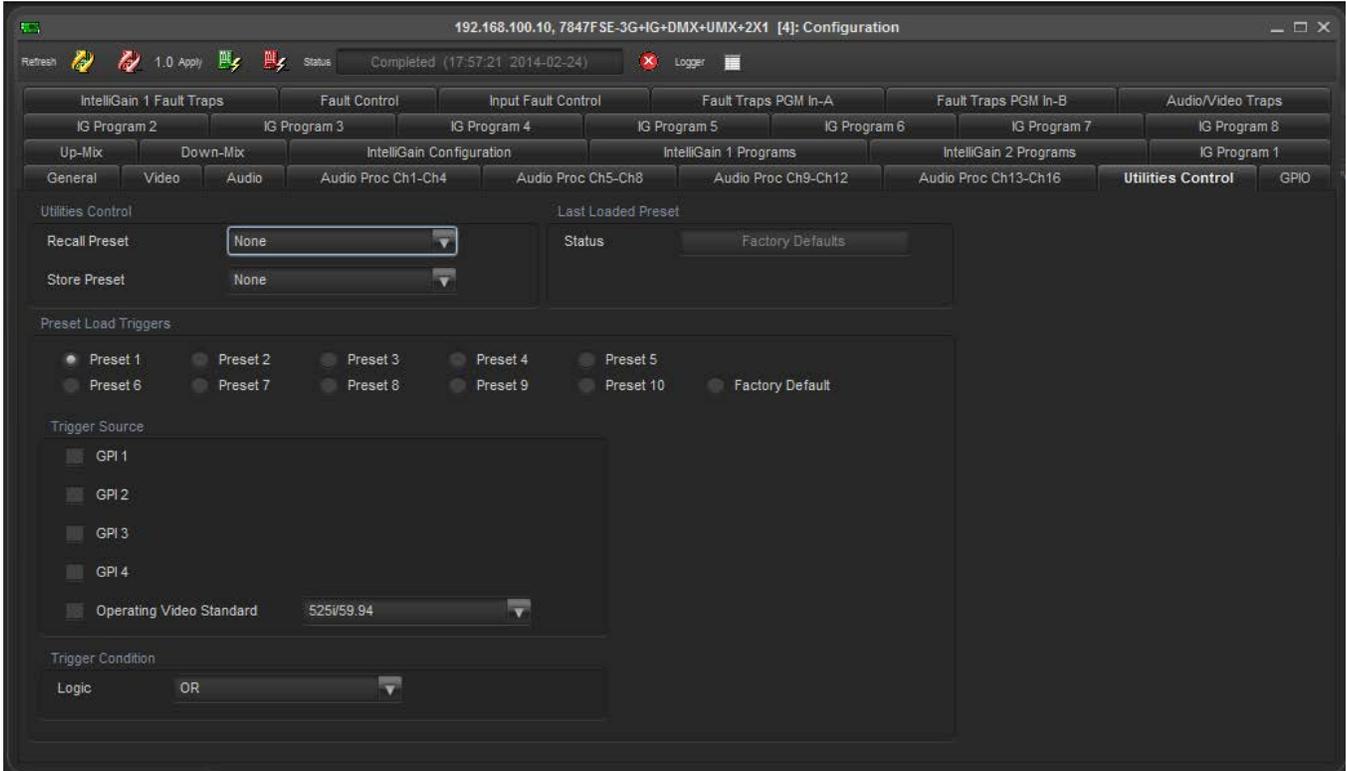


Figure 5-5 : Utilities Control Tab



There may be a slight disturbance in the operation of the card while the new preset is being recalled.

### 5.5.1. Recall Preset

The *Recall Preset* control enables the user to initiate a recall of the card configuration from one of the user presets or reset the card to factory defaults. The values for this control are as follows:

<b>None</b>	No Presets will be recalled
<b>Factory Default</b>	All controls for the card will revert to defaults
<b>User 1</b>	Recall User Preset 1
<b>User 2</b>	Recall User Preset 2
<b>User 3</b>	Recall User Preset 3
<b>User 4</b>	Recall User Preset 4
<b>User 5</b>	Recall User Preset 5
<b>User 6</b>	Recall User Preset 6
<b>User 7</b>	Recall User Preset 7
<b>User 8</b>	Recall User Preset 8
<b>User 9</b>	Recall User Preset 9
<b>User 10</b>	Recall User Preset 10

### 5.5.2. Store Preset

The *Store Preset* control enables the user to initiate a store of the current card configuration into one of the user presets. To store a card configuration to a specific preset, select the desired preset to store the card settings and press the APPLY button. The values for this control are as follows:

<b>None</b>	No Presets will be stored
<b>User 1</b>	Store to User Preset 1
<b>User 2</b>	Store to User Preset 2
<b>User 3</b>	Store to User Preset 3
<b>User 4</b>	Store to User Preset 4
<b>User 5</b>	Store to User Preset 5
<b>User 6</b>	Store to User Preset 6
<b>User 7</b>	Store to User Preset 7
<b>User 8</b>	Store to User Preset 8
<b>User 9</b>	Store to User Preset 9
<b>User 10</b>	Store to User Preset 10

### 5.5.3. Last Loaded Preset Status

The *Status* parameter under the *Last Loaded Preset* section displays the last preset that was loaded to the module.

#### 5.5.4. Preset Load Triggers

The *Preset Load Triggers* section allows the user to set conditions for the automatic loading of presets. These are the same presets that are stored in section 5.5.2 above. A different set of triggers can be defined for each preset. Selecting the radio button beside the desired preset will load the triggers for that specific preset. The controls pertaining to this function are as follows:

##### Trigger Source

The *Trigger Source* control enables the user to select the triggers that are used to load each preset. The values for this control are *GPI 1-4* and the *Operating Video Standard*. The *GPI 1-4* triggers will load a preset when that specific GPI is activated. The *Operating Video Standard* trigger will load a preset when the detected input video standard (see section 5.2.14 and 5.2.15) matches the standard set by this parameter.

##### Logic

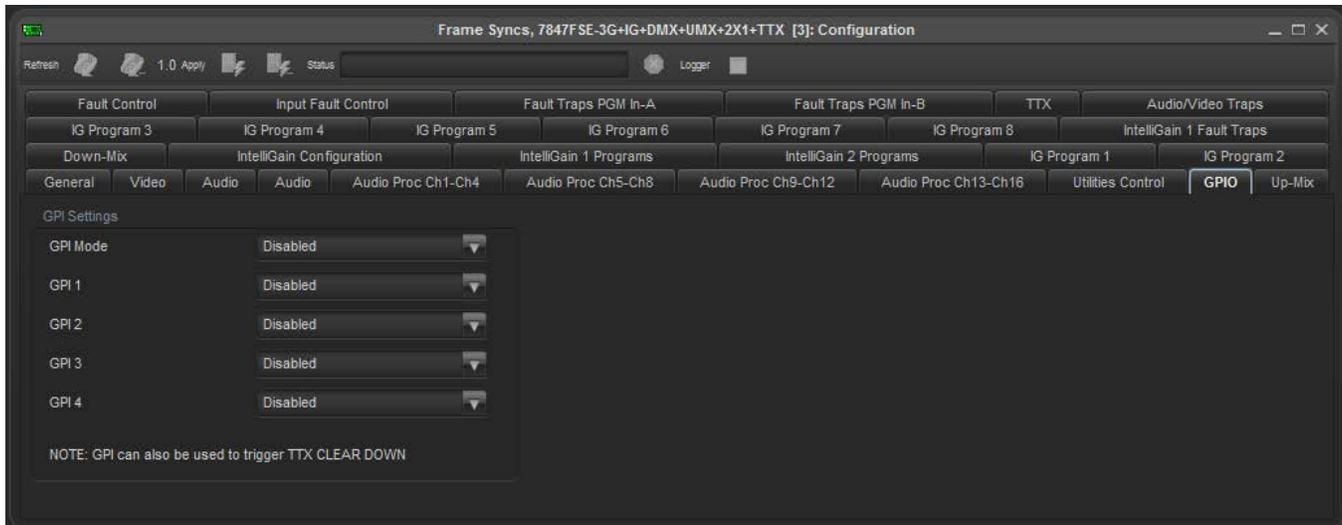
The *Logic* control enables the user to set the condition for how the trigger sources are used. The values for this control are *OR* and *AND*. The *OR* condition will cause a preset to load if any one of the trigger sources are satisfied. The *AND* condition will cause a preset to load only if all of the trigger sources are satisfied.



**Note: The GPI triggers used for preset loading are also configured in the GPIO tab as described in section 5.6. As such, a GPI may trigger several events at once so it is important to take caution when configuring a GPI.**

## 5.6. GPIO

The *GPIO* tab allows the user to configure settings associated with the behavior of the GPIOs. Sections 5.6.1 to 5.6.2 describe the various controls in detail.



**Figure 5-6 : GPIO Tab**

### 5.6.1. GPI Mode

The *GPI Mode* control allows the users to enable or disable the use of GPI triggers for switching between the two inputs of the module. The values for this control are as follows:

<b>Disabled</b>	GPI triggers are disabled for the switching of inputs.
<b>Active Low</b>	GPI triggers are enabled and set to active low.
<b>Active High</b>	GPI triggers are enabled and set to active high.

### 5.6.2. GPI 1 to 4

The *GPI 1*, *GPI 2*, *GPI 3* and *GPI 4* controls allow the users to set the input that is selected when the respective GPI is triggered. For the sake of brevity, only the GPI 1 control is shown. The values for this control are as follows:

<b>Disabled</b>	The GPI is disabled.
<b>Video Source PGM In-A</b>	PGM In-A is set as the input to the module if GPI 1 is triggered.
<b>Video Source PGM In-B</b>	PGM In-B is set as the input to the module if GPI 1 is triggered.

### 5.7. UP-MIX (+UMX OPTION ONLY)

The *Up-Mix* tab contains two sections. The *Control* section allows the user to set various parameters used to define the behavior of the upmix engine to produce the desired output. The *Audio Source Select* section allows the user to select the audio channels that will be used to produce a surround upmix. Sections 5.7.1 to 5.7.11 describe the various controls in detail.

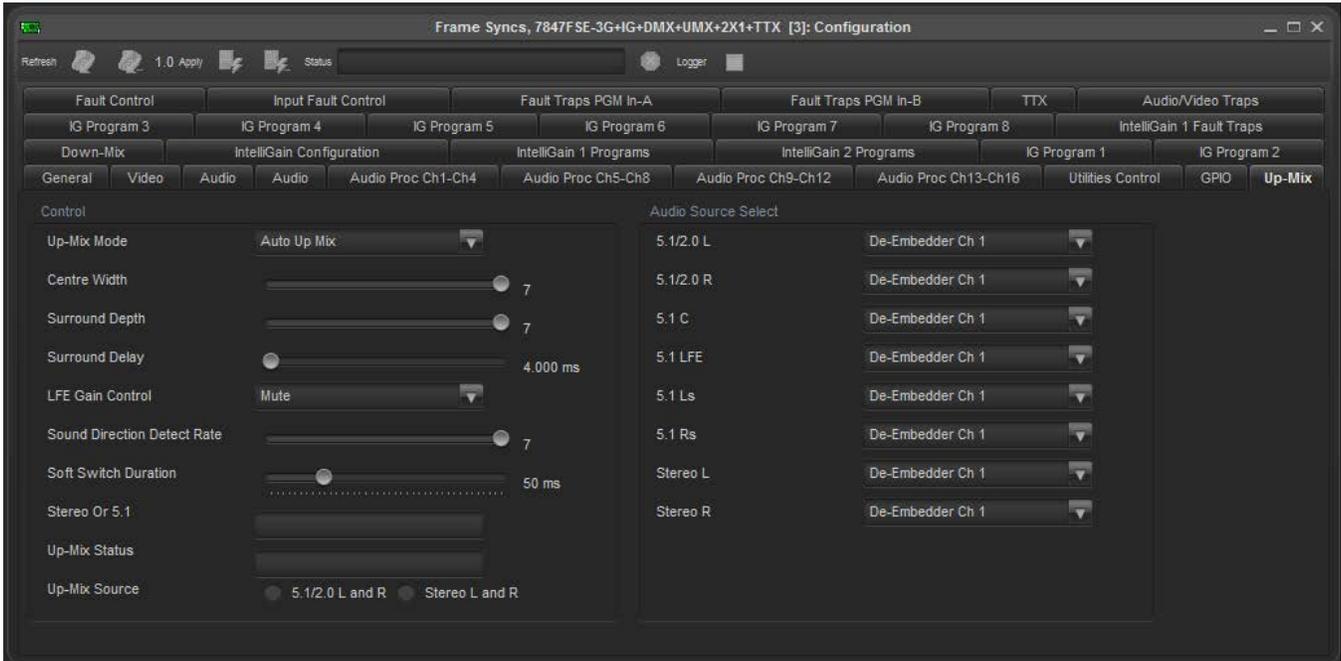


Figure 5-7 : Up-Mix Tab

#### 5.7.1. Up-Mix Mode

The *Up-Mix Mode* control allows the user to set whether the upmix engine will automatically determine if the audio needs to be upmixed. The values for this control are as follows:

<b>Auto</b>	The upmixer will determine if 5.1 or stereo is present. If stereo is present it will upmix the audio to 5.1, and pass if 5.1 is seen.
<b>Force</b>	The upmixer will always upmix the incoming audio.
<b>Disable</b>	The upmixer will not upmix the audio and just pass it through.

#### 5.7.2. Centre Width

The *Centre Width* control allows the user to adjust the width of the front centre sound in the perceived sound image when listening to upmixed audio. It mainly affects the perception of speech and dialogue. A narrower centre width will cause the front centre sound to come primarily from the centre speaker. A wider centre width will cause the front centre sound to come from the centre, left and right speakers. To adjust the centre width of the upmix control, drag the slider right to increase the value of the centre width or drag the slider left to decrease the value of the centre width. The value range is 0 to 7 in increments of 1. The default value is 3.

### 5.7.3. Surround Depth

The *Surround Depth* control allows the user to adjust the depth of surround sound in the perceived sound image when listening to upmixed audio. 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. To adjust the depth of the surround, drag the slider right to increase the depth or drag it left to decrease the depth. The value range is 0 to 7 in increments of 1. The default value is 3.

### 5.7.4. Surround Delay

This *Surround Delay* control allows the user to adjust the amount of time that the surround sound will be delayed against other channels. Proper amount of surround delay will provide a good perception of surround sound. To adjust the delay of the upmix surround, drag the slider to the right to increase the delay or drag it to the left to decrease the delay in milliseconds. The value range is 4 to 20 ms in increments of 0.021 ms. The default value is 10 ms.

### 5.7.5. LFE Gain

The *LFE Gain* control allows the user to adjust the gain of the LFE channel after audio is upmixed. The values for this control are as follows:

<b>Mute</b>	Mute the LFE channel in the upmixed audio.
<b>+ 0 dB</b>	Apply 0 dB gain to the generated LFE channel.
<b>-1.5 dB</b>	Apply –1.5 dB gain to the generated LFE channel.
<b>-3.0 dB</b>	Apply –3.0 dB gain to the generated LFE channel.
<b>-4.5 dB</b>	Apply –4.5 dB gain to the generated LFE channel.
<b>-6.0 dB</b>	Apply –6.0 dB gain to the generated LFE channel.
<b>-7.5 dB</b>	Apply –7.5 dB gain to the generated LFE channel.
<b>-9.0 dB</b>	Apply –9.0 dB gain to the generated LFE channel.

### 5.7.6. Sound Direction Detect Rate

The *Sound Direction Detect Rate* control allows the user to adjust the detection rate of sound direction. The upmixer constantly calculates the sound image that would be perceived from the stereo audio input. If the sound direction shifts in the sound image, the upmixer changes the output sound direction accordingly by switching the amount of sound going to different speakers. If a faster detection rate is selected, the sound direction switching may sound more dramatic, but may also be felt as unnatural. On the other hand, a slower detection rate would sound dull and uninteresting. To adjust the detection rate of the sound direction, drag the slider to the right to increase the rate or drag it to the left to decrease the rate. The value range is 0 to 7 in steps of 1. The default is level 4.

### 5.7.7. Soft Switch Duration

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

### 5.7.8. Stereo or 5.1

The *Stereo or 5.1* parameter reports the configuration of the incoming audio as 2.0 or 5.1.

### 5.7.9. Up-Mix Status

The *Up-Mix Status* parameter reports the state of the upmix engine.

### 5.7.10. Up-Mix Source

The *Up-Mix Source* control allows the user to set the stereo audio pair that will be used as the source for the upmix. The values for this control are as follows:

<b>5.1/2.0 L and R</b>	Use the two channels set by the 5.1/2.0 L and 5.1/2.0 R Audio Source Select controls.
<b>Stereo L and R</b>	Use the two channels set by the Stereo L and Stereo R Audio Source Select controls.

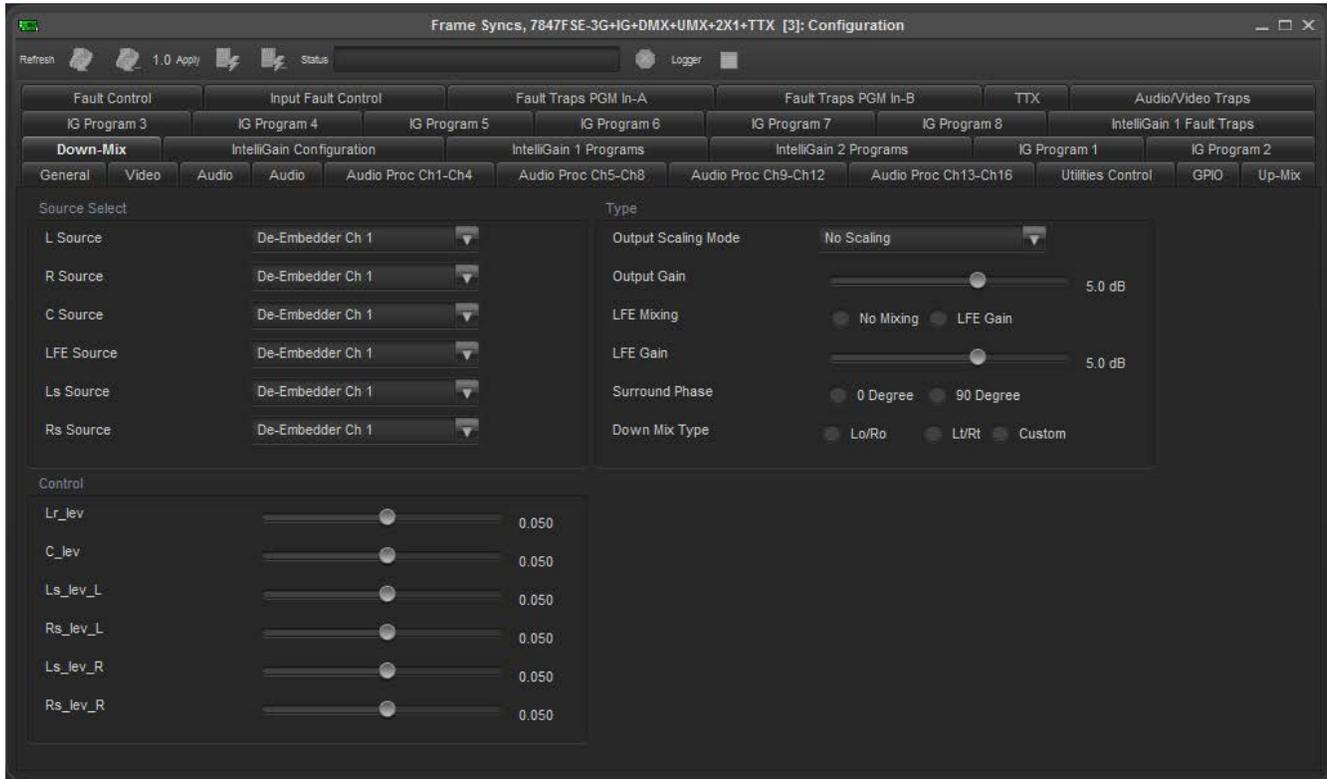
### 5.7.11. Audio Source Select

The *5.1/2.0 L*, *5.1/2.0 R*, *5.1 C*, *5.1 LFE*, *5.1 Ls*, *5.1 Rs*, *Stereo L* and *Stereo R* controls enable the user to route one of the 16 internally processed input audio channels to each input of the upmix engine. For the sake of brevity, only the 5.1/2.0L selection control is shown. Note that the channels selected for *5.1 C*, *5.1 LFE*, *5.1 Ls* and *5.1 Rs* are used to determine if the incoming audio configuration is 5.1. If these channels are silent then the configuration is considered stereo and the upmix engine will be initiated. The values for these controls are as follows:

<b>5.1/2.0 L</b>	De-embedder Ch 1
	De-embedder Ch 2
	De-embedder Ch 3
	De-embedder Ch 4
	De-embedder Ch 5
	De-embedder Ch 6
	De-embedder Ch 7
	De-embedder Ch 8
	De-embedder Ch 9
	De-embedder Ch 10
	De-embedder Ch 11
	De-embedder Ch 12
	De-embedder Ch 13
	De-embedder Ch 14
	De-embedder Ch 15
	De-embedder Ch 16
Mute	

## 5.8. DOWN-MIX (+DMX OPTION ONLY)

The *Down-Mix* tab contains three sections. The *Source Selection* section allows the user to select the audio channels that will be used to produce a stereo downmix. The *Type* section allows the user to set various parameters used to define the behavior of the downmix engine to produce the desired output. The *Control* section provides controls for additional customization of the downmix process. Sections 5.8.1 to 5.8.7 describe the various controls in detail.



**Figure 5-8 : Down-Mix Tab**

### 5.8.1. Source Select

The *L Source*, *R Source*, *C Source*, *LFE Source*, *Ls Source* and *Rs Source* controls enable the user to route one of the 16 internally processed input audio channels to each input of the downmix engine. For the sake of brevity, only the L Source selection control is shown. The values for these controls are as follows (on the next page):

<b>L Source</b>	De-embedder Ch 1
	De-embedder Ch 2
	De-embedder Ch 3
	De-embedder Ch 4
	De-embedder Ch 5
	De-embedder Ch 6
	De-embedder Ch 7
	De-embedder Ch 8
	De-embedder Ch 9
	De-embedder Ch 10
	De-embedder Ch 11
	De-embedder Ch 12
	De-embedder Ch 13
	De-embedder Ch 14
	De-embedder Ch 15
	De-embedder Ch 16
Mute	

### 5.8.2. Output Scaling Mode

The *Output Scaling Mode* control enables the user to set whether the downmix matrix is normalized or not. The values for this control are as follows:

<b>No Scaling</b>	The stereo downmix usually outputs at a similar level to the 5.1 audio input, but clipping may occur when input sound level is close to 0 dBFS.
<b>Overflow Scaling</b>	The normalization of matrix coefficients will avoid any possibility of overflow, but tends to lower the loudness level when compared against the original 5.1 input.

### 5.8.3. Output Gain

The *Output Gain* control enables the user to set the value of the output gain of the downmix. The user can adjust the gain of the output by moving the associated slider control left to decrease the value or right to increase the value. The range for the gain adjustments is -20 to +20 dB. Gain is incremented or decremented in 0.1 dB steps.

### 5.8.4. LFE Mixing

The *LFE Mixing* control enables the user to control whether the LFE channel is included or not in the audio downmixing. Note that the LFE Gain control is in effect only when LFE Gain is selected. The values for this control are as follows:

<b>No Mixing</b>	The LFE channel will not be included in the downmix.
<b>LFE Gain</b>	The LFE channel will be included in the downmix with gain for the LFE channel defined by the LFE Gain control.

### 5.8.5. LFE Gain

The *LFE Gain* control enables the user to set the value of the output gain of the LFE channel. The user can adjust the gain of the LFE channel by moving the associated slider control left to decrease the value or right to increase the value. The range for the gain adjustments is -20 to +20 dB. Gain is incremented or decremented in 0.1 dB steps.

### 5.8.6. Surround Phase

The *Surround Phase* control manages whether or not a 90 degree phase shift is applied to the surround channels before being passed to the downmix matrix. 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. The values for this control are as follows:

<b>0 degrees</b>	No phase shift is applied to the surround channels before being passed to down.
<b>90 degrees</b>	A 90 degree phase shift is applied to the surround channels before being passed to down.

### 5.8.7. Down Mix Type

The *Down Mix Type* control enables the user to set the type of audio downmixing that will be performed. The values for this control are as follows:

<b>LoRo</b>	The downmixer will generate Left Only and Right Only (LoRo) stereo audio.
<b>LtRt</b>	The downmixer will generate Left Total and Right Total (LtRt) Prologic compatible stereo audio.
<b>Custom</b>	The downmixer will generate Left and Right channels of audio using the custom downmixing equations.

### 5.8.8. Coefficient Control

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

$$L = (LR_{lev} \times L + C_{lev} \times C + LS_{levL} \times Ls\{0^\circ/90^\circ\} + RS_{levL} \times Rs\{0^\circ/90^\circ\} + lfe_{gain} \times LFE) \times gain \div norm$$

$$R = (LR_{lev} \times R + C_{lev} \times C + LS_{levR} \times Ls\{0^\circ/90^\circ\} + RS_{levR} \times Rs\{0^\circ/90^\circ\} + lfe_{gain} \times LFE) \times gain \div norm$$

Where  $lfe_{gain}$  is controlled by the *LFE Mixing* and *LFE Gain* controls,  $gain$  is controlled by *Output Gain* control and  $norm$  is controlled by the *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 downmixing coefficients are controlled using the appropriate slider bars in the *Control* section. The range for each of the coefficient adjustments is -1.000 to +1.000. The coefficients are incremented or decremented in 0.001 steps.

### 5.9. INTELLIGAIN CONFIGURATION (+IG OPTION ONLY)

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), “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 Configuration* tab displays the top-level IntelliGain control interface. There are a number of parameters that control both the intelligent leveler and the on-board dynamic processor (compressor, expander, limiter). The *IntelliGain 1 Programs* and *IntelliGain 2 Programs* tabs allow the user to control the behavior of the leveler and dynamic processor. The tabs also provide monitoring information for the measurement of the input loudness.

For complete instructions on how to configure IntelliGain refer to the *IntelliGain User Manual* for the most current instructions.

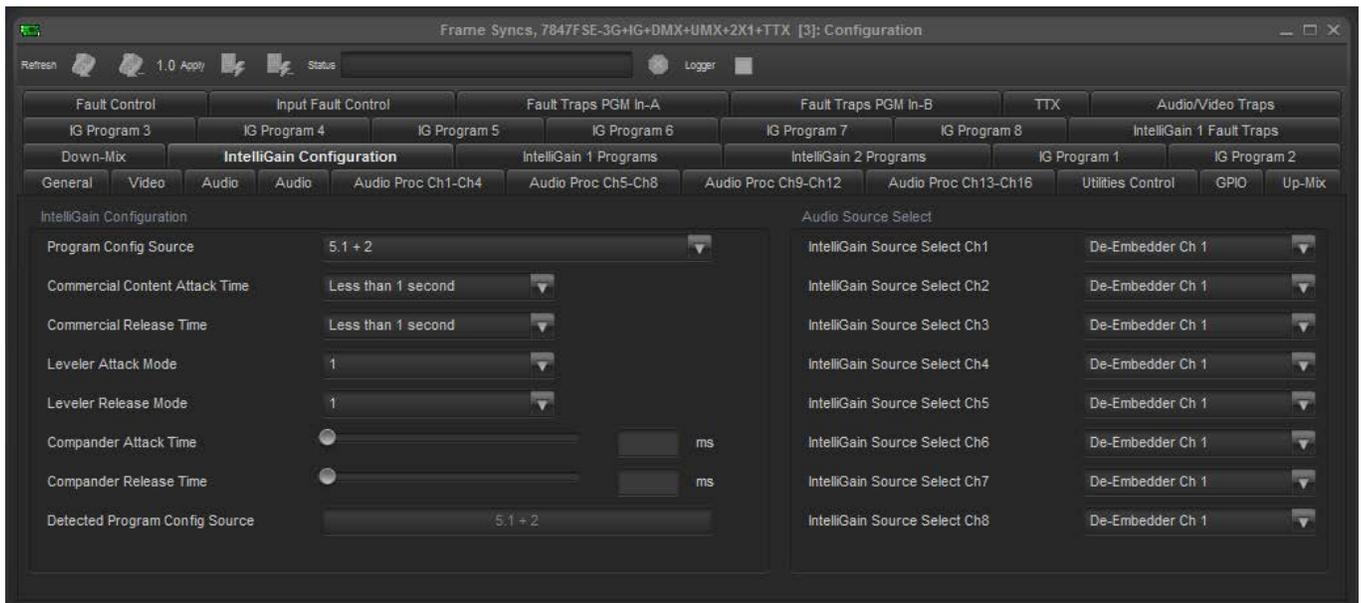


Figure 5-9 : IntelliGain Configuration Tab

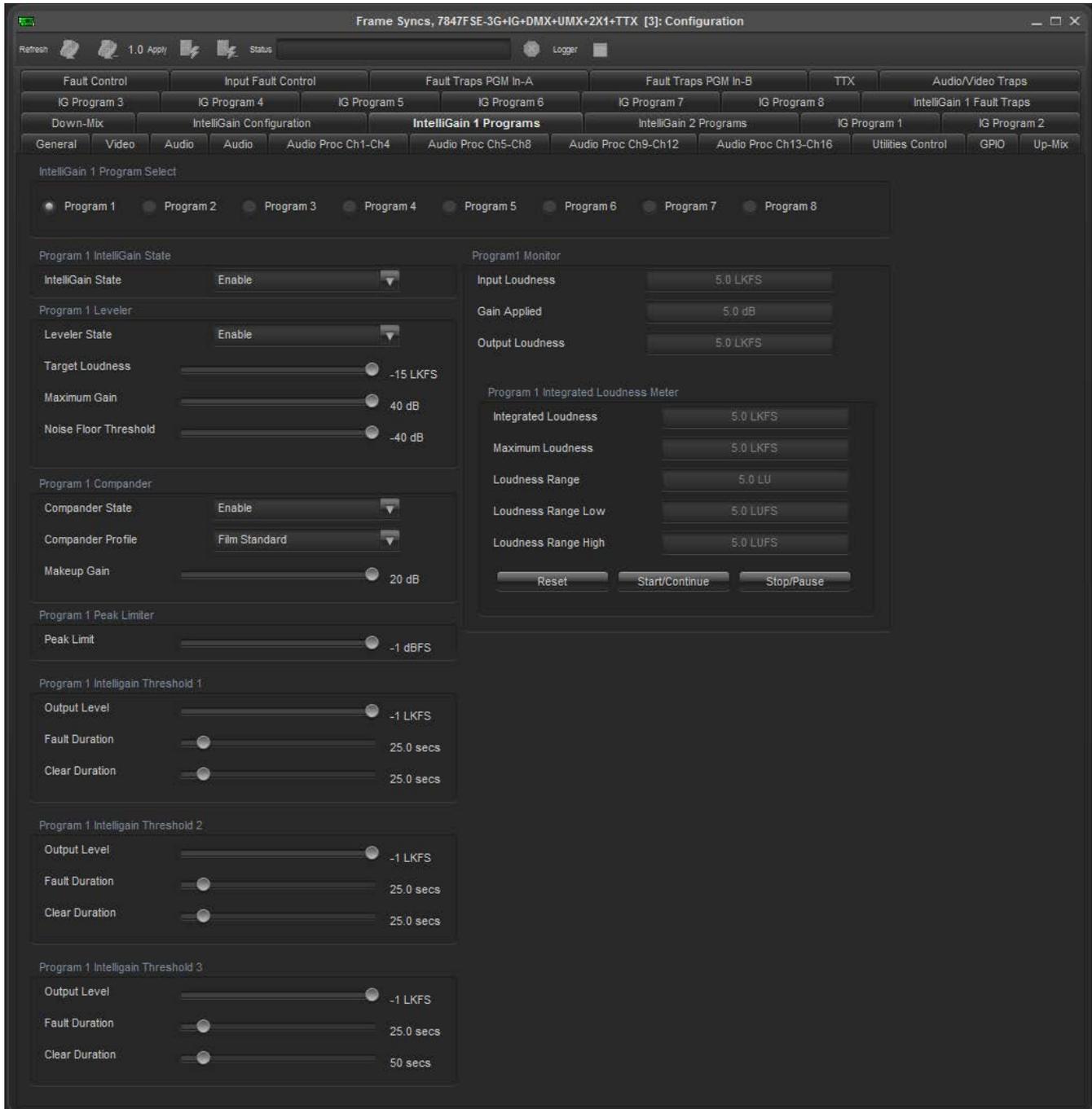


Figure 5-10 : IntelliGain 1 Programs Tab

### 5.10. INTELLIGAIN FAULT TRAPS (+IG OPTION ONLY)

The *IntelliGain 1 and IntelliGain 2 Fault Traps* tabs allow the user to configure traps and monitor the trap statuses for IntelliGain related functions. To enable a particular trap, simply click the box located beside each trap in the *Trap Enable* section so that a check mark appears. When a check mark is present, the trap is enabled. When a check mark is not present, the trap is disabled.

If a parameter under the *Trap Status* section is green, then the trap is present. If the parameter is red, then the trap is missing.

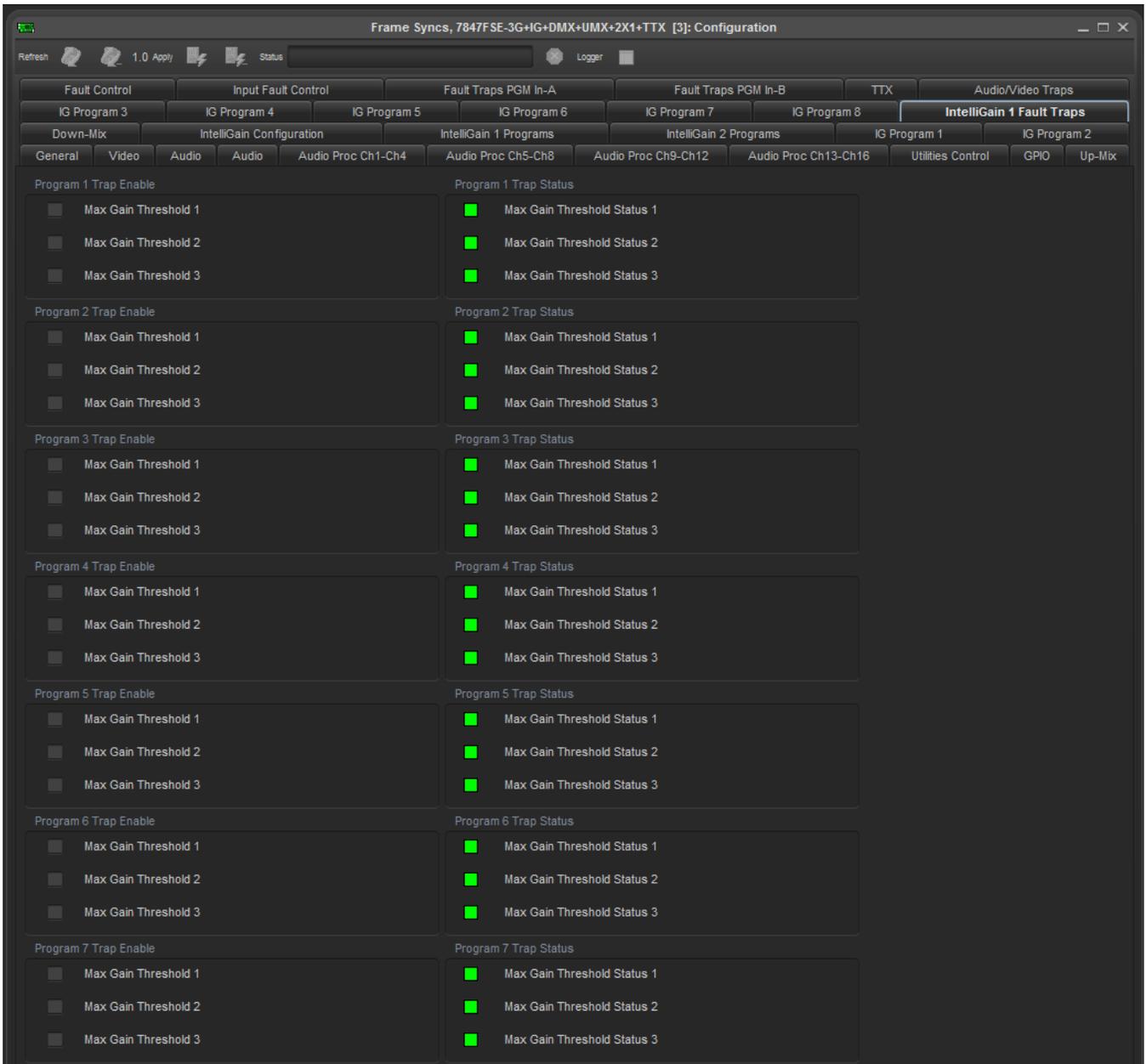


Figure 5-11 : IntelliGain 1 Fault Traps Tab

## 5.11. FAULT CONTROL (+2X1 OPTION ONLY)

The *Fault Control* tab contains two sections. The *Video Faults* section allows the user to set various parameters used to define the thresholds for detecting faults in the video. The *Audio Faults* section allows the user to define the thresholds for detecting faults in the audio. Both of these sections are used together to define the conditions used for switching. Sections 5.11.1 to 5.11.9 describe the various controls in detail.

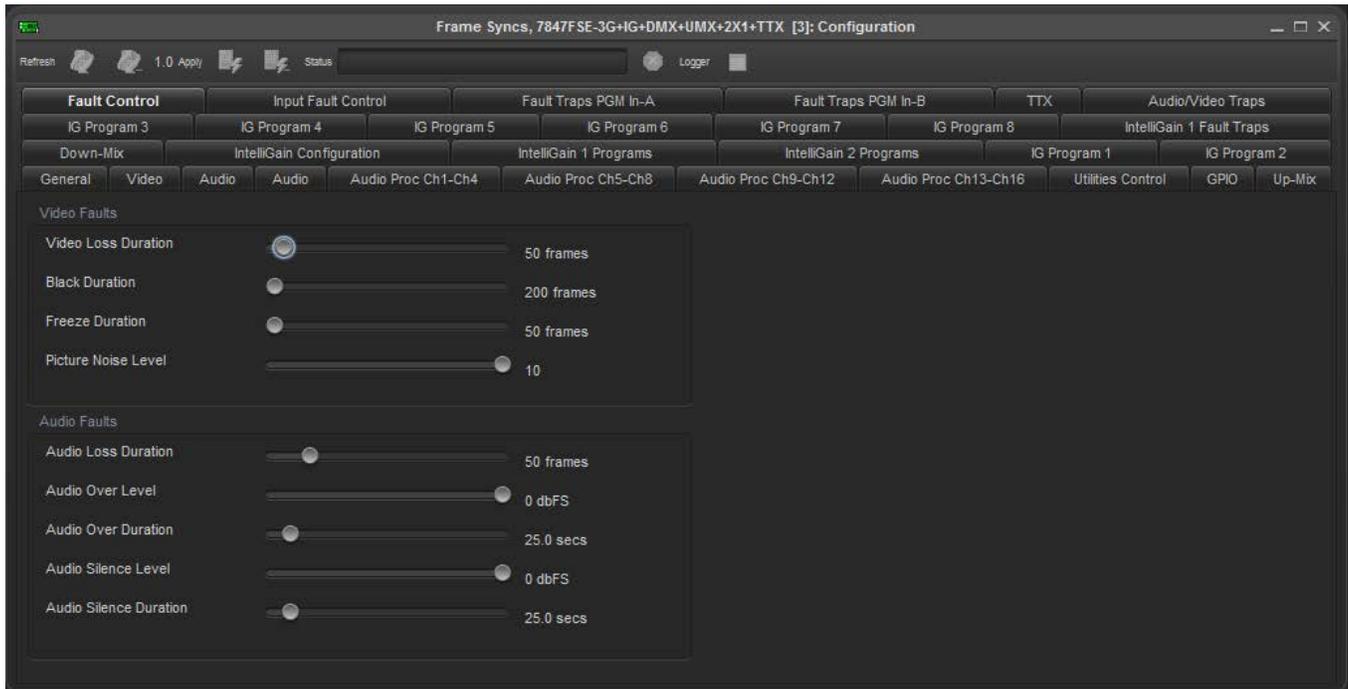


Figure 5-12 : Fault Control Tab

### 5.11.1. Video Loss Duration

The *Video Loss Duration* control enables the user to set the number of frames of missing video (or TRS/lock) that are detected before a video loss alarm is generated. The range of this control is 0 to 900 frames in 1 frame increments.

### 5.11.2. Black Duration

The *Black Duration* control enables the user to set the number of frames of black video that are detected before a video black alarm is generated. The range of this control is 4 to 9996 frames in 1 frame increments.

### 5.11.3. Freeze Duration

The *Freeze Duration* control enables the user to set the number of frames of frozen video that are detected before a video freeze alarm is generated. The range of this control is 1 to 2499 frames in 1 frame increments.

#### **5.11.4. Picture Noise Level**

The *Picture Noise Level* control enables the user to set the approximate level of noise expected in the video signal feed. This is used by the freeze detect feature to distinguish motion from background noise on top of a video feed. The range of this control is 1 to 10 in single increments. As a guide, a value of 1 is digital freeze (no noise on top of frozen picture) and a value of 10 is approximately 40 dB SNR.

#### **5.11.5. Audio Loss Duration**

The *Audio Loss Duration* control enables the user to set the number of frames of missing audio that are detected before an audio group loss alarm is generated. The range of this control is 0 to 300 frames in 1 frame increments.

#### **5.11.6. Audio Over Level**

The *Audio Over Level* control enables the user to set the level threshold for when an audio channel over alarm is generated. The range of this control is -80 to 0 dBFS in 1 dBFS increments.

#### **5.11.7. Audio Over Duration**

The *Audio Over Duration* control enables the user to set the time that the audio must be over the *Audio Over Level* before an audio channel over alarm is generated. The range of this control is 0.5 to 300.0 s in 0.5 s increments.

#### **5.11.8. Audio Silence Level**

The *Audio Silence Level* control enables the user to set the level threshold for when an audio channel silence alarm is generated. The range of this control is -80 to 0 dBFS in 1 dBFS increments.

#### **5.11.9. Audio Silence Duration**

The *Audio Silence Duration* control enables the user to set the time that the audio must be under the *Audio Silence Level* before an audio channel silence alarm is generated. The range of this control is 0.5 to 300.0 s in 0.5 s increments.

### 5.12. INPUT FAULT CONTROL (+2X1 OPTION ONLY)

The *Input Fault Control* tab contains two sections for each of the inputs PGM In-A and PGM In-B. The *Fault Triggers* and *Fault Conditions* sections are used together to allow the user to set the conditions used to determine when an input is considered faulty. This information is used by the automatic changeover to switch between the two inputs. Section 5.12.1 describes the various controls in detail.

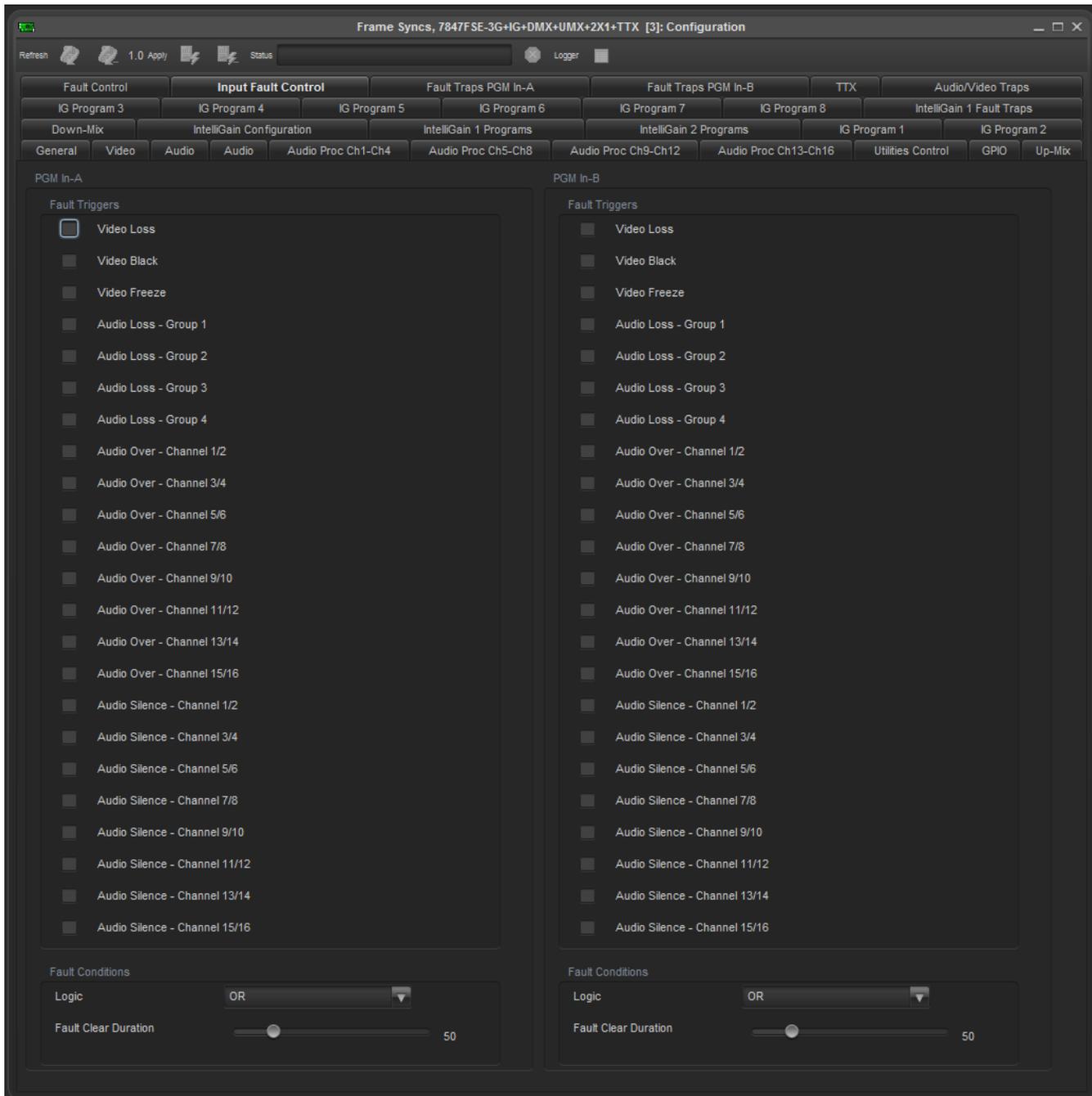


Figure 5-13 : Input Fault Control Tab

### 5.12.1. PGM In-A and PGM In-B Fault Triggers

The *PGM In-A* and *PGM-In-B Fault Triggers* sections allow the user to set conditions used to determine if the input is healthy. This is then used by the auto changeover to determine if and when to switch between the two inputs. These fault conditions are triggered based on the threshold and duration settings configured in section 5.11. The controls pertaining to this function are as follows:

#### **Fault Triggers**

The *Fault Triggers* are a list of faults that can be enabled and disabled by checking the associated checkbox beside the fault name. If checked, these faults are used to determine the health of each respective input.

#### **Logic**

The *Logic* control enables the user to set the condition for how the faults for each input source are used. The values for this control are *OR* and *AND*. The *OR* condition will consider the input as faulty if any one of the faults are triggered. The *AND* condition will consider the input as faulty only if all of the faults are triggered.

#### **Fault Clear Duration**

The *Fault Clear Duration* control enables the user to set the number of frames that an input is fault free before the fault condition for the input is cleared. The range of this control is 1 to 254 frames in 1 frame increments.

### 5.13. FAULT TRAPS PGM (+2X1 OPTION ONLY)

The *Fault Traps PGM In-A* and *Fault Traps PGM In-B* tabs allow the user to configure various traps and monitor the trap statuses associated with the 2X1 switching function. To enable a particular trap, simply click the box located beside each trap in the *Trap Enable* section so that a check mark appears. When a check mark is present, the trap is enabled. When a check mark is not present, the trap is disabled.

If a parameter under the *Trap Status* section is green, then the trap is present. If the parameter is red, then the trap is missing.

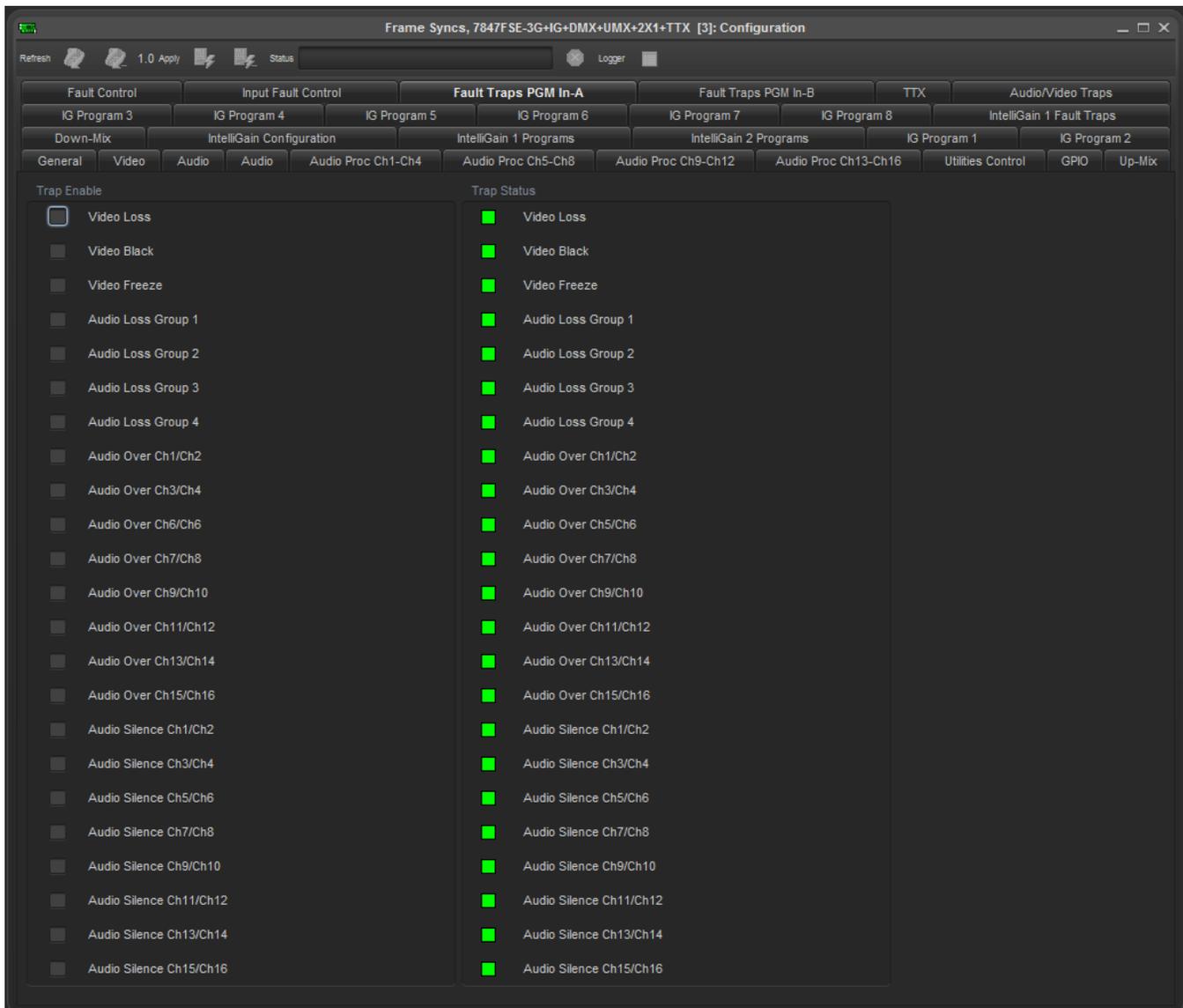


Figure 5-14 : Fault Traps PGM In-A Tab

### 5.14. TTX (+TTX OPTION ONLY)

The *TTX* tab contains four sections that are used to define the behavior of the WST inserter. The *Status* section provides information on the first two lines of WST that are detected by the card. The *Config* section provides the user with controls to define the insertion location for WST. The *Clear Down* section is used to define the parameters for using a clear down. The *Dummy/Apology Caption* section allows the user to configure a default message used in the absence of WST. Sections 5.14.1 to 5.14.11 describe the various controls in detail.

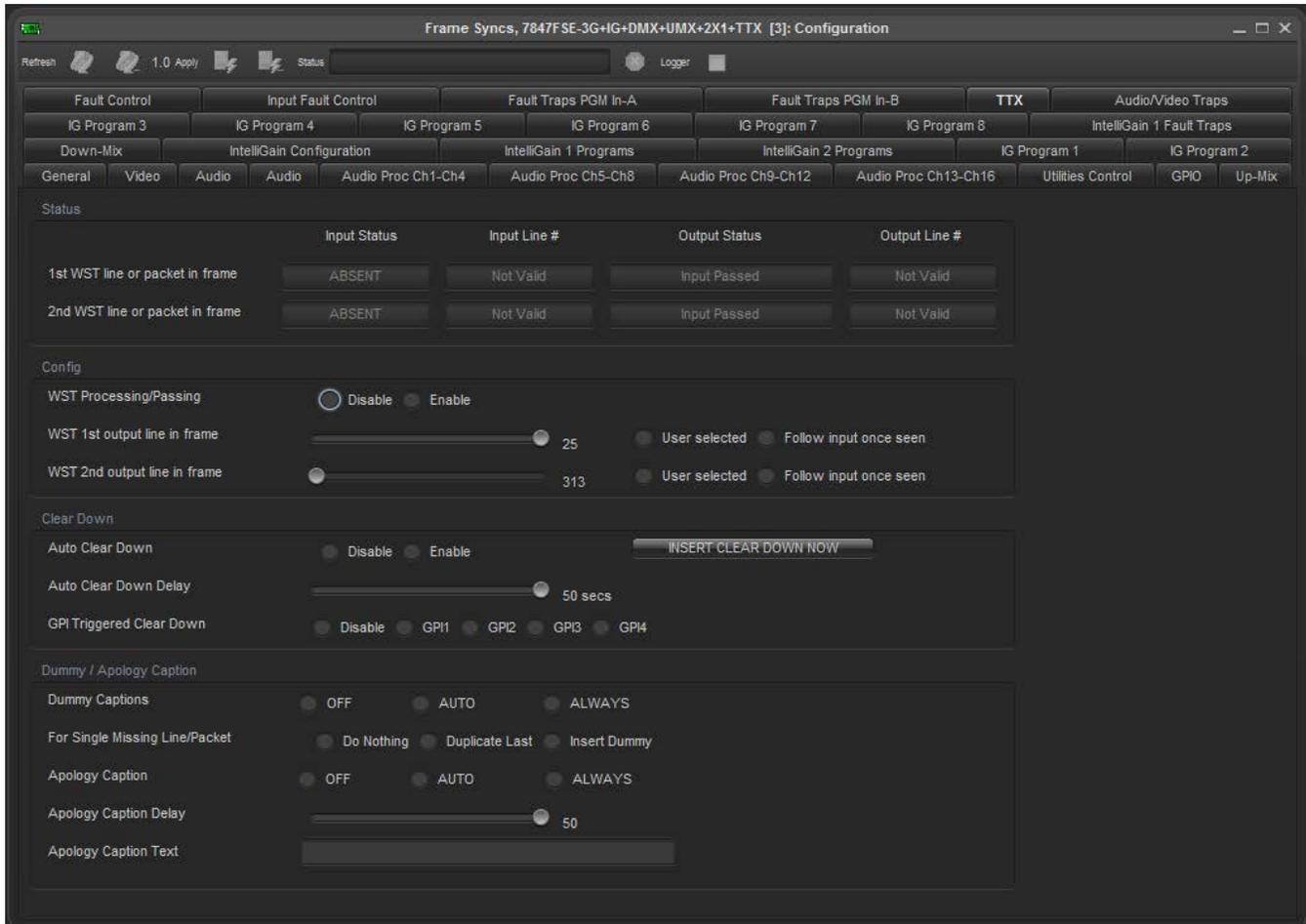


Figure 5-15 : TTX Tab

#### 5.14.1. WST Status

The *WST Status* section provides information regarding the status of the first and second WST lines. For each line the user is presented with the *Input Status*, *Input Line #*, *Output Status* and *Output Line #*. The values presented for the *Input Status* are *ABSENT*, *PRESENT-OP42* and *PRESENT-OP47*. The values presented for *Output Status* are *Input Passed*, *Dummy Captions Inserted*, *Clear Down Inserted*, *Apology Captions Inserted* and *Copied Packet from Packet 2*.

### 5.14.2. WST Processing/Passing

The *WST Processing/Passing* control enables the user to set whether WST is processed or not. The values for this control are as follows:

<b>Disable</b>	WST is not passed.
<b>Enable</b>	WST is passed and processing is allowed.

### 5.14.3. WST Output Line in Frame

The *WST 1<sup>st</sup> Output Line in Frame* and *WST 2<sup>nd</sup> Output Line in Frame* controls enable the user to set the output video line to insert the first and second WST lines respectively. If the *Follow input once seen* radio button is selected then this control is disabled and the output line will be the same as the input line. If the *User selected* ratio button is selected then this control is enabled with range 1 to 22 in 1 line increments. The range will change depending on the input video standard.

### 5.14.4. Auto Clear Down

The *Auto Clear Down* control enables the user to automatically insert a clear down if no WST is detected on the input. The values for this control are as follows:

<b>Disable</b>	A clear down cannot be inserted.
<b>Enable</b>	A clear down is automatically inserted.

### 5.14.5. Auto Clear Down Delay

The *Auto Clear Down Delay* control enables the user to set the number of seconds that WST is missing before a clear down is inserted. The range of this control is 1 to 50 s in 1 s increments.

### 5.14.6. GPI Triggered Clear Down

The *GPI Triggered Clear Down* control enables the user to insert a clear down by using a GPI. The values for this control are as follows:

<b>Disable</b>	A clear down cannot be inserted using a GPI.
<b>GPI1-4</b>	A clear down is inserted if the respective GPI is triggered.

### 5.14.7. Dummy Captions

The *Dummy Captions* control enables the user to insert a default dummy caption when no captions are detected on the input. The apology caption takes precedence over the dummy caption when both are enabled. The values for this control are as follows:

<b>Off</b>	Dummy caption is never inserted.
<b>Auto</b>	Dummy caption is inserted automatically when there are no captions on the input.
<b>Always</b>	Dummy caption is always inserted regardless of the input.

#### 5.14.8. For Single Missing Line/Packet

The *For Single Missing Line/Packet* control enables the user to set the behavior when only one WST line (OP-42) or packet (OP-47) is seen per frame instead of two. The values for this control are as follows:

<b>Do Nothing</b>	Nothing is inserted.
<b>Duplicate Last</b>	Duplicate the data from the last received line/packet and insert it in place of the missing one.
<b>Insert Dummy</b>	Insert the dummy caption.

#### 5.14.9. Apology Caption

The *Apology Captions* control enables the user to insert an apology caption when no captions are detected on the input. The apology caption takes precedence over the dummy caption when both are enabled. The values for this control are as follows:

<b>Off</b>	Apology caption is never inserted.
<b>Auto</b>	Apology caption is inserted automatically when there are no captions on the input.
<b>Always</b>	Apology caption is always inserted regardless of the input.

#### 5.14.10. Apology Caption Delay

The *Apology Caption Delay* control enables the user to set the number of seconds that captions are missing before an apology caption is inserted. The range of this control is 1 to 50 s in 1 s increments.

#### 5.14.11. Apology Caption Text

The *Apology Caption Text* field enables the user to enter text for the apology caption that is inserted. This field has a maximum length of 64 characters.

### 5.15. AUDIO/VIDEO TRAPS

The *Audio/Video Traps* tab allows the user to configure various traps and monitor the trap statuses. To enable a particular trap, simply click the box located beside each trap in the *Trap Enable* section so that a check mark appears. When a check mark is present, the trap is enabled. When a check mark is not present, the trap is disabled.

If a parameter under the *Trap Status* section is green, then the trap is present. If the parameter is red, then the trap is missing.

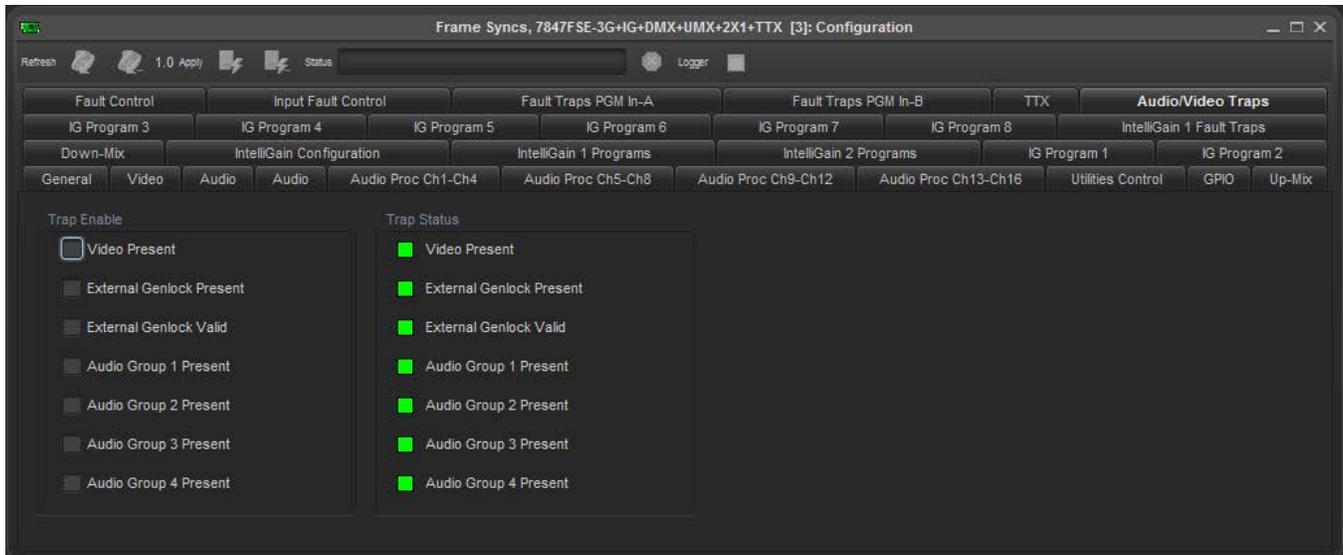


Figure 5-16 : Audio/Video Traps Tab

## 6. JUMPERS

Figure 6-1 provides the locations of the jumpers and LEDs on the 7847FSE board.

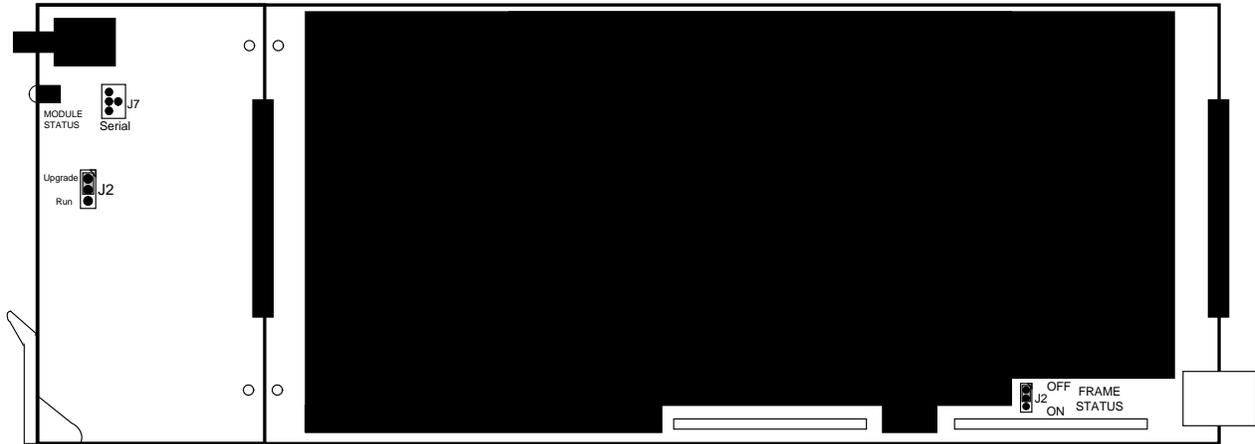


Figure 6-1: Location of Jumpers – Top View

### 6.1. SELECTING WHETHER LOCAL FAULTS WILL BE MONITORED BY THE GLOBAL FRAME STATUS

**FRAME STATUS:** The FRAME STATUS jumper J2 is located near the rear of the board and close to the white metal connector. The FRAME STATUS jumper determines whether local faults (as shown by the Local Fault indicator) 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.

### 6.2. CONFIGURING THE MODULE FOR FIRMWARE UPGRADES

Firmware updates can be performed using two methods. The first method is an Ethernet based up-load of firmware using VistaLINK<sup>®</sup> PRO. The second method is a serial interface based up-load of firmware which uses the on-card upgrade serial port.

**UPGRADE:** The UPGRADE jumper (J2) is located on the top side of the main module near the front of the card and is used when firmware upgrades are being performed on the module. For normal operation it should be switched to the *RUN* position as shown in the Figure 6-1 and Figure 6-2. See the *Upgrading Firmware* chapter in the front of the manual binder for more information.

To upgrade the firmware in the module unit pull it out of the frame. Move Jumper J2 into the *UPGRADE* position. Install the Upgrade cable provided (located in the vinyl pouch in the front of this manual) onto header J7 at the card edge. Re-install the

module into the frame. Run the upgrade as described in the *Upgrading Firmware* chapter. Once the upgrade is complete, remove the module from the frame, move J2 into the *RUN* position, remove the upgrade cable and re-install the module. The module is now ready for normal operation.

**The Upgrade baud rate for the 7847FSE module is 115,200 baud. Additional serial connection settings are as follows:**



**Data Bits = 8  
Parity = None  
Stop Bits= 1  
Flow Control = None**

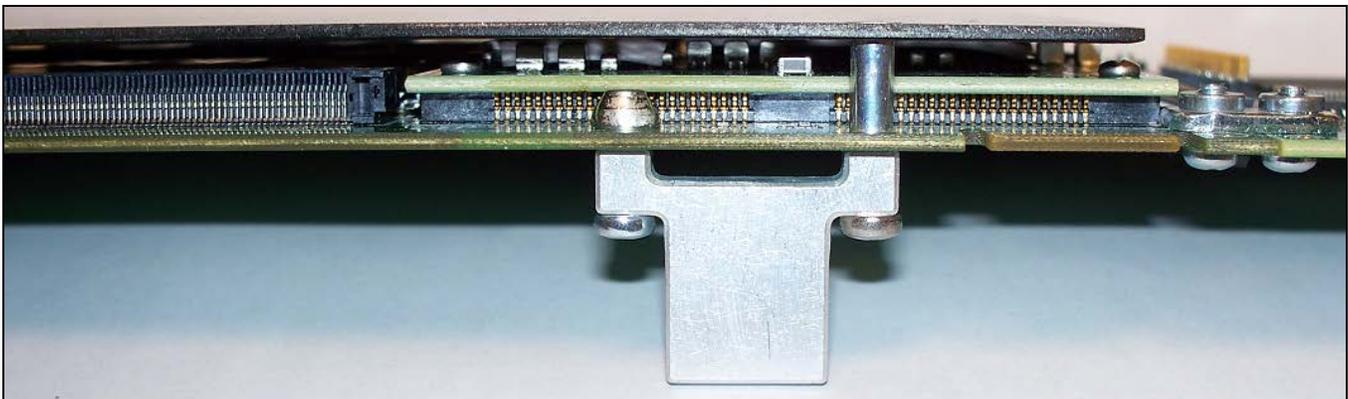
### 6.3. SELECTING WHETHER THE GENLOCK REFERENCE INPUT IS TERMINATED

**TERM:** The micro DIP switch on the bottom of the board (near the connector) is used to terminate the genlock loop input. When DIP Switch 1 is set to “ON”, the 75 ohm terminating resistor is placed between the genlock input and ground. When DIP Switch 1 is set in the “OFF” position the genlock input will be high impedance. Leave DIP SWITCH 2, 3 and 4 in the OFF position.

### 6.4. USING A SLOT BLOCKER

The 7847FSE module can be installed in either the 7700FR-C or the 7800FR frames. These modules are designed to occupy one slot in the Evertz 7800FR frame and two slots in the 7700FR-C.

The 7847FSE module can fit into one slot 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 7847FSE module is installed in the 7700FR-C, the module must occupy 2 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 frame, 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 frame, the card will also power-up and operate normally.



**Figure 6-2: Slot Blocker**

## **7. VISTALINK<sup>®</sup> REMOTE MONITORING/CONTROL**

### **7.1. WHAT IS VISTALINK<sup>®</sup>?**

*VistaLINK<sup>®</sup>* is Evertz' remote monitoring and configuration platform which operates over an Ethernet network using Simple Network Management Protocol (SNMP). SNMP is a standard computer network protocol that enables different devices sharing the same network to communicate with each other. *VistaLINK<sup>®</sup>* provides centralized alarm management, which monitors, reports, and logs all incoming alarm events and dispatches alerts to all the VLPro Clients connected to the server. Card configuration through *VistaLINK<sup>®</sup>* PRO can be performed on an individual or multi-card basis using simple copy and paste routines, which reduces the time to configure each module separately. Finally, *VistaLINK<sup>®</sup>* enables the user to configure devices in the network from a central station and receive feedback that the configuration has been carried out.

There are 3 components of SNMP:

1. An SNMP manager, also known as a Network Management System (NMS), is a computer running special software that communicates with the devices in the network. Evertz VL-Fiber demo Manager graphical user interface (GUI), third party or custom manager software may be used to monitor and control Evertz *VistaLINK<sup>®</sup>* enabled fiber optic products.
2. Managed devices, (such as 7707EO and 7707OE cards), each with a unique address (OID), communicate with the NMS through an SNMP Agent. Evertz *VistaLINK<sup>®</sup>* enabled 7700 series modules reside in the 3RU 7700FR-C MultiFrame and communicate with the manager via the 7700FC or 7800FC *VistaLINK<sup>®</sup>* frame controller modules, which serves as the Agent.
3. A virtual database, known as the Management Information Base (MIB), lists all the variables being monitored, which both the Manager and Agent understand. Please contact Evertz for further information about obtaining a copy of the MIB for interfacing to a third party Manager/NMS.

For more information on connecting and configuring the *VistaLINK<sup>®</sup>* network, see the 7700FC or 7800FC Frame Controller chapter.

### **7.2. VISTALINK<sup>®</sup> PARAMETERS**

All control and monitoring of the 7847FSE is done through the use of *VistaLINK<sup>®</sup>* so all control and monitoring parameters described in section 5 are the same as the ones available through *VistaLINK<sup>®</sup>*. Please refer to that section for more information.

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