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REVISION HISTORY

<u>REVISION</u>	<u>DESCRIPTION</u>	<u>DATE</u>
0.1	Preliminary version	Jun 2006
0.2	Added 7700RD2X2-HD Support	Jul 2006
0.3	Minor corrections throughout manual	Apr 2007
1.0	Removed references to thumbnails	May 2008
1.1	Added Transport Stream Monitoring and Audio Mixer Control Sections.	Dec 2008
1.2	Updated Formatting	Jan 2010
1.3	Added note regarding GPOs to section 2.3	May 2011
1.4	Updates made to “Module Control” & “Genlock Reference” sections	April 2012
1.5	Added Additional Feature	April 2013
1.6	Updated Features & Benefits section 1	April 2015

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1. OVERVIEW

The 7700R2x2 series modules are bypass routers for 1.5 Gb/s HDTV (SMPTE292) or standard definition 270 Mb/s serial digital video signals (SMPTE259M-C) or ASI signals(7700R2x2-HD only). There are two distinct models in the series, offering a cost-effective solution for your specific requirements. These are the 7700R2x2-HD and the 7700R2x2-HES. The differences between these two models are described below.

Besides the HD and SD input signals, 7700R2x2-HD also supports ASI signals. It provides essential monitoring on MPEG Transport Stream as well as the complete Transport Stream (TS) data measurement through VistaLINK[®] control.

The 7700R2x2-HES supports HD and SD input signals. It also incorporates Evertz proprietary SoftSwitch™ technology, for clean video and "popless" embedded audio switching. Line synchronizers on the video inputs can accommodate differences in timing of up to +/- ½ line on the video inputs.

Both 7700R2x2-HD and 7700R2x2-HES provide three re-clocked primary outputs, and one re-clocked backup output. The program output is bypass relay protected and provides protection on the program path. If the module is removed from the enclosure or power to the module is lost, the program path is maintained. On both the 7700R2x2-HD and the 7700R2x2-HES, PGM OUT 3 may be used as a Genlock input.

The two inputs are monitored at all times for a variety of error conditions and status including:

- Loss of input video or presence of invalid video
- Status of embedded audio
- Status of router selection state and cross-point configuration

Status is provided using a number of methods:

- Card edge 4-character alphanumeric display
- Card edge LED status for router state, signal presence, etc.
- Tally output on GPI's for router state
- SNMP reporting and monitoring via VistaLINK[®] PRO or any SNMP compliant manager

Output selection and control of the selector cross-point can be achieved by a number of methods:

- Contact closures (GPI control)
- Card edge control
- Via network control panels (9000NCP, 9000NCP2)
- VistaLINK[®] control

VistaLINK[®] provides a software GUI interface for control and monitoring of the device. VistaLINK[®] can be used to manually control the switch or be configured to trigger a change based on specific errors and thresholds. VistaLINK[®] enables remote monitoring, control and configuration capabilities via Simple Network Management Protocol (SNMP). This offers the flexibility to manage operations including signal monitoring and module configuration from SNMP enabled control systems (Manager or NMS) locally or remotely.

The 7700R2x2-HD and 7700R2x2-HES occupy one card slot and can be housed in the 3RU 7700FR frame, which will hold up to 15 single-slot modules, or one slot within the 1RU frame, which will hold up to three modules.

Features:

- Support for serial digital 1.5 Gb/s HD input signals per SMPTE 292M (Please see Table 3-1)
- Support for serial 270 Mb/s SD input signals per SMPTE 259M-C (525i/59.94 or 625i/50)
- Support for ASI input signals (7700R2x2-HD only)
- Auto sensing of HD and SD input formats
- Generation of three re-clocked program outputs and one preview output (HD if HD inputs are applied, SD if SD inputs are applied)
- Bypass relay protection on program output
- Controllable switch point when a Genlock reference is provided
- GPI control inputs
- GPO status outputs for reporting selector cross-point status
- Card edge menu control for configuration of operating modes
- Card edge LEDs for reporting signal presence, router state, module status
- VistaLINK[®] capable for offering remote monitoring, control, and configuration via SNMP



Please note: VistaLINK[®] is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK[®] Frame Controller module in slot 1 of the frame using the model 9000NCP Network Control Panel or Evertz VistaLINK[®] PRO or other third-party SNMP manager software.

Additional features on 7700R2X2-HD model only:

- Support ASI input signal
- Essential Transport Stream(TS) monitoring including TS Loss, Sync Byte Error, Bitrate Analysis, PIDs List Monitoring, Continuity Count and PAT Monitoring
- Complete TS data rate measurement with user settable measurement windows

Additional features on 7700R2X2-HES model only:

- Full support for 8 channels of embedded audio with audio mixer control through VistaLINK[®] (Only the first 8 channels of embedded audio are processed. The remaining channels, 9-16, are passed to the output.)
- Integrated SoftSwitch[™] technology for clean video and "popless" embedded audio switching
- Dolby-E compliant



Please note: From this point forward, the 7700R2x2-HD and the 7700R2x2-HES modules will be referred to as the "7700R2X2 Series", unless the feature in question is applicable only to one of the modules, in which case the specific model number will be referenced.

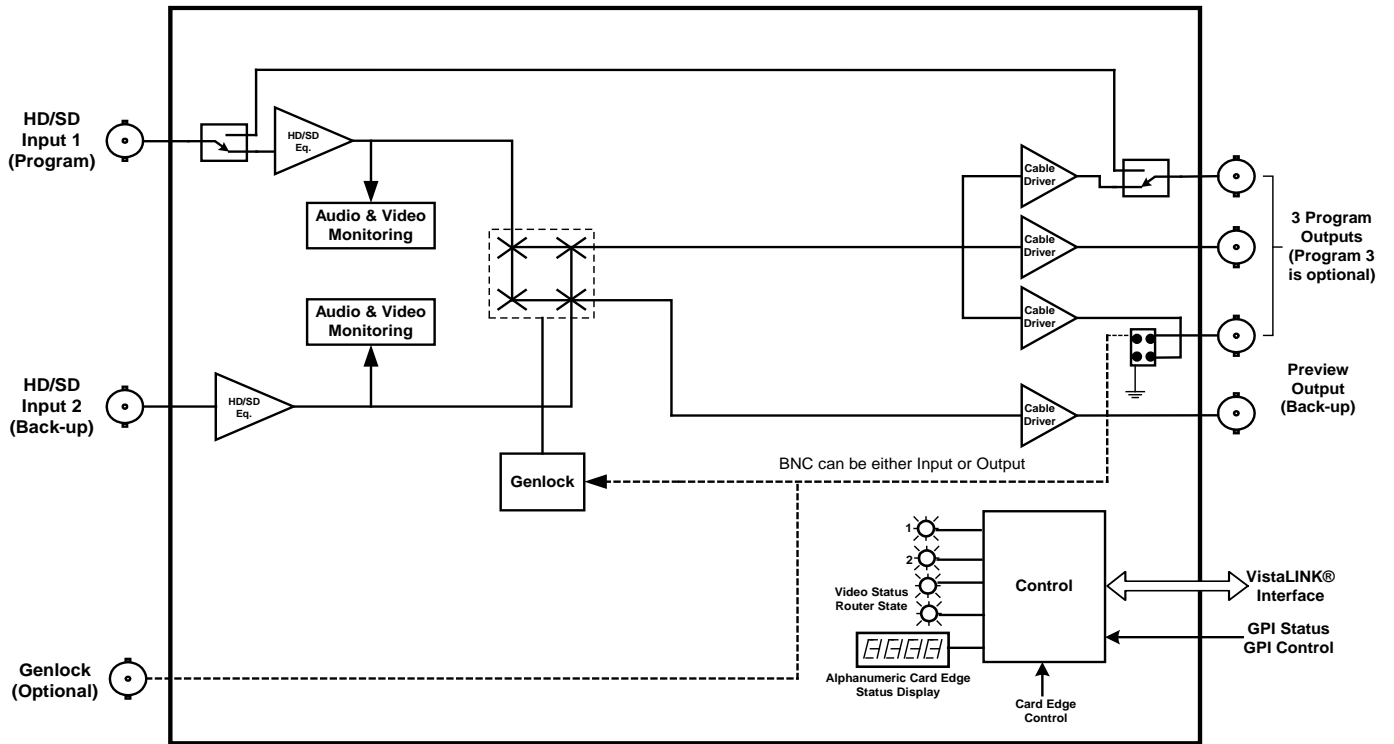


Figure 1-1: 7700R2x2-HD Block Diagram

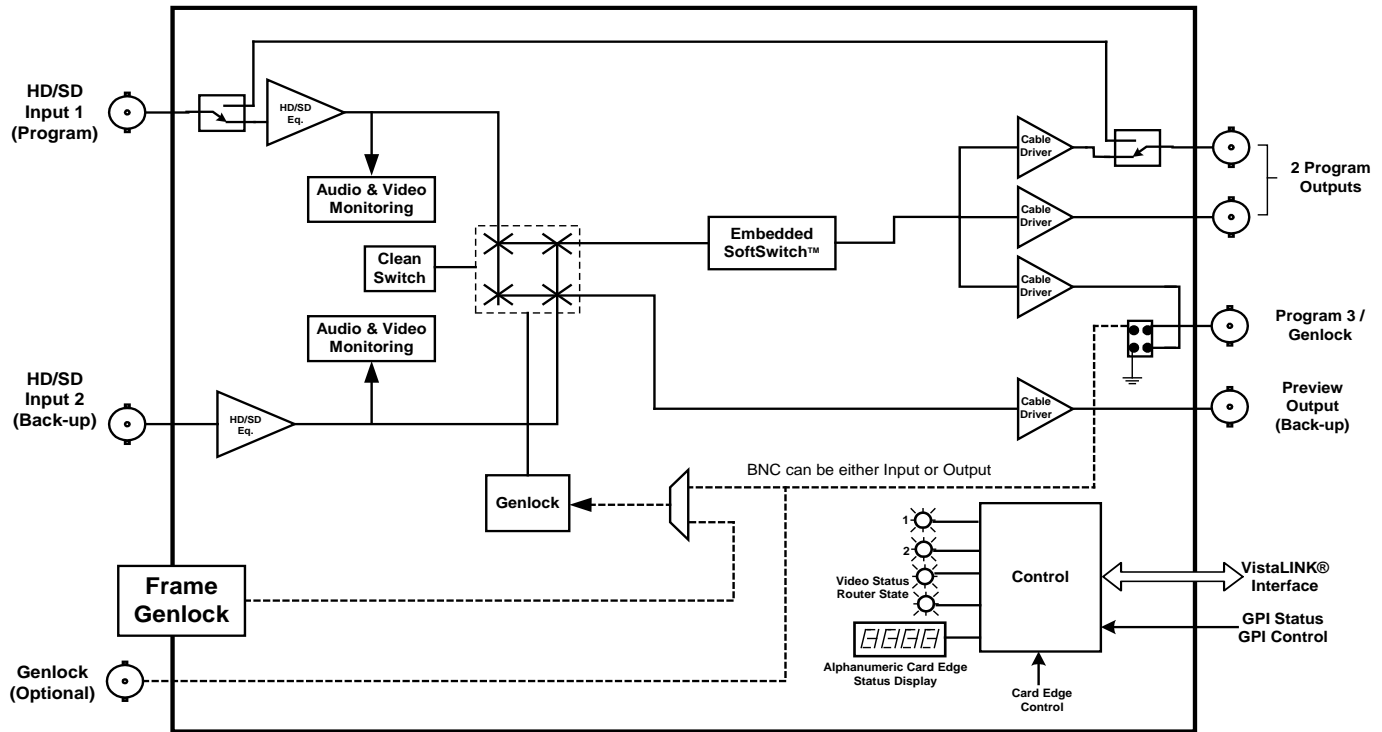


Figure 1-2: 7700R2x2-HES Block Diagram

2. INSTALLATION

The 7700R2x2 Series comes with a companion rear plate that occupies one slot in the frame. For information on inserting the module into the frame see section 3 of the 7700FR chapter.

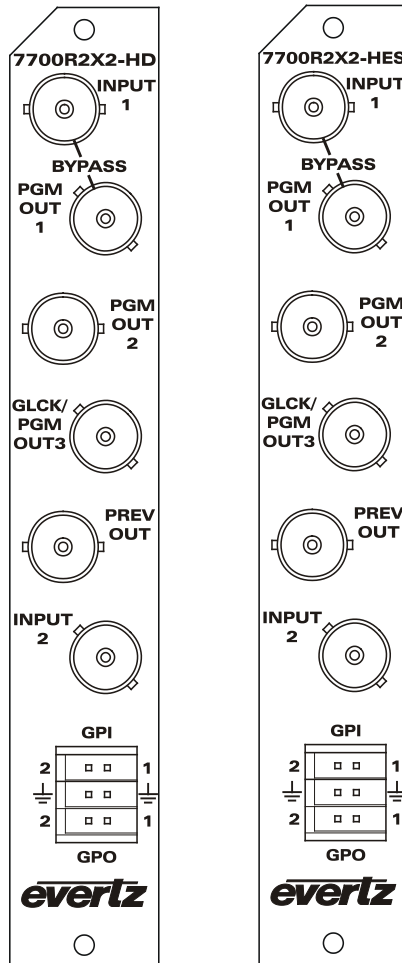


Figure 2-1: 7700R2X2-HD and 7700R2x2-HES Rear IO Modules

2.1. VIDEO CONNECTIONS

INPUTS 1 & 2: Input BNC connectors for serial digital signals compatible with the SMPTE 292M or SMPTE 259M-C standards. The INPUT 1 connector is the *Program* input and the INPUT 2 connector is for the *Backup* or *Preview* input.

PGM OUT 1 to 3: These three BNC connectors are used as the program video bus output. The output video standard is the same as the input video standard. The PGM OUT 1 output is protected by a bypass relay, which will activate in the event that power to the module is lost or the module is removed. PGM OUT 2 and PGM OUT 3 are identical to PGM OUT 1 except that these outputs are not bypass relay protected. PGM OUT 3 can also be selected as a Genlock input (please refer to section 2.2 for Genlock option and section 8.3 for information on how to define this BNC).

PREV OUT: This BNC connector is used as the preview video bus output and is always the same standard as the video input.

2.2. GENLOCK REFERENCE

GENLOCK: The Genlock signal may be NTSC or PAL colour black or tri-level sync. The reference input type is auto-detected. Jumper J17 on the 7700R2x2 Series selects whether the selected reference input is terminated to 75 ohms (default) or to high impedance. Please refer to Figure 8-1 and Figure 8-2. The Genlock reference may also be supplied to the 7700R2X2-HES card through the Frame Genlock if the 7700FR-G frame is being utilized.



Please note: Video sources must be genlocked to support the audio mixer (constant audio phase relationship is necessary), otherwise audio will drift wrt each other and the amplitude may not be as expected.

2.3. GENERAL PURPOSE INPUTS & OUTPUTS

The 6-pin terminal strip has two general purpose inputs and two general purpose outputs. The GPI inputs are active low with internal pull-ups. If an input is left floating (not connected) it will not be activated. Lowering the GPI input to a voltage below 0.8 volts will activate the input. GPIs can be activated by simply connecting the GPI input pins to ground using a button, switch, relay, or an open collector transistor. The inputs are internally pulled up to either +5 or +12 volts DC set by jumper J16 (please refer to Figure 8-1 and Figure 8-2). The GPO outputs are open collector. Care must be taken to limit the load to 0.5 W so there is no effect on the power supply of the module.

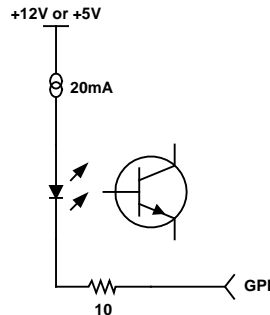


Figure 2-2: Typical GPI Circuitry

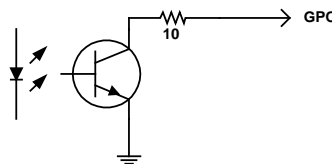


Figure 2-3: Typical GPO Circuitry

The GPIOs can be setup to control and monitor the switching behaviour of the 7700R2x2 Series. GPIO cables can be secured into the removable portion of the terminal strips using a small screwdriver. The removable part of the terminal strip is then inserted into the rear panel and secured using the hold down screws.

GPI 1 & 2: When the module is set to manual switch mode the GPI's control the routing of the module. For example, if GPI 1 is pulled low momentarily, Input 1 will be routed to PGM OUT 1-3 & Input 2 will be routed to PREV OUT. If GPI 2 is pulled low momentarily, Input 1 will be routed to PREV OUT & Input 2 will be routed to PGM OUT 1-3.

GPO 1 & 2: The GPO's indicate whether the primary or secondary input has been selected as the primary output. When GPO 1 is high, then the primary input (Input 1) has been selected, and if GPO 2 is high, then the secondary input (Input 2) has been selected.



Please note: When SMOD is set to AUS, the user can use the GPIs to force a switch to the desired inputs. If user selects GPI 1, then INPUT 1 will be sent to PGM OUT 1 to 3 and INPUT 2 to PREV OUT, regardless of the signal quality. The same applies for GPI 2, where INPUT 2 would be sent to PGM OUT 1 to 3 and INPUT 1 to PREV OUT.

If the GPIs are BOTH HI or BOTH LOW, the auto-switch functionality is retained.



Please note: GPOs are NOT active low. There is no internal pull-up resistor to +5V. The GPO outputs are open collector.

3. SPECIFICATIONS

3.1. SERIAL DIGITAL VIDEO INPUTS

Standard: 270 Mb/s SMPTE 259M – auto-detects standard
1.485 Gb/sec SMPTE 292M – auto-detects standard
SMPTE 125M, SMPTE 274M, SMPTE 296M – see Table 3-1 for a list of supported video standards

Common Name	Pixels / Active Lines	Frame Rate	Progressive /Interlace	SMPTE Standard
480i/59.94	720x480	59.94	I	125M
576i/50	720x576	50	I	125M
1080i/59.94	1920 x 1080	29.97 (30/1.001)	I	274M
1080i/50	1920 x 1080	25	I	274M
1080p/30	1920 x 1080	30	P	274M
1080p/29.97	1920 x 1080	29.97 (30/1.001)	P	274M
720p/59.94	1280 x 720	59.94 (60/1.001)	P	296M
720p/50	1280 x 720	50	P	296M

Table 3-1: Video Input Formats

Connector: 2 BNC per IEC 61169-8 Annex A
Input Equalization: Automatic to 100m @ 1.5Gb/s with Belden 1694 or equivalent cable
Return Loss: >20 dB up to 270 MHz
>12 dB up to 1.5GHz

3.2. RE-CLOCKED SERIAL DIGITAL VIDEO ROUTER OUTPUTS

Standard: Same as input
Number of Outputs: 3 Program outputs re-clocked, (1 output is bypass relay protected)
1 preview output
Connector: BNC per IEC 61169-8 Annex A
Signal Level: 800mV nominal
DC Offset: 0V ±0.5V
Rise and Fall Time: 200ps nominal for HD
900ps nominal for SD
Overshoot: <10% of amplitude
Return Loss: >20 dB up to 270 MHz
> 15 dB at 1.5 Gb/s
Jitter: < 0.16UI (HD) or < 0.10UI (SD)

3.3. GENLOCK INPUT

Type: NTSC or PAL Colour Black 1 V p-p
HD Tri-level Sync

Connector: BNC per IEC 61169-8 Annex A or Frame Genlock (available with 7700R2x2-HES only)

Termination: High impedance or internal 75 ohm termination (jumper selectable, see section 8.3 and Figure 8-1 and Figure 8-2)

3.4. GENERAL PURPOSE INPUTS AND OUTPUTS

Number of Inputs: 2

Number of Outputs: 2

Type: Opto-isolated, active low with internal pull-ups to +5 or +12V (jumper settable, see Section 8.4 and Figure 8-1 and Figure 8-2)

Connector: 6 pin removable terminal block

Signal Level: Closure to ground

3.5. ELECTRICAL

Voltage: +12V DC

Power: 9 W (7700R2X2-HD)
14 W (7700RD2X2-HD)
11 W (7700R2X2-HES)

EMI/RFI: Complies with FCC regulations for class A devices
Complies with EU EMC directive

3.6. PHYSICAL

7700 Frame Mounting:
Number of Slots: 1 (7700R2X2-HD and 7700R2X2-HES)

7701 frame Mounting:
Number of Slots: 1

4. STATUS INDICATORS

The 7700R2x2 Series has 11 LED status indicators on the main circuit-board front card edge to show the operational status of the card at a glance. Figure 8-1 and Figure 8-2 show the location of the LEDs and card edge controls.

Two large LEDs on the front of the board indicate the general health of the module.

LOCAL FAULT: This red LED indicates poor module health and will be ON during the absence of a valid input signal or if a local input power fault exists (i.e.: a blown fuse). The LOCAL FAULT indication can also be reported to the frame through the FRAME STATUS jumper.

MODULE OK: This green LED indicates good module health. It will be ON when a valid input signal is present on both inputs, and the board power is good.

Five small LEDs near the upper edge of the board indicate the status of the 7700R2X2 Series.

VIDEO 1 PRESENT: This green LED will be ON when there is a valid signal present on module Input 1.

VIDEO 2 PRESENT: This green LED will be ON when there is a valid signal present on module Input 2.

INPUT 1 PGM: This green LED will be ON when user selects Input 1 as PGM output.

INPUT 2 PGM: This green LED will be ON when user selects Input 2 as PGM output.

GENLOCK PRESENT: This green LED will be ON when Genlock Input is present.

4.1. AUDIO STATUS LEDs

Four LEDs located on the lower edge of the module (near the card extractor) indicate which audio groups are present in the input video. Audio group LED 1 is located closest to the center of the module.

Audio LED	Colour	Audio Group Status
1	Off	Neither group 1 or group 2 present on input 1 video
	Flashing	Only group 1 or group 2 present on input 1 video
	Green	Both group 1 and group 2 present on input 1 video
2	Off	Neither group 3 or group 4 present on input 1 video
	Flashing	Only group 3 or group 4 present on input 1 video
	Green	Both group 3 and group 4 present on input 1 video
3	Off	Neither group 1 or group 2 present on input 2 video
	Flashing	Only group 1 or group 2 present on input 2 video
	Green	Both group 1 and group 2 present on input 2 video
4	Off	Neither group 3 or group 4 present on input 2 video
	Flashing	Only group 3 or group 4 present on input 2 video
	Green	Both group 3 and group 4 present on input 2 video

Table 4-1: Audio Group Status LEDs

5. CARD EDGE CONTROLS

The 7700R2x2 Series is equipped with an 8-position DIP switch, a toggle switch, a push button, and a 4-character dot-matrix display to allow the user to select various functions. The DIP switch provides basic configuration functions that will normally be set only once, such as VistaLINK® remote control selection, and control/monitor mode selection. All other card functions are available through a menu system controlled by the toggle switch and push button, and displayed on the 4-character dot-matrix display (please see section 6.2).

DIP switch 1 is located at the top of the DIP switch (farthest from to the card ejector). Table 5-1 gives an overview of the DIP switch functions. Sections 5.1 to 5.2 provide a detailed description of each of the DIP switch function.



There are two types of DIP switches possible. For slide switches the ON (closed) position is farthest from the front edge of the printed circuit board. For 'piano key' switches the ON (closed) position is down, or closest to the printed circuit board.

DIP Switch	Function
1	VistaLINK® or Local Control Selection
2	Reserved – Set to Off
3	
4	
5	
6	
7	Control or Monitoring Mode Selection
8	

Table 5-1: DIP Switch Functions

5.1. SELECTING WHETHER THE MODULE WILL BE CONTROLLED FROM THE LOCAL CONTROLS OR THROUGH THE VISTA LINK® INTERFACE

The 7700R2x2 Series can be controlled using the card edge DIP switches and menu system or remotely via SNMP using VistaLINK® PRO. See section 7 for a full description of the parameters that can be monitored or controlled using VistaLINK®. VistaLINK® control is only available when the card is installed in the 3RU 7700FR-C frame, and a 7700FC VistaLINK® Frame Controller card is installed in slot 1 of the frame.

DIP switch 1 is used to enable or disable VistaLINK® control:

DIP 1	CONTROL MODE
Off	Local control mode - the module will be controlled using the DIP switches and menu system.
On	VistaLINK® control mode - the module will be controlled remotely through SNMP.

Table 5-2: VistaLINK® Mode Switch Settings

5.2. ENABLING CARD EDGE CONTROL

DIP switch 8 is used to control whether the card will be controlled using the menu items or whether it is in monitor mode. Section 6 describes more details on these two functions.

DIP 8	FUNCTION	DESCRIPTION
Off	Control Mode	Card edge display is used for module setup using the menu system.
On	Monitor Mode	Card edge display is used for router status. Pushbutton controls the switch in Manual mode.

Table 5-3: Control Mode Switch Setting

6. CARD EDGE MENUS

6.1. NAVIGATING THE CARD EDGE MENU SYSTEM

Status monitoring and control over the card's parameters is provided via the 4-digit alphanumeric display located on the card edge. DIP switch 8 is used to select whether you are displaying status from the card (monitoring mode) or setting control parameters for the card (control mode). When you are in control mode, the toggle switch and pushbutton are used to navigate through a menu system to set various parameters for the module. In Status mode, the menu system only provides the card's status. To enter the menu system, press the pushbutton. This will bring you to the main setup menu where you can use the toggle switch to move up and down the list of available sub-menus. When you have chosen the desired sub-menu, press the pushbutton to select the next menu level.

In the sub-menu there will be a list of parameters to adjust. To adjust any parameter, use the toggle switch to move up or down to the desired parameter and press the pushbutton. Using the toggle switch, adjust the parameter to its desired value. If the parameter is a numerical value, the number will increase if you lift the toggle switch, and decrease if you push down on the toggle switch. If the parameter contains a list of options, you can cycle through the list by pressing the toggle switch in either direction.

Once you have reached the desired value press the pushbutton. This will update the parameter to the selected value and return the user to the sub-menu. To change another parameter, press the pushbutton to enter the main menu system again and continue selecting and adjusting other parameters.

Each of the menu items with function descriptions are described in the following sections.

In the following section, the default values for the menu items are indicated with an underline.

6.2. CARD EDGE DISPLAY – MONITOR MODE

When the module is in monitoring mode (DIP switch 8 is ON), the card edge display will show which input has been routed to the PGM outputs. Selecting one of these items will route the user down into the next menu level.

SW1	Input 1 is routed to the PGM outputs. Input 2 is routed to PREV output.
SW2	Input 2 is routed to the PGM outputs. Input 1 is routed to PREV output.

6.3. CARD EDGE DISPLAY – CONTROL MODE

The following is a brief description of the top level of the menu tree that appears when you enter the card edge setup menu. (DIP switch 8 is OFF). Selecting one of these items will take you down into the next menu level. The details of the each of the displays are described in sections 6.3.1 to 6.3.12.

Main Menu	Function Description
BACK	Returns the display back to monitoring mode
AUDN (7700R2x2-HES only)	Configures Audio Processing function
V1AS	Auto switch condition controls for input 1
V2AS	Auto switch condition controls for input 2
V1FD	Fault condition control definitions for input 1
V2FD	Fault condition control definitions for input 2
GSRC (7700RX2X-HES only)	Selects the genlock source
SWCT	Selects the control system used to configure the module
SMOD	Selects the type of switch mode
SLIN	Selects the switch line
V1D1	Selects the first audio de-mux group for input 1
V1D2	Selects the second audio de-mux group for input 1
V2D1	Selects the first audio de-mux group for input 2
V2D2	Selects the second audio de-mux group for input 2
V1M1 (7700RX2X-HES only)	Selects audio embedder 1 group select for input 1
V1M2 (7700RX2X-HES only)	Selects audio embedder 2 group select for input 1
V2M1 (7700RX2X-HES only)	Selects audio embedder 1 group select for input 2
V2M2 (7700RX2X-HES only)	Selects audio embedder 2 group select for input 2
PCTL (7700RX2X-HES only)	Controls Vertical and Horizontal Phase Offsets
ESS (7700RX2X-HES only)	Controls embedded audio SoftSwitch™ functionality for input 1
AMIX (7700RX2X-HES only)	Enable or disable audio mixer
FCOL	Control fault collection method
DISP	Sets the orientation of the display
VER	Displays the firmware version number

Table 6-1: Card Edge Display – Main Menu

6.3.1. Configuring the Audio Processing Function – AUDN (7700R2x2-HES only)

The *AUDN* menu is used to configure parameters associated with the audio processing and routing functions of the 7700R2x2-HES. The chart below shows the items available in the **AUDN** menu. Sections 6.3.1.1 to section 6.3.1.4 provide detailed information for each of the menu items.

AUDN Menu	Function Description
MASS	Selects the input source for Mixer A
MAGC	Sets the gain of the inputs for Mixer A
MAIV	Sets the inversion control for the inputs for Mixer A
MBSS	Selects the input source for Mixer B
MAGC	Sets the gain of the inputs for Mixer B
GRP1	Selects the embedded audio group 1 in the output program to be removed or passed through
GRP2	Selects the embedded audio group 2 in the output program to be removed or passed through
GRP3	Selects the embedded audio group 3 in the output program to be removed or passed through
GRP4	Selects the embedded audio group 4 in the output program to be removed or passed through

6.3.1.1. Selecting the Source for Audio Channels

The parameters for each pair (X and Y) for all 16 channels are the same. For the sake of brevity, only the menus for Channel 1-X for Mixer A will be described in the manual.

AUDN	This parameter selects the source for Channel 1-X of Mixer A.
MASS	
1AS	
V1C1	<i>Video 1 channel 1</i>
V1C2	<i>Video 1 channel 2</i>
V1C3	<i>Video 1 channel 3</i>
V1C4	<i>Video 1 channel 4</i>
V1C5	<i>Video 1 channel 5</i>
V1C6	<i>Video 1 channel 6</i>
V1C7	<i>Video 1 channel 7</i>
V1C8	<i>Video 1 channel 8</i>
V2C1	<i>Video 1 channel 1</i>
V2C2	<i>Video 2 channel 2</i>
V2C3	<i>Video 2 channel 3</i>
V2C4	<i>Video 2 channel 4</i>
V2C5	<i>Video 2 channel 5</i>
V2C6	<i>Video 2 channel 6</i>
V2C7	<i>Video 1 channel 7</i>
V2C8	<i>Video 2 channel 8</i>
1D12	<i>Video 1 down mixed channel 1 & 2</i>
1D34	<i>Video 1 down mixed channel 3 & 4</i>
1D56	<i>Video 1 down mixed channel 5 & 6</i>
1D78	<i>Video 1 down mixed channel 7& 8</i>
1U12	<i>Video 1 up mixed channel 1&2</i>
1U34	<i>Video 1 up mixed channel 3&4</i>
1U56	<i>Video 1 up mixed channel 5&6</i>
1U78	<i>Video 1 up mixed channel 7&8</i>
2D12	<i>Video 2 down mixed channel 1&2</i>
2D34	<i>Video 2 down mixed channel 3&4</i>
2D56	<i>Video 2 down mixed channel 5&6</i>
2D78	<i>Video 2 down mixed channel 7&8</i>
2U12	<i>Video 2 up mixed channel 1&2</i>
2U34	<i>Video 2 up mixed channel 3&4</i>
2U56	<i>Video 2 up mixed channel 5&6</i>
2U78	<i>Video 2 up mixed channel 7&8</i>
MUTE	<i>Mute Channel 1-X</i>

6.3.1.2. Setting the Gain of the Input Sources for Mixer A

The gain of the input sources for each channel can be controlled through this menu.

AUDN	
MAGC	
1AGC	(-24 to +24 dB)
1BGC	(-24 to +24 dB)
2AGC	(-24 to +24 dB)
2BGC	(-24 to +24 dB)
3AGC	(-24 to +24 dB)
3BGC	(-24 to +24 dB)
4AGC	(-24 to +24 dB)
4BGC	(-24 to +24 dB)
5AGC	(-24 to +24 dB)
5BGC	(-24 to +24 dB)
6AGC	(-24 to +24 dB)
6BGC	(-24 to +24 dB)
7AGC	(-24 to +24 dB)
7BGC	(-24 to +24 dB)
8AGC	(-24 to +24 dB)
8BGC	(-24 to +24 dB)

This control allows the user to adjust the gain of the input sources for each pair (X and Y) of the 16 channels of Mixer A. For unity gain, set the parameter to 0. The adjustment range is +/- 24 dB, in increments of 0.1 dB.

- Ch1 X Gain Control
- Ch1 Y Gain Control
- Ch2 X Gain Control
- Ch2 Y Gain Control
- Ch3 X Gain Control
- Ch3 Y Gain Control
- Ch4 X Gain Control
- Ch4 Y Gain Control
- Ch5 X Gain Control
- Ch5 Y Gain Control
- Ch6 X Gain Control
- Ch6 Y Gain Control
- Ch7 X Gain Control
- Ch7 Y Gain Control
- Ch8 X Gain Control
- Ch8 Y Gain Control

6.3.1.3. Setting the Inversion Control of the Input Sources for Mixer A

The inversion control allows the user to set the inversion control of the input sources for each pair (X and Y) of the 16 channels of Mixer A.

This allows the user to invert audio pairs if desired. This control is useful in cases of wiring errors, etc.

AUDN	
MAIV	
1AIV, 1BIV to 8AIV, 8BIV	

Sets the inversion control of the input sources for each pair (X and Y) of the 16 channels of Mixer A.

When set to *NRML*, the pairs will remain as is. When set to *INVT*, the pairs will be inverted.

6.3.1.4. Select Audio Group

User can select the embedded audio group in the output program to be removed or passed through. There are four groups to select from: group 1 (GRP1) to group 4 (GRP4). For the sake of the brevity, only GRP1 will be discussed in the manual.

AUDN	
GRP1	
ENAB	
DISB	

Selects the embedded audio group in the output program to be removed or passed through
Group 1 is passed through
Group 1 is to be removed

6.3.2. Configuring the Video 1 and Video 2 Auto Switch Condition Controls – V1AS and V2AS

The 7700R2x2 has two fault conditions (one for each input) that can be configured to warn the user of numerous conditions. The *V1AS* and *V2AS* menu items are re-used to configure when fault 1 or fault 2 is triggered, and these menu items identify how the fault should be presented. For audio loss, audio over, audio silence, audio phase reversal, and audio mono, fault triggers become active if the fault condition is active for the programmed fault duration. The fault trigger will deactivate within one second (user configurable, by default) once the fault condition is inactive. These two sub-menus also control the router’s auto-switch when the module is in auto-switch mode (*SMOD*). The controls for *V1AS* and *V2AS* operate in the same way. For the sake of brevity, only *V1AS* will be discussed in the manual.

V1AS Menu	Function Description
<i>V1AS</i>	Video 1 switch condition
<i>BACK</i>	Back to the main menu.
<i>FDUR</i>	Sets the length of the fault duration
<i>FLOG</i>	Generates a fault based on the item
<i>VLOS</i>	Generates a fault based upon loss of video.
<i>VFRE</i>	Generates a fault based upon video freeze.
<i>VBLK</i>	Generates a fault based upon black video.
<i>AG1L</i>	Generates a fault based upon loss of audio group 1.
<i>AG2L</i>	Generates a fault based upon loss of audio group 2.
<i>AG3L</i>	Generates a fault based upon loss of audio group 3.
<i>AG4L</i>	Generates a fault based upon loss of audio group 4.
<i>P1OV</i>	Generates a fault when audio pair 1 is over.
<i>P2OV</i>	Generates a fault when audio pair 2 is over.
<i>P3OV</i>	Generates a fault when audio pair 3 is over.
<i>P4OV</i>	Generates a fault when audio pair 4 is over.
<i>P1SL</i>	Generates a fault when audio pair 1 is in silence.
<i>P2SL</i>	Generates a fault when audio pair 2 is in silence.
<i>P3SL</i>	Generates a fault when audio pair 3 is in silence.
<i>P4SL</i>	Generates a fault when audio pair 4 is in silence.
<i>P1PH</i>	Determines whether a fault will be generated when audio pair 1 phase is reversed.

P2PH	Generates a fault when audio pair 2 phase is reversed.
P3PH	Generates a fault when audio pair 3 phase is reversed.
P4PH	Generates a fault when audio pair 4 phase is reversed.
P1MO	Generates a fault when audio pair 1 is mono.
P2MO	Generates a fault when audio pair 1 is mono.
P3MO	Generates a fault when audio pair 1 is mono.
P4MO	This control determines whether a fault will be generated when audio pair 1 is mono.
VINV	Generates a fault when video is invalid.
TLOS (7700R2x2-HD only)	Generates a fault when Transport stream has loss of sync bytes.
TSYN (7700R2x2-HD only)	Generates a fault when Transport stream has sync byte errors.
TMIR (7700R2x2-HD only)	Generates a fault when minimal bit rate reached
TMAR (7700R2x2-HD only)	Generates a fault when maximal bit rate reached
TNUL (7700R2x2-HD only)	Generates a fault when null packet threshold reached
TMIP (7700R2x2-HD only)	Generates a fault when minimal PIDs reached
TNEP (7700R2x2-HD only)	Generates a fault when not matching expected number of PIDs
TPNM (7700R2x2-HD only)	Generates a fault when PID list not matched
TCCE (7700R2x2-HD only)	Generates a fault when continuity count error threshold reached
TNPA (7700R2x2-HD only)	Generates a fault when there is no PAT table present

6.3.2.1. Setting the Fault Duration

V1AS
FDUR
1 to 254
<u>30</u>

This control sets how long the fault condition will be held. The fault display will be displayed as long as the fault condition is active and the Fault mode is set to "Enable."

In the normal video mode, the setting ranges from 1 to 254 frames. In DVB-ASI mode, the setting ranges from 1 x 50 milliseconds to 254 x 50 milliseconds.

6.3.2.2. Configuring the Fault Log

V1AS
FLOG
<u>OR</u> AND

Select "OR" to generate a Fault if one of the items is in a fault condition.
Select "AND" to generate a Fault if all of the items are in a fault condition.

6.3.2.3. Controlling Video Loss Fault

V1AS
VLOS
Yes <u>No</u>

This control determines whether a fault will be generated upon loss of video. (VLOS has no duration control).

6.3.2.4. Controlling Video Freeze Fault

V1AS
VFRE
Yes <u>No</u>

This control determines whether a fault will be generated upon video freeze.

6.3.2.5. Controlling Black Video Fault

V1AS
VBLK
Yes <u>No</u>

This control determines whether a fault will be generated upon video freeze.

6.3.2.6. Controlling Loss of Audio Fault

There are four *Loss of Audio* groups: AG1L, AG2L, AG3L, and AG4L). For the sake of brevity, only *Loss of Audio Group 1* will be discussed in the manual.

V1AS
AG1L
Yes <u>No</u>

This control determines whether a fault will be generated upon loss of audio group 1.

6.3.2.7. Controlling Audio Pair is Over Fault

There are four *Audio Pair is Over* groups: P1OV, P2OV, P3OV, and P4OV. For the sake of brevity, only P1OV will be discussed in the manual.

V1AS
P1OV
Yes <u>No</u>

This control determines whether a fault will be generated when audio pair 1 is over.

6.3.2.8. Controlling Audio Pair in Silence Fault

There are four *Audio Pair in Silence* groups: *P1SL*, *P2SL*, *P3SL*, and *P4SL*. For the sake of brevity, only *P1SL* will be discussed in the manual.

V1AS
P1SL
Yes
<u>No</u>

This control determines whether a fault will be generated when audio pair 1 is in silence.

6.3.2.9. Controlling the Audio Pair Phase Fault

There are four *Audio Pair Phase* groups: *P1PH*, *P2PH*, *P3PH*, and *P4PH*. For the sake of brevity, only *P1PH* will be discussed in the manual.

V1AS
P1PH
Yes
<u>No</u>

This control determines whether a fault will be generated when audio pair 1 phase is reversed.

6.3.2.10. Controlling the Audio Pair is Mono Fault

There are four *Audio Pair is Mono* groups: *P1MO*, *P2MO*, *P3MO*, and *P4MO*. For the sake of brevity, only *P1MO* will be discussed in the manual.

V1AS
P1MO
Yes
<u>No</u>

This control determines whether a fault will be generated when audio pair 1 is mono.

6.3.2.11. Controlling the Invalid Video Fault

V1AS
VINV
Yes
<u>No</u>

This control determines whether a fault will be generated when video is invalid. (VINV is controlled by a duration setting VDUR)

6.3.2.12. Controlling the Transport Stream Loss of Sync Bytes Fault (7700R2x2-HD Only)

V1AS
TLOS
Yes
<u>No</u>

This control determines whether a fault will be generated when Transport stream has loss of sync bytes.

6.3.2.13. Controlling the Transport Stream Sync Byte Errors Fault (7700R2x2-HD Only)

V1AS
TSYN
Yes
<u>No</u>

This control determines whether a fault will be generated when Transport stream has sync byte errors.

6.3.2.14. Controlling the Minimal Bit Rate Fault (7700R2x2-HD Only)

V1AS
TMIR
Yes
<u>No</u>

This control determines whether a fault will be generated when minimal bit rate is reached.

6.3.2.15. Controlling the Maximum Bit Rate Fault (7700R2x2-HD Only)

V1AS
TMAR
Yes
<u>No</u>

This control determines whether a fault will be generated when maximal bit rate is reached.

6.3.2.16. Controlling the Null Packet Threshold Fault (7700R2x2-HD Only)

V1AS
TNUL
Yes
<u>No</u>

This control determines whether a fault will be generated when null packet threshold is reached.

6.3.2.17. Controlling the Minimal PIDs Fault (7700R2x2-HD Only)

V1AS
TMIP
Yes
<u>No</u>

This control determines whether a fault will be generated when minimal PIDs is reached.

6.3.2.18. Controlling the Number of PIDs Fault

V1AS
TNEP
Yes
<u>No</u>

This control determines whether a fault will be generated when expected number of PIDs does not match.

6.3.2.19. Controlling the PID List Fault

V1AS
TPNM
Yes
<u>No</u>

This control determines whether a fault will be generated when PID list is not matched.

6.3.2.20. Controlling the Continuity Count Error Fault

V1AS
TCCE
Yes
<u>No</u>

This control determines whether a fault will be generated when continuity count error threshold is reached.

6.3.2.21. Controlling the PAT Table Fault

V1AS
TNPA
Yes
<u>No</u>

This control determines whether a fault will be generated when there is no PAT table present.

6.3.3. Configuring Fault Condition Control Definitions for Input 1 and 2 - V1FD and V2FD

This sub-menu defines fault condition controls. The menus for fault condition control definitions for inputs 1 and 2 (**V1FD** and **V2FD**) are identical. For the sake of brevity, only **V1FD** will be discussed in the manual.

V1FD Menu
V1FD
BACK
NLVL
FDUR
BDUR
OLVL
ODUR
SLVL
SDUR
PLVL
PDUR
MLVL
MDUR
VDUR
TSLs (7700R2x2-HD only)
SYER (7700R2x2-HD only)
MINR (7700R2x2-HD only)
MAXR (7700R2x2-HD only)
NUPK (7700R2x2-HD only)
MPID (7700R2x2-HD only)
EPID (7700R2x2-HD only)
CCER (7700R2x2-HD only)
NPAT (7700R2x2-HD only)

Description
Video 1 fault condition control
Back to the main menu
Video noise level control
Video freeze duration control
Video black duration control
Audio over level control
Audio over duration control
Audio silence level control
Audio silence duration control
Audio phase reversal level control
Audio phase reversal duration control
Audio mono level control
Audio mono duration control
Video invalid duration control
Lost of TS signal control
TS Sync byte error control
TS minimal bit rate control
TS maximal bit rate control
TS null packet threshold control
TS minimal PIDs control
TS not matching expected number of PIDs control
TS continuity count error threshold control
TS no PAT table present control

6.3.3.1. Detecting Picture Freeze

The Picture noise level (*NLVL*) and Picture freeze duration (*FDUR*) controls are used to detect when a video picture is considered frozen. The *NLVL* control sets the threshold that decides whether activity in the picture is considered to be noise. The picture activity must be greater than this amount for the duration set by the *FDUR* control before the fault condition exists.

6.3.3.1.1. Setting the Picture Noise Level – NLVL

V1FD
NLVL
$\frac{9}{1 \text{ to } 10}$

This control sets the approximate level of noise expected in the video signal feed, it is used by the freeze detect feature to distinguish motion from background noise on top of a video feed.

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

6.3.3.1.2. Setting the Picture Freeze Duration – FDUR

V1FD
FDUR
$\frac{302 \text{ frames}}{6 \text{ to } 9998 \text{ frames}}$

This control sets the duration, in number of frames, of video activity under the picture noise level that is considered a fault.

This parameter is adjusted in four-frame increments.

When increasing *NLVL* (Picture noise level), it is recommended that you increase *FDUR* (Picture freeze duration) 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.

6.3.3.1.3. Optimizing the Picture Noise Level and Picture Freeze Duration Parameters

Setting up the optimum picture noise level (*NLVL*) and picture freeze duration (*FDUR*) parameters will depend on the amount of noise in the video path from the first equipment with freeze-frame capability to the monitoring point. The system designer should determine the maximum amount of time permissible between the moment of freeze and the alarm.

Setting this time as high as tolerable has two benefits:

- It lowers the frequency of "false" freeze alarms generated when a perfectly valid content contains long motionless periods
- It allows raising the picture noise level parameter, without increasing frequency of "false" freeze alarms.

It is suggested that the *NLVL* (picture noise level) should be set after setting the *FDUR* (Picture freeze duration).

If the video path is fully digital, then set the *NLVL* (picture noise level) depending on the bit-error rate of the link as follows:

- For bit-error rates less than 1 in 10^{E-12} , set the value in the range of 1 to 5
- For bit-error rates greater than 1 in 10^{E-12} , set value in the range of 6 to 10

Failing to accomplish optimal adjustment of the *Picture noise level* will result in either:

- A large number of false alarms, or
- Lack of alarm condition when the video is frozen

The *NLVL* (picture noise level) and *FDUR* (picture freeze duration) controls have been designed to detect short-term "digital" freezes such as MPEG or motion JPEG server artifacts. When these devices have significant problems with the content that they are de-compressing, they will typically start to produce a "blocky" effect. If the problem is severe enough, they will freeze a frame of video and play it out for a number of frames. When the *NLVL* (picture noise level) is set to 1 (i.e. only detect exact, or nearly exact pictures) and the *FDUR* (picture freeze duration) is set to *minimum*, the unit can detect quick "digital freezes". However, you cannot detect both this type of freeze and a freeze from a link that has added noise to the picture.

6.3.3.2. Detecting Picture Black Duration – BDUR

V1FD
BDUR
<u>88 frames</u> 4 to 9996 frames

This control sets the duration, in frames, of active picture content below 7 IRE that is considered a fault.

A fault is generated when the video level within the active picture area falls below the preset black level (7 IRE) and remains for the specified duration.

6.3.3.3. Detecting Audio Over Level Faults

The Over level (*OLVL*) and Over duration (*ODUR*) controls are used to detect when an audio amplitude is close to a dangerous level (i.e. clipping a downstream device, or saturating the digital word length). The Over level control sets the audio level over which there is considered to be a fault. The audio must be over this level for the duration set by the Over duration control before the fault condition exists. A fault will be generated when any channel has generated an over condition.

6.3.3.3.1. Setting the Audio Over Level – OLVL

V1FD
OLVL
<u>-6dB FS</u> -30dB to 0dB FS

This control sets the audio level over which there is considered to be over level. This value is expressed in dB full scale (FS) and can even be used to detect digital clipping. If set to 0 dB FS, then if 3 or more consecutive samples (set with the duration control) are at digital saturation (max or min), then the digital word length has been exceeded.

This parameter is adjusted in 0.25 dB increments.

6.3.3.3.2. Setting the Audio Over Duration – ODUR

V1FD
ODUR
<u>*3</u> 3 to 255 samples

This control sets the duration, in number of consecutive samples that are at or above the *Over level* before a fault condition exists.

Please note: that as longer durations are configured, you are eliminating the detection of higher frequency content over the set *Over level*.

The parameter is adjusted in one-sample increments

6.3.3.4. Detecting Audio Silence Faults

The silence level (*SLVL*) and silence duration (*SDUR*) controls are used to detect when the audio is considered silent. The silence level (*SLVL*) control sets the audio level under which the audio is considered to be silent. The audio must be under the silence level (*SLVL*) for the duration set by the silence duration (*SDUR*) control before the fault condition exists. When the fault condition exists, the audio must be over the silence level (*SLVL*) for one second before the fault condition will be removed. A fault will be generated when both channels in a pair (1 and 2 or 3 and 4) have satisfied a silence condition.

6.3.3.4.1. Setting the Audio Silence Level – *SLVL*

<i>V1FD</i>
<i>SLVL</i>
<i>-60dB FS</i>
<i>-96dB to -20dB FS</i>

This control sets the audio level under which it is considered to be silent. This value is expressed in dB full scale (FS).

This parameter is adjusted in 0.25 dB increments.

6.3.3.4.2. Setting the Audio Silence Duration – *SDUR*

<i>V1FD</i>
<i>SDUR</i>
<i>10 sec</i>
<i>0.5 to 127 sec</i>

This control sets the length of audio silence, in seconds, before a fault occurs.

This parameter is adjusted in 0.5 second increments.

6.3.3.5. Detecting Audio Phase Reversal Faults

All stereo audio material has a varying amount of phase difference between the two channels. If there is significant phase reversal for a period of time, then this is a sign that the audio signals may be out of phase.

The phase reversal level (*PLVL*) and phase reversal duration (*PDRU*) controls are used to detect when the left and right audio channels are considered to be out of phase. The phase reversal level (*PLVL*) control sets the amount of phase difference that is considered to be out of phase. The audio must be out of phase by more than the phase reversal level (*PLVL*) amount for the duration set by the phase reversal duration (*PDRU*) control before the fault condition exists. When the fault condition is active, the audio must be out of phase by less than the phase reversal level (*PLVL*) amount for one second before the fault condition will be removed.

6.3.3.5.1. Setting the Audio Phase Reversal Level – *PLVL*

<i>V1FD</i>
<i>PLVL</i>
<i>0.9</i>
<i>0.5 to 1</i>

This control sets the amount of phase difference before the audio is considered to be out of phase. This phase reversal is calculated by comparing the difference of the two channels to the average of the two. If a signal is always out of phase, then the difference between the two will be substantial compared to the average of the two. This corresponds to 1 in this control.

If there is only content on one of the channels (i.e. left only or right only), then the difference is equivalent to the average of the two channels. This corresponds to 0.5 in this control.

6.3.3.5.2. Setting the Audio Phase Reversal Duration – PDUR

V1FD
PDUR
10 sec 0.5 to 127 sec

This control sets the period over which to analyze the audio content for phase reversal.

Please note: Conditions of silence are not included in this value. This means that if the audio is 50% quiet then it will take twice the period set with this control to detect a phase reversal condition.

This parameter is adjusted in 0.5 second increments.

6.3.3.6. Detecting Audio Mono Faults

Mono audio material can take two forms: one channel with information and the other quiet or both channels with the same information. The AVM cards will detect both types of mono material.

If there is only a small amount of phase difference between the two channels (perhaps caused by the noise present on the audio) then the content may be mono. If there is no significant difference for a period of time, then this is a sign that the audio signals are mono.

Mono is detected by comparing the difference of the two channels to the average of the two. If a signal always has no out of phase information (or just a small amount) for a period of time, then the signal may be mono.

The mono threshold level (*MLVL*) and mono duration (*MDUR*) controls are used to detect when two audio channels are considered to be mono. The mono threshold level (*MLVL*) control sets the threshold that decides whether the signals are the same. The audio difference must be less than the mono threshold level (*MLVL*) amount for the duration set by the mono duration (*MDUR*) control before the fault condition exists. When the fault condition exists, the audio difference must be more than the mono threshold level (*MLVL*) amount for one second before the fault condition will be removed.

Material that is mono and out of phase will be detected as out of phase and will not be detected as mono. Once the phase polarity is fixed, then the card will detect mono material.

6.3.3.6.1. Setting the Audio Mono Level – MLVL

V1FD
MLVL
0.2 0.2 to 0.5

This control sets the level of L/R audio difference under which is considered mono.

0 corresponds to both channels being identical while 1 corresponds to both channels being exactly out of phase.

This parameter is adjusted in 0.01 increments.

6.3.3.6.2. Setting the Audio Mono Duration – MDUR

V1FD
MDUR
<u>10 sec</u> 0.5 to 127 sec

This control sets the duration of mono audio, in seconds, that is considered a fault.

This parameter is adjusted in 0.5 second increments.

6.3.3.7. Setting the Video Invalid Duration – VDUR

V1FD
VDUR
<u>0</u> 0 to 900 Frames

This control sets the duration for which the board ignores glitches on the video signal, thereby not displaying fault alert messages.

This parameter is adjusted in one-frame increments.

6.3.3.8. Setting the TS Lost Duration – TSLS

V1FD
TSLS
<u>50</u> 0 to 2400

This control set the duration for which the board ignores glitches on the TS input signal, thereby not displaying fault alert messages

This parameter is adjusted in 100 milli-second increments.

6.3.3.9. Setting the Sync Byte Error Threshold --SYER

V1FD
SYER
<u>10</u> 0 to 64000

This control defines threshold for number of sync byte error detected before sending out a trap.

6.3.3.10. Setting the TS Minimal Bit Rate --MINR

V1FD (or V2FD)
MINR
<u>0</u> 0 to 21600

This control sets the minimal TS bitrate expected.

The unit is in '10Kbits/s'.

6.3.3.11. Setting the TS Maximal Bit Rate --MAXR

V1FD (or V2FD)
MAXR
<u>21600</u> 0 to 21600

This control sets the maximal TS bitrate expected.

The unit is in '10Kbits/s'.

Please note: this value can not be smaller than TS Minimal Bit Rate.

6.3.3.12. Setting the TS NULL Packet Threshold – NUPK

V1FD
NUPK
21600 0 to 21600

This control sets the threshold for TS NULL packet bit rate.

The unit is in '10Kbits/s'

6.3.3.13. Setting the TS Minimal Number of PIDs – MPID

V1FD
MPID
1 0 to 300

This control allows the user to set the minimal expected number of PIDs in the input TS stream.

6.3.3.14. Setting the TS Expected Number of PIDs – EPID

V1FD
EPID
4 0 to 300

This control allows the user to set the expected number of PIDs in the input TS stream.

Please note: this value can not be smaller than Minimal Number of PIDs

6.3.3.15. Setting the TS Continuity Count Error Threshold – CCER

V1FD
CCER
500 0 to 65535

This control sets the threshold for number of continuity count errors in the input TS stream.

6.3.3.16. Setting the TS No PAT Duration – NPAT

V1FD
NPAT
10 1 to 100

This control allows the user to set the duration on no PAT table detected in the input TS stream.

The unit is in '100 milli-seconds'

6.3.4. Selecting the Genlock Source – GSRC (7700RX2X-HES only)

GSRC
RFIN
FRF 1 FRF 2

This control selects the Genlock source being used.

Please note: This applies only to the 7700R2X2-HD and 7700R2X2-HES modules that have REV A or newer circuit boards.

Select BNC reference input from the rear plate.
Select BNC reference input 1 from the 7700FR-G frame.
Select BNC reference input 2 from the 7700FR-G frame.

6.3.4.1. Configuring the Method of Control – SWCT

SWCT
<u>L & R</u>
REM
LOC

This control selects the control system source for the module.
Both local and remote control.
Select *REM* for Remote mode only (VistaLINK®)
Select *LOC* for Local mode only (card edge)

6.3.4.2. Configuring the Switch Mode – SMOD

SMOD
<u>AUSB</u>
MAN
AUS

This control selects the switching mode for the module.
Auto switches back to primary input when video is applied to Input 1.
When set to *MAN*, switches are controlled by the GPI's.
When set to *AUS*, the module will automatically switch to the input that has video if another input is removed.



When SMOD is set to AUSB, the user can use the GPIs to force a switch to the desired inputs. If user selects GPI 1, then INPUT 1 will be sent to PGM OUT 1 to 3 and INPUT 2 to PREV OUT, regardless of the signal quality. The same applies for GPI 2, where INPUT 2 would be sent to PGM OUT 1 to 3 and INPUT 1 to PREV OUT.

If the GPIs are BOTH HI or BOTH LOW, the auto-switch functionality is retained.

6.3.4.3. Configuring the Switch Line – SLIN

SLIN
<u>10</u>
1-64

This control selects the switch line based on the reference input.
Select switch line from 1 to 64.

6.3.5. Configuring the Audio De-Embedder Groups – VxDx

V1D1
<u>GRP1</u>
GRP2
GRP3
GRP4

Selects the source audio group for de-embedder 1 on Input 1.
Audio group1 to audio group 4.

V1D2
<u>GRP1</u>
GRP2
GRP3
GRP4

Selects the source audio group for de-embedder 2 on Input 1.
Audio group1 to audio group 4.

V2D1	Selects the source audio group for de-embedder 1 on Input 2. Audio group1 to audio group 4.
<u>GRP1</u>	
GRP2	
GRP3	
GRP4	

V2D2	Selects the source audio group for de-embedder 2 on Input 2. Audio group1 to audio group 4.
<u>GRP1</u>	
GRP2	
GRP3	
GRP4	

6.3.6. Configuring the Audio Embedder Groups – VxMx (7700RX2X-HES Only)

V1M1	Selects the source audio group for embedder 1 on Input 1. Audio group1 to audio group 4.
<u>GRP1</u>	
GRP2	
GRP3	
GRP4	

V1M2	Selects the source audio group for embedder 2 on Input 1. Audio group1 to audio group 4.
<u>GRP1</u>	
GRP2	
GRP3	
GRP4	

V2M1	Selects the source audio group for embedder 1 on Input 2. Audio group1 to audio group 4.
<u>GRP1</u>	
GRP2	
GRP3	
GRP4	

V2M2	Selects the source audio group for embedder 2 on Input 2. Audio group1 to audio group 4.
<u>GRP1</u>	
GRP2	
GRP3	
GRP4	

6.3.7. Control V & H Phase Offsets – PCTL (7700RX2X-HES Only)

PCTL	This control sets the vertical phase offset of both the PGM and PREV outputs. Sets the vertical phase offset. This parameter is adjusted in 1 line increments.
VPHA	
<u>0 to max lines</u>	

<i>PCTL</i>
<i>HPHA</i>
<i>0 to max lines</i>

This control sets the horizontal phase offset of both the PGM and PREV outputs.

Sets the horizontal phase offset. This parameter is adjusted in 1 line increments.

6.3.8. Control Embedded Audio SoftSwitch Functionality (7700R2X2-HES Only)

<i>ESS</i>
<i>ON</i>
<i>OFF</i>

This control switches the audio embedded softswitch function ON or OFF. The audio SoftSwitch is applied to the PGM outputs only.

6.3.9. Audio Mixer Enable or Disable

<i>AMIX</i>
<i>AMEN</i>
<i>AMDA</i>

This control allows the user to enable or disable the audio mixer. Select *AMEN* to enable audio mixer. Select *AMDA* to disable audio mixer.

6.3.10. Configuring the Fault Collection

<i>FCOL</i>
<i>INDI</i>
<i>COLL</i>

This control allows the user to select whether the fault collection will be on an individual or collective basis. Select *INDI* for individual fault collection. Select *COLL* for collective fault collection.

6.3.11. Configuring the Orientation of the Text on the Display

<i>DISP</i>
<i>VERT</i>
<i>HORZ</i>

This control allows the user to select a horizontal or vertical orientation for the displays to accommodate mounting the module in the 3RU or 1RU frames. Select *VERT* for vertical display. Select *HORZ* for horizontal display.

6.3.12. Viewing the Firmware Version

<i>VER</i>
<i>x.xx BUILD xxxx</i>

This control displays the firmware version and the build number of the firmware. The message will scroll across the display.

For example: **VER 1.0 BLD 067**

7. VISTALINK[®] REMOTE MONITORING/CONTROL

7.1. WHAT IS VISTALINK[®]?

VistaLINK[®] is Evertz's 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[®] 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[®] 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[®] 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 VistaLINK[®] Pro Manager graphical user interface (GUI), third-party, or custom manager software may be used to monitor and control Evertz VistaLINK[®] enabled products.
2. Managed devices (such as 7700R2x2-HD and 7700R2x2-HES), each with a unique address (OID), communicate with the NMS through an SNMP Agent. Evertz VistaLINK[®] enabled 7700 series modules reside in the 3RU 7700FR-C Multi-Frame and communicate with the manager via the 7700FC VistaLINK[®] frame controller module, 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[®] network, see the 7700FC Frame Controller chapter.

7.2. VISTALINK® CONFIGURATION FOR THE 7700R2X2-HD

7.2.1. Monitor—General Video Status and Card Status

The video status and the card status are shown in the *Monitor* tab. When an ASI signal is present at the input, the *Video Status* field will read “ASI” as show in Figure 7-1. The card type, Genlock standard, and the board build number detected will be displayed in the *Card Status* field.

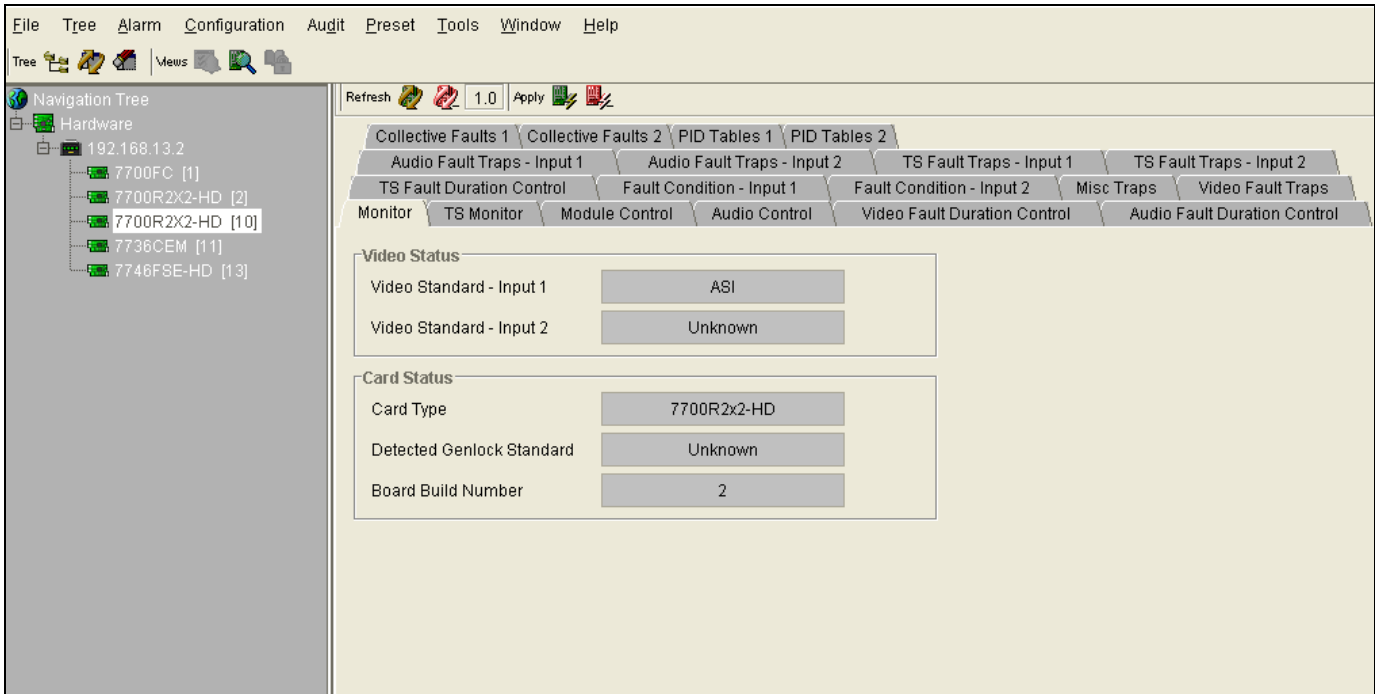


Figure 7-1: 7700R2x2-HD VistaLINK® Configuration – Monitor Tab

7.2.2. TS Monitor – Transport Stream Monitor

The parameters for the *TS Monitor* tab are described in Table 7-1. These parameters are applicable to both Input 1 and Input 2. For the sake of brevity, only Input 1 parameters will be discussed.

The screenshot shows the configuration interface for the 7700R2X2-HD VistaLINK router. The 'TS Monitor' tab is selected, displaying the following data:

Parameter	Value
Signal Presence	Present
Sync Byte Errors	0
Total Bitrate	30.00 Mbits/s
NULL Packet Bitrate	28.28 Mbits/s
Useful Bitrate	1.71 Mbits/s
Number Of Active PIDs	6
Num of Cont. Count Errors	0
Detected Packet Length	188
PAT Present	Present

Parameter	Value
Signal Presence	Not Present
Sync Byte Errors	0
Total Bitrate	0.00 Mbits/s
NULL Packet Bitrate	0.00 Mbits/s
Useful Bitrate	0.00 Mbits/s
Number Of Active PIDs	0
Num of Cont. Count Errors	0
Detected Packet Length	0
PAT Present	Not Present

Figure 7-2: 7700R2x2-HD VistaLINK® Configuration -- TS Monitor

Parameter	Description
Signal Present	Indicates whether TS is present
Sync Byte Errors	Indicates the number of sync errors occurred
Total Bitrate	Indicates the total bitrate of the stream
NULL Packet Bitrate	Indicates the bitrate of the null bits
Useful Bitrate	Indicates the bitrate of the useful bits
Number of Active PIDS	Indicates the number of active PIDs detected
Number of Cont. Count Errors	Indicates the number of continuity count errors
Detected Packet Length	Indicates the length of the detected packet
PAT Present	Indicates whether PAT is present

Table 7-1: 7700R2x2-HD VistaLINK® Configuration - TS Monitor Parameters

7.2.3. Module Control

The user can control the basic switch settings, fault collection, and reset the TS states using the *Module Control* tab.

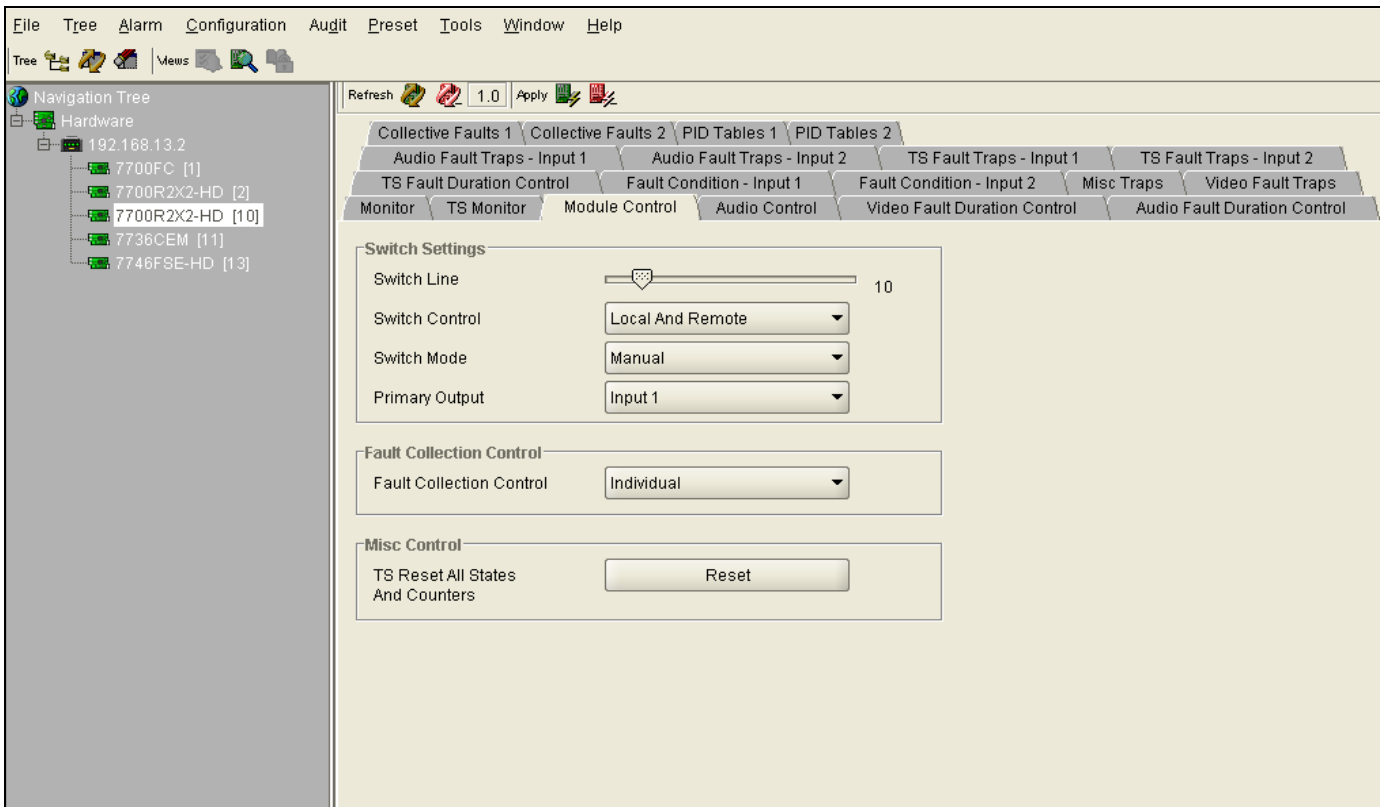


Figure 7-3: 7700R2x2-HD VistaLINK® Configuration - Module Control Tab

7.2.3.1. Switch Settings

- Switch Line:** Sets switch line number. The range is between 1 and 64.
- Switch Control:** This control enables the user to set the switch control to local, remotely, or both locally and remotely.
- Switch Mode:** This control enables the user to set the switch mode to manual or automatic. Selecting “Auto Back” will revert to main if the fault is no longer present. Selecting “Auto” will stay on backup even if main no longer has a fault.
- Primary Output:** This control enables the user to set the output to Input 1 or Input 2.

7.2.3.2. Fault Collection Control

The *Fault Collection Control* enables the user to set the fault trigger. Selecting “Individual” will set the fault trigger to use the regular fault condition. Selecting “Collective” will set the fault trigger to use the collection fault condition.

7.2.3.3. Misc Control

The *Misc Control* enables the user to reset all TS states and counters.

7.2.4. Audio Control

The audio de-embedder group can be selected from the *Audio Control* tab.

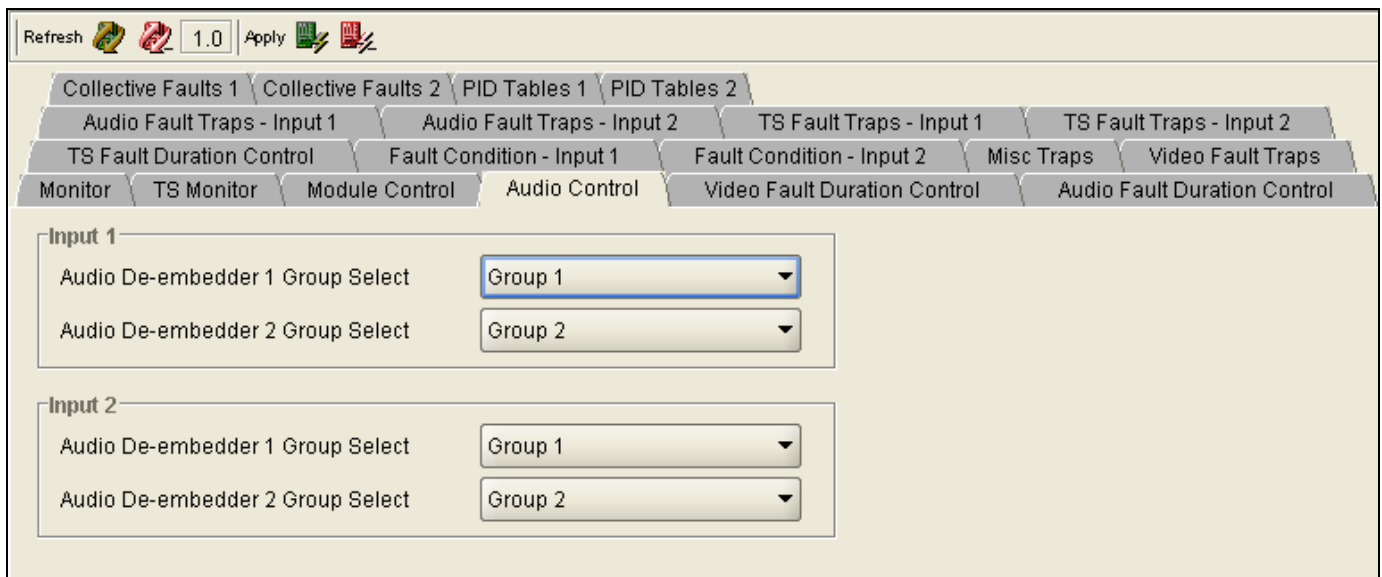


Figure 7-4: 7700R2x2-HD VistaLINK® Configuration - Audio Control Tab

7.2.4.1. Input 1 Configuration

The *Audio Control* parameters are applicable to both Input 1 and Input 2. For the sake of brevity, only Input 1 will be discussed in the manual.

Audio De-embedder 1 Group Select: Select audio de-embedder 1 from group 1 to group 4
Audio De-embedder 2 Group Select: Select audio de-embedder 2 from group 1 to group 4

7.2.5. Video Fault Duration Control

The *Video Fault Duration Control* tab allows the user to set the video fault duration as illustrated in Figure 7-5.

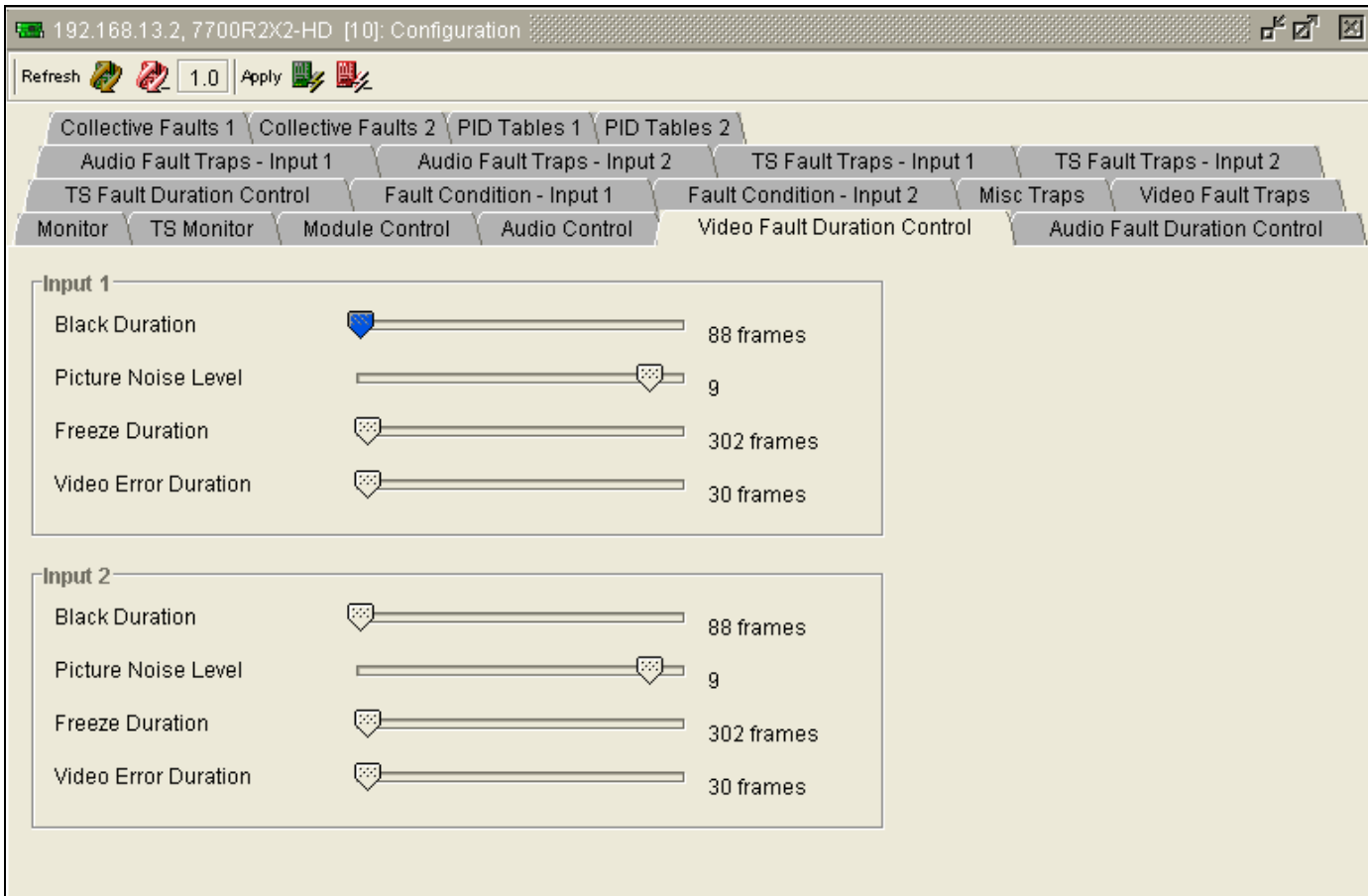


Figure 7-5 : 7700R2x2-HD VistaLINK® Configuration - Video Fault Duration Control Tab

7.2.5.1. Input 1 Configuration

The *Video Fault Duration Control* parameters are applicable to both Input 1 and Input 2. For the sake of brevity, only Input 1 will be discussed in the manual.

Black Duration: Sets the black duration from 8 frames up to 9996 frames.

Picture Noise Level: Sets the maximum picture noise level ranging from 1 to 10.

Freeze Duration: Sets the freeze duration from 6 frames up to 9998 frames.

Video Error Duration: Set the video error duration from 0 frames up to 900 frames

7.2.6. Audio Fault Duration Control

The *Audio Fault Duration Control* tab allows the user to set the audio fault duration as illustrated in Figure 7-6.

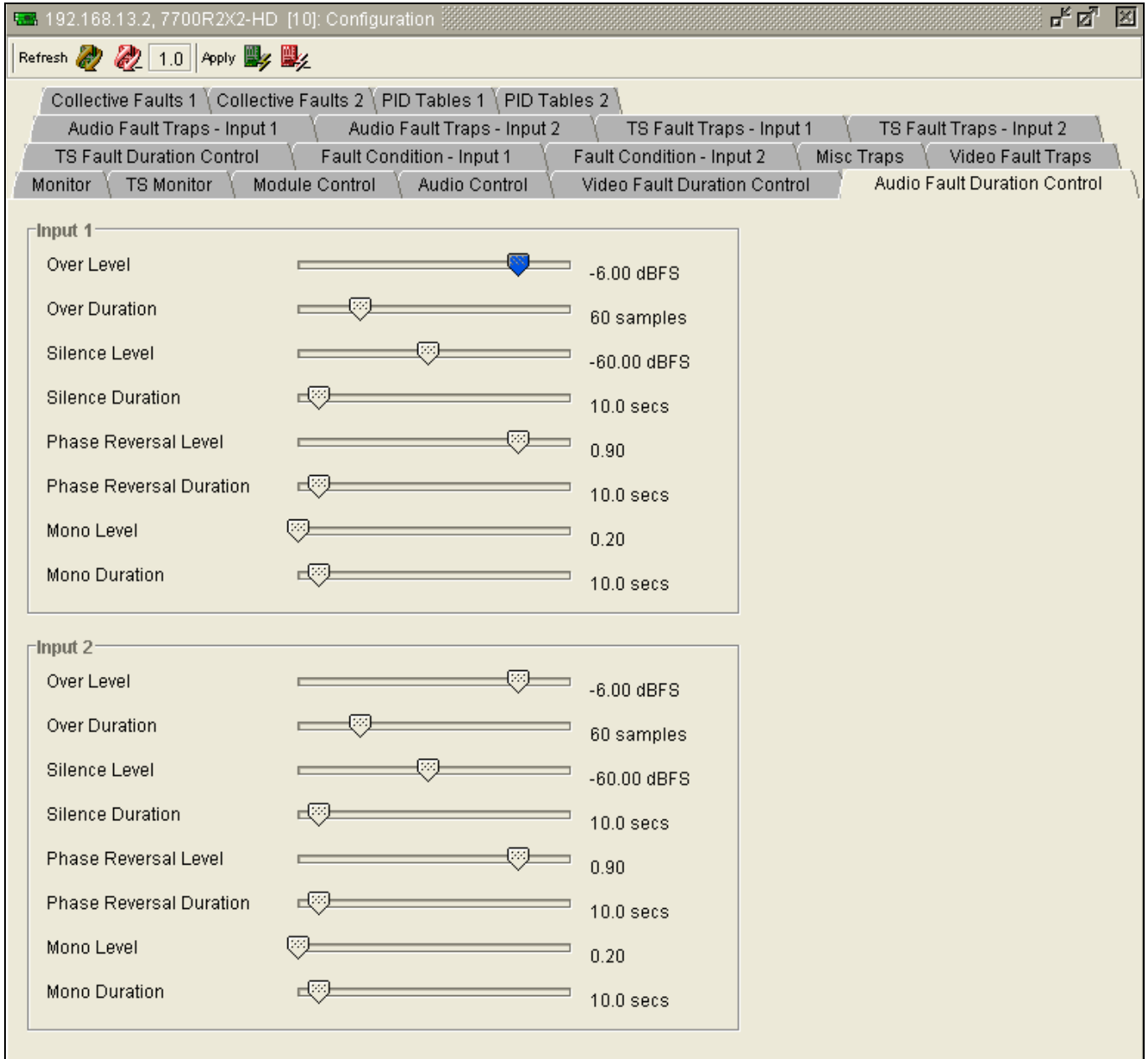


Figure 7-6: 7700R2x2-HD VistaLINK® Configuration - Audio Fault Duration Control Tab

7.2.6.1. Input 1 Configuration

The *Audio Fault Duration Control* parameters are applicable to both Input 1 and Input 2. For the sake of brevity, only Input 1 will be discussed in the manual.

Over Level:	Sets the audio level that is considered 'over' ranging from -30dBFS to 0dBFS.
Over Duration:	Sets the maximum duration of audio 'over' ranging from 3 samples to 255 samples.
Silence Level:	Sets the audio level that is considered as 'silence' ranging from -96dBFS to -20dBFS.
Silence Duration:	Sets the maximum duration of audio 'silence' ranging from 0.5 seconds to 127 seconds.
Phase Reversal Level:	Sets the maximum acceptable phase reversal level ranging from 0.5 to 1.
Phase Reversal Duration:	Sets maximum duration of phase reversal ranging from 0.5 seconds to 127 seconds.
Mono Level:	Sets the level of L/R audio difference under which is considered 'mono' ranging from 0.2 to 0.5.
Mono Duration:	Sets the duration of mono audio, in seconds, that is considered a fault ranging from 0.5 seconds to 127 seconds.

7.2.7. TS Fault Duration Control

The *TS Fault Duration Control* tab allows the user to configure the TS fault duration as illustrated in Figure 7-7.

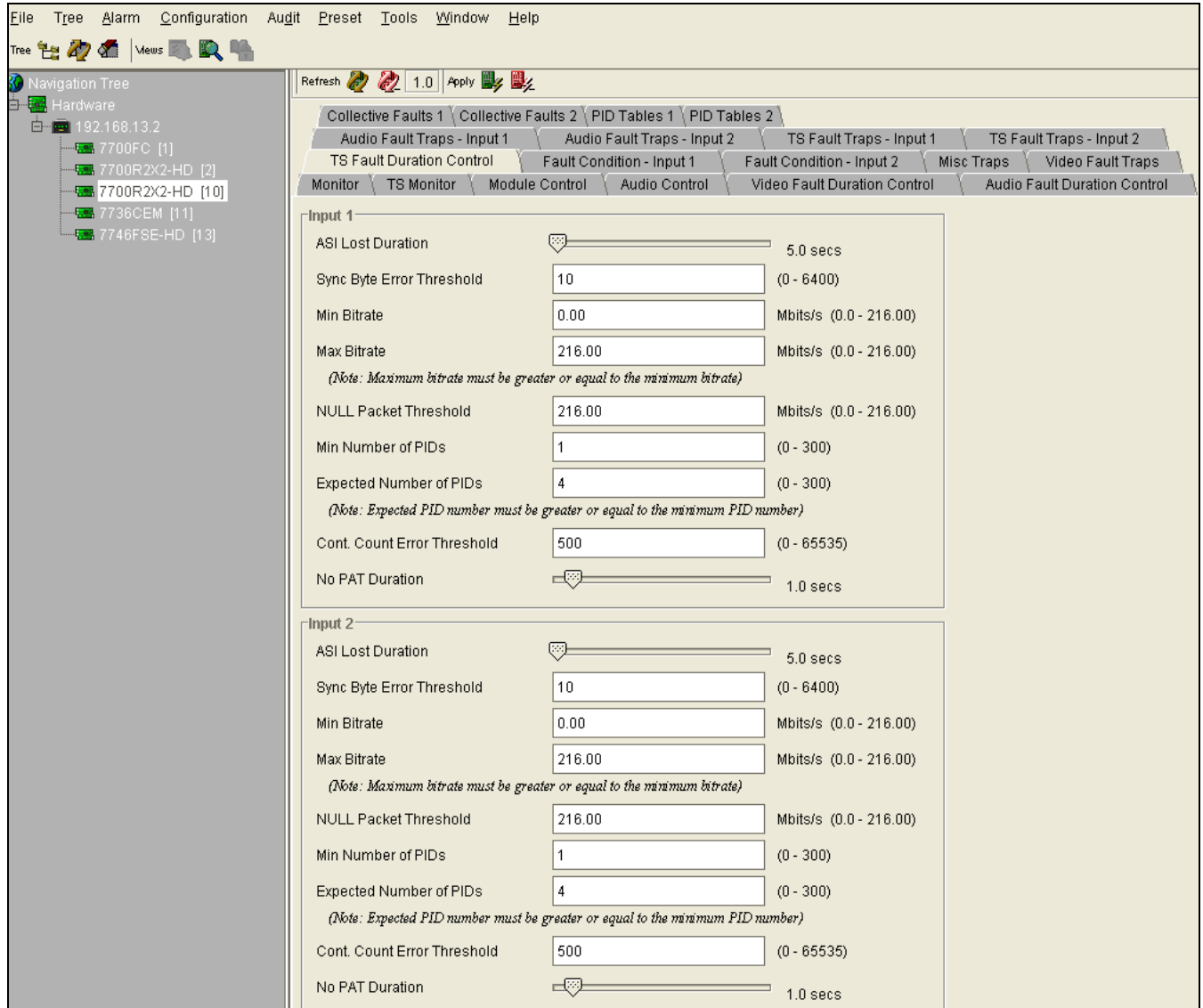


Figure 7-7: 7700R2x2-HD VistaLINK® Configuration - TS Fault Duration Control Tab

7.2.7.1. Input 1 Configuration

The parameters for the *TS Fault Duration Control* tab are applicable to both Input 1 and Input 2. For the sake of brevity, only Input 1 will be discussed in the manual.

ASI Lost Duration: Duration that is considered a fault when ASI is not detected.

Sync Byte Error Threshold: A fault if the maximum number of sync errors occurs.

Min Bitrate: A fault if the minimum bitrate occurs.

Max Bitrate:	A fault if the maximum bitrate occurs.
NULL Packet Threshold:	A fault if NULL Packet bitrate reaches designated threshold.
Min Number of PIDs:	Sets the minimum number of the PIDs.
Expected Number of PIDs:	Sets the expected number of PIDs.
Cont. Count Error Threshold:	Set the continuity count error threshold.
No PAT Duration:	Duration that is considered a fault when PAT is not present.

7.2.8. Fault Condition – Input 1 & Input 2

The *Fault Condition* tabs enable the user to select the necessary fault triggers. These parameters are applicable to both *Fault Condition - Input 1* and *Fault Condition - Input 2*. For the sake of brevity, only the *Fault Condition - Input 1* tab will be discussed in the manual. To enable a particular fault trigger, simply click the box located beside each fault so that a check-mark appears. When a check-mark is present, the fault trigger is enabled. When a check-mark is not present, the fault trigger is disabled.

The *Select All* button will put a check-mark beside every fault trigger. Press the “*Deselect All*” button to remove all check-marks.

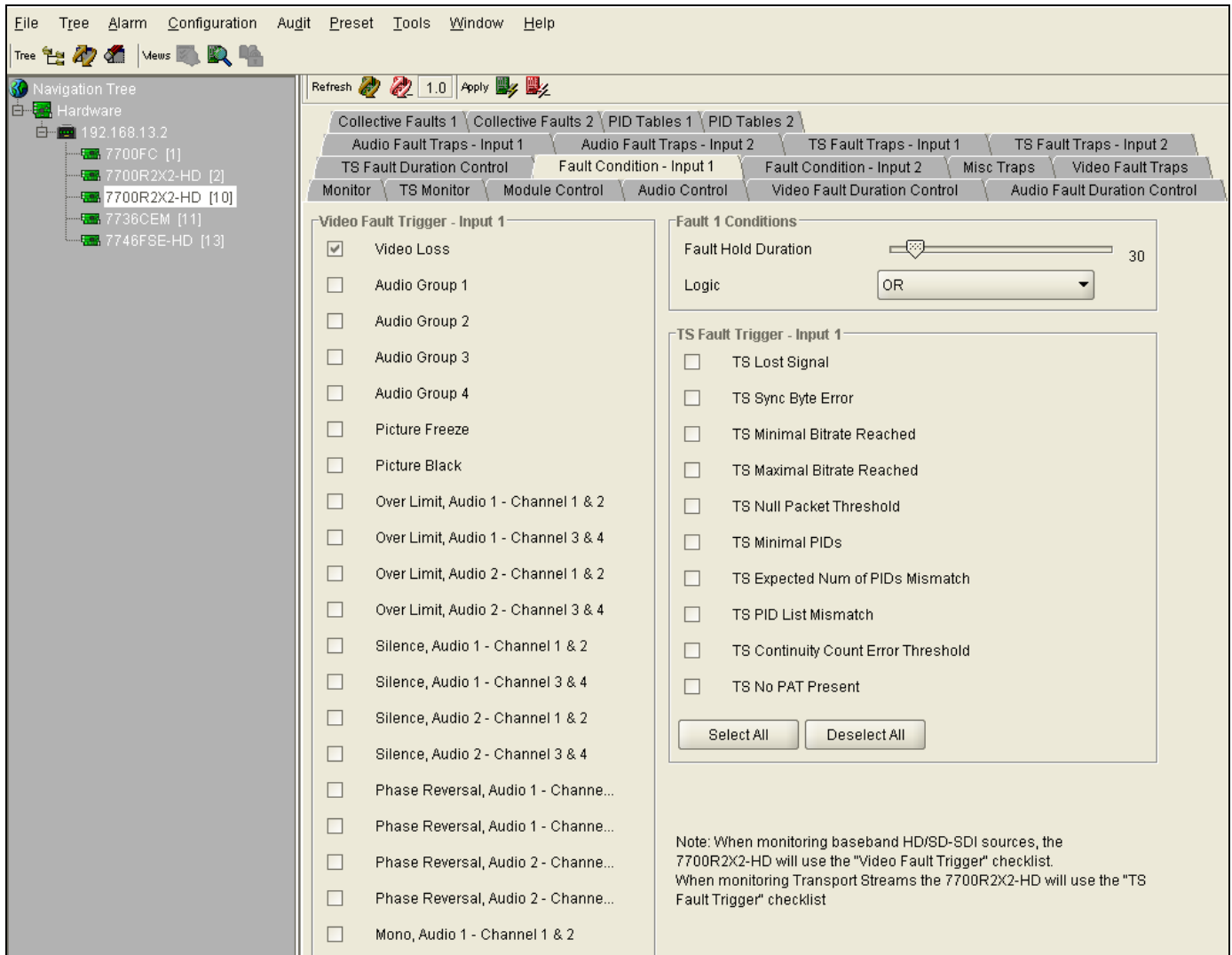


Figure 7-8: 7700R2X2-HD VistaLINK® Configuration - Fault Condition Tab

7.2.8.1. Fault 1 Conditions

Fault Hold Duration: Defines how long the fault condition will be held after the fault condition is no longer true. In the normal video mode, the setting ranges from 1 to 254 frames. In DVB-ASI mode, the setting ranges from 1 x 50 milliseconds to 254 x 50 milliseconds.

Logic: Enables the user to set the fault trigger. Selecting “OR” will trigger a fault if any of the selected fault conditions occurs. Selecting “AND” will trigger a fault when all the selected fault conditions occurs.

7.2.9. Misc Traps

The *Misc Traps* tab enables the user to set miscellaneous traps and monitor the trap status as illustrated in Figure 7-9. To enable a particular trap, simply click the box located beside each trap 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.

The *Trap Status* section defines whether a trap is a normal condition or a fault condition. Green indicates a normal condition and red indicates a fault condition.

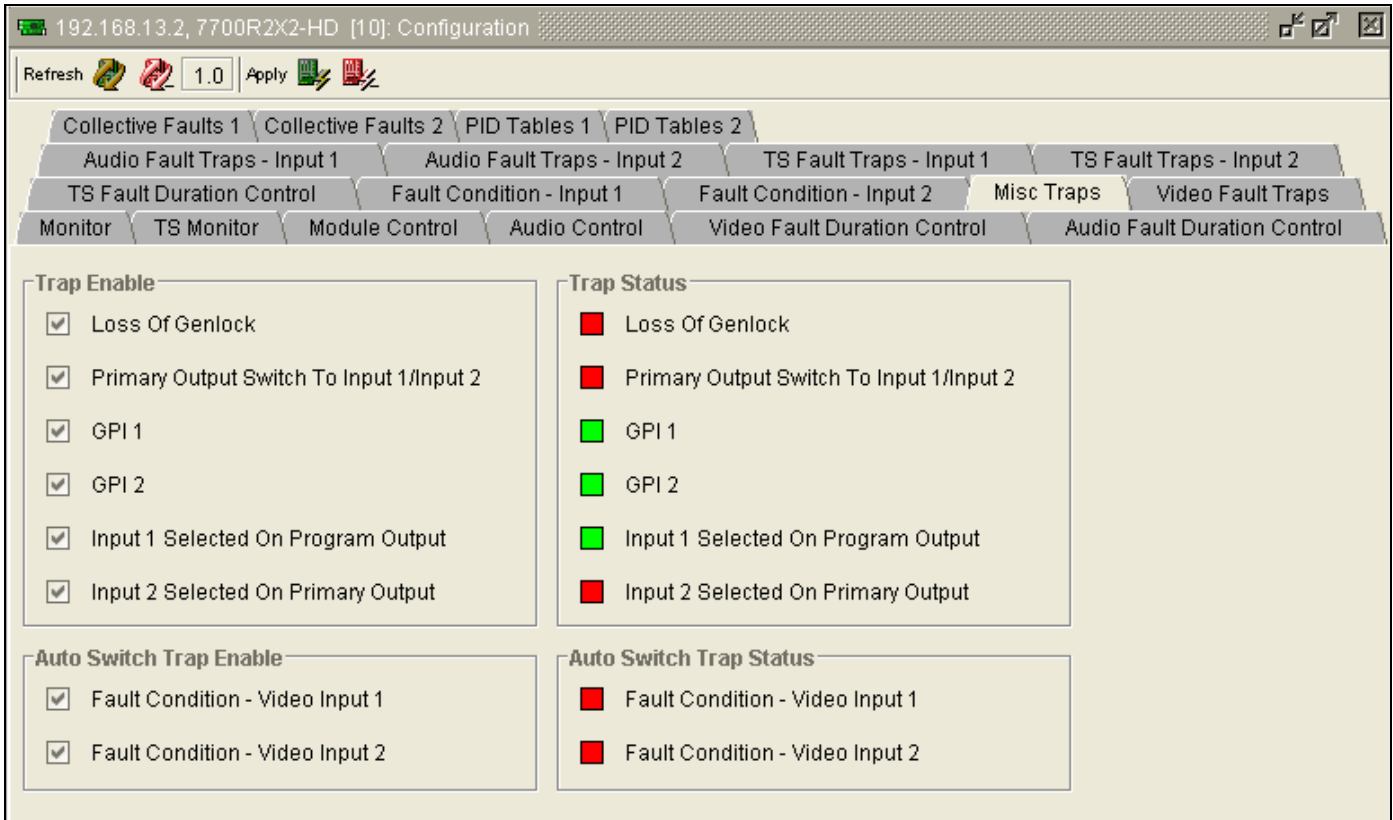


Figure 7-9: 7700R2x2-HD VistaLINK® Configuration - Misc Traps Tab

7.2.10. Video Fault Traps

The *Video Fault Traps* tab enables the user to set video traps and monitor the video trap status as illustrated in Figure 7-10. To enable a particular trap, simply click the box located beside each trap 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.

The *Trap Status* section defines whether a trap is a normal condition or a fault condition. Green indicates a normal condition and red indicates a fault condition.

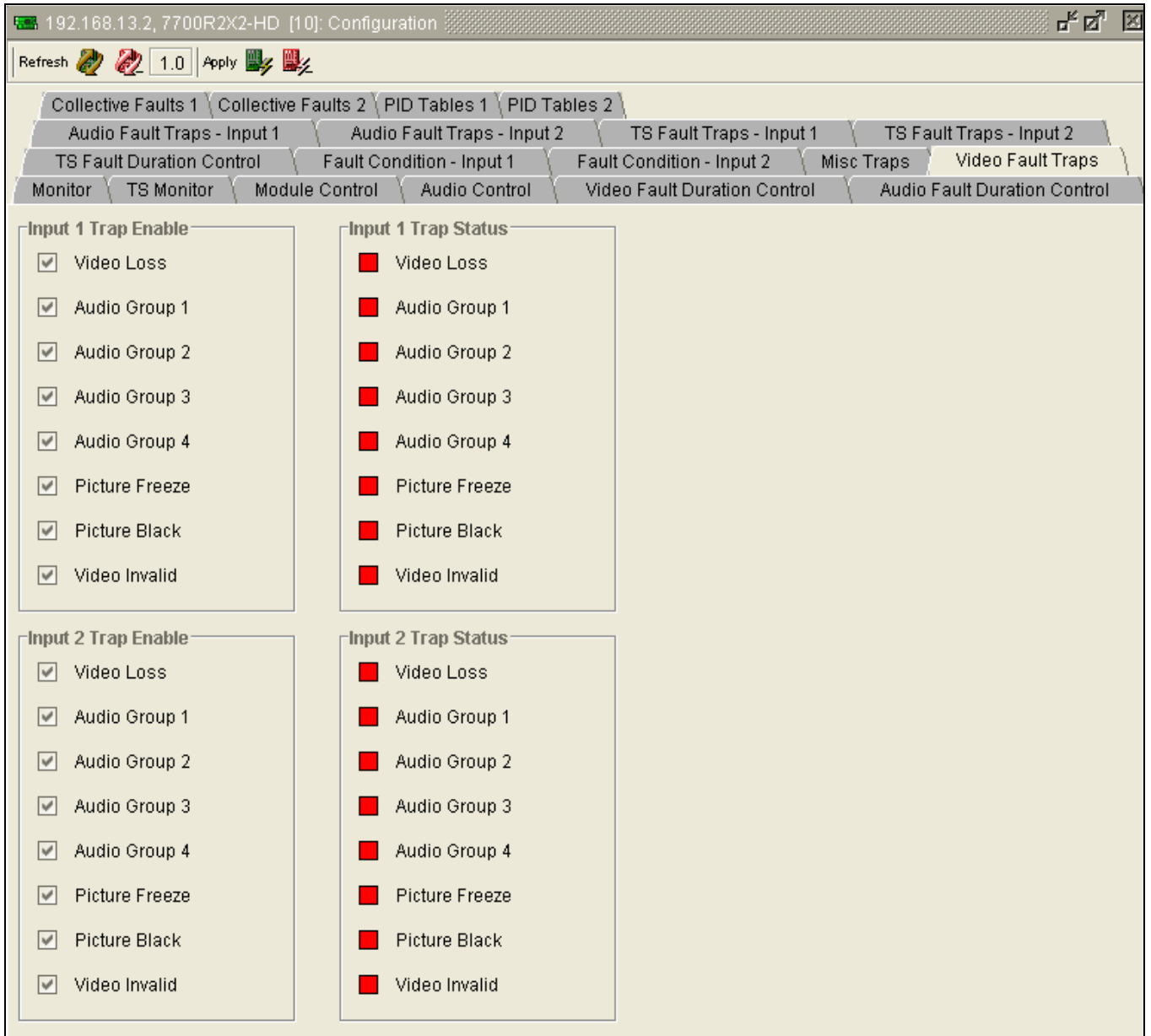


Figure 7-10: 7700R2x2-HD VistaLINK® Configuration - Video Fault Traps Tab

7.2.11. Audio Fault Traps – Input 1 & Input 2

The *Audio Fault Traps* tabs enable the user to set audio traps and monitor audio trap statuses as illustrated in Figure 7-11. An alarm will be sent to the user if any of the traps (user enabled) are triggered. These parameters are applicable to both *Audio Fault Traps – Input 1* and *Audio Fault Traps – Input 2*. For the sake of brevity, only *Audio Fault Traps – Input 1* will be discussed in the manual. To enable a particular trap, simply click the box located beside each trap 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. The *Trap Status* section defines whether a trap is a normal condition or a fault condition. Green indicates a normal condition and red indicates a fault condition.

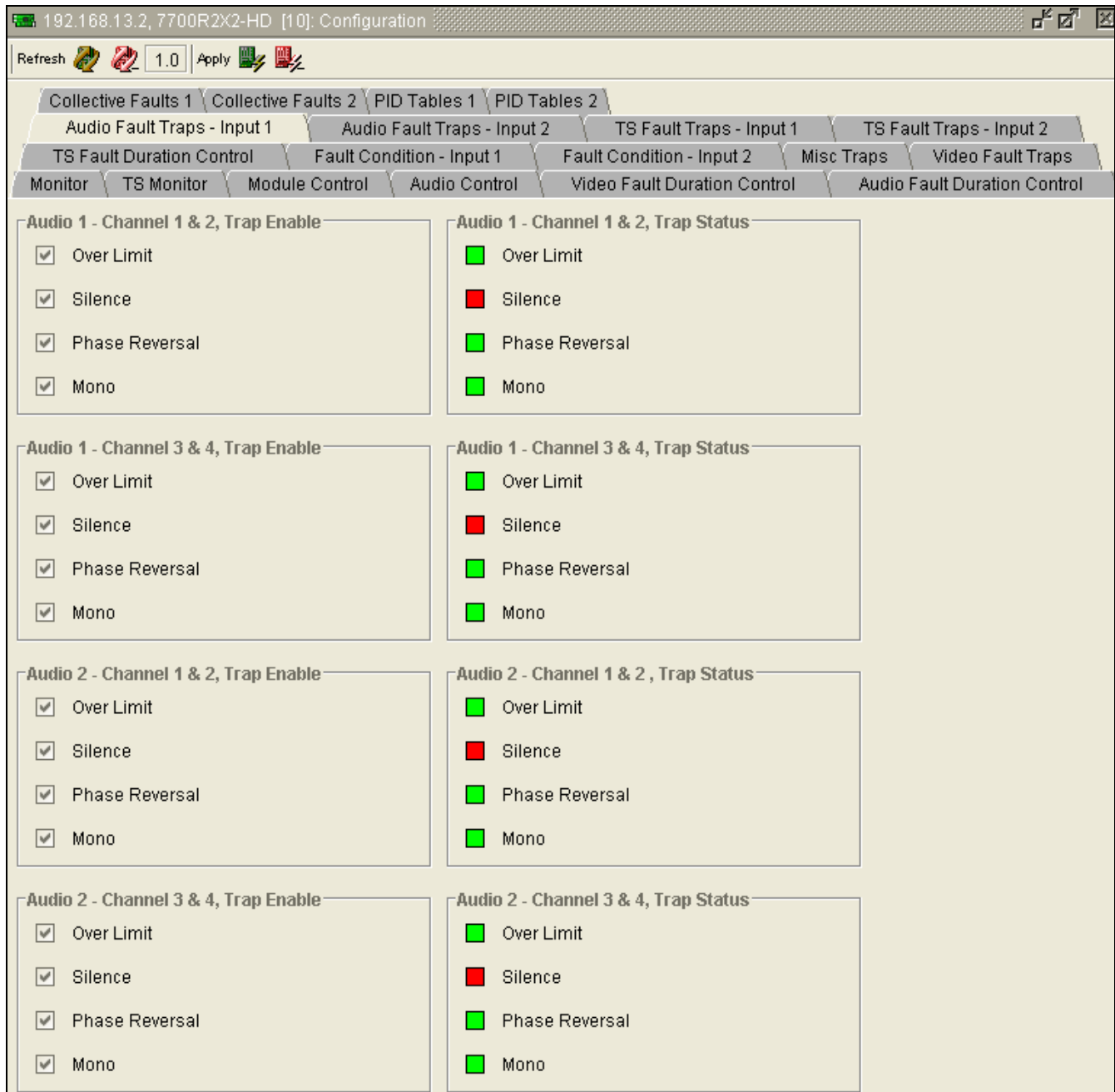


Figure 7-11: 7700R2x2-HD VistaLINK® Configuration - Audio Fault Traps Tab

7.2.12. TS Fault Traps – Input 1 & Input 2

The *TS Fault Traps* tabs enable the user to set TS fault traps and monitor TS fault trap statuses as illustrated in Figure 7-12. An alarm will be sent to the user if any of the traps (user enabled) are triggered. These parameters are applicable to both *TS Fault Traps – Input 1* and *TS Fault Traps – Input 2*. For the sake of brevity, only *TS Fault Traps – Input 1* will be discussed in the manual. To enable a particular trap, simply click the box located beside each trap 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.

The *Input 1 Trap Status* section defines whether a trap is a normal condition or a fault condition. Green indicates a normal condition and red indicates a fault condition.

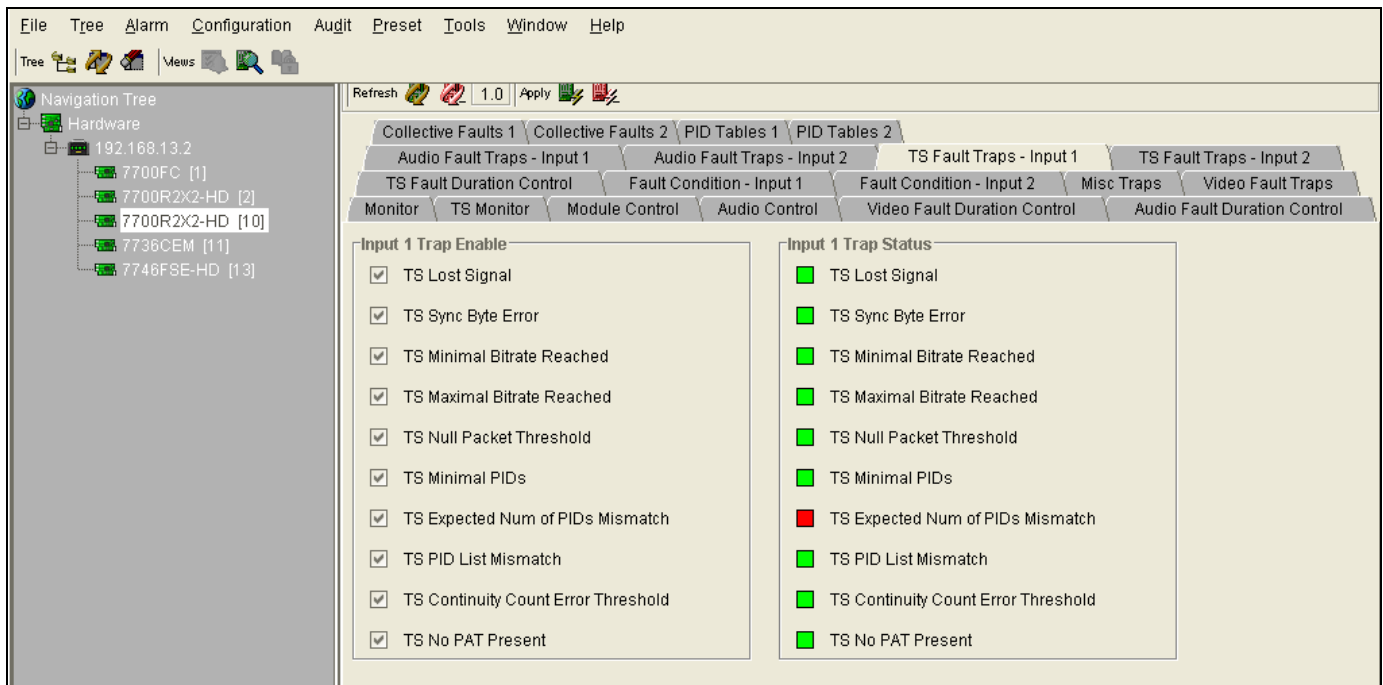


Figure 7-12: VistaLINK® Configuration – TS Fault Traps Input 1 Tab

7.2.13. Collective Faults 1 & 2

In order to enable collective fault controls, the user must, first, open the *Module Control* tab and select “Collective” under the *Fault Collection Control* drop down menu. By default it is set to “Individual,” enabling regular fault condition controls as described in section 7.2.3.

This tab enables the user to select the collective fault triggers. These parameters are applicable to both *Collective Faults - Input 1* and *Collective Faults -Input 2*. For the sake of brevity, only the *Collective Fault - Input 1* tab will be discussed in the manual. To enable a particular fault trigger, simply click the box located beside each fault so that a check-mark appears. When a check-mark is present, the fault trigger is enabled. When a check-mark is not present, the fault trigger is disabled.

The *Select All* button will put a check-mark beside every fault trigger. Press the *Deselect All* button to remove all check-marks.

For *Collective Faults*, there are 2 columns of faults defined as “Fault A” (left column) and “Fault B” (right column). The final fault trigger condition will depend on the logical “OR” of “Fault A” and “Fault B” (i.e. Result equals Fault A OR Fault B).

Collective Faults 1		Collective Faults 2		PID Tables 1		PID Tables 2	
Audio Fault Traps - Input 1		Audio Fault Traps - Input 2		TS Fault Traps - Input 1		TS Fault Traps - Input 2	
TS Fault Duration Control		Fault Condition - Input 1		Fault Condition - Input 2		Misc Traps	
Video Fault Traps							
Monitor	TS Monitor	Module Control	Audio Control	Video Fault Duration Control	Audio Fault Duration Control		

<p>Fault A Triggers</p> <input checked="" type="checkbox"/> Video Loss <input type="checkbox"/> Audio Group 1 <input type="checkbox"/> Audio Group 2 <input type="checkbox"/> Audio Group 3 <input type="checkbox"/> Audio Group 4 <input type="checkbox"/> Picture Freeze <input type="checkbox"/> Picture Black <input type="checkbox"/> Over Limit, Audio 1 - Channel 1 and 2 <input type="checkbox"/> Over Limit, Audio 1 - Channel 3 and 4 <input type="checkbox"/> Over Limit, Audio 2 - Channel 1 and 2 <input type="checkbox"/> Over Limit, Audio 2 - Channel 3 and 4 <input type="checkbox"/> Silence, Audio 1 - Channel 1 and 2 <input type="checkbox"/> Silence, Audio 1 - Channel 3 and 4 <input type="checkbox"/> Silence, Audio 2 - Channel 1 and 2 <input type="checkbox"/> Silence, Audio 2 - Channel 3 and 4 <input type="checkbox"/> Phase Reversal, Audio 1 - Channel 1 and 2 <input type="checkbox"/> Phase Reversal, Audio 1 - Channel 3 and 4 <input type="checkbox"/> Phase Reversal, Audio 2 - Channel 1 and 2 <input type="checkbox"/> Phase Reversal, Audio 2 - Channel 3 and 4 <input type="checkbox"/> Mono, Audio 1 - Channel 1 and 2 <input type="checkbox"/> Mono, Audio 1 - Channel 3 and 4 <input type="checkbox"/> Mono, Audio 2 - Channel 1 and 2 <input type="checkbox"/> Mono, Audio 2 - Channel 3 and 4 <input type="checkbox"/> Video Invalid	<p>FAULT A</p> <p>OR</p> <p>FAULT B</p>	<p>Fault B Triggers</p> <input checked="" type="checkbox"/> Video Loss <input type="checkbox"/> Audio Group 1 <input type="checkbox"/> Audio Group 2 <input type="checkbox"/> Audio Group 3 <input type="checkbox"/> Audio Group 4 <input type="checkbox"/> Picture Freeze <input type="checkbox"/> Picture Black <input type="checkbox"/> Over Limit, Audio 1 - Channel 1 and 2 <input type="checkbox"/> Over Limit, Audio 1 - Channel 3 and 4 <input type="checkbox"/> Over Limit, Audio 2 - Channel 1 and 2 <input type="checkbox"/> Over Limit, Audio 2 - Channel 3 and 4 <input type="checkbox"/> Silence, Audio 1 - Channel 1 and 2 <input type="checkbox"/> Silence, Audio 1 - Channel 3 and 4 <input type="checkbox"/> Silence, Audio 2 - Channel 1 and 2 <input type="checkbox"/> Silence, Audio 2 - Channel 3 and 4 <input type="checkbox"/> Phase Reversal, Audio 1 - Channel 1 and 2 <input type="checkbox"/> Phase Reversal, Audio 1 - Channel 3 and 4 <input type="checkbox"/> Phase Reversal, Audio 2 - Channel 1 and 2 <input type="checkbox"/> Phase Reversal, Audio 2 - Channel 3 and 4 <input type="checkbox"/> Mono, Audio 1 - Channel 1 and 2 <input type="checkbox"/> Mono, Audio 1 - Channel 3 and 4 <input type="checkbox"/> Mono, Audio 2 - Channel 1 and 2 <input type="checkbox"/> Mono, Audio 2 - Channel 3 and 4 <input type="checkbox"/> Video Invalid
--	---	--

Select All	Deselect All	Select All	Deselect All
------------	--------------	------------	--------------

Figure 7-13: VistaLINK® Configuration - Collective Faults 1 and 2 Tab

7.2.14. PID Tables 1 & 2

The user can set the values of the PID tables using the parameters shown in Figure 7-14. These parameters are applicable to both *PID Tables 1* and *PID Tables 2* tabs. For the sake of brevity, only *PID Tables 1* will be discussed in the manual. The right hand side of this tab shows the PID table detected in the *Continuity Count PID Table* section.

The screenshot shows the configuration interface for the 7700R2x2-HD VistaLINK. The 'PID Tables 1' tab is selected. The 'Expected PID Table' section contains a table with the following data:

PID
2
4
5

Below this table, a note states: "The size of the expected PID list is controlled in the tab 'TS Fault Duration Control'. Refresh is required after changes are made to the 'Expected PID number' parameter."

The 'Continuity Count PID Table' section contains a table with the following data:

PID	Continuity Count Error
0	0
16	0
17	0
8176	0
8187	0
8191	0

Figure 7-14: 7700R2x2-HD VistaLINK® Configuration - PID Tables 1 and 2 Tab

7.3. VISTALINK® CONFIGURATION FOR THE 7700R2X2-HES

7.3.1. General – Card Information

The *General* tab provides information related to the card status as illustrated in Figure 7-15.

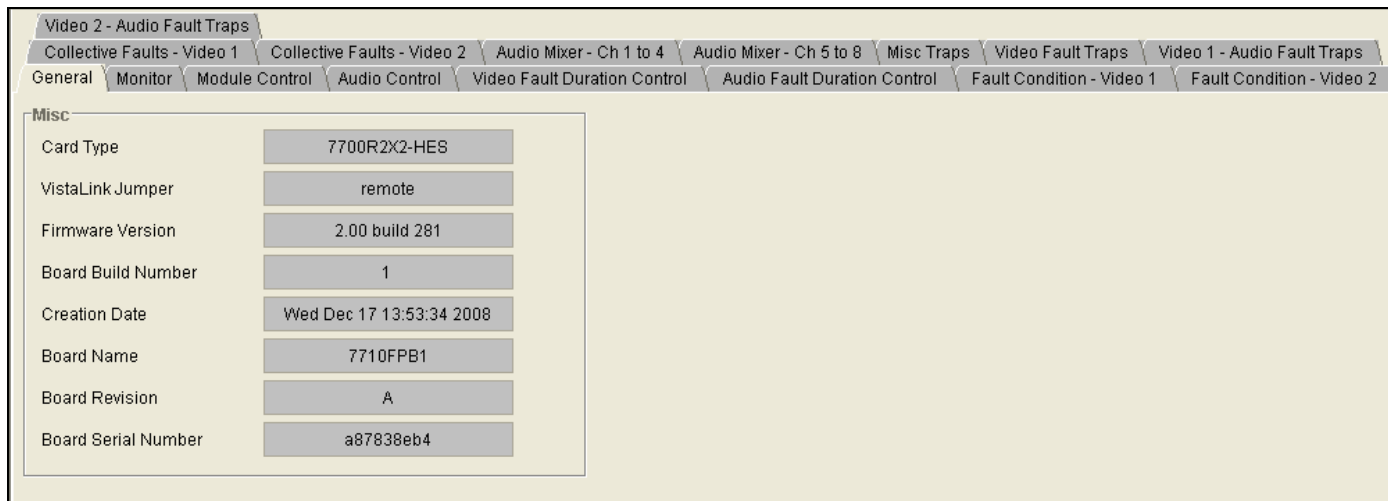


Figure 7-15: 7700R2x2-HES VistaLINK® Configuration - General Tab

7.3.1.1. Misc Display

- Card Type:** Shows the name of the card detected.
- VistaLINK® Jumper:** Reports the status of the VistaLINK® jumper in case the user is not physically able to get to the module.
- Firmware Version:** Shows the firmware version of the card detected.
- Board Build Number:** Shows the PCB build number.
- Creation Date:** Shows the date firmware was created.
- Board Name:** Shows the name of the PCB board.
- Board Revision:** Shows the revision number of the PCB board.
- Board Serial Number:** Shows the serial number of the PCB board.

7.3.2. Monitor – Video Input Status

Input 1, Input 2, and the Detected Genlock Standard are displayed within the *Monitor* tab. The supported video standards are listed in Table 7-2.

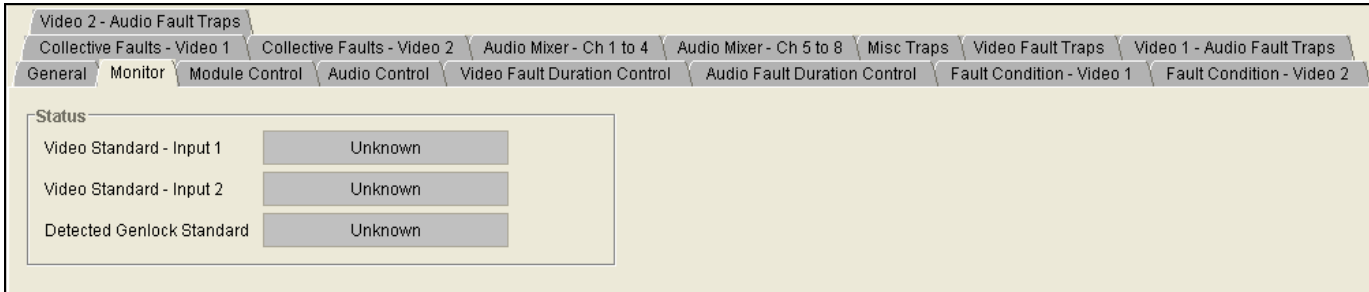


Figure 7-16: 7700R2X2-HES VistaLINK® Configuration – Monitor Tab

Input	Supporting Standard
<p>Input 1 and Input 2</p>	<p>Unknown 525i/59.94 625i/50 1080i/59.94 1080i/50 720p/59.94 720p/50</p>
<p>Genlock</p>	<p>Unknown NTSC 525 PAL 625 1080i5994 1080i50 720p5994 720p50</p>

Table 7-2: Supported Video Standards

7.3.3. Module Control

The *Module Control* tab enables the user to configure basic *switch settings*, *phase control*, and *soft-switch control* as illustrated in Figure 7-17.

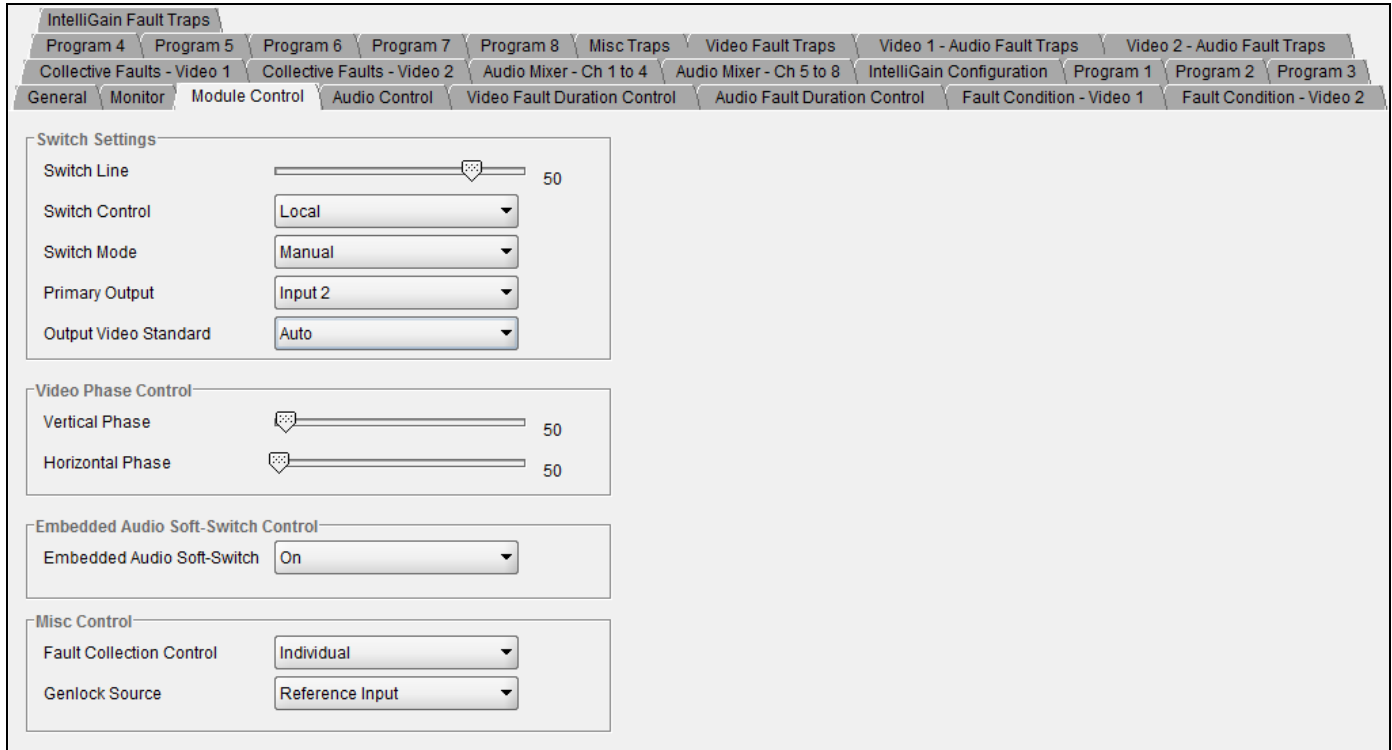


Figure 7-17: 7700R2x2-HES VistaLINK® Configuration – Module Control Tab

7.3.3.1. Switch Settings

- Switch Line:** Sets the switch line number ranging between 1 and 64.
- Switch Control:** Enables the user to set the switch control to local, remotely, or both locally and remotely.
- Switch Mode:** Enables the user to set the switch mode to manual or automatic. Selecting “Auto Back” will revert to main if the fault is no longer present. Selecting “Auto” will stay on backup even if main no longer has a fault.
- Primary Output:** Enables the user to set the output to Input 1 or Input 2.
- Output Video Standard:** Enables the user to set the output standard. Options include: Auto, 525i/59.94, 625i/50, 1080i/59.94, 720p/59.94, 1080i/50, 720p/50, 1080p/23.98sf, and 1080p/29.97.

7.3.3.2. Video Phase Control

- Vertical Phase:** Sets the vertical phase offset. This parameter is adjusted in 1 line increments ranging from 0 to 1125.

Horizontal Phase: Sets the horizontal phase offset. This parameter is adjusted in 1 line increments ranging from 0 to 1125.

7.3.3.3. Embedded Audio Soft Switch Control

Embedded Audio Soft-Switch: Enables the user to turn on or off the embedded audio soft-switch function.

7.3.3.4. Misc Control

Fault Collection Control: Enables the user to set fault triggers to “Individual” or “Collective.” Selecting “Individual” will set the fault trigger to use the regular fault condition. Selecting “Collective” will Set fault trigger to use the collection fault condition

Genlock Source: Enables the user to set the input for *Genlock Source*. Select “Reference Input” to use input feed at GCLK BNC. Select “Reference Input 1” to Use video input 1 as genlock reference. Use “Reference Input 2” to use video input 2 as genlock reference.

7.3.4. Audio Control

The *Audio Control* tab enables the user to configure the input and output signals for the audio de-embedder groups. The user can also enable/disable the audio mixer as well as individual audio groups.

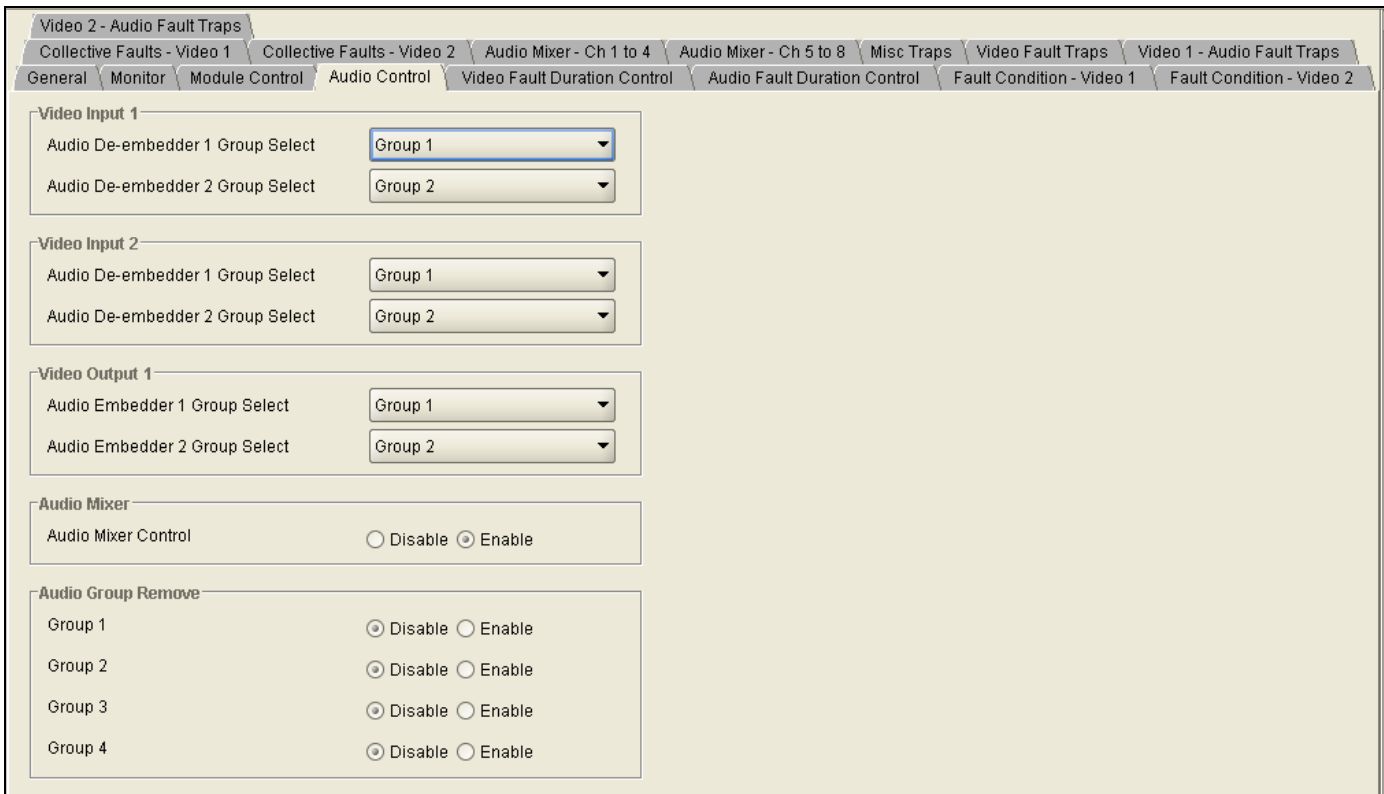


Figure 7-18: 7700R2x2-HES VistaLINK® Configuration – Audio Control Tab

7.3.4.1. Video Input 1

The following parameters are applicable to both *Video Input 1* and *Video Input 2*. For the sake of brevity, only *Video Input 1* will be discussed in the manual.

Audio De-embedder 1 Group Select: Enables the user to select audio de-embedder 1 from group 1 to group 4.

Audio De-embedder 2 Group Select: Enables the user to select audio de-embedder 2 from group 1 to group 4.

7.3.4.2. Video Output 1

Audio Embedder 1 Group Select: Enables the user to select audio de-embedder 1 from group 1 to group 4 as well as turn off audio embedder 1.

Audio Embedder 2 Group Select: Enables the user to select audio de-embedder 2 from group 1 to group 4 as well as turn off audio embedder 2.

7.3.4.3. Audio Mixer

The *Audio Mixer* control allows the user to enable or disable the audio mixer function.

7.3.4.4. Audio Group Remove

The *Audio Group Remove* control allows the user to individually enable or disable *audio groups 1 to 4*. Selecting “Enable” will allow the audio group to be removed from the output program. Selecting “Disable” will allow the audio group to pass through the output program.

7.3.5. Video Fault Duration Control

The user can set the video fault duration using the *Video Fault Duration Control* tab as illustrated in Figure 7-19.

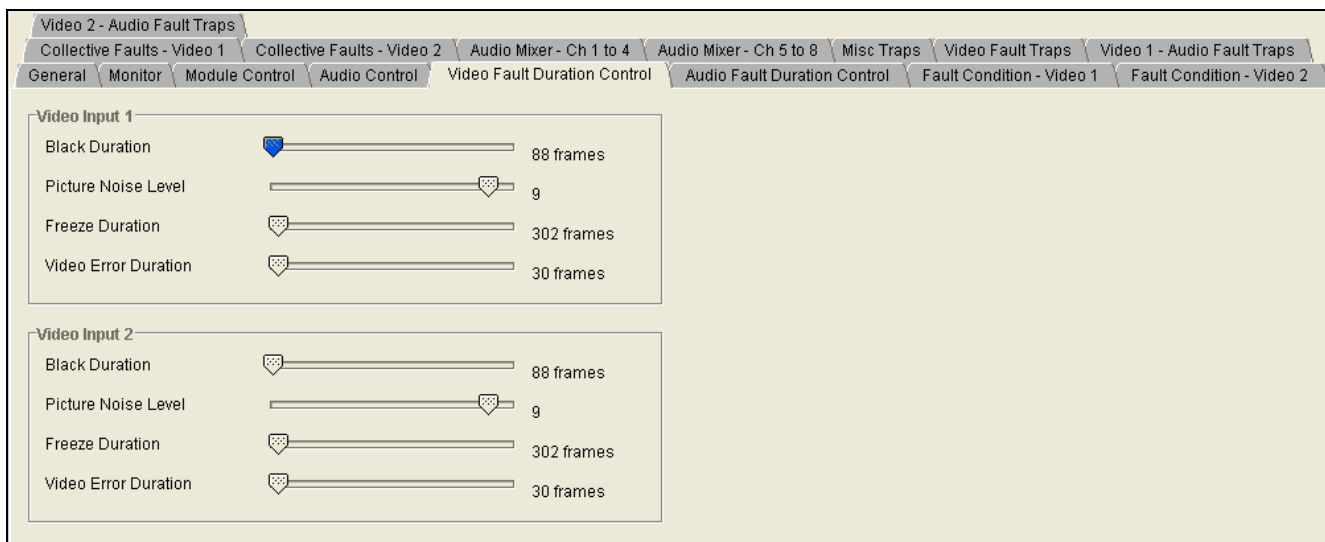


Figure 7-19: 7700R2X2-HES VistaLINK® Configuration – Video Fault Duration Control Tab

7.3.5.1. Video Input 1

The following parameters are applicable to both *Video Input 1* and *Video Input 2*. For the sake of brevity, only *Video Input 1* will be discussed in the manual.

Black Duration: Sets the black duration from 8 frames up to 9996 frames.

Picture Noise Level: Sets the maximum picture noise level ranging from 1 to 10.

Freeze Duration: Sets the freeze duration from 6 frames up to 9998 frames.

Video Error Duration: Sets the video error duration from 0 frames up to 900 frames.

7.3.6. Audio Fault Duration Control

The user can set the duration of the audio fault parameters using the *Audio Fault Duration Control* tab as illustrated in Figure 7-20.

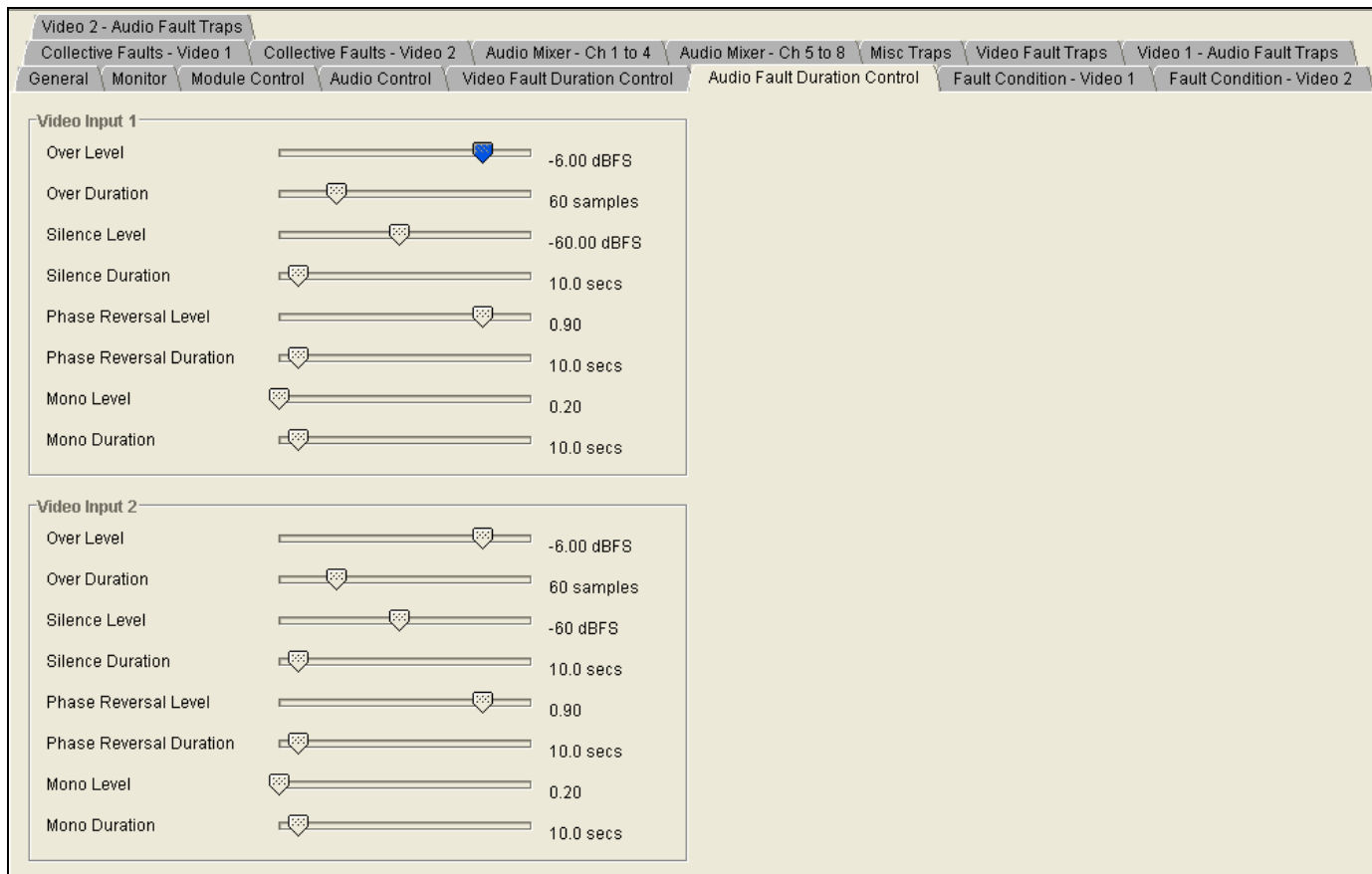


Figure 7-20: 7700R2x2-HES VistaLINK® Configuration – Audio Fault Duration Control Tab

7.3.6.1. Video Input 1

The following parameters are applicable to both *Video Input 1* and *Video Input 2*. For the sake of brevity, only *Video Input 1* will be discussed in the manual.

- Over Level:** Sets the audio level that is considered as ‘over’ ranging from -30dBFS to 0dBFS.
- Over Duration:** Sets the maximum duration of audio over ranging from 3 samples to 255 samples.
- Silence Level:** Sets the audio level that is considered as ‘silence’ ranging from -96dBFS to –20dBFS.
- Silence Duration:** Sets the maximum duration of audio silence ranging from 0.5 seconds to 127 seconds.
- Phase Reversal Level:** Sets the maximum acceptable phase reversal level ranging from 0.5 to 1.
- Phase Reversal Duration:** Sets maximum duration of phase reversal ranging from 0.5 seconds to 127 seconds.
- Mono Level:** Sets the level of L/R audio difference under which is considered mono ranging from 0.2 to 0.5.
- Mono Duration:** Sets the duration of mono audio, in seconds, that is considered a fault ranging from 0.5 seconds to 127 seconds.

7.3.7. Fault Condition – Video 1 & Video 2

The *Fault Condition* tabs enable the user to select the fault trigger conditions for *Video Input 1* and *2* as illustrated in Figure 7-21. If the selected fault occurs, an alarm will be sent to the user. As well, the user can control the duration and logic relationship of selected fault triggers.

The following parameters are applicable to both *Fault Condition Video - 1* and *Fault Condition Video - 2*. For the sake of brevity, only *Fault Condition Video - 1* will be discussed in the manual.

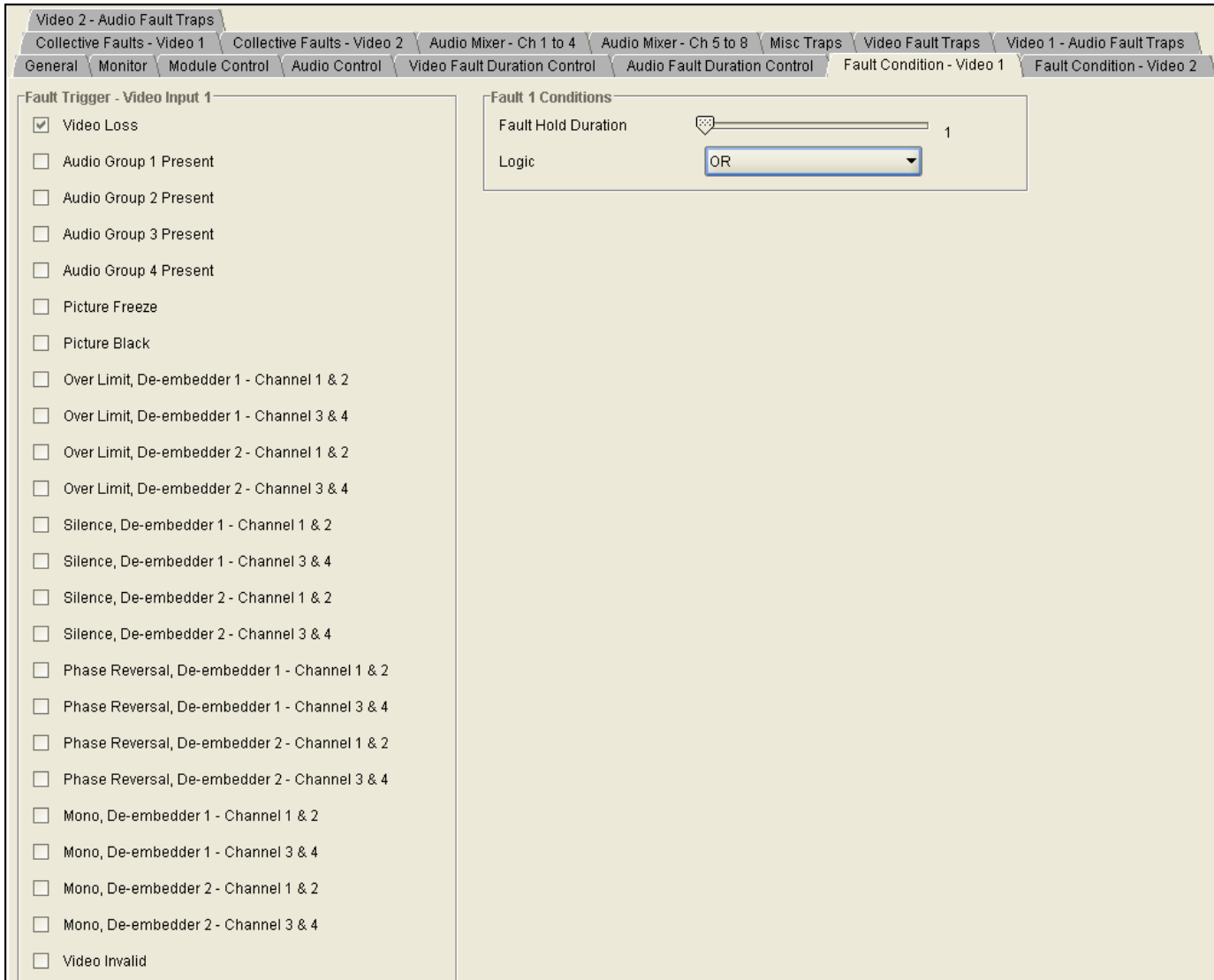


Figure 7-21: 7700R2x2-HES VistaLINK® Configuration – Fault Condition Tab

7.3.7.1. Fault 1 Conditions

Fault Hold Duration: Defines how long the fault condition will be held after the fault condition is no longer true. The setting ranges from 1 to 254 frames.

Logic: Enables the user to set the fault trigger. Selecting “OR” will trigger a fault if any of the selected fault conditions occurs. Selecting “AND” will trigger a fault when all the selected fault conditions occurs.

7.3.8. Collective Faults – Video 1 & Video 2

Collective faults allow the user to setup ‘fault 1 and fault 2’ or ‘fault 3 and fault 4’, providing more flexibility. Individual faults only allow the user to setup an “AND” or an “OR” situation. For example, if you want to trigger a fault for video frozen, and video black or audio group 1 not present, and audio group 2 not present you would have to use a collective fault.

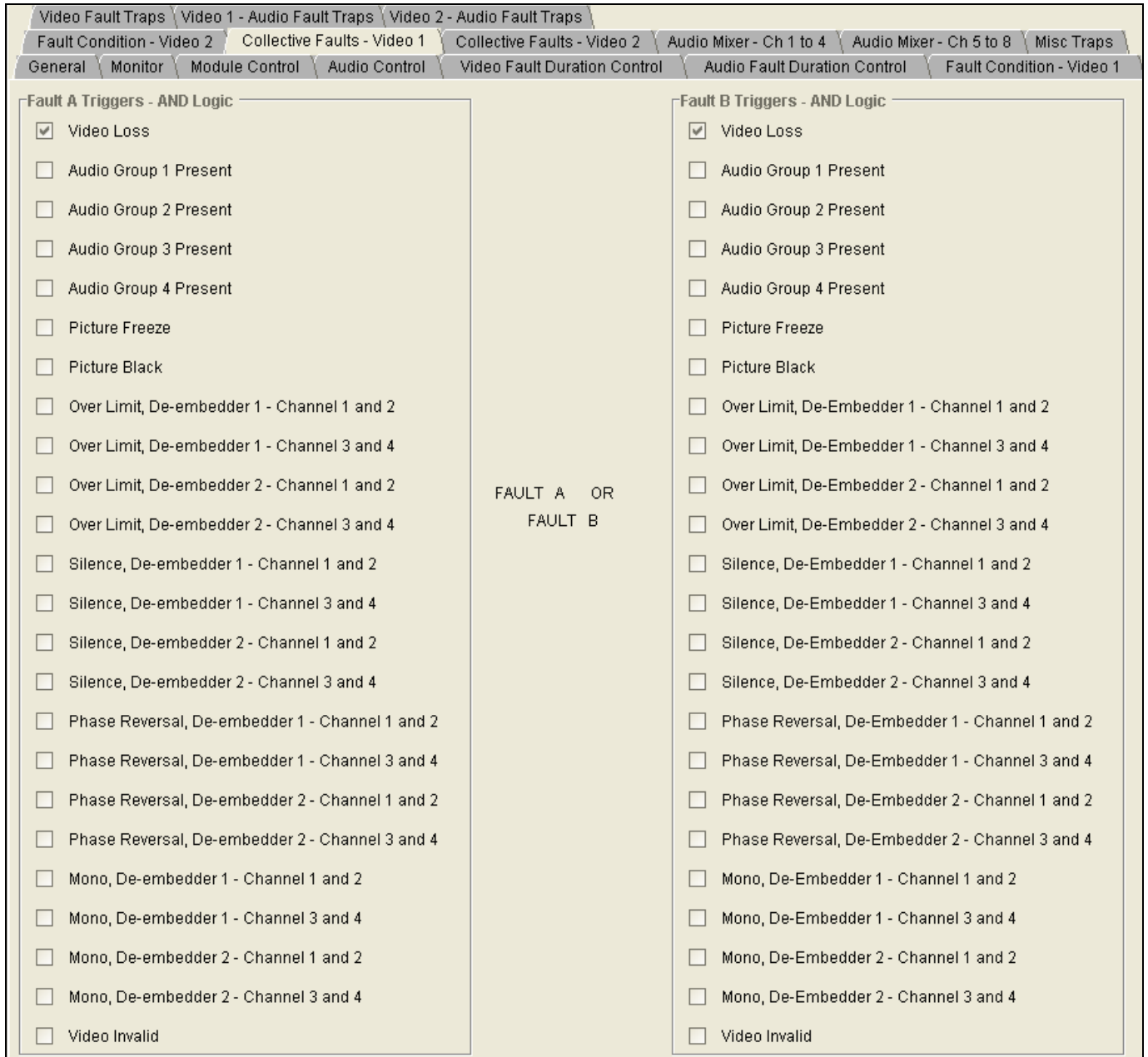


Figure 7-22: 7700R2x2-HES VistaLINK® Configuration – Collective Faults Tab

7.3.9. Audio Mixer – Channel 1 to Channel 8

The *Source*, *Gain*, and *Invert* options for each channel can be controlled through the *Audio Mixer - Ch1 to 4* and *Audio Mixer - Ch 5 to 8* tabs, as illustrated in Figure 7-23. For the sake of brevity, only *Audio Mixer - Ch1 to 4* parameters will be discussed in the manual.

Figure 7-23: 7700R2x2-HES VistaLINK® Configuration - Audio Mixer Tab

7.3.9.1. Channel 1 Controls

The following parameters are applicable to *Channel 1* to *Channel 4*. For the sake of brevity, only Channel 1 will be discussed in the manual.

Source Select – X: Enables the user to select the audio channel source. The following table lists the channel options available:

Options	Description
V1 Ch1	Video 1 channel 1
V1 Ch2	Video 1 channel 2
V1 Ch3	Video 1 channel 3
V1 Ch4	Video 1 channel 4
V1 Ch5	Video 1 channel 5
V1 Ch6	Video 1 channel 6
V1 Ch7	Video 1 channel 7
V1 Ch8	Video 1 channel 8
V2 Ch1	Video 2 channel 1
V2 Ch2	Video 2 channel 2
V2 Ch3	Video 2 channel 3
V2 Ch4	Video 2 channel 4
V2 Ch5	Video 2 channel 5
V2 Ch6	Video 2 channel 6
V1 Ch7	Video 1 channel 7
V2 Ch8	Video 2 channel 8
V1 MM Ch1+2	Video 1 mono mixed channel 1+2
V1 MM Ch3+4	Video 1 mono mixed channel 3+4
V1 MM Ch5+6	Video 1 mono mixed channel 5+6
V1 MM Ch7+8	Video 1 mono mixed channel 7+8
V1 MM Ch1-2	Video 1 mono mixed channel 1-2
V1 MM Ch3-4	Video 1 mono mixed channel 3-4
V1 MM Ch5-6	Video 1 mono mixed channel 5-6
V1 MM Ch7-8	Video 1 mono mixed channel 7-8
V2 MM Ch1+2	Video 2 mono mixed channel 1+2
V2 MM Ch3+4	Video 2 mono mixed channel 3+4
V2 MM Ch5+6	Video 2 mono mixed channel 5+6
V2 MM Ch7+8	Video 2 mono mixed channel 7+8
V2 MM Ch1-2	Video 2 mono mixed channel 1-2
V2 MM Ch3-4	Video 2 mono mixed channel 3-4
V2 MM Ch5-6	Video 2 mono mixed channel 5-6
V2 MM Ch7-8	Video 2 mono mixed channel 7-8

Gain Adjust – X: Enables the user to set the gain for source X ranging from -24dB to 24dB.

Invert Enable – X: Allows the user to set the invert control. Selecting “Normal” will not invert source X. Selecting “Invert” will invert source X.



Please note: The settings listed for *Source Select –X*, *Gain Adjust –X*, and *Invert Enable –X* apply to *Source Select –Y*, *Gain Adjust –Y*, and *Invert Enable –Y* as well.

7.3.10. Misc Traps

The *Misc Traps* tab enables the user to set miscellaneous traps and monitor trap statuses as illustrated in Figure 7-24. To enable a particular trap, simply click the box located beside each trap 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.

The *Trap Status* section defines whether a trap is a normal condition or a fault condition. Green indicates a normal condition and red indicates a fault condition.

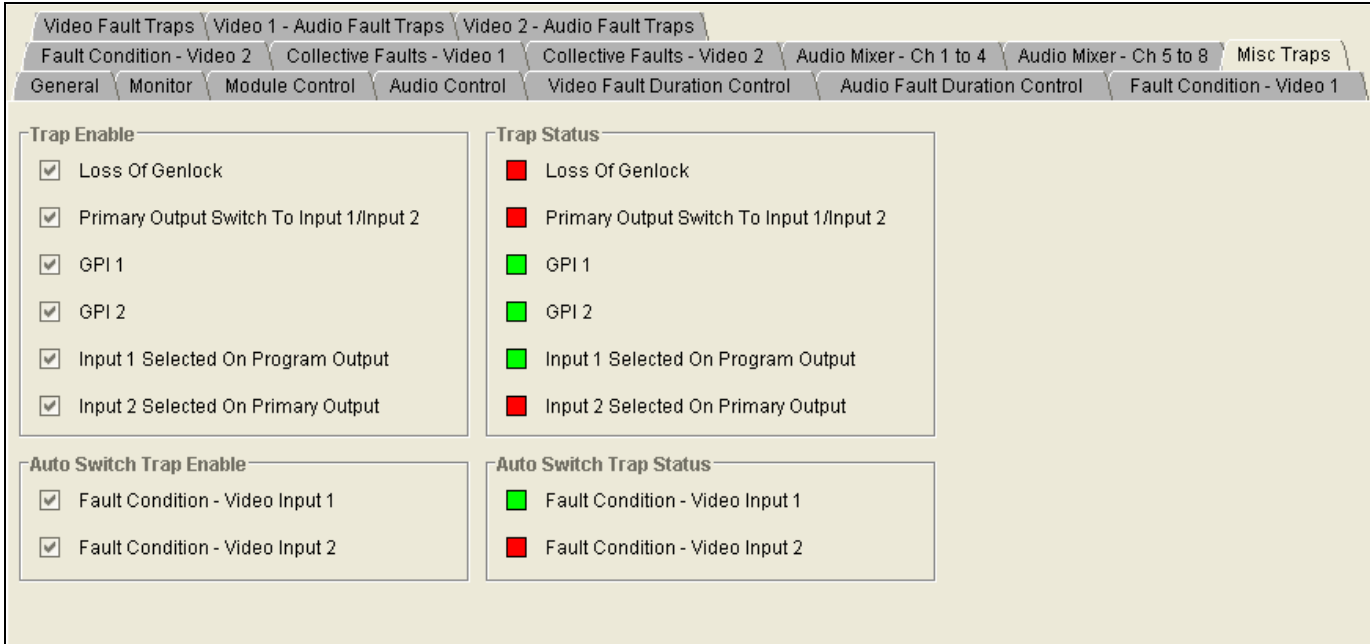


Figure 7-24: 7700R2x2-HES VistaLINK® Configuration - Misc Traps Tab

7.3.11. Video Fault Traps

The *Video Fault Traps* tab enables the user to set video traps and monitor the video trap status as illustrated in Figure 7-25. To enable a particular trap, simply click the box located beside each trap 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.

The *Trap Status* section defines whether a trap is a normal condition or a fault condition. Green indicates a normal condition and red indicates a fault condition.

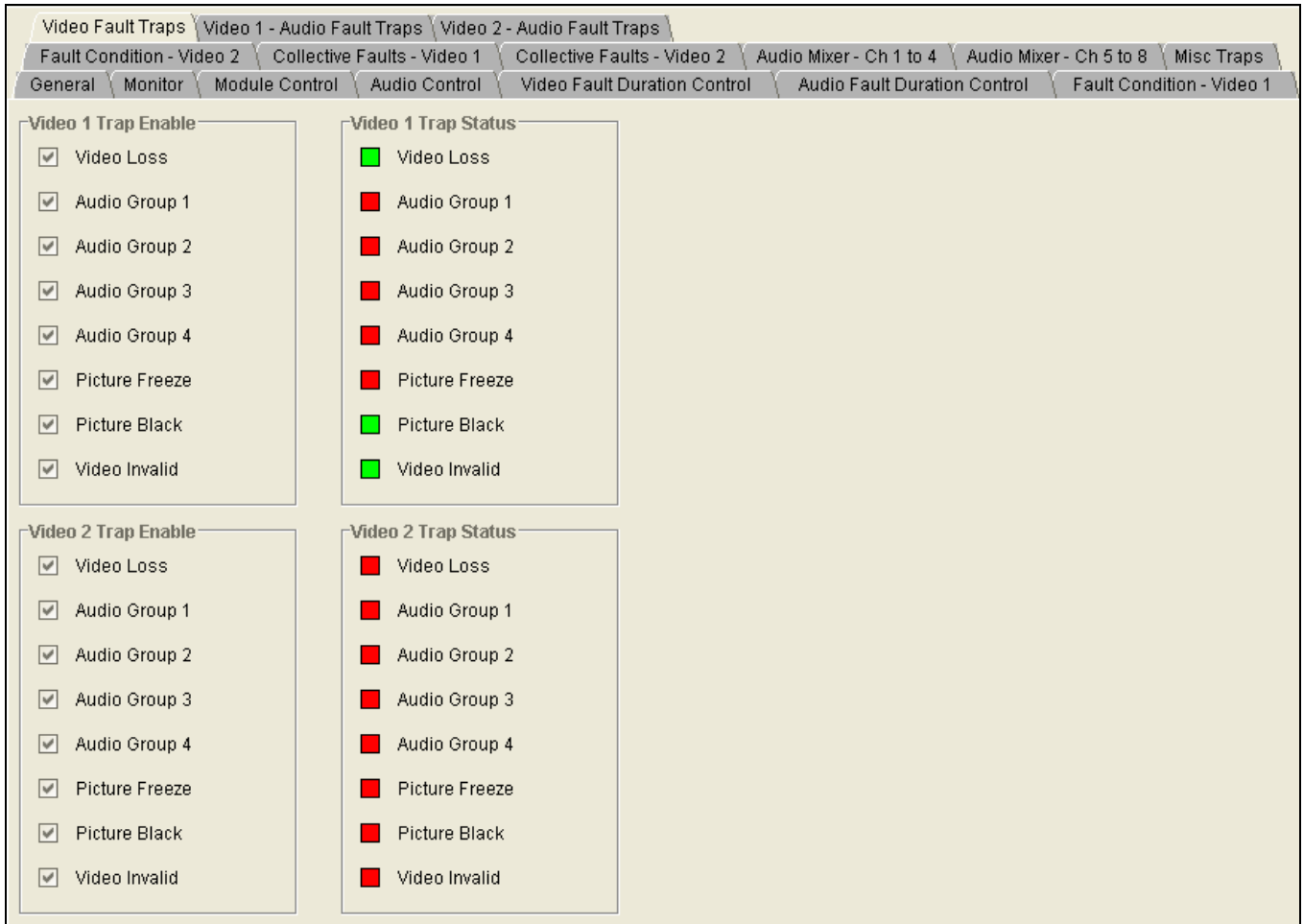


Figure 7-25: 7700R2x2-HES VistaLINK® Configuration - Video Fault Traps Tab

7.3.12. Audio Fault Traps -- Video 1 & Video 2

The *Video 1 & Video 2 – Audio Fault Traps* tab enables the user to set audio traps and monitor audio trap statuses as illustrated in Figure 7-26. An alarm will be sent to the user if any of the traps (user enabled) are triggered. These parameters are applicable to both *Audio Fault Traps – Input 1* and *Audio Fault Traps – Input 2*. For the sake of brevity, only *Audio Fault Traps – Input 1* will be discussed in the manual.

To enable a particular trap, simply click the box located beside each trap 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.

The *Input 1 Trap Status* section defines whether a trap is a normal condition or a fault condition. Green indicates a normal condition and red indicates a fault condition.

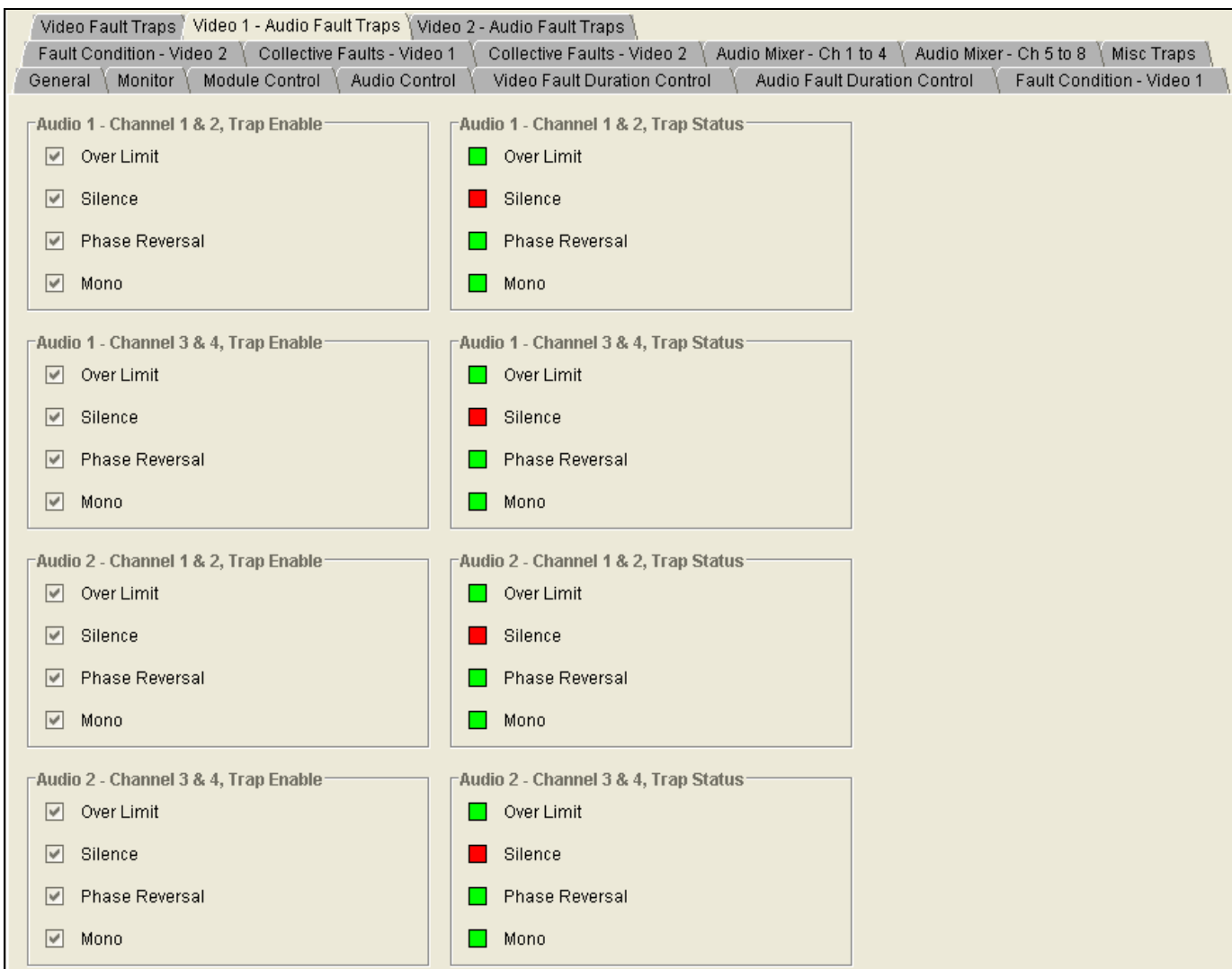


Figure 7-26: 7700R2x2-HES VistaLINK® Configuration - Audio Fault Traps Tab

8. LOCATION OF LEDS AND JUMPERS

Figure 8-1 and Figure 8-2 provides illustrations of the LED and Jumper locations on the Rev A and Rev B boards.

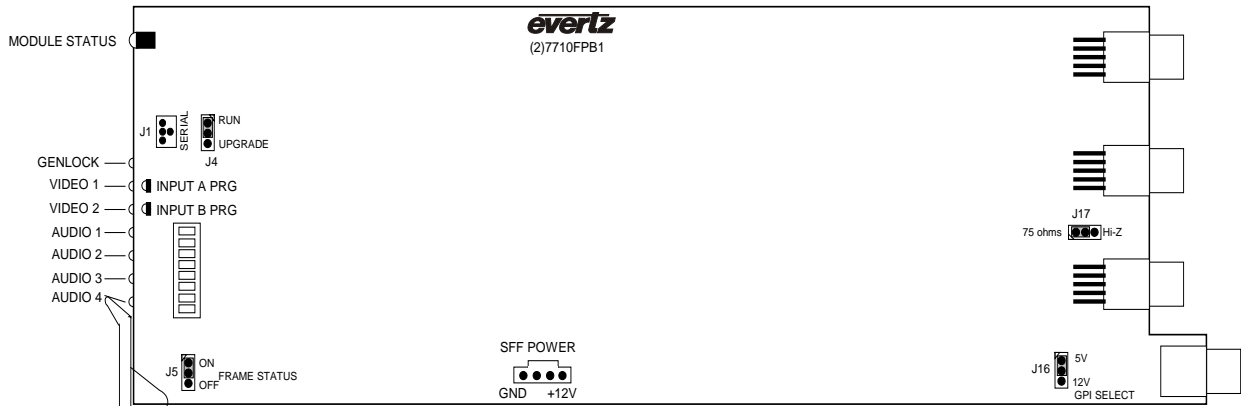


Figure 8-1: LED and Jumper Locations on REV 2 Boards

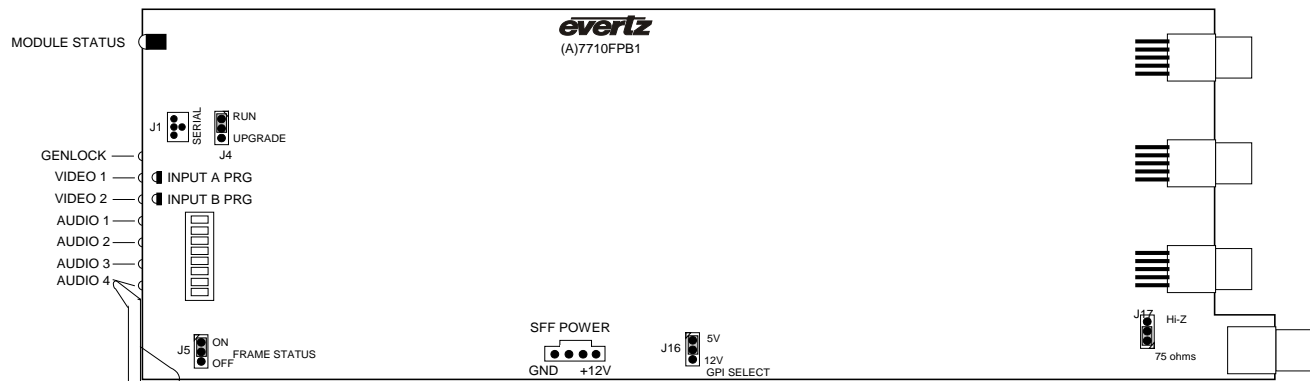


Figure 8-2: LED and Jumper Locations on REV A Boards

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

The FRAME STATUS jumper J5, located at the front of the module, determines whether local faults (as shown by the Local Fault indicator) will be connected to the 7700FR frame's global status bus.

FRAME STATUS: To monitor faults on this module with the frame status indicators (on the power supply's FRAME STATUS LEDs and on the Frame's Fault Tally output), install this jumper in the ON position.

When this jumper is installed in the Off position local faults on this module will not be monitored.

8.2. CONFIGURING THE MODULE FOR FIRMWARE UPGRADES

UPGRADE: The UPGRADE jumper J4 located at the front edge of the module, near the serial port header, is used when firmware upgrades are being done to the module. For normal operation it should be installed in the *RUN* position. See the *Upgrading Firmware* section in the front of the binder for more information.

To upgrade the firmware in the module pull it out of the frame. Move Jumper J4 into the *UPGRADE* position. Install the Upgrade cable provided (located in the vinyl pouch in the front of this manual) onto header J24 near the card ejector. Re-install the module into the frame. Run the upgrade as described in the *Upgrading Firmware* section in the front of the binder. Once the upgrade is completed, remove the module from the frame, move J4 into the *RUN* position, remove the upgrade cable and re-install the module. The module is now ready for normal operation.



Please note that the baud rate for firmware upgrades is 115200 baud.

Alternatively, the 7700R2X2 series modules can be upgraded via VistaLINK®. Please refer to your VistaLINK® user manual for more details.

8.3. SELECTING WHETHER THE GENLOCK REFERENCE INPUT IS TERMINATED

TERM: The TERM jumper J17 located at the rear of the module is used to terminate the genlock loop input. Then it is in the 75R position a 75 ohm terminating resistor will connect the input to ground. When it is in the HI-Z position the genlock input will be high impedance.

8.4. CONTROLLING GPI PULLUP VOLTAGE

Jumper J16, located at the rear of the module, controls whether the GPI inputs and outputs are pulled up to 5 volts or 12 volts.

GPI SELECT: To pull the GPI inputs and outputs up to 12 volts install this jumper in the position closest to edge of the module.

To pull the GPI inputs and outputs up to 5 volts install this jumper in the position closest to center of the module.

8.5. SELECTING THE GENLOCK INPUT SOURCE VS. THE PGM OUTPUT 3

8.5.1. Genlock Input Mode of Operation

The 7700R2x2 (excluding the 7700RD2X2-HD) can optionally be configured to accept a Genlock input from the PGM Output 3 BNC. To enable this mode, remove the rear plate from the 7700FR frame. Locate jumper J1 on the PCB, apply a jump across the “GL” pin with the “BNC” pin, and a jump across the “TERM” pin with the “PGM” pin (please refer to Figure 8-3). This will map the BNC to the Genlock input circuitry and terminate the PGM output path.

The 7700R2x2-HES can also use the 7700FR-G frame Genlock (Rev A cards or newer). To enable this mode, access the menu system and locate the GSRC (Genlock Source), and select which of the two frame Genlock signals will be used. Please refer to section 6.3.4.

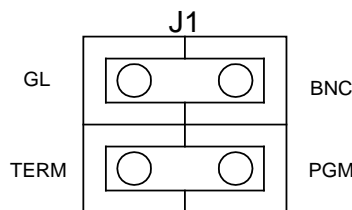


Figure 8-3: Genlock Source Jumper Configuration

8.5.2. PGM Output 3 Mode of Operation

The 7700R2x2 (excluding the 7700RD2x2-HD) can optionally be configured to output a third PGM signal from the PGM Output 3 BNC. To enable this mode, locate jumper J1 on the rear plate. Apply a jump across the “PGM” pin with the “BNC” pin, and a jump across the “TERM” pin with the “GL” pin. This will map the BNC to the PGM output circuitry and terminate the Genlock BNC input path.

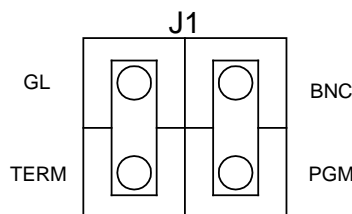


Figure 8-4 PGM Output 3 Jumper Configuration

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