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REVISION HISTORY

REVISION	DESCRIPTION	DATE
0.1	Preliminary Version	Sep 06
1.0	Updated Table 5-1 Dip Swich Functions, VistaLINK®, and Status Window items	Jun 07
1.1	Updated VistaLINK section	Nov 08

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1. OVERVIEW

The 7780DLY-ASI is a full function ASI Delay module designed for applications such as: satellite uplink, redundant path matching, and matching delays in the compressed domain caused by multi-path compression and distribution.

The 7780DLY-ASI will delay any transport streams with any content (MPEG-2, H.264, VC-1, data, audio, etc…). It is completely agnostic of the content of the stream.

The 7780DLY-ASI offers up to 16 seconds of delay in 1 ms increments.

Model	Video Standard	Delay Range	Bitrate
7780DLY-ASI	DVB ASI	65 μs up to 16 seconds	From 100Kbits/s to 213Mbits/s

The 7780DLY-ASI ASI Delay modules will delay the complete ASI stream bit by bit maintaining any transport stream timing and ASI packet distribution. The delay can be set in seconds with 1 ms increments.

With the broadcast environment in mind, the modules feature bypass relay protection to one output. The 7780DLY-ASI ASI Delay modules are housed in a 3RU frame that will hold up to seven 7780DLY-ASI modules or a 1RU frame that will hold up to three modules.

Features:

- 1 ASI input 100kb/s to 213Mb/s and 2 ASI outputs
- Delay from few bytes to 16 seconds in 1ms increment
- Support 188 and 204 bytes packets (Auto-detect)
- ASI input test includes:
    - Sync Byte error and Sync loss detection
    - Total Bitrate
    - Useful Bitrate
    - Null packet Bitrate
    - Continuity count error
    - List of active PIDs
- Controlled by VistaLINK® PRO or Card Edge
- Fully integrated with the industry leading Evertz VistaLINK® PRO NMS system
- OSD (On-Screen Display) on SDI output for status and configuration display
- 7 programmable preset delays controllable by GPI and VistaLINK® PRO
- Passive bypass for increased safety

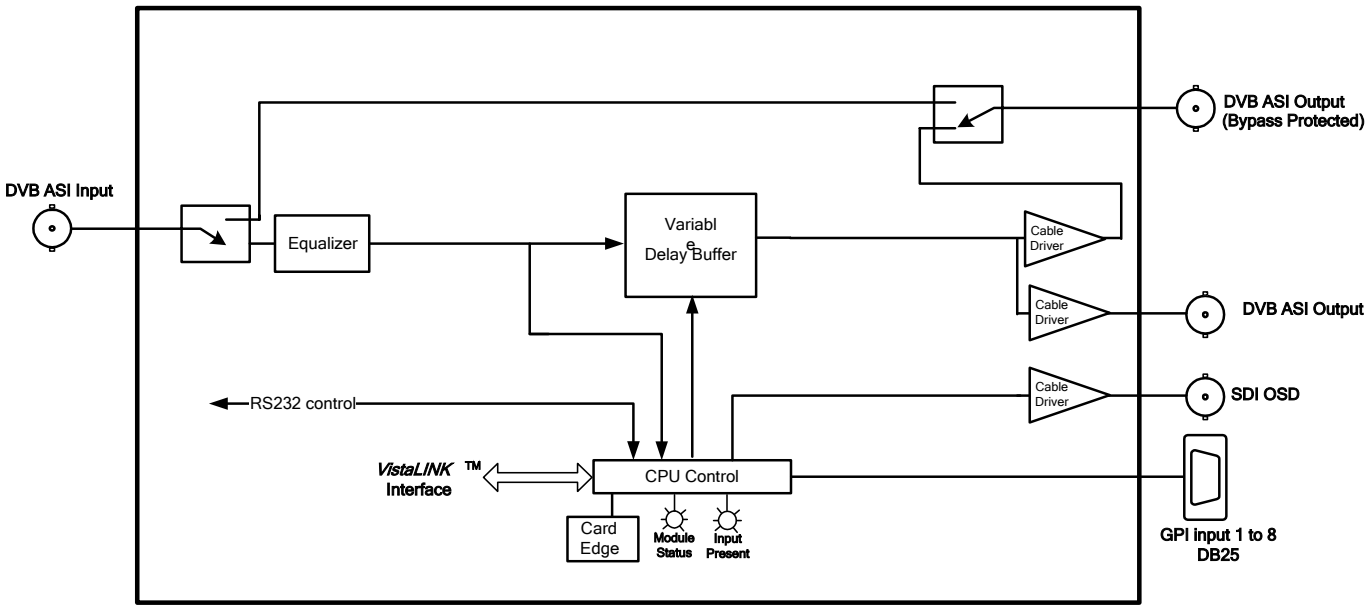

Figure 1-1: 7780DLY-ASI ASI Delay Block Diagram

2. INSTALLATION

The 7780DLY-ASI module comes with a companion rear plate that has 4 BNC connectors and a 25 pin D connector and occupies two slots in the frame. For information on mounting the rear plate and inserting the module into the frame see section 3 of the 7700FR chapter.

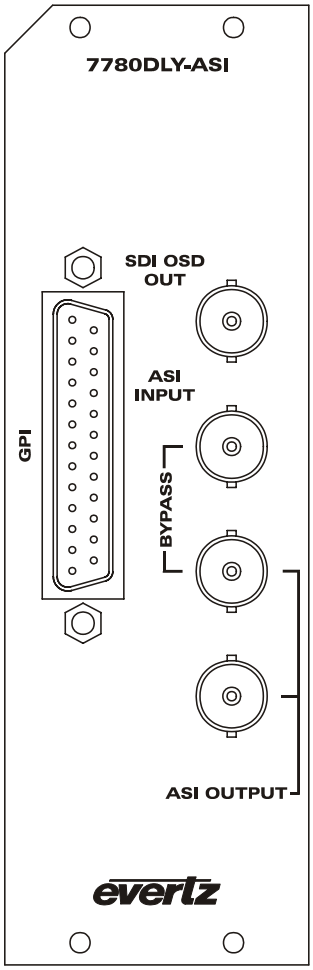

Figure 2-1: 7780DLY-ASI Rear Panel

2.1. ASI CONNECTIONS

ASI INPUT: Input BNC connector for the DVB ASI signal.

ASI OUTPUT (VIDEO OUTPUT): Two BNC ASI outputs are provided. Output 1 is protected by a bypass relay, which will activate in the event of power loss to the module. The remaining output is not bypass protected.

2.2. SDI OUTPUT OVER OSD

SDI OSD OUT: This BNC is used to connect a SDI video monitor to view the on screen display.

2.3. GENERAL PURPOSE INPUTS

A 25 pin D connector labeled GPI contains 8 GPI inputs. The connector pinout is shown in Table 2-1.

Pin #	Name	Description
1	-	Not used
2	-	Not used
3	GPI 0	Bypass Relay Enable
4	GPI 1	Preset 1
5	-	Not used
6	-	Not used
7	-	Not used
8	-	Not used
9	-	Not used
10	-	Not used
11	GPI 2	Preset 2
12	GPI 3	Preset 3
13	GPI 4	Preset 4
14	GPI 6	Preset 6
15	GPI 7	Preset 7
16	-	Not used
17	-	Not used
18	-	Not used
19	-	Not used
20	-	Not used
21	GND	Ground
22	-	Not used
23	-	Not used
24	-	Not used
25	GPI 5	Preset 5
	Shell	Ground

Table 2-1: GPI Connector Pin Definitions

3. SPECIFICATIONS

3.1. ASI INPUT/OUTPUT

3.1.1. Asynchronous Serial Interface

Standard: DVB TR101 891, 270Mb/s
Number of Inputs: 1
Number of Outputs: 1 (with relay bypass)
Bitrate: 100kb/s to 213Mb/s

3.1.2. Standard Definition Serial Digital Video (OSD)

Number of Outputs: 1
Connector: BNC per IEC 61169-8 Annex A
Signal Level: 800mV nominal
DC Offset: 0V ±0.5V
Rise and Fall Time: 200ps nominal (HD), 740ps nominal (SD)
Overshoot: < 10% of amplitude
Return Loss: > 15dB up to 1.5Gb/s (HD)
Wide Band Jitter: < 0.2 UI

3.2. FUNCTIONAL

Minimum Delay:
7780DLY-ASI: 5 MPEG-2 packets
Maximum Delay:
7780DLY-ASI: 16 sec independent of the ASI bitrate

3.3. ELECTRICAL

Voltage: + 12VDC
Power: 20 watts
EMI/RFI: Complies with FCC Part 15, class A devices.
Complies with EU EMC directive.

3.4. PHYSICAL

7700 frame mounting:
Number of slots: 2

7701 frame mounting:
Number of slots: 1

Stand Alone Enclosure:
Dimensions: 14 " L x 4.5 " W x 1.9 " H
(355 mm L x 114 mm W x 48 mm H)
Weight: approx. 1.5 lbs. (0.7 Kg)

4. STATUS LEDS

The 7780DLY-ASI has 2 LED Status indicators on the main circuit board and 1 indicator on the sub-module to show operational status of the card at a glance. Figure 7-1 and Figure 7-2 shows the location of the LEDs and card edge controls.

Two large LEDS on the front of the main 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 the board power is good and the module detects a valid input.

SIGNAL PRESENT: This Green LED will be ON when there is a valid ASI signal present at the module input.

One LED on the sub-module (7700CC) indicates the presence of the ASI TS input.

5. CARD EDGE CONTROLS - 7780DLY-ASI

The 7780DLY-ASI module is equipped with a 4 position DIP switch on the top edge of the card to allow the user to select various functions. All positions are assigned sequentially such that the DIP switch 1 is located farthest from the front of the card. Table 5-1 gives an overview of the DIP switch functions for the 7780DLY-ASI. Sections 5.1 and 5.2 describe the assigned DIP switch functions. The On (closed) position is down, or closest to the printed circuit board. The Off (open) position is up, or farthest from the printed circuit board. There is also a toggle switch and pushbutton which are used to navigate the on screen menu. (See section 6).

DIP 1	DIP 2	DIP 3	DIP 4	Setting
0	0	0	0	525i/59.94
0	0	0	1	Not used
0	0	1	0	Not used
0	0	1	1	Not used
0	1	0	0	Not used
0	1	0	1	Not used
0	1	1	0	Not used
0	1	1	1	Not used
1	0	0	0	625i/60
1	0	0	1	Not used
1	1	1	1	VistaLINK® remote ON (otherwise, VistaLINK® remote OFF)

Table 5-1: Overview of DIP Switch Functions – 7780DLY-ASI

5.1. SELECTING THE OSD VIDEO STANDARD – 7780DLY-ASI

DIP switch 1 is used to select the video standard for the SDI OSD output.

DIP 1	Video Format
Off	525 lines (525i/59.94)
On	625 lines (625i/50)

Table 5-2: Video Standard Switch Settings – 7780DLY-ASI

Note that when VistaLINK® is enabled, the control of the OSD format is done through software.

5.2. SELECTING WHETHER THE MODULE WILL BE CONTROLLED FROM THE LOCAL CONTROLS OR THROUGH THE VISTALINK® INTERFACE – 7780DLY-ASI

DIP switch 2, 3, 4 selects whether the module will be controlled from the local user controls or through the *Vista*LINK® interface.

DIP 1	DIP 2	DIP 3	DIP 4	VISTALINK® CONTROL
Off	Off	Off	Off	525i/59.94
ON	Off	Off	Off	625i/50
Off	Off	On	Off	Not used
Off	Off	On	On	Not used
On	On	Off	Off	Not used
On	On	Off	On	Not used
On	On	On	Off	Not used
On	On	On	On	The card functions are controlled through the VistaLINK® interface and local menu (See section 8)

Table 5-3: VistaLINK® Control Switch Settings – 7780DLY-ASI

6. USING THE ON SCREEN MENU

An On Screen Display (OSD) is used to configure many of the module's parameters. The three position, return to center, toggle switch and momentary pushbutton located on the front edge of the module are used to navigate the OSD setup menus and configure the cards various controls.

The OSD menu system is always present on the SDI output. You can use the toggle switch to move up and down the list of available sub-menus. An arrow (>) moves up and down the left hand side of the menu items to indicate which item you are currently selecting. Once the arrow is on the desired item, press the pushbutton to select the next menu.

On all menus, there is a selectable item *Done*. Selecting *Done* will take you to the previous menu (the one that was used to get into the menu). If you are at the top level of the menu tree then selecting *Done* will exit the OSD menu and return to the main status display.

Once you are in a sub-menu, there may be another menu level, or there may be a list of parameters to adjust. If there is another set of menu options, use the toggle switch to select the next choice with the same procedure as in the main menu.

If there is a list of parameters to adjust, use the toggle switch to move up or down to the desired parameter and press the pushbutton. The arrow will move to the right hand side (<) indicating that you can now adjust the parameter. 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 choices, you can cycle through the list by pressing the toggle switch in either direction.

When you have stopped at the desired value, depress the pushbutton. This will update the parameter with the selected value and move the arrow back to the left side of the parameter list. Continue selecting and adjusting other parameters or use the *Done* commands to return to the next higher menu level.

NOTE: THERE IS NO PICTURE DISPLAYED ON THE SDI OSD AS THE INPUT OF THE 7780DLY-ASI IS A COMPRESSED STREAM AND THE CARD DOES NOT HAVE AN MPEG-2 DECODER.

6.1. TOP LEVEL MENU STRUCTURE

When the module is running, the OSD will show the status of the input. The status window displays the following:

SIGNAL	ASI input presence status.
TOTAL TS BITRATE	A measurement of the total Bitrate of the input stream.
NULL PACKETS	A measurement of the null packet Bitrate in the input stream.
USEFUL BITRATE	A measurement of the non null packet Bitrate in the input stream.
DETECTED TS PACKET LENGTH	Detected packet length on the input stream (188 or 204 bytes).
MODULE STATUS	Displays the module health status.
ASI DELAY	Identifies the current settings of the ASI delay.
SYNC BYTE ERROR COUNTER	A running count of the number of sync errors since the last stream synchronization or reset.
MAX BITRATE THRESHOLD ERROR	Indicates whether the max total Bitrate threshold has been exceeded.
MIN BITRATE THRESHOLD ERROR	Indicates whether the min total Bitrate threshold has been exceeded.
TOTAL CONTINUATY COUNT ERRORS	A running count of the number of continuity errors across all PIDs since the last stream synchronization or reset.
ACTIVE PID COUNTS	Defines a total of all active PID's detected.
OSD VIDEO STANDARD	Video standard of the SD OSD output.
VistaLINK® CONTROL	Indicates whether remote control of the module is enabled.

The following is a brief description of the top level of the menu tree that appears when you enter the on screen menu. Selecting one of these items will take you down into the next menu level.

SET ASI DELAY	Set the amount of delay.
MONITORING PARAMETER	Setup monitoring parameters and reset parameters.
UTILITY	Enter the utility menu.
DONE	Exit On Screen Menu System.

6.1.1. Setting the ASI Delay

The *SET ASI DELAY* menu item allows the user to set the ASI delay. The maximum delay is approximately 16 seconds. The ASI delay is set using millisecond increments. Each time the pushbutton is pressed to accept a new value of delay, the new ASI delay will be implemented immediately.

DELAY	Sets the amount of ASI delay in seconds and milliseconds.
DONE	Return to main menu.

6.2. CONFIGURING THE MONITORING PARAMETERS

The *MONITORING PARAMETER* menus are used to set measurement thresholds. The chart below shows the items available in the *Reference Phase* menu.

MAX BITRATE THRESHOLD	Sets the maximum Bitrate threshold above which an error will be generated.
MIN BITRATE THRESHOLD	Sets the minimum Bitrate threshold below which an error will be generated.
TS PACKET LENGTH	Set to auto-detect or force to 188 or 204 bytes per packet.
TIMEOUT WINDOW	Sets the timeout period to report sync byte errors.
RESET ERROR	Reset all error counters.
DONE	Return to main menu.

6.3. UTILITY MENU

BYPASS RELAY OFF/ON	Activates bypass from input to the first output BNC. The module will not detect an input in this condition.
RECALL PRESET	Recalls one of the 7 delay presets.
SAVE PRESET	Save current settings into one of the 7 delay presets.
FACTORY RESET	Reset the module to factory defaults.
VISTALINK STATUS	Enable or disable VistaLINK® control.
FIRMWARE VERSION	Displays the firmware version installed in the module.
DONE	Return to the main menu.

7. JUMPERS AND USER CONTROLS

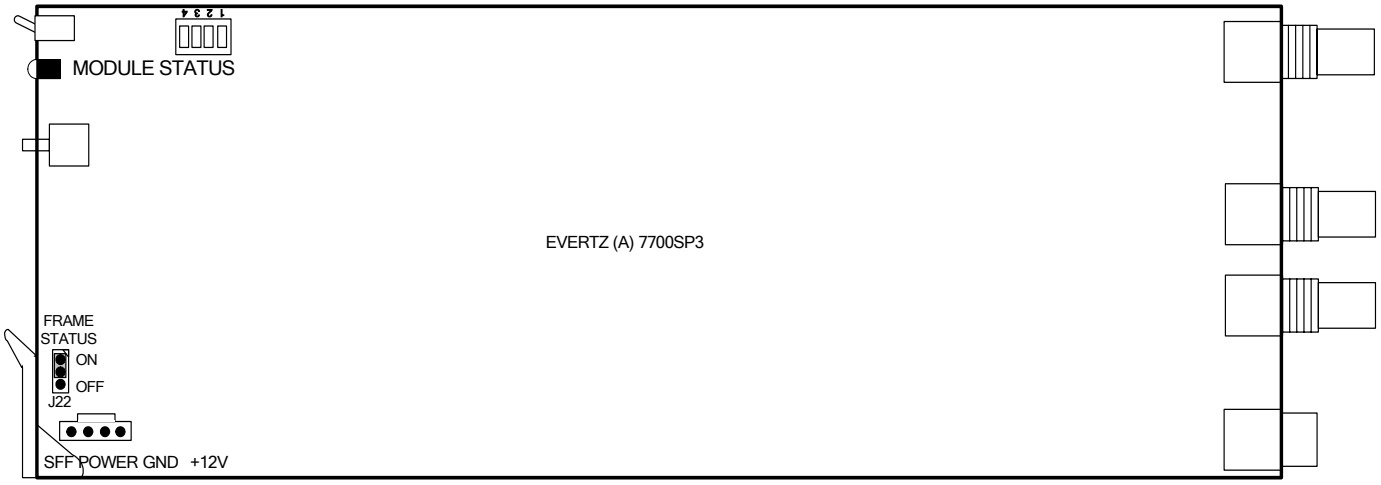

Figure 7-1: Location of Jumpers on Main Boards

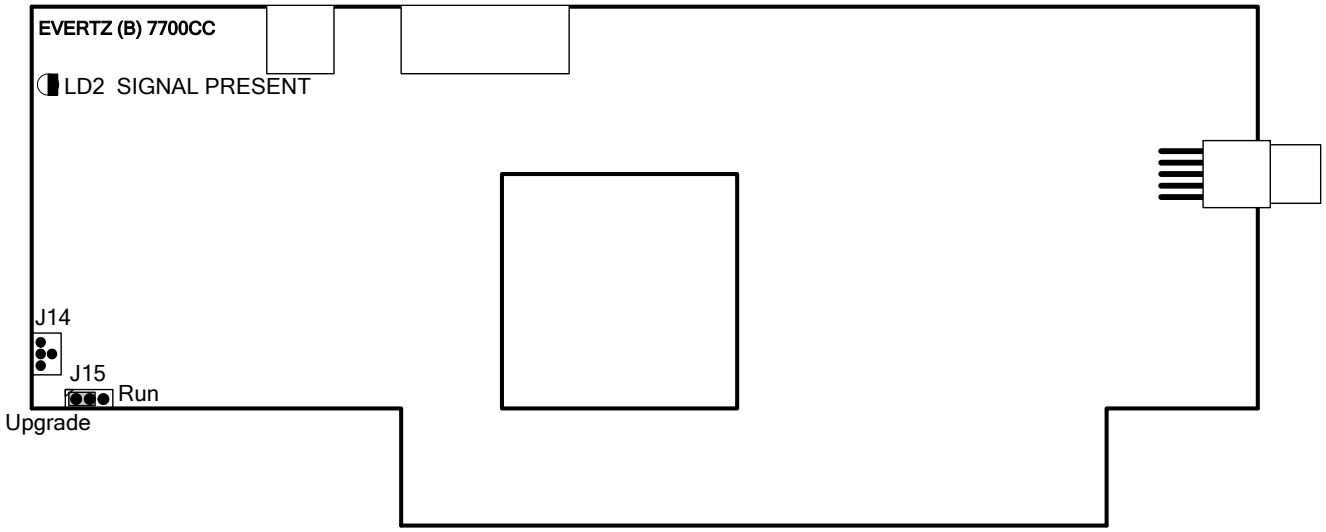

Figure 7-2: Location of Jumpers on 7700CC Sub-Module

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

FRAME STATUS: The FRAME STATUS jumper J22 located at the front of the main module determines whether local faults (as shown by the Local Fault indicator) will be connected to the 7700FR frame's global status bus.

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

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

7.2. CONFIGURING THE MODULE FOR FIRMWARE UPGRADES

UPGRADE: The UPGRADE jumper J15 located near the front of the sub-module 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* chapter in the front of the binder for more information.

To upgrade the firmware in the module, pull it out of the frame. Move Jumper J15 to the *UPGRADE* position. Install the Upgrade cable provided (located in the vinyl pouch in the front of this manual) onto header J14 at the card edge. Re-install the module into the frame. Perform the upgrade as described in the *Upgrading Firmware* chapter. Once the upgrade is complete, remove the module from the frame, move J15 to the *RUN* position, remove the upgrade cable and re-install the module. The module is now ready for normal operation.

8. VISTALINK® REMOTE MONITORING/CONTROL

8.1. 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 *Vista*LINK®-C Configuration Utility graphical user interface (GUI), third party or custom manager software may be used to monitor and control Evertz *Vista*LINK® enabled products.

2. Managed devices each with a unique address (OID), communicate with the NMS through an SNMP Agent. The 7780DLY-ASI communicates directly with the manager using its internal 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.

8.2. VISTALINK® MONITORED PARAMETERS

The following parameters can be remotely monitored through the VistaLINK® interface.

Parameter	Description
ASI Delay	The current ASI delay.
Bypass relay status	The current relay status.
Local remote mode	The status of the VistaLINK® DIP switch.
Data bitrate	The value of the input ASI bitrate.
Null packet data rate	The value of the input null packet rate.
Useful data rate	The value of the useful input data rate.
Packet length	The packet length of the input stream.
Number of PIDs	The number of active PIDs on the input.
Continuity count error counter	The value of the number of continuity count errors reported.
Module Status	Indicates module status.
Input ASI Present	Indicates the status of the ASI input signal. (The state of the ASI PRESENT LED)
Max Bitrate threshold	Indicates the set threshold for maximum bitrate.
Min Bitrate threshold	Indicates the set threshold for minimum bitrate.

Table 8-1: VistaLINK® Monitored Parameters

8.3. VISTALINK® CONTROLLED PARAMETERS

Parameter	Description
ASI Delay	Set ASI delay.
Bypass relay	Set bypass relay mode.
Preset recall	Recall a preset.
Preset store	Store current configuration into preset.
Packet length	Force packet length.
OSD video standard	Set video standard for the OSD.
Max Bitrate threshold	Indicates the set threshold for maximum bitrate.
Min Bitrate threshold	Indicates the set threshold for minimum bitrate.
Timeout Window	Set timeout period to report sync byte errors.
Reset Errors	Reset all error counters.

Table 8-2: VistaLINK® Controlled Parameters

8.4. VISTALINK® TRAPS

The following traps can be controlled through the VistaLINK® interface. Each trap will indicate a fault condition when its value is True.

Parameter	Description
Module Status	Indicates good module health and the presence of a valid ASI input signal. (The state of the MODULE OK LED)
Input ASI Present	Indicates the presence of a valid ASI input signal. (The state of the ASI PRESENT LED)
Max Bitrate threshold	Indicates the max bitrate threshold that has been exceeded.
Min Bitrate threshold	Indicates the min bitrate threshold that has not been exceeded.
Continuity count error	Indicates the module detected continuity count error.
Sync byte error	Indicates the module detected sync byte error.
Transport Stream Sync Loss	Indicates the module detected transport stream sync loss.

Table 8-3: VistaLINK® Traps

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