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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

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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 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:

- Full ASI signal delay capability
- Delay programmable in ms up to 16 seconds
- Bypass relay for program path protection on power loss
- Card edge controls operate on screen menu system to program delay settings
- ASI input basic measurements and alarming
- On screen display of main parameters (SDI output)
- VistaLINK® - enabled offering remote control and configuration capabilities via SNMP using VistaLINK® Pro or 9000NCP Network Control Panel. 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

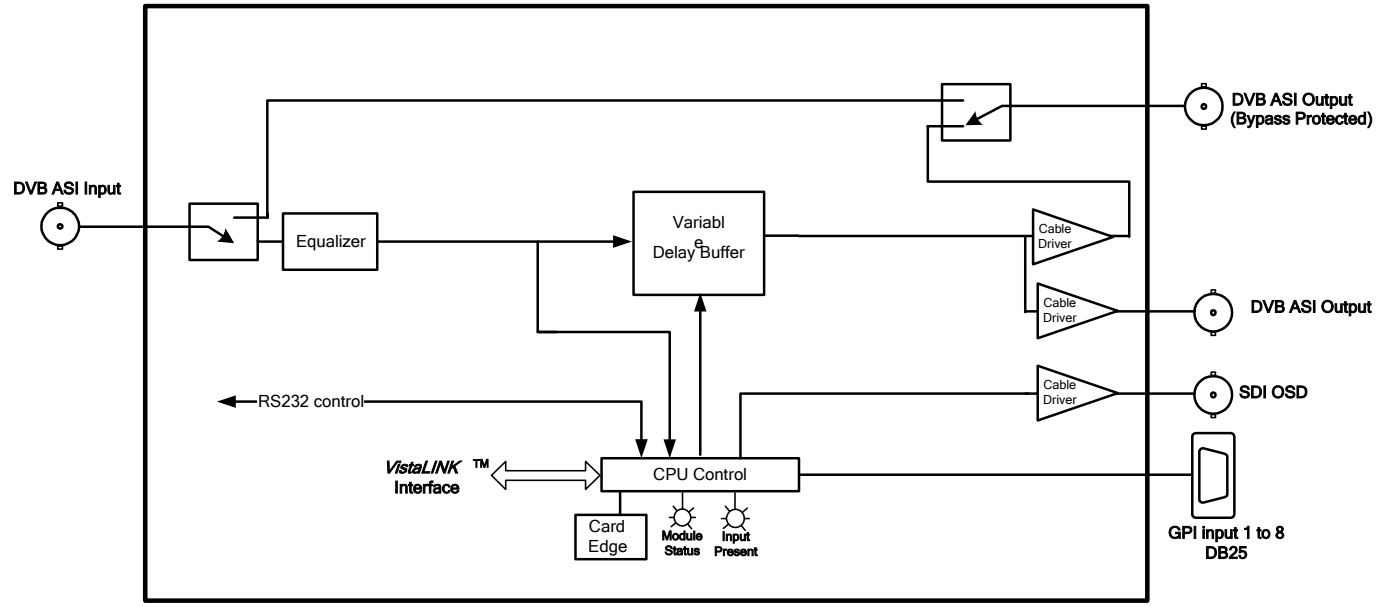

Figure 1-1: 7780DLY-ASI ASI Delay Block Diagram

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.

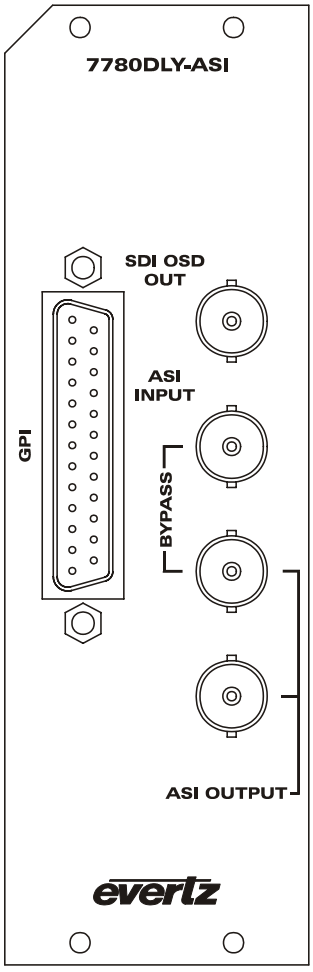

Figure 2-1: 7780DLY-ASI Rear Panel

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

3.1.1. Asynchronous Serial Interface

Standard: ASI per DVB TR 101 891-270Mbits/s
Rate: Minimum ASI TS input bitrate 100Kbits/s, Maximum ASI TS input bitrate 213 Mbits/s
Connector: BNC per IEC 60169-8 Amendment 2.

3.2. SERIAL VIDEO OUTPUTS

3.2.1. ASI Output

Number of Outputs: 1 with relay bypass, 1 additional output.
Standard: ASI per DVB TR 101 891-270Mbits/s
Connector: BNC per IEC 60169-8 Amendment 2.

3.2.2. Standard Definition Serial Digital Video (OSD)

Number of Outputs: 1 for OSD
Connector: BNC per IEC 60169-8 Amendment 2.
Signal Level: 800mV nominal
DC Offset: 0V ±0.5V
Rise and Fall Time: 560ps nominal
Overshoot: <10% of amplitude
Return Loss: > 15 dB up to 540 Mb/s
Wide Band Jitter: < 0.2 UI

3.3. FUNCTIONAL

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

3.4. ELECTRICAL

Voltage: + 12VDC
Power: 14 watts
EMI/RFI: Complies with FCC regulations for class A devices.
Complies with EU EMC directive.

3.5. 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 choosing. 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 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 input stream (188 or 204 bytes)
MODULE STATUS	Module health status
ASI DELAY	Current set 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	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	Set 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 input in this condition
RECALL PRESET	Recall one of the 7 delay presets
SAVE PRESET	Save current settings into one of the 7 delay preset
FACTORY RESET	Reset the module to factory defaults
VISTALINK STATUS	Enable or disable VistaLINK® control
FIRMWARE VERSION	Display the firmware version installed in the module
DONE	Return to main menu

7. JUMPERS AND USER CONTROLS

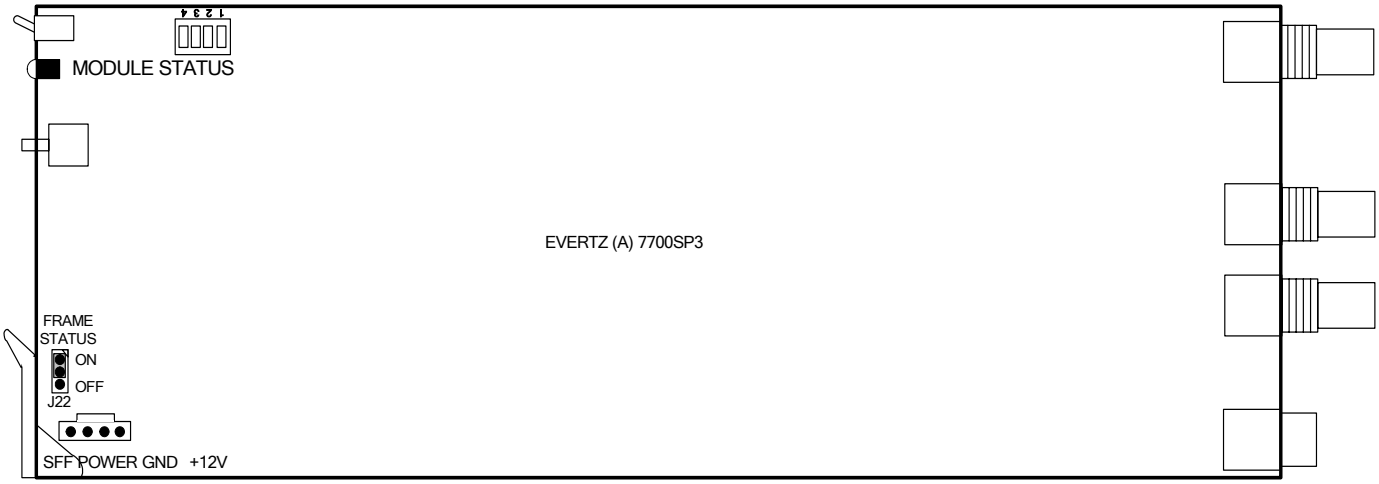

Figure 7-1: Location of Jumpers on Main Boards

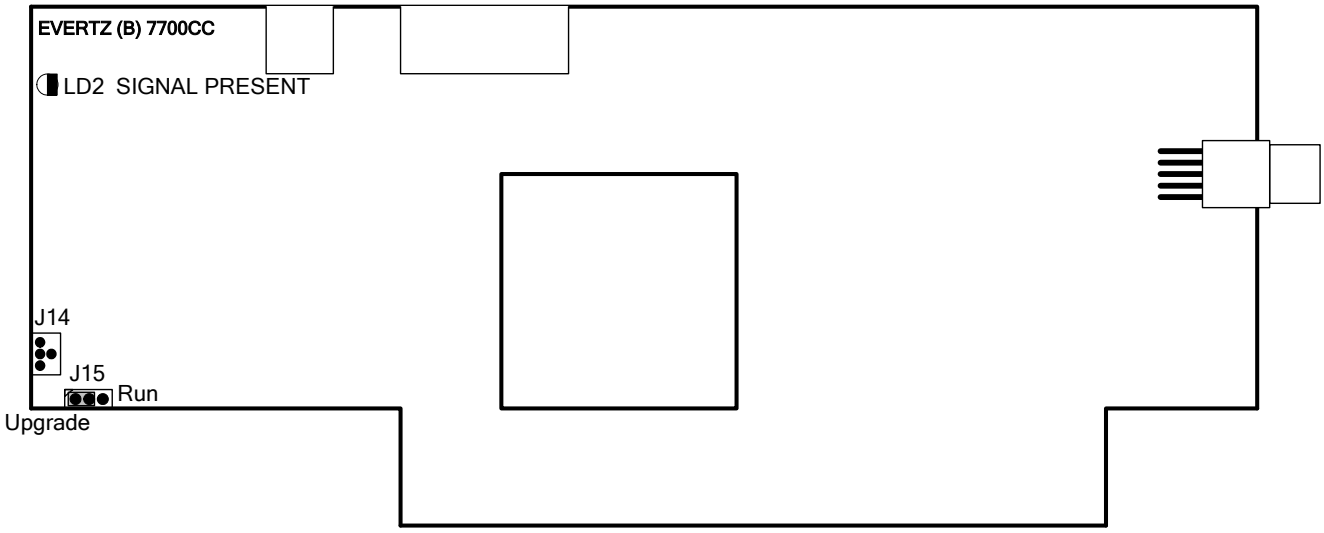

Figure 7-2: Location of Jumpers on 7700CC Sub-Module

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® Pro Manager graphical user interface (GUI), third party or custom manager software may be used to monitor and control Evertz *Vista*LINK® enabled fiber optic products.

2. Managed devices, (such as 7707MB), 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 MultiFrame 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 *Vista*LINK® network, see the 7700FC Frame Controller chapter.

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 that the max bitrate threshold has been exceeded
Min Bitrate threshold	Indicates that the min bitrate threshold has not been exceeded
Continuity count error	Indicates that the module detected continuity count error
Sync byte error	Indicates that the module detected sync byte error
Transport Stream Sync Loss	Indicates that the module detected transport stream sync loss

Table 8-3: VistaLINK® Traps