

TABLE OF CONTENTS

1.	OVERVIEW.....	1
2.	INSTALLATION.....	3
2.1.	VIDEO SIGNAL CONNECTIONS.....	3
2.2.	AES AUDIO CONNECTIONS (MODEL 7707VAT-HD).....	4
2.3.	AES AUDIO CONNECTIONS (MODEL 7707VAT-U-HD).....	4
2.4.	OPTICAL SIGNAL CONNECTIONS	4
2.5.	CARE AND HANDLING OF OPTICAL FIBER.....	5
2.5.1.	Safety	5
2.5.2.	Assembly.....	5
2.5.3.	Labeling.....	5
2.5.4.	Handling and Connecting Fibers	6
3	SPECIFICATIONS.....	7
3.1	SERIAL DIGITAL VIDEO INPUT.....	7
3.2	SERIAL DIGITAL VIDEO OUTPUT.....	7
3.3	AES AUDIO INPUTS	7
3.4	OPTICAL OUTPUT.....	8
3.5	VIDEO LOCK TIME	8
3.6	ELECTRICAL	8
3.7	COMPLIANCE	8
3.8	PHYSICAL	8
4	STATUS INDICATORS AND DISPLAYS	9
4.1	STATUS INDICATOR LEDS	9
4.2	DOT-MATRIX DISPLAY AND CONTROLS	10
4.2.1	Display of Warning Status Indications.....	12
4.2.2	Displaying the Input Video Standard	12
4.2.3	Displaying the Input Equalization Strength	13
4.2.4	Displaying the Status of Input Video Embedded Audio Groups	13
4.2.5	Displaying the AES Audio Sample Rate.....	13

4.2.6	Displaying the Software Version	14
4.2.7	Selecting the Output Video Standard	14
4.2.8	Selecting Audio Embedding Group	15
4.2.9	Selecting the Output Video when the Signal is Lost.....	16
4.2.10	Selecting the COAX Mode	16
4.2.11	Selecting the Output Laser Enable Mode.....	17
4.2.12	Selecting Input Video Cleaning	17
4.2.13	Selecting Video Error Detection	17
4.2.14	Selecting AES Sample Rate Conversion	18
4.2.15	Selecting Audio Error Detection	18
4.2.16	Selecting the Headphone Monitoring Jack Channel	18
4.2.17	Setting the Orientation of the Display.....	19
4.2.18	Selecting the Factory Reset Configuration.....	19
5	JUMPER CONTROLS.....	20
5.1	SELECTING WHETHER LOCAL FAULTS WILL BE MONITORED BY THE GLOBAL FRAME STATUS.....	20
5.2	CONFIGURING THE MODULE FOR FIRMWARE UPGRADES	20
6	V/STALINK® REMOTE MONITORING/CONTROL	21
6.1	WHAT IS V/STALINK®?	21
6.2	V/STALINK® MONITORED PARAMETERS	21
6.3	V/STALINK® CONTROLLED PARAMETERS	22
6.4	V/STALINK® TRAPS	22

Figures:

Figure 1-1:	7707VAT-HD Block Diagram	2
Figure 2-1:	7707VAT-HD Rear Panel	3
Figure 2-2:	Reproduction of Laser Certification and Identification Label.....	5
Figure 4-1:	Location of Jumpers and Card Edge Controls	9
Figure 4-2:	Card-edge Menu Quick Reference.....	11

Tables:

Table 6-1:	VistaLINK® Monitored Parameters.....	21
Table 6-2:	VistaLINK® Controlled Parameters	22
Table 6-3:	VistaLINK® Traps	22

REVISION HISTORY

<u>REVISION</u>	<u>DESCRIPTION</u>	<u>DATE</u>
1.0	Preliminary Version	Jan 05
1.1	Added 7707VAT-U-HD and updated laser warning	Aug 05
1.2	Updated Menu and VistaLINK descriptions	Sept 05
1.3	Added Video Lock Time Spec	Mar 06
1.4	Added GEN and COAX menu descriptions	Nov 08
1.5	Updated GEN and CLN menu items	Oct 09
1.6	Updated block diagram	Nov 09

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

WARNING



Never look directly into an optical fiber. Non-reversible damage to the eye can occur in a matter of milliseconds.



Do not hook up the 7707VAT-HD DWDM cards and 7707VAR-HD cards directly with a short fiber optic cable. The 7707VAT-HD DWDM card produces +7dBm of power which will damage the receiver if connected directly.



Do not hook up the 7707VAT-HD cards that output more than -7dBm of power (see 7707VAT-HD specifications for output power of various laser types) and 7707VAR-HD-H high sensitivity receiver cards directly with a short fiber optic cable. The 7707VAT-HD cards that produce more than -7dBm of power will damage the receiver if connected directly.

1. OVERVIEW

The 7707VAT-HD fiber transmitter extends one HD or SD digital video signal over a fiber optic link, accompanied by four AES audio signals. Audio signals are embedded into HD, SD, or SDTi video for optical transport. The 7707VAT-HD is designed to operate with a companion 7707VAR-HD receiver, to permit communication over distances up to 120Km, with minimum possible latency. The 7707VAT-U-HD has unbalanced audio connections and is identical to the 7707VAT-HD in all other respects.

Monitoring and control of card status and parameters is provided locally at the card-edge, or remotely via VistaLINK® capability.

The fiber output is available in an assortment of optical wavelengths, accommodating standard, or CWDM transmission schemes. (See Specifications for complete information)

7707VAT13-HD	1310 nm FP	-7dBm output, suitable for distances up to 50 Km
7707VAT15-HD	1550 nm DFB	0dBm output, suitable for distances up to 75 Km

There are several versions with built in isolators specifically suited to coarse wave division multiplexing (CWDM) applications. These versions all have 0dBm output and are suitable for distances up to 75 Km.

7707VAT27-HD	1270 nm DFB
7707VAT29-HD	1290 nm DFB
7707VAT31-HD	1310 nm DFB
7707VAT33-HD	1330 nm DFB
7707VAT35-HD	1350 nm DFB
7707VAT37-HD	1370 nm DFB
7707VAT43-HD	1430 nm DFB
7707VAT45-HD	1450 nm DFB
7707VAT47-HD	1470 nm DFB
7707VAT49-HD	1490 nm DFB
7707VAT51-HD	1510 nm DFB
7707VAT53-HD	1530 nm DFB
7707VAT55-HD	1550 nm DFB
7707VAT57-HD	1570 nm DFB
7707VAT59-HD	1590 nm DFB
7707VAT61-HD	1610 nm DFB

There are several versions with built in isolators specifically suited to dense wave division multiplexing (DWDM) applications. The DWDM versions are suitable for distances >50 Km @ 1.5 Gb/s (for DWDM applications contact factory).

7707VATDyyy-HD DWDM DFB laser output, yyy – ITU channel number

The 7707VAT-HD occupies one card slot and can be housed in either a 1RU frame, which will hold up to three modules, or a 3 RU frame, which will hold up to 15 modules.

Features:

- HD/SD video and AES audio conveniently presented in a single product.
- Provides embedding of audio and control signals into HD-SDI (SMPTE 292M), SD-SDI (SMPTE 259M-C), SDTi (SMPTE 305.2M).
- Audio sample rate conversion permits asynchronous input of 32KHz, 44.1KHz, or 48KHz AES, with up to 24-bit resolution.
- Audio sample rate conversion may be disabled to permit Dolby-E support.
- With sample rate conversion enabled, transport of audio signals is independent of video interruptions other than format change.
- Audio inputs automatically accept balanced or unbalanced AES without configuration.
- 7707VAT-U-HD has unbalanced audio connections.
- Selectable embedded audio groups and selectable input video cleaning provide flexibility.
- Comprehensive signal and status monitoring via four-digit card-edge display, or *VistaLINK*®.
- Monitoring of input video format, audio group availability, EDH or CRC errors, and signal strength.
- Optical output wavelengths of 1310nm, 1550nm, and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant).
- DWDM wavelengths also available (ITU-T G.694.1 compliant).
- Compatible with multi-mode and single-mode fiber
- SC/PC, ST/PC, or FC/PC fiber connector options.
- Fully hot-swappable from front of frame.
- *VistaLINK*® enabled for remote monitoring and control when installed in 7700FR-C frame with 7700FC *VistaLINK*® Frame Controller.

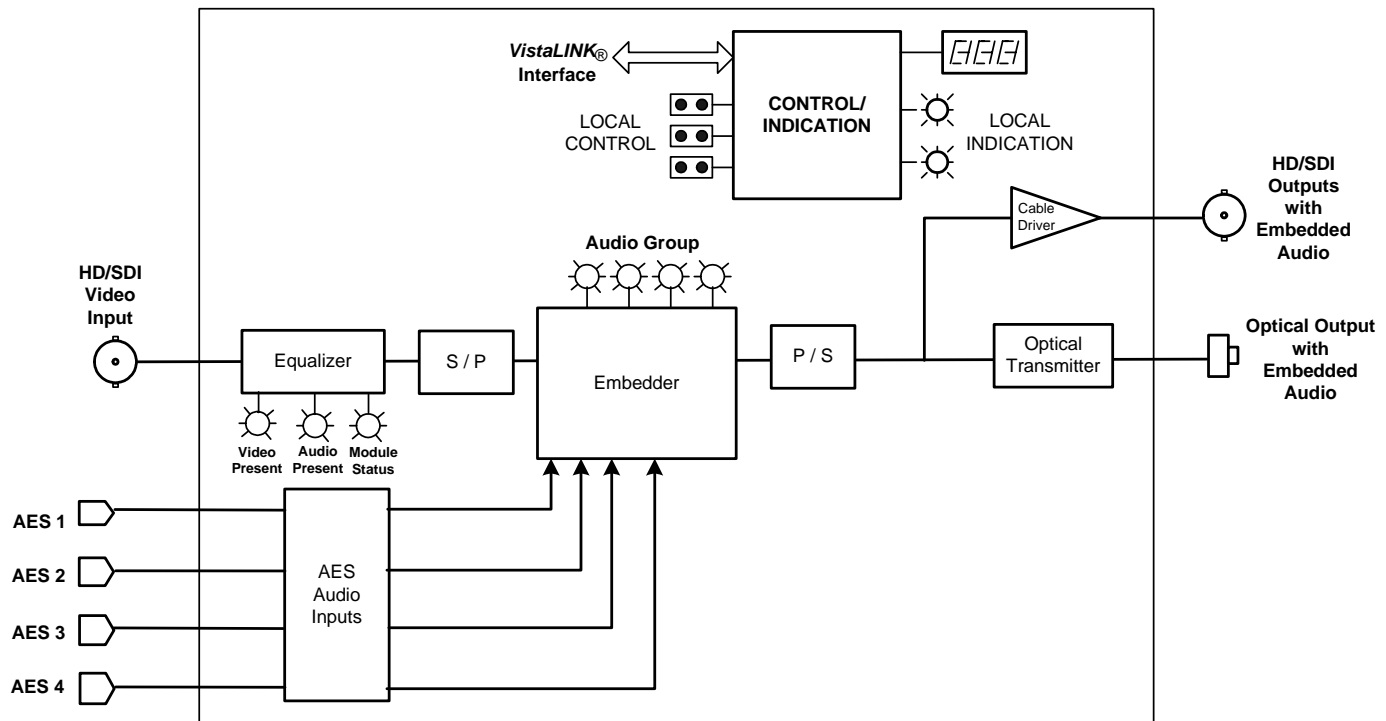


Figure 1-1: 7707VAT-HD Block Diagram

2. INSTALLATION

Each 7707VAT-HD module comes with a companion rear plate that has two BNC connectors, multi-pin removable terminal block connections, and an SC/PC (shown), ST/PC or FC/PC optical connector. The 7707VAT-U-HD modules come with a companion rear plate that has six BNC connectors and one SC/PC, SC/PC with cover (shown), ST/PC or FC/PC optical connector. For information on mounting the rear plate and inserting the module into the frame see section 3 of the 7700FR chapter.

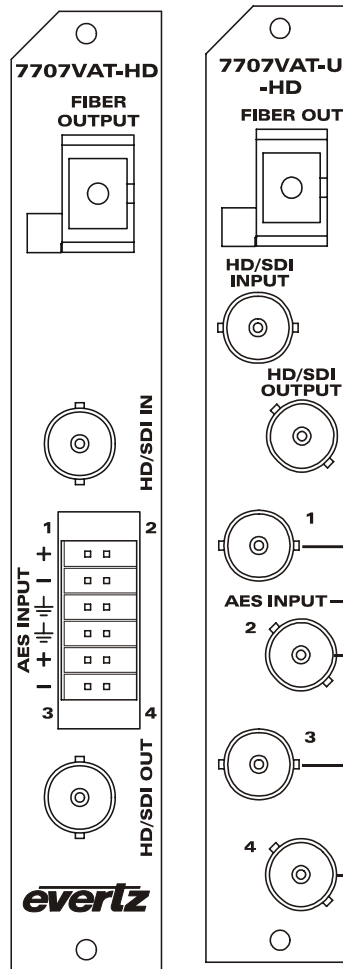


Figure 2-1: 7707VAT-HD Rear Panel

2.1. VIDEO SIGNAL CONNECTIONS

HD INPUT: Input BNC connector for serial digital video signals compatible with HD-SDI (SMPTE 292M), SD-SDI (SMPTE 259M-C), or SDTi (SMPTE 305.2M) standards. This input provides adaptive equalization for up to 100m of industry standard Belden 1694A cable, at 1.485Gb/s. At 270Mb/s, this input provides adaptive equalization for up to 250m of Belden 1694A cable. See section 3.1 for video input specifications.

HD OUTPUT: Reclocked, level-restored, loop-back output BNC connector for serial digital video signals compatible with HD-SDI (SMPTE 292M), SD-SDI (SMPTE 259M-C), or SDTi (SMPTE 305.2M) standards. See section 3.2 for video output specifications.

2.2. AES AUDIO CONNECTIONS (MODEL 7707VAT-HD)

AES IN: AES audio input connections of the removable terminal block. The 7707VAT-HD accommodates four AES audio channels, designated as A1, A2, A3, and A4. Each of these four channels has a positive and negative terminal associated with it, and is able to accept balanced or unbalanced AES without card configuration. Balanced and unbalanced audio signals are connected as follows:

Balanced: Connect positive and negative audio signals to the corresponding positive and negative terminals of the 7707VAT-HD. This connection arrangement yields a nominal 110 Ω input impedance for balanced audio signals.

Unbalanced: Connect unbalanced audio signals to the positive input terminal of the 7707VAT-HD. Leave the negative input terminal unconnected. This connection arrangement yields a nominal 75 Ω input impedance for unbalanced audio signals.

See section 3.3 for AES audio input specifications.

2.3. AES AUDIO CONNECTIONS (MODEL 7707VAT-U-HD)

AES AUDIO IN: Unbalanced AES audio inputs for four AES audio pairs (2 groups) designated as A1, A2, A3, and A4 are available on four BNC connectors.

2.4. OPTICAL SIGNAL CONNECTIONS

FIBER OUTPUT: This is the optical output for the 7707VAT-HD. This output should be connected to the FIBER IN connector of a companion 7707VAR-HD module with a suitable fiber optic cable. The 7707VAR-HD maintains active output video while input video is not suitable for transmission (VID...LOS or STD...ERR condition. See section 4.2.1). In this case, active picture will be grey. The connector is a female SC/PC (shown), ST/PC, or FC/PC connection as specified at the time of purchase. This optical output is available in 1310nm, 1550nm, up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant) and up to 40 DWDM wavelengths (ITU-T G.694.1 compliant). The output wavelength or DWDM channel number is marked on the rear panel of each module. When connected directly to a companion module, the output is compatible with multi-mode fiber optic cable. If not connected directly (i.e. connected through CWDM, DWDM, WDM, or splitter/combiner) the output is compatible only with single-mode fiber optic cable.



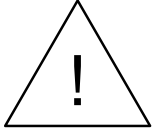
Do not hook up the 7707VAT-HD DWDM cards and 7707VAR-HD cards directly with a short fiber optic cable. The 7707VAT-HD DWDM card produces +7dBm of power which will damage the receiver if connected directly.



Do not hook up the 7707VAT-HD cards that output more than -7dBm of power (see 7707VAT-HD specifications for output power of various laser types) and 7707VAR-HD-H high sensitivity receiver cards directly with a short fiber optic cable. The 7707VAT-HD cards that produce more than -7dBm of power will damage the receiver if connected directly.

2.5. CARE AND HANDLING OF OPTICAL FIBER

2.5.1. Safety



Background colour: yellow
Triangular band: black
Symbol: black

CLASS 1 LASER PRODUCT

2.5.2. Assembly

Assembly or repair of the laser sub-module is done only at Evertz facility and performed only by qualified Evertz technical personnel.

2.5.3. Labeling

Certification and Identification labels are combined into one label. As there is not enough room on the product to place the label it is reproduced here in the manuals.

- There is no date of manufacture on this label as it can be traced by bar code label placed on the Printed circuit board of each Evertz plug-in module
- The Model number is one of: 7707VAT13-HD, 7707VAT15-HD, 7707VATxx-HD, (xx = 27, 29, 31, 33, 35, 37, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61) 7707VATDyyy-HD (Dyyy represents ITU Grid Channel: D200, D210, D220, D230, D240, D250, D260, D270, D280, D290, D300, D310, D320, D330, D340, D350, D360, D370, D380, D390, D400, D410, D420, D430, D440, D450, D460, D470, D480, D490, D500, D510, D520, D530, D540, D550, D570, D580, D590, D600)

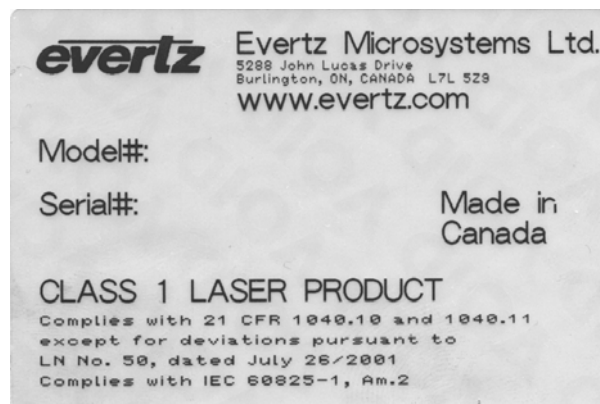


Figure 2-2: Reproduction of Laser Certification and Identification Label

2.5.4. Handling and Connecting Fibers



Never touch the end face of an optical fiber. Always keep dust caps on optical fiber connectors when not connected and always remember to properly clean the optical end face of a connector before making a connection.

The transmission characteristics of the fiber are dependent on the shape of the optical core and therefore care must be taken to prevent fiber damage due to heavy objects or abrupt fiber bending. Evertz recommends that you maintain a minimum bending radius of 5 cm to avoid fiber-bending loss that will decrease the maximum attainable distance of the fiber cable. The Evertz fiber optic modules come with cable lockout devices, to prevent the user from damaging the fiber by installing a module into a slot in the frame that does not have a suitable I/O module. For further information about care and handling of fiber optic cable see section 3 of the Fiber Optics System Design section of this manual binder.

3 SPECIFICATIONS

3.1 SERIAL DIGITAL VIDEO INPUT

Number of Signals:	1 Input
Standards:	SMPTE 292M (HD-SDI), SMPTE 259M-C (SD-SDI), SMPTE305.2M (SDTi)
Connector:	BNC input per IEC 169-8
Equalization:	Automatic to 100m (typ) @ 1.485Gb/s with Belden 1694A or equivalent cable Automatic to 250m (typ) @ 270 Mb/s with Belden 1694A or equivalent cable
Return Loss:	> 15 dB up to 1.5GHz

3.2 SERIAL DIGITAL VIDEO OUTPUT

Number of Signals:	1 Output
Standards:	SMPTE 292M (HD-SDI), SMPTE 259M-C (SD-SDI), SMPTE305.2M (SDTi)
Connectors:	BNC per IEC 169-8
Signal Level:	800mV nominal
DC Offset:	0V \pm 0.5V
Rise and Fall Time:	600ps nominal @270Mb/s 150ps nominal @1.485Gb/s
Overshoot:	<10% of amplitude
Return Loss:	> 15 dB up to 1.5GHz
High Freq. Jitter:	< 0.2 UI

3.3 AES AUDIO INPUTS

Number of Signals:	4 Inputs
Standards:	AES3-2003 (Balanced AES), SMPTE 276M (Unbalanced AES)
Connector:	
7707VAT-U:	4 BNC per IEC 61169-8 Annex A
7707VAT:	12 pin removable terminal strip
Sampling Rate:	32KHz, 44.1KHz, 48kHz
Resolution:	up to 24 bits
Minimum Input:	< 200mVp-p
Maximum Input:	
Balanced:	> 7Vp-p
Unbalanced:	> 1.2Vp-p
Equalization:	
Balanced:	< 1500ft @ 48KHz, with Belden 1800B, and 2Vp-p source signal
Unbalanced:	< 1200m @ 48KHz, with Belden 8281, and 1Vp-p source signal
Impedance:	
Balanced:	\approx 110 Ω
Unbalanced:	\approx 75 Ω
Return Loss:	> 15dB, from 1MHz to 6MHz
Wideband Jitter:	< 10nsp-p, with conditions of minimum to maximum cable length

3.4 OPTICAL OUTPUT

Number of Signals:	1 Output
Standards:	
HD-SDI Input:	SMPTE 292M, with SMPTE 299M Embedded Audio
SD-SDI Input:	SMPTE 259M-C, with SMPTE 272M Embedded Audio
SDTi Input:	SMPTE 305.2M, with SMPTE 272M Embedded Audio
Signaling Rate:	Rate of applied video
Connector:	SC/PC, ST/PC, FC/PC female housing
Fiber Size:	9 μ m core / 125 μ m overall
Wavelengths:	
Standard:	1310nm, 1550nm (nominal)
CWDM:	1270nm to 1610nm (ITU-T G.694.2 compliant)
DWDM:	ITU channel 20 to 60, 100GHz spacing, (ITU-T G.694.1 compliant)
Output Power:	
1310nm FP (Standard)	-7dBm \pm 1dBm
1550nm & CWDM DFB	0dBm \pm 1dBm
DWDM DFB	+7dBm \pm 1dB
Return Loss:	>14dB

3.5 VIDEO LOCK TIME

Synchronous switch:	< 0.5 s
Asynchronous switch:	< 0.8 s
Standards switch:	<10 s

3.6 ELECTRICAL

Voltage:	+12VDC
Power:	12 Watts

3.7 COMPLIANCE

Electrical Safety:	CSA Listed to CSA C22.2 No. 60065-03, UL 60065-03 IEC 60065-(2001-12) 7th Edition Complies with CE Low voltage Directive 93/68/EEC
Laser Safety:	Complies with 24 CFR 1040.10 and 1040.11 except for deviations pursuant to LN No. 50, dated July 26, 2001 Complies with IEC 60825-1, Am. 2
EMI/RFI:	Complies with FCC regulations for class A devices. Complies with EU EMC directive.

3.8 PHYSICAL

7700 or 7701 frame mounting:	
Number of slots:	1

4 STATUS INDICATORS AND DISPLAYS

The 7707VAT-HD has five LED status indicators and a 4-digit dot-matrix display on the front card-edge for monitoring and control of card status and parameters. The card-edge pushbutton and toggle switch are used to select various indications to the dot-matrix display. Figure 4-1 shows the locations of the indicators and pushbutton.

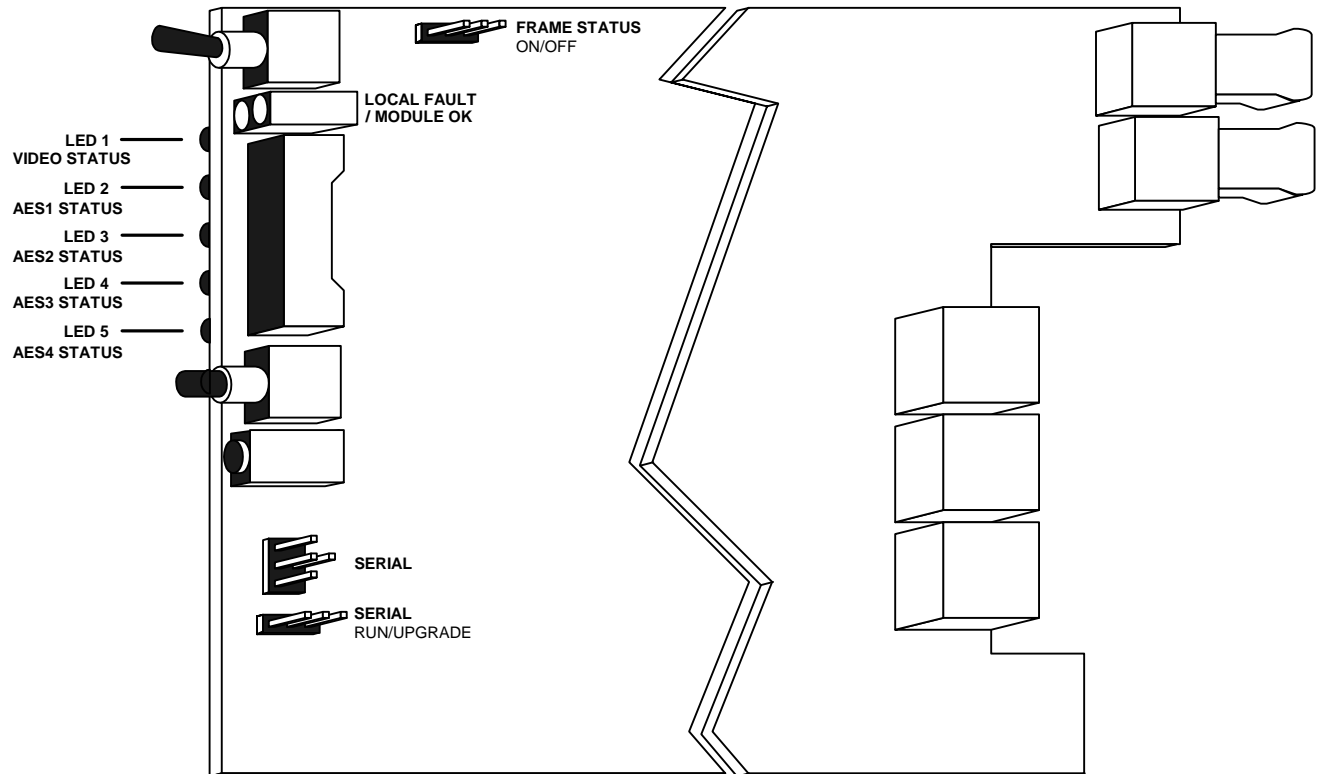


Figure 4-1: Location of Jumpers and Card Edge Controls

4.1 STATUS INDICATOR LEDS

Two large LEDs at the front card-edge indicate operational health of the module as follows:

- MODULE OK:** This green LED indicates good module health. It will be on while a valid signal is present at the video input, the output laser is operating properly, and the card power is good.
- LOCAL FAULT:** This red LED indicates poor module health. Three conditions could cause this fault indication to be active: (1) No valid signal is present at the video input, (2) operation of the output laser is erroneous, or (3) if a card power fault exists (i.e. a blown fuse). The LOCAL FAULT indication can also be reported to the frame by setting the FRAME STATUS jumper.

There are five small LEDs on the back of the card-edge that indicate signal presence. These LEDs are Bi-colour, and able to illuminate as red or green. The functions of these LEDs are as follows:

LED 1, VIDEO STATUS: This LED indicates the status of the video Input. When a valid input video signal is detected the LED will be green. The LED will be red while errors are detected within the input video. If no video is detected on the video input of the 7707VAT-HD the LED will remain off.

LED 2, AES 1 STATUS: This LED indicates the status of Audio Input 1. When a valid input audio signal is detected the LED will be green. When errors are detected within the input audio signal the LED will flash red. If no audio is detected on the first audio input of the 7707VAT-HD the LED will remain off.

LED 3, AES 2 STATUS: This LED indicates the status of Audio Input 1. When a valid input audio signal is detected the LED will be green. When errors are detected within the input audio signal the LED will flash red. If no audio is detected on the second audio input of the 7707VAT-HD the LED will remain off.

LED 4, AES 3 STATUS: This LED indicates the status of Audio Input 1. When a valid input audio signal is detected the LED will be green. When errors are detected within the input audio signal the LED will flash red. If no audio is detected on the third audio input of the 7707VAT-HD the LED will remain off.

LED 5, AES 4 STATUS: This LED indicates the status of Audio Input 1. When a valid input audio signal is detected the LED will be green. When errors are detected within the input audio signal the LED will flash red. If no audio is detected on the fourth audio input of the 7707VAT-HD the LED will remain off.

4.2 DOT-MATRIX DISPLAY AND CONTROLS

Additional monitoring and control functions are implemented via the 4-digit dot-matrix display and controls located at the card-edge. The card-edge pushbutton and toggle-switch are used to navigate through the display menu. Figure 4-2 provides a quick reference to the display menu structure.

Pressing the pushbutton advances the display to the next menu level. The toggle-switch may then be used to move up or down through selections of that menu level. Select **BACK** to return to the previous menu level.

Pushbutton ?				
Menu Level 1		Menu Level 2		Menu Level 3
Menu Level 4				
?	Toggle Switch	Indications		
		LASR...ERR (Laser Error)		
		Supersedes		
		VID...LOS (Video Loss)		
		Supersedes		
		STD...ERR (Standard Error)		
		Supersedes		
		OK (A-Okay)		
?	Toggle Switch	Selections		
		STAT (Status)		
		VIN (Video Input)		
		STD (Video Standard)		
		EQ (Cable Length)		
		GRP1 (Audio Group 1)		
		GRP2 (Audio Group 2)		
		GRP3 (Audio Group 3)		
		GRP4 (Audio Group 4)		
		AIN1 (Audio Input 1)		
?	Toggle Switch	AIN2 (Audio Input 2)		
		AIN3 (Audio Input 3)		
		AIN4 (Audio Input 4)		
		VER (Software Version)		
		BACK (Abort)		
?	Toggle Switch	Selections		
		VOUT (Video Output)		
		STD (Video Standard)		
		A1+2 (AES1 and AES2)		
		A3+4 (AES3 and AES4)		
		GEN		
		COAX		
		LASR (Laser Enable Mode)		
		CLN (Clean Input Hanc)		
		EDET (Error Detection)		
?	Toggle Switch	AIN1 (Audio Input 1)		
		AIN2 (Audio Input 2)		
		AIN3 (Audio Input 3)		
		AIN4 (Audio Input 4)		
		SRC (Sample Rate Convert)		
		EDET (Error Detection)		
		JACK (Monitor Jack)		
		CHAN (Audio Channel)		
		VOL (Volume)		
		DISP (Display Orientation)		
?	Toggle Switch	HORIZ (Horizontal)		
		VERT (Vertical)		
		FRST (Factory Reset)		
		NO (Abort)		
		YES (Accept)		
		BACK (Abort)		

Figure 4-2: Card-edge Menu Quick Reference



If a specific menu selection has a configuration value associated with it, then this may be changed using the toggle switch. Pressing the pushbutton will apply the displayed value and return you to the previous menu level.

The most recent user selection will be maintained in non-volatile memory in the event of power loss to the module.

4.2.1 Display of Warning Status Indications

Upon entering menu level 1 on power up, or following a configuration selection, the default display selection will indicate the warning status of the 7707VAT-HD. This warning status indication can also be entered while already in menu level 1, by using the toggle switch. During normal operation, while no warnings conditions are active, the OK indication will be displayed. Three warning indications can supersede this display state. The following list describes possible indications for this menu item, listed in order of display priority:

LASR...ERR	Laser Error Warning. Flashing indication alternates between LASR and ERR
VID...LOS	Video Loss of Signal. Flashing indication alternates between VID and LOS
STD...ERR	Video Standard Error. Input video standard does not match a manually selected output video standard. Flashing indication alternates between STD and ERR
OK	Okay. No warning conditions are active

4.2.2 Displaying the Input Video Standard

The card-edge display of the 7707VAT-HD can report the signal standard present at the active video input. To indicate the input video standard, select the STAT (Status) menu item in menu level 1, followed by VIN (Video Input) and VSTD (Video Standard) menu items. The following list describes possible indications for this menu selection:

STAT
VIN
VSTD
1080i/60
1080i/59.94
1080i/50
1035i/60
1035i/59.94
1080i/48
1080i/47.96
720p/60
720p/59.94
N270
P270
LOS

The MUTE controls (1 to 4) allow the user to mute each channel. 1080i/60 or 1080p/30sF standard is present:	
1080i/60	1080i/60 or 1080p/30sF standard is present
1080i/59.94	1080i/59.94 or 1080p/29.97sF standard is present
1080i/50	1080i/50 or 1080p/25sF standard is present
1035i/60	1035i/59.94 standard is present
1035i/59.94	1035i/59.94 standard is present
1080i/48	1080i/48 or 1080p/24sF standard is present
1080i/47.96	1080i/47.96 or 1080p/23.98sF standard is present
720p/60	720p/60 standard is present
720p/59.94	720p/59.94 standard is present
N270	525i/59.94 standard is present
P270	624i/50 standard is present
LOS	Loss of signal. No valid video signal is detected at the selected input

4.2.3 Displaying the Input Equalization Strength

The 7707VAT-HD adaptively adjusts the amount of equalization applied to the digital video input and the applied equalization strength can be reported to the display. To indicate the input equalization strength, select the **STAT** (Status) menu item in menu level 1, followed by the **VIN** (Video Input) and **VEQ** (Video Equalization) menu items.

STAT
VIN
VEQ
>100m
0m to 100m

The following list describes possible indications for this menu selection:

0m to 100m	Amount of equalization adaptively applied to the digital video input in meters.
>100m	Adaptive equalization greater than 100m.

4.2.4 Displaying the Status of Input Video Embedded Audio Groups

The 7707VAT-HD allows the user to monitor the status of input video embedded audio groups. This allows conflicts to be identified and resolved. To view the current status of input video embedded audio groups, select the **STAT** (Status) menu item in menu level 1, followed by the **VIN** (Video Input) and **GRP1**, **GRP2**, **GRP3** or **GRP4** (Audio Groups 1 through 4) menu items. For the sake of brevity, only the **GRP1** menu item will be described below.

STAT
VIN
GRP1
FREE
USED
CLN
LOS

The following list describes possible indications for this menu item:

FREE	The monitored audio group is unused in applied input video.
USED	The monitored audio group is used in applied input video.
CLN	The monitored audio group is used in applied input video, but has been cleaned by the 7707VAT-HD. See section 4.2.12 for details.
LOS	No video input detected.

4.2.5 Displaying the AES Audio Sample Rate

The 7707VAT-HD can detect the sample rate of valid AES input audio on each channel and the detected sample rate can be reported to the display. To indicate the AES input sample rate, select the **STAT** (Status) menu item in menu level 1, followed by the **AIN1**, **AIN2**, **AIN3**, or **AIN4** (Audio Input 1 through 4) menu item. For the sake of brevity, only the **AIN1** menu item will be described below.

STAT
AIN1
48K
44K
32K
LOS

The following list describes possible Audio Sample Rate indications:

48K	AES input sample rate is 48KHz
44K	AES input sample rate is 44.1KHz
32K	AES input sample rate is 32KHz
LOS	Loss of signal. No valid signal is detected



4.2.6 Displaying the Software Version

Software operating on the 7707VAT-HD has a version number associated with it. This version number can be indicated to the display. By this means, it can be verified that the module is operating with the most recent software. To reveal the software version,* select the *STAT* (Status) menu item in menu level 1, followed by the *VER* (Software Version) menu item.

<i>STAT</i>
<i>VER</i>
<i>VER x.x BUILD xxx</i>

The following describes the function of version menu item:

<i>VER x.x BUILD xxx</i>	Software version. Character string scrolls across four digit display
--------------------------	--

4.2.7 Selecting the Output Video Standard

User configuration selects the video standard for transmission over the optical interface. If the *AUTO* mode is selected, then the output video standard will match the input video standard. Otherwise, the output video standard will be as selected, regardless of the input standard. To configure the output video standard sent across the optical link by the 7707VAT-HD, select the *CTRL* (Control) menu item in menu level 1, followed by the *VOUT* (Video Output) and *STD* (Video Standard) menu items.

<i>CTRL</i>
<i>VOUT</i>
<i>STD</i>
<i>AUTO</i>
<i>1080i/60</i>
<i>1080i/59.94</i>
<i>1080i/50</i>
<i>1035i/60</i>
<i>1035i/59.94</i>
<i>1080i/48</i>
<i>1080i/47.96</i>
<i>720p/60</i>
<i>720p/59.94</i>
<i>N270</i>
<i>P270</i>

The following list describes possible user selections for this menu item:

<i>AUTO</i>	Automatically transports the video standard detected at the input
<i>1080i/60</i>	1080i/60 or 1080p/30sF standard
<i>1080i/59.94</i>	1080i/59.94 or 1080p/29.97sF standard
<i>1080i/50</i>	1080i/50 or 1080p/25sF standard
<i>1035i/60</i>	1035i/59.94 standard
<i>1035i/59.94</i>	1035i/59.94 standard
<i>1080i/48</i>	1080i/48 or 1080p/24sF standard
<i>1080i/47.96</i>	1080i/47.96 or 1080p/23.98sF standard
<i>720p/60</i>	720p/60 standard
<i>720p/59.94</i>	720p/59.94 standard
<i>N270</i>	525i/59.94 standard
<i>P270</i>	625i/50 standard

The 7707VAT-HD maintains active output video while input video is not suitable for transmission (*VID...LOS* or *STD...ERR* condition. See section 4.2.1). In this case, active picture will be black.

4.2.8 Selecting Audio Embedding Group

This user menu item provides configuration of the embedded audio groups. To minimize conflicts, groups that are detected as **USED** in the applied input video (see section 4.2.4) are not provided as selections. To select the audio embedding groups select the **CTRL** (Control) menu item in menu level 1, followed by the **VOUT** (Video Output) and **A1+2** (AES 1 and AES 2) or **A3+4** (AES 1 and AES 2) menu items. For the sake of brevity, only the **A1+2** menu item will be described below.

CTRL
VOUT
A1+2
GRP1
GRP2
GRP3
GRP4
NONE

The following list describes possible user selections for this menu item:

GRP1	Embed the selected AES signals (A1+2 or A3+4) into group 1.
GRP2	Embed the selected AES signals (A1+2 or A3+4) into group 2.
GRP3	Embed the selected AES signals (A1+2 or A3+4) into group 3.
GRP4	Embed the selected AES signals (A1+2 or A3+4) into group 4.
NONE	Will not embed the selected AES signals (A1+2 or A3+4) into video.

Note that the same audio group cannot be selected twice; the selection for **A1+2** cannot match the selection for **A3+4**. To minimize conflicts, the group configured for **A3+4** will not be provided as a selection for group **A1+2**, and vice-versa.

4.2.9 Selecting the Output Video when the Signal is Lost

The GEN menu item enables the user to select the type of generated output that will be displayed on loss of video.

CTRL
VOUT
GEN
OFF
GREY
BLACK
BYP

The following list describes possible user selections for this menu item:

OFF	When set to OFF, the video output is muted upon loss or interruption of the input video.
GREY	When the signal is lost, grey video will be output. This enables a video "keep-alive" function for sustained transport of embedded audio upon input video loss, interruption or timing errors. A grey signal is generated until input video is re-qualified as valid (i.e., no loss, interruption or timing errors for some time).
BLACK	When the signal is lost, black video will be output. This enables a video "keep-alive" function for sustained transport of embedded audio upon input video loss, interruption or timing errors. A black signal is generated until input video is re-qualified as valid (i.e., no loss, interruption or timing errors for some time).
BYP	When set to BYP, the video "keep alive" function is bypassed for use in cases where input video has minor interruptions or timing errors that should not trigger the generated black or gray "keep-alive" output. This selection does not affect embedding or other functions of the product, except that input video must have sustained quality that is suitable for embedding.

4.2.10 Selecting the COAX Mode

The COAX menu item enables the user to either pass the original audio or embed the current audio into the selected group.

CTRL
VOUT
COAX
LOOP
EMBD

The following list describes possible user selections for this menu item:

LOOP	When set to <i>LOOP</i> , the module will pass the original audio from the input to the output.
EMBD	When set to <i>EMBD</i> , the audio will be embedded into the selected group and will be sent to video out.

4.2.11 Selecting the Output Laser Enable Mode

In some applications it is desirable to have the laser output disabled while no input video signal is present. Alternatively, it may be preferable to maintain an optical output signal, even with no input video. The 7707VAT-HD supports both modes of operation. To configure the output laser enable mode, select the **CTRL** (Control) menu item in menu level 1 followed by the **VOUT** (Video Output) and **LASR** (Laser) menu items.

CTRL
VOUT
LASR
CONT
DISC

The following list describes possible user selections for this menu item:

CONT	Continuous operation. Laser is always enabled, even without valid video signal.
DISC	Discontinuous operation. Laser is disabled when no valid input video is detected.

4.2.12 Selecting Input Video Cleaning

Information might already be contained in the horizontal ancillary space of the applied input video. The user might wish to maintain this information in an unaltered state, or the user could favour cleaning this information. To enable or disable input video cleaning, select the **CTRL** (Control) menu item in menu level 1 followed by the **VIN** (Video Input) and **CLN** (Clean Input Hanc) menu items.

CTRL
VIN
CLN
ON
OFF
AUTO

The following list describes possible user selections for this menu item:

ON	Enables cleaning of all embedded audio from input video HANC.
OFF	Disables cleaning of embedded audio from input video HANC. In the case where CTRL/VOUT/Ax+x menu selects a conflicting group for embedding, the priority is given to embedded audio in input video.
AUTO	Automates cleaning of embedded audio from input video HANC. In the case where CTRL/VOUT/Ax+x menu selects a conflicting group for embedding, the group is cleaned from input video and the priority is given to the 7707VAT-HD.

4.2.13 Selecting Video Error Detection

The 7707VAT-HD is capable of detecting incoming CRC or EDH errors on its video input. To turn error detection on or off select the **CTRL** (Control) menu item in menu level 1 followed by the **VIN** (Video Input) and **EDET** (Error Detection) menu items.

CTRL
VIN
EDET
ON
OFF

The following list describes possible user selections for this menu item:

ON	Enable video error detection. Errors will be reported to the card edge LED or VistaLINK® . The VIDEO STATUS LED will blink red on the occurrence of an error.
OFF	Disable video error detection.

4.2.14 Selecting AES Sample Rate Conversion

Audio must have a sample rate of 48KHz for embedding. To accommodate other input audio sample rates, the 7707VAT-HD provides sample rate conversion. Sample rate conversion should be turned on for normal operation, however, Dolby-E audio uses a proprietary encoding scheme that is not compatible with sample rate conversion. To enable or disable sample rate conversion, select the **CTRL** (Control) menu item in menu level 1, followed by the **AIN1**, **AIN2**, **AIN3**, or **AIN4** (Audio Inputs 1 through 4) and **SRS** (Sample Rate Convert) menu items. For the sake of simplicity, only **AIN1** menu item will be described in this manual.

CTRL	The following list describes possible user selections for this menu item:
AIN1	
SRS	
ON	
OFF	

- | | |
|------------|----------------------------------|
| ON | Turns sample rate conversion ON |
| OFF | Turns sample rate conversion OFF |

4.2.15 Selecting Audio Error Detection

The 7707VAT-HD is capable of detecting incoming errors on its four audio inputs. To turn audio error detection on or off select the **CTRL** (Control) menu item in menu level 1, followed by the **AIN1**, **AIN2**, **AIN3**, or **AIN4** (Audio Inputs 1 through 4) and **EDET** (Error Detection) menu items. For the sake of simplicity, only **AIN1** will be described.

CTRL	The following list describes possible user selections for this menu item:
AIN1	
EDET	
ON	
OFF	

- | | |
|------------|---|
| ON | Enable audio error detection. Errors will be reported to the card edge LED or VistaLINK [®] . The corresponding AUDIO STATUS LED will blink red on the occurrence of an error. |
| OFF | Disable audio error detection. |

4.2.16 Selecting the Headphone Monitoring Jack Channel

The 7707VAT-HD provides a convenient headphone monitoring jack at the card-edge. The monitored audio channel is configured by the user, via the card-edge interface. Audio volume of the headphone monitoring jack can also be adjusted using the card-edge volume control. To configure the headphone monitoring jack channel, select the **CTRL** (Control) menu item in menu level 1, followed by the **JACK** (Audio Jack) and **CHAN** (Audio Channel) menu items.

CTRL	The following list describes possible user selections for this menu item:
JACK	
CHAN	
AUD1	
AUD2	
AUD3	
AUD4	

- | | |
|-------------|--|
| AUD1 | Channel 1 is selected to the headphone monitoring jack |
| AUD2 | Channel 2 is selected to the headphone monitoring jack |
| AUD3 | Channel 3 is selected to the headphone monitoring jack |
| AUD4 | Channel 4 is selected to the headphone monitoring jack |

To configure the headphone volume, select the **CTRL** (Control) menu item in menu level 1, followed by the **JACK** (Audio Jack) and **VOL** (Volume) menu items.

CTRL
JACK
VOL
0 to 64

The following list describes possible user selections for this menu item:

0 to 64 Sets the volume of the headphone jack.

4.2.17 Setting the Orientation of the Display

The 7707VAT-HD provides the ability to adjust the orientation of the display. When using a 3RU frame it is convenient to have the text read vertical whereas when using a 1RU frame a horizontal display is desirable. To change the orientation of the display select the **CTRL** (Control) menu item in menu level 1, followed by the **DISP** (Display) menu item.

CTRL
DISP
HORZ
VERT

The following list describes possible user selections for this menu item:

HORZ Sets the orientation of the text to horizontal
VERT Sets the orientation of the text to vertical

4.2.18 Selecting the Factory Reset Configuration

It is convenient to have a quick method of returning all configuration settings to a known value. The 7707VAT-HD provides a factory reset for this purpose. All values which are user configurable will be returned to a known state, as indicated below. To initialize a factory reset, select the **CTRL** (Control) menu item in menu level 1, followed by the **FRST** (Factory Reset) menu item.

CTRL
DISP
NO
YES

The following list describes possible user selections for this menu item:

NO Return to previous menu item, without modification of configuration settings
YES Initialize factory reset

5 JUMPER CONTROLS

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

The FRAME STATUS jumper J4 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 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.

5.2 CONFIGURING THE MODULE FOR FIRMWARE UPGRADES

UPGRADE: The UPGRADE jumper J5 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 of this manual for more information.

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

6 VISTALINK[®] REMOTE MONITORING/CONTROL

6.1 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 fiber optic products.
2. Managed devices (such as 7707VAT-HD and 7707VAR-HD cards), 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 VistaLINK[®] network, see the 7700FC Frame Controller chapter.

6.2 VISTALINK[®] MONITORED PARAMETERS

The following parameters can be remotely monitored via the VistaLINK[®] interface.

Parameter	Description
Video Input Standard	The detected video standard
Cable Length	Indicates input cable length in metres
Input Video Embedded Audio Group 1, 2, 3, 4	Status of Input video embedded audio groups
AES Input 1, 2, 3, 4	Displays AES Audio sample rate

Table 6-1: VistaLINK[®] Monitored Parameters

6.3 VISTALINK® CONTROLLED PARAMETERS

The following parameters can be remotely controlled via the VistaLINK® interface.

Parameter	Description
Video Output Standard	Sets output video standard
Laser	Sets output laser mode
Clean Input Video HANC	Enable/ Disable input video HANC cleaning
AES 1 / 2 Destination	Sets destination for AES 1 and 2
AES 3 / 4 Destination	Sets destination for AES 3 and 4
AES 1 to 4 Sample Rate Conversion	Enable/ Disable sample rate converters
Cable Length Alarm Threshold	Sets cable length alarm threshold

Table 6-2: VistaLINK® Controlled Parameters

6.4 VISTALINK® TRAPS

The following parameters can be remotely enabled and monitored through the VistaLINK® interface as traps in Alarm View.

Parameter	Description
Video Loss	Triggers on loss of input video signal
Video Error	Triggers on error in input video signal
Laser Fault	Triggers on optical output laser fault
Cable Length Fault	Triggers on cable length exceeds set threshold
AES Audio 1 to 4 Loss	Triggers on loss of AES audio signal
AES Audio 1 to 4 Error	Triggers on AES audio error

Table 6-3: VistaLINK® Traps