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REVISION HISTORY

REVISION	DESCRIPTION	DATE
1.0	Preliminary Version	Sep 01
1.1	First Release	Oct 01
1.2	Rear panel changed, general cleanup	Feb 02
1.3	Jumper numbers updated	Mar 02
1.4	Sections on AES Output Level and Impedance added Added unbalanced AES to specifications and installation instructions	Apr 02
1.5	Support for separate monitoring of AES1 and AES2	Jun 02
2.0	Added VAR-A4	Sep 02
2.1	Added factory reset menu	Dec 02
2.2	Added output video control parameters	Feb 05
2.3	Added 7707VAR-U option, updated Laser safety information, added DWDM	Jul 05
2.4	Updated VistaLINK® description and fixed format	Jun 08
2.5	Updated specs & cleaned up format	Oct 08

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 DWDM cards and 7707VAR cards directly with a short fiber optic cable. The 7707VAT DWDM card produces +7dBm of power which will damage the receiver if connected directly.

1. OVERVIEW

The 7707VAR series modules are *Vista*LINK® enabled fiber optic receiver for SDI Video and Audio. The single slot 7707VAR series module is available in three versions. The module demultiplexes one SDI Video plus two AES (model 7707VAR) or four analog (7707VAR-A4) Audio signals that have been Time Domain Multiplexed (TDM) by the companion 7707VAT series SDI Video and Audio Fiber Transmitter module. The 7707VAR-U is similar in features to the 7707VAR but has unbalanced audio connections.

Evertz's patent pending SoftSwitch™ technology is applied to the received signal to ensure virtually glitch-free AES Audio output signals when upstream SDI or AES feeds are switched. Throughout this manual both references to the 7707VAR include the 7707VAR-U and 7707VAR-A4 unless specifically noted otherwise.

The 7707VAR and companion 7707VAT series modules will transparently pass incoming SDI video feeds with embedded AES audio or any other data in the horizontal or vertical ancillary data space. Minimal Audio to Video latency over the transport interface is also achieved.

The 7707VAR 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:
- Single card demultiplexer for SDI Video and 2 balanced AES Audio (7707VAR) or 2 unbalanced AES audio (7707VAR-U) or 4 analog audio (7707VAR-A4)
- Supports 270Mb/s on 525 or 625 line 4:2:2 component SDI or SDTi (SMPTE 305M) video signals
- Low Audio to Video latency
- Output Video "Black" or "Blue" (selectable) on loss of fiber optic input signal
- SDI Video regeneration for jitter reduction
- Comprehensive signal and status monitoring via four-digit card-edge display, or through SNMP and *Vista*LINK® enabled capability
- Optional support for DVB-ASI signals
- Fully Hot-swappable from front of frame with no fiber disconnect/reconnect required
- Supports single mode and multi mode fiber optic cable
- Accepts any wavelength in the 1310nm to 1610nm range

Features: (7707VAR and 7707VAR-U)
- Supports 32, 44.1, 48 KHz AES audio inputs
- Incorporates Evertz SoftSwitch™ (Patent Pending) technology for virtually glitch-free AES Audio outputs when upstream SDI or AES feeds are switched
- User selectable SoftSwitch™ bypass
- Output AES "Mute" on loss of fiber optic input signal or AES feed to upstream 7707VAT multiplexer
- Dolby E compatible with SoftSwitch™ Disabled
- Local display of Optical signal strength; video and audio presence; video and AES formats; EDH errors

Features: (7707VAR-A4 only)
- Broadcast quality analog audio performance
- Local display of Optical signal strength; video and audio presence; video format; EDH errors

evertz
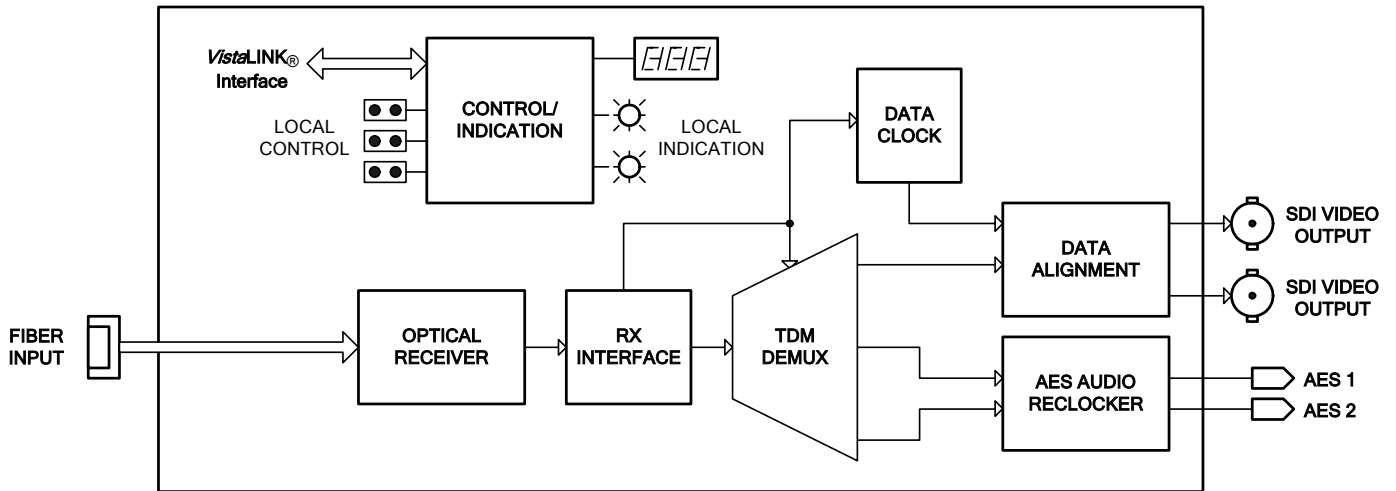
Figure 1-1: 7707VAR and 7707VAR-U Block Diagram
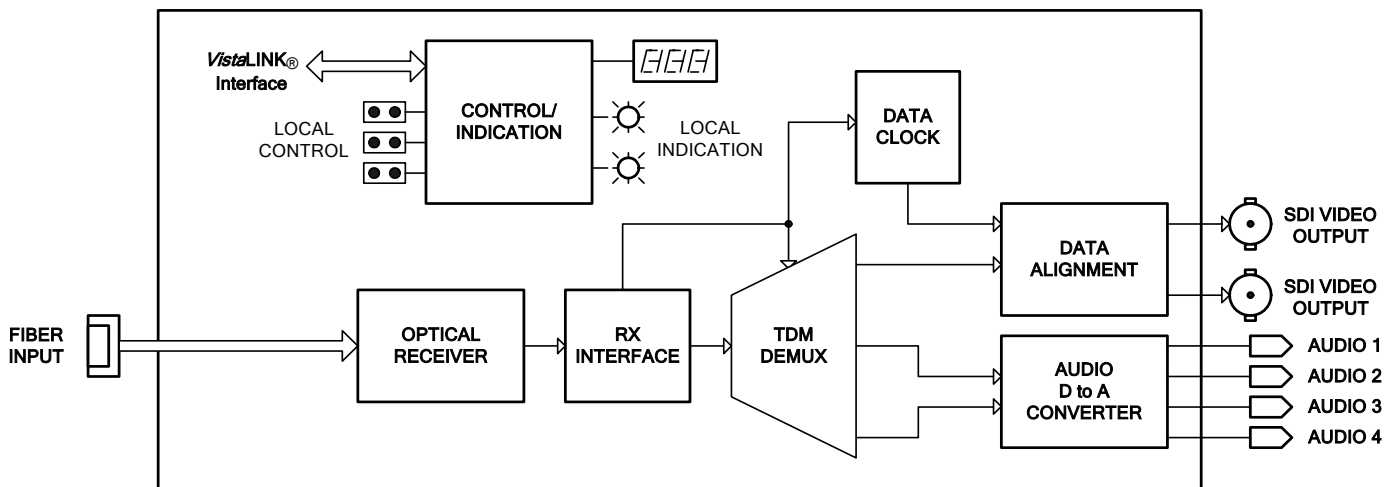
Figure 1-2: 7707VAR-A4 Block Diagram

2. INSTALLATION

The 7707VAR and 7707VAR-A4 modules come with a companion rear plate that has two BNC connectors, one terminal header with removable terminal block and one SC/PC, SC/PC with cover (shown), ST/PC or FC/PC optical connector. The 7707VAR-U modules come with a companion rear plate that has four 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 the 7700FR chapter section 3.
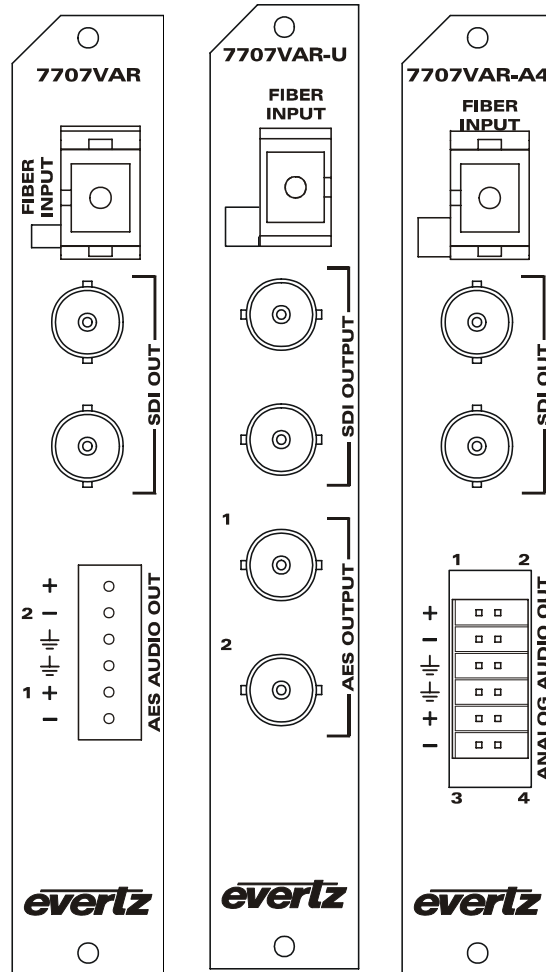
Figure 2-1: 7707VAR Series Rear Panels

2.1. VIDEO SIGNAL CONNECTIONS

SDI OUTPUT: Two BNC outputs for reclocked serial digital component video signals, compatible with the SMPTE 259M standard.

2.2. OPTICAL SIGNAL CONNECTIONS

OPTICAL INPUT: SC/PC, SC/PC with cover (shown), ST/PC or FC/PC female connector. This wide range input accepts optical wavelengths of 1310nm to 1610nm, accommodating standard, CWDM or DWDM transmission schemes.

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

2.3.   AES AUDIO CONNECTIONS (MODEL 7707VAR)

AES AUDIO OUT: AES audio outputs for channels 1&2 (AES1) and 3&4 (AES2) of an audio group. Each balanced AES output (+, -, GND) is on three of six pins on six pin terminal header. AES outputs are available with SoftSwitch™ technology to provide virtually glitch-free audio outputs when upstream AES audio sources are switched.

For Balanced AES signals connect to the respective + and – pins and the shared GND pin. The AES Term Jumpers J30 and J31 must be set to the 110 position for proper source impedance of the balanced AES outputs. The AES LEVEL jumpers J28 and J29 must also be set to the HI position for balanced AES signal levels of 5 volts. (See section 7.4 and 7.5).

For Unbalanced AES signals connect to the AES+ output pin with the ground connected to the AES- output pin. The AES Term Jumpers J30 and J31 must be set to the 75 position for proper source impedance of the unbalanced AES outputs. The AES LEVEL jumpers J28 and J29 must also be set to the LO position for unbalanced AES signal levels of 1 volt. (See section 7.4 and 7.5)

2.4.   AES AUDIO CONNECTIONS (MODEL 7707VAR-U)

AES AUDIO OUT: AES audio outputs for channel 1&2 (AES1) and 3&4 (AES2) of an audio group are provided on two BNC connectors. AES outputs are available with SoftSwitch™ technology to provide virtually glitch-free audio outputs when upstream AES audio sources are switched. The AES outputs on the card should be configured at the factory for use with unbalanced outputs. (See section 7.4)

2.5.   ANALOG AUDIO CONNECTIONS (MODEL 7707VAR-A4)

ANALOG AUDIO OUT: Balanced analog audio outputs for 4 channels. Each output (+, -, GND) is on three of twelve pins on the twelve pin terminal header.

2.6.   CARE AND HANDLING OF OPTICAL FIBER

> ✍ **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 the user maintains 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 regarding care and handling of fiber optic cable see section 3 of the Fiber Optics System Design chapter in the front of the binder.

3. SPECIFICATIONS

3.1. OPTICAL INPUT

Number of Inputs: 1
Connector: Female SC/PC, SC/PC with cover, ST/PC, FC/PC
Return Loss: > 25 dB
Operating Wavelength: 1270nm to 1610nm
Maximum Input Power: 0dBm
Optical Sensitivity: -28dBm

3.2. SERIAL VIDEO OUTPUTS

Number of Outputs: 2 regenerated
Standard: SMPTE 259M-C (525 or 625 line component) SMPTE 305M (SDTi)
Connector: 1 BNC per IEC 61169-8 Annex A
Signal Level: 800mV nominal
DC Offset: 0V ±0.5V
Rise and Fall Time: 900ps nominal
Overshoot: <10% of amplitude
Return Loss: > 15dB at 270Mb/s
High Freq. Jitter: < 0.15UI

3.3. AES AUDIO OUTPUTS (MODEL 7707VAR and 7707VAR-U)

Number of Outputs: 2 regenerated
Standard: Jumper selectable for balanced or unbalanced output
  Unbalanced AES: SMPTE 276M
  Balanced AES: AES3-1992 balanced AES
Connector:
7707VAR-U: 1 BNC per IEC 61169-8 Annex A
  7707VAR: 6 pin terminal strip
Signal Level
  Unbalanced: 1V p-p
  Balanced: 5 V p-p
Resolution: up to 24 bits
Sampling Rate: 32, 44.1, 48 kHz
Intrinsic Jitter: < 20ns
Impedance
  Unbalanced: 75 Ω
  Balanced: 110 Ω

3.4. ANALOG AUDIO OUTPUTS (MODEL 7707VAR-A4)

Number of Outputs: 4
Type: Balanced analog audio
Connector: 12 pin removal terminal block
Output impedance: 66Ω
Freq. Response: +/-0.1 dB, 20Hz to 20 kHz
THD 20Hz–20Khz: < 0.005%
Channel Phase Diff. +/-1 degree
SNR (weighted):   > 85 dB
Output Level Adj: -20 dB to +3 dB
Max Output Level: +24 dBu into 10 k˛ loads

3.5. SYSTEM PERFORMANCE

Video Input to Output Delay: < 1.5 μs
Audio to Video delay: (7707VAT/VAR)
                < 1μs with SoftSwitch™ disabled
                < 2ms with SoftSwitch™ enabled

3.6. ELECTRICAL

Voltage: +12V DC
Power: 10 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
EMI/RFI: Complies with FCC regulations for class A devices
                      Complies with EU EMC directive 89/336/EEC

3.8. PHYSICAL

7700 or 7701 frame mounting:
   Number of slots: 1

4. STATUS INDICATORS AND DISPLAYS

The 7707VAR series modules have LED Status indicators and a 4 digit alphanumeric display on the front card edge to show operational status of the card at a glance. The card edge pushbutton is used to select various displays on the alphanumeric display. Figure 7-1 and Figure 7-2 show the location of the LEDs and card edge controls.

4.1. STATUS INDICATOR LEDS

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 optical 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 optical input signal is present, and the board power is good.

On the 7707VAR and 7707VAR-U there are three small LEDs on the back of the board that indicate the presence of video and audio in the input signal.

VIDEO PRESENT: This Green LED indicates the presence of a valid input video signal on the optical input.

AES1 PRESENT: This Green LED indicates the presence of a valid AES1 signal on the optical input.

AES2 PRESENT: This Green LED indicates the presence of a valid AES2 signal on the optical input.

On the 7707VAR-A4 there are four small LEDs on the back side of the board that indicate the presence of audio signals above the detection level (see section 5.4.3 for information about configuring the audio detection).

AUDIO 1 PRESENT: This Green LED indicates the presence of a valid signal on the Audio 1 input.

AUDIO 2 PRESENT: This Green LED indicates the presence of a valid signal on the Audio 2 input.

AUDIO 3 PRESENT: This Green LED indicates the presence of a valid signal on the Audio 3 input.

AUDIO 4 PRESENT: This Green LED indicates the presence of a valid signal on the Audio 4 input.

4.2. DOT-MATRIX DISPLAY

4.2.1. Using the Dot Matrix Display – 7707VAR and 7707VAR-U

Additional signal and status monitoring is provided via the 4-digit dot-matrix display located on the card edge. The card edge toggle switch is used to select which data is being displayed in the alphanumeric display. Each time the toggle switch is pressed up/down, the display advances to the next/previous display. A message indicating what display mode is active is shown for one second. After one second without the toggle switch being pressed, the selected display data is shown. The card edge pushbutton is used to select sub-items where applicable.

The following display messages on the 7707VAR and 7707VAR-U indicate what is being displayed. The details of each of the displays are described in the sections 4.2.3 to 4.2.9.

LINK ERR	Loss of optical link.
AJCK	Set headphone jack audio channel.
PWR	Input optical power.
VSTD	Video standard in use.
A1S	Clock rate in use on AES1.
A2S	Clock rate in use on AES2.
DISP	Set orientation of text in the card edge display.
S/W	Display firmware version.

4.2.2. Using the Dot Matrix Display – 7707VAR-A4

Additional signal and status monitoring and control over the card's parameters are provided via the 4-digit alphanumeric display located on the card edge. The card edge toggle switch is used to select whether the user is displaying status from the card (monitoring mode) or setting control parameters for the card (control mode). To select one of the display modes, press the pushbutton one or more times to exit the current display mode and return to the mode select display (The display will show **MON** or **SET**). Press the toggle switch to select monitor mode (**MON**) or control mode (**SET**). Once the desired mode is selected, press the pushbutton to enter that mode. For information about setting up the module in control mode see section 5.

While in monitor mode, the toggle switch determines what data is being displayed on the alphanumeric display. Each time the toggle switch is pressed up/down, the display advances to the next/previous display. A message indicating what display mode is active is shown for one second. After one second without the toggle switch being pressed, the selected display data is shown. The card edge pushbutton is used to return to the mode select menu item. The following display messages indicate what is being displayed.

The following display messages on the 7707VAR-A4 indicate what is being displayed. The details of the each of the displays are described in the sections 4.2.3 to 4.2.6.

LINK ERR	Loss of optical link.
AJCK	Set headphone jack audio channel.
PWR	Input optical power.
VSTD	Video standard in use.

4.2.3. Displaying the Link Activity

When there is no valid optical link between the 7707VAR series module and its companion 7707VAT series module the display will alternately show **LINK** and **ERR**. This message will override any of the other display messages

4.2.4. Setting the Headphone Jack Channel

The **AJCK** display allows the user to set which audio channels will be monitored on the card edge headphone jack. After one second the display will show a message indicating the current audio channels being monitored at the headphone jack. When this message is showing, press the pushbutton to change the audio channel being monitored.

On the 7707VAR and 7707VAR-U the display will show:

AES1   AES1 audio is being monitored at the headphone jack.
AES2   AES2 audio is being monitored at the headphone jack.

On the 7707VAR-A4 the display will show:

A1/2   Audio channels 1 and 2 will be monitored at the headphone jack.
A3/4   Audio channels 3 and 4 will be monitored at the headphone jack.

4.2.5. Displaying the Optical Power

The 7707VAR series modules detect the input optical power and display this on the four-digit card edge display. The following list describes possible displays and their meaning:

OK   Indicates optical input power is within acceptable range (> -13 dB).
-13 to -28 Numerical value of optical input power.

4.2.6. Displaying the Video Standard

The 7707VAR series modules detect the Video standard of the input signal and display this on the four-digit card edge display. The following list describes possible displays and their meaning:

N270   SMPTE 259M-C, 270 Mb/s 4:2:2 Component 525 line.
P270   SMPTE 259M-C, 270 Mb/s 4:2:2 Component 625 line.
LSV   Indicates that no valid video signal is present on the input. This message overrides the normal video standard message.
EDH   Indicates that there is an EDH error. This message overrides the normal video standard message.

On the 7707VAR series modules, when the user is displaying one of the Video Standard messages, pressing and holding the pushbutton for 3 seconds will turn off the card edge EDH error indication. The display will show **EDH↓** momentarily to indicate that EDH local reporting has been turned off and then the normal video standard message will be displayed. This does not affect the monitoring of EDH errors and reporting through SNMP over the *Vista*LINK® interface. Pressing and holding the pushbutton for 3 seconds will turn on the card edge EDH error indication. The display will show **EDH↑** momentarily to indicate that EDH local reporting has been turned on.

On the 7707VAR-A4 and 7707VAR-U the *EDH* menu item is used to turn off the card edge EDH error indication. Please refer to section 5.6.

4.2.7. Displaying the Audio Sample Rate (7707VAR and 7707VAR-U)

The 7707VAR and 7707VAR-U detect the Audio sample rate of the audio on the input signal and displays this on the four-digit card edge display. The following list describes possible displays and their meaning:

32K   AES Audio with 32 kHz sample rate is being received and output.
44K   AES Audio with 44.1 kHz sample rate is being received and output.
48K   AES Audio with 48 kHz sample rate is being received and output.
LSA1   When DIP switches 2 and 3 are set to set to the *Auto* sample rate mode it indicates that no valid AES1 signal is being received. When DIP switches 2 and 3 are set to one of the supported sample rates, it indicates that there is no AES1 signal being received at the selected sample rate. This message overrides the normal audio sample rate message.
LSA2   When DIP switches 2 and 3 are set to set to the *Auto* sample rate mode it indicates that no valid AES2 signal is being received. When DIP switches 2 and 3 are set to one of the supported sample rates, it indicates that there is no AES2 signal being received at the selected sample rate. This message overrides the normal audio sample rate message.

4.2.8. Setting the Orientation of the Text on the Card Edge Display (7707VAR and 7707VAR-U)

The **DISP** display allows the user to set a horizontal or vertical orientation for the card edge display messages. (See section 5.5 for information on setting the display orientation on the 7707VAR-A4). After one second the display will show a message indicating the current orientation of the display. When this message is showing the user can press the pushbutton to change the orientation of the display.

HOR   Horizontal display used when the module is housed in the 1 rack unit 7701FR frame or the stand alone enclosure.

VERT   Vertical display used when the module is housed in the 3 rack unit 7700FR frame.

4.2.9. Displaying the Firmware Version (7707VAR and 7707VAR-U)

The **S/W** display shows the firmware version and build number of the 7707VAR or 7707VAR-U firmware. The message will scroll across the display.

For example: **VER 1.0 BLD 067**

5.   CARD EDGE MENU SYSTEM (MODEL 7707VAR-A4 ONLY)

5.1.   NAVIGATING THE MENU SYSTEM

When the user is in control mode, the toggle switch and pushbutton are used to navigate through a menu system to set various parameters for the module. To enter the menu system, press the pushbutton one or more times to exit the current display mode and return to the mode select menu item. The display will show MON or SET. Press the toggle switch to select control mode (SET) and then press the pushbutton to enter that control mode main setup menu. Use the toggle switch to move up and down the list of available sub menus. Once the desired submenu name is displayed, press the pushbutton to select the next menu level.

While 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 the toggle switch is pressed upward and decrease if pushed downward. If the parameter contains a list of choices, the user can cycle through the list by pressing the toggle switch in either direction.

Once the desired value is reached, depress the pushbutton. This will update the parameter to the selected value and return to the mode select menu item (the display shows SET). To change another parameter, press the pushbutton to enter the main menu system again and continue selecting and adjusting other parameters.

Throughout the descriptions of the Menu items, default values are shown in <u>underlined</u> text.

Each time the toggle switch is pressed up/down, the display advances to the next/previous display. A message indicating what display mode is active is shown for one second. After one second without the toggle switch being pressed, the selected display data is shown. The card edge pushbutton is used to select sub-items where applicable.

5.2.   TOP LEVEL MENU STRUCTURE

The following is a brief description of the top level of the menu tree that appears when the user enters the On screen menu. Selecting one of these items will take the user down into the next menu level. The details of the each of the displays are described in the sections 5.3 to 5.5.

STD	Selects video standard that will be output when there is no video input signal.
OTYP	Selects either blue or black video to output when there is no video input.
VOL1	Configures the Volume of Audio channel 1.
VOL2	Configures the Volume of Audio channel 2.
VOL3	Configures the Volume of Audio channel 3.
VOL4	Configures the Volume of Audio channel 4.
MUT1	Mutes Audio channel 1.
MUT2	Mutes Audio channel 2.
MUT3	Mutes Audio channel 3.
MUT4	Mutes Audio channel 4.
ADET	Sub menu allows the user to set parameters relating to the Audio detection.
DISP	Allows the user to set the orientation of the front panel display.
EDH	Allows the user to turn the EDH indication on an off.
FRST	Resets the module to its factory reset values.

5.3. CONTROLLING THE OUTPUT VIDEO STANDARD

The first group of menu items are used to configure the output video standard.

5.3.1. Setting the Output Video Standard

```
STD
    N270
    P270
```

The *STD* controls the output video standard when there is no valid input video signal detected within the optical input signal

N270   SMPTE 259M-C, 270 Mb/s 4:2:2 Component 525 line
P270   SMPTE 259M-C, 270 Mb/s 4:2:2 Component 625 line

5.3.2. Setting the Output Colour

```
OTYP
    BLU
    BLK
```

The *OTYP* controls the output video colour when there is no valid input video signal detected within the optical input signal. The format of the output video signal can be selected through the STD menu item, section 5.3.1

BLU   Blue video
BLK   Black video

5.4. SETTING THE AUDIO CONTROLS

The next group of menu items are used to configure the control items relating to the Audio. The menu items for each channel are identical. For the sake of simplicity, only the menu items for the A1 channel are shown.

5.4.1. Setting the Audio Volume Level

```
VOL1
    0
    –20 to +3
```

The *VOL* controls set the audio volume of each channel level expressed in dB. The volume level can be adjusted in 0.5 dB increments.

5.4.2. Muting the Output Audio

```
MUT1
    OFF
    ON
```

The *MUTE* controls allow the user to mute each channel.

5.4.3. Configuring Audio Presence Detection

The ADET sub menu contains 3 menu items (for each audio channel) relating to the Audio detection. The menu items for each channel are identical and so, for the sake of simplicity, only the menu items for `A1` channel are shown.

```
DET1
    OFF
    ON
```

The *DET* controls enable audio presence detection on each of the channels.

The *LVL* and *DUR* controls are used to detect when the audio is considered to be missing. The *LVL* control sets the audio level under which the audio is considered to be missing. The audio must be under the *LVL* level for the duration set by the *DUR* control before the audio is considered missing. When audio is missing, the audio must be over the *LVL* level for 1 sec. before the audio will be considered present.

```
LVL1
    -67 to 0
    -40
```

The *LVL* control sets the audio level under which audio is considered to be missing. This value is expressed in dBu

```
DUR1
    1 to 20
    10
```

The *DUR* control sets the amount of time (in seconds) the audio is below the level set by the *LVL* control before the audio is considered missing.

5.4.3.1. Procedure to Calibrate Audio Presence Detection

1. Supply the 7707VAT-A4 module that is connected to the 7707VAR-A4 module being calibrated with the plant's noisiest audio feed without any audio program material present. This will be a baseline noise level to calibrate the audio-missing detector.
2. Set the *DUR* control to 1 sec in order to see the results of adjusting the *LVL* parameter without getting confused with the detection time.
3. Adjust the audio *LVL* control upward from its minimum value until the corresponding *AUDIO PRESENT* LED on the card edge goes Off. This will be the noise floor level. Raise the *LVL* a few dB to make the detector insensitive to this noise level.
4. Set the *DUR* control to a time appropriate to the application. This should be set to a value longer than the worst case acceptable quiet period.

5.5. CHANGING THE ORIENTATION OF THE TEXT ON THE DISPLAY

```
DISP
    VERT
    HOR
```

The *DISP* 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.

5.6. CONFIGURING EDH ERROR DETECTION

```
EDH
    OFF
    ON
```

The *EDH* control enables the EDH (error detection and handling) error display on the Dot matrix display.

5.7. RESTORING THE FACTORY SETTINGS

FRST
<u>NO</u>
YES

The *FRST* control allows the user to restore the factory values (<u>those underlined</u>) for the module's parameters described in sections 5.3 and 5.6.

6.   CARD EDGE CONTROLS

The 7707VAR series modules are equipped with a three position; return to center toggle switch which is used to select the various card-edge displays and menu items and is also used in conjunction with a momentary pushbutton to select some sub-items of the menu system on the 7707VAR-A4. See sections 4.2 and 5 for information about the card edge displays and menu system.

6.1.   MONITORING THE AES AUDIO

A stereo headphone jack located at the front of the module is used to monitor the individual AES channels. The `AJCK` display is used to select the AES channel currently being monitored. (See section 4.2.4) The monitoring volume level can be adjusted but turning the level potentiometer located beside the headphone jack.

6.2.   DIP SWITCHES

The 7707VAR series modules are equipped with a 4 position DIP switch to allow the user to select various functions. DIP switch 1 is located at the top of the DIP switch (farthest from to the card ejector). Table 6-1 gives an overview of the DIP switch functions. Sections 6.2.1 to 6.2.3 give a detailed description of each of the DIP switch functions. The DIP switches are disabled when the MASTER jumper is in the *Remote* position. The On position is down, or closest to the printed circuit board.

DIP Switch	Function
1	Output on Signal Loss
2	AES Sample Rate (7707VAR and
3	7707VAR-U)
4	SoftSwitch™ Disable (7707VAR and 7707VAR-U)

Table 6-1: DIP Switch Functions

6.2.1.   Controlling the Action on Loss of Video Signal

DIP switch 1 controls the behaviour of the Video output when there is no video present on the input signal, or there is not input optical signal. The Control 1 jumper sets the video standard of the output when there is not input video. Please refer to section 7.3.

DIP 1	FUNCTION	DESCRIPTION
Off	Black	Output black on loss of input video.
On	Blue	Output blue on loss of input video.

Table 6-2: Loss of Video Switch Settings

6.2.2. Setting the AES Sample Rate (7707VAR AND 7707VAR-U)

DIP switches 2 and 3 are used to select the audio sample rate. The 7707VAR and 7707VAR-U can be set to automatically lock to the incoming audio sample rate, or the user can manually set the sample rate of the audio being transported through the system. When the 7707VAR or 7707VAR-U is not in the auto rate, and incoming audio does not match the selected rate, the dot matrix display will show `LSA` when the `ASTD` display is selected.

DIP 2	DIP 3	AES Sample Rate
Off	Off	48 kHz (default)
Off	On	44.1 kHz
On	Off	32 kHz
On	On	Auto

Table 6-3: AES Sample Rate Switch Settings

6.2.3. Disabling the Audio SoftSwitch™ Feature (7707VAR AND 7707VAR-U)

The 7707VAR and 7707VAR-U are equipped with Evertz's patent pending SoftSwitch™ technology, which mitigates audio pops during hot-switching while maintaining consistent video and audio sequences and formats. DIP switch 4 controls whether SoftSwitch™ is enabled or not.

DIP 4	FUNCTION	DESCRIPTION
Off	Enable (default)	SoftSwitch™ is enabled.
On	Disable	SoftSwitch™ is disabled.

Table 6-4: SoftSwitch™ Settings

7. JUMPERS

**Figure 7-1: Location of Jumpers and Card Edge Controls - 7707VAR and 7707VAR-U**

Figure 7-2: Location of Jumpers and Card Edge Controls - 7707VAR-A4
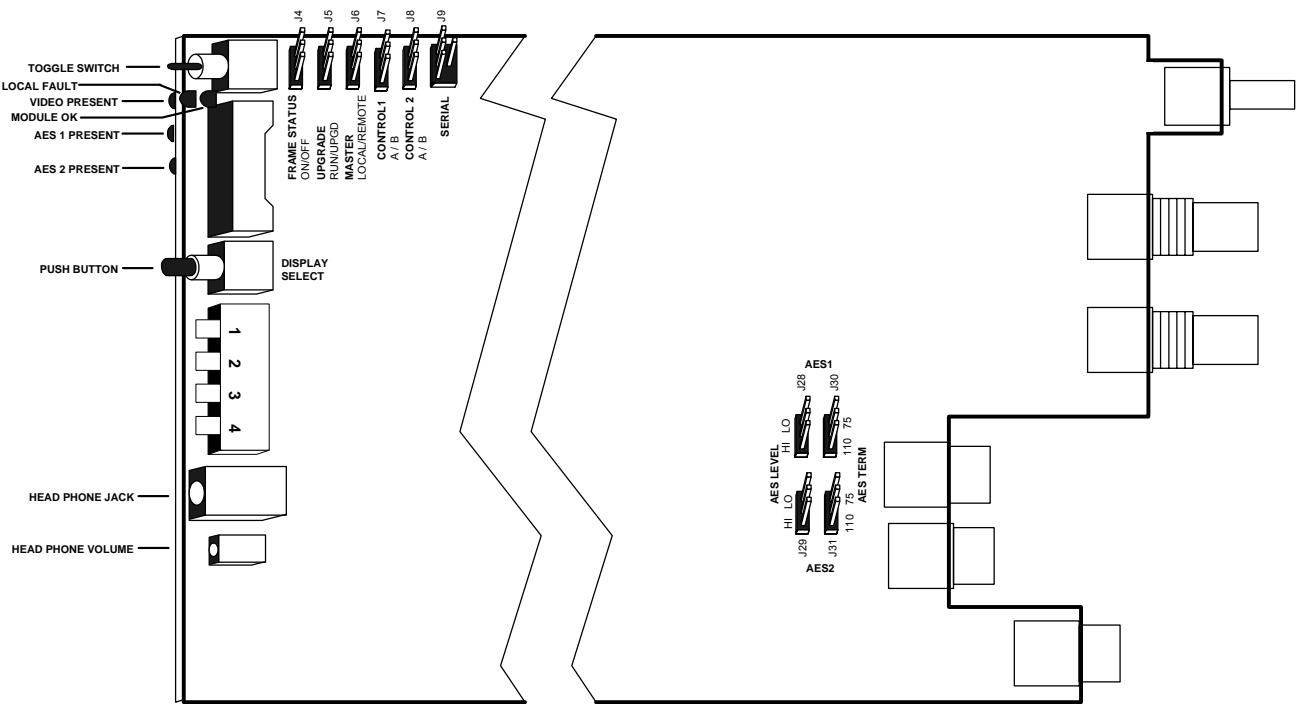
7.1. SELECTING WHETHER LOCAL FAULTS WILL BE MONITORED BY THE GLOBAL FRAME STATUS

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.

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

The MASTER jumper J6 selects whether the module will be controlled from the local user controls or through the *Vista*LINK® interface.

MASTER: When this jumper is installed in the LOCAL position, the card functions are controlled through the local controls.

When this jumper is installed in the REMOTE position, the card functions are controlled through the *Vista*LINK® interface.

7.3. SELECTING THE OUTPUT VIDEO STANDARD ON LOSS OF VIDEO SIGNAL

The CONTROL 1 jumper J7 located at the top of the module is used to configure the video standard of the output video when there is no video present on the input signal.

CONTROL 1: To set the output video format to PAL set the jumper to the *A* position.

To set the output video format to NTSC set the jumper to the *B* position.

7.4. SELECTING THE AES OUTPUT IMPEDANCE (7707VAR and 7707VAR-U)

The AES TERM jumpers J30 and J31 located near the rear of the module are used to configure whether source impedance of the AES outputs are compatible with balanced (110 ohm) or unbalanced (75 ohm) AES signals.

AES TERM: To configure the source impedance of the AES outputs for use with balanced AES signals that conform to AES3-1992 set the jumpers to the 110 position.

To configure the source impedance of the AES outputs for use with unbalanced AES signals conforming to SMPTE 276M set the jumpers to the 75 position.

> **The AES TERM jumper should always be set to the 75 position on the 7707VAR-U**

7.5. SETTING THE AES OUTPUT LEVEL (7707VAR and 7707VAR-U)

The AES LEVEL jumpers J28 and J29 control the peak to peak voltage level of the outputs.

AES LEVEL: When the AES TERM jumpers are set to the 110 position the AES LEVEL jumpers must be set to the HI position to give a 5 volt balanced signal level.

When the AES TERM jumpers are set to the 75 position the AES LEVEL jumpers must be set to the LO position to give a 1 volt unbalanced signal level.

> **The AES LEVEL jumper should always be set to the LO position on the 7707VAR-U**

7.6. 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 in the front of the binder 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 in the front of the binder. Once the upgrade is completed, 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.

8. *VISTA*LINK® REMOTE MONITORING/CONTROL

8.1. WHAT IS *VISTA*LINK®?

*Vista*LINK® 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. *Vista*LINK® 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 *Vista*LINK® 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, *Vista*LINK® enables the user to configure devices in the network from a central station and receive feedback that the configuration has been carried out.

There are 3 components of SNMP:

1. An SNMP manager, also known as a Network Management System (NMS), is a computer running special software that communicates with the devices in the network. Evertz VL-Fiber demo Manager graphical user interface (GUI), third party or custom manager software may be used to monitor and control Evertz *Vista*LINK® enabled fiber optic products.

2. Managed devices, (such as 7707EO and 7707OE cards), each with a unique address (OID), communicate with the NMS through an SNMP Agent. Evertz *Vista*LINK® enabled 7700 series modules reside in the 3RU 7700FR-C MultiFrame and communicate with the manager via the 7700FC *Vista*LINK® 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. *VISTA*LINK® MONITORED PARAMETERS

Table 8-2 shows the parameters that can be remotely monitored through the *Vista*LINK® interface.

Parameter	Description
Master Jumper	Indicates whether card is in local or *Vista*LINK® control (the state of the MASTER jumper).
Module OK	Indicates if module is in good health (the state of the MODULE OK LED).
Optical Power	A range of values describing optical power at the fiber input.
Signal Valid	Indicates the presence of a valid video input signal (the state of the VIDEO PRESENT LED).
Video Standard	A range of values describing the detected video standard.
AES Audio Signal 1	Indicates the presence of an AES1 input signal (the state of the AES1 PRESENT LED).
AES Audio Signal 2	Indicates the presence of an AES2 input signal (the state of the AES2 PRESENT LED).
AES Rate Detect 1	Indicates the AES1 Sample Rate.
AES Rate Detect 2	Indicates the AES2 Sample Rate.
Carrier Weak	Indicates weak optical input signal.
EDH Error	The status of Full Field EDH errors present in the input signal.

Table 8-1: 7707VAR and 7707VAR-U *Vista*LINK® Monitored Parameters

Parameter	Description
Master Jumper	Indicates whether card is in local or *Vista*LINK® control (the state of the MASTER jumper).
Link Not OK	Indicates if there is a valid optical link established between VAR-A4 and VAT-A4.
Optical Power	A range of values describing optical power at the fiber input.
SDI Video Not Present	Indicates the presence of a valid video input signal (the state of the VIDEO PRESENT LED).
Video Standard	A range of values describing the detected video standard.
Audio 1 Silent	Indicates the presence of an Audio 1 input signal (the state of the AUDIO 1 PRESENT LED).
Audio 2 Silent	Indicates the presence of an Audio 2 input signal (the state of the AUDIO 2 PRESENT LED).
Audio 3 Silent	Indicates the presence of an Audio 3 input signal (the state of the AUDIO 3 PRESENT LED).
Audio 4 Silent	Indicates the presence of an Audio 4 input signal (the state of the AUDIO 4 PRESENT LED).
Carrier Weak	Indicates weak optical input signal.
EDH Error	The status of Full Field EDH errors present in the input signal.

Table 8-2: 7707VAR-A4 *Vista*LINK® Monitored Parameters

8.3. *VISTA*LINK® CONTROLLED PARAMETERS

Table 8-3 to Table 8-5 show the parameters that can be remotely controlled through the *Vista*LINK® interface:

Parameter	Description
Output video Black or Blue	Enables video output to be black or blue on loss of input fiber link.

Table 8-3: *Vista*LINK® Controlled Parameters

Parameter	Description
AES Sample Rate	Sets the AES Sample Rate.
SoftSwitch™ Disable	Enables or Disables SoftSwitch™ functionality.

Table 8-4: *Vista*LINK® Controlled Parameters (7707VAR only)

Parameter	Description
Output video 525 or 625	Enables video output to be 525 or 625 line on loss of input fiber link
Audio 1 Volume Level	Sets the Audio 1 Volume Level
Audio 2 Volume Level	Sets the Audio 2 Volume Level
Audio 3 Volume Level	Sets the Audio 3 Volume Level
Audio 4 Volume Level	Sets the Audio 4 Volume Level
Audio 1 Presence Detect	Sets the Audio 1 Presence Detect Mode
Audio 1 Presence Level	Sets the Audio 1 Presence Detect Level
Audio 1 Presence Duration	Sets the Audio 1 Presence Detect Duration
Audio 2 Presence Detect	Sets the Audio 2 Presence Detect Mode
Audio 2 Presence Level	Sets the Audio 2 Presence Detect Level
Audio 2 Presence Duration	Sets the Audio 2 Presence Detect Duration
Audio 3 Presence Detect	Sets the Audio 3 Presence Detect Mode
Audio 3 Presence Level	Sets the Audio 3 Presence Detect Level
Audio 3 Presence Duration	Sets the Audio 3 Presence Detect Duration
Audio 4 Presence Detect	Sets the Audio 4 Presence Detect Mode
Audio 4 Presence Level	Sets the Audio 4 Presence Detect Level
Audio 4 Presence Duration	Sets the Audio 4 Presence Detect Duration
Audio 1 Mute	Sets the Audio 1 Mute Mode
Audio 2 Mute	Sets the Audio 2 Mute Mode
Audio 3 Mute	Sets the Audio 3 Mute Mode
Audio 4 Mute	Sets the Audio 4 Mute Mode

Table 8-5: *Vista*LINK® Controlled Parameters (7707VAR-A4 only)