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REVISION HISTORY

REVISION	DESCRIPTION	DATE
1.0	First Release	Feb 04
1.1	Updated *Vista*LINK™ Parameters and Specs	Jun 04
1.2	Updated *Vista*LINK™ Monitored Parameters and Traps	Sep 04
1.3	Updated safety section and added assembly and labeling sections	Aug 05
1.4	Updated *Vista*LINK® description and fixed format	Nov 08

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 7707CVDT DWDM cards directly with a short fiber optic cable. The 7707CVDT DWDM cards produce +7dBm of power which will damage the receiver if connected directly.

1. OVERVIEW

The 7707CVDT series modules are *Vista*LINK® enabled, Composite Analog Video fiber transmitters for broadcast quality video and serial data signals. The -A4 versions are also Analog Audio transmitters. These modules accept an NTSC or PAL analog video input with up to four analog audio inputs (on the -A4 versions), perform analog to digital conversion and transmit them over a single fiber optic cable. All 7707CVDT series modules provide bi-directional transport of RS232/RS422 data on the fiber when connected to a companion 7707CVDR module. The companion 7707CVDR series Composite Video fiber receivers demultiplex the signals and convert them back to NTSC or PAL analog video, serial data and up to four analog audio signals (on the –A4 versions).

The 7707CVDT and 7707CVDT-A4 occupy 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.

Two optical interface configurations allow the user to choose the optimal function / price / performance ratio to suit a particular application. The standard configuration transmits and receives over a single fiber. The dual fiber (-F2) configuration is compatible with CWDM and DWDM systems and is designed to transmit and receive over separate fibers. The optical output of the 7707CVDT is available in 1310nm, 1550nm, or any one of up to sixteen CWDM wavelengths or a multitude of DWDM wavelengths. All versions accept 1270 nm to 1610 nm optical input signals on multi-mode or single-mode fiber (Please see specifications, section 3, for complete information).

Video & Data	Video, Audio & Data	Wavelength	Comments
7707CVDT13	7707CVDT13-A4	1310 nm FP	Suitable for distances up to 6 km
7707CVDT13-F2	7707CVDT13-A4-F2	1310 nm FP	Suitable for distances up to 50 km
7707CVDT15-W	7707CVDT15-W-A4	1550 nm DFB	Suitable for distances up to 60 km

There are several versions with built in isolators specifically suited to coarse wave division multiplexing (CWDM) applications. The CWDM versions are suitable for distances up to 80 km.

Video & Data	Video, Audio & Data	Wavelength	Comments
7707CVDT27-F2	7707CVDT27-A4-F2	1270 nm DFB	
7707CVDT29-F2	7707CVDT29-A4-F2	1290 nm DFB	
7707CVDT31-F2	7707CVDT31-A4-F2	1310 nm DFB	
7707CVDT33-F2	7707CVDT33-A4-F2	1330 nm DFB	
7707CVDT35-F2	7707CVDT35-A4-F2	1350 nm DFB	
7707CVDT37-F2	7707CVDT37-A4-F2	1370 nm DFB	
7707CVDT43-F2	7707CVDT43-A4-F2	1430 nm DFB	
7707CVDT45-F2	7707CVDT45-A4-F2	1450 nm DFB	
7707CVDT47-F2	7707CVDT47-A4-F2	1470 nm DFB	
7707CVDT49-F2	7707CVDT49-A4-F2	1490 nm DFB	
7707CVDT51-F2	7707CVDT51-A4-F2	1510 nm DFB	
7707CVDT53-F2	7707CVDT53-A4-F2	1530 nm DFB	
7707CVDT55-F2	7707CVDT55-A4-F2	1550 nm DFB	
7707CVDT57-F2	7707CVDT57-A4-F2	1570 nm DFB	
7707CVDT59-F2	7707CVDT59-A4-F2	1590 nm DFB	
7707CVDT61-F2	7707CVDT61-A4-F2	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 up to 105 km. (for DWDM applications contact factory).

Video & Data	Video, Audio & Data	Wavelength	Description
7707CVDTDyyy-F2	7707CVDTDxxx-A4-F2	DWDM DFB	xxx – ITU channel number

Features:

- Single card slot including fiber optic converter
- Supports both NTSC and PAL video
- Broadcast quality analog video and audio (-A4 versions) performance
- Superior digital data transmission methods
- Video loop-through for additional signal distribution or monitoring (single fiber versions only)
- Signal transport over fiber is uninterrupted by loss of input video or audio feeds.
- Low Audio to Video latency (-A4 versions only)
- Supports bi-directional RS232/422 signals
- Comprehensive signal and status monitoring via four-digit card-edge display
- *Vista*LINK® enabled for remote monitoring and control through SNMP when installed in 7700FR-C frame with 7700FC *Vista*LINK® Frame Controller.
- Adjustable gain equalization for up to approximately 300m of Belden 1694 coaxial cable
- Fully Hot-swappable from front of frame with no fiber disconnect/reconnect required
- Supports Single mode (8-10 μm) and Multi-mode (50/62.5 μm) fiber optic cable
- Bi-directional or dual fiber optical input/output configurations
    1. Accepts any wavelength in the 1270nm to 1610nm range
    2. Optical output wavelengths of 1310nm, 1550nm, up to sixteen CWDM wavelengths from 1270nm to 1610nm and DWDM wavelengths from 1529.55nm to 1561.42nm.

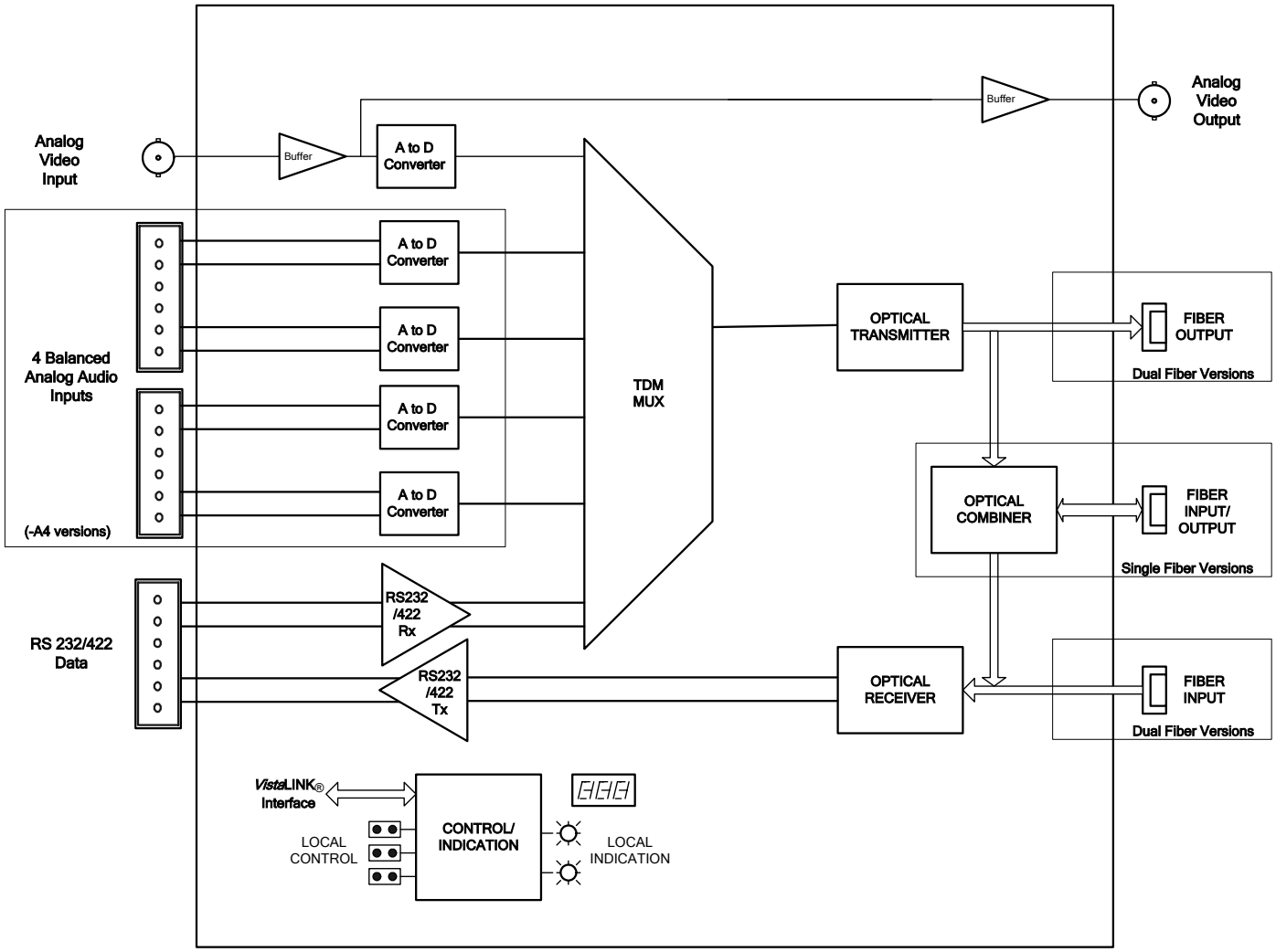

Figure 1-1: 7707CVDT and 7707CVDT-A4 Block Diagram

2. INSTALLATION

The 7707CVDT series modules comes with a companion rear plate that has one or two BNC connectors, one sixteen pin terminal header with removable terminal block and one or two SC/PC, ST/PC or FC/PC optical connectors. For information on mounting the rear plate and inserting the module into the frame see the 7700FR chapter section 3.

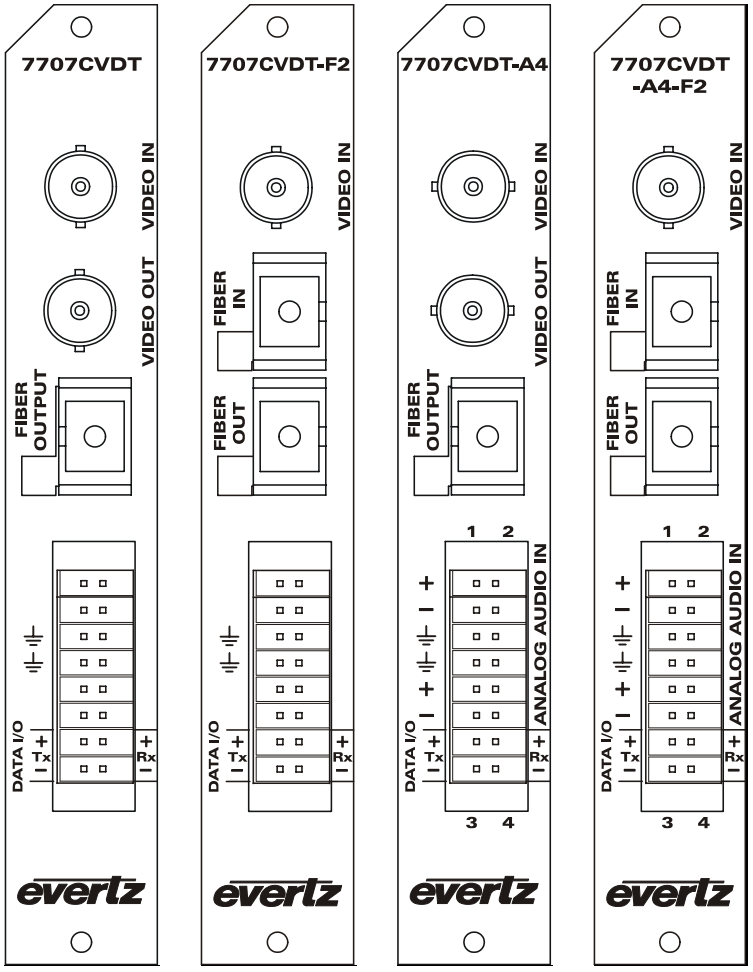

Figure 2-1: 7707CVDT and 7707CVDT-A4 Rear Panels

2.1. OPTICAL CONNECTIONS

The 7707CVDT modules are designed to work with single-mode or multi-mode optical fiber depending on the version ordered.

2.1.1. Single Fiber versions

FIBER I/O: There is one SC/PC, (shown), ST/PC or FC/PC female connector with the optical input/output from the 7707CVDT. This connector should be connected to the **FIBER I/O** connector of a matching single fiber 7707CVDR module at the destination end with a suitable fiber optic cable.

All single fiber versions of the 7707CVDT are designed to work with single-mode fiber optic cable. Single fiber 7707CVDT13 and 7707CVDT13-A4 versions use 1310nm wavelengths. Single fiber 7707CVDT15-W and 7707CVDT15-W-A4 versions use 1550nm wavelengths.

2.1.2. Standard Dual Fiber version (-F2 versions)

FIBER IN: There is one SC/PC (shown), ST/PC or FC/PC female connector with the optical input to the module. This connector should be connected to the **FIBER OUT** connector of a matching dual fiber 7707CVDR-F2 or 7707CVDR-A4-F2 module at the destination end with a suitable fiber optic cable. The dual fiber 7707CVDT-F2 versions receive on wavelengths in the 1270 to 1610nm range accommodating standard, CWDM or DWDM transmission schemes.

FIBER OUT: There is one SC/PC (shown), ST/PC or FC/PC female connector with the optical output from the module. This output contains the digitized serial data from the RX receive input signal. This optical output is available in 1310nm, 1550nm, up to sixteen CWDM wavelengths (ITU-T G.694 compliant) and many DWDM wavelengths. This connector should be connected to the **FIBER IN** connector of a matching dual fiber 7707CVDR-F2 or 7707CVDR-A4-F2 module at the destination end with a suitable fiber optic cable. The dual fiber 7707CVDT-F2 versions transmit on the wavelength marked on the rear panel and are designed to work with either single-mode fiber optic cable. The dual fiber 7707CVDT-F2 versions are compatible with multi-mode fiber when connected directly to a companion 7707CVDR-F2 module.

2.2. VIDEO CONNECTIONS

VIDEO IN: This input BNC accepts analog NTSC or PAL video signals. This input provides equalization compensation for up to approximately 300m of industry standard Belden 1694 coaxial cable.

VIDEO OUT: This output BNC connector is available only on single fiber versions and provides a buffered output for additional signal distribution or signal monitoring.

2.3. SIGNAL CONNECTIONS

A sixteen pin removable terminal block has the connections for bi-directional serial data. The –A4 versions also have four balanced analog audio inputs. The cables can be secured into the removable portion of the terminal strips using a small screwdriver. The removable part of the terminal strip is then inserted into the rear panel and secured using the hold down screws.

2.3.1. Serial Data Connections

The bottom four pins of the terminal block are used for a bi-directional serial data port conforming to RS-422 signal levels when the SERIAL jumper is set to the 422 position. When the SERIAL Jumper is set to the 232 position these pins are configured as two RS-232 bi-directional serial data ports. See section 7.3 and 7.4 for information on configuring the serial data port. The shield of the data communication should be connected to one of the ground pins on the terminal block.

Pin #	RS-232 Pin Function	RS-422 Pin Function
Gnd	Ground	Ground
-Tx	RS-232 Port 1 Tx Output	RS-422 Tx-(a) Output
+Rx	RS-232 Port 2 Rx Input	RS-422 Rx+(b) Input
+Tx	RS-232 Port 2 Tx Output	RS-422 Tx+(b) Output
-Rx	RS-232 Port 1 Rx Input	RS-422 Rx-(a) Input

Table 2-1: RS-232/422 Connector Pin Definitions

2.3.2. Analog Audio Connections (-A4 Versions only)

ANALOG AUDIO IN: Balanced analog audio inputs for 4 channels. Each input (+, -, GND) is on three of twelve pins on the sixteen pin terminal block.

2.4. CARE AND HANDLING OF OPTICAL FIBER

2.4.1. Safety

CLASS 1 LASER PRODUCT

Background colour: yellow
Triangular band: black
Symbol: black

2.4.2. Assembly

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

2.4.3. Labeling

Certification and Identification labels are combined into one label. As there is inadequate space 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: 7707CVDT13, 7707CVDT13-A4, 7707CVDT13-F2, 7707CVDT13A4-F2, 7707CVDT15-W, 7707CVT15-W-A4
  7707CVDT xx, (xx = 27, 29, 31, 33, 35, 37, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61)
  7707CVDT Dyyy (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

2.4.4. 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 the user 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. OPTICAL INPUT/OUTPUT

Connector:
Single Fiber version: 1 Bi-directional optical connector: SC/PC, ST/PC or FC/PC female housing
Dual Fiber (F2) version: 2 optical connector: SC/PC, ST/PC or FC/PC female housing
Maximum Input Power:
Single fiber versions: 0 dBm
Dual fiber (F2) versions: 0 dBm
Input Optical Sensitivity:
Single fiber versions: -24 dBm
Single fiber (W) versions: -26 dBm
Dual fiber (F2) versions: -28 dBm
Fiber Size and Type:
Single Fiber versions: 9 μm core / single mode
Dual Fiber (F2) versions: 9 μm core / single-mode on TX, 62.5 μm core / multi-mode on RX
Output Wavelengths:
Standard: 1310nm, 1550nm (nominal)
CWDM: 1270nm to 1610nm, 20 nm channel spacing
DWDM: 1529.55nm to 1561.42nm (ITU-T ch # 60 to 20), 0.8nm channel spacing
Output Power:
Single fiber version:
1310nm FP (Standard): -10 dBm ±1dBm
1550nm DFB (W Versions): -1 dBm ±1dBm
Dual fiber version:
1310nm FP (Standard): -7 dBm ±1dBm
CWDM DFB: 0 dBm ±1dBm
DWDM DFB: +7 dBm ±1dBm

3.1. ANALOG VIDEO INPUT

Standards: NTSC, SMPTE 170M, PAL, ITU-R 624-4
Number of Inputs: 1
Connector: BNC per IEC 60169-8 Amendment 2.
Signal Quantization: 12 bits
System Bandwidth: 5.5MHz
Input Level: 2 Vp-p (Maximum)
Gain Equalization: up to 250m of Belden 1694 or equivalent (adjustable)
Input impedance: 75 Ohms
Return Loss: > 30 dB to 5.5 MHz
Signal/Noise Ratio: > 67 dB
Differential Gain: < 1.0 %
Differential Phase: < 0.7 Degree
Passband Ripple:
NTSC: < +/- 0.1dB to 4.1 MHz
< +/- 0.2dB to 5.5 MHz
PAL: < +/- 0.1dB to 4.8 MHz
< +/- 0.2dB to 5.8 MHz
Chroma/Luma Gain: 98% to 103%

Chroma/Luma Delay:
NTSC: < 5 ns
PAL: < 12 ns
Line Time Distortion: 1.2%

3.2. ANALOG VIDEO OUTPUTS (SINGLE FIBER VERSIONS ONLY)

Standard: NTSC, SMPTE 170M, PAL, ITU-R 624-4
Number of Outputs: 1 buffered version of input
Connector: BNC per IEC 60169-8 Amendment 2.
Output Level: 1V p-p
Output Impedance: 75 Ohms
Return Loss: > 30 dB to 5.5 MHz

3.3. SERIAL DATA PORT

Number of Ports: 1 RS-422 or 2 RS-232 – Jumper Selectable
Connector: 4 pins (plus ground) on 16 pin removal terminal block
Baud Rate: Up to 3 Mb/s (Determined by incoming data)

3.4. ANALOG AUDIO INPUTS (-A4 VERSIONS ONLY)

Number of Inputs: 4
Type: Balanced analog audio
Connector: 16 pin removal terminal block
Input impedance: High Impedance (>20 KOhm)
Freq. Response: +/-0.1 dB, 20Hz to 20 kHz
THD 20Hz–20Khz: < 0.005%
Channel Phase Diff.: +/- 1 deg
SNR (weighted): > 85 dB
Max. Audio Input Level: +24 dBu
Signal Quantization: 24 Bits

3.5. SYSTEM PERFORMANCE

Video Input to Video Output Delay: < 10μs
Audio Input to Audio Output Delay: < 1.9ms (-A4 version only)

3.6. ELECTRICAL

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

3.7. PHYSICAL

7700 or 7701 frame mounting:
Number of slots: 1

4. STATUS INDICATORS AND DISPLAYS

The 7707CVDT has 6 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 and toggle switch are used to select various displays on the alphanumeric display. Figure 7-1 shows 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 video and audio input signal, if a laser fault exists, 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 video or audio input signal is present, and the laser and board power are good.

There are four small LEDs on the back side of the board that indicate the presence of serial data activity. On the –A4 versions these LEDS also indicate the presence of audio signals above the detection level (see section 5.4.1 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 / SERIAL TX: This Green LED indicates the presence of a valid signal on the Audio 3 input or serial TX data activity (see LEDS Menu section 5.7).

AUDIO 4 / SERIAL RX: This Green LED indicates the presence of a valid signal on the Audio 4 input or serial RX data activity (see LEDS Menu section 5.7).

4.2. DOT-MATRIX DISPLAY

Additional signal and status monitoring and control over the card's parameters is 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 menu item (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.

When the user is 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 details of the each of the displays are described in the sections 4.2.1 to 4.2.4.

PWR	Input Optical Power
S/W	Display firmware version
AJCK	Set Headphone Jack Audio Channel
STD1	Video Standard in Use

4.2.1. Displaying the Optical Power

The 7707CVDR detects the input optical power and displays 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 (> -12 dBm)
-12 to –28	Numerical value of optical input power
<-28	Indicates the optical input power is below -28dBm

4.2.2. Displaying the Firmware Version

The **S/W** display allows the user to view the firmware version of the 7707CVDT. After one second the display will show a message the firmware version such as:

S/W VER: 1.00 BLD: 025

4.2.3. Setting the Headphone Jack Channel (-A4 versions only)

The **AJCK** display allows the user to set a whether audio channels 1/2 or 3/4 will be monitored on the card edge headphone jack. After one second the display will show a message indicating the current audio channel being monitored at the headphone jack. When this message is showing, press the pushbutton to change the audio channel being monitored.

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.

4.2.4. Displaying the Video Standard

The 7707CVDT detects the Video standard of the input signal and displays this on the four-digit card edge display. The following list describes possible displays and their meaning.

NTSC	SMPTE 170M
PAL	ITU-R624-4
LSV	Indicates that no valid video signal is present on the input. This message overrides the normal video standard message.

5. CARD EDGE MENU SYSTEM

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 the control mode main setup menu. The user can 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.

Once the user is 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 the toggle switch is lifted and it will decrease the toggle switch pushed down. If the parameter contains a list of choices, the user can cycle through the list by pressing the toggle switch in either direction.

When 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 you enter the Control menu. Selecting one of these items will take you down into the next menu level. The details of the each of the displays are described in the sections 5.3 to 5.6.

EQ1	Configures the input cable equalization on the video input.
ADET	Sub menu allows the user to set parameters relating to the Audio detection (-A4 versions only).
FRST	Resets the module to its factory reset values.
DISP	Allows the user to set the orientation of the front panel display.
LEDS	Allows the user to monitor serial activity (for channels 3 and 4 only).

5.3. SETTING THE VIDEO CONTROLS

5.3.1. Setting the Cable Equalization

EQ1
0
0 to 300

The *EQ1* control is used to set the amount of cable equalization being applied at the video input. It can be adjusted to compensate for various input cable lengths to achieve a flat frequency curve. The display shows a range of approximate cable length values expressed in meters for Belden 1694 cable or equivalent. When set to 0 the cable equalization is turned off.

5.4. SETTING THE AUDIO CONTROLS (-A4 VERSIONS ONLY)

5.4.1. 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 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 reported missing.

5.4.1.1. Procedure to Calibrate Audio Presence Detection

1. Supply the 7707CVDT module that is being calibrated with your 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 0.5 sec so that the user can 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. RESTORING THE FACTORY SETTINGS

FRST
NO
YES

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

5.6. 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.

5.7. MONITORING AUDIO PRESENT/SERIAL ACTIVITY (-A4 VERSIONS ONLY)

LEDS
AUD
DATA

The *LEDS* control selects what the four small LEDs display. On the non – A4 version, this control is always set to the *DATA.*

When set to *AUD* position, the four small LEDS show audio presence for all four channels.

When set to *DATA* position the AUDIO 3/SERIAL TX LED shows serial transmit activity and AUDIO 4/SERIAL RX LED shows serial receive activity.

6. CARD EDGE CONTROLS

The 7707CVDT is equipped with a three position, return to center, toggle switch which is used to select the various card-edge displays and menu items. It is also used in conjunction with a momentary pushbutton to select some sub-items of the menu system. See sections 0 and 5 for information about the card edge displays and menu system.

6.1. MONITORING THE AUDIO (-A4 VERSIONS ONLY):

A stereo headphone jack located at the front of the module is used to monitor the individual audio channel pairs. The *AJCK* menu item is used to select the audio channels currently being monitored (See section 4.2.1). The monitoring volume level can be adjusted but turning the level potentiometer located beside the headphone jack.

7. JUMPERS

Several jumpers, located at the front and rear of the module are used to preset various operating modes. Figure 7-1 shows the location of the card edge controls, status indicators and jumpers.

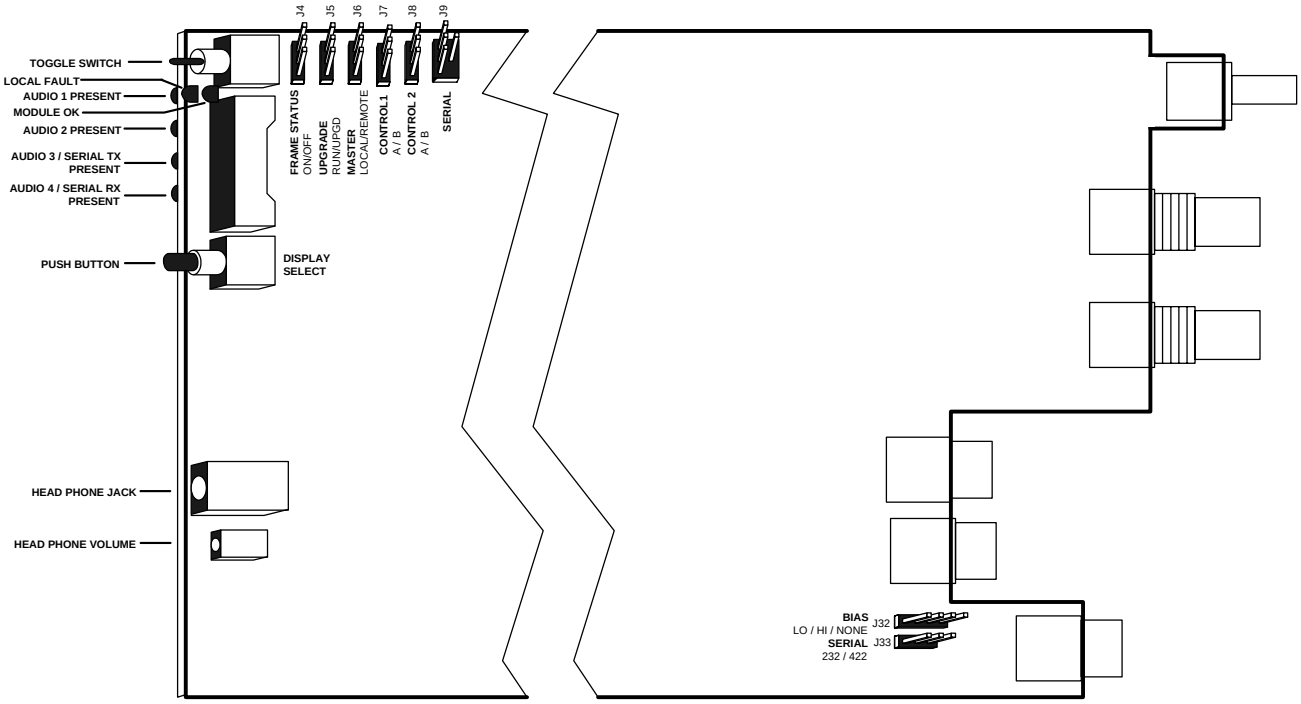

Figure 7-1: Location of Jumpers and Card Edge Controls

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 jumpers.

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

7.3. SELECTING THE DATA COMMUNICATIONS STANDARD (RS-232 OR RS-422)

The SERIAL jumper J33 located at the rear of the module is used to configure whether the serial data channel will operate in the RS-232 or RS-422 standard. The sixteen pin terminal block has a pair of inputs, a pair of outputs and a ground connection for the Serial Data Channel.

SERIAL: To set the serial data inputs and outputs to operate in the RS-232 standard install the jumper in the *232* position. In this mode the input and output pins will be configured as two RS-232 Rx/Tx ports (Port 1 and Port 2).

To set the serial data inputs and outputs to operate in the RS-422 standard install the jumper in the *422* position. In this mode the input and output pins will be configured as one RS-422 Rx/Tx port.

7.3.1. Configuring RS422 Device Communication between a Controller and Tributary

SMPTE Standard 207M defines the electrical and mechanical characteristics of the device interface used in transferring data and control signals between production and post-production equipment. Each interface system consists of a single bus-controller and one or more tributaries. The bus-controller controls the communication flow to all tributaries connected to it, while a tributary transmits data to an operational device.

A 7707CVDT/7707CVDR pair can be configured to interface between a bus-controller and a tributary if configured as follows:

Controller DB9 PIN #	Transmitting 7707CVDT PIN #
2	Tx- Out
3	Rx+ In
7	Tx+ Out
8	Rx- In

Receiving 7707CVDR PIN #	Tributary DB9 PIN #
Rx- In	2
Tx+ Out	3
Rx+ In	7
Tx- Out	8

7.4. SELECTING THE DEFAULT BEHAVIOUR OF THE INPUTS WHEN THERE IS NO SIGNAL CONNECTED

The BIAS jumper J32 located at the rear of the board controls the behaviour of the RS-422 inputs when there is no signal connected. This is not critical for most applications, and the setting will not typically affect performance. Figure 7-2 shows a simple schematic of the receiver input. The RS-422 receiver device has a pulldown to ground on the Rx+ input and a pullup to +5v on the Rx- input.

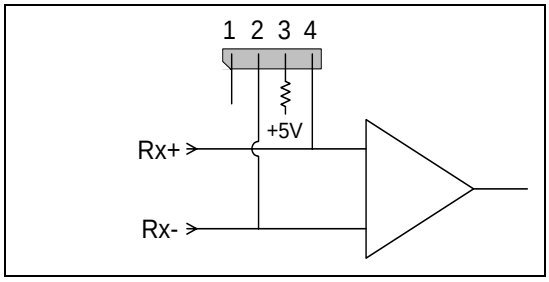

Figure 7-2: Receiver Input Pull-up Configuration

If you want to override the default pull-ups set the appropriate jumper as shown in the chart below.

Label	Jumper on pins	Function
None	1 & 2	Default pull-ups (Rx+ low, Rx- high)
HI	2 & 3	Rx- pulled up to +5 volts, Rx+ default (low)
LOW	3 & 4	Rx+ pulled up to + 5 volts, Rx- default (high)

7.5. 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* chapter 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 the binder) onto the SERIAL header at the card edge. Re-install the module into the frame. Run the upgrade as described in the *Upgrading Firmware* chapter 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' 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

The following parameters can be remotely monitored through the *Vista*LINK® interface:

Fiber Link Loss	Indicates the loss of a valid optical link with a 7707CVDR module.
Optical Power	A range of values describing optical power at the fiber input.
Video Standard	Indicates if the input video standard is NTSC or PAL.
Master Jumper	Indicates whether the card is set in local or remote mode.
Serial TX Data Present	Indicates the presence of serial transmit activity (the state of the AUDIO 3/SERIAL TX PRESENT LED).
Serial RX Data Present	Indicates the presence of serial receive activity (the state of the AUDIO 4/SERIAL RX PRESENT LED).
Laser Fault	Indicates deficient operation of the optical output laser. (State of the Laser Fault LED).
Carrier Weak	Indicates the optical power is approaching optical receiver sensitivity limits.
Loss of Video	Indicates the loss of a valid video input signal.

Table 8-1: *Vista*LINK® Monitored Parameters – All versions

Audio 1 Silence	Indicates the silence of an Audio 1 input signal (the counter state of the AUDIO 1 PRESENT LED).
Audio 2 Silence	Indicates the silence of an Audio 2 input signal (the counter state of the AUDIO 2 PRESENT LED).
Audio 3 Silence	Indicates the silence of an Audio 3 input signal (the counter state of the AUDIO 3 PRESENT LED).
Audio 4 Silence	Indicates the silence of an Audio 4 input signal (the counter state of the AUDIO 4 PRESENT LED).

Table 8-2: *Vista*LINK® Monitored Parameters – A4 versions

8.3. *VISTA*LINK® CONTROLLED PARAMETERS

When the CONTROL jumper is set to the REMOTE position, the following parameters can be remotely controlled through the *Vista*LINK® interface. When the MASTER jumper is set to the LOCAL position the local jumper settings will override the settings configured through the *Vista*LINK® interface.

Parameter	Description
Video Input Equalization	A range of values describing equalization being applied to the Video input.

Table 8-3: *Vista*LINK® Controlled Parameters – all versions

Parameter	Description
Audio 1 Silence Detect	Sets the Audio 1 Presence Detect Mode.
Audio 1 Silence Level	Sets the Audio 1 Presence Detect Level.
Audio 1 Silence Duration	Sets the Audio 1 Presence Detect Duration.
Audio 2 Silence Detect	Sets the Audio 2 Presence Detect Mode.
Audio 2 Silence Level	Sets the Audio 2 Presence Detect Level.
Audio 2 Silence Duration	Sets the Audio 2 Presence Detect Duration.
Audio 3 Silence Detect	Sets the Audio 3 Presence Detect Mode.
Audio 3 Silence Level	Sets the Audio 3 Presence Detect Level.
Audio 3 Silence Duration	Sets the Audio 3 Presence Detect Duration.
Audio 4 Silence Detect	Sets the Audio 4 Presence Detect Mode.
Audio 4 Silence Level	Sets the Audio 4 Presence Detect Level.
Audio 4 Silence Duration	Sets the Audio 4 Presence Detect Duration.

Table 8-4: *Vista*LINK® Controlled Parameters –A4 versions only

8.4. *VISTA*LINK® TRAPS

Fiber Link Loss	Indicates the loss of a valid optical link with a 7707CVDR module.
Loss of Video	Indicates the loss of a valid video input signal.
Laser Fault	Indicates deficient operation of the optical output laser (the state of the LASER FAULT LED).
Carrier Weak	Indicates the optical power is approaching optical receiver sensitivity limits.

Table 8-5: *Vista*LINK® Traps –All versions

Audio Silence 1	Indicates the silence of an Audio 1 input signal (the counter state of the AUDIO 1 PRESENT LED).
Audio Silence 2	Indicates the silence of an Audio 2 input signal (the counter state of the AUDIO 2 PRESENT LED).
Audio Silence 3	Indicates the silence of an Audio 3 input signal (the counter state of the AUDIO 3 PRESENT LED).
Audio Silence 4	Indicates the silence of an Audio 4 input signal (the counter state of the AUDIO 4 PRESENT LED).

Table 8-6: *Vista*LINK® Traps –A4 version

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