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## REVISION HISTORY

<u>REVISION</u>	<u>DESCRIPTION</u>	<u>DATE</u>
0.1	Preliminary Version	May 05
1.0	First Release - updated drawings, and menu items	Jun 05
1.1	Updated Safety info, and formatting	Jan 06
1.2	Updated menu items and VistaLINK® description	Jan 07
1.3	Added card edge controls information to section 4.2. Updated menu structure format throughout 4.2.1 to 4.2.6. Updated technical specs.	Oct 08
1.4	Added 'OFF' Menu setting to Output Standard on Loss to Table 4.2 and Section 4.2.2	Jun 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 7707VT-8 DWDM and 7707VR-8 cards directly with a short fiber optic cable. The 7707VT-8 DWDM card produce +7dBm of power, which will damage the receiver if connected directly.



Do not hook up the 7707VT-8 cards that output more than -7dBm of power (see 7707VT-8 specifications for output power of various laser types) and 7707VR-8-H high sensitivity receiver cards directly with a short fiber optic cable. The 7707VT-8 cards that produce more than -7dBm of power will damage the receiver if connected directly.

## 1. OVERVIEW

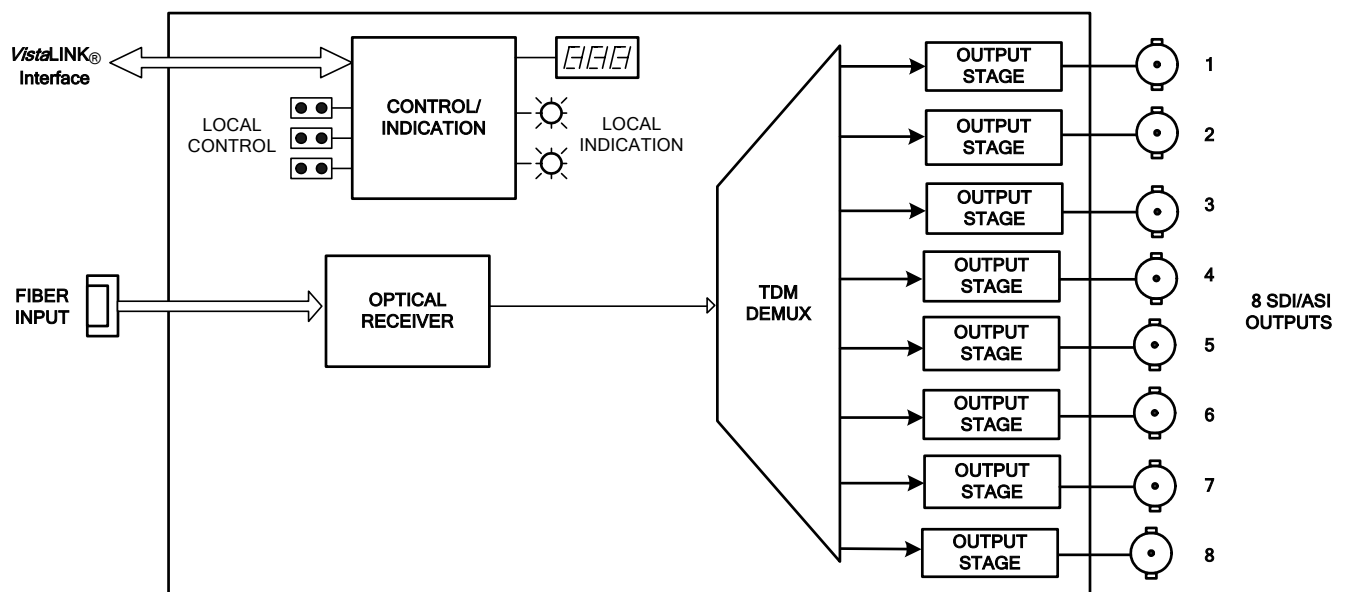
The 7707VR-8 is a VistaLINK® – enabled fiber optic receiver for SDI, DVB-ASI or SDTi signals. This double card module demultiplexes up to eight SDI, DVB-ASI or SDTi video signals that have been Time Domain Multiplexed (TDM) by the companion 7707VT-8 Octal SDI Fiber Transmitter module.

The 7707VR-8 and companion 7707VT-8 will transparently pass embedded AES audio or any other data in the horizontal or vertical ancillary data space. Monitoring and control of card status and parameters is provided locally at the card edge or remotely via VistaLINK®.

The 7707VR-8 occupies two card slots in the 3 RU frame, which will hold up to 7 modules or one card slot in the 1RU frame, which will hold up to three modules. One 7707VR-8 module can also be installed in the S7701 stand-alone enclosure.

### Features:

- Demultiplexor for eight synchronous or asynchronous 270Mb/s SDI, DVBAISI or SDTi video signals
- Signal transport over fiber uninterrupted by loss of any input video feed
- Transparently passes embedded AES or any other data in the horizontal or vertical ancillary data space
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®
- Can be housed in either a 1RU frame which will hold up to 3 modules, a 3RU frame which will hold up to 7 modules, 3RU portable frame that holds up to 3 modules or a standalone frame which will hold 1 module
- VistaLINK® capability is available when modules are used with the 3RU
- 7700FR-C or 350FR frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame
- Supports single-mode and multi-mode fiber optic cable
- Accepts any wavelength in the 1270nm to 1610nm range
- SC/PC, ST/PC, FC/PC fiber connectors available



**Figure 1-1: 7707VR-8 Block Diagram**

## 2. INSTALLATION

The 7707VR-8 comes with a companion rear plate that has eight BNC connectors and one SC/PC (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.

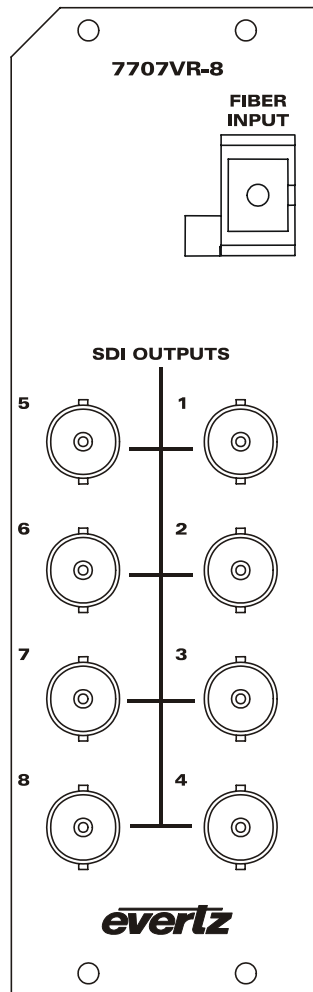


Figure 2-1: 7707VR-8 Rear Panel

**SDI OUTPUT:** Eight BNC outputs for eight independent reclocked serial digital component video signals, compatible with the SMPTE 259M-C, SMPTE305M and DVB-ASI standards.

**OPTICAL INPUT:** SC/PC, SC/PC with cover (shown), ST/PC or FC/PC female connector. This wide range input accepts optical wavelengths of 1270nm to 1610nm, accommodating standard or CWDM transmission schemes.



**Do not hook up the 7707VT-8 DWDM and 7707VR-8 cards directly with a short fiber optic cable. The 7707VT-8 DWDM card produces +7dBm of power, which will damage the receiver if connected directly.**



**Do not hook up the 7707VT-8 cards that output more than -7dBm of power (see 7707VT-8 specifications for output power of various laser types) and 7707VR-8-H high sensitivity receiver cards directly with a short fiber optic cable. The 7707VT-8 cards that produce more than -7dBm of power will damage the receiver if connected directly.**

## 2.1. 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. OPTICAL INPUT

<b>Number of Inputs:</b>	1
<b>Connector:</b>	Female SC/PC, ST/PC or FC/PC
<b>Return Loss:</b>	>25dB
<b>Operating Wavelength:</b>	1270nm to 1610nm
<b>Maximum Input Power</b>	
<b>Standard Version:</b>	-1dBm
<b>-H Version:</b>	-8dBm
<b>Optical Sensitivity</b>	
<b>Standard Version:</b>	-21dBm
<b>-H Version:</b>	-28dBm

#### 3.2. SERIAL VIDEO OUTPUTS

<b>Standards:</b>	SMPTE 259M, SMPTE 305M, DVB-ASI
<b>Number of Outputs:</b>	8 independent SDI, SDTi or DVB-ASI 270Mb/s signals
<b>Connector:</b>	1 BNC per IEC 61169-8 Annex A
<b>Signal Level:</b>	800mV nominal
<b>DC Offset:</b>	0V $\pm$ 0.5V
<b>Rise and Fall Time:</b>	900ps nominal
<b>Overshoot:</b>	< 10% of amplitude
<b>Return Loss:</b>	> 15dB to 270Mb/s
<b>Wide Band Jitter:</b>	< 0.2 UI

#### 3.3. ELECTRICAL

<b>Voltage:</b>	+12V DC
<b>Power:</b>	12W

#### 3.4. COMPLIANCE

<b>Electrical Safety:</b>	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
<b>EMI/RFI:</b>	Complies with FCC regulations for class A devices. Complies with EU EMC directive 89/336/EEC.

#### 3.5. PHYSICAL

<b>7700 or 7701 frame mounting:</b>	
<b>Number of slots:</b>	2



## 4. STATUS INDICATORS AND DISPLAYS

The 7707VR-8 has 11 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 4-1 shows the locations of the indicators, pushbutton and toggle switch.

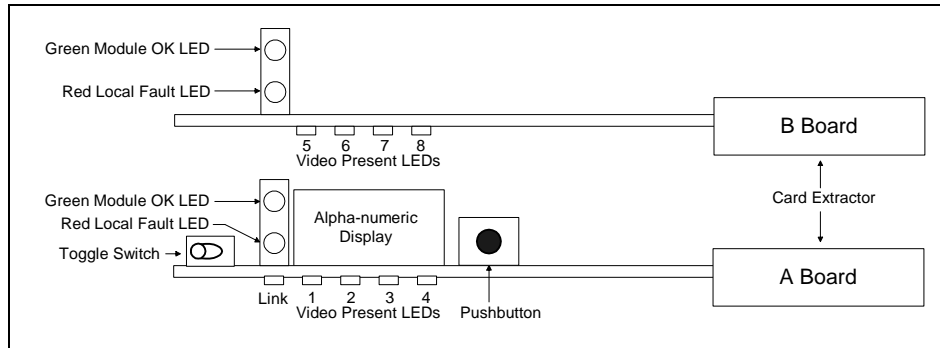


Figure 4-1: Location of Status Indicators and Controls

### 4.1. STATUS INDICATOR LEDs

**LOCAL FAULT:** On the 7707VR-8A main board this Red LED indicates poor module status and will be ON during the absence of a valid fiber link input signal or if a local input power fault exists (i.e.: a blown fuse).

On the 7707VR-8B sub-board this Red LED will be ON if a local input power fault exists (i.e.: a blown fuse).

The LOCAL FAULT indications can also be reported to the frame through the FRAME STATUS jumper.

**MODULE OK:** This Green LED indicates good module status. It will be ON when a valid input signal is present, and the board power is good.

On the 7707VR-8, there are nine small LEDs on the front of the board that indicate the optical link status and the presence of video signals.

#### LINK STATUS LED:

GREEN	Valid signal input. No errors.
RED	Valid signal input. Errors detected.
OFF	No valid input detected.

#### VIDEO 1 STATUS LED:

GREEN	Valid signal output. No errors.
RED	Valid signal output. Errors detected.
OFF	No valid output detected.
YELLOW	Output is blocked by user

**VIDEO 2-8 STATUS LEDs** function similar to **VIDEO 1 STATUS LED**.

## 4.2. DOT-MATRIX DISPLAY

Additional signal and status monitoring is provided via the 4-digit dot-matrix display 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 of the display menu structure. The details of the each of the displays are described in the sections 4.2.1 to 4.2.6.

You can use the toggle switch to move up and down the list of available 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 you push up on the toggle switch and decrease if you push down on the toggle switch. If the parameter contains a list of choices, you can cycle through the list by pressing the toggle switch in either direction. The parameter values are changed as you cycle through the list.

When you have stopped at the desired value, depress the pushbutton. This will return to the parameter select menu item you are setting (the display shows the parameter name you were setting). To change another parameter, use the toggle switch to select other parameters. If neither the toggle switch nor pushbutton is operated for several seconds the card edge control will exit the menu system and return to an idle state.

On all menus, there is an extra selectable item: *BACK*. Selecting *BACK* will take you to the previous menu (the one that was used to get into the current menu). On the main menu, *BACK* will both take the user to the normal operating mode (indicated by the moving line on the card edge display).

	Top Level	⇨ Push Button ⇨		
	 Toggle Switch	<b>OK</b> Fiber Link is Present and Error Free	CH1 ⋮ CH8	VSD OSTD
PWR			LOW / OVER / (-40 to +1)	
PSWD			0 - 9999 PWSL	0 - 9999
DISP			VCH1 ⋮ VCH8	DIS / EN DIS / EN
VER			HORZ / VERT	
			Software ID	

Figure 4-2: Display Menu Structure

### 4.2.1. Displaying the Video Standard

The 7707VR-8 detects the Video standards of the signals present at its fiber input. To display the Video Standard, press the pushbutton, select the appropriate input and navigate the pushbutton to the VSD option.

CH1-CH8	N270 SMPTE 259M-C, 270 Mb/s 4:2:2 Component 525 line, 4:3.
VSD	P270 SMPTE 259M-C, 270 Mb/s 4:2:2 Component 625 line, 4:3.
N270	ASI Indicates DVB-ASI Signal at Output.
P270	UNKN Unknown Video Output.
ASI	LSV Loss of Valid Fiber Input Video Signal.
UNKN	
LSV	

### 4.2.2. Setting the Video Standard on Loss of Signal

The 7707VR-8 can be individually configured to output black video with a user set standard if an input video signal is lost. To select the video standard, select the desired option then select the OSTD menu. This value is auto setup when valid inputs are detected.

CH1-CH8	N270 SMPTE 259M-C, 270 Mb/s 4:2:2 Component 525 line, 4:3
OSTD	P270 SMPTE 259M-C, 270 Mb/s 4:2:2 Component 625 line, 4:3
N270	ASI DVB-ASI
P270	OFF Signal Generator off
ASI	
OFF	

### 4.2.3. Displaying the Optical Power

The 7707VR-8 module can measure and display the input optical power over a range of +5dBm to –40dBm at increments of 1 dBm. To display the Input Optical Power press the pushbutton one or more times until the PWR message is shown on the display. After one second the detected input optical power will be shown (in units of dBm).

PWR	LOW Optical power measure is lower then operating range.
LOW	OVER Optical power measure is higher then operating range.
OVER	-40 to +1 Optical input power within this range.
-40 to +1	

### 4.2.4. Signal BLOCK Configuration

Depress the Button and select the PSWD option. Actuate the toggle switch to achieve the correct code number (Factory Default = 7154).

PSWD	Code number (Factory Default = 7154).
0-9999	

PSWD	PWSL Store a new passcode (0-9999) required for BLOCK configuration. This menu is not available without entering the correct passcode.
PWSL	
0-9999	

For brevity in the manual, only VCH1 will be discussed.

<i>PSWD</i>
<i>VCH1-VCH8</i>
<i>DIS</i> <i>EN</i>

**VCH1** Disable/Enable. When Disabled the data received on the fiber link intended for output 1 is not output. This menu item is not modifiable without entering the correct passcode, though its current state is viewable.

The functionality is similar for menu selections VCH2 through VCH8.

#### 4.2.5. Setting the Orientation of the Text on the Card Edge Display

On the 7707VR-8 the **DISP** display enables the user to set a horizontal or vertical orientation for the card edge display messages. After one second the display will show a message indicating the current orientation of the display. When this message is showing, press the pushbutton to change the orientation of the display.

<i>DISP</i>
<i>HORZ</i> <i>VERT</i>

**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.

#### 4.2.6. Displaying the Firmware Version

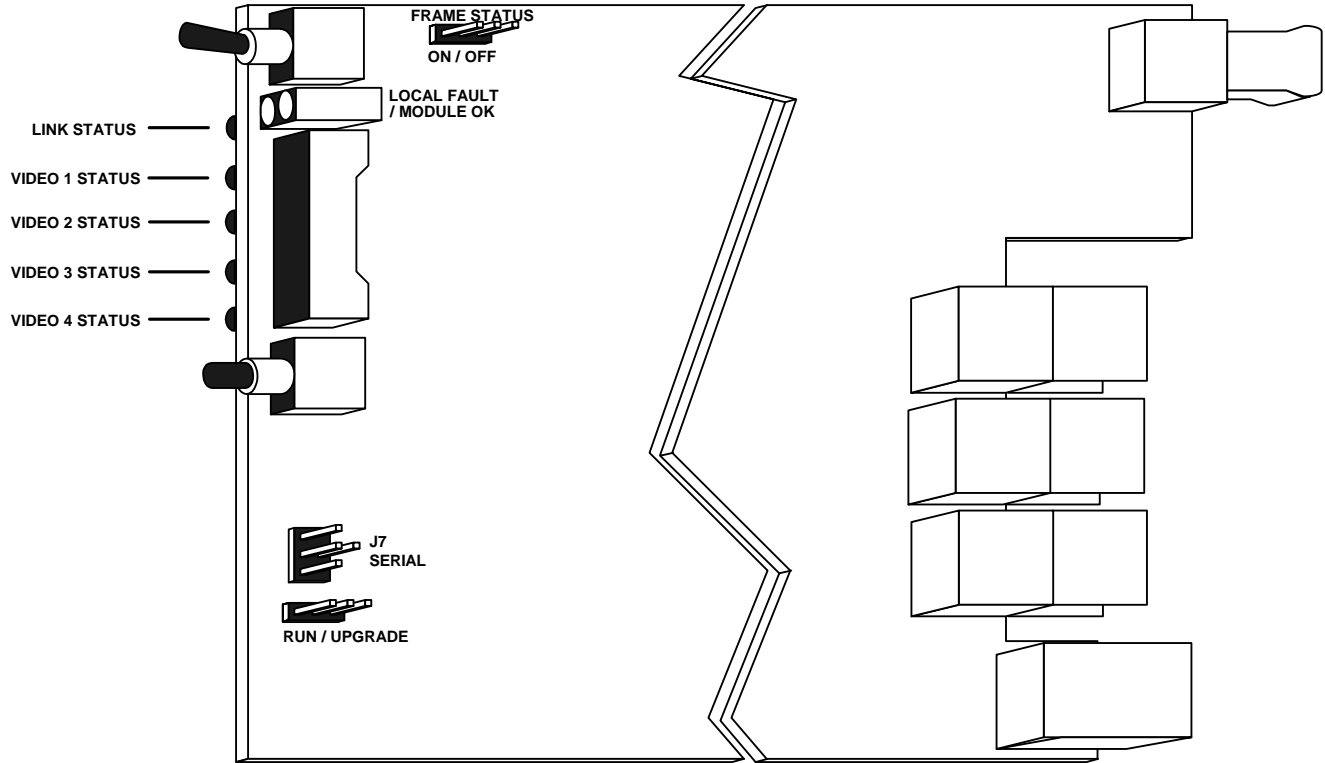
The **s/w** display shows the firmware version and build number of the 7707VR-8 firmware. The following message will scroll across the display:

<i>VER</i>
<i>SOFTWARE ID</i>

For example: **VER 1.0 BLD 067**

## 5. JUMPERS

Several jumpers, located at the front of the module are used to preset various operating modes. Figure 5-1 and Figure 5-2 show the locations of the jumpers on the bottom and top board respectively.



**Figure 5-1: Location of Status Indicators and Jumpers – Bottom board (A)**

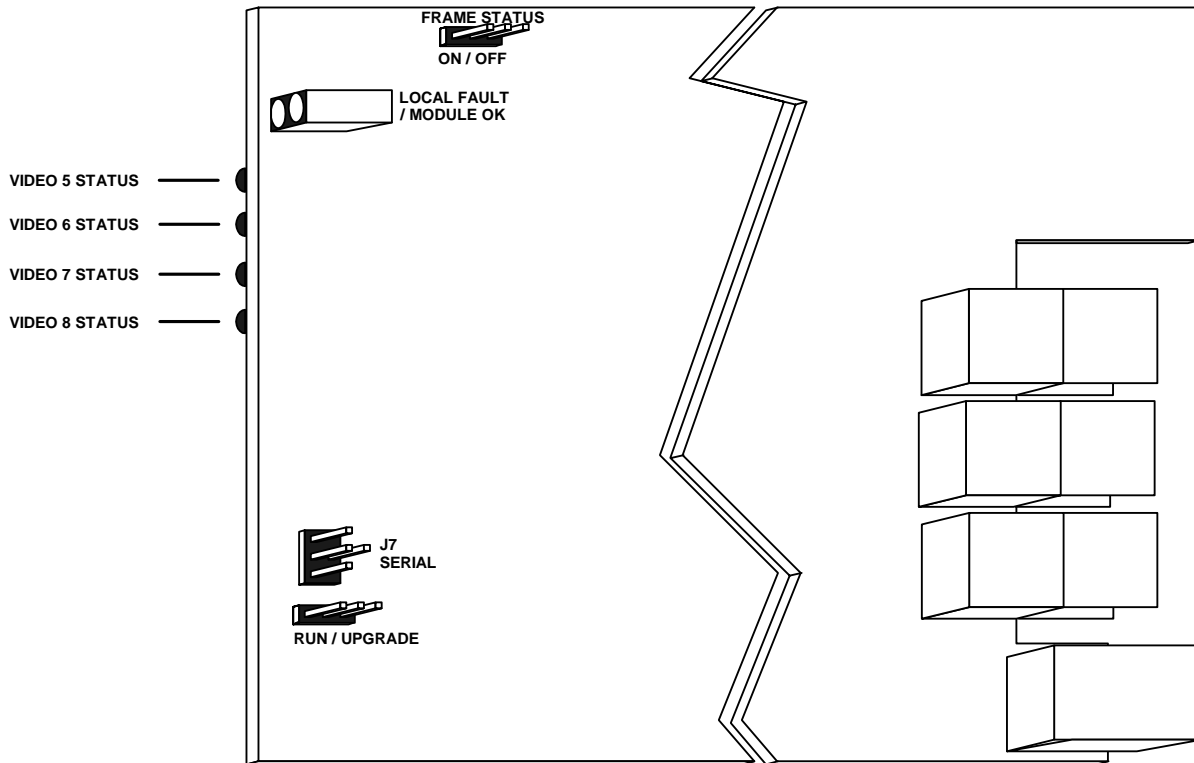


Figure 5-2: Location of Status Indicators and Jumpers – Top board (B)

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

The FRAME STATUS jumper determines whether local faults (as shown by the Local Fault indicator) will be connected to the 7700FR frame's global status bus. Each of the cards of the module pair has a frame status jumper. Be sure to change both jumpers to the same state.

**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

Each of the cards of the module pair needs to be upgraded with its specific firmware (A & B). Follow the same procedure for both the top and bottom modules. The module can be configured for firmware upgrades using the UPGRADE jumpers or with the serial port 'upgrade' command as described below.

For the A board (bottom) of the module pair use the file with a name similar to 7707VR8A.BIN

For the B board (top) of the module pair 7707VR8B.BIN

### 5.2.1. Using the Upgrade Jumper

**UPGRADE:** The UPGRADE jumper is used when firmware upgrades are being performed on 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 *UPGRADE* 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 this manual binder. 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.

### 5.2.2. Upgrade Serial Port Command

Install the Upgrade cable provided (located in the vinyl pouch in the front of this manual) onto the SERIAL header at the card edge of the card to be upgraded. Connect this cable to your computer and run a terminal program as described in the *Upgrading Firmware* section in the front of this manual binder. Type in “upgrade” without the quotes and hit Enter. Follow the prompts that are presented on your terminal screen and proceed to download the new firmware specified for this card.

## **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 VL-Fiber demo 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 7707VT-8 and 7707VR-8 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 through the VistaLINK® interface.

Parameter	Description
<b>Video Present 1 to 8</b>	Indicates the presence of a valid video fiber input signal.
<b>Video Error 1 to 8</b>	Indicates the presence of errors on a video fiber input signal.
<b>Video Standard 1 to 8</b>	Indicated the detected video standard.
<b>Video EDH Present 1 to 8</b>	Indicates the presence of EDH Error Detection packets in video fiber inputs.
<b>Video EDH Error 1 to 8</b>	Indicates EDH Errors in Full Field, Active Picture or ANC Data Checksums.
<b>Fiber Link Present</b>	Indicates a valid fiber link data stream at fiber input.
<b>Fiber Link Error</b>	Indicates errors on valid fiber link input.
<b>Optical Power Alarm</b>	Indicates Optical Power at fiber input has dropped below a configurable threshold.
<b>Optical Power</b>	Indicates optical power level at fiber input.

**Table 6-1: VistaLINK® Monitored Parameters**

### 6.3. VistaLINK® CONTROLLED PARAMETERS

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

Parameter	Description
<b>Video Output Standard on Loss 1 to 8</b>	Selects an Output Standard to be generated on loss of Fiber Link. This value auto-updates to match the current valid input standard when applied.
<b>EDH Insertion 1 to 8</b>	Enables recalculated EDH packets to be inserted into video stream, with updated error flags.
<b>Video Signal Block 1 to 8</b>	Allows the User to Block specific video paths. Blocked outputs will flip to generated sources.
<b>Passcode Set</b>	Setup the Password used to access the Video Blocking features.
<b>Optical Alarm Threshold</b>	Set the optical power level that trips an alarm if the fiber signal degrades.

**Table 6-2: VistaLINK® Controlled Parameters**

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