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REVISION HISTORY

REVISION	DESCRIPTION	DATE
1.0	Original Version	July 03
1.1	Updated safety section and added assembly and labeling section	July 05
1.2	Added table format to section 4. General clean up.	Feb 09
1.3	Updated video enable/disable LED status. Added support for continuous and discontinuous video modes.	Feb 09

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-4 DWDM cards and 7707VR-4 cards directly with a short fiber optic cable. The 7707VT-4 DWDM card produces +7dBm of power which will damage the receiver if connected directly.

Do not hook up the 7707VT-4 cards that output more than -7dBm of power (see 7707VT-4 specifications for output power of various laser types) and 7707VR-4-H high sensitivity receiver cards directly with a short fiber optic cable. The 7707VT-4 cards that produce more than -7dBm of power will damage the receiver if connected directly.

1.   OVERVIEW

The 7707VR-4 is a VistaLINK® – enabled fiber optic receiver for SDI, DVB-ASI or SDTi signals. This single card module demultiplexes up to four SDI, DVB-ASI or SDTi video signals that have been Time Domain Multiplexed (TDM) by the companion 7707VT-4 Quad SDI Fiber Transmitter module.

The 7707VR-4 and companion 7707VT-4 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®.

Features:
- Single card demultiplexor for four synchronous or asynchronous 270Mb/s SDI, DVB-ASI or SMPTE 305M video signals
- SDI video regeneration on outputs
- 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
- VistaLINK® –enabled for remote monitoring and control when installed in a 7700FR-C frame with 7700FC VistaLINK® Frame Controller
- Supports single-mode and multi-mode fiber
- Accepts any wavelength in the 1270nm to 1610nm range
- SC/PC, ST/PC, FC/PC fiber connectors available
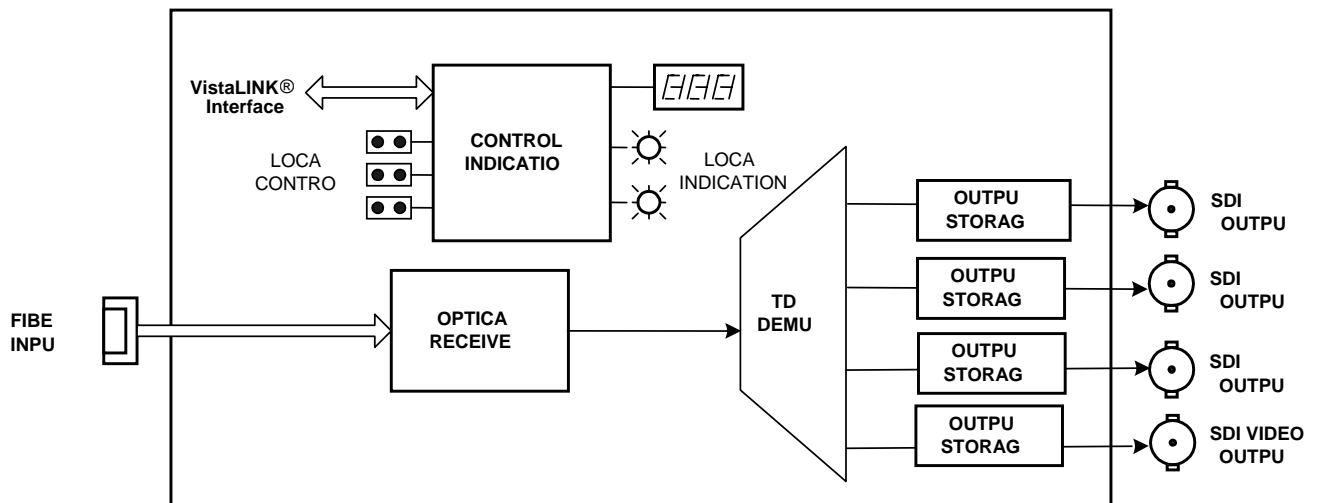
Figure 1-1: 7707VR-4 Block Diagram

2. INSTALLATION

The 7707VR-4 comes with a companion rear plate that has four 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.
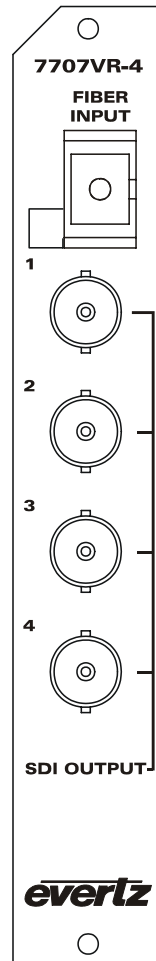
Figure 2-1: 7707VR-4 Rear Panel

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-4 DWDM cards and 7707VR-4 cards directly with a short fiber optic cable. The 7707VT-4 DWDM card produces +7dBm of power which will damage the receiver if connected directly.**

> **Do not hook up the 7707VT-4 cards that output more than -7dBm of power (see 7707VT-4 specifications for output power of various laser types) and 7707VR-4-H high sensitivity receiver cards directly with a short fiber optic cable. The 7707VT-4 cards that produce more than -7dBm of power will damage the receiver if connected directly.**

SDI OUTPUT: Four BNC outputs for four independent reclocked serial digital component video signals, compatible with the SMPTE 259M, SMPTE 305M and DVB-ASI standards.

2.1.   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 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

Number of Inputs: 1
Connector: Female SC/PC, ST/PC or FC/PC
Return Loss: >25dB
Input Wavelength: 1270nm -1610nm
Maximum Input Power
    Standard Version: 0dBm
    -H Version: -7dBm
Optical Sensitivity
    Standard Version: -23dBm
    -H Version: -28dBm

3.2. SERIAL VIDEO OUTPUTS

Standards: SMPTE 259M, SMPTE 305M, DVB-ASI
Number of Outputs: 4 Independent SDI, SDTi or DVB-ASI 270Mb/s signals
Connectors: 1 BNC per IEC 61169-8 Annex A
Signal Level: 800mV(nominal)
DC Offset: $0V \pm 0.5V$
Rise and Fall Time: 900ps(nominal)
Overshoot: < 10% of amplitude
Return Loss: > 15dB to 540Mb/s
Wide Band Jitter: < 0.20UI

3.3. ELECTRICAL

Voltage: +12VDC
Power: 10 Watts
EMI/RFI: Complies with FCC regulations for class A devices
Complies with EU EMC directive

3.4. PHYSICAL

7700 or 7701 frame mounting:
    Number of slots: 1

4.   STATUS INDICATORS AND DISPLAYS

The 7707VR-4 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 is used to select various displays on the alphanumeric display. Figure 4-1 shows the locations of the indicators and pushbutton.
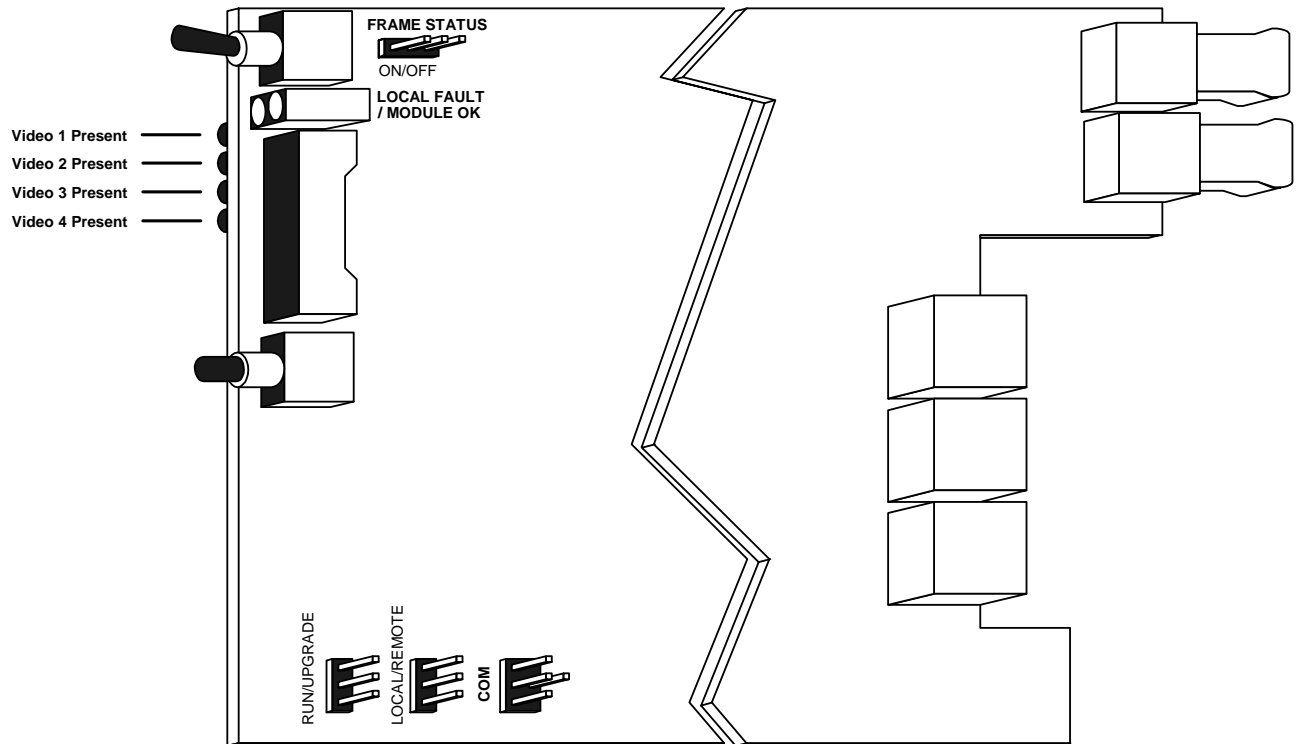
Figure 4-1: Location of Status Indicators and Jumpers

4.1.   STATUS INDICATOR LEDS

LOCAL FAULT: This Red LED indicates poor module health and will be On during the absence of a valid input signal or if a local input power fault exists (i.e.: a blown fuse). The LOCAL FAULT indication can also be reported to the frame through the FRAME STATUS jumper.

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

On the 7707VR-4 there are four small LEDs on the back of the board that indicate the presence of video signals.

VIDEO 1:   The Green LED indicates the presence of a valid signal on the Video 1 input.
A flashing green LED indicates that Video 1 input is disabled.

VIDEO 2:   The green LED indicates the presence of a valid signal on the Video 2 input.
A flashing green LED indicates that Video 2 input is disabled.

VIDEO 3:   The green LED indicates the presence of a valid signal on the Video 3 input. A flashing green LED indicates that Video 3 input is disabled.

VIDEO 4:   The green LED indicates the presence of a valid signal on the Video 4 input. A flashing green LED indicates that Video 4 input is disabled.

4.2. DOT-MATRIX DISPLAY

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

Pushbutton			
Top Menu Level	**Menu Level 1**	**Menu Level 2**	**Menu Level 3**
		OVER	
	PWR (OpticalPower)	**0 to -40 dBm**	
		-7 to -40	
		< MIN	
	VSD1 (Video Standard)	**Output Video 1 Standard** (see list in 4.2.2 section)	
	VSD2 (Video Standard)	**Output Video 2 Standard** (see list in 4.2.2 section)	
	VSD3 (Video Standard)	**Output Video 3 Standard** (see list in 4.2.2 section)	
LINK ERR (If No Link with VT-4)	**VSD4** (Video Standard)	**Output Video 4 Standard** (see list in 4.2.2 section)	
OK (If Linked with VT-4)	**VOUT** (Video Output on Loss)	**OUT1** ⋮	**DISC / CONT**
		OUT4	**DISC / CONT**
	PSWD (Passcode)	**0 - 9999**	
		VCH1 ⋮	**DIS / EN**
		VCH4	**DIS / EN**
	DISP (Display Orientation)	**VERT**	
		HOR	
	VER (Software Version)	Version number and build shifted right to left	
	UPGRD (Upgrade Mode)	**YES**	
		NO	

(Leftmost column, spanning: **Toggle Switch**)

Figure 4-2: Display Menu Structure

The following display messages indicate what is being displayed.

PWR:	Input Optical Power
VSD1:	Video Standard in Use On Channel 1
VSD2:	Video Standard in Use On Channel 2
VSD3:	Video Standard in Use On Channel 3
VSD4:	Video Standard in Use On Channel 4
PSWD:	Sets/configures password for enabling video channels
DISP:	Sets the orientation of the text displayed on the card edge
VER:	Displays the present Firmware version
UPGRD:	Sets the card into run/upgrade mode

4.2.1. Displaying the Optical Power

The 7707VR-4 module can measure and display the input optical power over a range of 0dBm to –40dBm at increments of 1dBm for the standard version and -7dBm to –40dBm in 1dBm increments for the –H version. 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
OVER
0 to -40
-7 to -40
< MIN

OVER	Indicates that input power is over 0dBm for standard version and over –7dBm for "H" version.
0 to –40	Optical input power within this range (Standard Version).
-7 to –40	Optical input power within this range (-H Version).
< MIN	Indicates that input power is below –40dBm.

4.2.2. Displaying the Output Video Standard

When the reclocker is enabled, the 7707VR-4 detects the Video standards of the signal present at its outputs. To display the Video Standard press the pushbutton one or more times until the `VSD1`, `VSD2`, `VSD3` or `VSD4` message is shown on the display. After one second the detected video standard will be shown. For the sake of brevity, only *VSD1* will be discussed in the manual.

VSD1	`N270`	SMPTE 259M-C, 270 Mb/s 4:2:2 Component 525 line, 4:3 or SMPTE 305M
N270		
P270	`P270`	SMPTE 259M-C, 270 Mb/s 4:2:2 Component 625 line, 4:3 or SMPTE 305M
DVB		
LSV	`DVB`	Indicates DVB-ASI Signal at Input
UNKN	`LSV`	Indicates that no valid input signal is present
	`UNKN`	270Mb/s unrecognized format

4.2.3. Video Output On Loss

The *Video Output on Loss* occurs when input video to the transmitter or the fiber input to the receiver is lost. The 7707VR-4 will generate SD-SDI grey video based on the previous input standard under continuous video mode. Alternatively the 7707VR-4 will mute the video outputs if discontinuous mode is chosen. Each individual output can be configured for continuous or discontinuous mode independently. To change the video output on loss, press the push button and cycle the toggle switch one or more times until the `VOUT` message is shown on the display. Press the push button and cycle through the outputs: `OUT1`, `OUT2`, `OUT3`, `OUT4`. Press the push button when the desired output is selected and then cycle through `CONT` (continuous mode) or `DISC` (discontinuous mode). Press the push button when the desired mode is shown on the display. For the sake of brevity, only *VSD1* will be discussed in the manual.

VOUT	`DISC`	**Discontinuous mode:** Output is muted on loss of video or fiber link.
OUT1		
OUT2		
OUT3	`CONT`	**Continuous mode:** Output is grey video with the same SD-SDI video standard as the last input video.
OUT4		
DISC		
CONT		

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 = 0).

PSWD
0-9999
VCH1 – VCH4
EN
DIS

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

VCH1   Enable / Disable. 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.

Similar functionality for menu selections **VCH2** through **VCH4**.

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

On the 7707VR-4 the DISP display allows you 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 displayed, press the pushbutton to change the orientation of the display.

DISP
HOR
VERT

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 VER display shows the firmware version and build number of the 7707VR-4 firmware. The message will scroll across the display.

For example: **VER 1.0 BLD 067**

4.2.7. Upgrade Mode

The UPGRD display allows you to set the 7707VR-4 into upgrade mode for firmware upgrade. When in the UPGRD menu, press the pushbutton and use the toggle switch to set the mode of the card.

UPGRD	
YES	
NO	

YES   Card is in upgrade mode.
NO   Card is in run mode.

5. JUMPERS AND LOCAL CONTROLS

Several jumpers, located at the front of the module are used to preset various operating modes. Figure 4-1 shows the locations of the jumpers.

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.

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. SELECTING WHETHER THE MODULE WILL BE CONTROLLED FROM THE LOCAL CONTROLS OR THROUGH THE VISTALINK® INTERFACE

The MASTER jumper selects whether the module will be controlled from the local user controls or through the VistaLINK® 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 VistaLINK® interface. The adjacent yellow LED will be On when VistaLINK® control in enabled. This LED is intended to alert the user that local controls are not currently active.

5.3. CONFIGURING THE MODULE FOR FIRMWARE UPGRADES

UPGRADE: The UPGRADE jumper is used when firmware upgrades are being done to the module. For normal operation it should be installed in the *RUN* position. See the *Upgrading Firmware* section of this manual for more information.

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

6.   VISTALINK® REMOTE MONITORING/CONTROL

6.1.   WHAT IS VISTALINK®?

VistaLINK® is Evertz's remote monitoring and configuration platform which operates over an Ethernet network using Simple Network Management Protocol (SNMP). SNMP is a standard computer network protocol that enables different devices sharing the same network to communicate with each other. VistaLINK® provides centralized alarm management, which monitors, reports, and logs all incoming alarm events and dispatches alerts to all the VLPro Clients connected to the server. Card configuration through VistaLINK® PRO can be performed on an individual or multi-card basis using simple copy and paste routines, which reduces the time to configure each module separately. Finally, VistaLINK® enables the user to configure devices in the network from a central station and receive feedback that the configuration has been carried out.

There are 3 components of SNMP:

1. An SNMP manager, also known as a Network Management System (NMS), is a computer running special software that communicates with the devices in the network. Evertz 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 7707VR-4) 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
Video 1,2,3,4 Standard	A range of values describing the detected video standard.
Optical Power	A range of values describing optical power at the fiber input.
Local Remote Jumper	Indicates whether the card is in Local or Remote mode. (The position of master jumper)

Table 6-1: VistaLINK® Monitored Parameters

6.3. VISTALINK® CONTROLLED PARAMETERS

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

Parameter	Description
Change Password	Allows the user to change the password that is needed in order to enable/disable video channels.
Video 1,2,3,4 Enable	Enables or disables an output video channel.
Optical Power Alarm Threshold	Sets optical power alarm threshold.

Table 6-2: VistaLINK® Controlled Parameters

6.4. VISTALINK® TRAPS

The following traps can be remotely monitored through VistaLINK® interface.

Trap	Description
Video 1,2,3,4 not present	Triggers when there is a loss of video signal.
Video 1,2,3,4 EDH Errors Present	Triggers when there is an EDH error present in the video signal.
Optical power alert	Triggers when optical power falls below the set threshold.
Optical Link Not Ok	Triggers on loss of optical link with 7707VT-4.

Table 6-3: VistaLINK® Traps