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REVISION HISTORY

REVISION	DESCRIPTION	DATE
1.0	First release	Apr 08

WARNING

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

1. OVERVIEW

The 7707VT-3-HS-OC48 is a *Vista*LINK® enabled, fiber transmitter for HD-SDI, SD-SDI, DVB-ASI or SDTi video signal that transports signals at OC-48/STM-16 data rates (2488.32 Mb/s) and interfaces directly to SONET/SDH infrastructure. The card also has a built-in Ethernet transceiver with a 10/100/1000 Base-T port. This dual fiber single card combines up to one HD-SDI plus two asynchronous SDI, DVB-ASI or SDTi signals using Time Domain Multiplex (TDM) technology. A companion 7707VR-3-HS-OC48 card acts as a demultiplexer for the incoming signal and converts them back to separate SDI video feeds, while utilizing a separate fiber for the outgoing signal.

The 7707VT-3-HS-OC48 will transparently pass incoming HD and SD-SDI video feeds with 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 *Vista*LINK®.

The fiber output is available in an assortment of optical wavelengths, accommodating standard, CWDM or DWDM transmission schemes.

7707VT13-3-HS-OC48	1310 nm FP	-7dBm output, suitable for distances up to 50 Km
7707VT15-3-HS-OC48	1550 nm DFB	0dBm output, suitable for distances up to 75 Km

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

7707VT27-3-HS-OC48	1270 nm DFB
7707VT29-3-HS-OC48	1290 nm DFB
7707VT31-3-HS-OC48	1310 nm DFB
7707VT33-3-HS-OC48	1330 nm DFB
7707VT35-3-HS-OC48	1350 nm DFB
7707VT37-3-HS-OC48	1370 nm DFB
7707VT43-3-HS-OC48	1430 nm DFB
7707VT45-3-HS-OC48	1450 nm DFB
7707VT47-3-HS-OC48	1470 nm DFB
7707VT49-3-HS-OC48	1490 nm DFB
7707VT51-3-HS-OC48	1510 nm DFB
7707VT53-3-HS-OC48	1530 nm DFB
7707VT55-3-HS-OC48	1550 nm DFB
7707VT57-3-HS-OC48	1570 nm DFB
7707VT59-3-HS-OC48	1590 nm DFB
7707VT61-3-HS-OC48	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 >120 km @ 270 Mb/s (for DWDM applications contact the factory).

7707VTDyyy-3-HS-OC48	DWDM DFB laser output, yyy – ITU channel number

The 7707VT-3-HS-OC48 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 7707VT-3-HS-OC48 module can also be installed in the S7701 stand-alone enclosure.

Features:

- Transports signal over OC-48/STM-16 data rates (2488.32 Mb/s)
- Single card TDM multiplexer for one HD/SD-SDI plus two asynchronous SD-SDI, SDTi and DVB-ASI signals
- Built-in Ethernet transceiver with one 10/100/1000 Base-T port
- Uncompressed, full-rate video transport
- Signal transport uninterrupted by loss of any HD, SD-SDI, DVB-ASI or SDTi input feed
- Transparently passes embedded AES or any other data in the horizontal or vertical ancillary data space
- Stratum 3 wander/holdover/jitter compliance
- Wide input frequency range tolerance (±50ppm)
- Comprehensive signal and card status monitoring via four character card-edge display
- *Vista*LINK® – enabled offering remote monitoring, control and configuration capabilities via SNMP. *Vista*LINK® is available when modules are used with the 3RU 7700FR-C frame, a 7700FC *Vista*LINK® Frame Controller module in slot 1 of the frame using the 9000NCP Network Control Panel or Evertz *Vista*LINK® PRO or other third party SNMP manager software.
- Automatic coaxial equalization up to 100m at 1.485Gb/s and 250m at 270Mb/s (Belden 1694A or equivalent cable)
- Fully hot-swappable from front of frame with no fiber/coax disconnect/reconnect required
- Supports single-mode and multi-mode fiber optic cable
- Optical output wavelengths of 1310nm, 1550nm and up to 16 CWDM wavelengths
- DWDM wavelengths also available
- SC/PC, ST/PC, FC/PC fiber connectors available

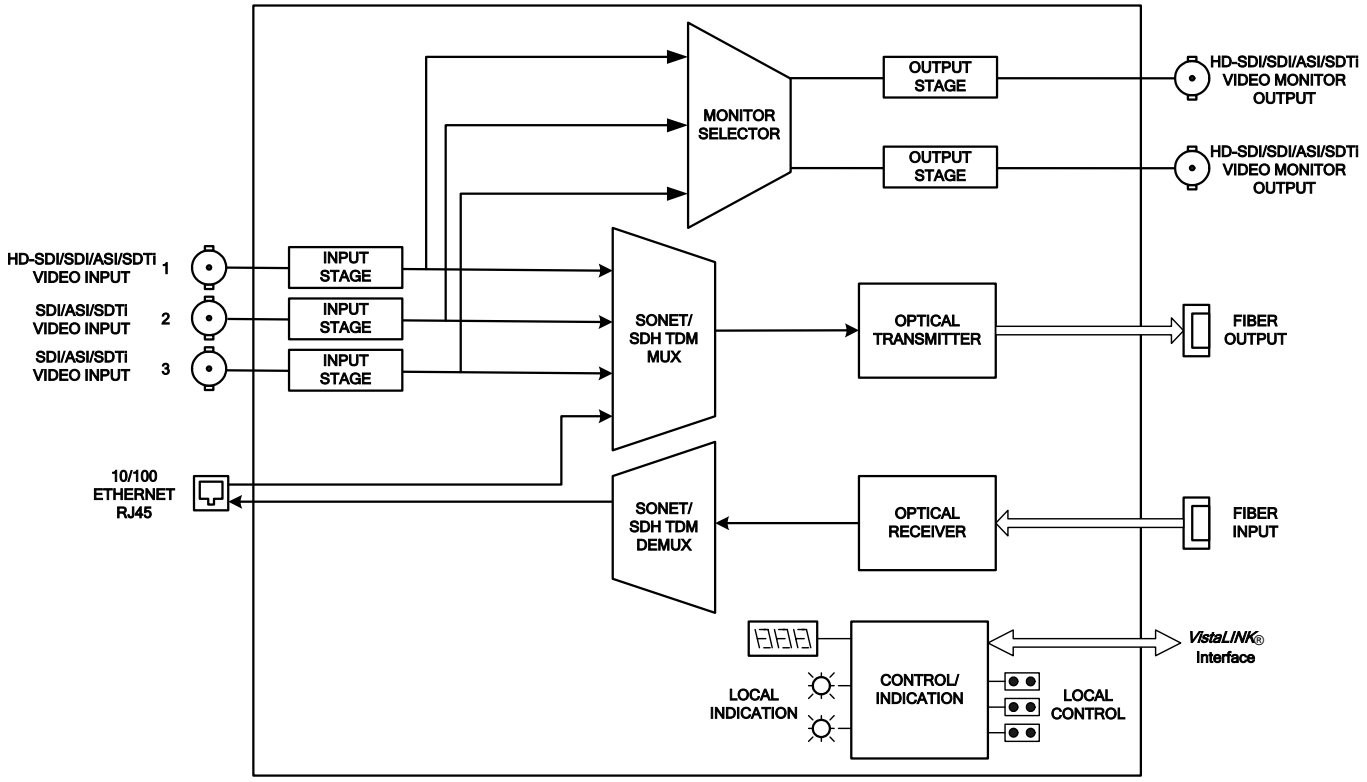

Figure 1-1: 7707VT-3-HS-OC48 Block Diagram

2. INSTALLATION

The 7707VT-3-HS-OC48 comes with a companion rear plate that has 5 BNC connectors and two 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.

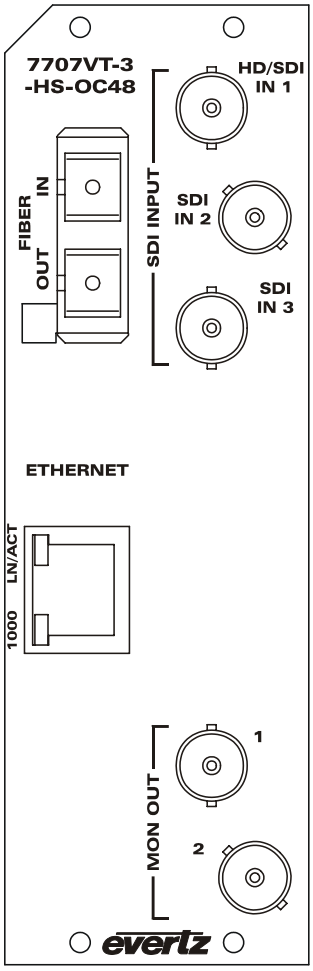

Figure 2-1: 7707VT-3-HS-OC48 Rear Panel

HD/SD IN 1 One BNC input connection for HD-SDI, SDI/SDTi video signals compatible with HD-SDI (SMPTE 292M), SD-SDI (SMPTE 259M-C), SDTi (SMPTE 305.2M) and DVB-ASI standards (auto sensing). These inputs provide adaptive compensation for up to 100m of industry standard Belden 1694A cable at 1.485Gb/s or 250m of 1694A cable at 270Mb/s.

SD IN 2,3 Two independent BNC input connectors for 10-bit serial digital video signals compatible with the SMPTE 259M, DVB-ASI or SMPTE 305M standards. These inputs provide adaptive compensation for up to 250m of industry standard Belden 8281 cable, at 270Mb/s.

MON OUT 1,2 User selectable video loopback outputs. Any of the inputs can source these ports for reclocked loop back functionality. Selection is controlled via the card edge menu or *Vista*LINK®. If EDH correction is activated, the selected output will be EDH corrected.

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.

OPTICAL OUTPUT Output SC/PC, SC/PC with cover (shown), ST/PC or FC/PC female connector. This optical output contains the two input SDI video signals. Any ancillary data (e.g. embedded audio, closed captioning, etc) present in the input SDI video stream prior to multiplexing is transparently passed through to the fiber output.

2.1. CARE AND HANDLING OF OPTICAL FIBER

2.1.1. Safety

CLASS 1 LASER PRODUCT

Background colour: yellow
Triangular band: black
Symbol: black

2.1.2. Assembly

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

2.1.3. Labeling

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

- There is no date of manufacture on this label as it can be traced by the bar code label placed on the printed circuit board of each Evertz plug-in module
- The Model number is one of: 7707VT13-3-HS-OC48, 7707VT15-3-HS-OC48, 7707VTxx-3-HS-OC48, (xx = 27, 29, 31, 33, 35, 37, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61) 7707VTDyyy-8 (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

2.1.4. Handling and Connecting Fibers

Never touch the end face of an optical fiber. Always keep dust caps on optical fiber connectors when not connected. 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 the care and handling of fiber optic cable see section 3 of the Fiber Optics System Design section of this manual binder.

3. SPECIFICATIONS

3.1. SERIAL VIDEO INPUT

Standards:
- **HD/SDI Inputs:** SMPTE 292M, SMPTE 259-C, SMPTE305.2M, DVB-ASI
- **SDI Inputs:** SMPTE 259M-C, SMPTE 305M(SDTi), DVB-ASI

Number of Inputs: 1 HD/SDI
2 independent SDI, SDTi or DVB-ASI 270Mb/s signals
Connector: 3 BNC input per IEC 60169-8 Amendment 2
Equalization: Automatic 250m (min) @ 270 Mb/s with Belden 1694 or equivalent cable
Return Loss: > 15 dB up to 1.5Gb/s
Frequency Offset Tolerance: ±50ppm

3.2. SERIAL VIDEO MONITOR OUTPUTS

Standards:
- **HD/SDI Inputs:** SMPTE 292M, SMPTE 259-C, SMPTE305.2M, DVB-ASI
- **SDI Inputs:** SMPTE 259M-C, SMPTE 305M(SDTi), DVB-ASI

Number of Outputs: 2 signals user-selectable from the 3 inputs
Connectors: BNC per IEC 60169-8 Amendment 2
Signal Level: 800mV(nominal)
DC Offset: 0V ± 0.5V
Rise and Fall Time: 900ps(nominal)
Overshoot: < 10% of amplitude
Return Loss: > 14dB
Wide Band Jitter: < 0.2UI

3.3. OPTICAL OUTPUT

Standards: OC-48/STM-16
Number of Outputs: 1
Connector: Female SC/PC, ST/PC or FC/PC
Return Loss: > 14 dB
Wide Band Jitter: < 0.2UI
Fiber Size: 9 μm core / 125 μm overall
Wavelengths:
- **Standard:** 1310nm, 1550nm (nominal)
- **CWDM:** 1270nm to 1610nm (See ordering information)
- **DWDM:** C-Band channel 20 to 60, 100GHz spacing (ITU-T G.694.1 compliant)

Output Power:
- **1310nm FP:** -7dBm ± 1dBm
- **1550nm & CWDM:** 0 dBm ± 1dBm
- **DWDM:** +7dBm ± 1dBm

3.4. OPTICAL INPUT

Number of Inputs:	1
Standards:	OC-48/STM-16
Connector:	Female SC/PC, ST/PC or FC/PC
Return Loss:	> 25dB
Wavelength:	1270nm to 1610nm
Maximum Input Power:	
Standard:	-1dBm
High Sensitivity (-H):	-8dBm
Optical Sensitivity:	
Standard:	-21dBm
High Sensitivity (-H):	-28dBm

3.5. ELECTRICAL

Voltage:	+12VDC
Power:	10 Watts (Non DWDM) 13 Watts (DWDM)

3.6. PHYSICAL

Number of slots:	2

3.7. COMPLIANCE

Electrical Safety:	CSA Listed to CSA C22.2 No. 60065-03, UL 60065-03 IEC 60065-(2001-12) 7th Edition Complies with CE Low voltage directive 93/68/EEC
Laser Safety:	Complies with 24 CFR 1040.10 and 1040.11 except for deviations pursuant to LN No. 50, dated July 26, 2001 Complies with IEC 60825-1, Am. 2
EMI/RFI:	Complies with FCC regulations for class A devices. Complies with EU EMC directive 89/336/EEC.

4. STATUS INDICATORS AND DISPLAYS

The 7707VT-3-HS-OC48 has 8 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 5-1 shows the locations of the indicators, pushbutton and toggle switch.

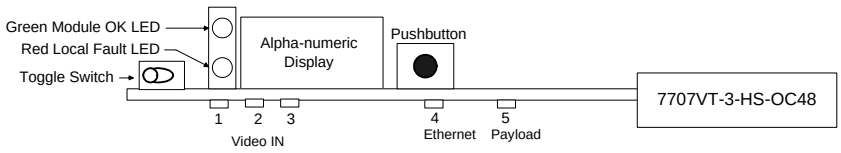

Figure 4-1: Location of Status Indicators and Controls

4.1. STATUS INDICATOR LEDS

LOCAL FAULT: On the 7707VT-3-HS-OC48 board this Red LED will be ON if a laser fault exists, or if the laser is set to Discontinuous mode with no valid inputs present, or 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 health. It will be ON when a valid input signal is present, and the laser and board power are good.

VIDEO IN STATUS LED:

GREEN	Valid signal input. No errors.
RED	Valid signal input. Errors detected.
OFF	No valid input detected.
YELLOW	Input is password blocked by the user from being transported through fiber.

ETHERNET STATUS LED:

GREEN	Connection established.
BLINK	Sending or receiving data.
OFF	No valid connection.

PAYLOAD STATUS LED:

GREEN	Payload OK.
RED	Errors detected.

4.2. CARD EDGE DISPLAY

Additional signal and status monitoring is provided via the 4-digit dot-matrix display located at the card-edge. The card edge toggle switch is used to select whether you are displaying status from the card (monitoring mode) or setting control parameters for the card (control mode). Press the toggle switch to select ‘monitor mode’ (STAT) or ‘control mode’ (CTRL).

Figure 4-2 shows the menu structure for the 7707VT-3-HS-OC48 card.

Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
STAT	FIBR	STD	OC, STM		
		PWR	-40 to 0 dB		
		CIC	15M	TIME	0 to 899
				ESL, SESL, ESS, SESS, ESP, SESP, SEFS	0 to 9999
			24H	TIME	0 to 1439
				ESL, SESL, ESS, SESS, ESP, SESP, SEFS	0 to 9999
		LIC	15M, 24H	ESL, SESL, ESS, SESS, ESP, SESP, SEFS	0 to 9999
		ESR	SECT, LINE, PATH	0.0% - 100%	
		LOSL	0 to 9999		
		REF	OUT	REF ERR, XO, HOLD, LINK	
			INP	LOS, FOS, OK	
	TDMD	LOSS, ERR, OK			
	VINP	VI1	STD	{HD Standards List} ASI, N270, P270, SDTI-N270, SDTI-P270, LOSS	
			EDH	PRES, LOSS	
			SDTI	PRES, LOSS	
		VI2, VI3	STD	ASI, N270, P270, SDTI-N270, SDTI-P270, LOSS	
			EDH	PRES, LOSS	
			SDTI	PRES, LOSS	
	ETH	PORT	LINK	UP, DOWN	
			SPD	10, 100, 1000, DOWN	
CTRL	FIBR	STD	BACK, OC, STM		
		LASR	BACK, CONT, DISC		
		REF	HOLD, LINK, XO, AUTO		
		CIC	ALL, 15M, 24H	CLR, BACK	
		LOSL	CLR, BACK		
		CESR	CLR, BACK		
		SETH	SESS, SESL, SESP, SEFS	1 to 9999	
	VINP	VI1, VI2, VI3	BACK, EDH	OFF, ON	
	VMON 1,VMON2	BACK, VI1, VI2, VI3			
	PSWD	0 to 9999			
	This area visible only if correct password is entered	PWSL	0 to 9999		
		VIN	VI1, VI2, VI3	DIS, EN	
		ETH	OFF, 100, 500, 750, 1000, AUTO		
	DISP	HORZ, VERT			

Figure 4-2: Card Edge Menu

4.2.1. STAT Menu

When in monitoring 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 option. The card-edge pushbutton and toggle switch are used to navigate through the display menu. Figure 4-3 provides a quick reference to the monitoring mode display. The details of the each of the displays are described in the sections 4.2.1.1 to 4.2.1.14. For information about setting up the module in control mode (CTRL), see section 4.2.2.

Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
STAT	FIBR	STD	OC, STM		
		PWR	-40 to 0 dB		
		CIC	15M	TIME	0 to 899
				ESL, SESL, ESS, SESS, ESP, SESP, SEFS	0 to 9999
			24H	TIME	0 to 1439
				ESL, SESL, ESS, SESS, ESP, SESP, SEFS	0 to 9999
		LIC	15M, 24H	ESL, SESL, ESS, SESS, ESP, SESP, SEFS	0 to 9999
		ESR	SECT, LINE, PATH	0.0% - 100%	
		LOSL	0 to 9999		
		REF	OUT	REF ERR, XO, HOLD, LINK	
			INP	LOS, FOS, OK	
	TDMD	LOSS, ERR, OK			
	VINP	VI1	STD	{HD Standards List} ASI, N270, P270, SDTI-N270, SDTI-P270, LOSS	
			EDH	PRES, LOSS	
			SDTI	PRES, LOSS	
		VI2, VI3	STD	ASI, N270, P270, SDTI-N270, SDTI-P270, LOSS	
			EDH	PRES, LOSS	
			SDTI	PRES, LOSS	
	ETH	PORT	LINK	UP, DOWN	
			SPD	10, 100, 1000, DOWN	

Figure 4-3: STAT Menu Structure

4.2.1.1. Displaying the Optical Link Data Standard

STAT
FIBR
STD
OC
STM

The STD menu displays the current transmission standard implemented by the card.

OC is displayed for SONET transmission.
STM is displayed for SDH transmission. These modes can be set through the control menu, see section 4.2.2.

4.2.1.2. Displaying Optical Power

- *STAT*
  - *FIBR*
    - *PWR*
      - *-40 to 0 dBm*

The 7707VT-3-HS-OC48 can measure and display optical power over a range of -40 to 0dBm in 1dBm increments.

4.2.1.3. Displaying the Current Interval Counter

- *STAT*
  - *FIBR*
    - *CIC*
      - *15M, 24H*
        - TIME
        - ESL
        - SESL
        - ESS
        - SESS
        - ESP
        - SESP
        - SEFS
          - 0 to 899 (15H, TIME)
          - 0 to 1439 (24H, TIME)
          - 0 to 9999

The Current Interval Counter menu provides the user with an option to monitor 15m or 24h counters to detect errored transmission.

The following parameters are available:
TIME, ESL, SESL, ESS, SESS, ESP, SESP, SEFS

For a detailed description see Table 4-1.

STAT/FIBR/CIC	15M	24H
TIME	Displays elapsed time in seconds from 0 to 899 of the 15 minute interval	Displays elapsed time in seconds from 0 to 1439 of the 24 hour interval
ESL	Current 15 minute interval, errored seconds line	Current 24 hour interval, errored seconds line
SESL	Current 15 minute interval, severe errored seconds line	Current 24 hour interval, severe errored seconds line
ESS	Current 15 minute interval, errored seconds section	Current 24 hour interval, errored seconds section
SESS	Current 15 minute interval, severe errored seconds section	Current 24 hour interval, severe errored seconds section
ESP	Current 15 minute interval, errored seconds path	Current 24 hour interval, errored seconds path
SESP	Current 15 minute interval, severe errored seconds path	Current 24 hour interval, severe errored seconds path
SEFS	Current 15 minute interval, severe errored seconds frame	Current 24 hour interval, severe errored seconds frame

Table 4-1: Current Interval Counter Menu

For detailed information about these parameters, refer to section 4.2.1.4.

4.2.1.4. Displaying the Last Interval Counter

- *STAT*
  - *FIBR*
    - *LIC*
      - *15m, 24h*
        - ESL
        - SESL
        - ESS
        - SESS
        - ESP
        - SESP
        - SEFS
          - 0 to 9999

Displays the last interval counter for the following parameters:
ESL, SESL, ESS, SESS, ESP, SESP, SEFS

For a detailed description see Table 4-2.

STAT/LIC	15M	24H
ESL	Last 15 minute interval, errored seconds line	Last 24 hour interval, errored seconds line
SESL	Last 15 minute interval, severe errored seconds line	Last 24 hour interval, severe errored seconds line
ESS	Last 15 minute interval, errored seconds section	Last 24 hour interval, errored seconds section
SESS	Last 15 minute interval, severe errored seconds section	Last 24 hour interval, severe errored seconds section
ESP	Last 15 minute interval, errored seconds path	Last 24 hour interval, errored seconds path
SESP	Last 15 minute interval, severe errored seconds path	Last 24 hour interval, severe errored seconds path
SEFS	Last 15 minute interval, severe errored seconds frame	Last 24 hour interval, severe errored seconds frame

Table 4-2: Last Interval Counter Menu

4.2.1.5. Displaying the Errored Seconds Ratio

- *STAT*
  - *FIBR*
    - *ESR*
      - *SECT*
      - *LINE*
      - *PATH*
        - *0.0% - 100%*

Displays the Errored Seconds Ratio in Percentage for Section, Line, and Path layers from 0.0 to 100%

SECT = Sets the Section Parameter.
LINE = Sets the Line Parameter.
PATH = Sets Path Parameter.

4.2.1.6. Displaying the Loss of Signal seconds in Line Layer

- *STAT*
  - *FIBR*
    - *LOSL*
      - *0 to 9999*

Displays the Loss of Signal seconds in Line Layer.

4.2.1.7. Displaying the Link Output Reference Clock Source

- *STAT*
  - *FIBR*
    - *REF*
      - *OUT*
        - *REF ERR*
        - *XO*
        - *HOLD*
        - *LINK*

Displays Link Output Clock Reference Source.

REF ERR = Sets the Reference error.
XO = Indicates the Oscillator.
HOLD = Indicates the Hold Over.
LINK = Indicates the Link Input.

4.2.1.8. Displaying the Link Input Status

- *STAT*
  - *FIBR*
    - *REF*
      - *INP*
        - *LOS*
        - *FOS*
        - *OK*

Displays Link Input Status.

LOS = Indicates the LINK LOST.
FOS = Indicates the FREQUENCY OFFSET.
OK = Indicates the LINK VALID.

4.2.1.9. Displaying the TDM Data Errors

- *STAT*
  - *TDMD*
    - *LOSS*
    - *ERR*
    - *OK*

Displays if there are errors in the clear channel TDM data.
This allows you to monitor if transmission errors are occurring at the SONET network or at TDM stream.

LOSS = Indicates TDM Data Lost.
ERR = Indicates TDM Error Detected.
OK = Indicates TDM Data is present and no errors are detected.

4.2.1.10. Displaying the Video Standard at Input Ports

```
STAT
  VINP
    VI1, VI2, VI3
      STD
        {HD Standards
        List
        (VI1 Only)}
        ASI
        N270
        P270
        SDTI-N270
        SDTI-P270
        LOSS
```

Displays the video standard present at the input ports.

ASI = Indicates DVB-ASI Signal at Input.

N270 = Indicates SMPTE 259M-C, 270 Mb/s 4:2:2 Component 525 line, 4:3 at input.

P270 = Indicates SMPTE 259M-C, 270 Mb/s 4:2:2 Component 625 line, 4:3 at input.

SDTI-N270 = Indicates SDTI-N270, component 525 line, SMPTE 305M at input at 270Mb/s.

SDTI-P270 = Indicates SDTI-P270, component 625 line, SMPTE 305M at input at 270Mb/s.

LOSS = Loss of Valid Input Signal

4.2.1.11. Detecting the EDH Presence in a Compatible Signal at Input Ports

```
STAT
  VINP
    VI1, VI2, VI3
      EDH
        PRES
        LOSS
```

Displays video EDH status at the input terminal.

PRES = Indicates EDH Packets present with the input signal.
LOSS = Indicates EDH Packets missing from the input signal.

4.2.1.12. Displaying the SDTI Status at Input Ports

```
STAT
  VINP
    VI1, VI2, VI3
      SDTI
        PRES
        LOSS
```

Displays output video SDTI input status.

4.2.1.13. Displaying the Ethernet Status

```
STAT
  ETH
    PORT
      LINK
        UP
        DOWN
```

Displays the Ethernet Transmission Speeds.

UP = Indicates a valid Ethernet connection
DOWN = Indicates that there is No valid Ethernet connection.

4.2.1.14. Displaying the Ethernet Speed

STAT *ETH* *PORT* *SPD* *10* *100* *1000* *DOWN*	Displays the Ethernet Transmission Speeds. **10** = Indicates 10 Base-TX Ethernet link. **100** = Indicates 100 Base-TX Ethernet link. **1000** = Indicates 1000 Base-TX Ethernet link. **DOWN** = Indicates No valid Ethernet connection.

The 7707VT-3-HS-OC48 card enables the user to proactively monitor the performance parameters of three physical layers in two different counter settings. A *current interval counter* is indicated on the card as CIC and the *last interval counter* is indicated as LIC. Both counters keep track of 15-minute and 24-hour time period.

To display the errors, depress the pushbutton, go to STAT/FIBR and choose the appropriate setting (for example, STAT/FIBR/CIC/15m/ESL to access the line errors reported in the last 15 minutes on the *current interval counter*). Refer to Figure 4-2 and Figure 4-3 for menu structure.

Line Layer Performance Parameters

- *ESL (Errored Seconds – Line)* shows the number of seconds during which a line Bit Interleaved Parity (BIP) error or an alarm signal was detected.
- *SESL (Severely Errored Seconds – Line)* displays the number of seconds during which H, line BIP, or alarm signal error was detected. H can be set by the user through the CTRL/SETH/SESL menu.

Section Layer Performance Parameters

- *ESL (Errored Seconds – Section)* shows the number of seconds during which a signal Bit Interleaved Parity (BIP) error or an alarm signal was detected.
- *SESL (Severely Errored Second – Section)* shows the number of seconds during which H, section BIP, or alarm signal error was detected. H can be set by the user through the CTRL/SETH/SESS menu.

Path Layer Performance Parameters

- *ESL (Errored Seconds – Path)* shows the number of seconds during which a path Bit Interleaved Parity (BIP) error or an alarm signal was detected.
- *SESL (Severely Errored Seconds – Path)* shows the number of seconds during which H, more path BIP, or alarm signal error was detected. H can be set by the user using the CTRL/SETH/SESP menu.

Frame Errors

- *SEFS (Severe Errored Seconds – Frame)* shows the number of seconds during which H or more Frame errors were detected. H can be set by the user in the CTRL/SETH/SEFS menu.

4.2.2. Control Menu

The Control menu enables the user to control and set different parameters on 7707VT-3-OC48 cards.

Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
CTRL	FIBR	STD	BACK, OC, STM		
		LASR	BACK, CONT, DISC		
		REF	HOLD, LINK, XO, AUTO		
		CIC	ALL, 15M, 24H	CLR, BACK	
		LOSL	CLR, BACK		
		CESR	CLR, BACK		
		SETH	SESS, SESL, SESP, SEFS	1 to 9999	
	VINP	VI1, VI2, VI3	BACK, EDH	OFF, ON	
	VMON 1,VMON 2	BACK, VI1, VI2, VI3			
	PSWD	0 to 9999			
	This area visible only if correct password is entered	PWSL	0 to 9999		
		VIN	VI1, VI2, VI3	DIS, EN	
		ETH	OFF, 100, 500, 750, 1000, AUTO		
	DISP	HORZ, VERT			

Figure 4-4: Control Menu

4.2.2.1. Setting the Optical Link Standard

CTRL
FIBR
STD
BACK
OC
STM

The user can select the Optical Link Data Standard from the Control menu.

To set the Optical Link Data Standard to SONET, select **OC** (SONET).
To set the Optical Link Data Standard to SDH transmission, select **STM**.

4.2.2.2. Setting the Behavior of Laser When There is No Applied Video

On the 7707VT-3-HS-OC48, the LASR menu item allows the user to set the behavior of the laser transmitter when there is no video signal applied to the coaxial video inputs.

CTRL
FIBR
LASR
BACK
CONT
DISC

CONT = The laser will transmit continuously regardless of whether there are valid input video signals present on the coaxial inputs of the 7707VT-3-HS-OC48.

DISC = The laser will turn off when there is no recognizable video on any of the coaxial inputs.

4.2.2.3. Setting the Clock Source

- *CTRL*
  - *FIBR*
    - *REF*
      - *XO*
      - *LINK*
      - *HOLD*
      - *AUTO*

Three different clock settings are available for serial fiber output. Select the appropriate clock source from the FIBR/REF menu.

XO to select the Stratum 3 oscillator.
LINK to select POS Link clock.
HOLD to select hold over.
AUTO to automatically select the best setting.

4.2.2.4. Clearing the Counters

- *CTRL*
  - *FIBR*
    - *CIC*
      - *15M*
      - *24H*
      - *ALL*
        - *CLR*
        - *BACK*

This control enables you to clear the contents of all the current counters and reset them back to the default values.

Select **15m** then CLR to clear the 15-minute counter.
Select **24h** then CLR to clear the 24-hour counter.
Select **ALL** then CLR to clear both counters.

To clear the loss of link counter, go to CTRL/FIBR/LOSL and choose CLR to clear it.

- *CTRL*
  - *FIBR*
    - *LOSL*
      - *CLR*
      - *BACK*

Clear Loss of Link Counter.

This control enables the user to clear the loss of link counter.

To clear the error ratios (ESR SECT, LINE and PATH), go to CTRL/FIBR/CESR and choose CLR to clear them and restart the timer.

- *CTRL*
  - *FIBR*
    - *CESR*
      - *CLR*
      - *BACK*

This control enables the user to Clear Error Ratios.

4.2.2.5. Setting the Severe Errored Second Threshold

- *CTRL*
  - *FIBR*
    - *SETH*
      - *SESS*
      - *SESL*
      - *SESP*
      - *SEFS*
        - *1 to 9999*

This control enables the user to set the Severe Errored Second Threshold.

SESS = Severe Errored Seconds – Section
SESL = Severe Errored Seconds – Line
SESP = Severe Errored Seconds – Path
SEFS = Severe Errored Seconds - Frame
SET THRESHOLD FOR SEVERE ERRORED SECONDS 1 TO 9999.

You can set the value of the BIP errors occurring in one second at or above which it is considered a severely errored second. These threshold limits can be set for Line, Section or Path layers. Threshold values are from 1 to 9999.

If input signal has EDH packets, EDH Insert will always be forced to ON.

4.2.2.6. Activating or Deactivating EDH Processing

CTRL
VINP
VI1, VI2, VI3
EDH
ON
OFF

Enables or Disables EDH Processing of Compatible signals on VI1, VI2 and VI3.

ON = Input Signals will be EDH monitored and recalculated EDH packets will be embedded into the video signal. Flags are also updated. EDH processing will not monitor or modify non-compatible signals (ex. DVB-ASI).

OFF = EDH recalculation and reinsertion is disabled. EDH errors are still reported when present.

4.2.2.7. Monitoring a Specific Channel

The 7707VT-3-HS-OC48 enables the user to output a channel without having to switch the BNC connectors. One ***MON OUT*** terminal is provided which can be set to output any of the three incoming or outgoing channels.

CTRL
VMON 1, 2
BACK
VI1
VI2
VI3

This control enables user selectable video loopback output.

This option allows the user to select one of the four channels to output on the **MON OUT 1 or 2** connectors.

VIN1 = Selects HD/SD-SDI Input 1
VIN2 = Selects SDI Input 2
VIN3 = Selects SDI Input 3

4.2.2.8. Signal BLOCK Configuration

Depress the pushbutton and select the PSWD option. Actuate the toggle switch to achieve the correct code number (Factory Default = 7154). Once you have entered the correct password, you will be able to reset the password and/or block channels. Without the correct password, this option would not be visible.

CTRL
PSWD
PWSL
0 to 9999

Store a new passcode (0-9999) required for BLOCK configuration.

This menu is not available without entering the correct passcode.

- *CTRL*
  - *PSWD*
    - *VIP*
      - *VI1, VI2, VI3*
        - *EN*
        - *DIS*

This menu item cannot be modified without entering the correct passcode, though its current state is viewable.

EN = Enable
DIS = Disable

When Disabled, the data input on the selected signal is not placed on the fiber link data stream.

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

On the 7707VT-3-HS-OC48 card, the **DISP** display allows 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.

- *CTRL*
  - *DISP*
    - *HORZ*
    - *VERT*

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

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

5. JUMPERS

Several jumpers, located at the front of the module are used to preset various operating modes. Figure 5-1 shows the locations of the jumpers on the board.

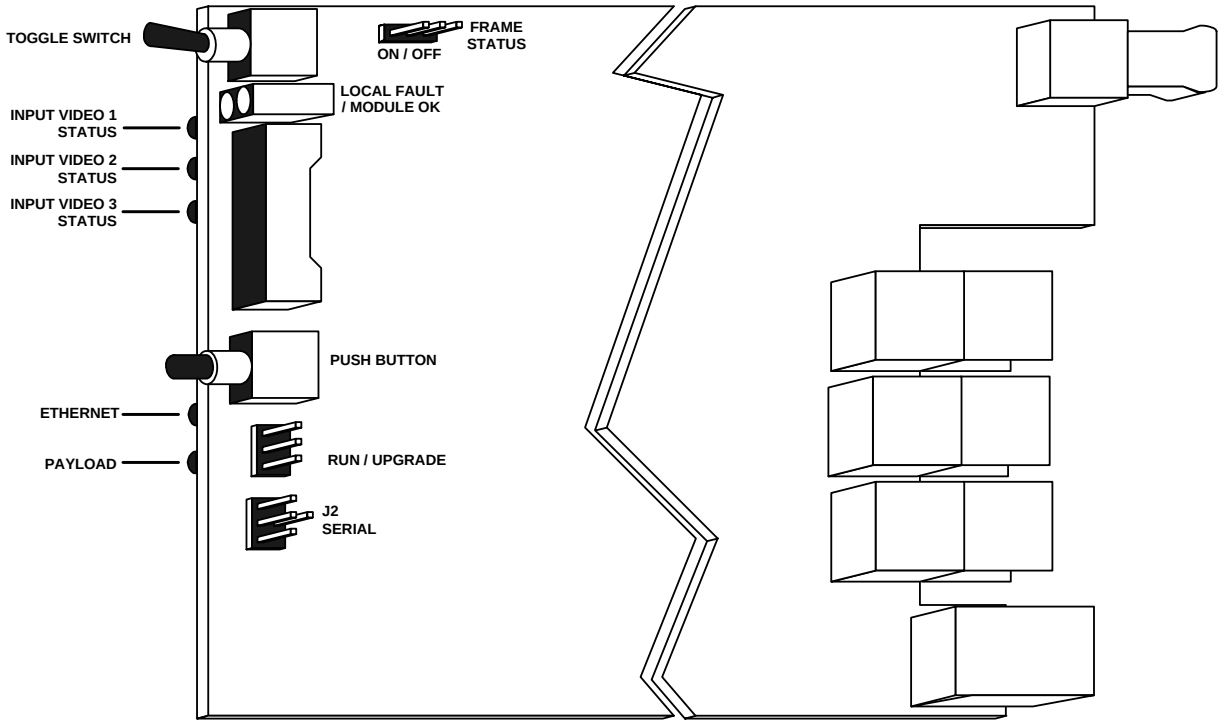

Figure 5-1: Location of Status Indicators and Jumpers

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. 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

The 7707VT-3-HS-OC48 card can be configured for firmware upgrades using the UPGRADE jumpers or with the serial port 'u' command as described below.

5.2.1. Using the Upgrade Jumper

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 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 "u" 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.

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