TABLE OF CONTENTS

REVISION HISTORY

REVISION	DESCRIPTION	DATE
1.0	First release	Apr 07
1.1	Updated rear plate drawing	Apr 08
1.2	Corrected Figure 2-1	Sept 08

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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.**

1. OVERVIEW

The 7707VB-2-OC12 is a *Vista*LINK®-enabled, fiber transreceiver for SDI, DVB-ASI or SDTi video signal that transports signals at OC-12/STM-4 data rates (622 Mb/s) and interfaces directly to SONET/SDH infrastructure. The card also has a built-in Ethernet transceiver with a 10/100 Base-T port. This dual fiber single card combines up to two asynchronous SDI, DVB-ASI or SDTi signals using Time Domain Multiplex (TDM) technology. A companion 7707VB-2-OC12 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 7707VB-2-OC12 will transparently pass incoming 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.

7707VB13-2-OC12   1310 nm FP   -7dBm output, suitable for distances up to 50 Km
7707VB15-2-OC12   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.

7707VB27-2-OC12	1270 nm DFB
7707VB29-2-OC12	1290 nm DFB
7707VB31-2-OC12	1310 nm DFB
7707VB33-2-OC12	1330 nm DFB
7707VB35-2-OC12	1350 nm DFB
7707VB37-2-OC12	1370 nm DFB
7707VB43-2-OC12	1430 nm DFB
7707VB45-2-OC12	1450 nm DFB
7707VB47-2-OC12	1470 nm DFB
7707VB49-2-OC12	1490 nm DFB
7707VB51-2-OC12	1510 nm DFB
7707VB53-2-OC12	1530 nm DFB
7707VB55-2-OC12	1550 nm DFB
7707VB57-2-OC12	1570 nm DFB
7707VB59-2-OC12	1590 nm DFB
7707VB61-2-OC12	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).

7707VBDyyy-2-OC12   DWDM DFB laser output, yyy – ITU channel number

The 7707VB-2-OC12 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 7707VB-2-OC12 module can also be installed in the S7701 stand-alone enclosure.

Features:

- Transports signal over OC-12/STM-4 data rates (622 Mb/s)
- Single card TDM multiplexer and demultiplexer for two asynchronous SD-SDI, SDTi and DVB-ASI signals
- Built-in Ethernet transceiver with one 10/100 Base-T port
- Interfaces directly to SONET/SDH infrastructure
- Uncompressed, full-rate video transport
- Signal transport uninterrupted by loss of any 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 250m at 270Mb/s (Belden 8281)
- 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
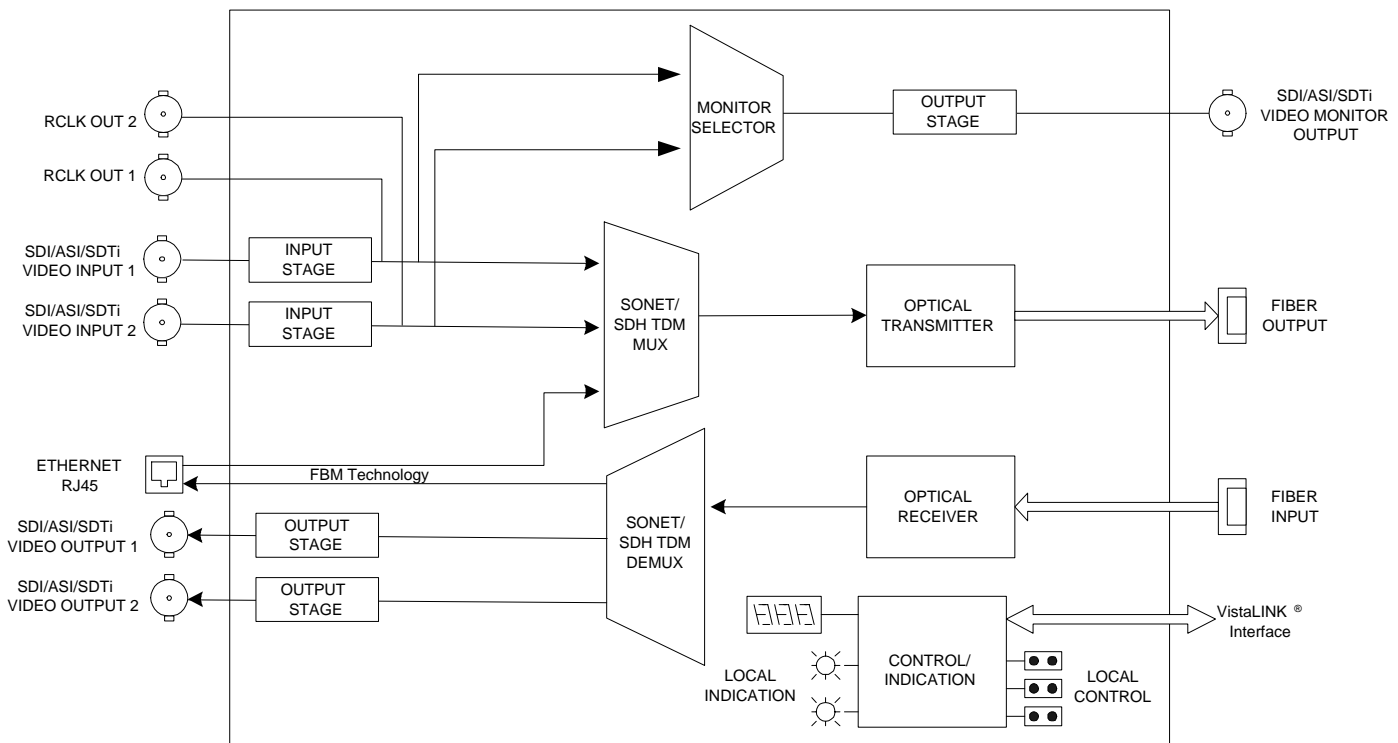
Figure 1-1: 7707VB-2-OC12 Block Diagram

2.   INSTALLATION

The 7707VB-2-OC12 comes with a companion rear plate that has nine 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.
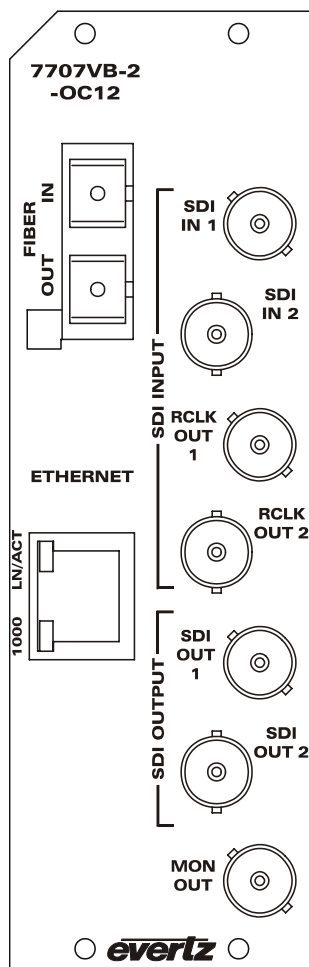
Figure 2-1: 7707VB-2-OC12 Rear Panel

SDI INPUT: 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.

SDI OUTPUT: Six BNC outputs for two independent incoming and four reclocked serial digital component video signals, compatible with the SMPTE 259M, SMPTE305M and DVB-ASI standards.

MON OUTPUT: User selectable video loopback output. Any of the inputs or the outputs can source this port 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 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: 7707VB13-2-OC12, 7707VB15-8-OC12,
  7707VBxx-8-OC12, (xx = 27, 29, 31, 33, 35, 37, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61)
  7707VBDyyy-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)
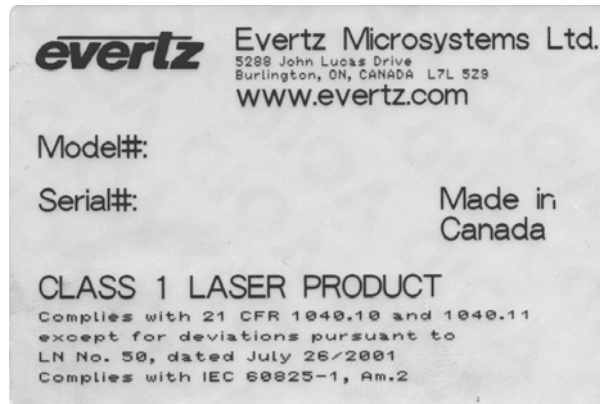
Figure 2-2: Reproduction of Laser Certification and Identification Label

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: SMPTE 259M-C, SMPTE 305M(SDTi), DVB-ASI.
Number of Inputs: 2 independent SDI, SDTi or DVB-ASI 270Mb/s signals
Connector: 2 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 OUTPUTS:

Standards: SMPTE 259M-C, SMPTE 305M, DVB-ASI
Number of Outputs: 2 Independent SDI, SDTi or DVB-ASI 270Mb/s signals
Connectors: BNC per IEC 60169-8 Amendment 2
Signal Level: 800mV(nominal)
DC Offset: $0V \pm 0.5V$
Rise and Fall Time: 900ps(nominal)
Overshoot: < 10% of amplitude
Return Loss: > 12dB
Wide Band Jitter: < 0.2UI

3.3. OPTICAL OUTPUT

Standards: OC-12/STM-4
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: $-7dBm \pm 1dBm$
   1550nm & CWDM: $0 dBm \pm 1dBm$
   DWDM: $+7dBm \pm 1dBm$

3.4. OPTICAL INPUT

Number of Inputs:	1
Standards:	OC-12/STM-4
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 7707VB-2-OC12 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 5-1 shows the locations of the indicators, pushbutton and toggle switch.
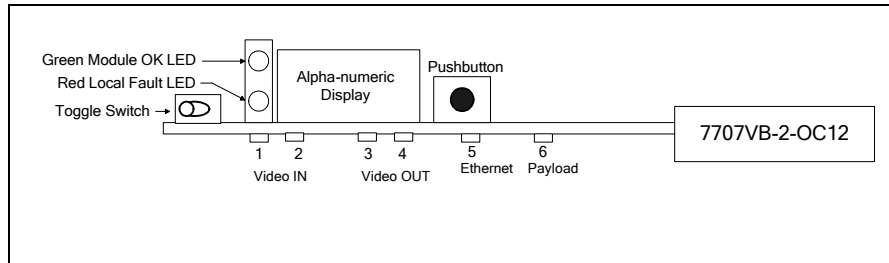
Figure 4-1: Location of Status Indicators and Controls

4.1. STATUS INDICATOR LEDS

LOCAL FAULT: On the 7707VB-2-OC12 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 blocked by user from being transported through fiber.

VIDEO OUT STATUS LED:
GREEN Valid signal at output. No errors.
RED Valid signal at output. Errors detected.
OFF No valid output detected.
YELLOW Output is blocked by 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 7707VB-2-OC12 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, 24H	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			
	VIN	STD	VID1, VID2	ASI, N270, P270, LOSS	
		EDH	VID1, VID2	PRES, LOSS	
		SDTI	VID1, VID2	PRES, LOSS	
	VOUT	STD	VID1, VID2	ASI, N270, P270, LOSS	
		EDH	VID1, VID2	PRES, LOSS	
		SDTI	VID1, VID2	PRES, LOSS	
		OSTD	VID1, VID2	OFF, ASI, N270, P270	
	ETH	LINK	UP, DOWN		
		SPD	10, 100, 1000, DOWN		
CTRL	FIBR	OSTD	OC, STM		
		LASR	CONT, DISC		
		REF	LINK, XO, AUTO		
		CIC	ALL, 15M, 24H	CLR	
		LOSL	CLR		
		CESR	CLR		
		SETH	SESS, SESL, SESP	1 to 9999	
	VIN	EDH	VID1, VID2	OFF, ON	
	VOUT	EDH	VID1, VID2	OFF, ON	
		OSTD	VID1, VID2	N270, P270, ASI, OFF	
	VMON	VIN1, VIN2, VOT1, VOT2			
	PSWD	0 to 9999			
	This area visible only if correct password is entered	PWSL	0 to 9999		
		VIN	VID1, VID2	DIS, EN	
		VOUT	VID1, VID2	DIS, EN	
	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, 24H	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			
	VIN	STD	VID1, VID2	ASI, N270, P270, LOSS	
		EDH	VID1, VID2	PRES, LOSS	
		SDTI	VID1, VID2	PRES, LOSS	
	VOUT	STD	VID1, VID2	ASI, N270, P270, LOSS	
		EDH	VID1, VID2	PRES, LOSS	
		SDTI	VID1, VID2	PRES, LOSS	
		OSTD	VID1, VID2	OFF, ASI, N270, P270	
	ETH	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 shows 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 7707VB-2-OC12 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	
ESL	
SESL	
ESS	
SESS	
ESP	
SESP	
SEFS	
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:
ESL, SESL, ESS, SESS, ESP, SESP, SEFS

For a detailed description see Table 4-1.

STAT/FIBR/CIC	15M	24H
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 4.2.1.18.

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 detected.

4.2.1.10. Displaying the Video Standard at Input Ports

STAT
VIN
STD
VID1
VID2
ASI
N270
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 or SMPTE 305M at input.
P270   Indicates SMPTE 259M-C, 270 Mb/s 4:2:2 Component 625 line, 4:3 or SMPTE 305M at input.
LOSS   Loss of Valid Input Signal.

4.2.1.11. Displaying the Video Standard at Output Ports

STAT
VOUT
STD
VID1
VID2
ASI
N270
P270
LOSS

Displays the video standard present at the output ports.

ASI   Indicates DVB-ASI Signal at Output.
N270   Indicates SMPTE 259M-C, 270 Mb/s 4:2:2 Component 525 line, 4:3 or SMPTE 305M at output.
P270   Indicates SMPTE 259M-C, 270 Mb/s 4:2:2 Component 625 line, 4:3 or SMPTE 305M at output.
LOSS   Loss of Valid Input Signal.

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

STAT
VIN
EDH
VID1
VID2
PRES
LOSS

Displays video EDH status at the input terminal.

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

4.2.1.13. Detecting the EDH Presence in a Compatible Signal at Output Ports

STAT
VOUT
EDH
VID1
VID2
PRES
LOSS

Displays video EDH status at the output terminal.

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

4.2.1.14. Displaying the SDTI Status at Input Ports

STAT
VIN
SDTI
VID1
VID2
PRES
LOSS

Displays input video SDTI status.

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

4.2.1.15. Displaying the SDTI Status at Output Ports

STAT
VOUT
SDTI
VID1
VID2
PRES
LOSS

Displays output video SDTI status.

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

4.2.1.16. Displaying the Output Standard on Video LOSS

STAT
VOUT
OSDT
VID1
VID2
OFF
ASI
N270
P270

Displays the video standard set to be generated when a valid video signal is lost.

OFF   Indicates No output standard.
ASI   Indicates DVB-ASI.
N270   Indicates SMPTE 259M-C, 270 Mb/s 4:2:2 Component 525 line, 4:3.
P270   Indicates SMPTE 259M-C, 270 Mb/s 4:2:2 Component 625 line, 4:3.

4.2.1.17. Ethernet Status and Speed

STAT
ETH
LINK
UP
DOWN

Displays the Ethernet Connection Status.

UP = Indicates Ethernet link established.
DOWN = Indicates No valid Ethernet connection.

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

4.2.1.18. Performance Monitoring and Error Reporting

The 7707VB-8-OC12 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 7707VB-2-OC12 cards.

Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
CTRL	FIBR	OSTD	OC, STM		
		LASR	CONT, DISC		
		REF	LINK, XO, AUTO		
		CIC	ALL, 15M, 24H	CLR	
		LOSL	CLR		
		CESR	CLR		
		SETH	SESS, SESL, SESP	1 to 9999	
	VIN	EDH	VID1, VID2	OFF, ON	
	VOUT	EDH	VID1, VID2	OFF, ON	
		OSTD	VID1, VID2	N270, P270, ASI, OFF	
	VMON	VIN1, VIN2, VOT1, VOT2			
	PSWD	0 to 9999			
	This area visible only if correct password is entered	PWSL	0 to 9999		
		VIN	VID1, VID2	DIS, EN	
		VOUT	VID1, VID2	DIS, EN	
	DISP	HORZ, VERT			

Figure 4-4: Control Menu

4.2.2.1. Setting the Optical Link Standard

CTRL
FIBR
OSTD
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 7707VB-2-OC12, 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
CONT
DISC

CONT The laser will transmit continuously regardless of whether there are valid input video signals present on the coaxial inputs of the 7707VB-2-OC12.

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
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.
Auto to automatically select the best setting.

4.2.2.4. Clearing the Counters

CTRL
FIBR
CIC
15M
24H
ALL
CLR

This control enables you to clear the contents of all the current counters and reset them back to the default values by going into the CTRL/FIBR/CIC menu.

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

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

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
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

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.

4.2.2.6. Activating or Deactivating EDH Processing

CTRL
VIN,
VOUT
EDH
VID1
VID2
ON
OFF

Enables or Disables EDH Processing of Compatible signals on VID1 and VID2.

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 (i.e. DVB-ASI).

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

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

4.2.2.7. Setting Video Standard on Loss

The SDI OUT ports of 7707VB-2-OC12 can be individually configured to output grey video with a user set standard if an input video signal is lost.

CTRL
VOUT
OSTD
VID1
VID2
N270
P270
ASI
OFF

To select the video standard select the desired channel and then select the standard.

N270   Selects SMPTE 259M-C, 270 Mb/s 4:2:2 Component 525 line, 4:3
P270   Selects SMPTE 259M-C, 270 Mb/s 4:2:2 Component 625 line, 4:3
ASI   Selects DVB-ASI
OFF   No output

4.2.2.8. Monitoring a Specific Channel

The 7707VB-2-OC12 enables the user to output a channel without having to switch the BNC connectors. A **_MON OUT_** terminal is provided which can be set to output any of the two incoming or outgoing channels.

CTRL
VMON
VIN1
VIN2
VOT1
VOT2

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** connector.

VIN1 = Selects SDI Input 1
VIN2 = Selects SDI Input 2
VOT1 = Selects SDI Output 1
VOT2 = Selects SDI Output 2

4.2.2.9. 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
VIN
VOUT
VID1
VID2
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.

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

On the 7707VB-2-OC12 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 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.

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.
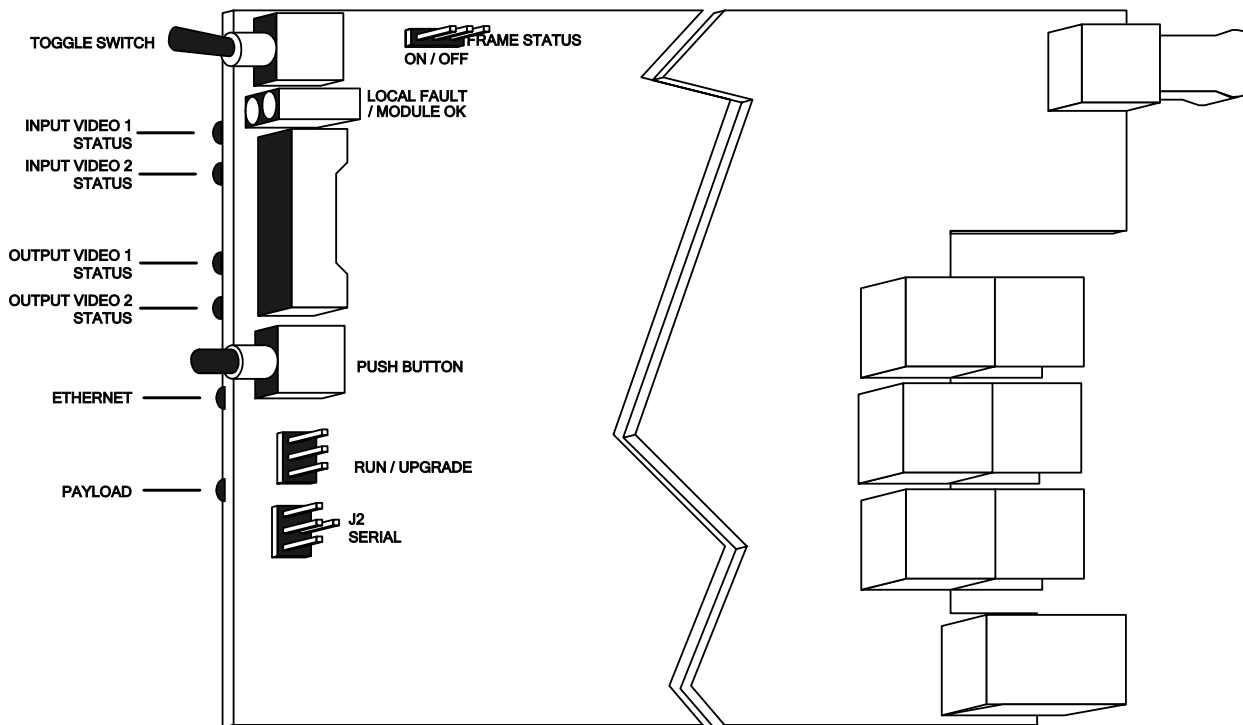

Figure 5-1: Location of Status Indicators and Jumpers

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 7707VB-2-OC12 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.

6. VISTALINK® REMOTE MONITORING/CONTROL

6.1. WHAT IS *VISTA*LINK®?

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

There are 3 components of SNMP:

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

2. Managed devices (such as 7707VB-2-OC12 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.

6.2. *VISTA*LINK® MONITORED PARAMETERS

Parameter The following parameters can be remotely monitored through the *Vista*LINK® interface.	Description
Input and Output Video Standard	Indicates the presence of a valid video signal.
Optical Standard and Power	Shows the current transmission standard implemented by the card (SONET or SDH) and the optical power detected on the card.
Input and Output EDH and SDTi Status	Indicates if EDH and SDTi packets are present.
Errored Seconds – Current and Last	Indicates the error counters as described in Table 4-1 and Table 4-2.
Clock Reference	Shows the current clock reference set as source.
Ethernet	Shows Ethernet Speed and Link status.
Interval Elapsed Time	Shows the current timer on 15 minutes and 24 hours counter.
Errored Seconds	Shows the errored seconds occurred in 15 min and 24 hr time interval.
Severe Errored Seconds	Shows the severe errored seconds occurred in 15 min and 24 hr time interval.

Table 6-1: *Vista*LINK® Monitored Parameters

6.3. *VISTA*LINK® CONTROLLED PARAMETERS

The following parameters can be remotely controlled through the *Vista*LINK® interface.

Parameter	Description
EDH Insert	Enables recalculated EDH packets to be inserted into video stream, with updated error flags.
Monitoring Video	Select the input to source the video monitor output port or turn monitor output OFF.
Video Block	Allows the User to enable/disable specific video paths. Disabled input data will not be placed on the fiber link.
Video Output on Loss	Select Video standard to output on valid video signal loss.
Change Password	Setup the Password used to access the Video Blocking features.
Laser	Allows the user to control the laser behavior when no video is present on coaxial inputs. In Discontinuous mode the laser will be shut off with no valid input signals. In Continuous mode the laser will continuously transmit and maintain the link to the companion 7707VB-2-OC12.
Threshold	Allows the user to set Optical Level and Errored Seconds Threshold.
Reference	Allows the user to select Oscillator, Link or Auto mode for clock settings.
Clear Counters	Option to clear all error counters and reset the timer.

Table 6-2: *Vista*LINK® Controlled Parameters

6.4. *VISTA*LINK® TRAPS

The following traps can be *Vista*LINK® enabled and monitored.

Trap	Description
Input Video Loss: Channel 1 and 2	Triggers when there is a loss of a valid video signal on channel 1 or 2.
Output Video Loss: Channel 1 and 2	Triggers when there is a loss of a valid video signal on channel 1 or 2.
Laser Fault	Triggers when there is a laser fault.
Link Loss	Triggers when a link loss is detected.
Severe Errors Seconds	Triggers when one or all of severe errored thresholds are crossed.
Errored Seconds	Triggers when Line, Path or Section errored second is present.
Ethernet Link	Triggers when Ethernet Link is lost.

Table 6-3: *Vista*LINK® Traps

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