

## TABLE OF CONTENTS

1.	OVERVIEW.....	1
2.	INSTALLATION.....	2
2.1.	77070E-DS3 CONNECTIONS .....	2
2.2.	77070E-E3 CONNECTIONS.....	3
2.3.	CARE AND HANDLING OF OPTICAL FIBER.....	4
2.3.1.	Safety .....	4
2.3.2.	Handling and Connecting Fibers.....	4
3.	SPECIFICATIONS.....	5
3.1.	77070E-DS3 SPECIFICATIONS.....	5
3.1.1.	Optical Input.....	5
3.1.2.	Electrical Outputs .....	5
3.1.3.	Electrical.....	5
3.1.4.	Physical.....	5
3.2.	77070E-E3 SPECIFICATIONS .....	6
3.2.1.	Optical Input.....	6
3.2.2.	Serial Video Outputs .....	6
3.2.3.	Electrical.....	6
3.2.4.	Physical.....	6
4.	STATUS LEADS.....	7
4.1.	DOT-MATRIX DISPLAY .....	7
4.1.1.	Displaying the Optical Power .....	7
5.	JUMPERS AND USER ADJUSTMENTS.....	8
5.1.	SELECTING WHETHER LOCAL FAULTS WILL BE MONITORED BY THE GLOBAL FRAME STATUS.....	8
5.2.	SELECTING THE OUTPUT MODE.....	9
5.3.	SETTING THE TRANSMIT LEVEL .....	9
5.4.	SELECTING WHETHER MODULE WILL BE CONTROLLED FROM THE LOCAL CONTROLS OR THROUGH THE <i>VISTALINK</i> <sup>®</sup> INTERFACE .....	9
5.5.	CONFIGURING THE MODULE FOR FIRMWARE UPGRADES .....	10
6.	<i>VISTALINK</i> <sup>®</sup> REMOTE MONITORING/CONTROL.....	11

**6.1. WHAT IS VISTA LINK<sup>®</sup>?**..... 11

**6.2. VISTA LINK<sup>®</sup> MONITORED PARAMETERS**..... 11

**6.3. VISTA LINK<sup>®</sup> CONTROLLED PARAMETERS**..... 12

**Figures**

Figure 1-1: 7707OE-DS3 or 7707OE-E3 Block Diagram..... 1

Figure 2-1: 7707OE-DS3 Rear Panels..... 2

Figure 2-2: 7707OE-E3 Rear Panels ..... 3

Figure 5-1: Jumper Locations ..... 8

**Tables**

Table 6-1: VistaLINK<sup>®</sup> Monitored Parameters..... 11

Table 6-2: VistaLINK<sup>®</sup> Controlled Parameters ..... 12

## REVISION HISTORY

<u>REVISION</u>	<u>DESCRIPTION</u>	<u>DATE</u>
1.0	Preliminary Version	May 01
1.1	Revised for DS3 only product	Oct 01
1.2	Revised sensitivity spec, removed preliminary watermark, minor typos fixed	Oct 03
1.3	Added 7707OE-E3	Jul 04
1.4	Corrected HI/LO Jumper Error & Output Connector Numbers	May 05
1.5	Updated specs, VistaLINK <sup>®</sup> description and fixed format	Nov 08

Information contained in this manual is believed to be accurate and reliable. However, Evertz assumes no responsibility for the use thereof nor for the rights of third parties, which may be affected in any way by the use thereof. Any representations in this document concerning performance of Evertz products are for informational use only and are not warranties of future performance, either expressed or implied. The only warranty offered by Evertz in relation to this product is the Evertz standard limited warranty, stated in the sales contract or order confirmation form.

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.

*This page left intentionally blank*

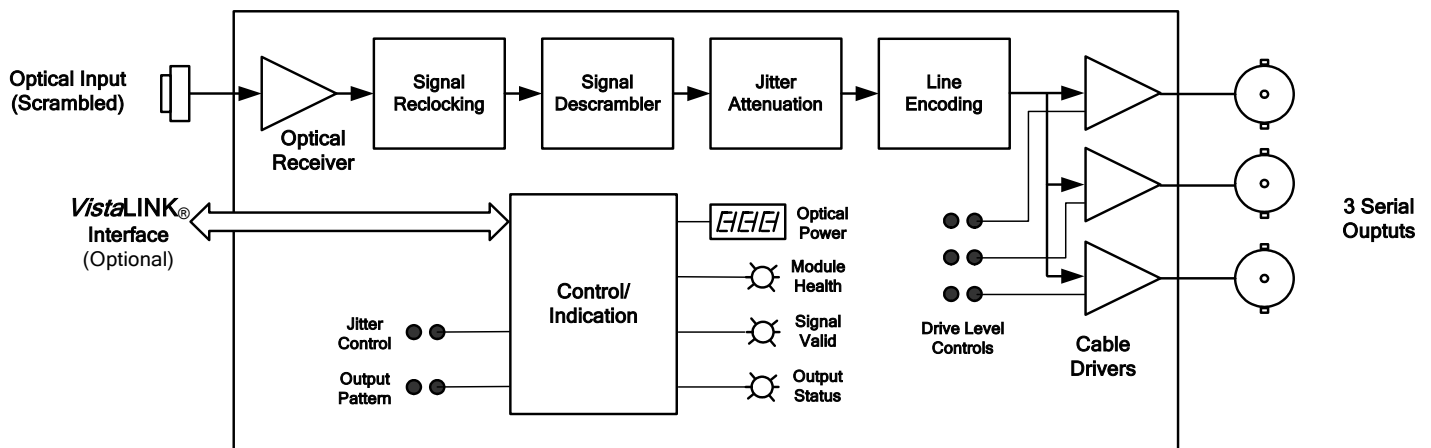
## 1. OVERVIEW

The 7707OE-DS3 and 7707OE-E3 are VistaLINK® enabled optical to electrical converter for DS3 (44.736 Mb/s) and E3 (34.368Mb/s) signals. Monitoring and control of card status and parameters is provided locally at the card edge, and remotely via VistaLINK® capability. The 7707OE-DS3 and 7707EO-E3 accepts one fiber input, and provides jitter attenuation to four reclocked G.703 compliant output signals.

The 7707OE-DS3 and 7707EO-E3 occupies one card slot and can be housed in either a 1RU frame that will hold up to three modules or a 3 RU frame that will hold up to 15 modules.

### Features:

- Signal reclocking and jitter attenuation functions
- Output wave shaping for G.703 standards compliance
- Outputs 1010 pattern generation upon loss of lock to an input signal
- Electrical output drive level control for enhanced distance
- Transformer coupled inputs/outputs
- Display of received optical power provides a pre-emptive indication of link integrity
- Wide range optical input (1310nm–1610nm)
- Supports multi-mode and single-mode fiber
- Fully hot swappable from front of frame
- VistaLINK® enabled for remote monitoring and control when installed in 7700FR-C frame with 7700FC Frame Controller



**Figure 1-1: 7707OE-DS3 or 7707OE-E3 Block Diagram**

## 2. INSTALLATION

The 7707OE-DS3 and 7707OE-E3 come with a companion rear plate that has 3 BNC connectors. For information on mounting the rear plate and inserting the module into the frame see the 7700FR chapter section 3.

### 2.1. 7707OE-DS3 CONNECTIONS

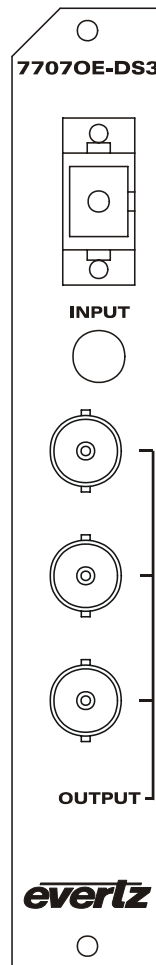
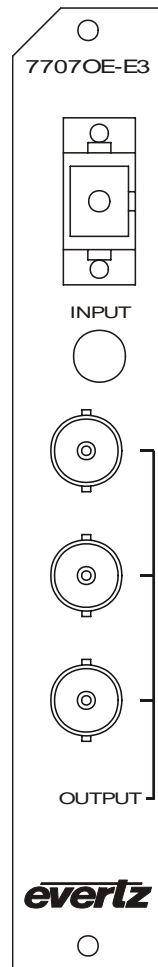


Figure 2-1: 7707OE-DS3 Rear Panels

**OPTICAL INPUT:** Input to the 7707OE-DS3, providing reclocking and jitter attenuation of serial digital signals. The jitter attenuator may also be turned off via card edge jumpers, or through the *VistaLINK*® interface. This wide range input accepts optical wavelengths of 1310nm to 1610nm, accommodating standard or CWDM transmission schemes.

**OUTPUT:** There are three BNC connectors with transformer coupled, reclocked outputs. The output drive levels for each output are independently jumper selectable for driving different cable lengths.

**2.2. 7707OE-E3 CONNECTIONS****Figure 2-2: 7707OE-E3 Rear Panels**

**OPTICAL INPUT:** Input to the 7707OE-E3, providing reclocking and jitter attenuation of serial digital signals. The jitter attenuator may also be turned off via card edge jumpers, or through the *VistaLINK*® interface. This wide range input accepts optical wavelengths of 1310nm to 1610nm, accommodating standard or CWDM transmission schemes.

**OUTPUT:** There are three BNC connectors with transformer coupled, reclocked outputs. The output drive levels for each output are independently jumper selectable for driving different cable lengths.

## 2.3. CARE AND HANDLING OF OPTICAL FIBER

### 2.3.1. Safety



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

The laser modules used in the Evertz fiber optic modules are Class I, with a maximum output power of 2mW, and wavelengths of either 1310 nm or 1270 nm to 1610 nm.

### 2.3.2. Handling and Connecting Fibers



**Never touch the end face of an optical fiber.**

The transmission characteristics of the fiber are dependent on the shape of the optical core and therefore care must be taken to prevent fiber damage due to heavy objects or abrupt fiber bending. Evertz recommends that the user maintains a minimum bending radius of 3 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 regarding care and handling of fiber optic cable see section 3 of the Fiber Optics System Design chapter of this manual.



### 3. SPECIFICATIONS

#### 3.1. 7707OE-DS3 SPECIFICATIONS

##### 3.1.1. Optical Input

<b>Standards:</b>	
<b>7707EO-DS3</b>	G.703 @ 44.736 Mb/s
<b>Connector:</b>	Female SC/PC, ST/PC or FC/PC
<b>Wavelength:</b>	1270 -1610nm
<b>Optical Sensitivity:</b>	-31dBm
<b>Max. Input Power:</b>	0dBm
<b>Fiber Size:</b>	62 $\mu$ m core / 125 $\mu$ m overall

##### 3.1.2. Electrical Outputs

<b>Number of Outputs:</b>	3 per Card-Reclocked
<b>Connector:</b>	1 BNC per IEC 61169-8 Annex A
<b>Waveform:</b>	Conforms to G.703 compliant masks
<b>Return Loss:</b>	> 15 dB up to 44.736 Mb/s
<b>Drive Level:</b>	
<b>High:</b>	For driving cable lengths > 70m
<b>Low:</b>	For driving cable lengths < 70m

##### 3.1.3. Electrical

<b>Voltage:</b>	+ 12V DC
<b>Power:</b>	6 Watts
<b>EMI/RFI:</b>	Complies with FCC Part 15, Class A EU EMC Directive

##### 3.1.4. Physical

<b>7700 or 7701 frame mounting:</b>	
<b>Number of slots:</b>	1

### 3.2. 7707OE-E3 SPECIFICATIONS

#### 3.2.1. Optical Input

**Standards:**

**7707EO-E3** G.703 @ 34.368 Mb/s  
SMPTE 259M A, B, C, D, SMPTE 297M, SMPTE 305M, SMPTE 310M,  
SMPTE344M, M2S, DVB-ASI

**Number of Inputs:** 3 (independent channels)

**Connector:** SC/PC, ST/PC, FC/PC female housing

**Operating Wavelength:** 1270nm to 1610nm

**Max. Input Power:** 0dBm

**Optical Sensitivity:** -30dBm

#### 3.2.2. Serial Video Outputs

**Number of Outputs:** 3 reclocked (independent channels)

**Connector:** 3 BNC per IEC 61169-8 Annex A

**Signal Level:** 800mV nominal

**DC Offset:** 0V  $\pm$ 0.5V

**Rise/Fall Time:** 900ps nominal

**Overshoot:** < 10% of amplitude

**Return Loss:** > 15dB up to 540Mb/s

**Jitter:** < 0.2 UI

#### 3.2.3. Electrical

**Voltage:** +12V DC

**Power:** 7W

**EMI/RFI:** Complies with FCC Part 15, Class A  
EU EMC Directive

#### 3.2.4. Physical

**Number of slots:**

**350FR:**

**7700FR-C:** 1

**7800FR:**

## 4. STATUS LEDES

- MODULE OK:** This Green LED will be On when the module is operating properly.
- LOCAL FAULT:** This Red LED will be On when the Signal Valid is Off, or Output Fault On or when there is a fault in the module power supply.
- SIGNAL VALID:** This Green LED will be On when a lock to the input signal is attained.
- OUTPUT FAULT:** This Red LED will be On when an output fault or output connection error exists.
- CARRIER FAULT:** This Yellow LED indicates a weak signal carrier at the input. The CARRIER FAULT threshold is calibrated to an optical power of  $-25\text{dBm}$ .

### 4.1. DOT-MATRIX DISPLAY

Additional signal and status monitoring is provided via the 4-digit dot-matrix display located on the card edge.

#### 4.1.1. Displaying the Optical Power

The 7707OE module can measure and display the input optical power over a range of  $-14\text{dBm}$  to  $-30\text{dBm}$  at 1dBm increments.

- |            |  |
|------------|--|
| OK         | Indicates optical input powers exceeding $-14\text{dBm}$ . |
| -14 to -30 | Optical input power within this range.                     |
| <-30       | Optical input power below $-30\text{dBm}$ .                |
| LOS        | Indicates that no valid input signal is present.           |

## 5. JUMPERS AND USER ADJUSTMENTS

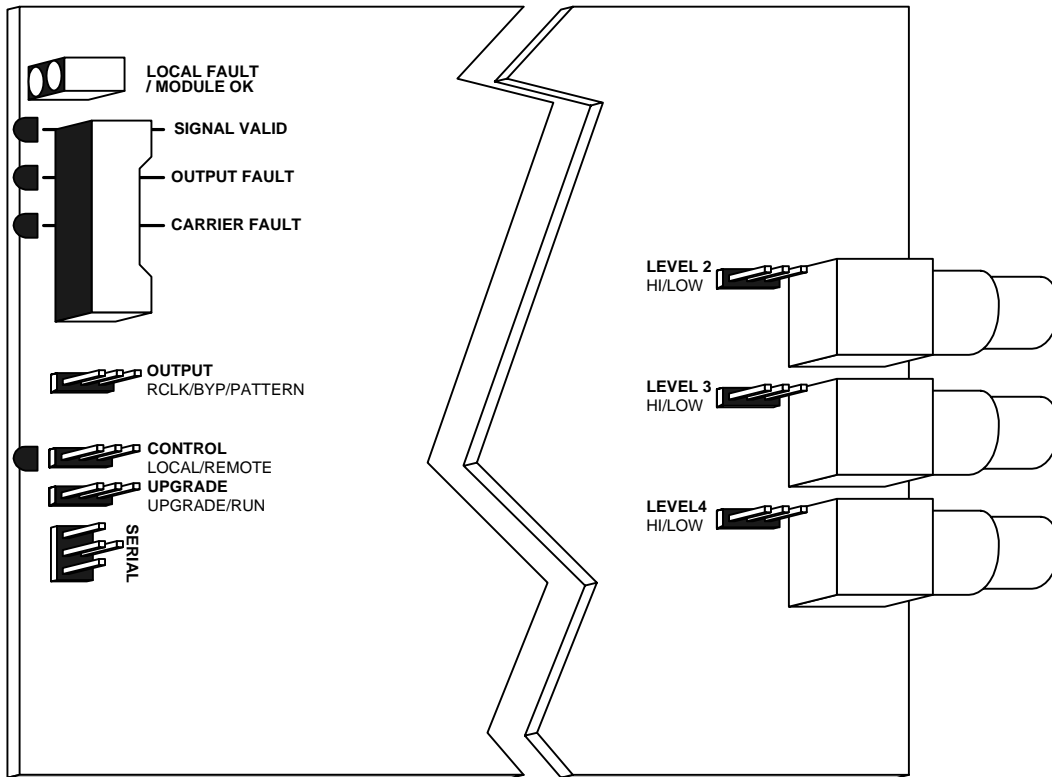


Figure 5-1: Jumper Locations

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

The FRAME STATUS jumper J7, located at the top front of the module 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 THE OUTPUT MODE

The OUTPUT jumper J14, located on the center front of the module, is a three position jumper that sets the output mode of the DA.

**OUTPUT:** To select the normal jitter-attenuation mode, set the jumper to the **RCLK** position (default). This provides signal reclocking for the DS3 signal. The output defaults to a '1010...' test pattern on loss of input signal.

To bypass jitter-attenuation, set the jumper to the **BYP** position. This position is useful for performing system diagnostics.

Set the jumper to the **PRBS** position to output a '1010...' test pattern for additional diagnostics testing.

## 5.3. SETTING THE TRANSMIT LEVEL

The three LEVEL jumpers, J19, J21 and J22 located at the rear of the module beside the four output BNCs, set the transmit level for the signal on the adjacent BNC output connector.

**LEVEL:** When the cable length connected to the output is less than 225 feet (68.5 meters) set the jumper to the **LOW** position in order to meet the DSX-3 pulse specification.

When the cable length connected to the output is greater than 225 feet (68.5 meters) set the jumper to the **HIGH** position in order to meet the DSX-3 pulse specification.

## 5.4. SELECTING WHETHER MODULE WILL BE CONTROLLED FROM THE LOCAL CONTROLS OR THROUGH THE *VistaLINK*<sup>®</sup> INTERFACE

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

## **5.5. 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 NOTE 1). 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 completed, remove the module from the frame, move the UPGRADE jumper into the *RUN* position, remove the upgrade cable and re-install the module. The module is now ready for normal operation.

## 6. VISTALINK<sup>®</sup> REMOTE MONITORING/CONTROL

### 6.1. WHAT IS VISTALINK<sup>®</sup>?

VistaLINK<sup>®</sup> 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<sup>®</sup> 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<sup>®</sup> 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<sup>®</sup> 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<sup>®</sup> enabled fiber optic products.
2. Managed devices, (such as 7707EO and 7707OE cards), each with a unique address (OID), communicate with the NMS through an SNMP Agent. Evertz VistaLINK<sup>®</sup> enabled 7700 series modules reside in the 3RU 7700FR-C MultiFrame and communicate with the manager via the 7700FC VistaLINK<sup>®</sup> 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 and 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<sup>®</sup> network, see the 7700FC Frame Controller chapter.

### 6.2. VISTALINK<sup>®</sup> MONITORED PARAMETERS

The following parameters can be remotely monitored through the VistaLINK<sup>®</sup> interface:

Parameter	Description
<b>Optical Power</b>	A range of values describing optical power at the fiber input.
<b>Signal Valid</b>	Indicates the presence of a valid input signal (the state of the SIGNAL VALID LED).
<b>Output Fault</b>	Indicates the presence of an output fault condition (the state of the OUTPUT FAULT LED).
<b>Carrier Fault</b>	Indicates the presence of a carrier fault condition (the state of the CARRIER FAULT LED).
<b>Output Mode jumper</b>	State of the OUTPUT jumper.

**Table 6-1: VistaLINK<sup>®</sup> Monitored Parameters**

**6.3. VISTA LINK<sup>®</sup> CONTROLLED PARAMETERS**

When the MASTER jumper is set to the REMOTE position, the following parameters can be remotely controlled through the *VistaLINK<sup>®</sup>* interface. When the MASTER jumper is set to the LOCAL position the local jumper settings will override the settings configured through the *VistaLINK<sup>®</sup>* interface.

<b>Parameter</b>	<b>Description</b>
<b>Output control</b>	Sets the OUTPUT mode control (same as the Output jumper).

**Table 6-2: *VistaLINK<sup>®</sup>* Controlled Parameters**