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REVISION HISTORY

REVISION	DESCRIPTION	DATE
1.0	Original Version	May 03
1.1	Updated safety section and added assembly & labeling sections	July 05
1.2	Updated features and format	Oct 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 7707EO-3 offers three independent channels of electrical to optical conversion, economically, in a single module. Each independent channel accepts one serial video input, complying with SMPTE 259M (143-360Mb/s), SMPTE 310M (19.4Mb/s), SMPTE 344M (540Mb/s), M2S or DVB-ASI (270Mb/s), and provides one fiber output, with an optical wavelength of 1310nm.

The 7707EO-3 is designed as a companion to the 7707OE-3 optical to electrical converter. The 7707EO-3 provides convenient indication of input cable length for each channel. Monitoring and control of card status and parameters is provided locally at the card edge, and remotely via *Vista*LINK®. The 7707EO-3 can be housed in either a 1RU frame, that will hold up to three modules, or a 3RU frame, that will hold up to fifteen modules, providing 45 channels of optical conversion in a single 3RU frame.

Features:

- Triple SDI electrical to optical converter for 3 independent channels
- Provides 45 independent channels of optical conversion, in a single 3RU frame
- Supports all SMPTE 259M standards with operation from 143Mb/s-360Mb/s
- Supports additional standards of SMPTE 305M (SDTi), SMPTE 310M (19.4Mb/s), SMPTE 344M (540Mb/s), M2S and DVB-ASI (270Mb/s)
- Supports multi-mode or single-mode fiber
- Fully hot-swappable from front of frame, with no fiber or BNC disconnect/reconnect required
- Occupies one card slot and can be housed in either a 1RU frame which will hold up to 3 modules, a 3RU frame which will hold up to 15 modules, 350FR portable frame that holds up to 7 modules or a standalone frame which will hold 1 module
- Comprehensive signal and card status monitoring via four digit card edge display

Inputs

- Three independent serial digital BNC inputs, each providing cable equalization to > 300m @ 270Mb/s (Belden 8281)

Outputs

- Three independent fiber outputs
- Optical output wavelength of 1310nm
- SC/PC, ST/PC, FC/PC connector options

Status LEDs

- Signal presence indication for each channel
- Laser status indication for each channel
- Module status indication

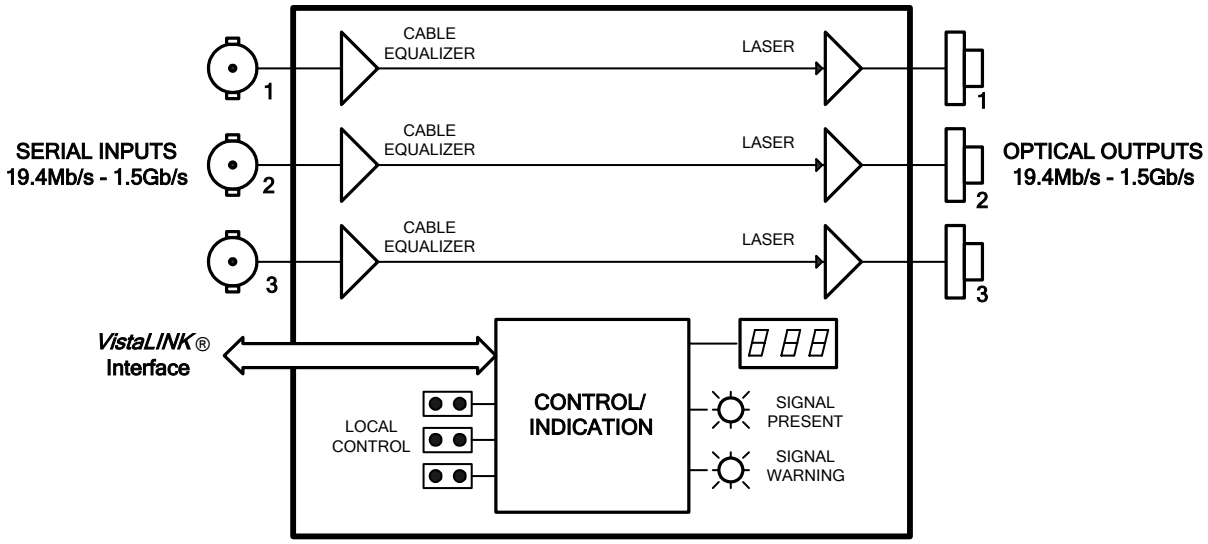

Figure 1-1: 7707EO-3 Block Diagram

2. INSTALLATION

The 7707EO-3 comes with a companion rear plate that has three BNC connectors and three SC/PC (shown), ST/PC or FC/PC optical connectors. For information on mounting the rear plate and inserting the module into the frame see section 3 of the 7700FR chapter.

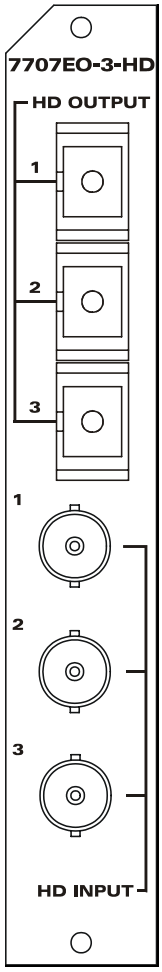

Figure 2-1: 7707EO-3 Rear Panel

SDI INPUT: Input BNC connectors for 10-bit serial digital video signals compatible with the SMPTE 259M, SMPTE 305M, SMPTE 344M, DVB-ASI or SMPTE 310M standards. These inputs provide adaptive compensation for up to 300m of industry standard Belden 8281 cable, at 270Mb/s.

SDI OUTPUT: There are three SC/PC (shown), ST/PC or FC/PC female optical connectors with the video output converted to an optical signal as specified in section 3.2.

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

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 bar code label placed on the Printed circuit board of each Evertz plug-in module
- The Model number is one of: 7707EO13-3

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 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. SERIAL VIDEO INPUTS

Standards: SMPTE 259M A, B, C, D, SMPTE 297M, SMPTE 305M, SMPTE 310M, SMPTE344M, M2S, DVB-ASI
Number of Inputs: 3 (independent channels)
Connector: 3 BNC per IEC 61169-8 Annex A
Equalization: Automatic to 300m (typ) @ 270 Mb/s with Belden 8281 or equivalent cable
Return Loss: >15dB up to 540Mb/s

3.2. OPTICAL OUTPUTS

Standard: SMPTE 297M
Number of Outputs: 3 (independent channels)
Connector: SC/PC, ST/PC or FC/PC female housing
Return Loss: > 14 dB
Rise and Fall Time: 400-700 ps
Fiber Size: 9 μm core / 125 μm overall
Wavelength: 1310nm (nominal)
Output Power: -7.5dBm ± 1dBm

3.3. ELECTRICAL

Voltage: +12VDC
Power: 7 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

3.5. COMPLIANCE

Electrical Safety: CSA Listed to UL 60065-03, IEC 60065
Complies with CE Low voltage Directive
Laser Safety: Class 1 laser product
Complies with 24 CFR 1040.10 and 1040.11
IEC 60825-1
EMI/RFI: Complies with FCC Part 15, Class A
EU EMC directive

4. STATUS INDICATORS AND DISPLAYS

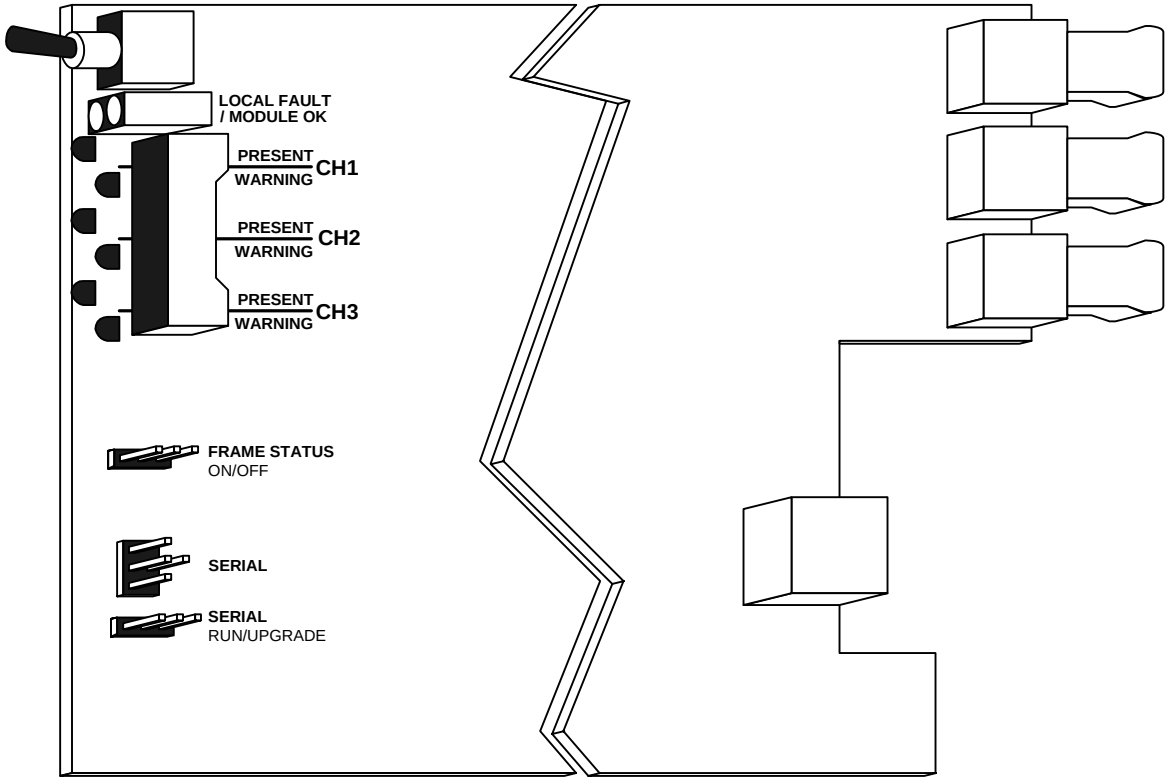

Figure 4-1: Location of Status Indicators and Jumpers

4.1. STATUS INDICATOR LEDS

Two large LEDs on the front of the board indicate the general health of the module:

LOCAL FAULT: This Red LED indicates poor module health and will be On if there is no valid input signal on all 3 inputs, if a laser fault exists on any channel, 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 on at least one of the input channels, and all the lasers and board power are good.

There are three pairs of small LEDs that indicate the status for each channel.

PRESENT: This Green LED indicates the presence of a valid input signal.

WARNING: This Red LED indicates poor operation of the optical output laser.

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 toggle switch is used to select which data is being displayed to the alphanumeric display. The up and down positions of the toggle switch are used to move through the display. A message indicating what display mode is active will be shown for one second. After one second without a switch toggle, the selected display data is shown.

The following display messages indicate what is being displayed.

EQ1	Cable length Indication for Channel 1
EQ2	Cable length Indication for Channel 2
EQ3	Cable length Indication for Channel 3
S/W	Indication of Software Revision

The details of the cable length indications are described in section 4.2.1.

4.2.1. Displaying the Input Cable Length

The 7707EO-3 detects and displays a range of values approximating the cable length being applied to the input. To display the input cable length, toggle the switch one or more times until the EQ1, EQ2 or EQ3 message is shown on the display. After one second the cable length indication will be shown in meters. Displayed values are in increments of 10m, and are accurate to ±10m for up to 300m of Belden 8281 cable at 270Mb/s. The following list describes possible displays and their meaning.

0m to 300m	Indicates applied cable length (calibrated to be accurate for Belden 8281 cable).
LOS	Indicates that no valid input signal is present.

5. JUMPERS AND LOCAL CONTROLS

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. 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* chapter in the front of the binder for more information.

To upgrade the firmware in the module unit pull it out of the frame. Move the RUN/UPGRADE jumper J16 into the *UPGRADE* position. Install the Upgrade cable provided (located in the vinyl pouch in the front of the binder) onto the SERIAL header J27 at the card edge. Re-install the module into the frame. Run the upgrade as described in *Upgrading Firmware* chapter in the front of the binder. Once the upgrade is completed, remove the module from the frame, move J16 into the *RUN* position, remove the upgrade cable and re-install the module. The module is now ready for normal operation.

6. *VISTA*LINK® REMOTE MONITORING/CONTROL

6.1. WHAT IS *VISTA*LINK®?

*Vista*LINK® is Evertz' 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 7707EO-3 and 7707OE-3-HD cards), each with a unique address (OID), communicate with the NMS through an SNMP Agent. Evertz VistaLINK® enabled 7700 series modules reside in the 3RU 7700FR-C MultiFrame and communicate with the manager via the 7700FC VistaLINK® frame controller module, which serves as the Agent.

3. A virtual database known as the Management information Base (MIB) lists all the variables being monitored, which both the Manager and Agent understand. Please contact Evertz for further information about obtaining a copy of the MIB for interfacing to a third party Manager/NMS.

For more information on connecting and configuring the *Vista*LINK® network, see the 7700FC Frame Controller chapter.

6.2. *VISTA*LINK® MONITORED PARAMETERS

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

Parameter	Description
Signal Presence	Indicates the presence of a valid input signal. (the state of the SIGNAL PRESENT LED's)
Laser Warning	Indicates deficient operation of the optical output laser. (The state of the SIGNAL WARNING LED's)
Cable Length	A range of values approximating cable length being applied to the input.

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

6.3. *VISTA*LINK® CONTROLLED PARAMETERS

The 7707EO-3 has no requirement for user control, and therefore has no requirement for *Vista*LINK® controlled parameters.