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REVISION HISTORY

REVISION	DESCRIPTION	DATE
1.0	Original Version	May 03
1.1	Updated Optical Power Monitoring information.	Jun 03
1.2	Updated features, specs, & *Vista*LINK® description. Fixed format.	Nov 08

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1. OVERVIEW

The 7707OE-3 offers three independent channels of optical to electrical conversion, economically, in a single module. Each independent channel accepts one optical input, complying with SMPTE 297M carrying SMPTE 259M (143-360Mb/s), SMPTE344M (540Mb/s), M2S or DVB-ASI (270Mb/s) signals, and provides one reclocked BNC output. The module provides selectable reclocking for SMPTE 310M.

The 7707OE-3 is designed as a companion to the 7707EO-3 electrical to optical converter. The 7707OE-3 provides convenient indication of input optical power and data rate for each channel. Monitoring and control of card status and parameters is provided locally at the card edge, and remotely via *Vista*LINK®. The 7707OE-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:

- Three independent channels of optical to electrical conversion that support all SMPTE 292M standards at 1.485Gb/s
- Supports reclocking of all SMPTE 259M standards with operation from 143Mb/s-360Mb/s
- Supports reclocking of additional standards of SMPTE 305M (SDTi), SMPTE 344M (540Mb/s), M2S and DVB-ASI (270Mb/s)
- Automatically operates in non-reclocking mode in the presence of rates not supported by reclocking
- Fully hot-swappable from front of frame, with no fiber or BNC disconnect/reconnect required
- High density -accommodates up to 45 independent channels of optical conversion in a single 3RU frame
- 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, 3RU 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 or remotely through SNMP and *Vista*LINK®
- *Vista*LINK® capability is available when modules are used with the 3RU 7700FR-C or 350FR portable frame and a 7700FC *Vista*LINK® Frame Controller module in slot 1 of the frame
- Detection and display of optical input power, and data rate
- Wide range optical input (1270nm-1610nm)
- Supports single-mode and multi-mode fiber optic cable
- SC/PC, ST/PC or FC/PC connector options
- Tally output on Frame Status bus upon loss of input signal

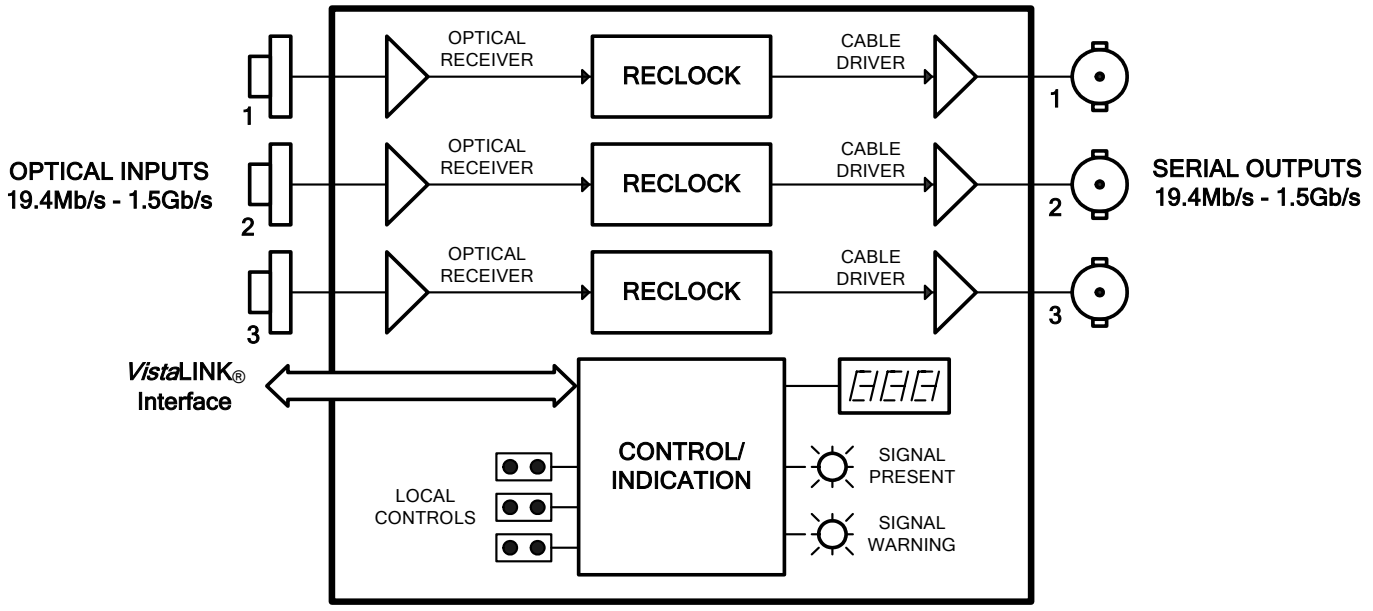

Figure 1-1: 7707OE-3 Block Diagram

2. INSTALLATION

The 7707OE-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 the 7700FR chapter section 3.

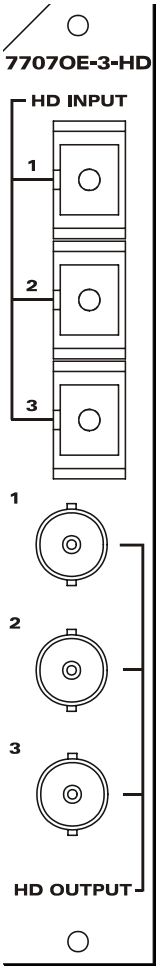

Figure 2-1: 7707OE-3 Rear Panel

SDI INPUT: There are three SC/PC (shown), ST/PC or FC/PC female optical connectors for 3 separate channels of SMPTE 297M optical 10-bit serial digital video signals compatible with the SMPTE 292M (1.485Gb/s), SMPTE 259M, SMPTE 305M SMPTE 344M, DVB-ASI or SMPTE 310M (19.4 Mb/s) standards.

SDI OUTPUT: There are three BNC connectors each with a reclocked serial component video output converted from the corresponding channel. The output signals are compatible with the SMPTE 292M (1.485Gb/s), SMPTE 259M, SMPTE 305M SMPTE 344M, DVB-ASI or SMPTE 310M (19.4 Mb/s) standards. See section 5.2 for information about operating the module with DVBASI signals.

2.1. CARE AND HANDLING OF OPTICAL FIBER

2.1.1. 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 7mW, and a wavelength of 1270 to 1610nm.

2.1.2. 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 you maintain 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. OPTICAL INPUTS

Standards: SMPTE 297M
Reclocked: SMPTE 259M A, B, C, D (143 to 540 Mb/s), SMPTE 305M, SMPTE310M, SMPTE 344M or DVB-ASI
Number of Inputs: 3 (independent channels)
Connector: SC/PC, ST/PC or FC/PC female housing
Wavelength 1270 nm to 1610 nm
Maximum Input Power: -1dBm
Optical Sensitivity: -23 dBm @ 270 Mb/s
Fiber Size: 62 μm core / 125 μm overall

3.2. SERIAL VIDEO OUTPUTS

Standards: same as input
Number of Outputs: 3 (1 per input channel) Reclocked
Connectors: 3 BNC per IEC 61169-8 Annex A
Signal Level: 800mV nominal
DC Offset: 0V ±0.5V
Rise and Fall Time:
SD @270Mb/s: 600ps nominal
HD @1.485Gb/s: 150ps nominal
Overshoot: <10% of amplitude
Return Loss: > 15 dB up to 1.5Gb/s
High Freq. Jitter: < 0.2 UI

3.3. ELECTRICAL

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

3.4. PHYSICAL

7700 or 7701 frame mounting:
Number of slots: 1

4. STATUS INDICATORS AND DISPLAYS

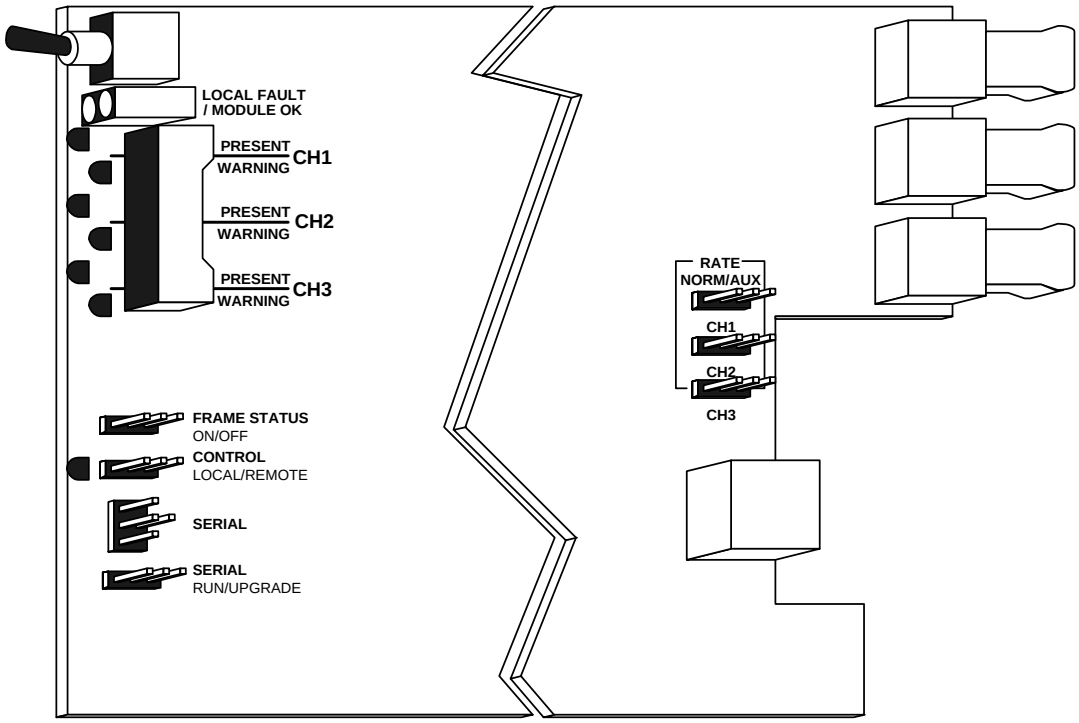

Figure 4-1: Location of Status Indicators and Jumpers

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 during the absence of a valid input signal on all 3 inputs, if any input detects a weak optical carrier, 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, board power is 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 video signal.

WARNING: This Yellow LED indicates a weak optical carrier.

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 is 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:

STD1 Data Rate Indication for Channel 1
PWR1 Input Optical Power Indication for Channel 1
STD2 Data Rate Indication for Channel 2
PWR2 Input Optical Power Indication for Channel 2
STD3 Data Rate Indication for Channel 3
PWR3 Input Optical Power Indication for Channel 3
S/W Indication of Software Revision

The details of the optical power and data rate indications are described in sections 4.2.1 and 4.2.2.

4.2.1. Displaying the Input Optical Power

The 7707OE-3-HD detects and displays a range of values indicating optical power present at the each input. To display the input optical power, toggle the switch one or more times until the PWR1, PWR2, or PWR3 message is shown on the display. After one second the optical power indication will be shown in dBm units. Displayed values are in increments of 1dB, and are accurate to ±1dB. The following list describes possible displays and their meaning:

-40 to 0 Indicates input optical power in dBm units.
<-40 Indicates input optical power levels lower than –40dBm
>0 Indicates input optical power levels greater than 0dBm

4.2.2. Displaying the Input Data Rate

The 7707OE-3-HD detects and displays a range of values indicating the signal data rate present at each input. To display the input data rate, toggle the switch one or more times until the STD1, STD2, or STD3 message is shown on the display. After one second a data rate indication will be shown. The following list describes possible displays and their meaning:

143 Indicates input data rate of 143Mb/s
177 Indicates input data rate of 177Mb/s
270 Indicates input data rate of 270Mb/s
360 Indicates input data rate of 360Mb/s
540 Indicates input data rate of 540Mb/s
1485 Indicates input data rate of 1.485Gb/s or 1.4835 Gb/s
NONE Indicates that the input signal data rate is not supported by reclocking, and that the board is automatically operating in non-reclocking mode.

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. SELECTING THE AUTOMATIC RECLOCKING RATES

The 7707OE-3-HD accommodates automatic reclocking of SMPTE 292M (1.485Gb/s), SMPTE 259M A, C, D (143, 270, and 360 Mb/s), SMPTE 305M (270 Mb/s SDTi), and SMPTE 344M (540 Mb/s). Additionally, the user can select either DVB-ASI (270Mb/s) or SMPTE 259M B (177Mb/s) to be included in the automatically reclocked signals.

RATE: This jumper is used to select which rates will be included for automatic reclocking. There are three RATE jumpers - one for each channel.

Place this jumper in the NORM position to select SMPTE 259M B (177Mb/s) for automatic reclocking.

Place this jumper in the AUX position to select DVB-ASI (270Mb/s) for automatic reclocking.

5.3. SELECTING WHETHER MODULE WILL BE CONTROLLED FROM THE LOCAL CONTROLS OR THROUGH THE *VISTA*LINK® INTERFACE

The MASTER jumper selects whether the module will be controlled from the local user controls or through the *Vista*LINK® interface.

CONTROL: 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 *Vista*LINK® interface. The adjacent yellow LED will be On when *Vista*LINK® control in enabled. This LED is intended to alert the user that local controls are not currently active.

5.4. 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 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'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 7707EO and 7707OE 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

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).
Signal Warning	Indicates a weak optical input carrier (the state of the SIGNAL WARNING LED's).
Optical Power	A range of values describing optical power at the fiber input.
Data Rate	A range of values describing the detected input data rate.
Rate CH1 Jumper	The state of the CH1 rate selection jumper.
Rate CH2 Jumper	The state of the CH2 rate selection jumper.
Rate CH3 Jumper	The state of the CH3 rate selection jumper.

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

6.3. *VISTA*LINK® CONTROLLED PARAMETERS

When the MASTER jumper is set to the REMOTE position, the following parameters can be remotely controlled through the *Vista*LINK® interface. When the CONTROL jumper is set to the LOCAL position the local jumper settings will override the settings configured through the *Vista*LINK® interface.

Parameter	Description
Rate CH1	The rate selection for the Channel 1 reclocker.
Rate CH2	The rate selection for the Channel 2 reclocker.
Rate CH3	The rate selection for the Channel 3 reclocker.

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

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