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REVISION HISTORY

REVISION	DESCRIPTION	DATE
1.0	Original Version	June 99
1.1	Added section on adjusting the EQ threshold, Bypass mode now called non-reclock mode, Figure 1 updated, Figure 3, 4 added	Sept 99
1.2	Added Safety notice	Mar 00
1.3	Added jumper locations for Rev C board (Figure 5 added) Added ST/PC and FC/PC connector options Specifications updated	July 00
1.4	Added information about new versions for CWDM applications	Nov 00
1.5	Specifications updated	Feb 01
1.6	Added 8 new CWDM wavelengths	Dec 02
1.7	Updated safety section and added assembly and labeling sections	July 05
1.8	Fixed formatting	Nov 08

WARNING

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

1. OVERVIEW

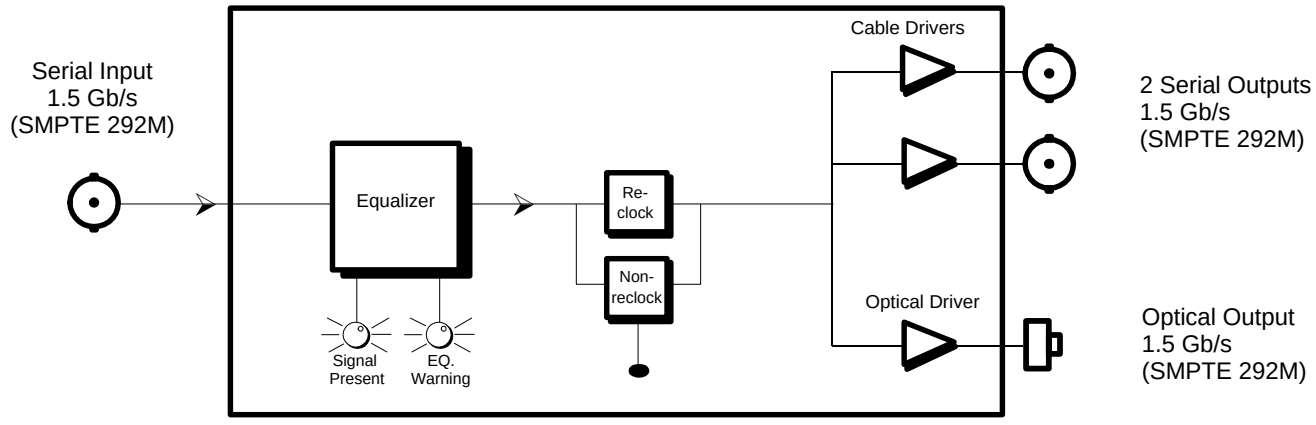
The 7705EO-HD Electrical to fiber converter provides an economical method of connecting in-plant coaxial distribution and longer distance optical distribution for SMPTE 292M (1.5 Gb/s) HDTV serial digital signals. The companion 7705OE-HD Fiber to Electrical converter facilitates conversion back to coaxial distribution at the destination. The 7705EO-HD converter features one auto-equalized coaxial input with two reclocked serial digital outputs and one reclocked fiber output. The 7705EO-HD has been designed to be used primarily as a reclocking 1.5Gb/s distribution amplifier and converter, however, it can also be used as a non-reclocking SMPTE 310M (19.4 Mb/s), DVB-ASI or SMPTE 259M (143 to 540 Mb/s) distribution product.

The 7705EO-HD is available in different versions to meet a variety of applications. (See specifications for complete information)

7705EO13-HD	1310 nm MQW	Suitable for distances up to 6 Km @ 1.5 Gb/s
7705EO13-HD-L	1310 nm DFB	Suitable for distances up to 40 Km @ 1.5 Gb/s
7705EO15-HD	1550 nm DFB	Suitable for distances up to 50 Km @ 1.5 Gb/s

Features:

- Reclocking mode for SMPTE 292M (1.5 Gb/s) signals
- Non-reclock mode for SMPTE 310M (19.4 Mb/s), SMPTE 259M (143 to 540 Mb/s) or DVB-ASI, or most other bit rates less than 1.5 Gb/s
- Fully hot-swappable from front of frame with no fiber or BNC disconnect required
- Independent isolated output drivers to ensure no cross channel loading effects and maintain polarity from input to output for DVB-ASI applications
- Automatic cable equalization to 130 m
- Operation with multi-mode or single-mode fiber
- SC/PC, ST/PC or FC/PC connector options
- Tally output on Frame Status bus upon loss of input signal



*Note: Non-reclock Mode will operate 19.4 Mb/s to 1.5 Gb/s.

Figure 1-1: 7705EO-HD Block Diagram

2. INSTALLATION

The 7705EO-HD comes with a companion rear plate that has three 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.

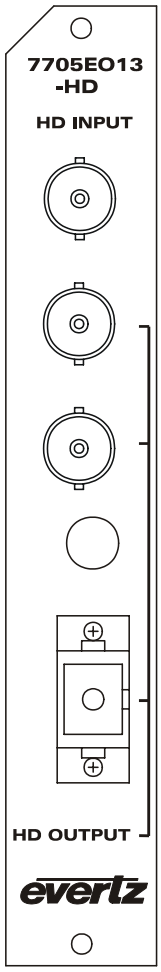


Figure 2-1: 7705EO-HD Rear Panel

HD INPUT: Input BNC connector for 10-bit serial digital video signals compatible with the SMPTE 292M standard. The 7705EO-HD can also be used in non-reclock mode with SMPTE 310M (19.4 Mb/s), SMPTE 259M (143 to 540 Mb/s) or DVB-ASI, or most other signals with bit rate less than 1.5 Gb/s. See section 5.1 for information on operating the module in non-reclock mode.

HD OUTPUT: There are two BNC connectors with reclocked serial component video outputs, compatible with the SMPTE 292M standard. In non-reclock mode these outputs contain an equalized copy of the input signal.

There is one SC/PC (shown), ST/PC or FC/PC female connector with reclocked serial component video outputs, compatible with the SMPTE 292M standard. This connector is the optical output from the 7705EO-HD as shown in section 3.3.

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: 7705EO13-HD, 7705EO13-HD-L, 7705EO15-HD

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 OUTPUT

Standards:
Normal: SMPTE 292M
Non-Reclock Mode: SMPTE 310M (19.4 Mb/s) or
SMPTE 259M A, B, C, D, or
DVB-ASI or most other bit rates less than 1.5 Gb/s
Connector: 1 BNC per IEC 169-8
Equalization: Automatic to 130m @ 1.5Gb/s with Belden 1694 or equivalent cable
Return Loss: > 15 dB up to 1 Gb/s, > 12 dB up to 1.5 Gb/s

3.2. SERIAL VIDEO OUTPUTS

Number of Outputs: 2 Per Card-Reclocked.
Standards: Same as input
Connectors: 2 BNC per IEC 169-8
Signal Level: 800mV nominal
DC Offset: 0V ±0.5V
Rise and Fall Time: 200 ps nominal
Overshoot: <10% of amplitude
Return Loss: > 15 dB up to 1 Gb/s, > 12 dB up to 1.5 Gb/s
Wide Band Jitter: < 0.15 UI (reclocked)

3.3. OPTICAL OUTPUT

Standard: SMPTE 292M
Number of Outputs: 1 reclocked
Connector: SC/PC, ST/PC or FC/PC female housing
Return Loss: < 14 dB
Rise and Fall Time: 200 ps nominal
Wide Band Jitter: < 0.2 UI (reclocked)
Fiber Size: 9 µm core / 125 µm overall

3.4. ELECTRICAL

Voltage: + 12VDC
Power: 6 Watts.
EMI/RFI: Complies with FCC regulations for class A devices.
Complies with EU EMC directive.

3.5. PHYSICAL

7700 or 7701 frame mounting:
Number of slots: 1

4. STATUS LEDS

MODULE OK: This Green LED will be On when the module is operating properly.

LOCAL FAULT: This Red LED will be On when input video is lost or when there is a fault in the module power supply.

CARRIER PRESENT: This Green LED will be On when there is a valid signal present at the module input.

CABLE LENGTH WARNING: This Yellow LED will be On when the cable equalizer detects that the cable length is greater than a preset threshold. (factory set for 125 meters of Belden 1694 or equivalent cable). See section 5.3 for information on adjusting the cable equalizer warning threshold.

5. JUMPERS AND USER ADJUSTMENTS

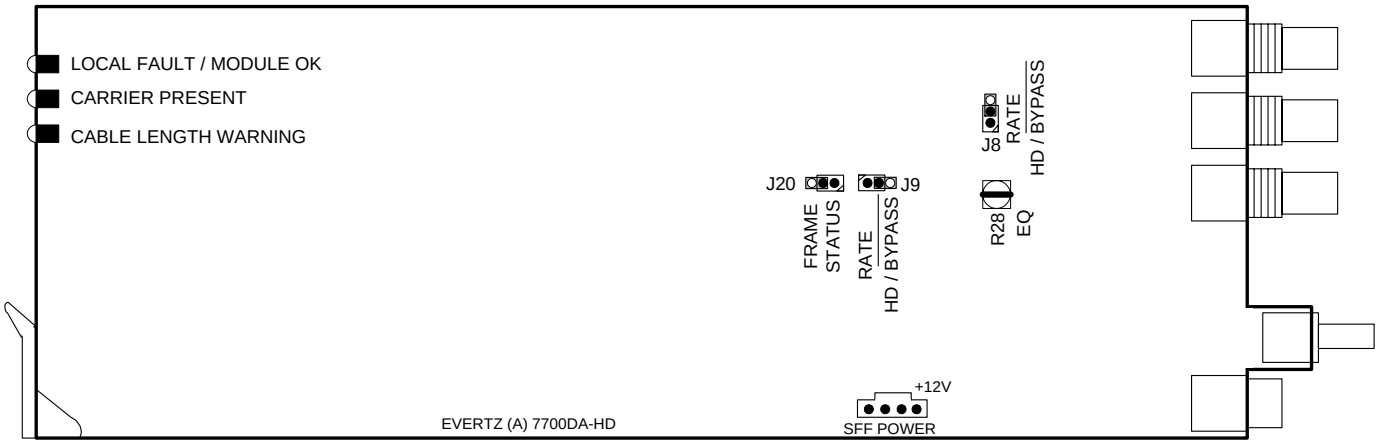


Figure 5-1: Jumper Locations for Rev A and Rev 1 DA Cards

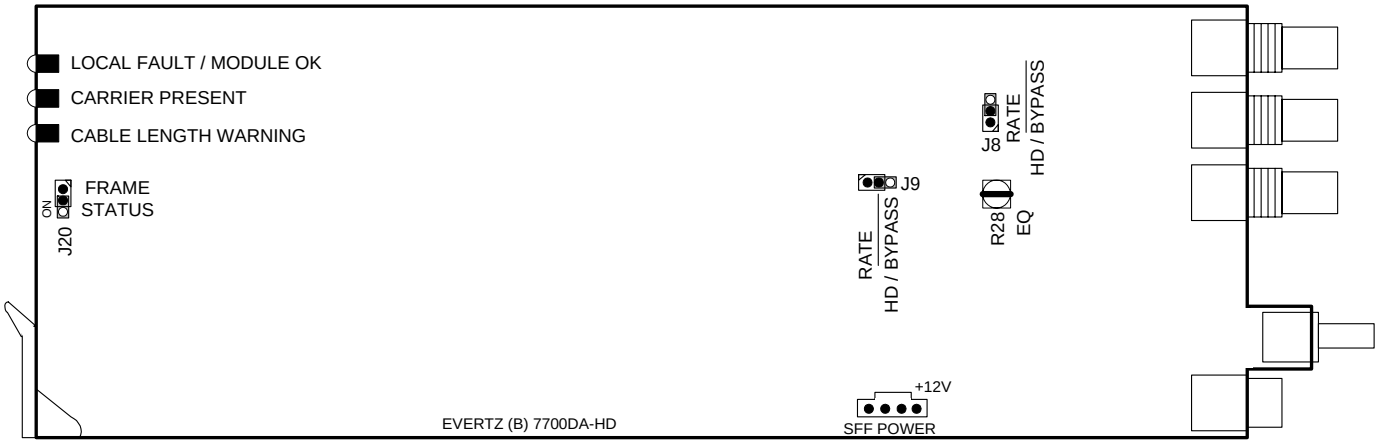


Figure 5-2: Jumper Locations for Rev B DA Cards

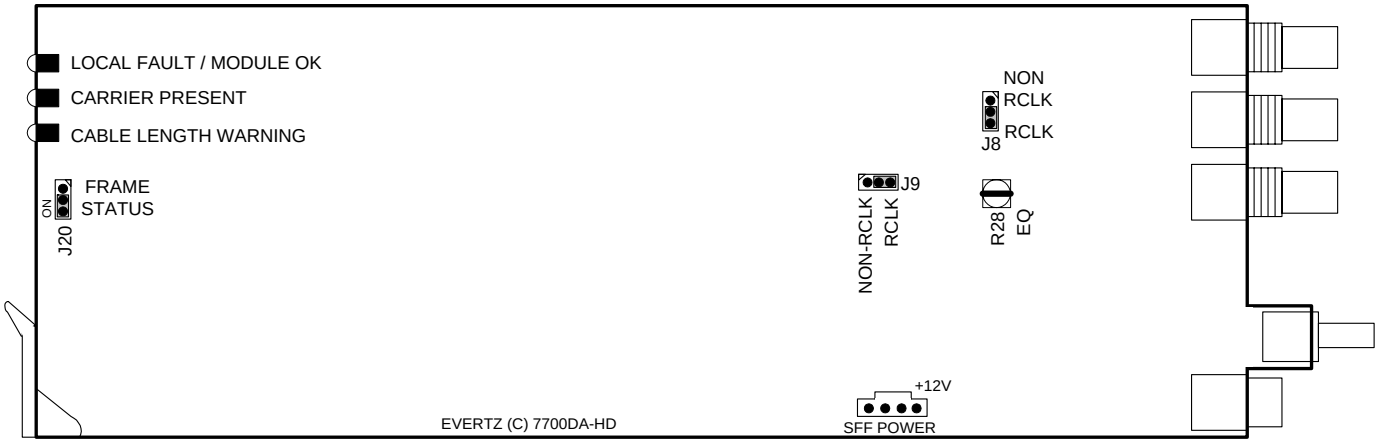


Figure 5-3: Jumper Locations for Rev C DA Cards

5.1. SELECTING RECLOCK OR NON-RECLOCK MODE

There are two jumpers J8 and J9 that determine whether the module will operate as a reclocking distribution amplifier with SMPTE 292M (1.5 Gb/s) video signals or as a non-reclocking distribution amplifier with other data rates.

For the A and B revision of the board:

HD / $\overline{\text{BYPASS}}$: To select the normal reclocking mode remove both of these jumpers. For convenience you may re-install the jumper so that only one side is connected.

To select the non-reclocking mode install both of these jumpers.

For the C revision and later of the board:

RCLK/NON-RCLK: To select the normal reclocking mode put both of these jumpers in the *RCLK* position. To select the non-reclocking mode install both of these jumpers in the *NON-RCLK* position.

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

The FRAME STATUS jumper located at the 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 PS FRAME STATUS LED's and on the Frame's Fault Tally output) install this jumper in the On position. On Rev A and B boards install the jumper. (default)

When this jumper is installed in the Off position local faults on this module will not be monitored. On rev Rev A and B boards remove the jumper and re-install it so that only one side is connected.

5.3. SETTING THE EQUALIZER WARNING THRESHOLD

The EQ trimpot R28 located near jumper J8 is used to set the threshold of the cable equalizer warning. The equalizer warning is factory set to 125 meters of Belden 1684 cable, but may be adjusted for other cable types or cable lengths. To adjust the cable equalizer warning threshold, connect a signal to the input of the DA using the required length of cable. Adjust the trimpot slowly until the Equalizer warning LED comes on. You can verify that the equalizer warning is operating correctly by removing a few meters of cable from the input. The LED should go off.