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REVISION HISTORY

REVISION	DESCRIPTION	DATE
1.0	Original Version	June 99
1.1	Added Figure 3, 4, Cable Equalizer section	Nov 99
1.2	Added Safety notice	Mar 00
1.3	Added jumper locations for Rev B 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 jumper information for LOCK Jumper Added 8 new CWDM wavelengths	Dec 02
1.7	Updated safety section and added assembly and labeling sections	July 05
1.8	Updated Features and Technical Specifications	Nov 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.

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1. OVERVIEW

The 7705EO Electrical to Fiber converter provides an economical method of connecting in-plant coaxial distribution and longer distance optical distribution for SMPTE 259M (143 - 540 Mb/s) serial digital signals. The companion 7705OE Fiber to Electrical converter facilitates conversion back to coaxial distribution at the destination. The 7705EO converter features one auto-equalized coaxial input with two reclocked serial outputs and one reclocked fiber output. The 7700EO has been designed to be used primarily as a reclocking SMPTE 259M or DVB-ASI distribution amplifier and converter, however SMPTE 310M (19.4 Mb/s) signals can also be reclocked.

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

7705EO13	1310 nm MQW	Suitable for distances up to 50 Km @ 270 Mb/s
7705EO15	1550 nm DFB	Suitable for distances up to 75 Km @ 270 Mb/s

Features:
- Electrical to optical converter for 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)
- Compatible with multi-mode or single-mode fiber
- Fully hot-swappable from front of frame with no fiber or BNC disconnect/reconnect require
- 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 holds 1 module
- Comprehensive signal and card status monitoring via four digit card edge display

Input:
- Automatic input cable equalization to > 300m @ 270Mb/s (Belden 8281)

Outputs:
- Two reclocked serial digital BNC outputs for loop-through or monitoring
- One reclocked fiber output available in 1310nm or 1550nm
- Wideband Jitter < 0.2 UI
- SC/PC, ST/PC, FC/PC connector options

Status LEDs:
- Signal presence indication
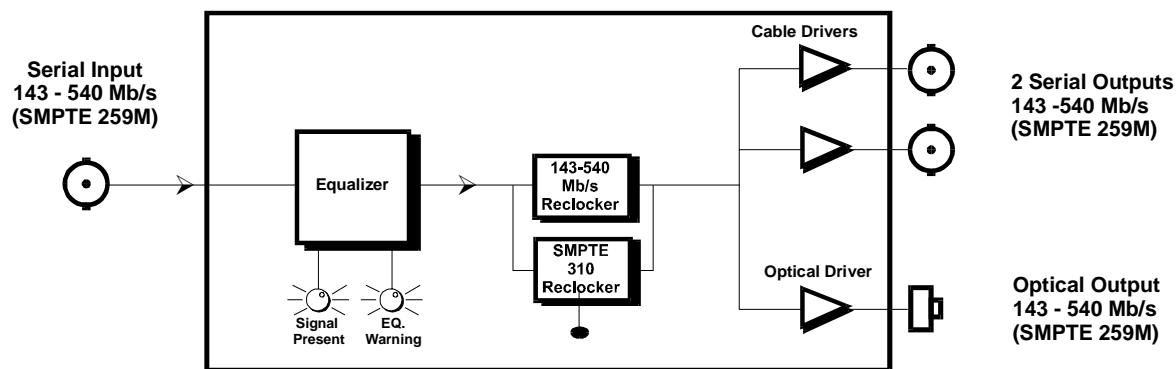- Maximum equalization warning indication
- Module status indication

Figure 1-1: 7705EO Block Diagram

2. INSTALLATION

The 7705EO 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.
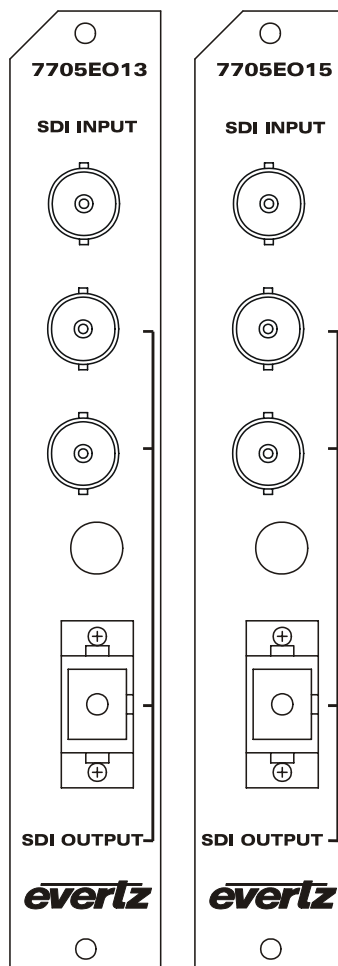
Figure 2-1: 7705EO Rear Panels

SDI INPUT: Input BNC connector for 10-bit serial digital video signals compatible with the SMPTE 259M, DVB-ASI or SMPTE 310M standard. See section 5.1 for information on selecting the correct video standard.

SDI OUTPUT: There are two BNC connectors with reclocked serial component video outputs, compatible with the SMPTE 259M, DVB-ASI or SMPTE 310M standard.

There is one SC/PC (shown), ST/PC or FC/PC female connector with reclocked serial component video outputs, compatible with the SMPTE 259M, DVB-ASI or SMPTE 310M standard. This connector is the optical output from the 7705EO as shown in section 3.3.

2.1.   CARE AND HANDLING OF OPTICAL FIBER

2.1.1. Safety

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CLASS 1 LASER PRODUCT

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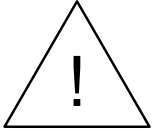
Background colour: yellow
Triangular band: black
Symbol: black

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
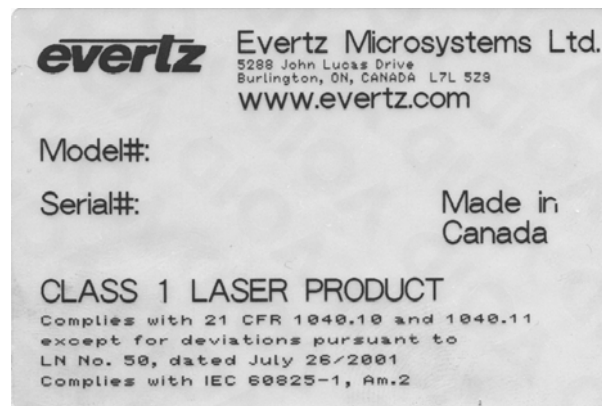- The Model number is one of: 7705EO13, 7705EO15

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

Standards: SMPTE 259M A, B, C, D, SMPTE 297M, SMPTE 305M, SMPTE 310M,
                            SMPTE 344M, M2S, DVB-ASI

3.1. SERIAL VIDEO INPUT

Connector: 1 BNC per IEC 61169-8 Annex A
Equalization: Automatic to 300m @ 270Mb/s with Belden 8281 (or equivalent)
Return Loss: > 15dB up to 540Mb/s

3.2. SERIAL VIDEO OUTPUTS

Number of Outputs: 2 per card-reclocked
Connector: 1 BNC per IEC 61169-8 Annex A
Signal Level: 800mV nominal
DC Offset: 0V ±0.5V
Rise and Fall Time: 900ps nominal
Overshoot: < 10% of amplitude
Return Loss: > 15dB up to 540Mb/s
Wideband Jitter: < 0.2 UI

3.3. OPTICAL OUTPUT

Number of Outputs: 1
Connector: SC/PC, ST/PC, FC/PC female housing
Return Loss: > 14dB
Wavelength: 1310nm, 1550nm

3.4. OPTICAL POWER

1310nm FP: -7dBm ±1dBm
1550nm DFB: 0dBm ±1dBm

3.5. ELECTRICAL

Voltage: + 12VDC
Power: 6 Watts

3.6. PHYSICAL

7700 or 7701 frame mounting:
    Number of slots: 1

3.7. 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 LEDS

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

LOCAL FAULT   This Red LED will be On when the cable length warning is active 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 250 meters of Belden 8281 or equivalent cable). See section 5.3 for information on adjusting the cable equalizer warning threshold.

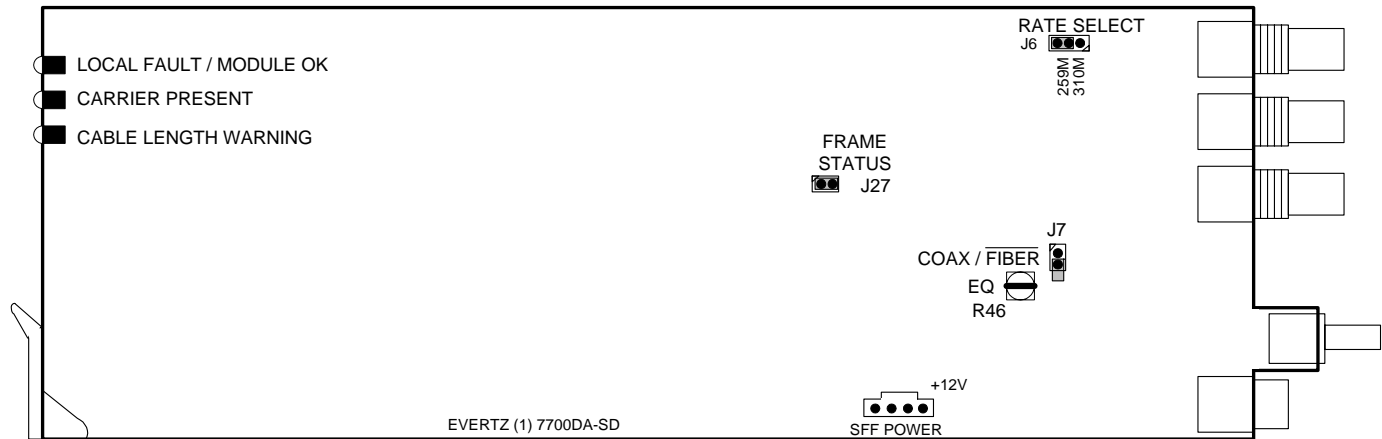# 5.   JUMPERS AND USER ADJUSTMENTS

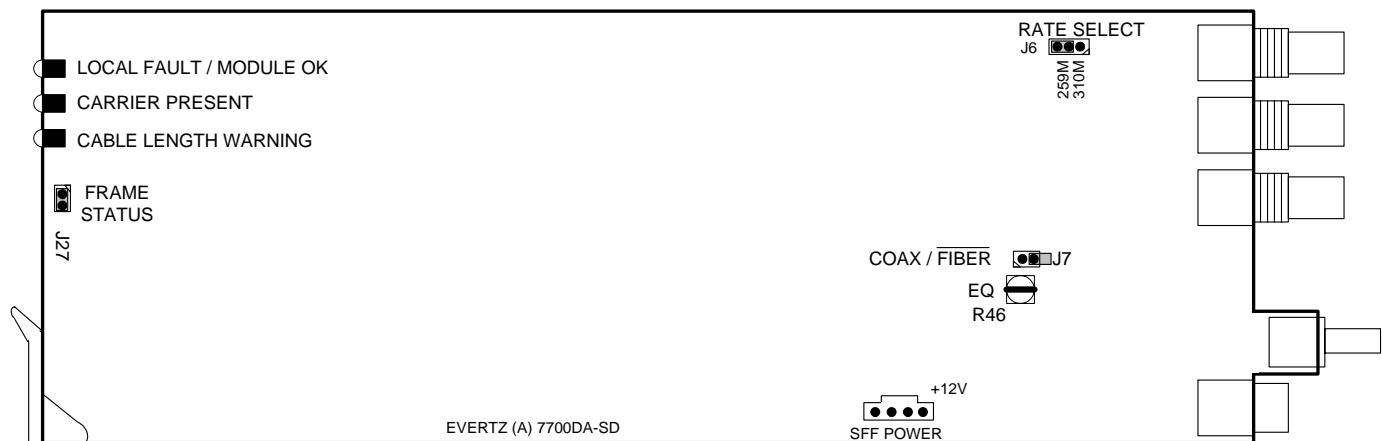**Figure 5-1: Jumper Locations for Rev 1 DA Cards**

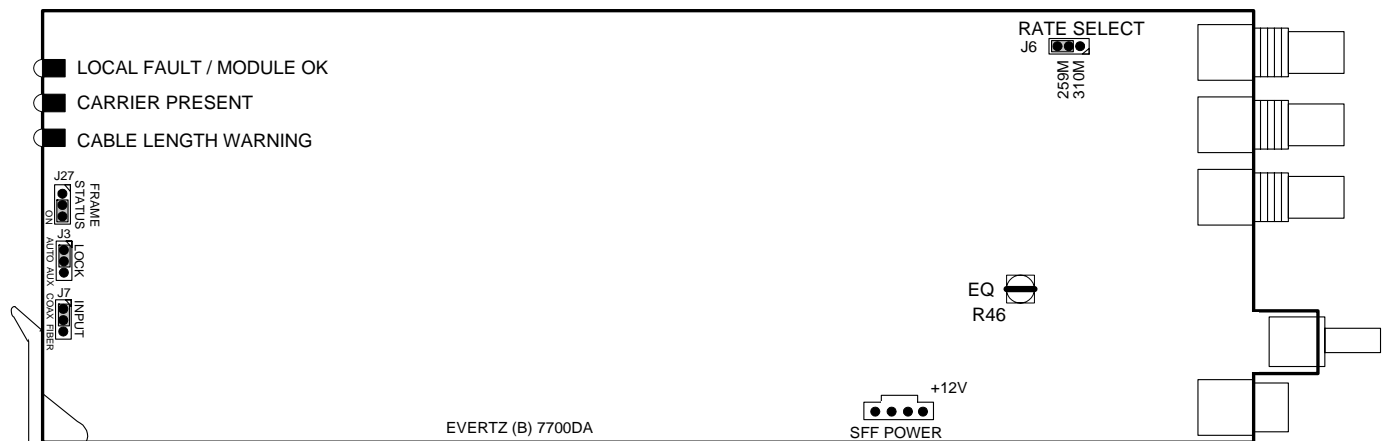**Figure 5-2: Jumper Locations for Rev A DA Cards**

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

5.1. SELECTING THE VIDEO STANDARD

The RATE SELECT jumper J6, located at the top rear of the module, determines whether the module will operate as a distribution amplifier with SMPTE 259M (143 to 540 Mb/s) or DVB-ASI video signals or with SMPTE 310M (19.4 Mb/s) signals. The LOCK jumper J3 located at the front of the module also needs to be set correctly.

RATE SELECT: To set the module to operate with SMPTE 259M or DVB-ASI signals install the jumper in the 259M position.

To set module to operate with SMPTE 310M signals install the jumper in the 310M position.

LOCK: To set the module to operate with SMPTE 259M or DVB-ASI signals install the jumper in the AUTO position.

To set module to operate with SMPTE 310M signals install the jumper in the AUX position.

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

The FRAME STATUS jumper J27, 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 1 and Rev A 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 1 and Rev A 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 R46 is used to set the threshold of the cable equalizer warning. The equalizer warning is factory set to 250 meters of Belden 8281 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.

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