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REVISION HISTORY

REVISION	DESCRIPTION	DATE
1.0	Original Version	Feb 01
1.1	Added jumper information for LOCK Jumper Added eight new CWDM wavelengths	Dec 02
1.2	Updated safety section and added assembly and labeling sections	July 05
1.3	Updated formatting	Dec 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 7705OO Fiber Optic Wavelength Converter provides an economical method of converting the wavelength for optical distribution of SMPTE 259M (143 - 540 Mb/s) serial digital signals. In addition the module can operate as a coaxial to optical or an optical to coaxial converter. The 7705OO converter features one auto-equalized coaxial input and one optical input (jumper selectable) with two reclocked coaxial outputs and one reclocked fiber output. The 7705OO has been designed for use primarily as a reclocking SMPTE 259M or DVB-ASI distribution amplifier, however SMPTE 310M (19.4 Mb/s) signals can also be reclocked.

The 7705OO is available in different versions to meet a variety of applications. All versions accept 1270 nm to 1610 nm optical input signals on multi-mode or single-mode fiber and translate the signal to another wavelength as indicated below. (See specifications for complete information)

| 7705OO13 | 1310 nm FP | Suitable for distances up to 50 Km @ 270 Mb/s |
| 7705OO15 | 1550 nm DFB | Suitable for distances up to 75 Km @ 270 Mb/s |

There are several versions with built in isolators specifically suited to coarse wave division multiplexing (CWDM) applications. These versions are suitable for distances up to 75 Km @ 270 Mb/s.

7705OO27	1270 nm DFB
7705OO29	1290 nm DFB
7705OO31	1310 nm DFB
7705OO33	1330 nm DFB
7705OO35	1350 nm DFB
7705OO37	1370 nm DFB
7705OO43	1430 nm DFB
7705OO45	1450 nm DFB
7705OO47	1470 nm DFB
7705OO49	1490 nm DFB
7705OO51	1510 nm DFB
7705OO53	1530 nm DFB
7705OO55	1550 nm DFB
7705OO57	1570 nm DFB
7705OO59	1590 nm DFB
7705OO61	1610 nm DFB

Features:
- Normal mode for SMPTE 259M (143 $\Rightarrow$ 540 Mb/s) or DVB-ASI signals - autodetects correct bitrate
- Jumper selectable mode for SMPTE 310M (19.4 Mb/s)
- Coaxial or optical input jumper selectable
- 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 on coaxial input to > 300 m at 270 Mb/s
- 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
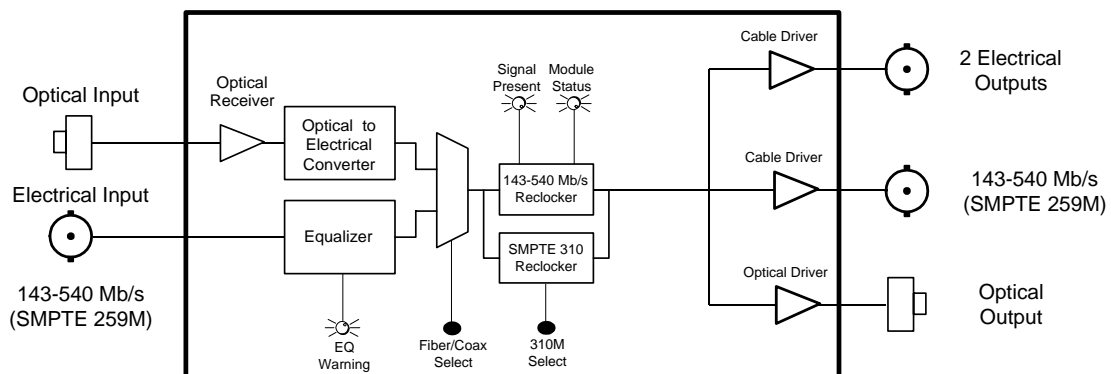
Figure 1-1: 7705OO Block Diagram

2. INSTALLATION

The 7705OO comes with a companion rear plate that has three BNC connectors and two 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.
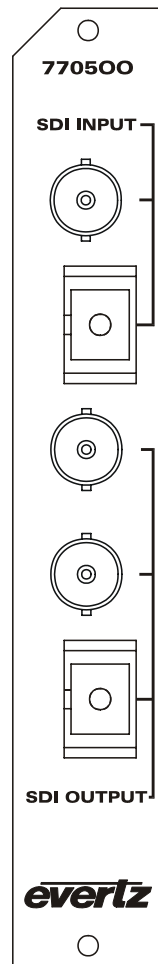
Figure 2-1: 7705OO Rear Panel

SDI INPUT: Input BNC connector for 10-bit serial digital video signals compatible with the SMPTE 259M, DVB-ASI or SMPTE 310M standard.

There is a SC/PC (shown), ST/PC or FC/PC female connector for optical 10-bit serial digital video signals compatible with the SMPTE 259M, DVB-ASI or SMPTE 310M standard.

See section 5.1 for information on choosing the correct video standard. See section 5.1 for information on selecting whether the coaxial or optical input is active.

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 7705OO as shown in section 3.2.

2.1. CARE AND HANDLING OF OPTICAL FIBER

2.1.1. Safety

| ![warning triangle] | **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: 7705OO13, 7705OO15
- 7705OOxx-4, (xx = 27, 29, 31, 33, 35, 37, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61)
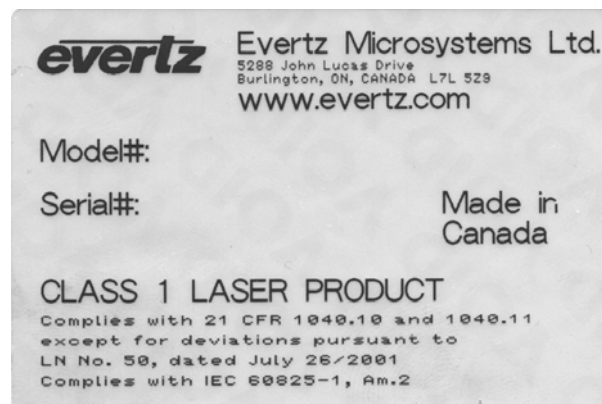
Figure 2-2: Reproduction of Laser Certification and Identification Label

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 the fiber optic cable see section 3 of the Fiber Optics System Design section of this manual binder.

3. SPECIFICATIONS

3.1. OPTICAL VIDEO INPUT

Standards:
Normal:	SMPTE 259M A, B, C, D (143 to 540 Mb/s) or DVB-ASI
Jumper Selectable:	SMPTE 310M (19.4 Mb/s)

Connector: SC/PC, ST/PC or FC/PC female housing
Maximum Input Power: 0 dBm
Wavelength 1310 nm to 1610 nm
Optical Sensitivity: -30 dBm @ 270 Mb/s
Fiber Size: 62 μm core / 125 μm overall

3.2. OPTICAL VIDEO OUTPUT

Number of Outputs: 1 reclocked
Connector: SC/PC, ST/PC or FC/PC female housing
Return Loss: < 14 dB
Rise and Fall Time: 400-700 ps
Wide Band Jitter: < 0.2 UI
Fiber Size: 9 μm core / 125 μm overall
Optical Characteristics:

Model	Wavelength	Laser Type	Line Width	Optical Power
7705OO13	1310 ±20 nm	FP	< 4.5 nm	> -7.5 dBm
7705OO15	1550 ±20 nm	DFB	< 1 nm	> 0 dBm
7705OO27	1270 ±10 nm	DFB CWDM	< 1 nm	> 0 dBm
7705OO29	1290 ±10 nm	DFB CWDM	< 1 nm	> 0 dBm
7705OO31	1310 ±10 nm	DFB CWDM	< 1 nm	> 0 dBm
7705OO33	1330 ±10 nm	DFB CWDM	< 1 nm	> 0 dBm
7705OO35	1350 ±10 nm	DFB CWDM	< 1 nm	> 0 dBm
7705OO37	1370 ±10 nm	DFB CWDM	< 1 nm	> 0 dBm
7705OO43	1430 ±10 nm	DFB CWDM	< 1 nm	> 0 dBm
7705OO45	1450 ±10 nm	DFB CWDM	< 1 nm	> 0 dBm
7705OO47	1470 ±10 nm	DFB CWDM	< 1 nm	> 0 dBm
7705OO49	1490 ±10 nm	DFB CWDM	< 1 nm	> 0 dBm
7705OO51	1510 ±10 nm	DFB CWDM	< 1 nm	> 0 dBm
7705OO53	1530 ±10 nm	DFB CWDM	< 1 nm	> 0 dBm
7705OO55	1550 ±10 nm	DFB CWDM	< 1 nm	> 0 dBm
7705OO57	1570 ±10 nm	DFB CWDM	< 1 nm	> 0 dBm
7705OO59	1590 ±10 nm	DFB CWDM	< 1 nm	> 0 dBm
7705OO61	1610 ±10 nm	DFB CWDM	< 1 nm	> 0 dBm

3.3. ELECTRICAL VIDEO INPUT

Standards:
    Normal: SMPTE 259M A, B, C, D (143 to 540 Mb/s) or DVB/ASI
    Jumper Selectable: SMPTE 310M (19.4)
Connector: 1 BNC input per IEC 169-8
Equalization: Automatic 300m @ 270 Mb/s with Belden 8281 or equivalent cable
Return Loss: > 15 dB up to 540 Mb/s

3.4. ELECTRICAL VIDEO OUTPUTS

Number of Outputs: 2 Per Card-Reclocked
Standards: Same as input
Connectors: BNC per IEC 169-8
Signal Level: 800mV nominal
DC Offset: 0V ±0.5V
Rise and Fall Time: 470ps nominal
Overshoot: <10% of amplitude
Return Loss: > 15 dB up to 540 Mb/s
Wide Band Jitter: < 0.2 UI

3.5. ELECTRICAL

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

3.6. 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 the *CARRIER PRESENT* LED is Off 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 5.4 for information on adjusting the cable equalizer warning threshold.
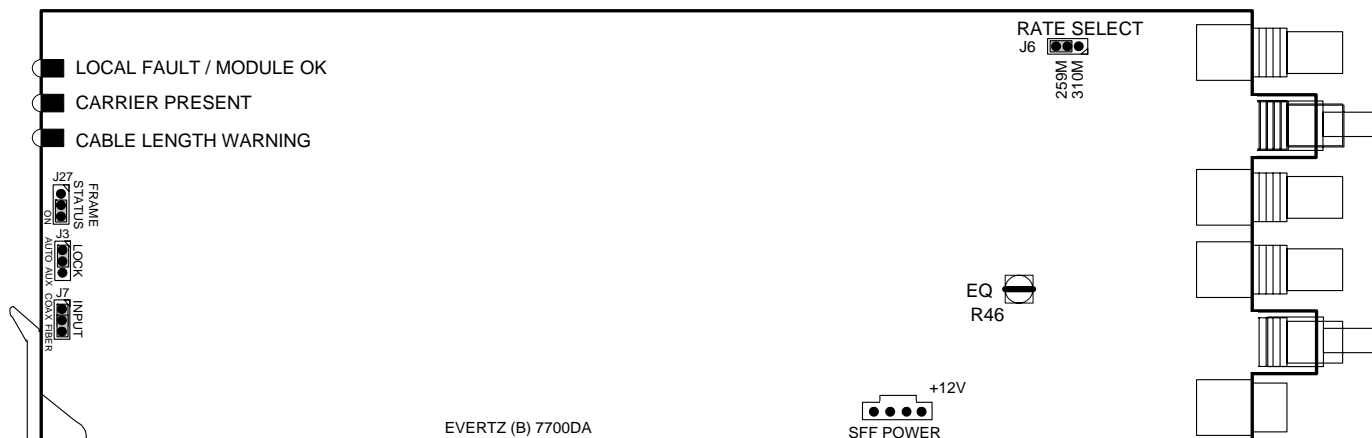
5. JUMPERS

Figure 5-1: 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 the 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 the module to operate with SMPTE 310M signals install the jumper in the AUX position.

5.2. SELECTING THE VIDEO INPUT CONNECTOR

The INPUT jumper J7, located at the front of the module, determines whether the coaxial or optical input will be active.

INPUT: To set the module to operate with the BNC input, install the jumper in the COAX position.

To set the module to operate with the optical input, install the jumper in the FIBER position.

5.3. 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. (default)

When this jumper is installed in the Off position local faults on this module will not be monitored.

5.4. 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.