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REVISION HISTORY

REVISION	DESCRIPTION	DATE
0.1	Preliminary version	Jul 03
1.0	First Official release -added info on CARD ID jumper for single fiber versions	Aug 03
1.1	Updated 7707DT-GPIO pinnout and expanded descriptions for this option; Updated Vistalink related items; Removed Local Fault jumper	Feb05
1.2	Added Master/Slave RS422 configuration	May 05
1.3	Updated safety section and added assembly and labeling sections	Aug 05

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

Do not hook up the 7707DT DWDM cards directly with a short fiber optic cable. The 7707DT DWDM cards produce +7dBm of power which will damage the receiver if connected directly.

1. OVERVIEW

The 7707DT series Fiber Data Transceivers provide an economical method of transmitting multiple bi-directional RS-232, RS-422, RS-485 data signals as well as Linear Time Code (LTC) over a single fiber optic link. Another 7707DT Data Transceiver facilitates conversion back to RS-232, RS-422, RS-485 data signals and LTC at the destination. The 7707DT-GPIO version provides additional channels of RS-232, and General Purpose Input/Outputs (GPIO). A pair of 7707DT Data Transceivers permits bi-directional data transmission over distances up to 50 Km, with minimum possible latency.

Two optical interface configurations allow the user to choose the optimal function /price /performance ratio to suit a particular application. The standard configuration transmits and receives over a single fiber. The dual fiber configuration is compatible with CWDM systems and is designed to transmit and receive over separate fibers. The optical output of the 7707DT is available in 1310nm, 1550nm, or any one of up to sixteen CWDM wavelengths.

Features:

- 7707DT version transports four RS-422 or RS-485, three RS-232, and one LTC.
- 7707DT-GPIO version transports four RS-422 or RS-485, eight RS-232, eight GPIO, one LTC.
- Selectable termination and failsafe bias settings for RS-422/485 data inputs.
- Selectable network timeouts for RS-485 accommodate twelve data rates.
- All configuration settings are controllable through the card-edge user interface, or *Vista*LINK™.
- Comprehensive signal and status monitoring via four-digit card-edge display, or *Vista*LINK™.
- Optical output wavelengths of 1310nm, 1550nm, and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant).
- DWDM wavelengths also available (ITU-T G.694.1 compliant).
- Compatible with multi-mode and single-mode fiber (dual fiber version).
- SC/PC, ST/PC, or FC/PC fiber connector options.
- Fully hot swappable from front of frame.
- *Vista*LINK™ enabled for remote monitoring and control when installed in 7700FR-C frame with 7700FC *Vista*LINK™ Frame Controller.

Fiber Type	Fiber Links	Optical/Link Budget	Transmit Side		Receive Side		Description
			Ordering Product Info	TX Power	Ordering Product Info	RX Sensitivity	
Multi-Mode	2	< 3km	7707DT13-F2	-7dBm	7707DT13-F2	-28dBm	1310nm on Tx & Rx fibers
Single-Mode	2	21dB/50km	7707DT13-F2	-7dBm	7707DT13-F2	-28dBm	1310nm on Tx & Rx fibers
Single-Mode	1	14dB/30km*	7707DT13	-10dBm	7707DT13	-24dBm	1310nm, bi-directional, one fiber
Single-Mode	1(WDM)	25dB/60km	7707DT13M-W	-1dBm	7707DT15-W	-26dBm	1310nm/1550nm, WDM, bi-directional on one fiber
Single-Mode	1(CWDM)	24dB/80km**	7707DTxx-F2	0dBm	7707DTyy-F2	-28dBm	Different CWDM wavlenghts on Tx & Rx, with 8 channel CWDM Mux/Demux**
Single-Mode	1(DWDM)	31dB/105km**	7707DTxxxx-F2	+7dBm	7707DTyyyy-F2	-28dBm	Different DWDM wavlenghts on Tx & Rx, with 8 channel DWDM Mux/Demux**

*With >20dB return loss on fiber Interface
**Assume 8 Ch Mux/Demux loss of 3.5dB
Tx Power/Rx Sensitivity are nominal values ± 1dBm
Fiber Loss = 0.4/0.3dB per km @ 1310nm/1550nm

Table 1: Typical Application Configurations

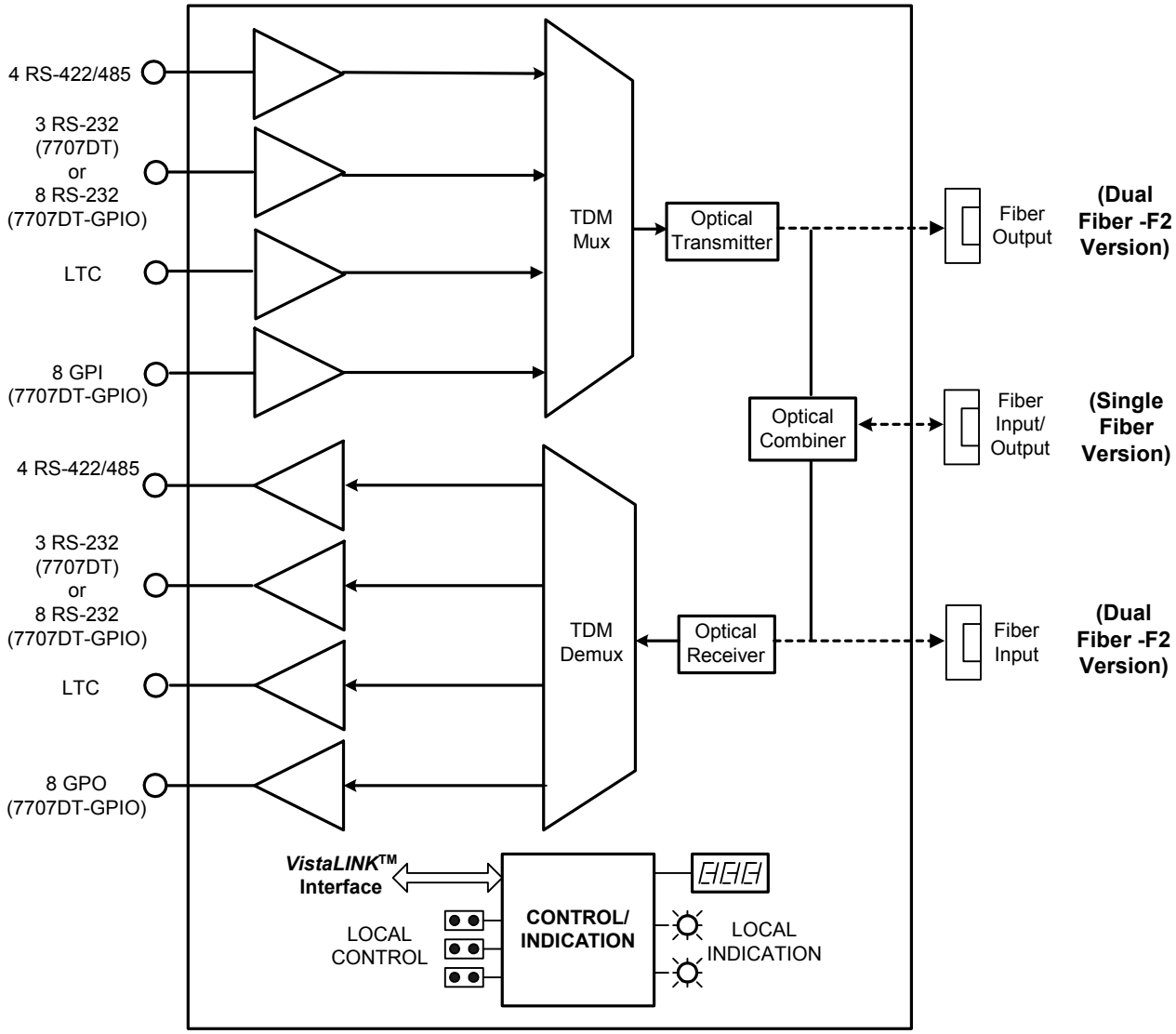

Figure 1: 7707DT Block Diagram

2. INSTALLATION

The 7707DT series modules come with a companion rear plate that has multi-pin removable terminal block connections, and an 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 the 7700FR chapter section 3. The following diagram shows four rear plate options.

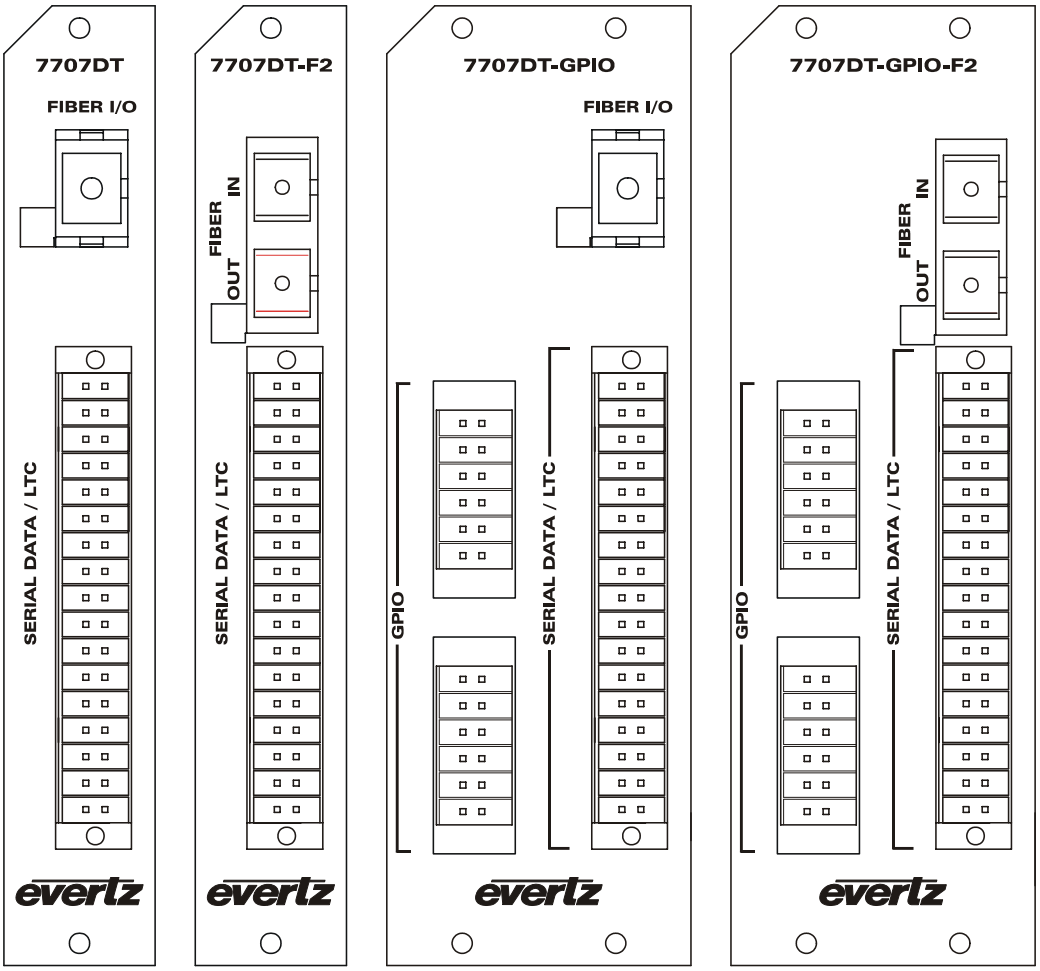

Figure 2: 7707DT Rear Panels

2.1. OPTICAL CONNECTIONS

The 7707DT modules are designed to work with single-mode or multi-mode optical fiber depending on the version ordered.

2.1.1. Single Fiber versions

FIBER I/O There is one SC/PC (shown), ST/PC or FC/PC female connector with the optical input/output from the 7707DT. This connector should be connected to the matching connector of a matching single fiber 7707DT module at the destination end with a suitable fiber optic cable.

All single fiber versions of the 7707DT are designed to work with single-mode fiber optic cable. Single fiber 7707DT and 7707DT-GPIO versions use 1310nm wavelengths. Single fiber 7707DT-W and 7707DT-GPIO-W versions use 1310nm or 1550nm wavelengths and have their associated transmit wavelength marked on the rear panel. Configuration of the CARD ID jumper is required for single-fiber 7707DT and 7707DT-GPIO versions only. Refer to section 6.1 for details about the CARD ID jumper.

2.1.2. Standard Dual Fiber version (-F2 version)

FIBER IN There is one SC/PC (shown), ST/PC or FC/PC female connector with the optical input to the module. This connector should be connected to the FIBER OUT connector of a matching dual fiber 7707DT-F2 module at the destination end with a suitable fiber optic cable. The dual fiber 7707DT-F2 versions receive on wavelengths in the 1270 to 1610nm range accommodating standard, CWDM or DWDM transmission schemes.

FIBER OUT There is one SC/PC (shown), ST/PC or FC/PC female connector with the optical output from the module. This optical output is available in 1310nm, 1550nm, and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant). This connector should be connected to the FIBER IN connector of a matching dual fiber 7707DT-F2 module at the destination end with a suitable fiber optic cable. The dual fiber 7707DT-F2 versions transmit on the wavelength marked on the rear panel and are designed to work with either single-mode fiber optic cable. The dual fiber 7707DT-F2 versions are compatible with multi-mode fiber when connected directly to a companion 7707DT-F2 module.

2.2. SIGNAL CONNECTIONS

SERIAL DATA / LTC This multi-pin terminal block has the connections for bi-directional serial data and LTC. The serial data and LTC cables can be secured into the removable portion of the terminal strips using a small screwdriver. The removable part of the terminal strip is then inserted into the rear panel. Please refer to the shown in Figure 3.

GPIO On the 7707DT-GPIO versions, these multi-pin terminal blocks have the connections for bi-directional General Purpose Inputs and Outputs (GPIO). The GPIO cables can be secured into the removable portion of the terminal strips using a small screwdriver..

Figure 3 shows the pinout diagram for the terminal blocks of both the 7707DT and the 7707DT-GPIO versions. Please note that input/output functions of RS-422/485 pins change with configuration. The following sections describe functionality of each pin designation:

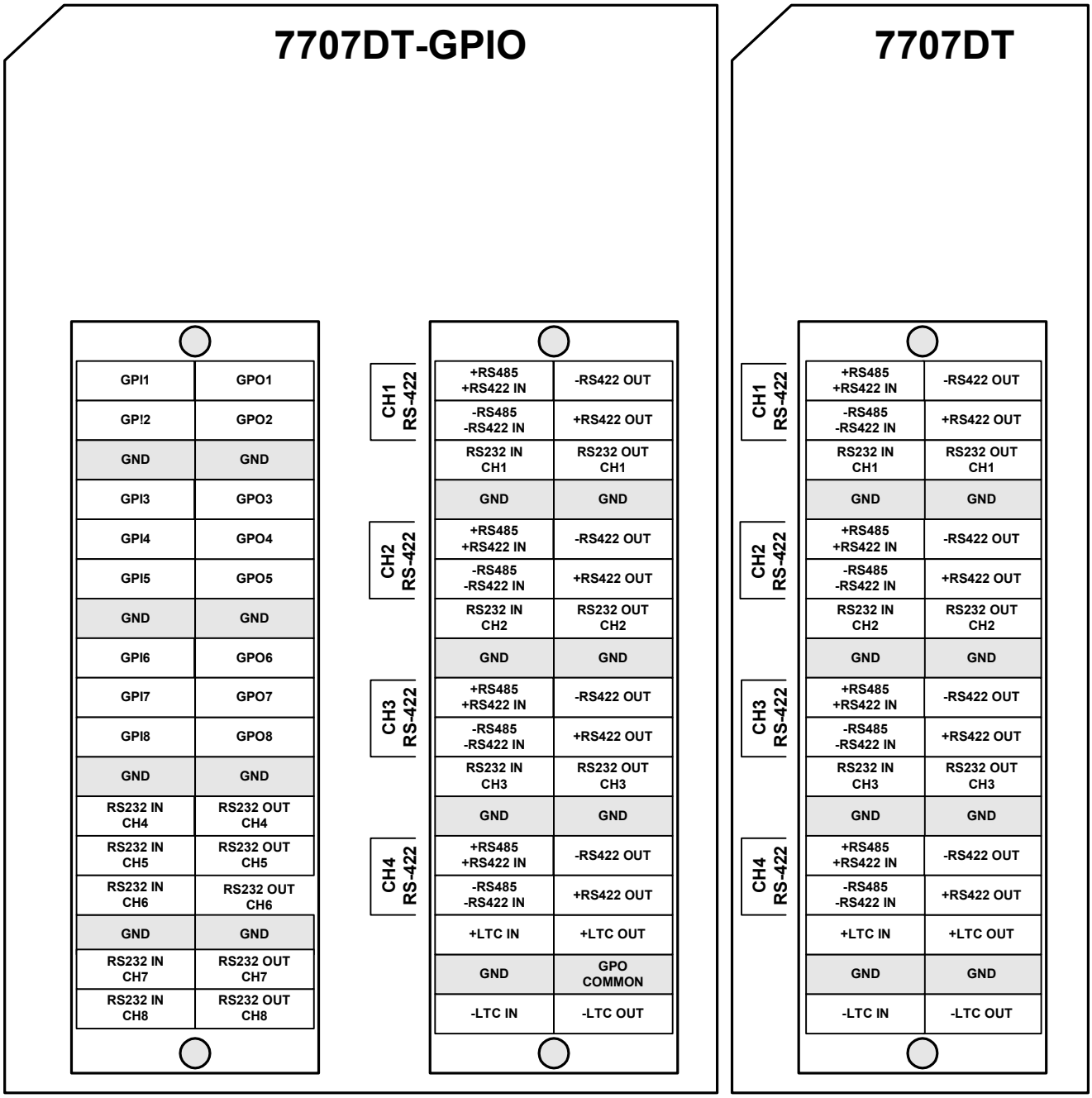

Figure 3: 7707DT Signal Connections

2.2.1. Serial Data Connections

+RS485/+RS422 IN Positive RS-422 input, or RS-485 input/output. When the associated channel is configured for use with RS-485, this pin becomes an RS-485 input/output. When the associated channel is configured for use with RS-422, this pin becomes an RS-422 input.

-RS485/-RS422 IN Negative RS-422 input, or RS-485 input/output. When the associated channel is configured for use with RS-485, this pin becomes an RS-485 input/output. When the associated channel is configured for use with RS-422, this pin becomes an RS-422 input..

+RS422 OUT Positive RS-422 output. The RS-422 interface is usable while the associated channel is configured for use RS-422.

-RS422 OUT Negative RS-422 output. The RS-422 interface is usable while the associated channel is configured for use RS-422.

2.2.2. LTC Connections

+LTC IN Positive LTC input connection.

-LTC IN Negative LTC input connection.

+LTC OUT Positive LTC output connection.

-LTC OUT Negative LTC output connection.

2.2.3. GPIO Connections (7707DT-GPIO Versions Only)

GPI1 thru GPI8 General purpose inputs to the 7707DT-GPIO. See section 3.4 for electrical characteristics, and section 5 for connection details.

GPO1 thru GPO8 General purpose outputs from the 7707DT-GPIO. See section 3.5 for electrical characteristics, and section 5 for connection details.

GPO COMMON This is the common connection for the GPO contact closures of the 7707DT-GPIO. See section 5 for connection details.

2.3. CARE AND HANDLING OF OPTICAL FIBER

2.3.1. Safety

CLASS 1 LASER PRODUCT

Background colour: yellow
Triangular band: black
Symbol: black

2.3.2. Assembly

Assembly or repair of the laser sub-module is done only at Evertz facility and performed only by qualified Evertz technical personnel.

2.3.3. Labeling

Certification and Identification labels are combined into one label. As there is no 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: 7707DT-13, 7707DT13-GPIO, 7707DT13M-W, 7707DT13M-W-GPIO, 7707DT15-W, 7707DT15-W-GPIO, 7707DT13-F2, 7707DT13-F2-GPIO
- 7707DTxx (xx = 27, 29, 31, 33, 35, 37, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61)
  7707DTDyyy (Dyyy represents ITU Grid Channel: D200, D210, D220, D230, D240, D250, D260, D270, D280, D290, D300, D310, D320, D330, D340, D350, D360, D370, D380, D390, D400, D410, D420, D430, D440, D450, D460, D470, D480, D490, D500, D510, D520, D530, D540, D550, D570, D580, D590, D600)

Figure 4: Reproduction of Laser Certification and Identification Label

2.3.4. 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. RS-422/485 SERIAL DATA

Number of Signals:	4 Inputs/Outputs
Connector:	Multi-pin Removable Terminal Block
Signal Type:	RS-485 or RS-422 (selectable)
Input Termination:	110Ω or Open (selectable)
Input Failsafe Bias:	200mV (3.3mA into 60Ω) or None (selectable)
Bit Rate (max):	
RS-422:	460Kb/s

RS-485: 1.2Kb/s, 2.4Kb/s, 4.8Kb/s, 9.6Kb/s, 19.2Kb/s, 38.4Kb/s, 57.6Kb/s, 76.8Kb/s, 115Kb/s, 153Kb/s, 230Kb/s, or 460Kb/s (selectable)

3.2. RS-232 SERIAL DATA

Number of Signals: 3 Inputs/Outputs
Connector: Multi-pin Removable Terminal Block
Signal Type: RS-232
Bit Rate (max): 115Kb/s

3.3. LTC DATA

Number of Signals: 1 Input/Output
Connector: Multi-pin Removable Terminal Block
Signal Type: SMPTE 12M Linear Time Code
Input Level: 0.2 to 4V p-p (balanced or unbalanced)
Rise/Fall Times: 40µs ± 10µs
Output Level: 1V p-p nominal (balanced)

3.4. GENERAL PURPOSE INPUTS (7707DT-GPIO ONLY)

Number of Signals: 8 Inputs
Connector: Multi-pin Removable Terminal Block
Type: Opto-isolated, Active low
Input Voltage:
- **Safe Voltage Range:** -20V to +10V
- **Off Condition (min):** +3.5V
- **On Condition (max):** +2.5V(active low)

Input Current (min): 1mA
Input Current (max): 10mA(internally limited)

3.5. GENERAL PURPOSE OUPUTS (7707DT-GPIO ONLY)

Number of Signals: 8 Outputs
Connector: Multi-pin Removable Terminal Block
Output Type: Dry contact relay closure, normally open
Output Current (min): 100mA

3.6. OPTICAL INPUT/OUTPUT

Connector:
Single Fiber version: 1 Bi-directional optical connector: SC/PC, ST/PC or FC/PC female housing
Dual Fiber (F2) version: 2 optical connector: SC/PC, ST/PC or FC/PC female housing
Maximum Input Power:
Single fiber versions: 0 dBm
Dual fiber (F2) versions: 0 dBm
Input Optical Sensitivity:
Single fiber versions: -24 dBm
Single fiber (W) versions: -26 dBm
Dual fiber (F2) versions: -28 dBm
Fiber Size and Type:
Single Fiber versions: 9 μm core / single mode
Dual Fiber (F2) versions: 9 μm core / single-mode on TX, 62.5 μm core / multi-mode on RX
Output Wavelengths:
Standard: 1310nm, 1550nm (nominal)
CWDM: 1270nm to 1610nm (ITU-T G.694.2 compliant).
DWDM: 1530nm to 1560nm (ITU-T G.694.1 compliant).
Output Power:
Single fiber version:
1310nm FP (Standard): -10 dBm ±1dBm
1310 & 1550 (W Versions): -1 dBm ±1dBm
Dual fiber version:
1310nm FP (Standard): -7 dBm ±1dBm
CWDM DFB: 0 dBm ±1dBm
DWDM DFB: +7 dBm ±1dBm

3.7. ELECTRICAL

Voltage: 12V DC
Power (max): 6 Watts (Non DWDM Laser)
8 Watts (DWDM Laser)
EMI/RFI: Complies with FCC regulations for class A devices.
Complies with EU EMC directive.

3.8. PHYSICAL

7700 frame mounting:
Number of Slots:
7707DT: 1
7707DT-GPIO: 2

7701 frame mounting:
Number of Slots:
7707DT: 1
7707DT-GPIO: 1

4. CARD-EDGE MONITORING AND CONTROL

The 7707DT has eight LED status indicators and a 4-digit dot-matrix display on the front card-edge to show operational status of the card at a glance. The card-edge pushbutton and toggle switch are used to select various indications to the dot-matrix display and LED's. Figure 5 shows the locations of the indicators and pushbutton.

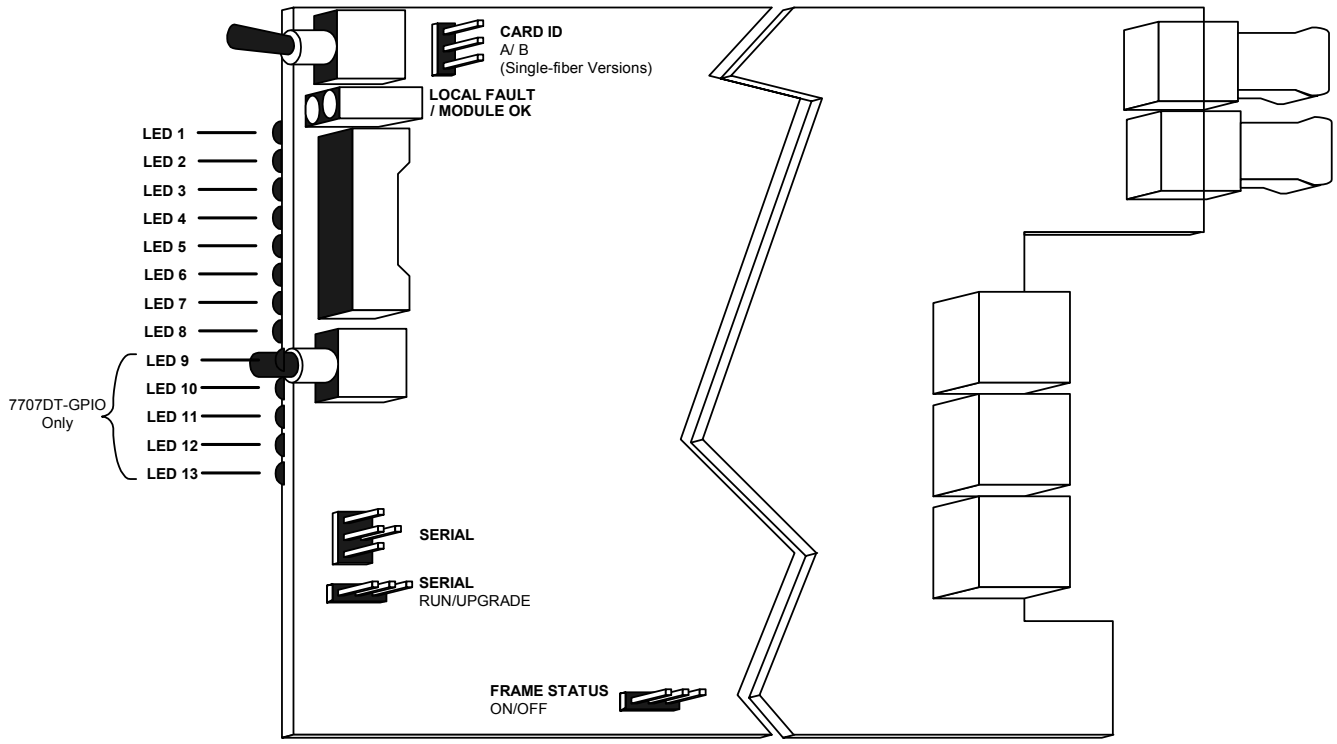

Figure 5: Location of Status Indicators and Jumpers

4.1. STATUS INDICATOR LEDS

LOCAL FAULT: This red LED indicates poor module health. Three conditions could cause this fault indication to be active: A link with a companion 7707DT has not been achieved, operation of the output laser is erroneous, or if a card power fault exists (i.e. a blown fuse). The LOCAL FAULT indication can also be reported to the frame by setting the FRAME STATUS jumper.

MODULE OK: This green LED indicates good module health. It will be on while a link is maintained with a companion 7707DT, the output laser is operating properly, and the card power is good.

LED 1 to **LED 8/13:** These green LED's indicate the signal status of the RS-422/485, RS-232, and LTC channels. Selectable modes accommodate signal presence indication of input data, output data, or both. Selectable modes of signal status indication are described in section 4.2.2 of this manual. LED designations are as follows:

7707DT Version		7707DT-GPIO Version	
LED 1	RS-422/485 Channel 1	**LED 1**	RS-422/485 Channel 1
LED 2	RS-422/485 Channel 2	**LED 2**	RS-422/485 Channel 2
LED 3	RS-422/485 Channel 3	**LED 3**	RS-422/485 Channel 3
LED 4	RS-422/485 Channel 4	**LED 4**	RS-422/485 Channel 4
LED 5	RS-232 Channel 1	**LED 5**	RS-232 Channel 1
LED 6	RS-232 Channel 2	**LED 6**	RS-232 Channel 2
LED 7	RS-232 Channel 3	**LED 7**	RS-232 Channel 3
LED 8	LTC	**LED 8**	RS-232 Channel 4
		LED 9	RS-232 Channel 5
		LED 10	RS-232 Channel 6
		LED 11	RS-232 Channel 7
		LED 12	RS-232 Channel 8
		LED 13	LTC

The 7707DT-GPIO provides additional status indicator modes, where LED1 through LED8 describe the states of the respective GPI or GPO channel.

CONTROL: This yellow LED is no longer considered by recent code versions, and if installed, should be disregarded by the user.

4.2. CARD-EDGE DISPLAY AND CONTROLS

Additional signal and status monitoring is provided via the 4-digit dot-matrix display located at the card-edge. The card-edge pushbutton and toggle-switch are used to navigate through the display menu. Figure 5 provides a quick reference to the display menu structure.

Pressing the pushbutton advances the display to the next menu level. The toggle-switch may then be used to move up or down through selections of that menu level. Select `BACK` to return to previous menu level.

If a specific menu selection has a configuration value associated with it, then this may be changed using the toggle switch. Pressing the pushbutton will apply the displayed value and return you to the previous menu level.

The most recent user selection will be maintained in non-volatile memory in the event of power loss to the module.

	Menu Level 1	Menu Level 2	Menu Level 3	Menu Level 4	
	Pushbutton⇨	Pushbutton⇨	Pushbutton⇨	Pushbutton⇨	
⇧ Toggle Switch ⇩	**Menu Selections:**	**Configuration Values:**	Return to Level 1		
	LASR…ERR (Laser Error) Overrides	**-40** to **+5** (dBm)			
	LINK…LOS (Link Loss) Overrides				

	PWR (Optical Power)				
	STAT (Status)	**DIO** (Data In/Out Status) **DI** (Data In Staus) **DO** (Data Out Staus) **GPI** (GPI Status) **GPO** (GPO Staus)			
	CTRL (Control)	**CH01** thru **CH04**	**Menu Selections:**	**Configuration Values:**	Return to Level 3
			TYPE (Data Type)	**RS422**	
				RS485	
			RATE (Data Rate) (Only when TYPE=RS485)	**1K2**	
				2K4	
				4K8	
				9K6	
				19K2	
				38K4	
				57K6	
				76K8	
				115K	
				153K	
				230K	
				460K	
			TERM (Termination)	**OFF**	
				ON	
			BIAS (Failsafe-bias)	**OFF**	
				ON	
			BACK	Return to Level 1	

Figure 6: Card-edge Menu Quick Reference

4.2.1. Displaying the Optical Power

The 7707DT can measure and display optical power over a range of –40 to 0dBm in 1dBm increments. Please heed the maximum optical input power specification for the specific product option you possess. Optical power monitoring is accommodated through the card-edge interface or *Vista*LINK™. To display the optical power to the card-edge select the `PWR` indication in menu level 1. The following list describes all possible indications for this menu selection:

-40 to **+5**	Optical input power in dBm units (see caution below)
LOW	Optical input powers below –40dBm
OVR	Optical input powers exceeding maximum (see caution below)
LINK…**LOS**	Link fault condition exists. Overrides other indications
LASR…**ERR**	Laser fault condition exists. Overrides other indications

***CAUTION**: Never exceed the maximum specified optical input power for the specific product option that you posses. See section 3.6 for optical input specifications. Exceeding the maximum optical input power can permanently damage the optical receiver.*

4.2.2. Selecting the Signal Status Indication Mode

The eight green LED's (thirteen on 7707DT-GPIO) indicate the signal status of the RS-422/485, RS-232, and LTC channels. Selectable modes accommodate signal presence indication of input data, output data, or both. LED designations are as follows:

7707DT Version		7707DT-GPIO Version	
LED 1	RS-422/485 Channel 1	**LED 1**	RS-422/485 Channel 1
LED 2	RS-422/485 Channel 2	**LED 2**	RS-422/485 Channel 2
LED 3	RS-422/485 Channel 3	**LED 3**	RS-422/485 Channel 3
LED 4	RS-422/485 Channel 4	**LED 4**	RS-422/485 Channel 4
LED 5	RS-232 Channel 1	**LED 5**	RS-232 Channel 1
LED 6	RS-232 Channel 2	**LED 6**	RS-232 Channel 2
LED 7	RS-232 Channel 3	**LED 7**	RS-232 Channel 3
LED 8	LTC	**LED 8**	RS-232 Channel 4
		LED 9	RS-232 Channel 5
		LED 10	RS-232 Channel 6
		LED 11	RS-232 Channel 7
		LED 12	RS-232 Channel 8
		LED 13	LTC

The 7707DT-GPIO provides additional status indicator modes, where each LED describes the state of the respective GPI or GPO channel.

To change the card-edge LED indicator mode, select the STAT menu item in menu level 1. Toggle to the desired satus indication selection shown in the list below. Press the pushbutton to apply the displayed selection and return to menu level 1.

DIO	Combines presence indications of serial data inputs and outputs
DI	Input data presence indication indicating signal transitions
DO	Output data presence indication indicating signal transitions
GPI	Indication of GPO states. Active LED indicates an active low GPI
GPO	Indication of GPI states. Active LED indicates an active low GPO

The factory default stauts display is DIO.

4.2.3. Selecting the Serial Data Type

The 7707DT provides four channels of serial data that are selectable as RS-422 or RS-485. Selection of the data type is done using the card-edge interface or through *Vista*LINK™ control.

To select the serial data type, select the CTRL menu item in menu level 1. The 7707DT allows data type to be set independently for each channel. Use the toggle switch to choose the channel to which the selection will be applied. Press the pushbutton to apply the displayed selection.

CH01 to **CH04**	Range of RS-422/485 channels

Use the toggle switch to select the TYPE menu item and press the pushbutton. The toggle switch may then be used select the desired data type. Press the pushbutton to apply the displayed selection and return to menu level 3. You can select other items on menu level 3, or select the BACK menu item to return to menu level 2.

422	Data type is RS-422
485	Data type is RS-485

The factory default configuration selects data type as RS-422.

4.2.4. Selecting the Serial Data Rate

While the data type is selected as RS-485, the 7707DT provides a data rate selection for the respective channel(s). This selection should match the RS-485 data rate used for the specific application, and applies the correct network timeout for the signal driver. Selection of the data rate is done using the card-edge interface or through *Vista*LINK™ control.

To select the RS-485 data rate, select the CTRL menu item in menu level 1. The 7707DT allows independent terminations to be set for each channel. Use the toggle switch to choose the channel to which the selection will be applied. Press the pushbutton to apply the displayed selection.

CH01 to **CH04** Range of RS-422/485 channels

Use the toggle switch to select the RATE menu item and press the pushbutton. The toggle switch may then be used select the desired data rate. Press the pushbutton to apply the displayed selection and return to menu level 3. You can select other items on menu level 3, or select the BACK menu item to return to menu level 2.

1K2 Data rate is selected as 1.2Kb/s
2K4 Data rate is selected as 2.4Kb/s
4K8 Data rate is selected as 4.8Kb/s
9K6 Data rate is selected as 9.6Kb/s
19K2 Data rate is selected as 19.2Kb/s
38K4 Data rate is selected as 38.4Kb/s
57K6 Data rate is selected as 57.6Kb/s
76K8 Data rate is selected as 76.8Kb/s
115K Data rate is selected as 115Kb/s
153K Data rate is selected as 153Kb/s
230K Data rate is selected as 230Kb/s
460K Data rate is selected as 460Kb/s

The factory default configuration selects the RS-485 data rate as 9.6Kb/s.

4.2.5. Selecting the Serial Data Termination

To simplify installation, the 7707DT provides a selectable input termination of 110Ω for the RS422/485 input signals. This termination should be active as required by the specific application, and common practice. Selection of the termination is done using the card-edge interface or through *Vista*LINK™ control.

To turn the termination on or off, select the CTRL menu item in menu level 1. The 7707DT allows terminations to set independently for each channel. Use the toggle switch to choose the channel to which the selection will be applied. Press the pushbutton to apply the displayed selection.

CH01 to **CH04** Range of RS-422/485 channels

Use the toggle switch to select the TERM menu item and press the pushbutton. The toggle switch may then be used to turn the termination on or off. Use the toggle switch to select the desired state then press the pushbutton to apply the displayed selection and return to menu level 3. You can select other items on menu level 3, or select the BACK menu item to return to menu level 2.

ON The 110Ω is selected as active
OFF The 110Ω is selected as inactive, and the input is high impedance

The factory default configuration turns the termination OFF.

4.2.6. Selecting the Serial Data Failsafe Bias

To simplify installation, the 7707DT provides a selectable failsafe bias for balanced serial data signals. This bias should be active as required by the specific application, and common practice. The failsafe bias will apply a differential +200mV bias to a properly designed RS-485 system while in the idle state. As a protection feature, the failsafe bias will not become active unless the termination is also active for the respective channel. The failsafe bias circuit of the 7707DT will function properly over the specified input common mode range. Selection of the failsafe bias is done using the card-edge interface or through *Vista*LINK™ control.

To turn the failsafe bias on or off, select the CTRL menu item in menu level 1. The 7707DT allows a failsafe bias threshold to be set independently for each channel. Use the toggle switch to choose the channel to which the selection will be applied. Press the pushbutton to apply the displayed selection.

CH01 to **CH04** Range of RS-422/485 channels

Use the toggle switch to select the BIAS menu item and press the pushbutton. The toggle switch may then be used to turn the failsafe bias on or off. Use the toggle switch to select the desired state then press the pushbutton to apply the displayed selection and return to menu level 3. You can select other items on menu level 3, or select the BACK menu item to return to menu level 2.

ON The failsafe bias is selected as active
OFF The failsafe bias is selected as inactive

The factory default configuration turns the failsafe bias OFF

4.3. CONNECTING RS422 DEVICES BETWEEN MASTER AND SLAVE

SMPTE Standard 207M defines the electrical and mechanical characteristics of the device interface used in transferring data and control signals between production and post-production equipment. Each interface system consists of a single bus-controller (Master) and one or more tributaries (Slaves). The bus-controller (Master) controls the communication flow to all tributaries (Slaves) connected to it, while a tributary (Slave) transmits data to an operational device.

A pair of 7707DTs can be configured to interface between a bus-controller (Master) and a tributary (Slave) if configured as follows:

Contoller (Master)

Signal	*DB9 Pin#*	*7707DT*
Rx-	2	RS422 Out -
Tx+	3	RS422 In +
Rx+	7	RS422 Out +
Tx-	8	RS422 In -

Tributary (Slave)

7707DT	*DB9 Pin#*	*Signal*
RS422 In -	2	Tx-
RS422 Out +	3	Rx+
RS422 In +	7	Tx+
RS422 Out -	8	Rx-

Table 2: Connecting RS422 Signals Between Master & Slave

5. GENERAL PURPOSE INPUTS AND OUTPUTS

The 7707DT-GPIO provides the user with 8 General Purpose Inputs (GPI's) and 8 General Purpose Outputs (GPO's). Figure 7 shows the input and output circuitry. Refer to sections 3.5 and 3.4 for electrical specifications. The GPI input stage uses opto-isolators for isolation. The GPO output stage uses dry contact relay closures. In a typical application providing a contact closure or transistor connection to ground would activate the GPI inputs.

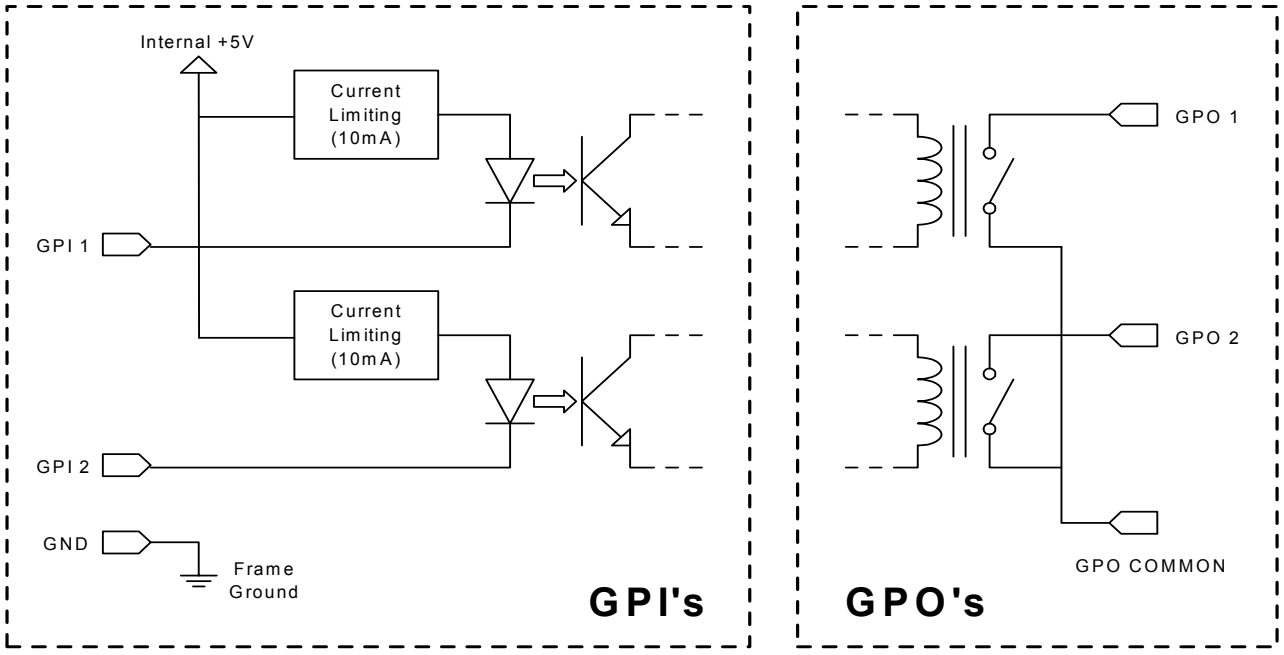

Figure 7: General Purpose Inputs and Outputs

6. JUMPER CONTROLS

Several jumpers, located at the front of the module are used to preset various operating modes. Figure 5 shows the locations of the jumpers.

6.1. SELECTING THE CARD ID

Configuration of the **CARD ID** jumper is required for single-fiber 7707DT and 7707DT-GPIO versions only**.** To maintain a robust optical link link between two companion 7707DT cards, the **CARD ID** jumper must be set differently on each.

CARD ID To maintain a link between two 7707DT cards, set this jumper to position A on one, and to position B on the other. Position B may be selected on either of the cards, as long as position A is selected for the companion card.

6.2. 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.

6.3. CONTROL JUMPER (No Longer Used)

The control jumper is no longer considered by recent code versions, and if installed, should be disregarded by the user.

6.4. CONFIGURING THE MODULE FOR FIRMWARE UPGRADES

RUN/UPGRADE The RUN/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.

7. *VISTA*LINK™ REMOTE MONITORING/CONTROL

7.1. WHAT IS *VISTA*LINK™?

*Vista*LINK™ is Evertz's remote monitoring and control capability 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. For monitoring, there needs to be a detecting device that automatically reports all errors to a central alarm and error logging station. We also need to be able to interrogate individual detector devices from the central station to determine the status of individual channels. Finally, we need to be able to configure devices in the network from the 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 7707DT 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 and 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.

7.2. *VISTA*LINK™ MONITORED PARAMETERS

The following parameters can be remotely monitored via the *Vista*LINK™ interface.

Parameter	Description
Optical Power	Optical Input Power . See section 4.2.1
Optical Link Not Present	Link Loss Condition. See section 4.2.1
Laser Fault	Laser Error Condition. See section 4.2.1
Data Input (DI) Status	Data Input Status. See section 4.2.2
Data Output (DO) Status	Data Output Status. See section 4.2.2
GPI Status (7707DT-GPIO versions)	GPI Status. See section 4.2.2
GPO Status (7707DT-GPIO versions)	GPO Status. See section 4.2.2
Card ID Jumper	Card ID Jumper State. See section 6.1

Table 2: *Vista*LINK™ Monitored Parameters

7.3. *VISTA*LINK™ CONTROLLED PARAMETERS

The following parameters can be remotely controlled via the *Vista*LINK™ interface.

Parameter	Description
Data Type	Data Type Control. See section 4.2.3
Data Rate	Data Rate Control. See section 4.2.4
Cable Termination	Input Termination Control. See section 4.2.5
Failsafe Bias	Input Failsafe Bias Control. See section 4.2.6
Optical Power Alarm Threshold	Threshold for optical input power warning trap

Table 3: *Vista*LINK™ Controlled Parameters

*7.4 VISTA*LINK™ TRAPS

The following traps are reported via the *Vista*LINK™ interface

Trap	Description
Optical Link Not Present	Link Loss Condition. See section 4.2.1
Laser Fault	Laser Error Condition. See section 4.2.1
Optical Power Below Threshold	Optical power is below Visalink configured threshold

Table 3: *Vista*LINK™ Traps

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