3405 Frame Manual

3405FR Fiber Optic SFP Frame

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REVISION HISTORY

REVISION	DESCRIPTION	DATE
1.0	First Release	Mar 09
1.1	Added Status LED and VistaLINK Monitoring description	Mar 09
1.2	Added power supply cabling information	Jun 09
1.3	Added SFP variants and VLPRO screenshots & parameter chart	Nov 09

1. OVERVIEW

The Evertz 3405FR SFP frame is the ideal solution for today's low cost, high density fiber optic distribution needs. The 3405FR provides the flexibility to handle the high-speed requirements of 3G and HDTV as well as SD-SDI, SDTi, DVB-ASI, and Analog.

All components are hot swappable through the front of the frame including SFP's, frame controllers, multiplexers, and power converters. This ensures the unit can be fully serviceable in the field without having to be de-cabled or removed from the customers rack.

The unit supports extraction of the SFP modules from the front without compromising performance. The 3405FR is a 1RU frame designed to house up to 16 single or dual channel SFP modules. Each module can either be a single or dual Electrical to Optical (EO) converter, or Optical to Electrical (OE) converter. This provides up to 16EO or 16OE with the single SFP's or 32EO or 32OE in a single rack unit of space. The frame can be configured for a variety of modules.

Features:

- Dual Power supplies (primary and redundant) and conversion trays (front extractable)
- Houses up to 16 front loading Evertz SFP modules
- 32 Input/Output BNCs on the of rear of unit for electrical connections
- Each slot can be used as an input and an output based on SFP type
- Dual 3405FC Frame controller capability SNMP - enabled for full VistaLINK® control and monitoring
- No electrical re-cabling required when hot swapping modules
- Power options include external 12V power supply bricks or 1RU power supply tray

Figure 1-1: 3405FR Frame

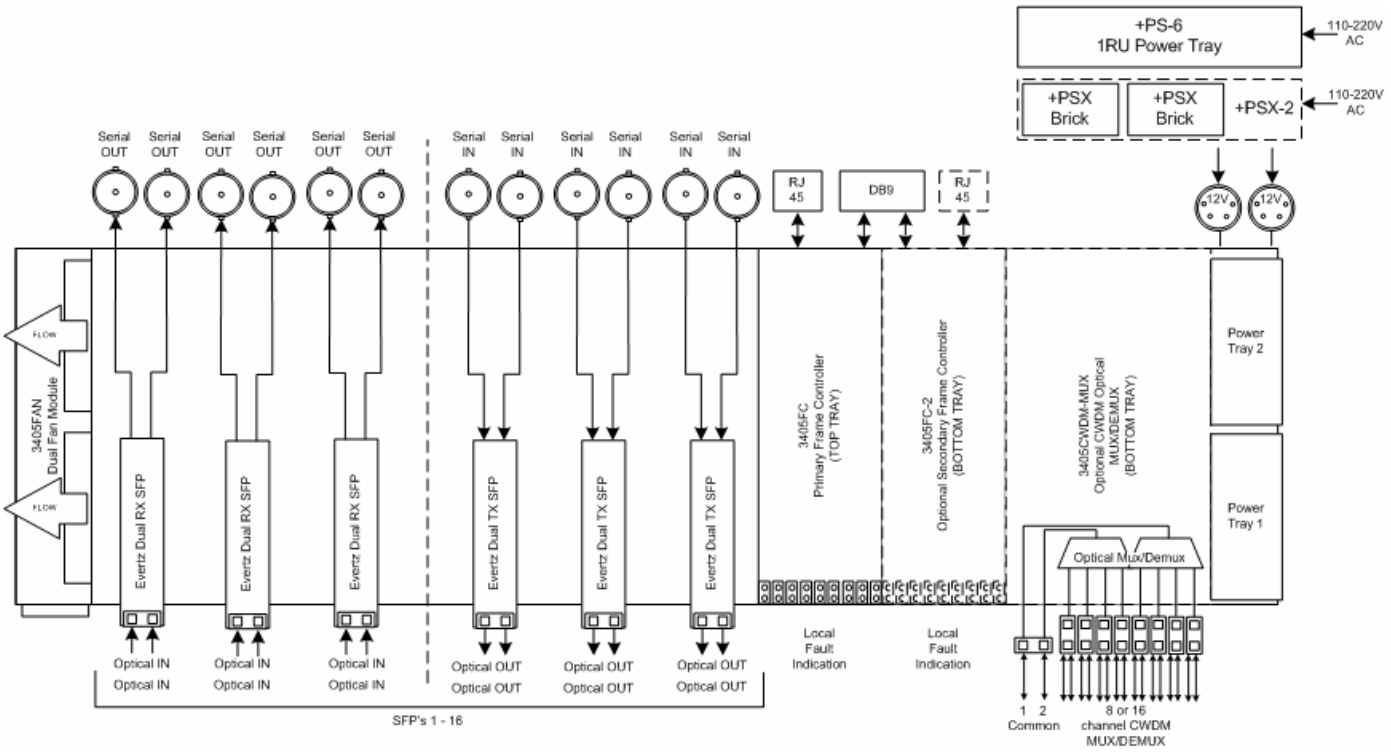

Figure 1-2: 3405FR Block Diagram

2. TECHNICAL SPECIFICATIONS

2.1. SYSTEM

Density:	Up to 16 or 32 EO, OE, or mixture of EO and OE in a 1RU unit
Impedance:	75 Ω
Connector:	BNC per IEC 61169-8 Annex A (F-type connector optional)

2.2. COMMUNICATION AND CONTROL

Serial:	RS-232 single Female 9 pin D connector
Ethernet:	SNMP over IEEE 802.3/U (10/100 BaseTx) RJ-45 connector
Control:	VistaLINK®

2.3. OPTICAL OUTPUT

Number of Outputs:	2 per SFP
Connector:	LC/UPC
Rise/Fall Time:	<270ps
Optical Power:	-2dBm +/- 1dBm
Wavelength:	1310nm

2.4. OPTICAL INPUT

Number of Inputs:	2 per SFP
Connector:	LC/UPC
Operating Wavelength:	1270nm to 1610nm
Maximum Input Power:	Standard: -1dBm
Optical Sensitivity:	Standard: -19dBm at 2.97Gb/s

2.5. COMPLIANCE

Safety:	CSA Listed, Complies with EU Safety Directive
EMC:	Complies with FCC part 15, Class A Complies with EU EMC Directives

2.6. PHYSICAL

Dimensions:	1.8"H x 19"W x 4.16"D
Module Capacity:	16 Evertz® SFP modules. Dual TX or Dual RX

2.7. ELECTRICAL

Power Supply Configuration:	Dual External Supplies (primary/secondary 3405PSX) 1RU Power Supply Tray (3405PS-6)
Voltage:	DC Input 12V DC (external power supplies required for 110-220V)
Maximum Power Consumption:	40 W (fully loaded frame with all accessories) Note: Power consumption dependent on SFP type

Connector:	4 PIN XLR (12V DC)
Status Indicators:	PSU status LEDs (each per power supply tray)
Fuses:	5 amp, time delay – 1 per power supply tray

2.8. 3405PSX EXTERNAL POWER SUPPLY BRICK

AC Mains Input:	Auto ranging, 100 ⇔ 240 VAC, 50/60 Hz
Number of Outputs:	1
Output Voltage:	12V DC
Output Connector:	4 PIN XLR
Maximum Power Dissipation:	120 W
Status Indicators:	Green OK LED

2.9. 3405PS-6 1RU POWER SUPPLY TRAY

AC Mains Input:	Auto ranging, 100 ⇔ 240 VAC, 50/60 Hz
Number of Outputs:	12 (6 primary/6 secondary)
Output Voltage:	12V DC
Output Connector:	4 PIN XLR
Maximum Power Dissipation:	250 W (primary) 250 W (secondary)
Status Indicators:	Green OK LED Red Fault LED

3. MOUNTING

The 3405FR Rack frame requires 1 rack unit (i.e. 1.8 inches (45 mm) of standard 19 inch (483 mm) wide rack space). To firmly fasten the frame to the equipment rack, make sure that all four mounting screws are securely tightened.

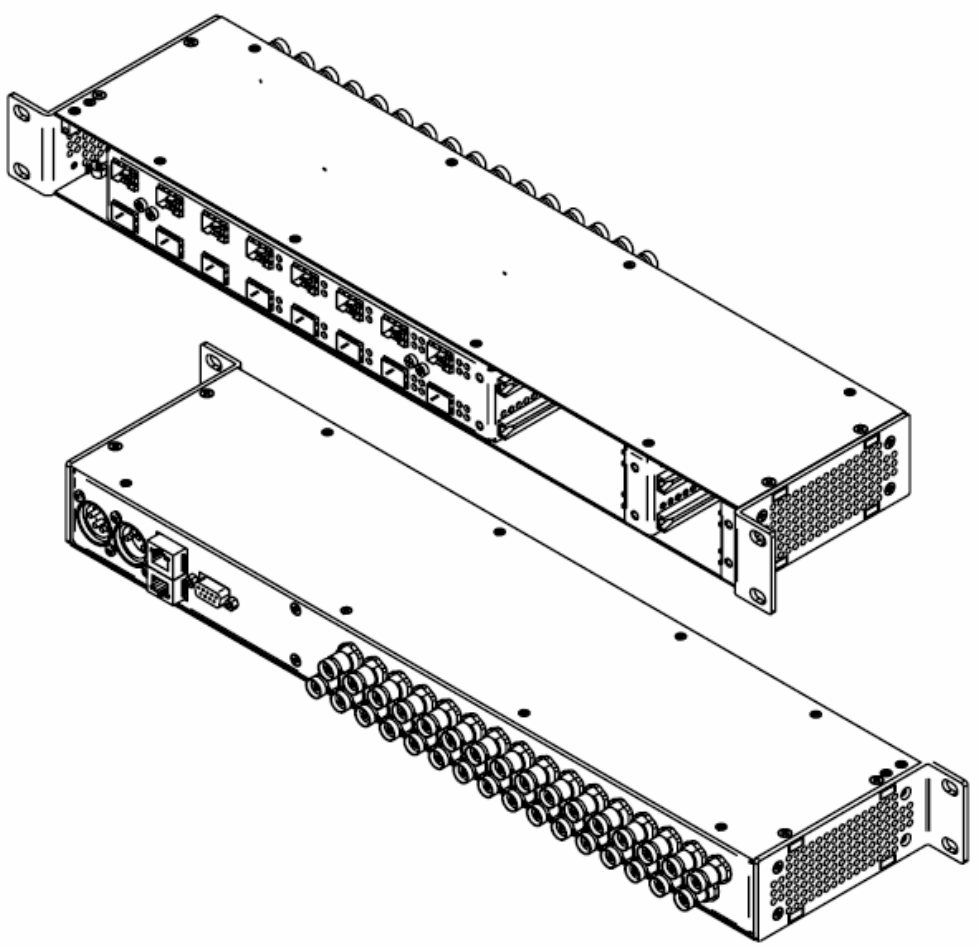

Figure 3-1: External Views of 3405FR

3.1. POWER

The 3405FR frame requires an auto-ranging external power supply (3405PSX or 3405PS-6) that automatically senses the input voltage over the range of 110 to 220 VAC. Power should be applied by connecting a 4 PIN XLR power supply cord to the power entry inlet on the rear panel (12V DC IN #1).

CAUTION - TO REDUCE THE RISK OF ELECTRIC SHOCK, GROUNDING OF THE GROUND PIN OF THE MAINS PLUG MUST BE MAINTAINED

Figure 3-2: 3405PSX Power Supply

3.1.1. Connecting a Secondary Power Supply

An external redundant power supply (a second model 3405PSX or the backup tray of the 3405PS-6) is available to supply power in case of a failure in the main power supply. Each inlet corresponds to a power supply tray at the front of the frame (3405PST).

Power should be applied by connecting a 4 PIN XLR power supply cord to the power entry module on the rear panel (12V DC IN #2).

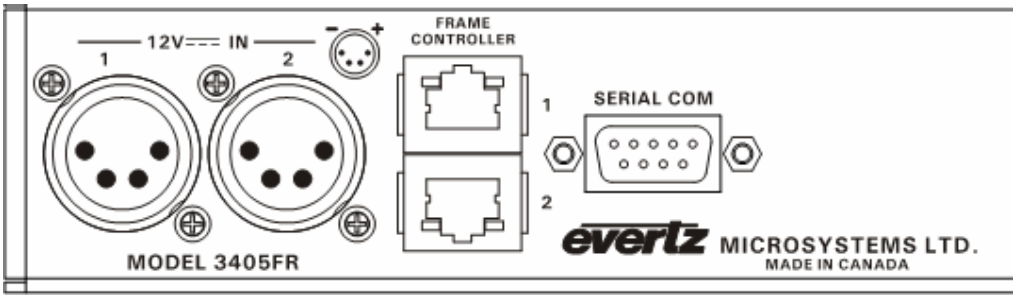

Figure 3-3: Locating the External Power Connector

There are two LEDs on the 3405PST DC power supply tray. The Red indicator will be On when the 3405PSX or 3405PS-6 is connected to the frame but is not connected to an AC input. This will cause the Status LED on the main power supply to be illuminated. When AC power is supplied to the 3405PSX, the Green indicator on its DC connector will be on and the Status indicator on the main power supply will go off unless there are other fault conditions still active.

3.1.2. Connecting the 1RU Power Supply Tray (3405PS-6/+PS-6 option)

The 3405PS-6 frame is an auto-ranging external power supply that automatically senses the input voltage over the range of 100 to 240 VAC. AC Power will need to be applied to both power inlets to ensure redundant operation of the supply and the 3405FR and the 3405PS-6 that it is connected to.

The 3405PS-6 is designed to supply power to six 3405FR frames in a redundant configuration. Bank A 4-pin XLR outlets will connect to the 3405FR 12V DC IN #1 and Bank B 4-pin XLR outlets will connect to the 12V DC IN #2 of each 3405FR.

3.1.2.1.External Power Supply Connector

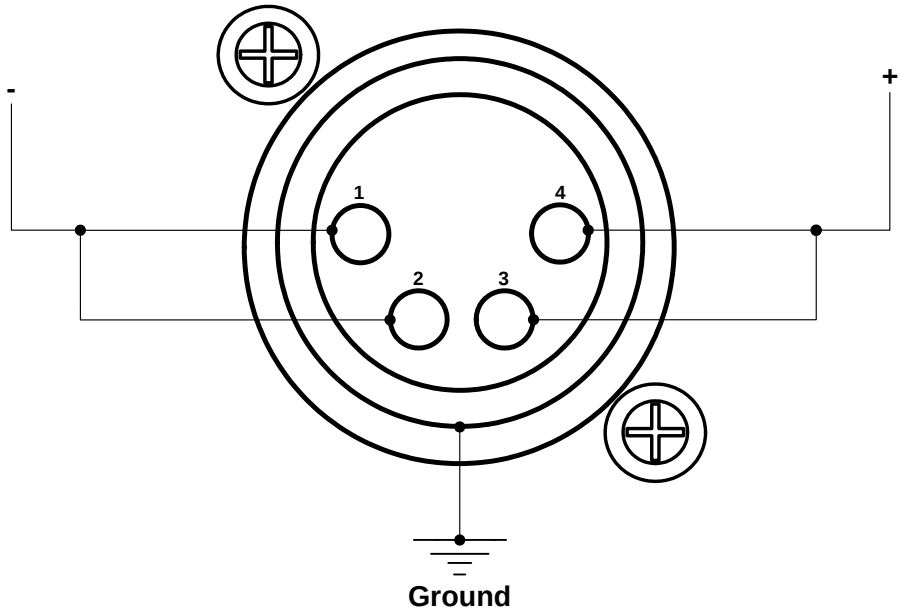

Figure 3-4: DC Power Connector to Frame and 3405PS-6

An additional external power supply, 3405PSX/3405PS-6, can be ordered to provide fully redundant powering of the frame. Power should be applied by connecting the 4-pin XLR power connector from the 3405PSX/3405PS-6 external power supply to the back of the frame labeled “12 VDC IN”.

Power to the external power supply should be applied by connecting a 3-wire grounding type power supply cord to the power entry module on the power supply. The power cord should be a minimum 18 AWG wire size; type SVT marked VW-1, maximum 2.5 m in length.

3.1.3. Power Supply Status Indicators

The 3405PST (on the 3405FR) and 3405PS (on the 3405PS-6) power supply trays have two status indicator LEDs. The green PSU STATUS LED indicates the health of the local power supply. The red STATUS LED indicates the health of the entire frame and is operated by the frame status bus of the frame. The STATUS LED will be Off under normal conditions and On when there are Frame Status Fault conditions.

If the 3405PSX power supply malfunctions (i.e. power cord disconnected, power switch is off, fuse is blown, etc,) when the 3405PSX external redundant power supply is connected, then its STATUS LED will go Off, and the red STATUS LED will turn On.

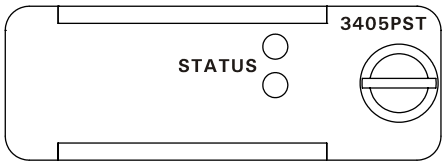

Figure 3-5: 3405PST Status Indicators

The power supplies are short circuit protected and should not blow the fuse under a short circuit condition. If there is a fuse failure, contact Evertz customer service regarding the power supply immediately.

3.2. FAN INSTALLATION AND REMOVAL (3405FAN)

Figure 3-6 provides an illustration of the 3405FAN front view.

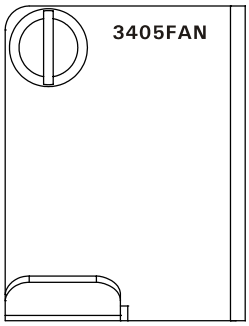

Figure 3-6: Front View of 3405FAN

3.2.1. Cooling

The 3405FR frame is designed to ensure adequate cooling for up to 35 watts of processing power per frame. Fans at the sides of the frame accomplish forced air cooling. Adjacent equipment may be mounted immediately to the top and bottom of the 3405FR frame. Additional module cooling is provided by interior cooling channels to ensure that even fully loaded frames mounted adjacent to each other will operate within the normal temperature range.

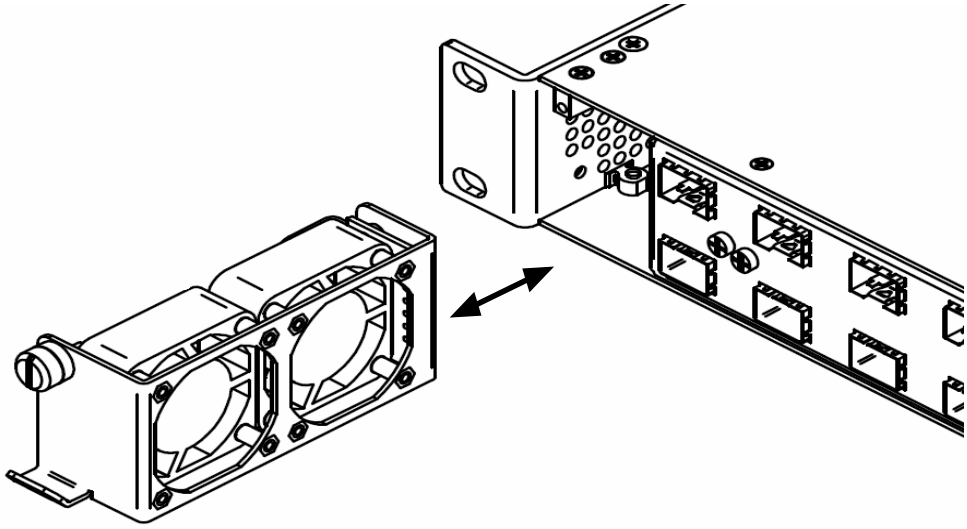

Figure 3-7: Cooling Fan Installation and Removal

If necessary, the cooling fans can be removed for the purposes of fan replacement. Always ensure that this procedure is applied while the frame is off. Removing the fans will cause unwanted heat build-up in the 3405FR. Undo the captive screw and pull outwards on the metal tab at the bottom of the 3405FAN. Installation is the reverse of removal.

CAUTION: To achieve adequate cooling, care should be taken to ensure that the fan inlets and exhaust openings are free of obstructions.

4. SFP FIBER MODULE INSTALLATION AND REMOVAL

Figure 4-1 shows the 3405T, 3405R, and 3405OO Evertz® SFP modules.

Figure 4-1: 3405T, 3405R, and 3405OO Evertz® SFP Modules

4.1. FIBER INPUT AND OUTPUT CONNECTIONS

These connections are made using standard LC fiber connector ends on single mode. There are a total of 16 dual SFP slots. There can be a mix of 32 fiber inputs or outputs on the 3405FR front panel. A high quality fiber cable such as Corning SMF-28 or suitable equivalents should be used for optimum performance. Compatible SFP modules currently come in two configurations: dual transmitters and dual receivers.

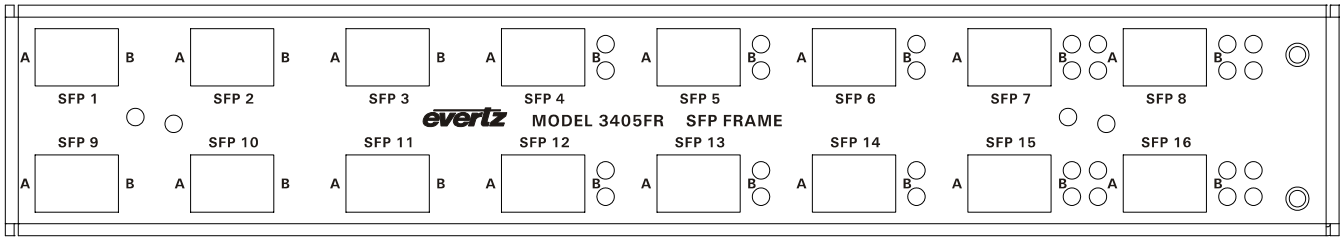

Figure 4-2: 3405FR Front View with Fiber Inputs and Outputs

Unpopulated SFP slots will remain inactive until the appropriate SFP is installed. Please ensure flat or ultra flat polished fiber LC connectors are used for the SFPs.

NOTE: Channels A and B on the front of the 3405FR frame correspond to channels A and B on the rear of the frame (Figure 5-1).

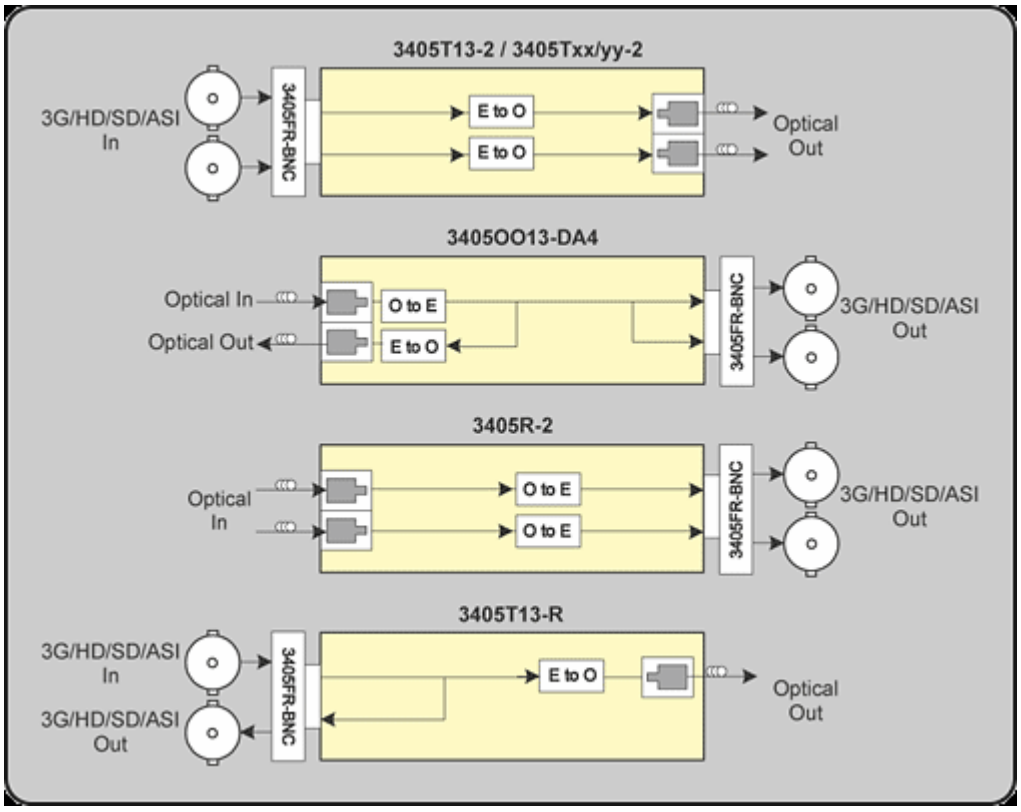

Figure 4-3: Evertz 3405 Series SFP Module Variants

4.1.1. Optical Fiber Handling and Care

The SFP fiber modules are equipped with a class 1 laser and emit invisible radiation. Avoid exposure to the laser emitter and do not stare directly into unconnected SFP emitter ports or fiber ends that are connected to SFP ports.

- It is recommended that trained and qualified personnel install, replace or handle this equipment.
- Ensure ESD precautions are followed during SFP install.
- Store SFP modules in static bags and wear an ESD strap when handling the optical modules. SFP modules are also dust sensitive.

- To prevent dust from entering the apertures of an SFP module, keep plugs inserted into the optical bores.
- Do not repeatedly remove and insert SFP modules more often than necessary. Repeated removals and insertions of an SFP module can shorten its life.

4.1.2. Installing an SFP Module

Note: In most cases, SFP modules will come from the factory preinstalled into its respective slot. The following steps outline the procedure for replacing or installing a new SFP module.

1. Remove the SFP module from its protective packaging. You can identify if your particular SFP module is a duplex transmitter or duplex receiver. Observe the top of the SFP module. The part number is located on the top of the SFP module. A 3405T part number denotes a duplex transmitter module (output) and a 3405R denotes a duplex receiver module (input).

2. Hold the sides of the SFP module between your thumb and forefinger, position the alignment grooves on the sides of the SFP with the corresponding guides in the SFP slot on your module.

3. Slide the SFP gently but firmly into the SFP slot. You should hear a click when the clips on either side of the SFP snap into place, locking the SFP in the port receptacle.

Note: Do not remove the dust plugs from the optical bores of the SFP or the dust caps from the fiber-optic cable until you are ready to connect the cable. The plugs and caps protect the SFP optical ports and the cable connectors from contamination.

4.1.3. Removing an SFP Module

Note: It is strongly recommended that you not install or remove the SFP module while the fiber-optic cable is attached to it because of the potential damage to the cables, to the cable connector, or to the optical interfaces in the SFP module. Disconnect the cable before you remove or install an SFP module.

1. Pull the bale-clasp latch out and down to eject the module. If the latch is obstructed and you are not able to release the clasp, use a small flat-blade screwdriver or other narrow flat instrument to open the bale-clasp latch.

2. Grasp the SFP module between your thumb and index finger and carefully remove the SFP from its slot.

3. Place the removed SFP module into an anti-static bag, or other ESD protective container.

5. REAR PANEL BNC CONNECTIONS

The BNC's on the rear of the 3405FR are fixed and correspond to a particular SFP module. These BNC connectors are agile and thus configured as inputs or outputs. A BNC will become an electrical input if its corresponding SFP spigot is an optical transmitter (Electrical to Optical converter). Conversely a BNC will become an electrical output if its corresponding SFP spigot is an optical receiver (Optical to Electrical converter).

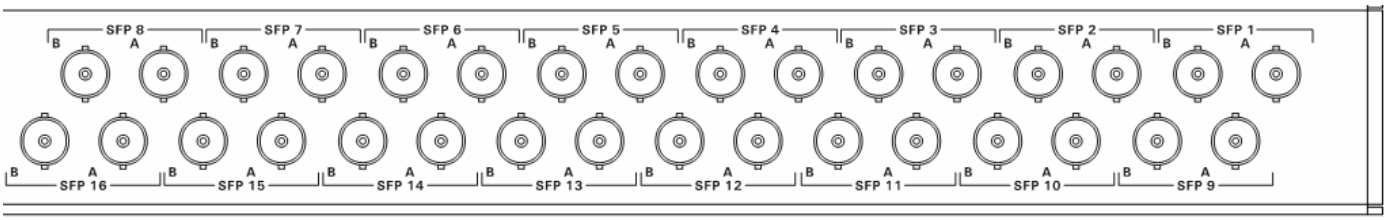

Figure 5-1: 3405FR Fixed Electrical Connections

NOTE: Channels A and B on the front of the 3405FR frame (Figure 4-2) correspond to channels A and B on the rear of the frame.

6. CONFIGURATION AND CONTROL

The 3405FC Frame Controller card provides a single point of access to communicate with the VistaLINK® enabled 3405FR. The 3405FC provides a 10Base-T/100Base-TX Ethernet port and communication is facilitated through the use of Simple Network Management Protocol (SNMP). The 3405FC handles all SNMP communications between the frame (3405FR) and the network manager (NMS), and serves as a gateway to individual cards in the frame. The 3405FC also provides a custom RS-232 serial port for customer configurations.

Note: Ethernet/SNMP/Serial connectivity is currently not supported.

6.1. VISTALINK® CONFIGURATION

The screenshots throughout sections 6.1.1 to 6.1.3 illustrate VistaLINK® parameters for the following SFP types: 3405T13-2, 3405R-2, and 3405OO13-DA4.

6.1.1. General Tab

The "General" tab enables the user to view the status of various parameters such as SFP *Type*, *Serial Number*, and *Version*.

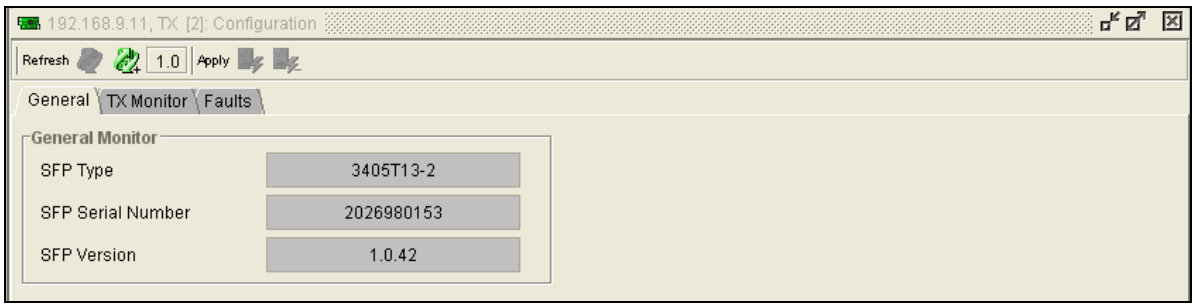

Figure 6-1: 3405T13-2 VistaLINK® General Tab

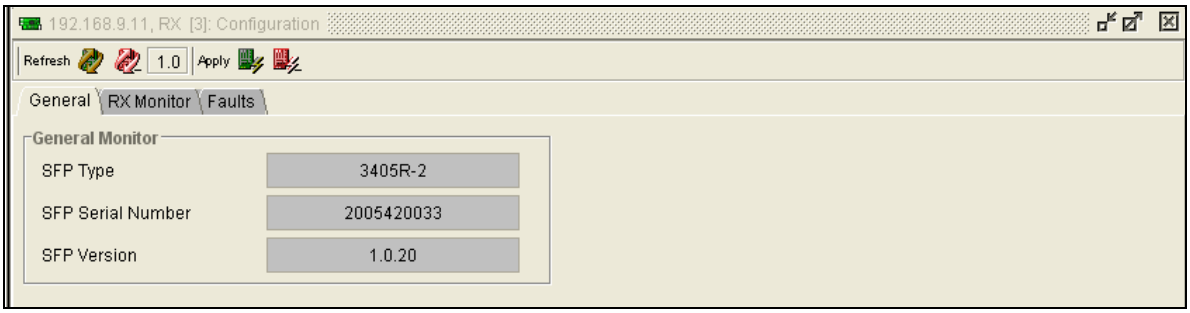

Figure 6-2: 3405R-2 VistaLINK® General Tab

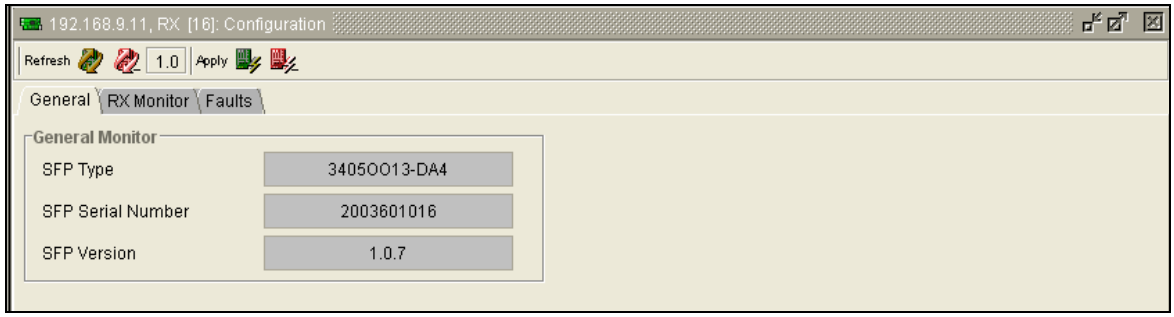

Figure 6-3: 3405OO13-DA4 VistaLINK® General Tab

SFP Type: Displays the type of SFP plugged into a particular slot.
SFP Serial Number: Displays the SFP serial number.
SFP Version: Displays the current SFP version number.

6.1.2. TX/RX Monitor Tabs

The "TX Monitor" tab displays the current *Laser Status* and *Wavelength*.

The "RX Monitor" tab measures the *Received Optical Power*.

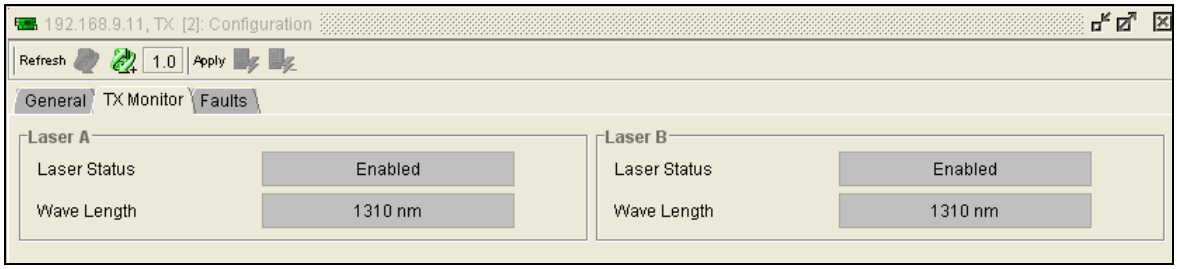

Figure 6-4: 3405T13-2 VistaLINK® TX Monitor Tab

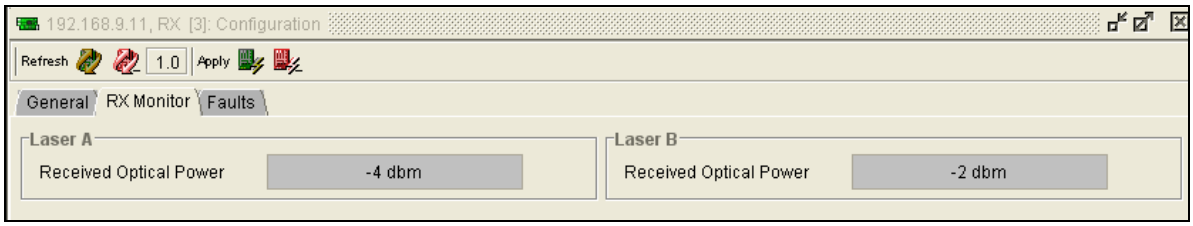

Figure 6-5: 3405R-2 VistaLINK® RX Monitor Tab

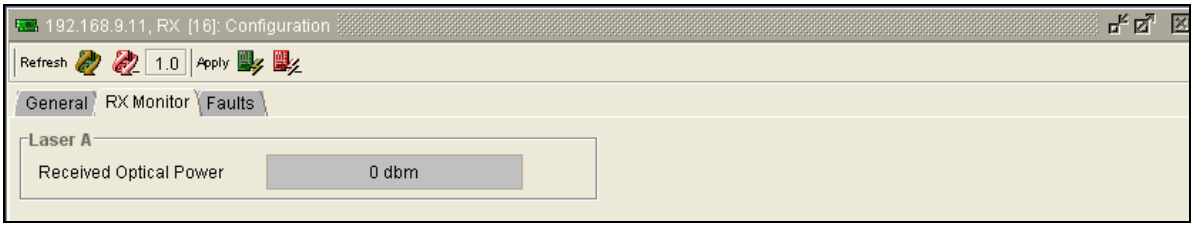

Figure 6-6: 3405OO13-DA4 VistaLINK® RX Monitor Tab

Laser Status: Displays the status of the laser in a SFP transmitter module.
Wavelength: Displays the wavelength of the SFP transmitter.
Received Optical Power: Displays the optical input power of a SFP receiver.

6.1.3. Faults Tab

The "Faults" tab allows the user to enable a variety of traps. To enable a particular trap, simply click the box located beside each trap so that a check-mark appears. When a check-mark is present, the trap is enabled. When a check-mark is not present, the trap is disabled.

The *Trap Status* section defines whether a trap is present or missing. If the box is green, then the corresponding trap is present. If the box is red, then the corresponding trap is missing.

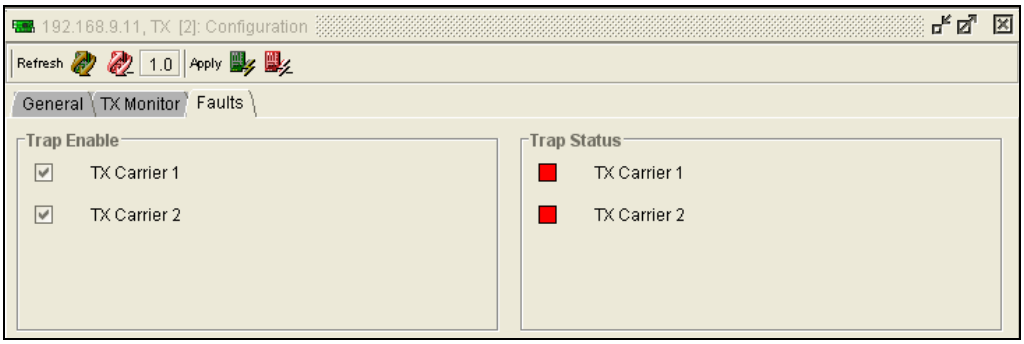

Figure 6-7: 3405T13-2 VistaLINK® Faults Tab

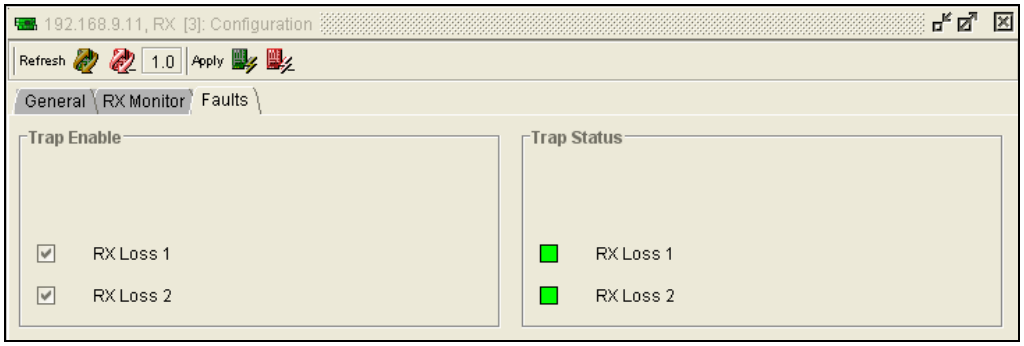

Figure 6-8: 3405R-2 VistaLINK® Faults Tab

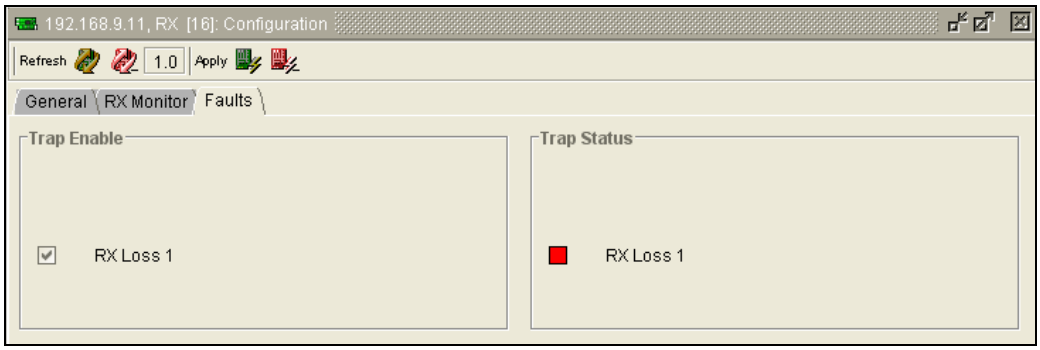

Figure 6-9: 3405OO13-DA4 VistaLINK® Faults Tab

The screenshots throughout sections 6.1.4 and 6.1.5 illustrate VistaLINK® parameters for the 3405FC Frame Controller.

6.1.4. Trap Destination Tab

The "Trap Destination" tab enables the user to define the IP address where SNMP traps will be sent to.

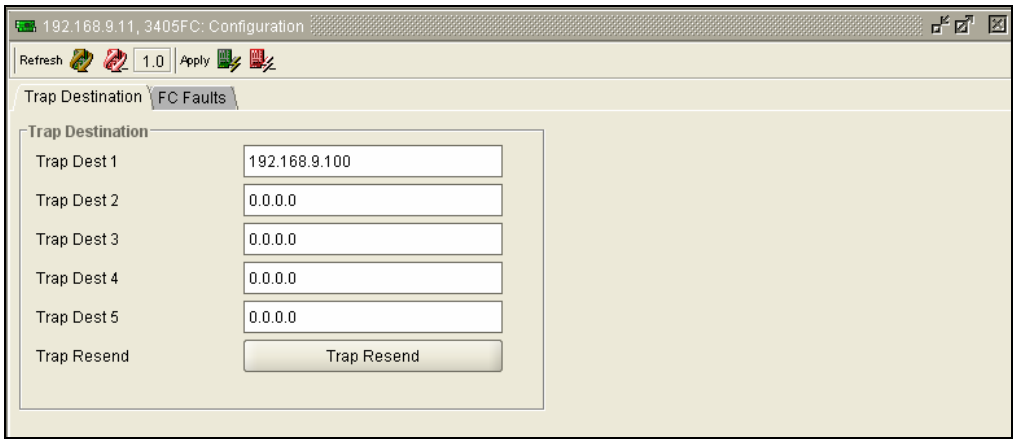

Figure 6-10: 3405FC VistaLINK® Trap Destination Tab

Trap Resend: Select this button to resend the current trap state of the card. All existing traps occurring on the card will be re-broadcast to the VistaLINK® SNMP Client and can be viewed in the trap log.

6.1.5. FC Faults Tab

The "FC Faults" tab allows the user to enable a variety of traps. To enable a particular trap, simply click the box located beside each trap so that a check-mark appears. When a check-mark is present, the trap is enabled. When a check-mark is not present, the trap is disabled.

The *Trap Status* section defines whether a trap is present or missing. If the box is green, then the corresponding trap is present. If the box is red, then the corresponding trap is missing.

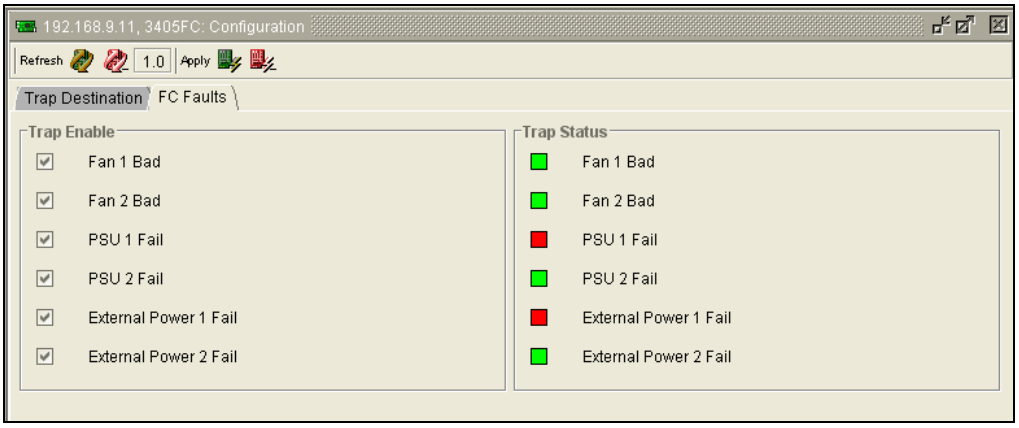

Figure 6-11: 3405FC VistaLINK® FC Faults Tab

6.2. INSTALLATION AND REMOVAL

The 3405FC frame controller card is inserted through the front of the frame and is secured to the 3405FR frame with the two captive screws on either side of the unit.

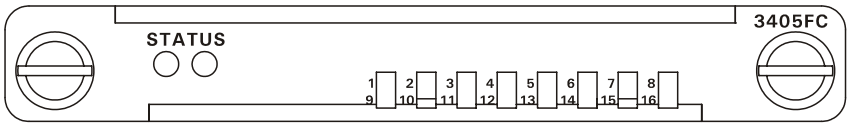

Figure 6-12: Front of 3405FC

6.2.1. STATUS LED

The two LEDs under the “STATUS” label on the front of the 3405FC identify the health of the frame and frame controller.

LED	Description
Red LED	**Red** LED indicates failure of the power supply, fan or frame controller. The following parameters are monitored by the RED Status LED: 1. 3405 Power Supply unit (blown fuse, short circuit condition) 2. Failure of the 3405FAN 3. Failure of 3405FC or 3405FC-2
Green LED	**Green** LED frame, frame controller and power supplies are all functioning normally.

Table 6-1: LED Status Chart

Note: The STATUS LED is currently not functional. The STATUS LED will become functional in the next release.

6.2.2. SFP Monitoring LEDs

The 16 LEDs on the front of the module signify SFP module presence and signal status (1 through 16).

LED	Description
No LED	An unlit LED signifies that the SFP slot is empty. This indicates that there is no SFP plugged in to the associated port.
Red LED	**Red** LEDs indicate the presence of an error with the particular SFP inserted in the corresponding slot number, or it indicates a loss of signal (fiber or coax). This LED indicates that the SFP is Present, but there are errors on the input signal and an input has been unplugged from the SFP.
Green LED	**Green** LEDs indicate the presence of a working SFP module corresponding to the SFP slot number. **Note:** Both fiber inputs (for receiver) or both coax inputs (for transmitter) will need to be connected to the SFP. This LED indicates that the SFP is Present, there is a valid signal input, and both inputs are plugged into the SFP.

Table 6-2: LED Chart

A secondary backup 3405FC frame controller module can optionally be installed in the frame in the same manner as the primary 3405FC.

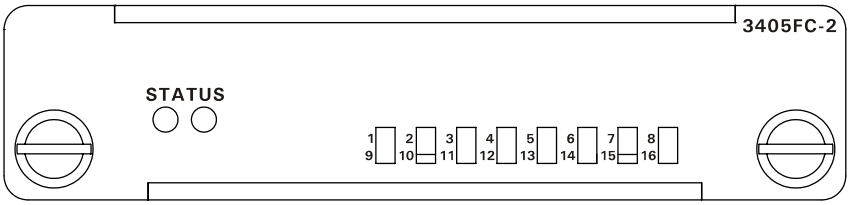

Figure 6-13: Front of 3405FC-2

Note: The Redundancy of the frame controller is currently not supported.

7. VISTALINK® MONITORING/CONTROL

7.1. WHAT IS VISTALINK®?

VistaLINK® 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 VistaLINK® 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, VistaLINK® enables the user to configure devices in the network from a central station and receive feedback that the configuration has been carried out.

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 VistaLINK® Pro Manager graphical user interface (GUI), third party or custom manager software may be used to monitor and control Evertz VistaLINK® enabled products.

7.2. VISTALINK® MONITORED PARAMETERS

The following parameters can be monitored via the VistaLINK® interface.

Parameter	Description
SFP Type	Monitors the type of SFP plugged into a particular slot (TX/RX/OO).
Laser Status	Monitors the health of the laser in a SFP transmitter module.
Laser Wavelength	Monitors the wavelength of the SFP transmitter.
Received Optical Power	Detects optical input power into each individual SFP receiver.

Table 7-1: VistaLINK® Monitoring

7.3. VISTALINK® TRAPS

The following traps can be enabled and monitored through the VistaLINK® interface.

Parameter	Description
TX Carrier 1	Monitors the presence of an electrical input into the TX 1 (Corresponds to A).
TX Carrier 2	Monitors the presence of an electrical input into the TX 2 (Corresponds to B).
RX Loss 1	Monitors the presence of a fiber input into the RX 1 (Corresponds to A).
RX Loss 2	Monitors the presence of a fiber input into the RX 2 (Corresponds to B).
Fan 1 Bad	Monitors the health of cooling fan 1.
Fan 2 Bad	Monitors the health of cooling fan 2.
PSU 1 Fail	Monitors the health of power supply tray 1.
PSU 2 Fail	Monitors the health of power supply tray 2.
External Power 1 Fail	Monitors the presence of external power into power tray 1.
External Power 2 Fail	Monitors the presence of external power into power tray 2.

Table 7-2: VistaLINK® Traps

7.4. VISTALINK® CONTROLLED PARAMETERS

The following parameters can be controlled via the VistaLINK® interface.

Parameter	Description
Frame Controller Trap Destination	Defines the IP address where SNMP traps will be sent to.

Table 7-3: VistaLINK® Controlled Parameters

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