2 OmniStack Uplink Submodules

Introduction

2000, 3000, and 5000 series OmniStack switches provide a slot for an uplink submodule. These uplink submodules allow the OmniStack's front panel ports to be aggregated onto a larger "pipe" that connects to high-speed servers and backbones.

This chapter provides detailed information on OmniStack uplink submodules.

Available Uplink Submodules

The following uplink submodules are available for the OmniStack switches:

- OSESM-100C-4 4-10/100BaseTx uplink ports
- OSESM-100FM-2 2-100BaseFx uplink ports (multimode)
- OSESM-100FS-2 2-100BaseFx uplink ports (single mode)
- OSASM2-155FM-1 1-155 Mbps ATM uplink port (multimode)
- OSASM2-155FS-1 1-155 Mbps ATM uplink port (single mode)
- OSASM2-155FSH-1 1-155 Mbps ATM uplink port (single mode long-reach)
- OSASM2-155RFM-1 1-155 Mbps ATM uplink port with redundant link (multimode)
- OSASM2-155RFS-1 1-155 Mbps ATM uplink port with redundant link (single mode)
- OSASM2-622RFM-1 1-622 Mbps ATM uplink port with redundant link (multimode)
- OSASM2-622RFS-1 1-622 Mbps ATM uplink port with redundant link (single mode)
- OSASM2-DS3-1 1-44.736 Mbps ATM BNC port
- OSASM2-E3-1 1-34.368 Mbps ATM BNC port
- OSGSM-FM-2 2-port 1000Base-SX Gigabit Ethernet fiber submodule (multimode)
- OSGSM-FS-2 2-port 1000Base-LX Gigabit Ethernet fiber submodule (single mode)
- OSWSM-FT1-SC-1 1-port T1 WAN submodule
- OSWSM-FE1-SC-1 1-port E1 WAN submodule
- OSWSM-BRI-SC-1 1-port BRI WAN submodule with backup ISDN port
- OSWSM-M013 2-port M013 WAN submodule
- OSWSM-S-2 2-port Serial WAN submodule
- OSWSM-SC-4 4-port Serial WAN submodule

♦ WAN Uplink Descriptions ♦

WAN Uplink Submodules are described in detail in Chapter 30, "WAN Switching Modules (OSWSMs).")

Installing an OmniStack Uplink Submodule

♦ Important ♦

OmniStack uplink submodules are NOT hot-swappable. "Hot-swapping" refers to installing or removing an uplink submodule while the OmniStack is receiving power.

1. Turn the OmniStack's on/off switch to the Off position.
2. Use a screwdriver to remove the uplink submodule cover plate on the OmniStack's front panel.
3. Insert the uplink submodule into the uplink submodule slot. Uplink submodules have an "up" and a "down" side. Use the printing on the submodule's front panel as a reference for orienting the submodule — if the printing is legible, you are installing the submodule correctly.
4. Slide the uplink submodule in until it rests against the backplane, then press firmly until it seats into the backplane. Once installed, tighten the screws with a screwdriver. Ensure that the screws are completely screwed down, but do not overtighten.
5. You can now make the appropriate connections to the uplink submodule's front panel ports.
6. If you turned the on/off switch to Off in Step 1, turn the switch to the On position.

Handling Fiber and Fiber Optic Connectors

Using fiber is extremely simple, but a few important rules should always be followed:

Step 1. Use Premium Grade Jumper Cables with Duplex SC Connectors

There are many brands of fiber optic jumper cables, with a wide range of quality between each manufacturer. Premium cables do three things well:

- They provide a good polish on the fiber optic connector endface (where the light exits the cable). Endface geometries must be exceptionally precise and aligned to extremely tight tolerances. The better the endface geometry, the lower the loss and more consistent the connection. Poor connector interfaces will reflect light back into the laser, causing an increase in laser noise.
- They mate well with other connector interfaces. Chances are the manufacturer of the jumper cable will not be the same as the manufacturer of the transceiver connector interface. Premium jumper cables mechanically align themselves well into most transceiver interfaces. This provides both better performance as well as better repeatability. You will always see a variance in transceiver power due to connector alignment, often as much as 0.3 to 0.7 dB. Good jumper cables help reduce this variance.
- They continue to mate well after many insertions and removals. Premium grade jumper use premium connectors that maintain their mechanical integrity up to and beyond 2000 insertion cycles.

For better repeatability, always use duplex (two connectors fused together and terminated to two cables) SC connectors on your jumper cables when connecting to a fiber-optic transceiver. Two simplex connectors inserted into a transceiver interface will often have up to 3 dB greater variation in repeatability compared to duplex connectors.

Never bend the fiber optic cable beyond its recommended minimum bend radius (1.2 inches minimum). This introduces bend losses and reflections that will degrade the performance of your system. It can also damage the fiber, although fiber is much tougher than most would assume. Still, it is highly recommended to buy only jumper cables with 3mm Kevlar jacketing, which offer superior protection and longer life.

Step 2. Keep Your Fiber Optic Connectors Clean

Unlike electrical connectors, fiber-optic connectors need to be extremely clean to ensure good system performance. Microscopic particles on the connector endface (where the light exits the connector) can degrade the performance of your system, often to the point of failure. If you have low-power output from a fiber-optic transceiver or a fault signal from your equipment, cleaning your fiber-optic connectors should always be done before trouble shooting.

Follow the steps below to clean your fiber optic connector:

1. Hold the connector cleaner tool in the palm of your left hand and, with the silver shutter upwards, rotate the cloth-forwarding lever (located on the right side of the tool) with your thumb away from your body. As the lever winds the cleaning cloth inside the case, it simultaneously opens the silver shutter located at the top of the unit.

2. Keeping your thumb pressed on the cloth-forwarding lever, press the optical plug ferrule endface against the cleaning cloth and drag the plug down toward your body (there should be arrows on the top of the tool that indicate the proper wiping direction). The connector is now clean.

3. Release the cloth-forwarding lever, allowing it to return to its initial position.

A cleaning cloth reel can enable over 400 cleanings and is replaceable. When cables are not being used, always put the plastic or rubber endcaps back on the connector to ensure cleanliness.

Step 3. Keep the Transceiver Interface Clean

If you have cleaned your connectors, but still experience low-power output from a fiber-optic transceiver or a fault signal from your equipment, you should clean the transceiver interface by blowing inert dusting gas inside the transceiver interface. This removes dust and other small particles that may block the optical path between the optics of the transceiver and the connector's endface.

Step 4. Attenuate Properly

Often equipment using laser-based transceivers need to have the optical path attenuated when performing loop-back testing or testing between two pieces of equipment. Too much optical power launched into the receiver will cause saturation and result in system failure. If you are using single mode fiber and you do not know the power output of the laser, it is always best to use a 10 dB attenuator when testing. Using the wrong type of attenuator will introduce problems, most notably reflection of light back into the laser, often resulting in excess noise and causing system failure.

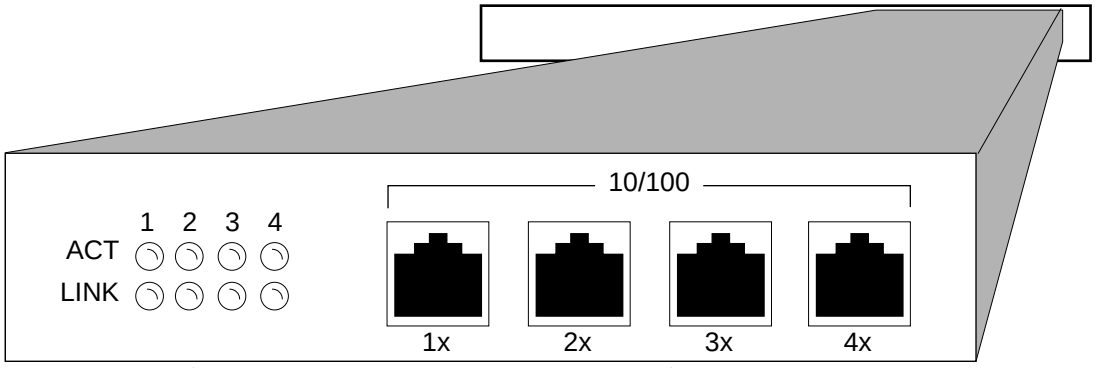
Inline attenuators eliminate the need for additional jumper cables and thus reduce the number of connection interfaces. This increases the integrity of the optical path resulting in a more accurate test.

OSESM-100C-4: Ethernet 10/100BaseTx Submodule

The OSESM-100C-4 is an uplink submodule that can connect to Fast Ethernet servers and backbones over copper cables. The OSESM-100C-4 provides four 10/100BaseTx RJ-45 ports. Each port is its own collision domain, has a unique MAC address, and connects directly to the OmniStack's backplane. Each port is autosensing, meaning that it will automatically configure itself to match the attached hub or device's configuration (i.e., half-duplex or full-duplex) and data rate (i.e., 10 Mbps or 100 Mbps).

Front Panel

The front panel of the OSESM-100C-4 contains four RJ-45 connectors, Ethernet port LEDs, and connecting screws for securing the submodule to the OmniStack switch. The following illustration describes the front panel.



Port LEDs

ACT. On Green when the corresponding port is transmitting or receiving data.

LINK. On Green continuously when a good cable connection to a 10/100BaseTx device exists. Off when a good connection does not exist. Flashes Green when the port has been disabled.

Ports

10/100. Each port is fully switched and supports 10 Mbps or 100 Mbps Ethernet. In addition, each port automatically configures itself to match the attached hub or device (i.e., 10 Mbps or 100 Mbps and half-duplex or full-duplex operation).

Fast Ethernet 10/100 Mbps Submodule

Configuring the Ethernet Ports

The Fast Ethernet ports support a fully switched 10 or 100 Mbps connection in full- or half-duplex mode. By default, the ports are configured for autosensing and half-duplex operation. To change these settings, refer to the **10/100cfg** command in Chapter 13, "Managing Ethernet Ports." The **10/100vc** command in Chapter 13 lets you view the current line speed and link mode of each port.

Technical Specifications

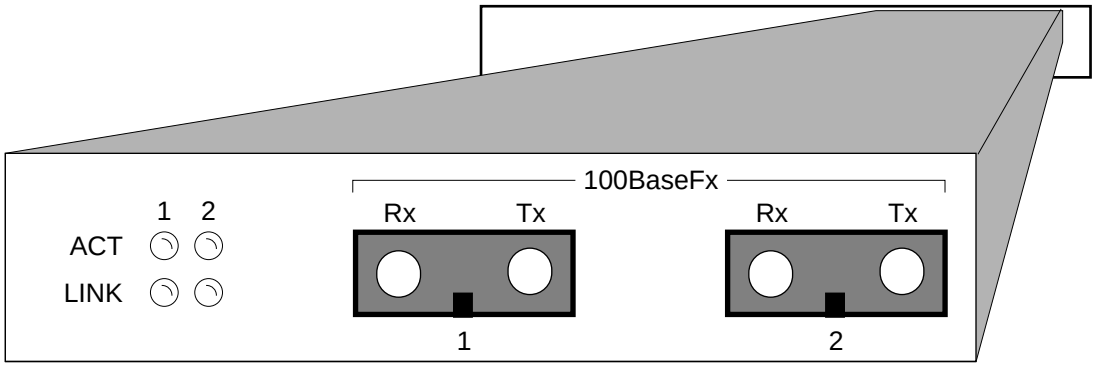
OSESM-100C-4 Technical Specifications	
Number of ports	4
Connector Type	RJ-45
Standards Supported	IEEE 802.3; IEEE 100BaseTx
Data Rate	10 or 100 Mbps
Maximum Frame Size	1,518 bytes
Connections Supported	100Base-Tx backbone or device
Cable Supported	Unshielded twisted-pair (100 Ohms), Category 5 required when running at 100 Mbps.

OSESM-100FM/FS-2: Ethernet 100BaseFx Submodules

The OSESM-100FM/FS-2 are uplink submodules that can connect to Fast Ethernet servers and backbones over fiber-optic cable. The OSESM-100FM-2 supports multimode fiber (black-colored connectors); the OSESM-100FS-2 supports single-mode fiber (blue-colored connectors). Both submodules provide two 100BaseFx SC ports. Each port is its own collision domain, has a unique MAC address, and connects directly to the OmniStack's backplane.

Front Panel

The front panel of the OSESM-100FM/FS-2 contains two SC connectors, Ethernet port LEDs, and connecting screws for securing the submodule to the OmniStack switch. The following illustration describes the front panel.



Port LEDs

ACT. On Green when the corresponding port is transmitting or receiving data.

LINK. On Green continuously when a good cable connection to a 100BaseFx device exists. Off when a good connection does not exist. Flashes Green when the port has been disabled.

Ports

100BaseFx. Each port is fully switched and supports 100 Mbps Ethernet. In addition, each port automatically configures itself to match the operation of the attached hub or device (i.e., half-duplex or full-duplex operation).

The OSESM-100FM-2 supports multimode fiber-optic cable, the OSESM-100FS-2 supports single-mode fiber-optic cable.

Fast Ethernet 100 Mbps Submodule

Configuring the Ethernet Ports

The Fast Ethernet ports support a fully switched 100 Mbps connection in full- or half-duplex mode. By default, the ports are configured for half-duplex operation and must be manually changed for full-duplex operation. To change these settings, refer to the **10/100cfg** command in Chapter 13, "Managing Ethernet Ports." The **10/100vc** command in Chapter 13 lets you view the current line speed and link mode of each port.

Technical Specifications

OSESM-100FM-2 Technical Specifications	
Number of ports	2
Connector Type	SC
Standards Supported	IEEE 802.3; IEEE 100BaseFx
Data Rate	100 Mbps
Maximum Frame Size	1,518 bytes
Connections Supported	100BaseFx backbone or device
Cable Supported	62.5 micron multimode fiber (13 dBm)
Distances Supported	2 km (half-duplex mode); 4.5 km (full-duplex mode)
Optical Power Output	-19 to -14 dBm
Receiver Sensitivity	-31 to -14 dBm
Power Budget	12 dBm

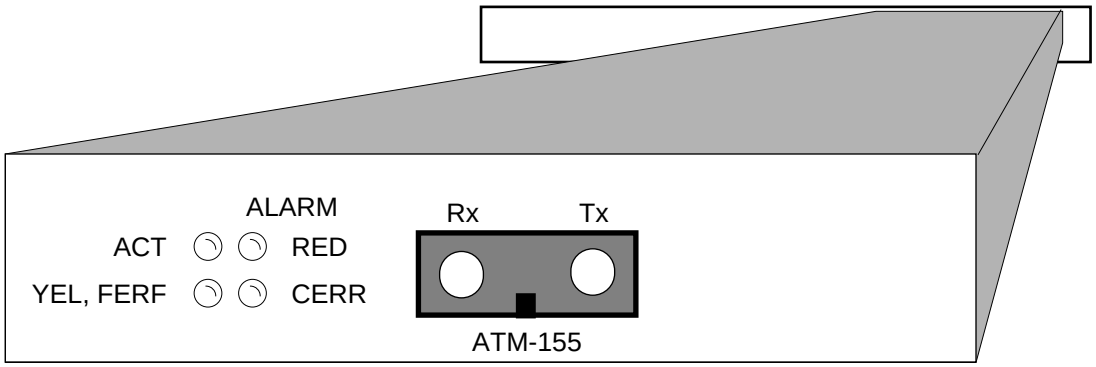
OSESM-100FS-2 Technical Specifications	
Number of ports	2
Connector Type	SC
Standards Supported	IEEE 802.3; IEEE 100BaseFx
Data Rate	100 Mbps
Maximum Frame Size	1,518 bytes
Connections Supported	100BaseFx backbone or device
Cable Supported	Single-mode fiber
Distances Supported (11 dBm)	16.5 km
Optical Power Output (Cat. 1)	-20 to -14 dBm
Receiver Sensitivity (Cat. 1)	-31 to -14 dBm
Power Budget	11 dBm

OSASM2-155FM/FS/FSH-1: ATM 155 Mbps Submodules

The OSASM2-155FM/FS/FSH-1 are uplink submodules that can connect to ATM servers and backbones over fiber-optic cable. The OSASM2-155FM-1 supports multimode fiber; the OSASM2-155FS-1 supports single mode fiber; the OSASM2-155FSH-1 supports long-reach single mode fiber. All submodules provide one 155 Mbps SC port.

Front Panel

The front panel of the OSASM2-155FM/FS/FSH-2 contains one SC connector, ATM port LEDs, and connecting screws for securing the submodule to the OmniStack switch. The following illustration describes the front panel.



Port LEDs

ACT. On Green when the port is transmitting or receiving cells.

RED (Red Alarm). On Amber when a receive failure occurs. A receive failure results when the port is persistently losing frames or when a cable is not inserted. This LED will be on when the uplink sub-module is plugged in, but no cable has been connected.

YEL (Yellow Alarm), **FERF** (Far End Receive Failure). On Amber when a far end receive failure occurs. The FERF is defined as FERF for ADM G.832 mapping protocols, and defined as Remote Alarm Indication (RAI) for PLCP and ADM G.751 mapping protocols. The recipient of cells from this uplink sub-module is not receiving those cells. This error may be due to a transmission error by the uplink sub-module or a receive error on the other end of the link.

CERR (Cell Loss Error). Interpretation of the CERR LED depends on the mapping protocol used on this ATM port. The mapping may be ATM Direct Mapped (ADM) or Physical Line Convergence Protocol (PLCP) and is configured through the **map** command.

If ADM is used, then the CERR LED goes on after seven consecutive cells with errors are received. It turns back off again when six consecutive cells are received without errors.

If PLCP is used, then this LED goes on when PLCP frames are out of frame for 1 ms. It turns back off again when no out-of-frame errors have occurred for 12 ms. In PLCP framing, ATM cells are prepended with three framing octets and a path overhead octet. A PLCP frame is considered out-of-frame when errors are detected in the first two framing octets, or in the third frame octet and the path overhead octet.

In addition, the CERR LED will be on when the receive cable is not inserted.

Single-Port 155 Mbps ATM Submodule

Technical Specifications

OSASM2-155FM-1 Technical Specifications	
Number of ports	1
Connector Type	SC
Standards Supported	ATM Forum User to Network Interface 3.0/3.1; CCITT Q.2931
Data Rate	155 Mbps
Connections Supported	ATM 155 Mbps backbone or device
Cable Supported	Multimode fiber
Distances Supported	4.2 km
Optical Power Output	-19 to -14 dBm
Receiver Sensitivity	-30 to -14 dBm
Power Budget	11 dBm

OSASM2-155FS-1 Technical Specifications	
Number of ports	1
Connector Type	SC
Standards Supported	ATM Forum User to Network Interface 3.0/3.1; CCITT Q.2931
Data Rate	155 Mbps
Connections Supported	ATM 155 Mbps backbone or device
Cable Supported	Single-mode fiber
Distances Supported	24 km
Optical Power Output	-15 to -8 dBm
Receiver Sensitivity	-31 to -8 dBm
Power Budget	16 dBm

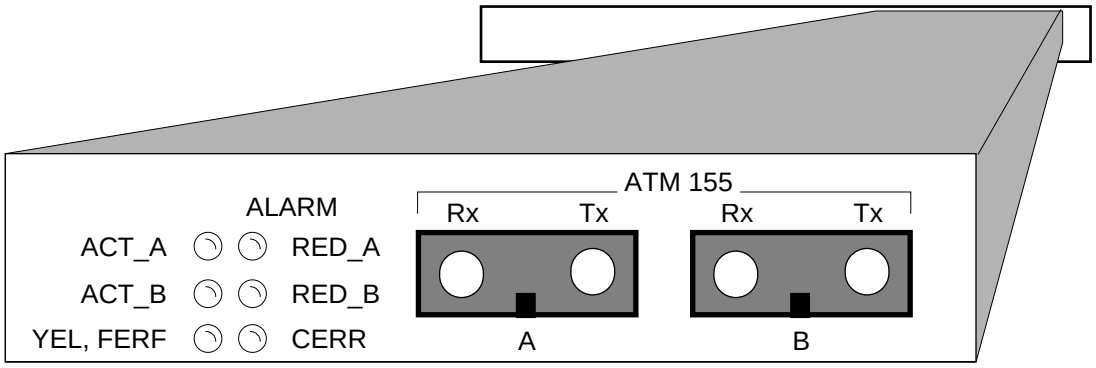
OSASM2-155FSH-1 Technical Specifications	
Number of ports	1
Connector Type	SC
Standards Supported	ATM Forum User to Network Interface 3.0/3.1; CCITT Q.2931
Data Rate	155 Mbps
Connections Supported	ATM 155 Mbps backbone or device
Cable Supported	Single-mode fiber
Distances Supported	40 km
Optical Power Output	-5 to 0 dBm
Receiver Sensitivity	-34 to -10 dBm
Power Budget	29 dBm

OSASM2-155RFM/RFS-1: ATM 155 Mbps Submodules

The OSASM2-155RFM/RFS-1 are uplink submodules that can connect to ATM servers and backbones over fiber-optic cable. The OSASM2-155RFM-1 supports multimode fiber (black-colored connectors); the OSASM2-155RFS-1 supports single-mode fiber (blue-colored connectors). Both submodules provide two 155 Mbps SC ports. However, only the **A** port is active. The **B** port is a back-up, providing redundancy in the case of a failure in the **A** port connection.

Front Panel

The front panel of the OSASM2-155RFM/FS-2 contains two SC connectors, ATM port LEDs, and connecting screws for securing the submodule to the OmniStack switch. The following illustration describes the front panel.



Port LEDs

ACT_A ACT_B. On Green when the corresponding port is transmitting or receiving cells.

RED_A RED_B (Red Alarm). On Amber when a receive failure occurs on the corresponding port. A receive failure results when the port is persistently losing frames or when a cable is not inserted. This LED will be on when the uplink sub-module is plugged in, but no cable has been connected.

YEL (Yellow Alarm), **FERF** (Far End Receive Failure). On Amber when a far end receive failure occurs. The FERF is defined as FERF for ADM G.832 mapping protocols, and defined as Remote Alarm Indication (RAI) for PLCP and ADM G.751 mapping protocols. The recipient of cells from this uplink sub-module is not receiving those cells. This error may be due to a transmission error by the uplink sub-module or a receive error on the other end of the link.

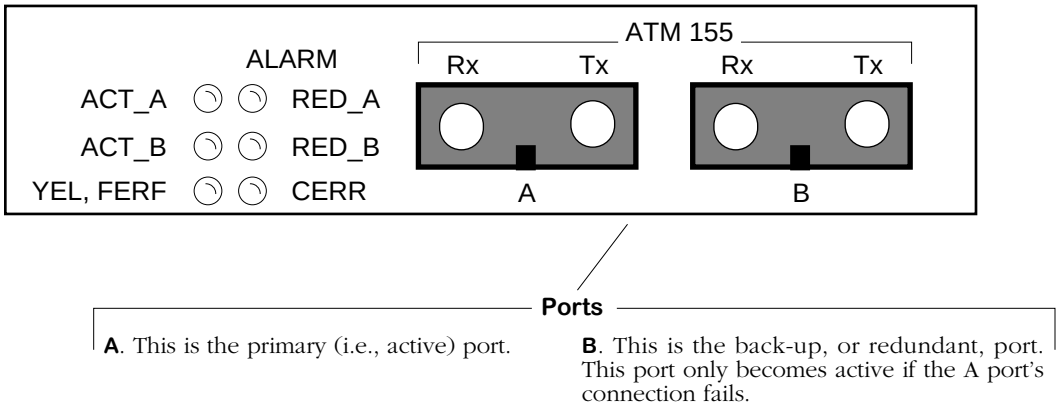
CERR (Cell Loss Error). Interpretation of the CERR LED depends on the mapping protocol used on this ATM port. The mapping may be ATM Direct Mapped (ADM) or Physical Line Convergence Protocol (PLCP) and is configured through the **map** command.

If ADM is used, then the CERR LED goes on after seven consecutive cells with errors are received. It turns back off again when six consecutive cells are received without errors.

If PLCP is used, then this LED goes on when PLCP frames are out of frame for 1 ms. It turns back off again when no out-of-frame errors have occurred for 12 ms. In PLCP framing, ATM cells are prepended with three framing octets and a path overhead octet. A PLCP frame is considered out-of-frame when errors are detected in the first two framing octets, or in the third frame octet and the path overhead octet.

In addition, the CERR LED will be on when the receive cable is not inserted.

Dual-Port 155 Mbps ATM Submodule LEDs



Dual-Port 155 Mbps ATM Submodule Ports

Technical Specifications

OSASM2-155RFM-1 Technical Specifications	
Number of ports	2 (primary and secondary)
Connector Type	SC
Standards Supported	ATM Forum User to Network Interface 3.0/3.1; CCITT Q.2931
Data Rate	155 Mbps
Connections Supported	ATM 155 Mbps backbone or device
Cable Supported	Multimode fiber
Distances Supported	4.2 km
Optical Power Output	-19 to -14 dBm
Receiver Sensitivity	-30 to -14 dBm
Power Budget	11 dBm

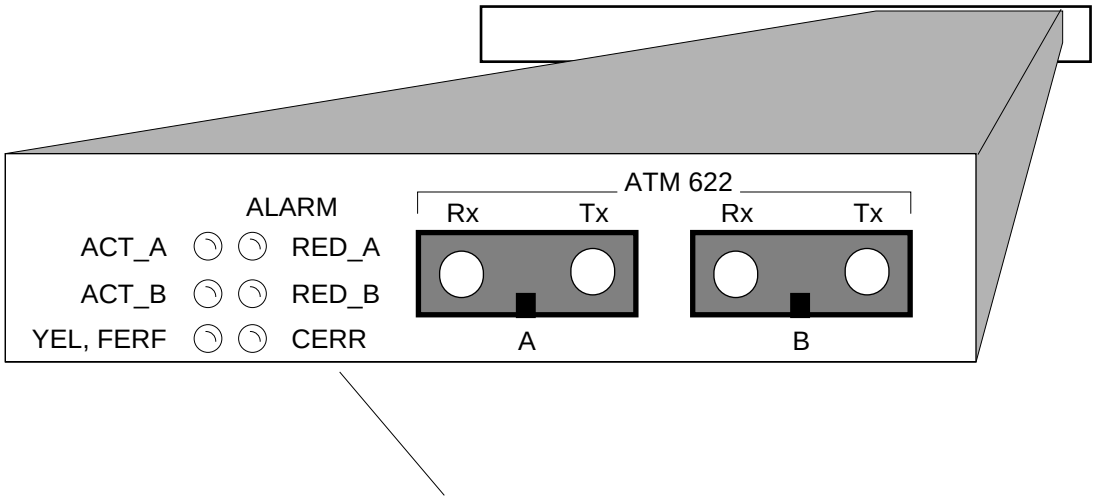
OSASM2-155RFS-1 Technical Specifications	
Number of ports	2 (primary and secondary)
Connector Type	SC
Standards Supported	ATM Forum User to Network Interface 3.0/3.1; CCITT Q.2931
Data Rate	155 Mbps
Connections Supported	ATM 155 Mbps hub or device
Cable Supported	Single-mode fiber
Distances Supported	24 km
Optical Power Output	-15 to -8 dBm
Receiver Sensitivity	-31 to -8 dBm
Power Budget	16 dBm

OSASM2-622RFM/RFS-1: ATM 622 Mbps Submodules

The OSASM2-622RFM/RFS-1 are uplink submodules that can connect to ATM servers and backbones over fiber-optic cable. The OSASM2-622RFM-1 supports multimode fiber (black-colored connectors); the OSASM2-622RFS-1 supports single-mode fiber (blue-colored connectors). Both submodules provide two 622 Mbps SC ports. However, only the **A** port is active. The **B** port is a back-up, providing redundancy in the case of a failure in the **A** port connection.

Front Panel

The front panel of the OSASM2-622RFM/FS-2 contains two SC connectors, ATM port LEDs, and connecting screws for securing the submodule to the OmniStack switch. The following illustration describes the front panel.



Port LEDs

ACT_A ACT_B. On Green when the corresponding port is transmitting or receiving cells.

RED_A RED_B (Red Alarm). On Amber when a receive failure occurs on the corresponding port. A receive failure results when the port is persistently losing frames or when a cable is not inserted. This LED will be on when the uplink sub-module is plugged in, but no cable has been connected.

YEL (Yellow Alarm), **FERF** (Far End Receive Failure). On Amber when a far end receive failure occurs. The FERF is defined as FERF for ADM G.832 mapping protocols, and defined as Remote Alarm Indication (RAI) for PLCP and ADM G.751 mapping protocols. The recipient of cells from this uplink sub-module is not receiving those cells. This error may be due to a transmission error by the uplink sub-module or a receive error on the other end of the link.

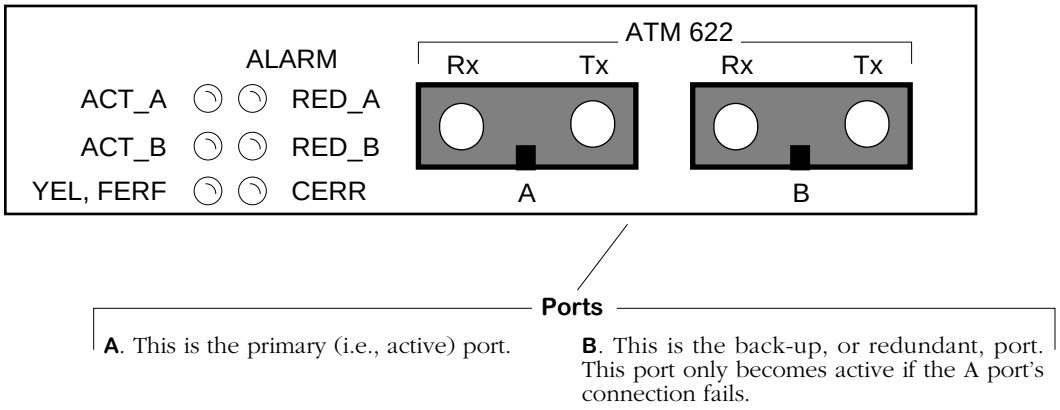
CERR (Cell Loss Error). Interpretation of the CERR LED depends on the mapping protocol used on this ATM port. The mapping may be ATM Direct Mapped (ADM) or Physical Line Convergence Protocol (PLCP) and is configured through the **map** command.

If ADM is used, then the CERR LED goes on after seven consecutive cells with errors are received. It turns back off again when six consecutive cells are received without errors.

If PLCP is used, then this LED goes on when PLCP frames are out of frame for 1 ms. It turns back off again when no out-of-frame errors have occurred for 12 ms. In PLCP framing, ATM cells are prepended with three framing octets and a path overhead octet. A PLCP frame is considered out-of-frame when errors are detected in the first two framing octets, or in the third frame octet and the path overhead octet.

In addition, the CERR LED will be on when the receive cable is not inserted.

Dual-Port 622 Mbps ATM Submodule LEDs



Dual-Port 622 Mbps ATM Submodule Ports

Technical Specifications

OSASM2-622RFM-1 Technical Specifications	
Number of ports	2 (primary and secondary)
Connector Type	SC
Standards Supported	ATM Forum User to Network Interface 3.0/3.1; CCITT Q.2931
Data Rate	622 Mbps
Connections Supported	ATM 622 Mbps backbone or device
Cable Supported	Multimode fiber
Distances Supported	0.5 km
Optical Power Output	-20 to -14 dBm
Receiver Sensitivity	-26 to -14 dBm
Power Budget	6 dBm

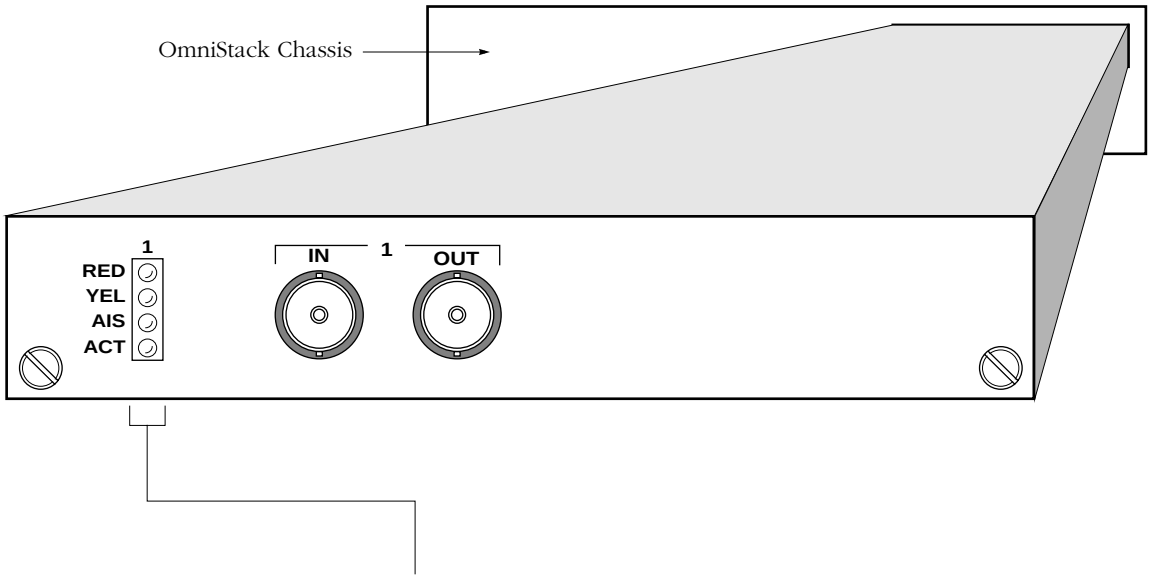
OSASM2-622RFS-1 Technical Specifications	
Number of ports	2 (primary and secondary)
Connector Type	SC
Standards Supported	ATM Forum User to Network Interface 3.0/3.1; CCITT Q.2931
Data Rate	622 Mbps
Connections Supported	ATM 622 Mbps backbone or device
Cable Supported	Single-mode fiber
Distances Supported	15 km
Optical Power Output	-15 to -8 dBm
Receiver Sensitivity	-28 to -8 dBm
Power Budget	12 dBm

OSASM2-DS3/E3-1: ATM 44.736 Mbps and 34.368 Mbps Submodules

The OSASM2-DS3/E3-1 are uplink submodules that can connect to ATM servers and backbones over coaxial (RG-59) cable. The OSASM2-DS3 supports a 44.736 Mbps DS-3 connection; the OSASM2-E3 supports a 34.368 Mbps E3 connection.

Front Panel

The front panel of the OSASM2-DS3-1 and OSASM2-E3-1 contains one (1) BNC port, corresponding port LEDs, and two (2) connecting screws for attaching the submodule to the OmniStack chassis. Refer to the illustration below for more details.



Port LEDs

RED (Red Alarm). On Amber when a receive failure occurs. A receive failure results when the port is persistently losing frames or when a cable is not inserted. This LED will be on when the submodule is plugged in, but no cable has been connected.

YEL (Yellow Alarm). On Amber when a far end receive failure occurs. The recipient of cells from this submodule is not receiving those cells. This error may be due to a transmission error by the submodule or a receive error on the other end of the link.

AIS (Alarm Indication Signal). On when a maintenance signal is sent to the submodule by the network. If this LED is on, there has been a change in the Alarm Indication Signal (AIS).

ACT (Activity). On Green when the port is transmitting or receiving cells.

DS3/E3 ATM Submodule

Technical Specifications

OSASM2-DS3-1 Technical Specifications	
Number of ports	1
Connector Type	BNC
Standards Supported	ATM Forum User-to-Network Interface 3.1 and 3.0 ISO Q.2931 IAB RFC 1483 (Multiprotocol Encapsulation over ATM) IAB RFC 1577 (Classical IP over ATM) IAB RFC 1755 (Signaling guidelines for Classical IP) ATM LAN Emulation Client V1.0 ANSI T1.624-1993 (PLCP Mapping)
Data Rate	44.736 Mbps
ATM Adaptation Layer	AAL5
Connections Supported	DS-3 connections to ATM carrier service
Cables Supported	Coaxial RG-59 (75 ohm)
Distances Supported	185 m
Current Draw	1.5 amps

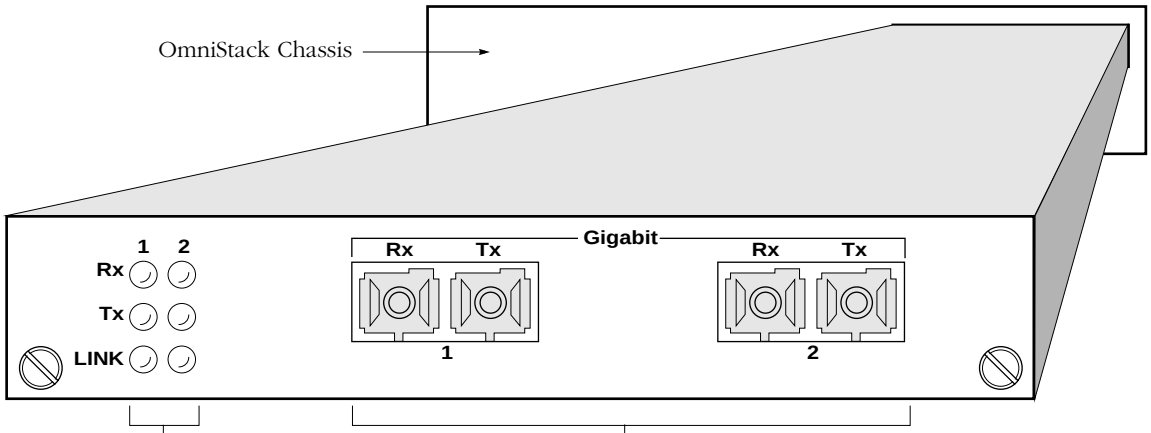
OSASM2-E3-1 Technical Specifications	
Number of ports	1
Connector Type	BNC
Standards Supported	ATM Forum User-to-Network Interface 3.1 and 3.0 ISO Q.2931 IAB RFC 1483 (Multiprotocol Encapsulation over ATM) IAB RFC 1577 (Classical IP over ATM) IAB RFC 1755 (Signaling guidelines for Classical IP) ATM LAN Emulation Client V1.0 ANSI T1.624-1993 (PLCP Mapping)
Data Rate	34.368 Mbps
ATM Adaptation Layer	AAL5
Connections Supported	E3 connections to ATM carrier service
Cables Supported	Coaxial RG-59 (75 ohm)
Distances Supported	185 m
Current Draw	1.5 amps

OSGSM-FM/FS-2 Gigabit Ethernet Submodules

The OSGSM-FM/FS-2 are uplink submodules that supports two (2) Gigabit Ethernet connections through fiber SC ports. The OSGSM-FM-2 supports two 1000BASE-SX multimode Gigabit Ethernet uplink ports (for short-distance transmission). The OSGSM-FS-2 supports two 1000BASE-LX single mode Gigabit Ethernet uplink ports (for long-distance transmission). The SC connectors for each of these modules are color coded: Black for multimode; blue for single mode.

Front Panel

The front panel of the OSGSM-F contains two (2) fiber SC connectors, corresponding Gigabit Ethernet port LEDs, and two (2) connecting screws for attaching the OSGSM-F submodule to the OmniStack chassis. Refer to the illustration below for more details.



Port LEDs

The OSGSM-F includes one row of LEDs for each port. The LEDs for a given port are displayed in the row labeled with the corresponding port number (either 1 or 2). Definitions for the LEDs are given below.

RX (Receive). Displays Green when the corresponding port is receiving data.

TX (Transmit). Displays Green when the corresponding port is transmitting data.

LINK (Link Status/Disabled). Displays Green when the corresponding port has a valid physical link and a signal is present. (Under normal conditions, this LED should always display Green whenever a cable is connected.)

Ports

Gigabit Ethernet Ports. Each port is fully switched and supports one (1) 1.25 Gbps connection.

SC connectors are color coded: Black for multimode; blue for single mode.

For additional technical information, refer to page 1-21.

Gigabit Ethernet 1.25 Gbps Submodule

Technical Specifications

OSGSM-FM-2 Technical Specifications	
Number of ports	2
Connector Type	SC (850 nm transceiver)
Standards Supported	IEEE 802.3z/2, 1000BASE-SX
Data Rate	1.25 Gbps
Connections Supported	Gigabit Ethernet backbone
Cables Supported	62.5/125 µm multimode fiber
Distances Supported	220 m
Output optical power	-9.5 to -4 dBm
Input optical power	-17 to 0 dBm

OSGSM-FS-2 Technical Specifications	
Number of ports	2
Connector Type	SC (1330 nm transceiver)
Standards Supported	IEEE 802.3z/2, 1000BASE-LX
Data Rate	1.25 Gbps
Connections Supported	Gigabit Ethernet backbone
Cables Supported	9/125 µm single mode fiber
Distances Supported	10 km
Output optical power	-9.5 to -3 dBm
Input optical power	-20 to -3 dBm