Mitel StreamLine

HARDWARE INSTALLATION GUIDE

Release 1.1

Proprietary Notice

Trademarks

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Mitel StreamLine Hardware Installation Guide
Release 1.1 – December 2014

Warranty Information

All statements in this document concerning the Mitel® StreamLine switch are for informational purposes only. No part of this document constitutes a warranty, either express or implied, regarding the StreamLine switch. Our standard limited warranty is provided with the sales contract and/or product package.

Service and Support

Mitel is dedicated to customer satisfaction and the high quality of its products. Our technical support team is prepared to assist you in maximizing the efficiency and dependability of your StreamLine switch environment, and will provide you with an immediate solution should a problem with your product arise. Contact us to discuss a plan of action, and be prepared to provide us with:

North America
1-800-561-0860 or 613-592-7849.
Please have your Technical Support ID Code ready when calling.

Europe, Middle East, Africa
Customer Management Center on +44 1291 436888.
Please have your Channel Support Agreement/Contract Number and password ready when calling.

Asia-Pacific
ap productsupport@mitel.com and include your Technical Support ID Code.

South-Pacific
spac supp@mitel.com and include your Technical Support ID Code.

Returning a Unit

If you must return a StreamLine switch, StreamLine Adapter or accessory component to Mitel Networks Corporation, ensure that all items are adequately protected with insulating material and packaged in the original carton before shipping. Failure to do so may void the equipment warranty. Consult the warranty statements included with the sales contract and/or product package. Contact us for specific RMA requirements before you ship.

Audience

This document is intended for the use of service technicians, system administrators, information technology experts and other personnel who are qualified to install, configure and maintain the StreamLine switch in the telephone network environment. The tasks and procedures described in this guide require a basic understanding of IP communications, Ethernet LAN networks, PBX telephone systems and the strategies and solutions currently practiced in your network environment. This document assumes that you are familiar with the architecture, specifications and functionality of your network. Certification training is required on the various Communication Platforms existing in the Network (i.e. 3300 ICP; 5000 CP; SX-200 ICP).

Document Conventions

In this document, some instructions are given particular emphasis to denote cautions, warnings and notes.

Cautions

A caution contains an instruction that the reader must follow in order to prevent damage to equipment, network failure or loss of data.

Example:

CAUTION: Do not expose the StreamLine switch or any of its components to a magnetic field or electrostatic charge. Damage to system components could result.

Warnings

A warning contains an instruction that the reader *must* follow in order to **prevent electrical shock, death or serious injury to personnel**.

Example:

WARNING: ENSURE THAT THE UNIT IS INDEPENDENTLY GROUNDED WITH A WIRE SECURELY ATTACHED TO THE GROUND LUG AT THE REAR OF THE UNIT.

Notes or Tips

A note or tip provides helpful information related to the topic of discussion.

Examples:

Note: The power supply unit is a field-replaceable part.

TIP: Use the handle on the right side to pull the power supply unit out.

Chapter 1 PRODUCT DESCRIPTION

QUICK LINKS

MITEL® STREAMLINE 24-PORT AND 48-PORT SWITCHES

MITEL STREAMLINE 8-PORT SWITCH

INTRODUCTION

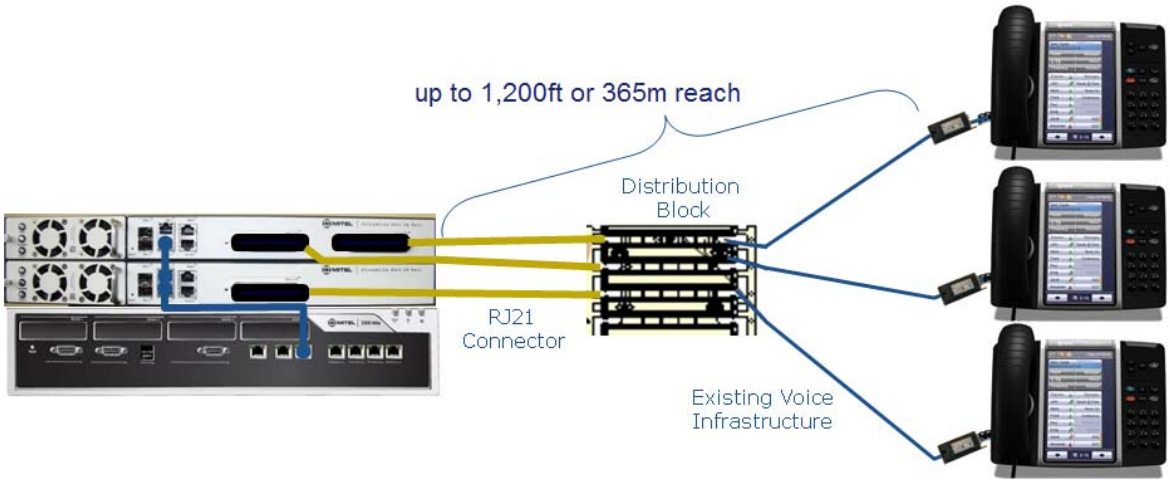
The Mitel StreamLine family are Power over Ethernet L2 switches. Unlike traditional L2 Ethernet switches which are limited in operation to distances of 100 m (328ft); the Mitel StreamLine switches can operate over distances of up to 365 m (1,200ft) over a single pair of CAT-3[1] cable.

A StreamLine Dongle is installed at each IP endpoint, the dongle bridges the signaling and power delivered from the StreamLine switch over the single pair of CAT-3 cable to the connected IEEE 802.3af compliant end device.

There are three different switches available within the Mitel StreamLine family:

- 8-Port switch
- 24-Port switch
- 48-Port switch

The default Mitel StreamLine configuration supports IP phones and provides a plug and play solution for replacing a legacy voice network using the existing network cabling plan. Up to 48 IP phones can be powered from a single Mitel StreamLine switch. The following diagram shows a typical configuration using a StreamLine 24-port switch and a StreamLine 48-port switch.



[1] StreamLine is supported on CAT-3 or better, and CW1308 cabling of up to 365 m (1,200ft). For more technical details, please consult the StreamLine Site Survey document available at "www.mitel.com/molstreamline".

STREAMLINE FAMILY OF SWITCHES

STREAMLINE 24-PORT AND 48-PORT SWITCHES

The Mitel StreamLine 24-Port and 48-Port Power over Ethernet (PoE) switches are 1 VU in height and 48 cm (19") in width, both models are rack mountable. The upstream ports connect to the Mitel IP PBX, router or data switch over Gigabit Ethernet copper or fibre optic Ethernet connections. Unlike typical PoE switches, the downstream ports connect to either one or two 25-pair RJ21 connectors and run over voice-grade cable[1] extending up to 365 m (1,200ft).

Both StreamLine 24-Port and the 48-Port switches are fully managed switches, for details refer to the StreamLine Administration guide.

STREAMLINE 8-PORT SWITCH

The StreamLine 8-Port switch allows small businesses and distributed enterprises to migrate to a hosted or premise based VoIP solution easily and inexpensively. It is ideal for those customers who simply want to introduce IP phones without the cost and inconvenience of having to rewire their existing cable plant. Instead, it transforms the existing voice infrastructure into a data connection with power delivery, ideal for IP Telephony.

The StreamLine 8-Port switch is not a managed switch; as such, it is intended for applications where a simple plug and play solution is called for.

DOWNLINK PORTS

All Mitel StreamLine switches permit the use of a legacy 2-wire telephony infrastructure to carry voice, data, and signals between the upstream switch or IP PBX to all IP endpoints in the network. StreamLine Dongles at the IP endpoints are like media converters that switch from the single pair to a standard RJ45 Ethernet PoE connection for providing connectivity and power to the attached IP device.

Important: Devices attached at the IP endpoints must be IEEE 802.3af compliant[1].

The StreamLine family of switches allows customers to combine all of the advantages of the Mitel IP telephony solution with the robustness of a centralized power distribution system for the IP phones.

Two StreamLine 8-Port switches can be connected together to allow the number of downlink ports to be expended to 16. To support larger deployments the StreamLine 24-Port and/or 48-port switches can be interconnected allowing the number of downlink ports to be increased.

When multiple Mitel StreamLine 24-Port/48-Port switches are deployed, higher system availability can be realized by making use of the StreamLine power supply sharing capabilities which allows the StreamLine switches to continue operating in the event that a StreamLine power supply should fail.

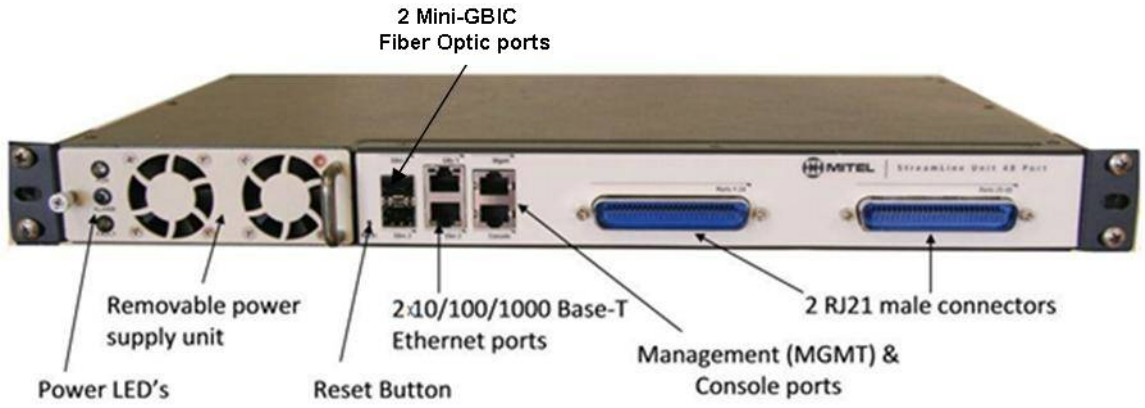
[1] The StreamLine 24-Port and 48-Port switches support PoE to IEEE 802.3af Class 1 and Class 2 end points. Some Class 3 end points are also supported, but the Powered Device (PD) must be rated at 10 Watts or less.

STREAMLINE HARDWARE DESCRIPTION

STREAMLINE 24-PORT AND 48-PORT SWITCHES

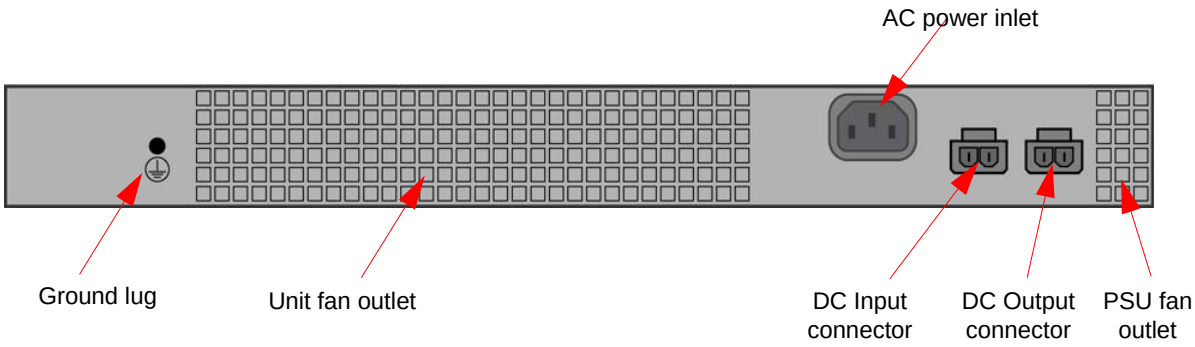
FRONT VIEW

The picture below shows the front view of StreamLine 48-Port model.



REAR VIEW

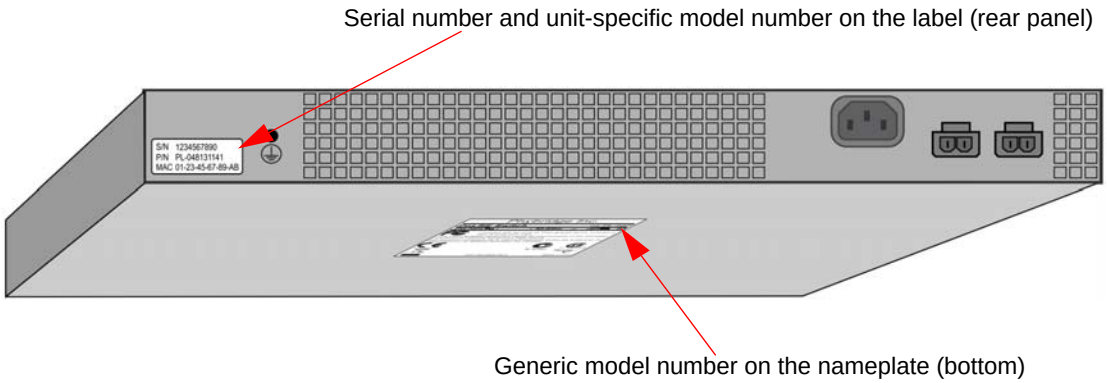
Models 24-Port and 48-Port



PRODUCT NUMBERS

The nameplate affixed to the bottom of the Mitel StreamLine switch indicates the generic model number (24-Ports or 48-Ports). The product serial number and the unit-specific model number are on a label affixed to the left side of the rear panel. You may be asked to provide these numbers if you contact Mitel Technical Support for assistance.

Product Nameplate and Label Locations



DIMENSIONS

- Height: 4.45 cm (1.75”), 1U
- Width: 43.5 cm (17.13”)
- Depth: 25.2 cm (9.92”)
- Weight: Model 24-Port: Net weight 3.215 kg (7 lb); Gross weight 4.491 kg (9.9 lb)
  Model 48-Port: Net weight 3.370 kg (7.4 lb); Gross weight 4.646 kg (10.24 lb)

OPERATING AND STORAGE ENVIRONMENT

- Operating temperature: -10°C to 50°C (14°F to 122°F)
- Storage temperature: -25°C to 70°C (-13°F to 158°F)
- Relative humidity: 10% to 95% (non-condensing) at 35°C (95°F)
- BTU rating: Model 24-Port: 61 BTU per hour
  Model 48-Port: 81 BTU per hour

INTERNAL COMPONENTS

- Processor: Broadcom BCM56018 switch processor, 266 MHz
- Memory: 32MB FLASH, 64MB DDR SDRAM

POWER SUPPLY UNIT

- Field-replaceable AC power supply unit (PSU)
- 1 male AC connector at the rear: Autosensing 100-240VAC, 50/60 Hz
- 2 male DC connectors (In/Out) at the rear of the Unit for power supply redundancy: -52VDC (nominal),
  -42VDC to -58VDC tolerance
- Power output: 500W max at 100VAC; 1000W max at 240VAC

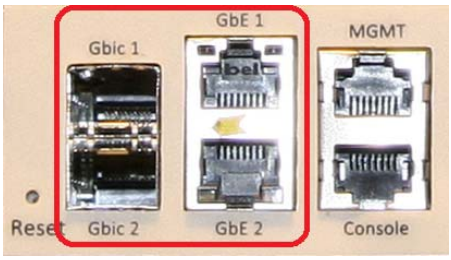
- Power injection (PoE): -54VDC; endpoint devices must be compliant with IEEE 802.3af
- 2 fans for cooling, front to rear
- 3 LEDs at the front: RUN (green), ALARM (amber) and FAULT (red). Refer to Status Indicators, page 12.

FRONT VIEW

CAUTION: Do not lift the Mitel StreamLine using the handle at the front of the PSU. This handle is intended for removing and replacing the power supply only. Refer to *Replacing the Power Supply Unit, page 45.*

REAR VIEW

UPLINK PORTS



- The front panel of the StreamLine 24-Port and 48-Port switches provides four Gigabit Ethernet connectors to allow for an uplink connection to the IP PBX, router or data switch.
- These Gigabit Ethernet connections also permit in-band management of the StreamLine 24-Port and 48-Port switches from a computer connected to the LAN; including all system OAM&P functions: software updates, configuration upload/download, status monitoring, and management system interactions.
- These connections run at 1 Gigabit/s and they operate in full duplex mode.

- There are two copper connectors and two fiber connectors provided so that uplink resiliency can be supported; however, to prevent network loops RSTP must be enabled and the Administrator must ensure that the LAN is properly designed to support RSTP.
- The StreamLine 24-Port and 48-Port switches support a maximum of 2 uplink connections: either both GbE ports, or both GBIC ports, or one of each. If you want to use one GbE port and one GBIC port, then the port numbers must be different.
- If only one uplink connection is required, then the Administrator should use GbE 1 for a copper connection or GBIC 1 for a fiber connection.

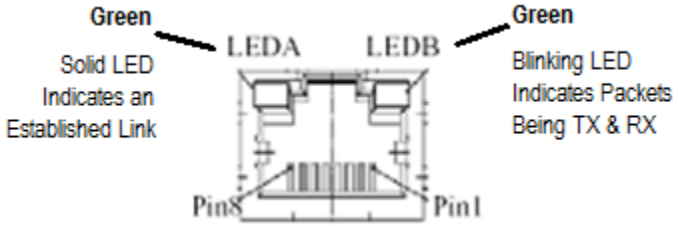
CAUTION: Do not connect both ports to the network unless STP/RSTP is enabled, the StreamLine 24-Port/48-Port switch RSTP parameters are correctly configured, and the customer's network has been designed to support the Spanning Tree Protocol. For more information, see the StreamLine Admin Guide. The StreamLine Admin Guide has a section that discusses STP and RSTP under the Services Tab. General information on designing networks with RSTP/STP can be found in the MCD Resiliency Guidelines.

- Cable required: copper, CAT-5e or better

PORT LABEL	PORT TYPE	CABLE REQUIRED
GbE 1, GbE 2	RJ45, Ethernet IEEE 802.3 10/100/1000 Base-T autosensing, independent speed selection Auto-MDIX	CAT-5e copper cable

Note: To select the type of medium to be used, copper or fiber, the Administrator will need to go to the Configure GbE Interface screen and make the desired selection. For details refer to the *StreamLine Admin Guide.*

GbE Port Pinout



PIN	FUNCTION
1, 2	T/Rx+, T/Rx–
3, 6	T/Rx+, T/Rx–
4, 5	T/Rx+, T/Rx–
7, 8	T/Rx+, T/Rx–

GBIC (Fiber) SFF Sockets

The GBIC SFF sockets will accept 1 Gb/s Ethernet IEEE 802.3z compliant Small Form Factor optical transceivers, allowing uplink connections ranging from 550 m (1,804ft) to 5 km (16,404ft). The correct fiber optic cable to use will depend on the type of IEEE 802.3z transceiver being used. The transceivers and fiber optic cables are customer supplied.

PORT LABEL	PORT TYPE	TRANSCEIVER & CABLE REQUIRED
GBIC 1, GBIC 2	Small Form Factor GBIC (SFC) Socket	The appropriate SFC GBIC Transceiver and fiber cable will be determined by the customer's environment.

DOWNLINK PORTS

- Provide downlink connections (Ethernet with PoE)
- Speed: 10 Mb/s, full duplex
- Number of ports:
  Model 24-Port: 1 RJ21 male Telco connector (standard), 24 pairs used
  Model 48-Port: 2 RJ21 male Telco connectors (standard), 48 pairs used

- Cable required: CAT-3 or better. Alternately, CW1308[1], 24 AWG
- Maximum cable length: 365 m (1200ft)
- PoE power: 10 Watts maximum at IP end point (PD). See Footnote[2].

CAUTION: To avoid possible damage to either the StreamLine switch or the IP end points, DO NOT POWER UP the StreamLine switch until all wiring has been completed and all IP end points are connected.

-

CAUTION: Once the StreamLine switch has been installed, and if it is necessary to make any wiring changes (Moves, Adds or Changes); the StreamLine switch SHOULD BE powered down.

Wiring changes at cross-connect panels MUST ALWAYS be performed with the StreamLine switch powered down, NEVER work on a cross-connect panel with live wires.

Downlink Port Pinout

StreamLine 24-port and 48-port switches:

PIN Number	1	2	3	4	5	6	7	8		18	19	20	21	22	23	24	25
Port Number	TR + – 1	TR + – 2	TR + – 3	TR + – 4	TR + – 5	TR + – 6	TR + – 7	TR + – 8		TR + – 18	TR + – 19	TR + – 20	TR + – 21	TR + – 22	TR + – 23	TR + – 24	X
PIN Number	26	27	28	29	30	31	32	33		43	44	45	46	47	48	49	50
Port Number	TR + – 1	TR + – 2	TR + – 3	TR + – 4	TR + – 5	TR + – 6	TR + – 7	TR + – 8		TR + – 18	TR + – 19	TR + – 20	TR + – 21	TR + – 22	TR + – 23	TR + – 24	X

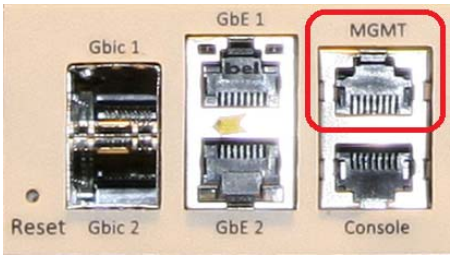
1 StreamLine is supported on CAT-3 or better, and CW1308 cabling of up to 365 m (1,200ft). For more technical details, please consult the StreamLine Site Survey document available at "www.mitel.com/molstreamline".

[2] The StreamLine 24-Port and 48-Port switches support PoE to IEEE 802.3af Class 1 and Class 2 end points. Some Class 3 end points are also supported, but the PD must be rated at 10 Watts or less.

StreamLine 48-port StreamLine switch:

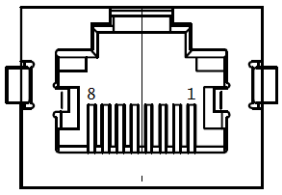
PIN Number	1	2	3	4	5	6	7	8		18	19	20	21	22	23	24	25
Port Number	TR + – 25	TR + – 26	TR + – 27	TR + – 28	TR + – 29	TR + – 30	TR + – 31	TR + – 32		TR + – 42	TR + – 43	TR + – 44	TR + – 45	TR + – 46	TR + – 47	TR + – 48	X
PIN Number	26	27	28	29	30	31	32	33		43	44	45	46	47	48	49	50
Port Number	TR + – 25	TR + – 26	TR + – 27	TR + – 28	TR + – 29	TR + – 30	TR + – 31	TR + – 32		TR + – 42	TR + – 43	TR + – 44	TR + – 45	TR + – 46	TR + – 47	TR + – 48	X

OUT-OF-BAND MANAGEMENT PORT



- 1 IEEE 802.3 Ethernet LAN port labeled **MGMT**
- Dedicated port for out-of-band management of the Mitel StreamLine, including all system OAM&P functions
- Speed: 10/100 Base-T autosensing Auto-MDIX
- Cable required: standard RJ45 LAN cable, CAT-5 or better

Out-of-band Management Port Pinout

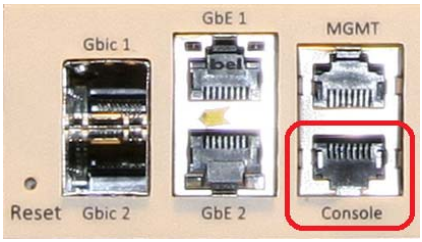


PIN	FUNCTION
1	TX +
2	TX –
3	RX +
4, 5	Bob Smith Termination
6	Rx –
7, 8	Bob Smith Termination

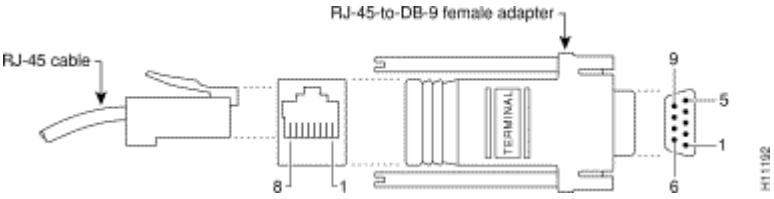
CAUTION: **The Management Port default IP address of 192.168.1.1 may conflict with other network devices/IP addresses and it needs to be changed. Refer to "Steps to Change the Management Port IP Address" section of the Quick Install Guide.**

Note: VLAN 1001 is reserved for internal use by the StreamLine Switch.

CONSOLE PORT

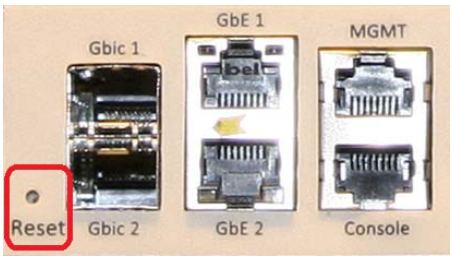


- 1 RJ45 UART port labeled **Console**
- Dedicated port for management of the Mitel StreamLine via a console terminal or PC
- Speed: 115200 Baud
- 8 data bits, no parity, 1 stop bit
- Cable required: RS232 RJ45 to DB9 connector included with StreamLine



Console Port	RTS	DTR	TxD	GND	GND	RxD	DSR	CTS
RJ45 Pin	1	2	3	4	5	6	7	8
DB-9 Pin	8	6	2	5	5	3	4	7
Console Device	CTS	DSR	RxD	GND	GND	TxD	DTR	RTS

RESET BUTTON

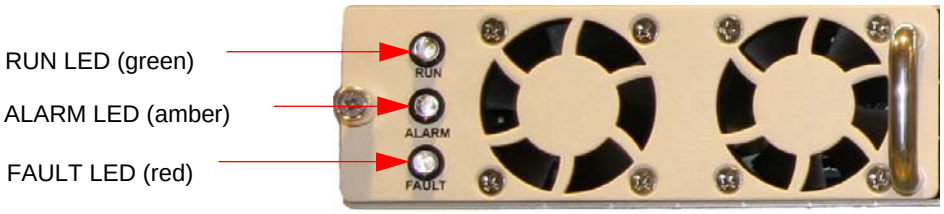


- Recessed button labeled **Reset**, for manually restarting the Mitel StreamLine
- Located on the front panel of the Mitel StreamLine immediately to the right of the power supply unit
- Use a paper clip or something similar to press the Reset button in.

CAUTION: Do NOT use a pencil tip to press the Reset button.

Note: If you press and hold for 10 seconds, the Mitel StreamLine will revert to its factory configuration, except for the Mgmt IP address. If you press and hold for under 10 seconds, the Mitel StreamLine will only reboot.

STATUS INDICATORS



3 LEDs on the front panel of the power supply unit indicate the operating status of the PS unit and Mitel StreamLine:

- **RUN** (green): Flashes during startup. Lights solid when the Mitel StreamLine is up and running.
- **ALARM** (amber): Flashes once during startup, then turns off. Lights solid to indicate a problem with the PS unit.
- **FAULT** (red): Flashes once during startup, then turns off. Lights solid to indicate a Mitel StreamLine software or hardware failure. Contact Mitel Technical Support for assistance.

STREAMLINE 8-PORT SWITCH

The Mitel StreamLine 8-Port family of data switches delivers Ethernet and Power over Ethernet on a single pair of telephony grade wire[1] with 4 times the reach of traditional data switches. With the StreamLine 8-Port switch, customers can transform their existing voice infrastructure into an IP network with power ideal for IP telephony deployment.

FRONT VIEW

Power LED

The Power LED is located on the front panel of the StreamLine 8-Port switch. The Power LED is a green LED and is illuminated when the StreamLine 8-Port switch is in the powered on state.

Uplink Ports

The StreamLine 8-Port switch has two Uplink ports located on the front panel. Both of these ports are 10/100 Mb/s Ethernet ports, Cat-5 cable should be used to make the connection to these ports.

Uplink Port 1 is to be used to connect the StreamLine switch to the IP PBX, network switch or router.

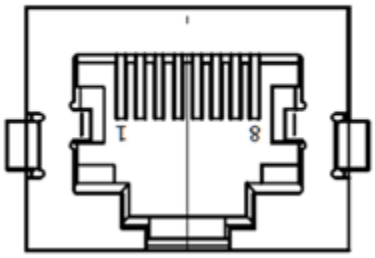
When more than 8 downlink ports are required a second StreamLine 8-Port switch can be added to expand the total downlink port count to 16 ports. To accomplish this, Uplink Port 1 on the StreamLine switch being used for expansion should be connected to Uplink Port 2 on the Streamline switch that is connected to the IP PBX, use a CAT-5 cable to make this connection.

WARNING: <u>Only one Uplink port</u> SHOULD BE CONNECTED TO THE IP PBX OR NETWORK SWITCH/ROUTER, THE STREAMLINE 8-PORT SWITCH UPLINK PORTS DO NOT SUPPORT STP OR RSTP, AS A RESULT THEY CANNOT BE USED TO IMPLEMENT REDUNDANT UPLINK NETWORK CONNECTIONS.

Connecting more than one StreamLine uplink port to the network will cause a network loop to be introduced and the network behavior will be severely affected.

The Uplink Ports use the following pin designations. CAT-5 cable should be used for making connections to this port.

Uplink Ports (RJ45) pinout



PIN	FUNCTION
1	TX +
2	TX –
3	RX +
4, 5	-
6	Rx –
7, 8	-

Downlink Ports

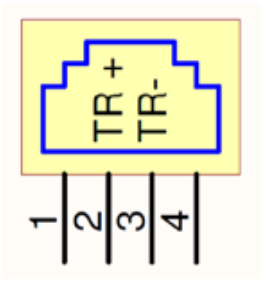
The StreamLine 8-Port switch provides 8 downlink ports, these ports can operate on CAT-3 or better cabling and CW1308 cabling with lengths of up to 365 m (1,200ft).

The StreamLine downlink ports provide Ethernet connectivity and PoE over a single pair of CAT-3 or better cabling[1].

The downlink ports operate at 10Mb/s and can provide a maximum of 10 watts of power to the IP endpoint (PD)[2].

The following diagram shows the pin designations for a downlink port RJ-11 connector. CAT-3 or better cabling should be used for making connections to this port.

Downlink Ports (RJ11) pinout



PIN	FUNCTION
1	Not Connected
2	TR+/48V Positive
3	TR-/48V Negative
4	Not Connected

Note: Only one of the eight RJ11 is shown.

[1] StreamLine is supported on CAT-3 or better, and CW1308 cabling of up to 365 m (1,200ft). For more technical details, please consult the StreamLine Site Survey document available at "www.mitel.com/molstreamline".

[2] The StreamLine 24-Port and 48-Port switches support PoE to IEEE 802.3af Class 1 and Class 2 end points. Some Class 3 end points are also supported, but the PD must be rated at 10 Watts or less.

REAR VIEW

Reset Switch

The Reset switch is single function switch; it is located on the front panel of the StreamLine 8-Port unit. To reset the StreamLine 8-Port unit, press the switch and hold for one second.

Note: DO NOT use a pencil to press the reset switch as the pencil lead may break off.

DC Power Input Jack

The DC power input jack is located on the rear panel of the StreamLine 8-Port switch.

The AC to DC power adapter provided by Mitel with the StreamLine 8-Port switch is the only approved power supply; DO NOT attempt to use any other power adapter.

The AC to DC power adapter specifications are:

INPUT: 100-240VAC 50/60Hz 140VA
OUTPUT: 48VDC 2A

Ventilation

The rear panel of the StreamLine 8-Port switch has an air vent. To ensure proper ventilation, leave at least 5 cm (2”) of unobstructed space at the rear of the switch. If the air vent is blocked the switch could overheat.

SOFTWARE UPGRADES

The StreamLine 8-Port switch is an unmanaged switch and does not require field software upgrades.

STREAMLINE DONGLE HARDWARE DESCRIPTION

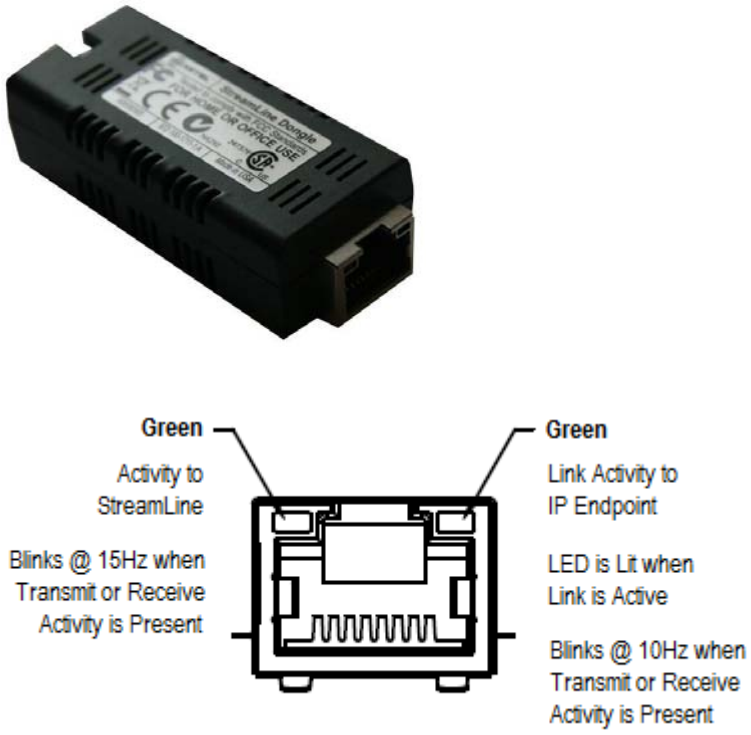
The StreamLine Dongle converts the StreamLine long reach Ethernet and PoE from the CAT-3 cabling plant into standard Ethernet and PoE for connection to the IP end point.

The StreamLine dongles are used with all the products in the StreamLine switch family.

STREAMLINE DONGLE PRODUCT NUMBER

The nameplate affixed to the bottom of the StreamLine Dongle enclosure indicates the product model number. You may be asked to provide this number if you contact Mitel Technical Support for assistance.

Product Nameplate Location



STREAMLINE DONGLE DIMENSIONS

- Height: 1.8 cm (0.71”)
- Width: 2.8 cm (1.1”)
- Depth: 6.5 cm (2.56”)
- Weight: 22 g (0.78 oz.)

NETWORK INFRASTRUCTURE CONNECTOR

- RJ11 port
- Connects to the single pair[1] on the legacy infrastructure side

Note: For BT-type connectors, use the optional adapter cable to connector to the dongle.

ETHERNET CONNECTOR

- RJ45 port
- Provides connectivity and power to the IEEE 802.3af IP end device
- DC voltage -54V max; -37V when 365m (1200ft) away from the Mitel StreamLine
- PoE Power: 10 Watts maximum - The IP end point cannot draw more than 10 watts. See footnote[2]
- Speed: Fixed 10 Mb/s Full Duplex Auto-MDIX
- Cable: CAT-5 or better

[1] StreamLine is supported on CAT-3 or better, and CW1308 cabling of up to 365 m (1,200ft). For more technical details, please consult the StreamLine Site Survey document available at "www.mitel.com/molstreamline".

[2] The StreamLine 24-Port and 48-Port switches support PoE to IEEE 802.3af Class 1 and Class 2 end points. Some Class 3 end points are also supported, but the PD must be rated at 10 Watts or less.

Chapter 2 UNPACKING STREAMLINE SWITCHES

STREAMLINE 24-PORT AND 48-PORT SWITCHES

PRODUCT PACKAGE

When you first take the Mitel StreamLine 24-Port /48-Port switch out of its carton, lay out the unit and all of its accessories in your work area and verify that you have received all of the items you ordered. Each component is labeled with its part number. The basic Mitel StreamLine product package includes:

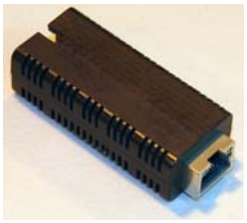
- 1 Mitel StreamLine switch, model 24-Port or model 48-Port
- 1 rackmount bracket kit
- 1 console cable
- 1 DC cable

Contact Mitel immediately if any parts are missing or have been damaged during shipment. Retain the shipping order and invoice for confirmation.

North America
Please have your Technical Support ID Code ready when calling for North America customers.

Europe, Middle East, Africa, Asia Pacific
Please have your Channel Support Agreement/Contract Number and password ready when calling.

- Other Mitel StreamLine components are packaged separately for installation in the field. Verify that you have received all of the items you ordered.
- StreamLine Dongles. The number of adapters shipped is determined from your order.



- (Optional) Replacement power supply unit. Note that the Mitel StreamLine comes standard with a factory installed power supply unit.

BEFORE YOU INSTALL

WARNING: The Mitel StreamLine 24-Port/48-Port switch can be installed in any indoor location in all countries except Finland, Norway and Sweden. In Finland, Norway and Sweden the StreamLine MUST BE INSTALLED IN A RESTRICTED ACCESS LOCATION.

The location has to meet the following size, distance and environmental criteria.

SIZE REQUIREMENTS

Select a standard 48 cm (19") equipment rack or, for a standalone unit, a flat, stable surface capable of supporting the size and weight of the Mitel StreamLine, its installable components and cabling. Refer to *Dimensions, page 5.*

Ensure that you have enough rack space for all equipment. Shelves and rear supporting brackets are not mandatory. See *Installing the Unit in a Rack, page 29*.

PHYSICAL LOCATION REQUIREMENTS

Power

The Mitel StreamLine 24-Port/48-Port switch must be placed within 1.8 m (6ft) of an available AC power source. Do not use an extension cord to connect the equipment to a power outlet.

Note: It is recommended that the Streamline Switch be powered from a dedicated power outlet. If the power outlet is used to power additional equipment and this additional equipment should cause the branch circuit breaker to trip, then all users connected to this StreamLine switch will lose service.

Ventilation

To ensure proper ventilation of the Mitel StreamLine, leave at least 5 cm (2”) of unobstructed space on all sides of the unit. If the fans are blocked, the unit could overheat. Refer also to *Operating and* Storage Environment*, page 5*.

Downlink

The StreamLine 24-Port/48-Port Dongles can be installed up to 365 m (1,200ft) away from the Mitel StreamLine switch.

WIRING PLANT REQUIREMENTS

A site survey and an examination of the existing wiring plant needs to be conducted prior to installing the StreamLine 24-Port/48-Port switch. You should have access to a Time Domain Reflectometer (TDR) for analyzing the wiring plant. For details, refer to the Customer Site Survey document and Appendix A, Verifying the Wiring Plant, within this document.

WHAT YOU WILL NEED

Installation procedures will be trouble-free if you ensure that the following items are available before you begin:

- The StreamLine 24-Port/48-Port switch, and all cables and accessories you received in the StreamLine package.
- All Dongles required for connecting the IP endpoint devices, provided with the product package according to the quantity ordered.
- Standard CAT-5e copper LAN cables for the **GbE** uplink trunks (user - supplied).
- Standard CAT-3 or better, alternately CW1308 24 AWG, for the downlink ports (user-supplied).

Note: Wiring harnesses and Amphenol-terminated cables are available from Mitel for connecting the StreamLine unit to the customer premises wiring. For more information, see *"Mitel Wiring Harnesses" on page 53*.

- Serial console cable for the **CONSOLE** port, provided with the product package.
- Standard CAT-5 or CAT-6 Ethernet LAN cable for the **MGMT** port. Optional, only if out-of band management is required (user - supplied).
- Protective Ground cable (user - supplied).
- DC cables for supporting power supply redundancy when multiple StreamLines are being deployed (provided with the product).
- Screws and screwdriver for securing the Mitel StreamLine switch to the standard 48 cm (19") equipment rack.
- A PC with a COM port for configuration and management of the Mitel StreamLine.
- If the PC connection is via a USB port, a USB cable will be required.
- If the out-of-band management port will be used, a standard RJ45 LAN cable.

Note: In-band management is also available through any of the Gigabit Ethernet (uplink) ports on the Mitel StreamLine, permitting remote access via a LAN connection.

- If the uplink connections are copper, you will require either one or two standard CAT-5e copper LAN cables to connect to the **GbE** uplink trunk ports (CAT-5e cables are user-supplied).
- If the uplink connections are fiber optic, you will require:
  a. One or two SFP transceiver modules to connect to the **GBIC** uplink trunk ports (SFP transceivers are user-supplied).

b. One or two fiber optic cables that are compatible with the particular SFP transceivers that have been selected. (Fiber optic cables are user-supplied).

Caution: If you plan to use two uplink connections, it is imperative that you enable the Rapid Spanning Tree Protocol (RSTP) and you consult with the Network Administrator to ensure that the network has been designed to support RSTP.

Details on product configuration and management are provided in the Mitel StreamLine Administration Guide.

STREAMLINE 8-PORT SWITCH

PRODUCT PACKAGE

When you first take the Mitel StreamLine 8-Port switch out of its carton, lay out the unit and all of its accessories in your work area and verify that you have received all of the items you ordered. Each component is labeled with its part number. The basic Mitel StreamLine product package includes:

- 1 Mitel StreamLine switch, model 8-Port
- 2 Mitel StreamLine Dongles
- 1 AC/DC Power Adapter

Contact Mitel immediately if any parts are missing or have been damaged during shipment. Retain the shipping order and invoice for confirmation.

North America
Please have your Technical Support ID Code ready when calling for North America customers.

Europe, Middle East, Africa, Asia Pacific
Please have your Channel Support Agreement/Contract Number and password ready when calling.

- (Optional) Replacement power supply unit. Note that the Mitel StreamLine comes standard with an AC/DC power adapter.

BEFORE YOU INSTALL

WARNING: The Mitel StreamLine 8-Port switch can be installed in any indoor location in all countries except Finland, Norway and Sweden. In Finland, Norway and Sweden the StreamLine MUST BE INSTALLED IN A RESTRICTED ACCESS LOCATION.

PHYSICAL LOCATION REQUIREMENTS

Power

The Mitel StreamLine 8-Port switch must be placed within 1.8 m (6ft) of an available AC power source. Do not use an extension cord to connect the equipment to a power outlet.

Note: It is recommended that the Streamline Switch be powered from a dedicated power outlet. If the power outlet is used to power additional equipment and this additional equipment should cause the branch circuit breaker to trip, then all users connected to this StreamLine switch will lose service.

Ventilation

To ensure proper ventilation of the Mitel StreamLine, leave at least 5 cm (2”) of unobstructed space on all sides of the unit. Refer also to *Operating and* Storage Environment*, page 5*.

Downlink

The StreamLine Dongles can be installed up to 365 m (1,200ft) away from the Mitel StreamLine switch.

WIRING PLANT REQUIREMENTS

A site survey and an examination of the existing wiring plant needs to be conducted prior to installing the StreamLine 8-Port switch. You should have access to a Time Domain Reflectometer (TDR) for analyzing the wiring plant. For details, refer to the Customer Site Survey document and Appendix A, Verifying the Wiring Plant, within this document.

WHAT YOU WILL NEED

Installation procedures will be trouble-free if you ensure that the following items are available before you begin:

- The StreamLine 8-Port switch, and all cables and accessories you received in the StreamLine package.
- All Dongles required for connecting the IP endpoint devices, provided with the product package according to the quantity ordered.
- Standard CAT-5e copper LAN cables for the uplink trunks (user - supplied).
- Standard CAT-3 or better, alternately CW1308 24 AWG, for the downlink ports (user-supplied).

UPLINK PORTS

The 8-Port StreamLine switch has two Uplink ports located on the front panel. Both of these ports are 10/100 Mb/s Ethernet ports; CAT-5 cable should be used to make the connection to these ports.

Uplink Port 1 is to be used to connect the StreamLine switch to the IP PBX, network switch or router.

When more than 8 downlink ports are required, a second StreamLine 8-Port switch can be added to expand the total downlink port count to 16 ports. To accomplish this, Uplink Port 1 on the StreamLine switch being used for expansion should be connected to Uplink Port 2 on the Streamline switch that is connected to the IP PBX; use a CAT-5 cable to make this connection.

WARNING: Only one Uplink port should be connected to the IP PBX or network switch/router. The StreamLine 8-Port switch Uplink ports do not support STP or RSTP, as a result they cannot be used to implement redundant uplink network connections.

Connecting more than one StreamLine uplink port to the network will cause a network loop to be introduced and the network behavior will be severely affected.

Chapter 3 INSTALLATION

QUICK LINKS

STREAMLINE 24-PORT AND 48-PORT SWITCHES

The StreamLine 24-Port and 48-Port switches are managed switches, for details on switch management refer to the StreamLine Administration Guide.

The following sections provide information related to installing the StreamLine 24-Port and 48-Port hardware.

REQUIREMENTS

Before you install the Mitel StreamLine, start it up or replace any components, review the suggestions in Chapter 2 Unpacking concerning:

- *Size Requirements, page 20*
- *Physical Location Requirements, page 20*
- *Wiring Plant Requirements, page 21*
- *What You Will Need, page 21*

SAFETY PRECAUTIONS

WARNING: TO PREVENT POSSIBLE PERSONAL INJURY OR EQUIPMENT DAMAGE, do not apply power to the Mitel StreamLine system until all other installation steps have been properly completed.

WARNING: Ensure that the unit is independently grounded with a wire securely attached to the ground lug at the rear of the unit chassis.

CAUTION: When upgrading a telephony environment, make sure you have removed all of the old analog/digital phones and fax machines before you apply power.

CAUTION: To ensure trouble-free synchronization with the Mitel StreamLine upon startup, all IP endpoint devices must be installed before you connect the Mitel StreamLine to a power source.

CAUTION: To avoid possible damage to either the StreamLine switch or the IP end points, DO NOT POWER UP the StreamLine switch until all wiring has been completed and all IP end points are connected.

CAUTION: Once the StreamLine switch has been installed, and if it is necessary to make any wiring changes (Moves, Adds or Changes); the StreamLine switch SHOULD BE powered down.

Wiring changes at cross-connect panels MUST ALWAYS be performed with the StreamLine switch powered down, NEVER work on a cross-connect panel with live wires.

See also Rackmount Safety Instructions on page 31.

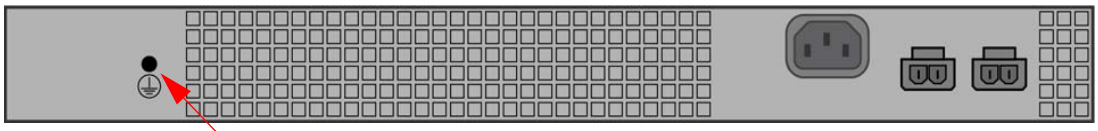
ESD PROCEDURE

ESD procedure is required for the Mitel StreamLine and all product components.

CAUTION: Do not expose the Mitel StreamLine, its removable components or the StreamLine Dongle to a magnetic field or electrostatic charge. Damage to system components could result.

- Wear an ESD (Electrostatic Sensitive Devices) wrist strap.

- Attach the wrist strap cable to the ground lug at the rear of the Mitel StreamLine switch, identified with the Gnd symbol ⏚ as shown below:



Ground lug location at the rear of the Mitel StreamLine chassis.

CAUTION: The ground lug is a main earth terminal that must be permanently connected to earth.

CARE OF THE MITEL STREAMLINE 24-PORT/48-PORT SWITCHES

CAUTION: Power off Unit and disconnect power before cleaning. The Mitel StreamLine switch will not be damaged by the application of common household solvents, non-abrasive cleaners or waxes to any of its external surfaces. However, these cleaning products must not be used on the components of the Mitel StreamLine, or applied to the interior of the Unit.

CARE OF REPLACEABLE COMPONENTS

CAUTION: Handle replacement components with care:

- **Do not** drop them
- **Do not** spill liquids on them
- **Do not** subject them to a magnetic field or electrostatic charge
- **Do not** keep them in a dusty area
- **Do not** store them at extreme temperatures or in high humidity. *See Operating and* Storage Environment*, page 5*.

Note: To ensure trouble-free installation of components, keep them in their original packaging until they are installed.

STREAMLINE 24-PORT/48-PORT SWITCH INSTALLATION OVERVIEW

IMPORTANT: It is imperative to perform a Site Survey including an evaluation of the existing wiring plant, end-to-end, prior to installation of the StreamLine switch. For details, refer to the Customer Site Survey document and Appendix A, Verifying the Wiring Plant, within this document

CAUTION: To avoid possible damage to either the StreamLine switch or the IP end points, DO NOT POWER UP the StreamLine switch until all wiring has been completed and all IP end points are connected.

-

CAUTION: Once the StreamLine switch has been installed, and if it is necessary to make any wiring changes (Moves, Adds or Changes); the StreamLine switch SHOULD BE powered down.

Wiring changes at cross-connect panels MUST ALWAYS be performed with the StreamLine switch powered down, NEVER work on a cross-connect panel with live wires.

For single-unit deployment in an IP telephony environment:

1. Remove the Mitel StreamLine switch and all accompanying accessories from the packaging materials. See Unpacking Chapter.
2. Install the rackmount brackets on the Unit and mount the unit in a standard 19” (48 cm) rack. See *Installing the Unit in a Rack, page 29.*
3. Remove all legacy analog/digital phones and fax machines from the RJ11 wall jacks

Note: It is extremely important that no legacy phones and fax machines be connected when you power on the Mitel StreamLine (step 8).

4. Install a StreamLine Dongle on each IP phone, and plug the other end of the StreamLine Dongle into the RJ11 wall jack. See Replacing Legacy Devices with IP Endpoint Devices, page 32.
5. Connect the Telco cable. See *Connecting to the 2-wire Network Infrastructure, page 33.*
6. Connect the console cable. See *Connecting to the Console, page 34*.
7. Connect the uplink cable from a Gigabit port to the IP PBX or network switch. See *Connecting to the IP PBX page 35.*

CAUTION: Do not connect both ports to the network unless STP/RSTP is enabled, the StreamLine RSTP parameters are correctly configured, and the customer's network has been designed to support the Spanning Tree Protocol. For more information, see the StreamLine Admin Guide. The StreamLine Admin Guide has a section that discusses STP and RSTP under the Services Tab. General information on designing networks with RSTP/STP can be found in the MCD Resiliency Guidelines.

Note: This connection also permits inband management over copper.

8. Connect the Mitel StreamLine to an AC power source. See Connecting to Power*, page 40.*

For multiple unit deployments, refer to the following section:

- *Daisy-chaining Mitel StreamLine Units for Power Supply Redundancy, page 42*.

INSTALLING THE UNIT IN A RACK

The Mitel StreamLine Product Package includes 2 rackmount brackets that must be installed on the left and right sides of the Unit using the 8 screws provided, for installation in a standard 48 cm (19”) rack.

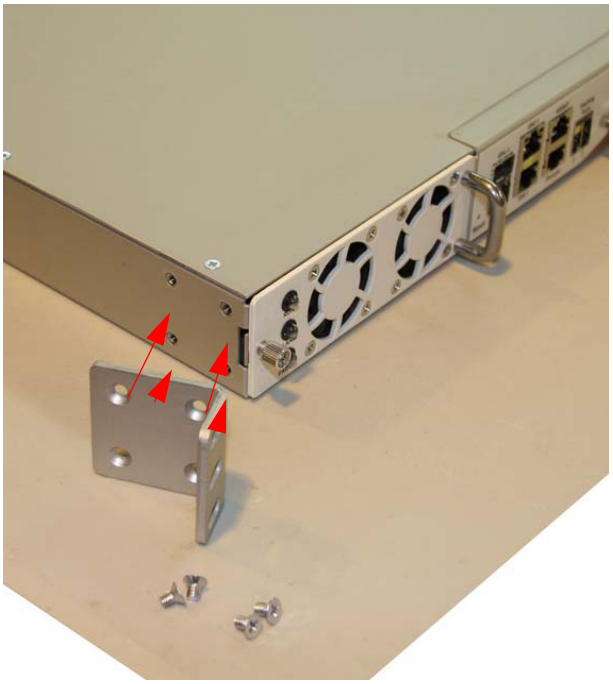
Note: No screws are supplied for mounting the Mitel StreamLine in the rack. You need a minimum of 4 screws for each rackmounted unit. Select the proper screw type and size for your equipment rack. If the rack has square holes, you may need to insert clips first in order to secure the 10-32 screws.

Figure shows the Mitel StreamLine installed in a standard 48 cm (19”) rack.

To install the unit in a rack:

1. Attach the left rackmount bracket to the left side of the Mitel StreamLine switch near the front, using 4 of the screws provided. The rack ear should be flush with the front panel of the Mitel StreamLine.

Install left bracket with screws provided



2. Attach the right rackmount bracket to the right side of the Mitel StreamLine switch near the front, using the other 4 screws provided. The rack ear should be flush with the front panel of the Mitel StreamLine.

Install right bracket with the screws provided

CAUTION: Do not lift the Mitel StreamLine using the handle at the front of the PS unit. This handle is intended for removing and replacing the power supply only.

3. Slide the Mitel StreamLine into the rack along its horizontal supports (or suspend the Unit in place using another means of support) so that the rackmount brackets at the front of the unit are in line with the vertical supports at the front of the rack, and at least 2 of the 3 holes in each rackmount bracket are aligned with holes on the rack.
4. Install 2 mounting screws in the bottom holes of the rackmount brackets, and partially tighten them (finger tight). This will provide temporary support for the unit.
5. Install the other 2 mounting screws in the upper holes of the rackmount brackets, and partially tighten them.
6. Ensure that you have mounted the unit at the same height on both sides of the rack, then tighten all mounting screws securely.

RACKMOUNT SAFETY INSTRUCTIONS

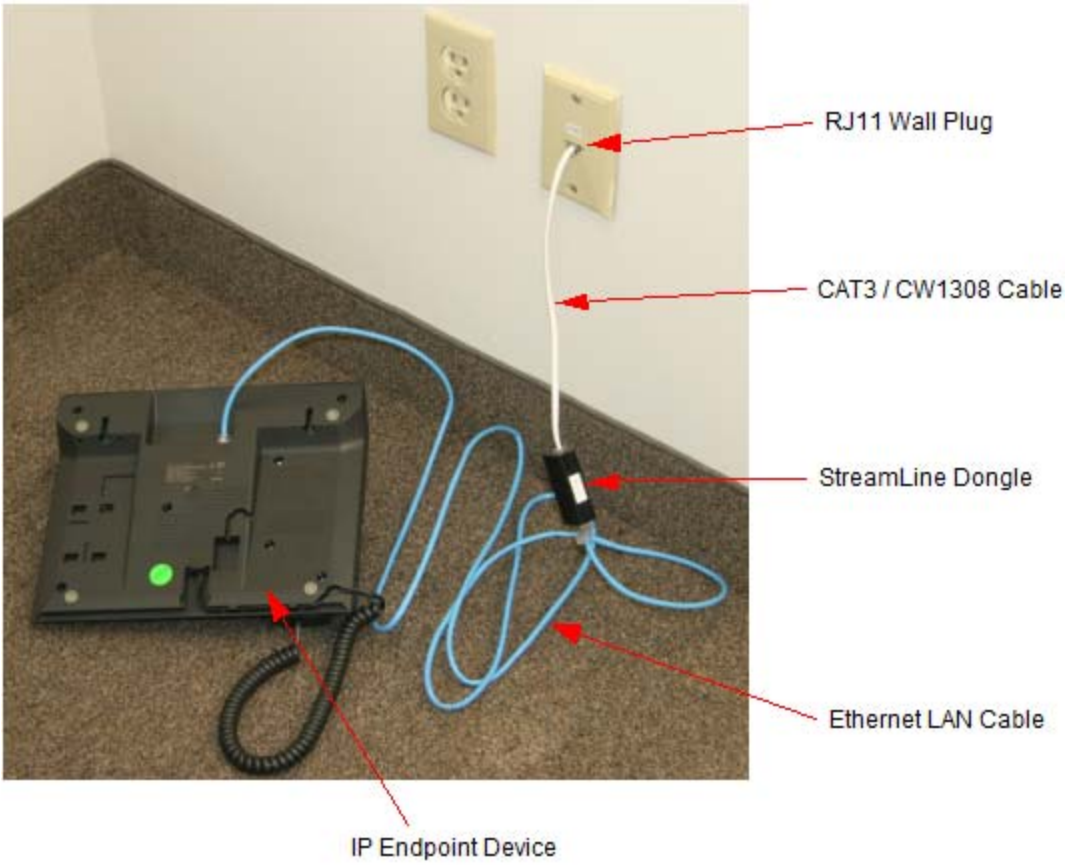
- **Elevated Operating Ambient:** If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature, as specified in *Operating and* Storage Environment*, page 5*.
- **Reduced Air Flow:** Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
- **Mechanical Loading**: Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
- **Circuit Overloading:** Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern. For reliability reasons the StreamLine should be powered from a dedicated mains outlet.
- **Reliable Earthing:** Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

REPLACING LEGACY DEVICES WITH IP ENDPOINT DEVICES

CAUTION: To ensure trouble-free synchronization with the Mitel StreamLine upon startup, all IP endpoint devices must be installed BEFORE YOU CONNECT THE MITEL STREAMLINE TO A POWER SOURCE.

To replace the legacy devices with IP endpoint devices:

1. **Important**: Remove all legacy analog/digital phones and fax machines from their Telco jacks (RJ11 wall plugs) before you carry out any further installation steps.
2. Connect the new IP phones to the StreamLine Dongles: Plug the IP phone to the RJ45 side of the StreamLine Dongle using a standard Ethernet cable.
3. Plug the other end of the StreamLine Dongle into the RJ11 wall plug using a standard cable[1]. From the RJ11 of the Dongle to the wall jack, the existing silver satin can be used when doing a DNIC/POTS replacement. For BT-type wall plate connectors, use the optional BT Adapter Cable instead.



[1] StreamLine is supported on CAT-3 or better, and CW1308 cabling of up to 365 m (1,200ft). For more technical details, please consult the StreamLine Site Survey document available at www.mitel.com/molstreamline.

CONNECTING A PC BEHIND THE IP PHONE

- Plug one end of the CAT-5 or better cable to the Ethernet connector on the PC.
- Plug the other end of the same cable to the port marked LAN on the IP phone.

Note: Port Lockdown must be disabled on this particular StreamLine downlink port to allow the PC to have network access.

- It is recommended to establish VLANs to ensure Quality of Service. For more information on how to set up VLANs, see the StreamLine Admin Guide.

Note: Data speeds are 10 Mb/s Full Duplex.

CONNECTING TO THE 2-WIRE NETWORK INFRASTRUCTURE

Note: Use a standard RJ21 Telco cable to connect the 2-wire network infrastructure to one of the downlink ports on the front panel of the Mitel StreamLine. The total cable length of the network infrastructure (from Mitel StreamLine to StreamLine Dongle) can be up to 365 m (1,200ft).

To connect to the 2-wire network infrastructure:

1. Connect the female connector of the RJ21 Telco cable to a downlink port.

If you are installing only one RJ21 Telco cable on a model 48-Port, either downlink port can be used. However, for easier reference to port numbering, use the connector on the left, labeled **Ports 1 - 24**.

StreamLine 24-Port Model RJ21 Connection

2. If you are installing a second RJ21 Telco cable on a model 48-port, connect it to the port labeled **Ports 25 - 48**.
3. Screw the cable connectors securely into place.

CONNECTING TO THE CONSOLE

The Mitel StreamLine Product Package includes a standard RJ45 to DB9 female console cable for connection to a console terminal or a computer running a terminal emulation program.

CAUTION: Do not connect the serial console cable to the management port labeled MGMT, which is for out-of-band management only.

To connect to the console:

1. Connect the RJ45 end of the supplied console cable to the port labeled **CONSOLE** on the front panel of the Mitel StreamLine.

2. Connect the DB9 end of the console cable to a COM port on your console terminal or computer.

Note: The terminal emulation program on your computer must be running at 115,200 baud with 8 data bits, no parity and 1 stop bit.

CONNECTING TO THE IP PBX

You can connect the Mitel StreamLine unit to the uplink network switch, IP PBX or router in two ways:

- *GbE Port Connection* (see next section) for copper LAN cable connection to either or both RJ45 ports labeled **GbE 1** and **GbE 2** on the front panel of the StreamLine switch.

Note: You need an Ethernet IEEE 802.3, CAT-5e copper cable with RJ45 connectors for each GbE port connection.

- *GBIC Port Connection, page 36*, for fiber optic cable connection to either or both ports labeled **GBIC 1** and **GBIC 2** on the front panel of the StreamLine switch.

Note: The Mitel StreamLine switch supports multimode or single mode, depending on the requirements of the environment. For each GBIC port connection, you need a fiber optic cable that matches the GBIC specifications at the site. The GBIC ports require installation of the *SFP Transceiver Modules, page 37*, before you connect the fiber optic cables.

CAUTION: The Mitel StreamLine switch supports a maximum of 2 uplink connections, either both GbE ports, both GBIC ports, or one of each. If you want to use one GbE port and one GBIC port, the port numbers must be different, for example GbE 1 and GBIC 2, or GbE 2 and GBIC 1. If you connect through same-numbered ports, for example GbE 1 and GBIC 1, only the fiber optic connection (GBIC) will work.

Note: To select the type of medium to be used, copper or fiber, the Administrator will need to go to the Configure GbE Interface screen and make the desired selection. For details refer to the *StreamLine Admin Guide.*

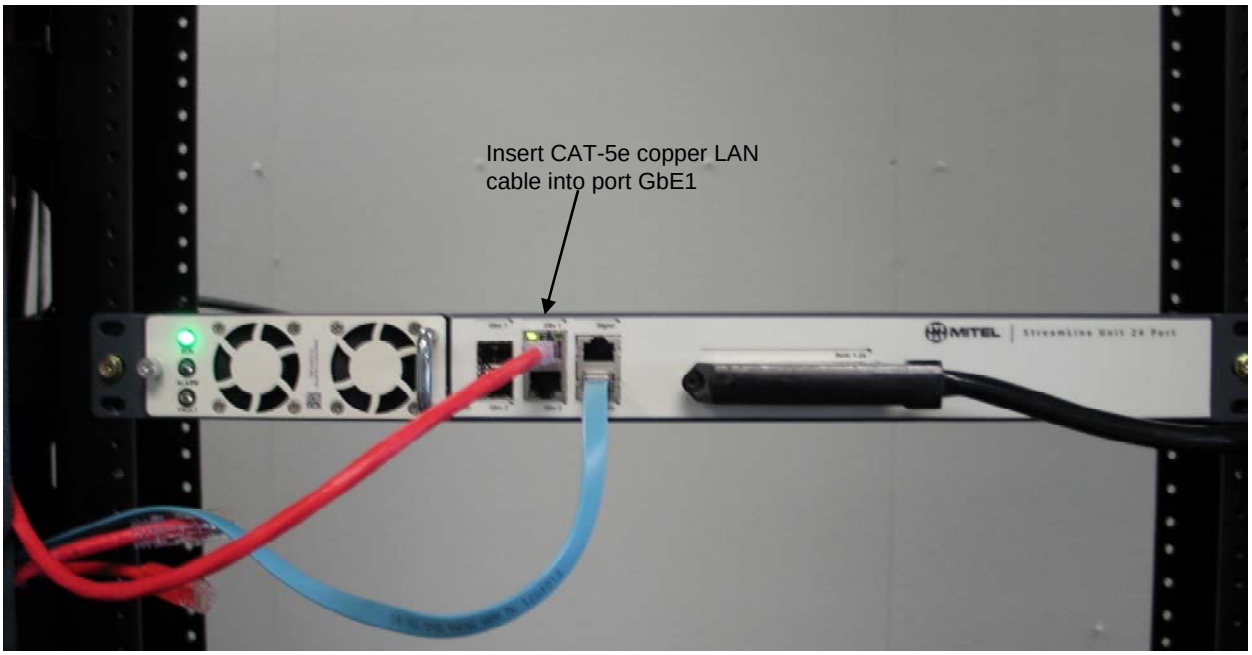
GBE PORT CONNECTION

To connect the Mitel StreamLine switch to the uplink network switch or the IP PBX using a copper LAN cable:

- Connect your CAT-5e copper LAN cable to port **GbE 1** or **GbE 2** on the front panel of the Mitel StreamLine.

CAUTION: Do not connect both ports to the network unless STP/RSTP is enabled, the StreamLine RSTP parameters are correctly configured, and the customer's network has been designed to support the Spanning Tree Protocol. For more information, see the StreamLine Admin Guide. The StreamLine Admin Guide has a section that discusses STP and RSTP under the Services Tab. General information on designing networks with RSTP/STP can be found in the MCD Resiliency Guidelines.

Note: Both ports can be used. If only one connection will be installed, use the port labeled GbE 1.



Note: To select the type of medium to be used, copper or fiber, the Administrator will need to go to the Configure GbE Interface screen and make the desired selection. For details refer to the *StreamLine Admin Guide.*

GBIC PORT CONNECTION

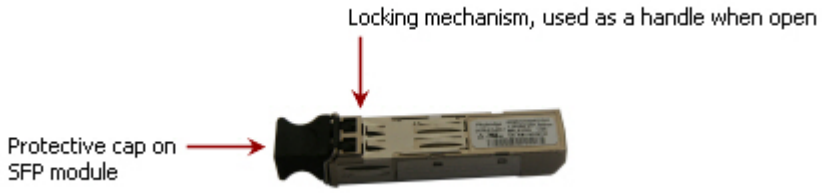
CAUTION: Do not connect both ports to the network unless STP/RSTP is enabled, the StreamLine RSTP parameters are correctly configured, and the customer's network has been designed to support the Spanning Tree Protocol. For more information, see the StreamLine Admin Guide. The StreamLine Admin Guide has a section that discusses STP and RSTP under the Services Tab. General information on designing networks with RSTP/STP can be found in the MCD Resiliency Guidelines.

Before you can connect a fiber optic cable to a **GBIC** port, you must install an SFP transceiver module that matches the requirements of your environment. The StreamLine switch supports 1000 Base-TX/SX/LX/EX/ZX/LHX, depending on which SFP transceiver module you install. The SFP transceivers are not a Mitel orderable part, SFP transceivers and fiber optic cabling are customer supplied items.

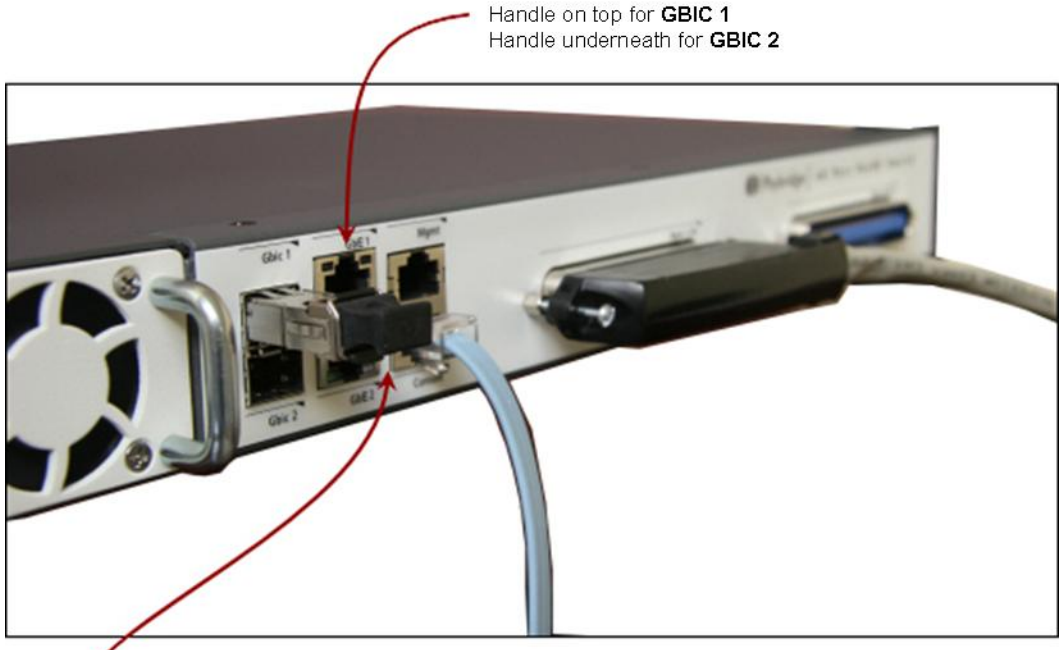
INSTALLING THE SFP TRANSCEIVER MODULES

To install an SFP module:

1. Remove the SFP module from its protective packaging, but DO NOT remove the black protective cap. Small particles of dust can interfere with proper operation of the SFP module.



2. Open the locking mechanism on the SFP module by temporarily removing the black dust cap; pull the locking mechanism downward and reinstall the black dust cap. When open, the locking mechanism can be used as a handle for inserting or removing the SFP module.
3. Determine which **GBIC** port the SFP module will be installed into.
   - For the upper port, **GBIC 1**, position the SFP module so that its handle is at the top, facing up.
   - For the lower port, **GBIC 2**, the SFP module must be turned upside down, with its handle at the bottom.



Install the SFP module into port **GBIC** 1 or **GBIC 2**.

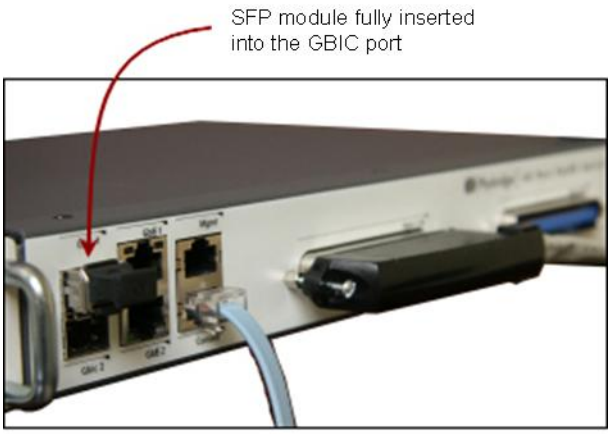
CAUTION: DO NOT remove the protective cap until you are ready to insert the fiber optic cable.

4. Align the SFP module in front of the desired **GBIC** port slot, and slide the module all the way in.

Note: When fully inserted, the SFP module extends slightly from the GBIC port.

5. Flip the locking mechanism up and over the black cap, pushing it back until it clicks into place.

CAUTION: DO NOT remove the black cap until you are ready to insert the fiber optic cable.



To remove an SFP module:

1. If required, remove the fiber optic cable from the SFP module.
2. Unlock the SPF module:
   - If the SFP module is in port **GBIC 1**, flip the handle down to unlock the module.
   - If the SFP module is in port **GBIC 2**, flip the handle up.
3. If required, remove the protective cap from the end of the SFP module.

WARNING: DO NOT LOOK INTO THE SFP CONNECTOR WHEN IT IS INSTALLED IN A GBIC PORT, AS THE LASER BEAM CAN CAUSE SERIOUS EYE INJURY.

4. Slide the SFP module out of the **GBIC** port, using its handle.

Note: The SFP module cannot be removed from the port if its protective cap is on.

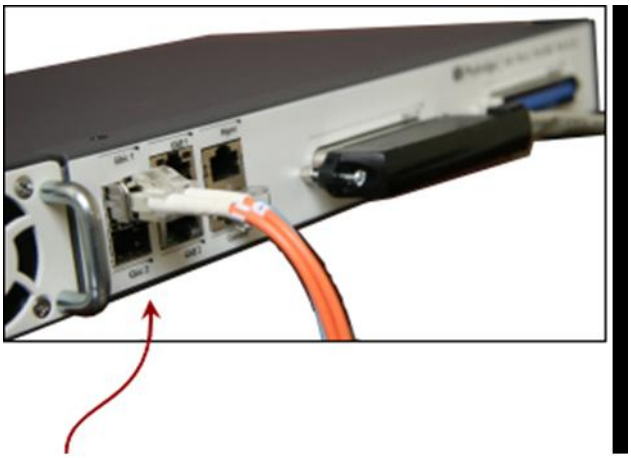
INSTALLING THE FIBER OPTIC CABLE

To connect the StreamLine unit to the uplink network switch or IP PBX using a fiber optic cable:

1. Remove the black protective cap from the SFP transceiver module.

WARNING: DO NOT LOOK INTO THE SFP CONNECTOR WHEN IT IS INSTALLED IN A GBIC PORT, AS THE LASER BEAM CAN CAUSE SERIOUS EYE INJURY.

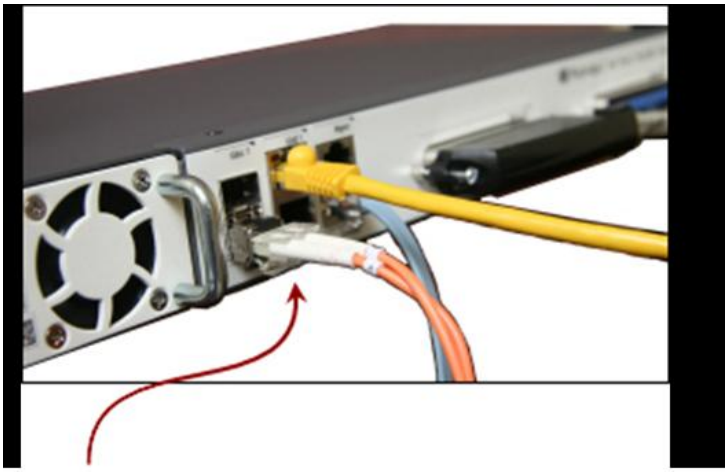
2. Connect your fiber optic cable to port **GBIC 1** or **GBIC 2** on the front panel of the StreamLine switch.



Insert fiber optic cable into port **GBIC 1** or **GBIC 2**.

Note: Both ports can be used. If only one connection will be installed, use the port labeled GbE 1.

CAUTION: If you have already installed a copper LAN cable in port GbE 1 to the right, you must connect the fiber optic cable to port GBIC 2. Likewise, if port GbE 2 has been deployed, the fiber optic cable must go in port GBIC 1. Otherwise, the GbE port will not work.



Fiber optic must go into **GBIC** 2 if port **GbE 1** is deployed.

Note: Observe the fiber optic cable manufacturer's recommendations on the maximum allowable bend radius when installing and dressing fiber optic cables.

CONNECTING TO POWER

-

CAUTION: To avoid possible damage to either the StreamLine switch or the IP end points, DO NOT POWER UP the StreamLine switch until all wiring has been completed and all IP end points are connected.

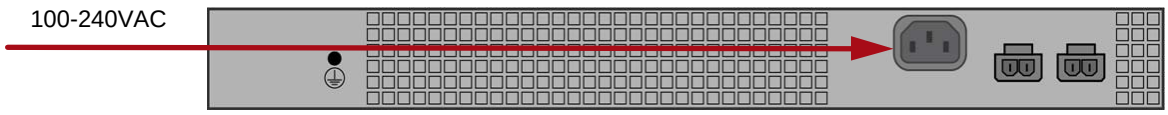
-

CAUTION: Once the StreamLine switch has been installed, and if it is necessary to make any wiring changes (Moves, Adds or Changes); the StreamLine switch SHOULD BE powered down.

Wiring changes at cross-connect panels MUST ALWAYS be performed with the StreamLine switch powered down, NEVER work on a cross-connect panel with live wires.

The Mitel StreamLine is powered through an AC Connection (see next section). If more than one StreamLine switch is being installed, then the switches can be configured to support power supply redundancy. This requires multiple Mitel StreamLine units to be installed in a standard 48cm (19”) equipment rack and the power supplies to be daisy chained. For details, refer to *Daisy-chaining Mitel StreamLine on page 42*.

AC CONNECTION



Connect to AC power inlet at the rear.

To connect the Mitel StreamLine to an AC power source:

1. Ensure that the power supply unit is fully inserted into its slot, and that its thumbscrew at the front is well tightened.
2. Connect the AC power cord to the AC power inlet located at the rear of the unit.
3. Plug the other end of the power cord into an AC power outlet (100-240 VAC, 50/60 Hz) with a protective earthing connection in good condition. For reliability purposes it is recommended that the StreamLine be powered from a dedicated mains outlet.

WARNING: ENSURE THAT THE UNIT IS INDEPENDENTLY GROUNDED WITH A WIRE FROM GROUND SECURELY ATTACHED TO THE GROUND LUG AT THE REAR OF THE UNIT. ESD PROCEDURE, PAGE 26.

Note: The unit will power up immediately and begin system status verification.

BACK UP POWER

In some circumstances maintaining phone operation during an AC power outage is an important customer requirement.

There are a number of things the Administrator can do regarding powering schemes to enhance system availability, such as:

- Make use of the StreamLine power supply sharing capabilities if deploying multiple StreamLine switches
- Ensure that each StreamLine switch is connected to a dedicated AC circuit
- Avoid plugging multiple StreamLine switches into the same AC power source
- Consider deploying an Uninterruptable Power Supply (UPS) with sufficient capacity to power the StreamLine switches (and in turn the phones), the IP PBX, and any necessary L2 switches and routers for the length of time that the customer requires to maintain phone functionality during an AC power outage.

The StreamLine Power Calculator Tool can be used to determine overall power requirements. This document is available on Mitel Online.

UPSS

UPSs can range from simple local battery units to larger central installations that include backup generators.

Consider the following factors to determine the type of unit to use:

- The power to be drawn by attached units
- The power output of the UPS, and its efficiency with battery capability
- The time the UPS must supply power
- The size of the unit.

Worked example:

Consider a small installation with a LAN switch and some powered phones. The LAN switch draws 100 W and 16 attached phones draw 8 W each. The UPS has a 12 V battery rated at 55 AH and runs at 70% efficiency. How long can this combination be powered?

- The output power available is 462 VAH (volt-amperes hour) (55 x 12 x 70%).
- The consumption is 228 VA (100 W + 16 x 8 W).
- The time available is 2 hours or 462 VAH / 228 VA.

America Power Conversion (APC) is a company that designs and sells UPS systems. Some useful calculations can also be found at the APC web site:

http://www.apc.com/tools/ups_selector/index.cfm

Mitel products are listed under “VoIP Solutions.” (Although information appeared correct when this publication was written, Mitel cannot take responsibility for incorrect information entered or supplied from this tool.)

MULTIPLE UNIT CONFIGURATIONS

Multiple Mitel StreamLine units can be installed together in the same equipment rack for power and load sharing between multiple Mitel StreamLine units. A fully redundant ring can be created, providing redundant power to any unit that has a power failure.

DAISY-CHAINING MITEL STREAMLINE UNITS FOR POWER SUPPLY REDUNDANCY

Up to four Mitel StreamLine power supply units can be daisy-chained together for power supply redundancy. They are connected in a ring using the DC In/Out connectors at the rear of the unit. If a power fault occurs on any unit in the ring, the others are able to share the load, and the affected unit continues to function normally.

CAUTION: StreamLine power supply redundancy is intended to keep all the StreamLine switches in a redundant power ring operating in the event that a single power supply fails. If a power supply fails in any of the StreamLine switches, replace the affected power supply as soon as possible.

The illustration on the next page shows how multiple Mitel StreamLine units can be interconnected using the two DC In/Out connectors at the rear of each unit. Apply this illustration to your particular environment before continuing with the procedure that follows the illustration.

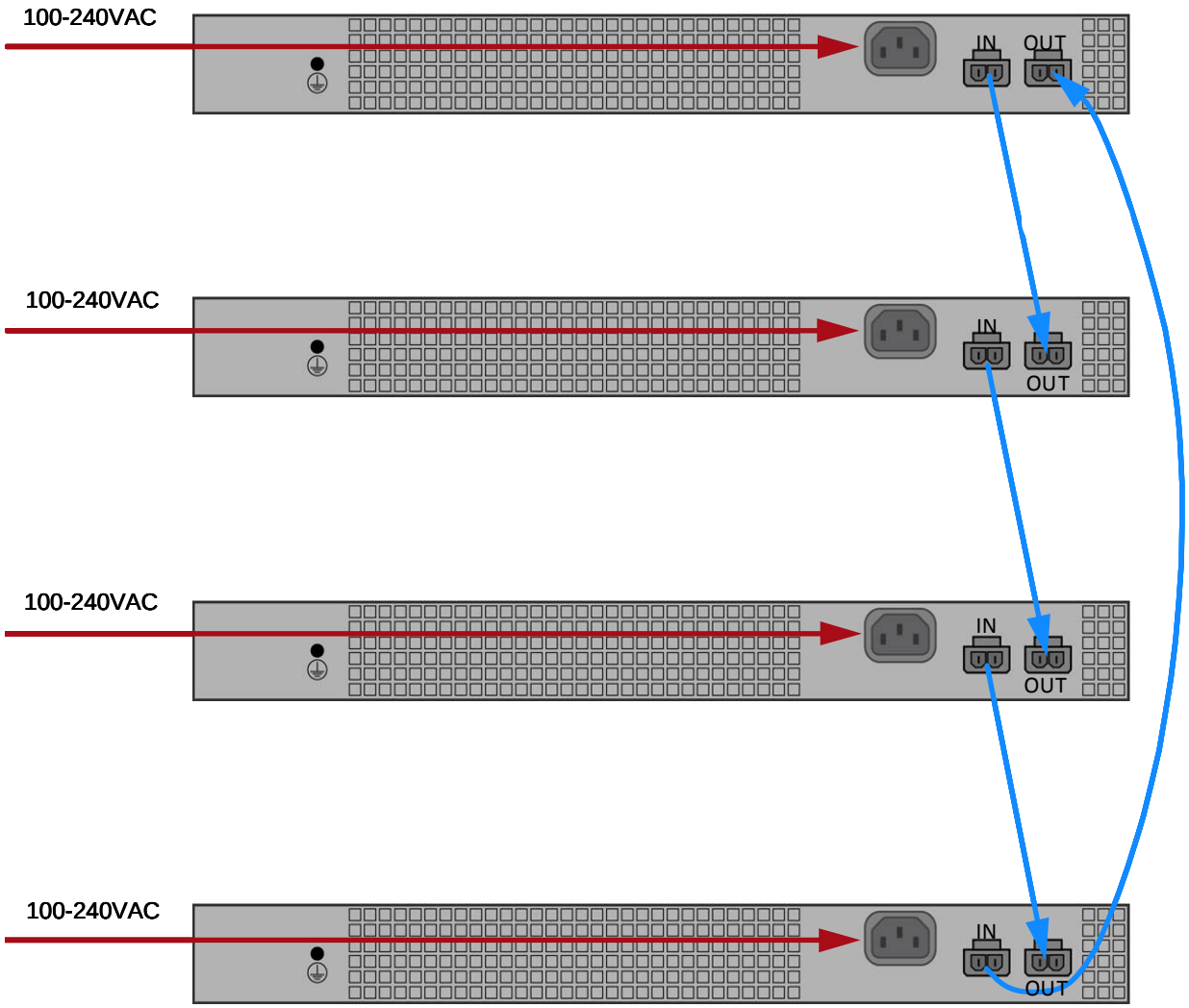
Note: This procedure requires that you have the following on hand:

The additional Mitel StreamLine units and their accessories, including the DC cables.

At least one unit must be powered with an AC connection. Typically, all units are AC powered before you begin.

Daisy-chaining Mitel StreamLine Switch for power supply redundancy

- Connect DC input (left) on one unit to DC output (right) on the next.
- For a fully redundant ring, connect DC input on bottom unit to DC output on top unit.
- AC connected on all units.



To daisy-chain multiple Mitel StreamLine Units for power supply redundancy:

1. Mount all Mitel StreamLine units in the same equipment rack, with no more than 1U space between any two units. Refer to Installing the Unit in a Rack

Note: You can daisy-chain the units together while they are up and running or power them up afterward.

2. Facing the rear of the units, install the DC cables as follows:

Note: To fit properly, the DC cable must be inserted into the DC input/output connector with its hairpin clip on top.

- For the top unit, insert the first cable into the DC input connector on the left until it clicks into place. Bring the other end of the cable down to the next unit, and connect to the DC output connector on the right.
- Continue in the same way for each pair of units, connecting the DC input (left) connector on the upper unit to the DC output (right) connector on the lower unit.
- **Important**: For the bottom unit, the last cable from the DC input (left) connector goes up to the DC output (right) connector on the top unit. This is required to create a fully redundant ring.

Note: If you need to move a cable to a different DC connector on the Mitel StreamLine, press the hairpin clip at the top of the DC cable and pull the cable out.

REPLACING THE POWER SUPPLY UNIT

If a power supply unit fails, you must replace it with a new power supply unit as soon as possible. If 2 or more daisy-chained units are up and running, you can hot swap the PSU on one of them without bringing the system down.

CAUTION: The following procedure should be carried out only if you have a spare PSU to replace the failed PSU. Spare PSUs, part number 50006601, can be purchased from Mitel Networks Corporation.

Note: The power supply unit is removed and replaced from the front of the Mitel StreamLine switch.

To remove the power supply unit:

1. Loosen the thumbscrew on the left side of the power supply unit.
2. Pull the power supply unit out from its housing using the handle on the right side.

CAUTION: Do not lift the Mitel StreamLine using the handle on the power supply unit. This handle is intended for removing and replacing the PSU only.

To replace the power supply unit:

1. Remove the new power supply unit from its packaging, and align it so that its front panel is facing you, with the handle on the right side.

2. Lift the new power supply unit by its handle, and slide it straight into the PSU housing on the left side of the Mitel StreamLine switch.
3. Push firmly on the power supply unit to insert its connector securely at the rear of the Mitel StreamLine.
4. Tighten the thumbscrew on the left side of the power supply unit. It should be finger tight only. **Do not use a tool to tighten it.**

STREAMLINE 8-PORT SWITCH

The StreamLine 8-Port switch is an unmanaged switch; installation is relatively straight forward, for details refer to the StreamLine 8-Port Quick Install Guide.

BEFORE YOU INSTALL

WARNING: The Mitel StreamLine 8-Port switch can be installed in any indoor location in all countries except Finland, Norway and Sweden. In Finland, Norway and Sweden the StreamLine MUST BE INSTALLED IN A RESTRICTED ACCESS LOCATION.

PHYSICAL LOCATION REQUIREMENTS

Power

The Mitel StreamLine 8-Port switch must be placed within 1.8 m (6ft) of an available AC power source. Do not use an extension cord to connect the equipment to a power outlet.

Note: It is recommended that the Streamline Switch be powered from a dedicated power outlet. If the power outlet is used to power additional equipment and this additional equipment should cause the branch circuit breaker to trip, then all users connected to this StreamLine switch will lose service.

Ventilation

To ensure proper ventilation of the Mitel StreamLine, leave at least 5 cm (2”) of unobstructed space on all sides of the unit. Refer also to *Operating and* Storage Environment*, page 5*.

Downlink

The StreamLine Dongles can be installed up to 365 m (1,200ft) away from the Mitel StreamLine switch.

WIRING PLANT REQUIREMENTS

A site survey and an examination of the existing wiring plant needs to be conducted prior to installing the StreamLine 8-Port switch. You should have access to a Time Domain Reflectometer (TDR) for analyzing the wiring plant. For details, refer to the Customer Site Survey document and Appendix A, Verifying the Wiring Plant, within this document.

WHAT YOU WILL NEED

Installation procedures will be trouble-free if you ensure that the following items are available before you begin:

- The StreamLine 8-Port switch, and all cables and accessories you received in the StreamLine package.
- All Dongles required for connecting the IP endpoint devices, provided with the product package according to the quantity ordered.
- Standard CAT-5e copper LAN cables for the uplink trunks (user - supplied).

- Standard CAT-3 or better, alternately CW1308 24 AWG, for the downlink ports (user-supplied).

UPLINK PORTS

The StreamLine 8-Port switch has two Uplink ports located on the front panel. Both of these ports are 10/100 Mb/s Ethernet ports; CAT-5 cable should be used to make the connection to these ports.

Uplink Port 1 is to be used to connect the StreamLine switch to the IP PBX, network switch or router.

When more than 8 downlink ports are required, a second StreamLine 8-Port switch can be added to expand the total downlink port count to 16 ports. To accomplish this, Uplink Port 1 on the StreamLine switch being used for expansion should be connected to Uplink Port 2 on the Streamline switch that is connected to the IP PBX; use a CAT-5 cable to make this connection.

WARNING: Only one Uplink port should be connected to the IP PBX or network switch/router. The StreamLine 8-Port switch Uplink ports do not support STP or RSTP, as a result they cannot be used to implement redundant uplink network connections.

Connecting more than one StreamLine uplink port to the network will cause a network loop to be introduced and the network behavior will be severely affected.

Chapter 4 TECHNICAL SPECIFICATIONS

MITEL STREAMLINE SWITCHES

Table 1: Mitel StreamLine Model 24-Port and 48-Port Model Technical Specifications

Description		Specification
Models		24-Port: Can drive up to 24 StreamLine Dongles 48-Port: Can drive up to 48 StreamLine Dongles
Dimensions		19 inches x 1U Without rack ears: 4.45cm x 43.5cm x 25.2 cm (HxWxD) [1.75” x 17.13” x 9.92” (HxWxD)]
Weight		3.61 kg (7.96 lb.)
Enclosure Material		Aluminum
Mounting		Standalone or rack or shelf-mountable 2 brackets included for installation
Processor		Broadcom BCM56018 switch processor, 266MHz
Memory		32MB FLASH 64MB DDR SDRAM
Interfaces:	Downlink (PoE and IP to adapter)	Model 24-Port: 1 RJ21 male Telco connector (standard), 24 pairs used Model 48-Port: 2 RJ21 male Telco connectors (standard), 48 pairs used Maximum distance: 365 m (1,200ft), 24 AWG, CAT-3 UTP or better and CW1308 cabling Speed: 10Mb/s (full duplex) PoE power: 10 Watts
	Ethernet uplink	Maximum 2 uplinks, each 1Gb/s (full duplex) **Copper**: 2 RJ45 ports: 10/100/1000 Base-T autosensing, independent speed selection, Ethernet IEEE 802.3, CAT-5e copper cable **Fiber**: 2 Ethernet IEEE 802.3z compliant Small Form Factor sockets that accept optical transceivers allowing uplink connections ranging from 550 m (1,804ft) to 5 km (16,404ft)
	Management	1 LAN port (MGMT): RJ45, 10/100 Base-T autosensing, IEEE 802.3 1 UART console port: RJ45 to DB9 cable.
Power supply		Hot-Swappable Power Supply Unit Input Power: 100-240 VAC, 50/60 Hz (Autosensing) Output Power: 500W max at 100 VAC Input 1000W max at 240 VAC Input

Table 1: Mitel StreamLine Model 24-Port and 48-Port Model Technical Specifications

Description	Specification
Power consumption (Does not Include PoE)	Model 24-Port 16.5W Model 48-Port 22W
Power injection (PoE)	DC voltage: -54VDC Endpoint devices must be compliant with IEEE 802.3af
Power load sharing	2 male connectors (rear), DC IN and DC OUT: -52VDC
Fans	2 on Unit, 2 on power supply unit
Operating temperature	-10°C to 50°C (14°F to 122°F)
Storage Temperature	-25°C to 70°C (-13°F to 158°F)
Humidity	10% to 95% (non-condensing) at 35°C (95°F)
BTU	Model 24-Port: 61 BTU per hour Model 48-Port: 81 BTU per hour
MTBF	50,000 hours (24 Port and 48 Port) and 10 years (Power Supply Unit)

Mitel StreamLine Dongle Model Technical Specifications

Description		Specification
Dimensions		1.8cm x 2.8cm x 6.5cm (HxWxD); 0.71” x 1.1” x 2.56” (HxWxD)
Weight		22 g (0.78 oz.)
Enclosure		ABS (AF-312B)
Mounting		Inline between the CAT-5e cable (to IP endpoint) and the CAT-3/CW1308 cable[1] (to RJ11 jack)
Interfaces	Mitel StreamLine side:	1 RJ11 port: CAT-3/CW1308 unshielded single twisted pair cable. Between the wall plate and adapter, you can reuse the existing silver satin when doing a DNIC/POTS displacement. BT wall plate connectors may require optional BT Adapter Cables.
	Ethernet side: for IP endpoint device	1 RJ45 port: 10/100 Base-T autosensing, IEEE 802.3af 10 Mb connection to IP end device
Power injection (PoE)		DC voltage on RJ45 port: -54V max -37V when 365 m (1,200ft) away from Mitel StreamLine Powers Class 1, Class 2 and some Class 3 IEEE 802.3af compliant IP devices
Power consumption		900 mW
Operating temperature		0°C to 40°C (0°F to 104°F)
Storage Temperature		-25°C to 70°C (-13°F to 158°F)
Humidity		10% to 95% (non-condensing) at 35°C (95°F)

[1] StreamLine is supported on CAT-3 or better, and CW1308 cabling of up to 365 m (1,200ft). For more technical details, please consult the StreamLine Site Survey document available at "www.mitel.com/molstreamline".

Mitel StreamLine 8-Port Model Technical Specifications

Description	Specification
Dimensions	4.5 cm x 17.8 cm x 12 cm (HxWxD) 1.77” x 7.01” x 4.72” (HxWxD)
Weight	0.308 kg (0.679 lbs.)
Interface: Uplink Port 1 - Ethernet Uplink Port	1 RJ45 port: 10/100 Base-T, auto-sensing, Ethernet IEEE 802.3, used to provide an Uplink connection to the IP PBX or network switch. CAT-5 cabling should be used.
Interface: Uplink Port 2 - Ethernet Expansion Port	1 RJ45 port: 10/100 Base-T, auto-sensing, Ethernet IEEE 802.3, used to provide connectivity to a second StreamLine 8-Port switch when more than 8 downlink ports are required. Connect this Port to Uplink Port 1 on the second StreamLine 8-Port switch. CAT-5 cabling should be used.
Interface: Downlink Ports 1-8 (PoE and IP to adapter)	8 x RJ11 Jacks Maximum distance: 365 m (1200') 24 AWG, CAT-3 UTP or better and CW1308 cabling Speed: 10 Watts maximum at PD. PoE power: 10 Watts
Power supply Input Requirements	48 VDC @ 2 Amps
Power consumption	2.9W (StreamLine unit only, Dongle and IP Phone power is not included)
Power injection (PoE)	48VDC Endpoint devices must be compliant with IEEE 802.3af IEEE 802.3af Class 1, Class 2 and some Class 3 devices are supported. PD power consumption must not exceed 10 watts.
Operating temperature	-10° C to 45° C (14°F to 114°F)
Humidity	10% to 95% (non-condensing) at 35° C (95° F)

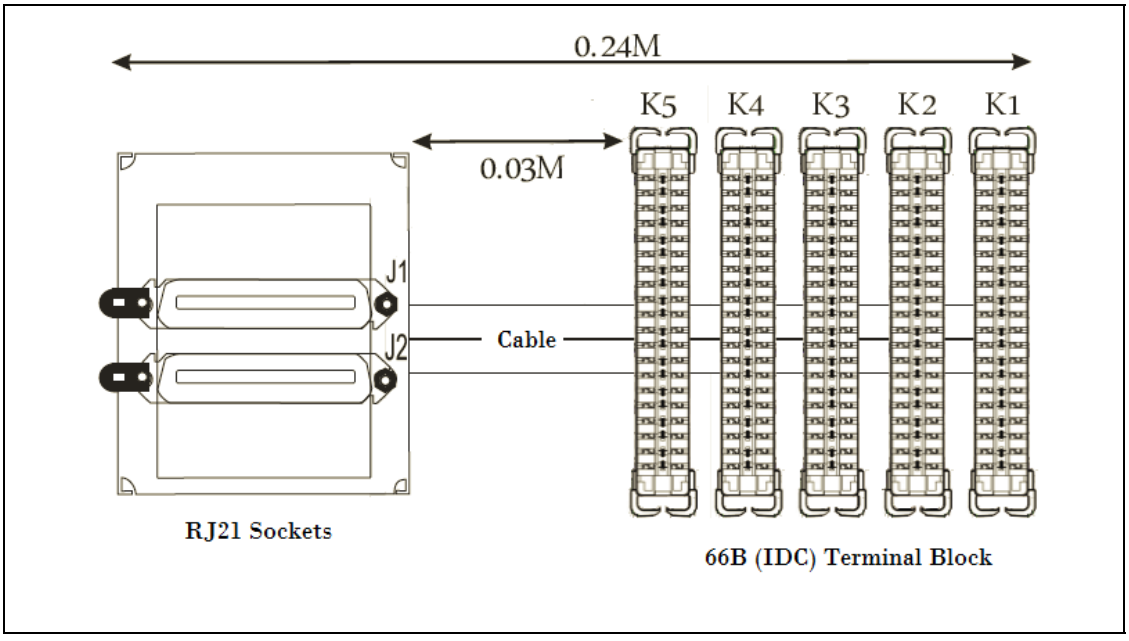
MITEL WIRING HARNESSES

Wiring harnesses are referenced as a convenience. They are industry standard telecom accessories and their usage is optional for the StreamLine solution.

Wiring harnesses and Amphenol cables of various port capacities and lengths are available from Mitel for connecting the StreamLine switch to the customer premises wiring.

PART NUMBER	DESCRIPTION
51300751	50-port Wiring Harness, 5 IDC strips with 50 ports wired and a two connector socket. Wall mountable (hardware not included).
51300752	100-port Wiring Harness, 10 IDC strips with 100 ports wired and four connector sockets. Wall mountable (hardware not included).
51300753	200-port wiring harness, 20 IDC strips with 200 ports wired and eight connector sockets. Wall mountable (hardware not included).
51300754	5m male to female system cable. Connects the StreamLine unit to the System Harness, Patch Panel, or other customer wiring solution. Two cables would be required for the StreamLine 48-port unit.
51300836	10m male to female system cable. Connects the StreamLine unit to the Wiring Harness, Patch Panel, or other customer wiring solution. Two cables required for the StreamLine 48-port unit.
51300837	15m male to female system cable. Connects the StreamLine unit to the Wiring Harness, Patch Panel, or other customer wiring solution. Two cables required for the StreamLine 48-port unit.

50-PORT WIRING HARNESS



Terminal Block Pinouts (50-port Wiring Harness)

K5	Telco	Telco connector	Color	K4	Telco	Telco connector	Color	K3	Telco	Telco connector	Color	K2	Telco	Telco connector	Color	K1	Telco	Telco connector	Color
1A	16		Blue/Yellow	1A	6		Blue/Red	1A	21		Blue/Violet	1A	11		Blue/Black	1A	1		Blue/White
1B	41		Yellow/Blue	1B	31		Red/Blue	1B	46		Violet/Blue	1B	36		Black/Blue	1B	26		White/Blue
2A	17		Orange/Yellow	2A	7		Orange/Red	2A	22		Orange/Violet	2A	12		Orange/Black	2A	2		Orange/White
2B	42		Yellow/Orange	2B	32		Red/Orange	2B	47		Violet/Orange	2B	37		Black/Orange	2B	27		White/Orange
3A	18		Green/Yellow	3A	8		Green/Red	3A	23		Green/Violet	3A	13		Green/Black	3A	3		Green/White
3B	43		Yellow/Green	3B	33		Red/Green	3B	48	J1	Violet/Green	3B	38		Black/Green	3B	28		White/Green
4A	19		Brown/Yellow	4A	9		Brown/Red	4A	24		Brown/Violet	4A	14		Brown/Black	4A	4		Brown/White
4B	44		Yellow/Brown	4B	34		Red/Brown	4B	49		Violet/Brown	4B	39		Black/Brown	4B	29		White/Brown
5A	20		Grey/Yellow	5A	10		Grey/Red	5A	25		Grey/Violet	5A	15		Grey/Black	5A	5		Grey/White
5B	45		Yellow/Grey	5B	35		Red/Grey	5B	50		Violet/Grey	5B	40		Black/ Grey	5B	30		White/Grey
6A	21	J2	Blue/Violet	6A	11	J2	Blue/Black	6A	1		Blue/White	6A	16	J1	Blue/Yellow	6A	16	J1	Blue/Red
6B	46		Violet/Blue	6B	36		Black/Blue	6B	26		White/Blue	6B	41		Yellow/Blue	6B	31		Red/Blue
7A	22		Orange/Violet	7A	12		Orange/Black	7A	2		Orange/White	7A	17		Orange/Yellow	7A	7		Orange/Red
7B	47		Violet/Orange	7B	37		Black/Orange	7B	27		White/Orange	7B	42		Yellow/Orange	7B	32		Red/Orange
8A	23		Green/Violet	8A	13		Green/Black	8A	3		Green/White	8A	18		Green/Yellow	8A	8		Green/Red
8B	48		Violet / Green	8B	38		Black / Green	8B	28	J2	White /Green	8B	43		Yellow/Green	8B	33		Red/Green
9A	24		Brown /Violet	9A	14		Brown /Black	9A	4		Brown /White	9A	19		Brown/Yellow	9A	9		Brown/Red
9B	49		Violet/ Brown	9B	39		Black /Brown	9B	29		White / Brown	9B	44		Yellow /Brown	9B	34		Red/Brown
0A	25		Grey/Violet	0A	15		Grey /Black	0A	5		Grey /White	0A	20		Grey /Yellow	0A	10		Grey/Red
0B	50		Violet/Grey	0B	40		Black / Grey	0B	30		White /Grey	0B	45		Yellow /Grey	0B	35		Red/Grey

Appendix A VERIFYING WIRING AND CABLING

VERIFYING THE WIRING PLANT

This Appendix is intended to be used by the field technician/engineer who is conducting the wiring plant site survey. The wiring plant evaluation should be done prior to installing the StreamLine switch into the customer's network.

STREAMLINE 24-PORT AND 48-PORT SWITCHES UPLINK PORTS

The Streamline 24-Port and 48-Port switches have two 1000 Base-T (1 Gb/s) Ethernet copper uplink ports and two Small Form Factor (SFF) GBIC sockets that can support two 1000 Base-T Small Form Factor Pluggable (SFP) fiber optic transceivers.

These ports are used to connect the StreamLine 24-Port or 48-Port switches to the IP PBX. They carry an aggregate of all the data being carried by the downlink ports.

Note: If more than one uplink port is going to be used, it will be imperative that the customer's network is designed for running the Rapid Spanning Tree Protocol (RSTP) and that the RSTP is configured correctly and enabled on the StreamLine Switch.

1000 Base-T Fiber Connections:

If the customer site already has fiber cabling in place, the installer will need to purchase the correct IEEE 802.3z Small Form Factor Pluggable (SFP) transceivers to work with the existing type of fiber.

If the site does not have existing fiber optic cable, the installer will need to determine what distances the uplinks need to cover and purchase the correct fiber and the correct IEEE 802.3z SFP transceivers.

The installer should use an appropriate fiber qualification tester to verify that the fiber uplink connections are compliant.

1000 Base-T Copper Connections:

The 1000 Base-T (gigabit Ethernet) ports are designed to run over a CAT-5e or CAT-6 compliant connection.

The installer should use a product such as the Fluke Networks Cable IQ Qualification Tester to verify that the uplink connections are CAT-5e or CAT-6 compliant.

STREAMLINE 8-PORT SWITCH UPLINK PORTS

The 100 Base-T (Fast Ethernet) ports are designed to run over a CAT-5 compliant connection.

The installer should use a product such as the Fluke Networks Cable IQ Qualification Tester to verify that the uplink connections are CAT-5 compliant.

ALL STREAMLINE SWITCHES DOWNLINK PORTS

The downlink ports on all Streamline Switches are designed to provide 10Mb/s full duplex data connectivity and Power over Ethernet to IEEE 802.3af compliant IP phones or IP appliances over a number of different types of wiring plants. The different types of wiring plants are:

- CAT-3 or CAT-5 compliant wiring plants (using just 2 wires). Note that to be truly CAT-3 or CAT-5 compliant the wiring plant must not exceed 100 m (328ft) in length.
- CAT-3 or CAT-5 wiring plants (using just 2 wires) that are complaint. The one exception being that the wiring plant exceeds 100 m (328ft) in length, but does not exceed 365 m (1,200ft) in length.
- A CW-1308 wiring plant (using just 2 wires) that does not exceed 365 m (1,200ft) in length.

Unlike conventional Ethernet switches, the Streamline Switch downlink ports operate over a single pair of wires and distances of up to 365 m (1,200ft) are supported.

For correct operation there are a few restrictions that must be observed:

- The wiring must fall into one of the wiring plant categories described above.
- To support a distance of 365 m (1,200ft) the wire gauge must be 24 AWG.
  If using 26 AWG, the maximum distance will be reduced.
- There can be no bridge taps, the connection must be point to point with no secondary connections.

  On a connection between point ‘A’ and point ‘B’, a bridge tap is a length of cable that may have previously gone to point ‘C’. It is likely un-terminated as it is no longer in use; it is usually a left-over from a previous cabling configuration. A bridge tap will introduce an impedance mismatch on the transmission line and it will cause undesired transmission effects.
- The StreamLine switches can provide a maximum of 10 watts of power to an IP end point (PD). This means that All IEEE 802.3af Class 1 and Class 2 devices and some Class 3 devices can be powered via PoE from the StreamLine switch. However, Class 3 devices that require more than 10 watts are not supported.

VERIFYING THE CABLING PLANT

To verify the suitability of the wiring plant, the installer will require some specific tools.

Devices such as the Fluke Network Cable IQ Qualification Tester or the XFTP/Trilithic Wild Cat Ethernet Cable Tester will be required to determine if a cabling plant is CAT-3, CAT-5, CAT-5e or CAT-6 compliant.

However, if the length of the cabling plant exceeds the tester’s length capabilities, the installer may need to go to an intermediate distribution frame and break the segment into shorter sections that meet the tester’s capabilities. This would allow the installer to verify each segment individually. The Fluke unit works out to a distance of 100 m (328ft) and the Wild Cat tester works out to a distance of 176 m (577ft). Check the test equipment vendor’s data sheet to determine the tester’s capabilities.

To determine the total length of a cable plant that is longer than 100 m (328ft), the installer will need a tool that can measure cables that are significantly longer than 100 meters. The installer should use a tool such as the XFTP/Trilithic TDR 2040 which works out to a distance of 762 m (2,500ft) or Fluke’s TS 100 Pro which works out to a distance of 975 m (3,200ft). Both of these

tools can also check the cable for the presence of bridge taps. If bridge taps are detected, the tool will indicate how many feet or meters down the cable the bridge is located.

Tools such as these can verify that the overall cable length does not exceed 365 m (1,200ft) and also be used to determine if there are any bridge taps present, and if so, where the bridge taps are located.

When selecting a tester, look for a unit that can detect voltages and one that can also act as a toner; these are very useful features.

The tool should also allow the installer the option of calibrating the tool for a specific type of cable in case the cable’s transmission characteristics are not available in the tester's cable data base.

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Appendix B ACRONYMS AND ABBREVIATIONS

ACRONYMS AND ABBREVIATIONS

ACRONYM/ ABBREVIATION	DEFINITION
AC	Alternating Current
CLI	Command Line Interface
DC	Direct Current
GUI	Graphical User Interface
IP	Internet Protocol
IPT	IP Telephony
LED	Light Emitting Diode
NMS	Network Management System
OAM&P	Operations, Administration, Maintenance and Provisioning
PoE	Power over Ethernet
PSE	Power Sourcing Equipment
PSU	Power Supply Unit
RAM	Random Access Memory
SFP	Small Form-factor Pluggable
SNMP	Simple Network Management Protocol

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