

# 1 OmniAccess 408

## Introduction

The OmniAccess 408 family of switches provides multiservice access to an ATM backbone. They are designed to connect branch offices to the main office ATM network. The OmniAccess 408 supports Ethernet LAN connections that feed into an ATM uplink.

The OmniAccess 408 is an ATM capable WAN Switch-Access device. It consists of four models, each one providing:

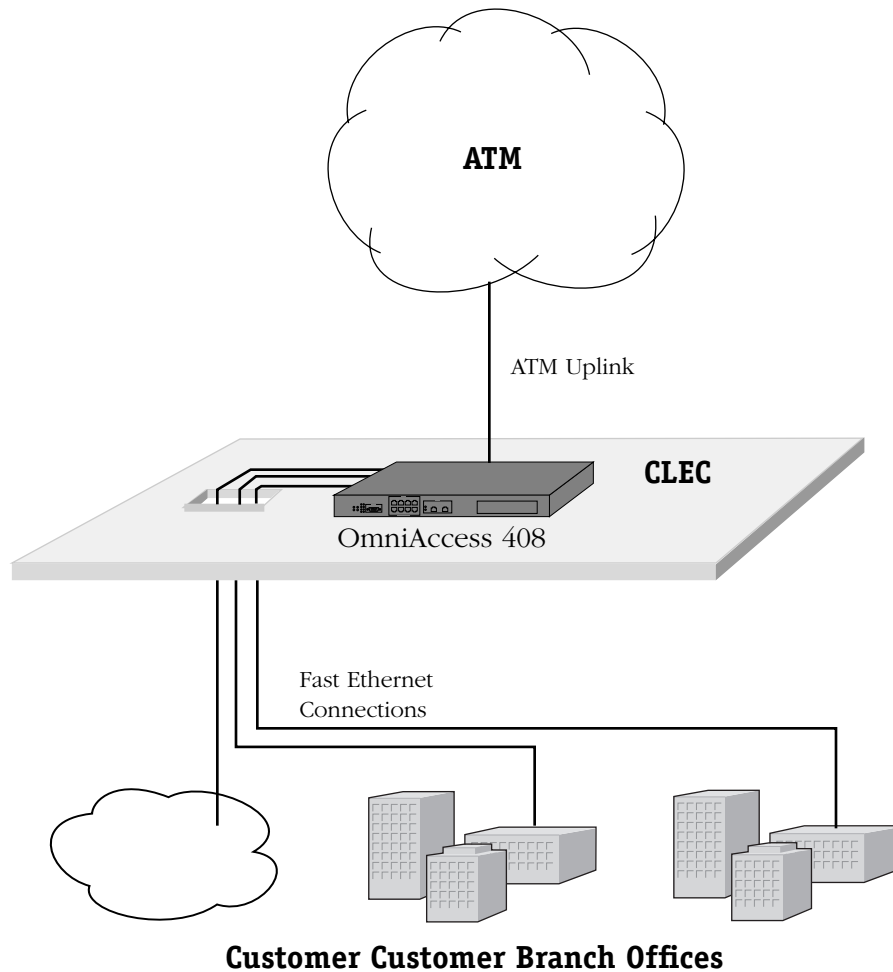
- 8 ports of 10/100 Ethernet switching with full Alcatel VLAN support.
- 2 T1 or E1 circuit emulation access ports
- 2 serial circuit emulation access ports
- An ATM uplink

The ATM uplink can be single port T1/E1 Inverse Multiplexing over ATM (IMA), four port T1/E1 IMA, DS3/E3, or OC-3.

The OmniAccess 408 family of products provides an “edge of the ATM network” connectivity solution.

## Application Example

The OmniAccess is intended to be used as a carrier managed device at the edge of a customer ATM network. The following diagram illustrates this idea:



In this example, three customer branch offices feed into the OmniAccess 408 using a fast Ethernet connection. The Local Exchange Carrier (CLEC) manages the switch at its office, which feeds into the ATM backbone with an ATM uplink. The uplink could be T1 IMA, DS3, or OC-3, depending on what flavor of the switch is used.

# OmniAccess 408 Hardware Options

The OmniAccess™ 408 family is a group of stackable switches that offers multiservice access to an ATM backbone.

## ◆ Note ◆

For information on the OmniAccess 512 switch, which offers multiservice access to an enterprise (WAN) backbone, please refer to the separate *OmniAccess 512 User Manual*.

## OmniAccess 408 Configurations

In addition to providing multiservice access to an ATM backbone, the OmniAccess 408 (OA-408) supports Transparent LAN Services (TLS) and Internet services for LAN ports, as well as circuit emulation services for T1, E1 and serial ports.

The OA-408 offers the following factory-installed chassis configurations:

- OA-408-IMA-DS1/E1 (8) 10/100 Ethernet ports, (2) T1/E1 circuit emulation ports, (2) universal serial circuit emulation ports, (4) DS1/E1 IMA uplink ports
- OA-408-155FM-T1/E1 (8) 10/100 Ethernet ports, (2) T1/E1 circuit emulation ports, (2) universal serial circuit emulation ports, (1) 155 Mbps multimode fiber uplink port
- OA-408-155FS-T1/E1 (8) 10/100 Ethernet ports, (2) T1/E1 circuit emulation ports, (2) universal serial circuit emulation ports, (1) 155 Mbps single mode fiber uplink port
- OA-408-155RFS-T1/E1 (8) 10/100 Ethernet ports, (2) T1/E1 circuit emulation ports, (2) universal serial circuit emulation ports, (1) primary 155 Mbps single mode fiber uplink port, (1) backup 155 Mbps single mode fiber uplink port
- OA-408-155FSH-T1/E1 (8) 10/100 Ethernet ports, (2) T1/E1 circuit emulation ports, (2) universal serial circuit emulation ports, (1) long-haul 155 Mbps single mode fiber uplink port
- OA-408-155RFSH-T1/E1 (8) 10/100 Ethernet ports, (2) T1/E1 circuit emulation ports, (2) universal serial circuit emulation ports, (1) primary long-haul 155 Mbps single mode fiber uplink port, (1) backup long-haul 155 Mbps single mode fiber port
- OA-408-DS3/E3 (8) 10/100 Ethernet ports, (2) T1/E1 circuit emulation ports, (2) universal serial circuit emulation ports, (1) DS3/E3 uplink port

## ◆ Important Note ◆

OmniAccess switches do not support the Alcatel Backup Power System (BPS) or Hardware Routing Engine (HRE).



# OmniAccess 408 Slot Designations

The front panel of an OA-408 switch is divided into several areas labeled **10/100**, **CIRCUIT EMULATION**, **ATM-155**, etc. Conceptually, think of these areas as a division of the switch into several modules, or slots. The User Interface and Command Line Interface, which are used to configure the switch, rely on these slot designations for many configuration and management commands.

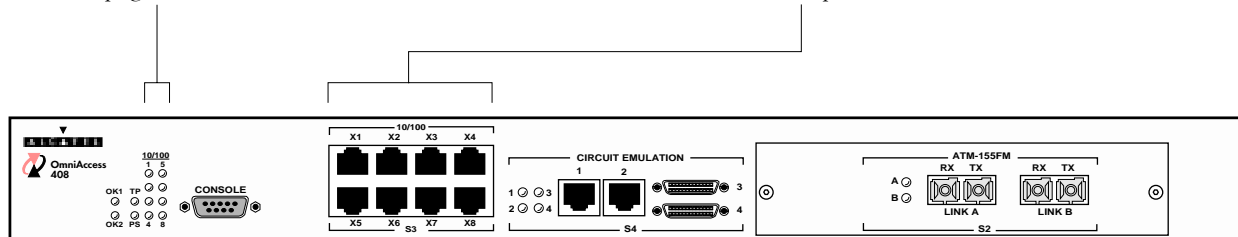
## ◆ LED Information◆

For detailed LED information, refer to *OmniAccess 408 Management LEDs* on page 1-6 and *OmniAccess 408 Ethernet Port LEDs* on page 1-7.

Because these eight (8) LEDs indicate the status of the 10/100 Ethernet ports to the right, they share the same slot designation as the ports they are monitoring. As a result, these LEDs are labeled 10/100.

For more information on Ethernet LEDs, refer to *OmniAccess 408 Ethernet Port LEDs* on page 1-7.

The area labeled 10/100 occupies Slot 3 of the OA-408. This slot contains eight (8) 10/100 Ethernet ports. Corresponding LEDs are located to the left of the switch's console port connector.

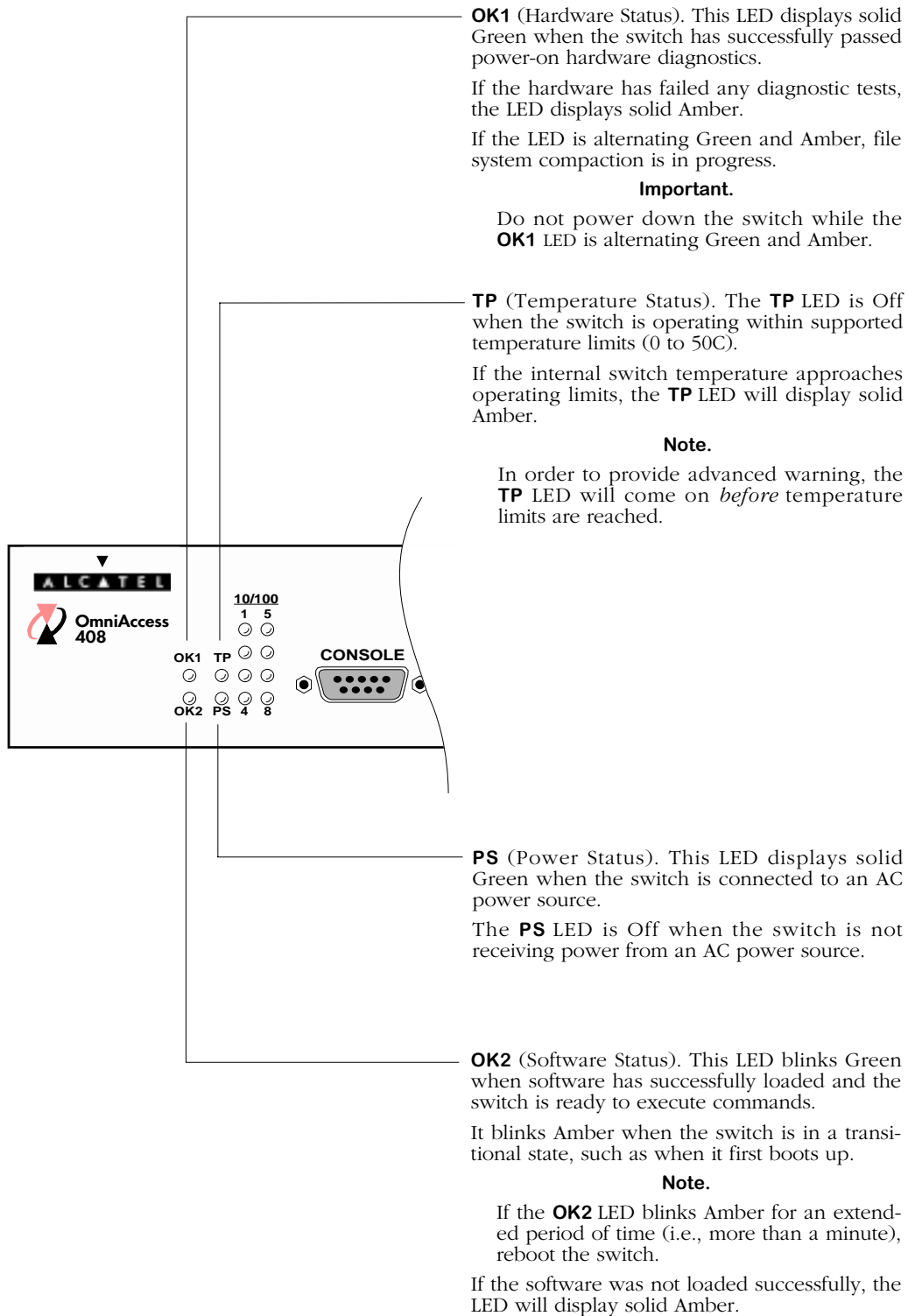


The area labeled **CONSOLE** represents Slot 1 of the OA-408. This slot contains the switch's management processor module (MPM). You can connect directly to the MPM and configure the switch via the console port.

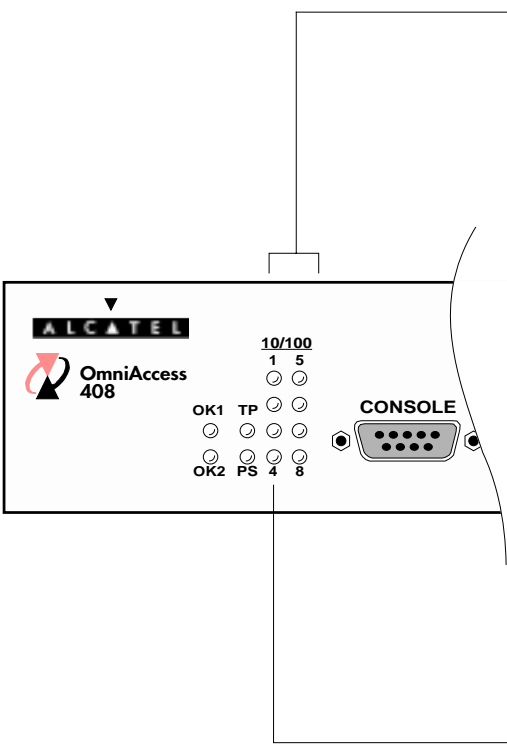
The area labeled **CIRCUIT EMULATION** occupies Slot 4 of the OA-408. This slot contains factory-installed circuit emulation ports: two (2) T1/E1 ports and two (2) Universal Serial Ports (USPs).

The area labeled **ATM-IMA** (IMA models), **ATM-155** (OC-3 models), or **ATM-DS3/E3** (DS3/E3 models) occupies Slot 2 of the OA-408. This slot contains factory-installed ATM uplink ports. Port types vary depending on the model number of the switch (155 Mbps multimode connection with redundant port shown).

## OmniAccess 408 Management LEDs



# OmniAccess 408 Ethernet Port LEDs



**10/100 (Ethernet Port Status).** Each LED is associated with a corresponding 10/100 Ethernet port located at Slot 3 (**S3**). In this figure, the LED labeled **1** (located at top left of the **10/100** LED bank) reports the status of Ethernet port **1X** at slot **S3**. The LED located immediately below LED **1** is LED **2** and reports the status of Ethernet port **2X**, etc. Refer to page 1-5 for slot locations.

An LED displays solid Green when a good cable connection exists on the corresponding port.

The LED then flashes Green when traffic is detected on the port.

If the LED is off, a cable is not connected to the corresponding port or the connected cable does not have link integrity.

Each LED corresponds to an RJ-45 Ethernet port located on the OmniAccess 408 front panel. For example, the LED labeled **4** displays the status of Ethernet port 4.

### Configuring the Ethernet Ports

Each of the eight (8) Ethernet ports on the OA-408 supports a fully-switched 10 or 100 Mbps connection in full- or half-duplex mode. By default, each port is configured to operate in auto-sensing, half-duplex mode. However, each port may be manually configured via the **10/100cfg** command. (The **10/100cfg** command allows you to disable or enable auto-sensing and/or set the link mode to half- or full-duplex.)

An additional software command, **10/100vc**, allows you to view the current line speed and link mode of each port connection. For more information on the **10/100cfg** and **10/100vc** commands, refer to Chapter 12, “Managing Ethernet Ports.”

### Configuring the T1/E1 Ports

The OA-408's T1/E1 ports are software configurable (i.e., you can configure ports to run at either T1 or E1 via the **temod** command).

For more information on the **temod** command, refer to Chapter 29, “Managing T1 and E1 Ports.”

### Configuring the DS3/E3 Ports

As with the T1 and E1 ports, each of the DS3/E3 ports on the OA-408-DS3/E3 is software configurable. You can configure each port to run at either DS3 or E3 via the **dscfg** command.

#### ◆ Note ◆

DS3/E3 port configuration applies only to OA-408-DS3/E3 switches.

For more information on the **dscfg** command, refer to Chapter 30, “Managing DS3 and E3 Ports.”

### The Console Management Port

You can access the switch management software via the console port on the OA-408's front panel. The console management port is a 9-pin female DCE connector per IBM AT serial port specifications. You can connect directly from this port to a PC or terminal with a standard straight-through cable available in most computer equipment stores.

#### ◆ Note ◆

If you are connected to a modem, use a null-modem cable.

If the connecting device does not conform to the IBM AT serial port specification, you may need to use a special cable or adapter. (See Appendix B, “OmniAccess Pinouts and Custom Cables,” for information on the pin signals used for this port.)

You can connect or disconnect a serial cable at the console port at any time without disrupting the switch.

The console management port supports serial data rates of 1200, 9600, 19,200, and 38,400. By default, the rate is set to 9600 bps. You can change this setting via the **ser** command (described in Chapter 6, “Configuring Switch-Wide Parameters”).



## OA-408-IMA-T1/E1

The front panel of the OA-408-IMA-T1/E1 contains one console management port, eight 10/100 Ethernet ports, four circuit emulation ports (two T1/E1 and two USPs), and four T1/E1 IMA uplink ports.

### ◆ T1/E1 Ports ◆

The switch's T1/E1 ports are software configurable (i.e., you can configure all ports to run at either T1 or E1). By default, all ports are configured to operate at T1. For more information on configuring the T1/E1 ports, refer to Chapter 29, "Managing T1 and E1 Ports."

The console management port can be connected to a management station (e.g., a laptop or desktop computer) in order to monitor and manage the switch via the User Interface (UI) or Command Line Interface (CLI). For additional console port information, refer to *The Console Management Port* on page 1-8.

### LED Information

The front panel also includes four management LEDs, eight Ethernet port LEDs, four circuit emulation LEDs, and four IMA uplink port LEDs.

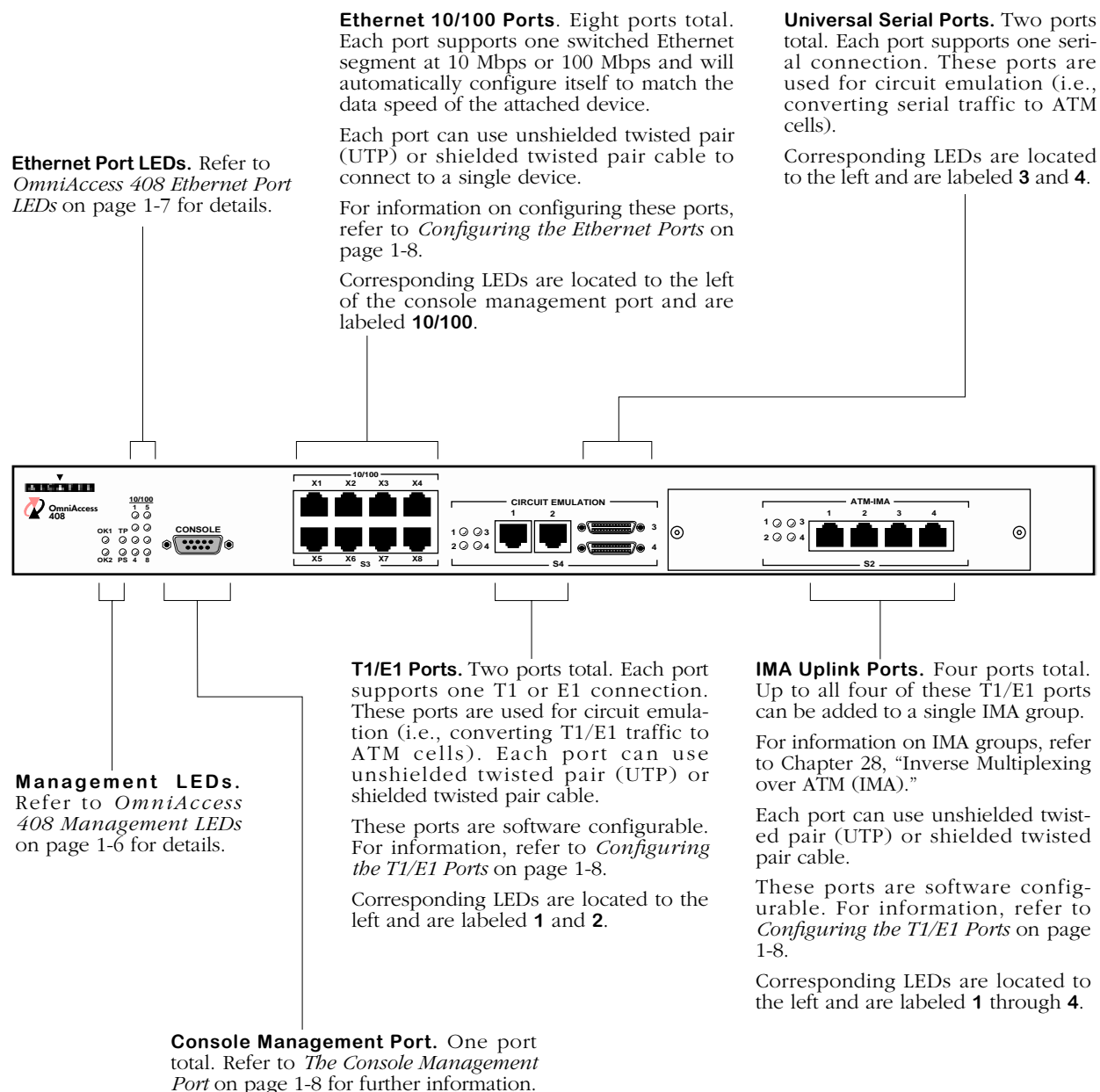
The management LEDs are used to monitor the hardware and software status for the switch. The Ethernet port LEDs indicate the link integrity status for each of the eight 10/100 ports. The circuit emulation LEDs provide the link integrity status for each of the T1/E1 and USP circuit emulation ports. The IMA uplink LEDs provide the link integrity status for each of the T1/E1 IMA uplink ports.

For additional information on management LEDs, refer to *OmniAccess 408 Management LEDs* on page 1-6. For additional information on Ethernet LEDs, refer to *OmniAccess 408 Ethernet Port LEDs* on page 1-7.

### Front Panel Layout

Refer to the illustration on page 1-10 for front panel layout information.

## OA-408-IMA-T1/E1 Front Panel



## OA-408-IMA-T1/E1 Front Panel

## OA-408-IMA-T1/E1 Hardware Specifications

General Chassis Information	
Chassis Configuration	eight 10/100 Ethernet ports two T1/E1 circuit emulation ports two Universal Serial Ports (USPs) for circuit emulation four T1/E1 IMA uplink ports one Console port for software management
Power Connectors	one AC power connector on rear panel (Backup Power System <i>is not</i> supported)
Physical Dimensions	17 1/4" w, 1 3/4" h, 12" d
Weight	11 lbs.
Voltage Range	90-265 VAC, 47 to 63 Hz auto-ranging and auto-sensing
Current Draw	1.0 Amps at 110 VAC
Watts	60
Current Provided	up to 15 Amps
Operating Temperatures	0 to 50 degrees Celsius 32 to 122 degrees Fahrenheit
Operating Humidity	10% to 95% (non-condensing)
Certification	FCC Class A, CE (EMI, EMS, LVD), UL, CSA, VCCI
System Resources/Memory	
Addresses Supported (CAM)	2,048 MAC addresses
Flash	8 MB
SDRAM	32 MB
SSRAM	1 MB
Ethernet Ports	
Cable Supported	Unshielded twisted-pair (UTP)—100 ohms (Category 5 required when running at 100 Mbps) Shielded twisted-pair (STP)—100 ohms
Data Rate	10 Mbps or 100 Mbps (auto-sensing)
Connector Type	RJ-45, MDI
Connections Supported	Hub or device; half-duplex or full-duplex

*Hardware Specifications continued on next page...*

## 0A-408-IMA-T1/E1 Hardware Specifications, continued

<b>T1/E1 Ports (Circuit Emulation)</b>	
Cable Distance	Short-haul: up to 200 meters maximum Long-haul: up to 1829 meters maximum
Data Rates	T1: 1.544 Mbps E1: 2.048 Mbps
Connector Type	RJ-45
Connections Supported	DTE or DCE
<b>Universal Serial Ports (Circuit Emulation)</b>	
Cable Supported	DTE or DCE in the following types: R2-232, V.35, X.21, RS-530, RS-449
Data Rates	56, 64, 128, 256, 384, 512, 768, 1024, 1536, 1544, 2048 Kbps
Connector Type	USP
Connections Supported	DTE or DCE
<b>T1/E1 IMA Uplink Ports</b>	
Cable Distance	Short-haul: up to 200 meters maximum Long-haul: up to 1829 meters maximum
Data Rates	T1: 1.544 Mbps E1: 2.048 Mbps
Connector Type	RJ-45
Connections Supported	DTE or DCE
<b>Console Port</b>	
Data Rates	1.2, 9.6, 19.2, and 38.4 Kbps
Connector Type	DB-9
Connections Supported	DCE; Direct connection to workstation (DTE)

## OA-408-IMA-T1 Software Specifications

Standards Supported	
IEEE Standards	IEEE 802.3u, 802.1d Spanning Tree, 802.3x Flow Control, 802.1Q VLAN
Routing Support	RIP, RIPv2, OSPF, BGP-4, DVMRP, DHCP Relay
VLAN Support	Port, MAC, Network Protocol, IP address, Multicast, Custom, Authenticated VLAN policies
ATM Forum Standards	ATM Forum CES-IS, version 2 (circuit emulation) ATM Forum User-to-Network Interface 4.0, 3.1, and 3.0 ITU-T I.432 and G.957 ANSI T1.105 Bellcore TR-NWT-000253 ATM Forum Traffic Management 4.0 Private Network-to-Network Interface (PNNI) 1.0 Interim Interswitch Protocol (IISP)
Additional Software Information	
Maximum Number of IMA Groups	1
Virtual Circuits Supported	Permanent Virtual Circuits (PVCs) for circuit emulation traffic; PVCs or Soft Virtual Circuits (SVCs) for LAN traffic.
Frame Formats	T1: Superframe, Extended Superframe, Unframed E1: E1, E1-CRC, E1-MF, E1-CRC-MF, Unframed
Line Coding	T1: B8ZS or AMI E1: HDB3 or AMI
Facility Datalink Protocol	ANSI T1.403 and AT&T 54016
CE Data Transfer Services	Structured or Unstructured
Clocking	Synchronous, SRTS, Adaptive

## OA-408-155FM-T1/E1

The front panel of the OA-408-155FM-T1/E1 contains one console management port, eight 10/100 Ethernet ports, four circuit emulation ports (two T1/E1 and two USPs), and one 155 Mbps multimode fiber uplink port.

### ◆ T1/E1 Ports ◆

The switch's T1/E1 ports are software configurable (i.e., you can configure all ports to run at either T1 or E1). By default, all ports are configured to operate at T1. For more information on configuring the T1/E1 ports, refer to Chapter 29, "Managing T1 and E1 Ports."

The console management port can be connected to a management station (e.g., a laptop or desktop computer) in order to monitor and manage the switch via the User Interface (UI) or Command Line Interface (CLI). For additional console port information, refer to *The Console Management Port* on page 1-8.

### LED Information

The front panel also includes four management LEDs, eight Ethernet port LEDs, four circuit emulation LEDs, and one fiber uplink port LED.

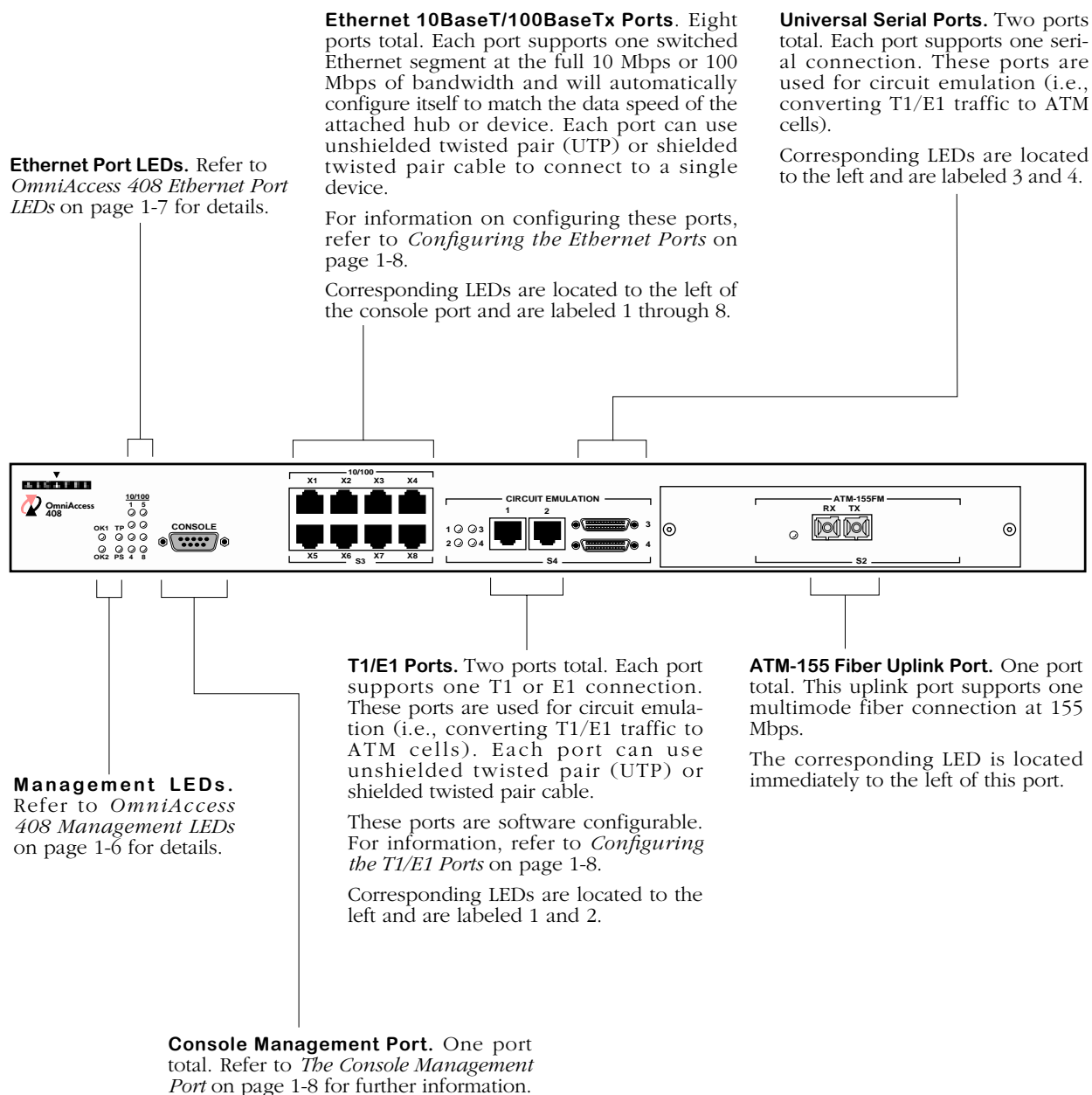
The management LEDs are used to monitor the hardware and software status for the switch. The Ethernet port LEDs indicate the link integrity status for each of the eight 10/100 ports. The circuit emulation LEDs provide the link integrity status for each of the T1/E1 and USP circuit emulation ports. The fiber uplink port LED indicates the link integrity status for the fiber uplink port.

For additional information on management LEDs, refer to *OmniAccess 408 Management LEDs* on page 1-6. For additional information on Ethernet LEDs, refer to *OmniAccess 408 Ethernet Port LEDs* on page 1-7.

### Front Panel Layout

Refer to the illustration on page 1-15 for front panel layout information.

## OA-408-155FM-T1/E1 Front Panel



## OA-408-155FM-T1/E1 Front Panel

## 0A-408-155FM-T1/E1 Hardware Specifications

General Chassis Information	
Chassis Configuration	eight 10/100 Ethernet ports two T1/E1 circuit emulation ports two Universal Serial Ports (USPs) for circuit emulation one ATM fiber uplink port one Console port for software management
Power Connectors	one AC power connector on rear panel (Backup Power System <i>is not</i> supported)
Physical Dimensions	17 1/4" w, 1 3/4" h, 12" d
Weight	11 lbs.
Voltage Range	90-265 VAC, 47 to 63 Hz auto-ranging and auto-sensing
Current Draw	1.0 Amps at 110 VAC
Watts	60
Current Provided	up to 15 Amps
Operating Temperatures	0 to 50 degrees Celsius 32 to 122 degrees Fahrenheit
Operating Humidity	10% to 95% (non-condensing)
Certification	FCC Class A, CE (EMI, EMS, LVD), UL, CSA, VCCI
System Resources/Memory	
Addresses Supported (CAM)	2,048 MAC addresses
Flash	8 MB
SDRAM	32 MB
SSRAM	1 MB
Ethernet Ports	
Cable Supported	Unshielded twisted-pair (UTP)—100 ohms (Category 5 required when running at 100 Mbps) Shielded twisted-pair (STP)—100 ohms
Data Rate	10 Mbps or 100 Mbps (auto-sensing)
Connector Type	RJ-45, MDI
Connections Supported	Hub or device; half-duplex or full-duplex

*Hardware Specifications continued on next page...*



## OA-408-155FM-T1/E1 Hardware Specifications, continued

<b>T1/E1 Ports (Circuit Emulation)</b>	
Cable Distance	Short-haul: up to 200 meters maximum Long-haul: up to 1829 meters maximum
Data Rates	T1: 1.544 Mbps E1: 2.048 Mbps
Connector Type	RJ-45
Connections Supported	DTE or DCE
<b>Universal Serial Ports (Circuit Emulation)</b>	
Cable Supported	DTE or DCE in the following types: R2-232, V.35, X.21, RS-530, RS-449
Data Rates	56, 64, 128, 256, 384, 512, 768, 1024, 1536, 1544, 2048 Kbps
Connector Type	USP
Connections Supported	DTE or DCE
<b>Fiber Uplink Port</b>	
Cable Supported	Multimode fiber
Cable Distance	4.2 km
Data Rate	155 Mbps
Connector Type	SC
Connections Supported	ATM 155 Mbps to backbone or device
Optical Power Output	-19 to -14 dBm
Receiver Sensitivity	-30 to -14 dBm
Power Budget	11 dBm
<b>Console Port</b>	
Data Rates	1.2, 9.6, 19.2, and 38.4 Kbps
Connector Type	DB-9
Connections Supported	DCE; Direct connection to workstation (DTE)

## 0A-408-155FM-T1/E1 Software Specifications

Standards Supported	
Ethernet ports:	IEEE 802.3z/2
Circuit Emulation ports:	ATM Forum CES-IS, version 2
ATM uplink port:	ATM Forum User-to-Network Interface, versions 3.1 and 3.0 CCITT Q2931 RFCs 1483, 1577, and 1755 ATM LAN Emulation Client, version 1.0
Additional Software Information	
Virtual Circuits Supported	Permanent Virtual Circuits (PVCs) for circuit emulation traffic; PVCs or Soft Virtual Circuits (SVCs) for LAN traffic.
Frame Formats	T1: Superframe, Extended Superframe, Unframed E1: E1, E1-CRC, E1-MF, E1-CRC-MF, Unframed
Line Coding	T1: B8ZS or AMI E1: HDB3 or AMI
Facility Datalink Protocol	ANSI T1.403 and AT&T 54016
Data Transfer Services	Structured or Unstructured
Clocking	Synchronous, SRTS, Adaptive

## OA-408-155FS-T1/E1

The front panel of the OA-408-155FS-T1/E1 contains one console management port, eight 10/100 Ethernet ports, four circuit emulation ports (two T1 and two USP), and one 155 Mbps single mode fiber uplink port.

### ◆ T1/E1 Ports ◆

The switch's T1/E1 ports are software configurable (i.e., you can configure all ports to run at either T1 or E1). By default, all ports are configured to operate at T1. For more information on configuring the T1/E1 ports, refer to Chapter 29, "Managing T1 and E1 Ports."

The console management port can be connected to a management station (e.g., a laptop or desktop computer) in order to monitor and manage the switch via the User Interface (UI) or Command Line Interface (CLI).

### LED Information

The front panel also includes four management LEDs, eight Ethernet port LEDs, four circuit emulation LEDs, and one fiber uplink port LED.

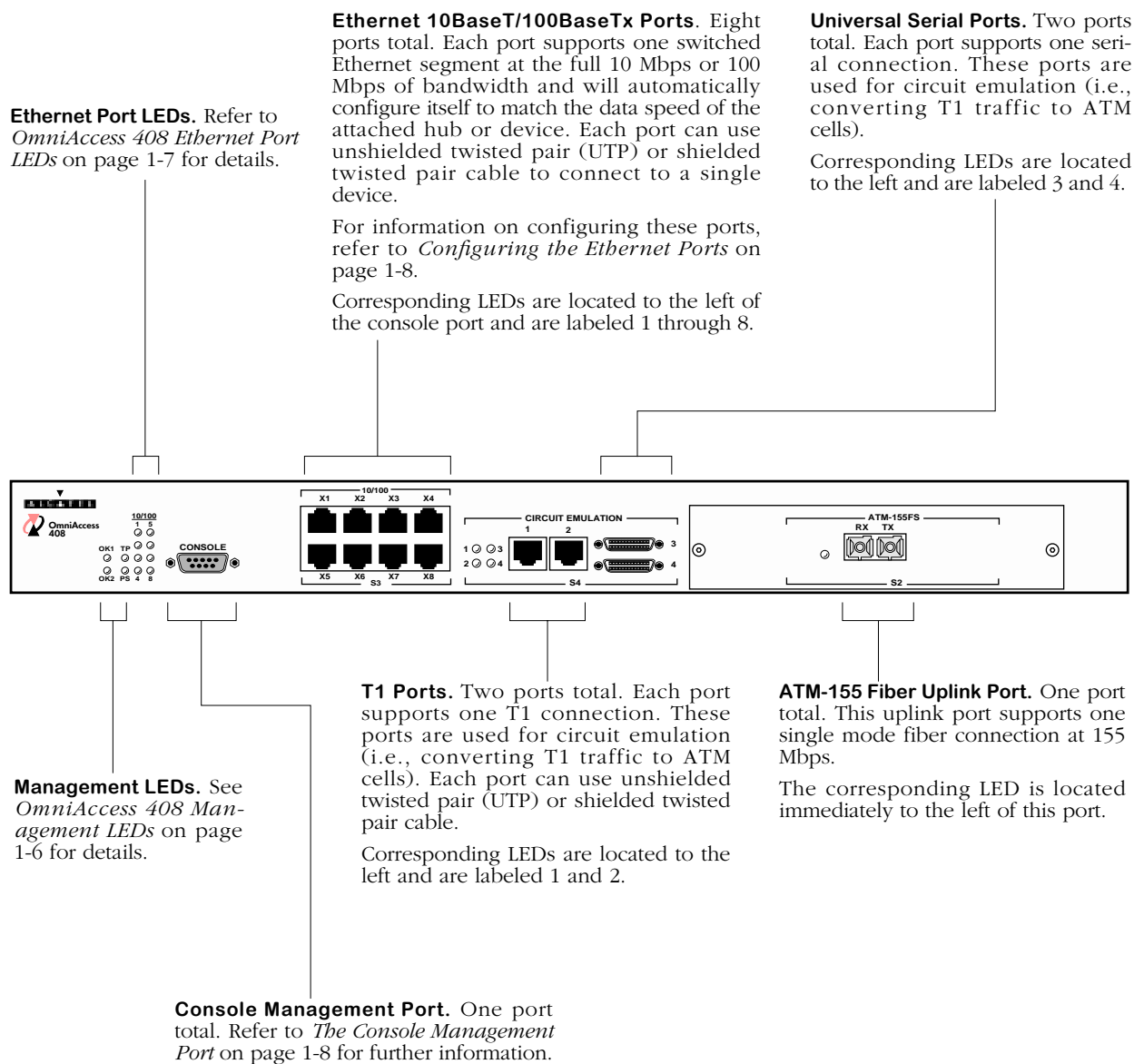
The management LEDs are used to monitor the hardware and software status for the switch. The Ethernet port LEDs indicate the link integrity status for each of the eight 10/100 ports. The circuit emulation LEDs provide the link integrity status for each of the T1 and USP circuit emulation ports. The fiber uplink port LED indicates the link integrity status for the fiber uplink port.

For additional information on management LEDs, refer to *OmniAccess 408 Management LEDs* on page 1-6. For additional information on Ethernet LEDs, refer to *OmniAccess 408 Ethernet Port LEDs* on page 1-7.

### Front Panel Layout

Refer to the illustration on page 1-20 for front panel layout information.

## 0A-408-155FS-T1/E1 Front Panel



## 0A-408-155FS-T1/E1 Front Panel

## OA-408-155FS-T1/E1 Hardware Specifications

General Chassis Information	
Chassis Configuration	eight 10/100 Ethernet ports two T1/E1 circuit emulation ports two Universal Serial Ports (USPs) for circuit emulation one ATM fiber uplink port one Console port for software management
Power Connectors	one AC power connector on rear panel (Backup Power System <i>is not</i> supported)
Physical Dimensions	17 1/4" w, 1 3/4" h, 12" d
Weight	11 lbs.
Voltage Range	90-265 VAC, 47 to 63 Hz auto-ranging and auto-sensing
Current Draw	1.0 Amps at 110 VAC
Watts	60
Current Provided	up to 15 Amps
Operating Temperatures	0 to 50 degrees Celsius 32 to 122 degrees Fahrenheit
Operating Humidity	10% to 95% (non-condensing)
Emissions Certification	FCC, CE, VCCI, AUSTEL, BCIQ (Class A with UTP cables; Class B with STP cables)
Safety Certification	UL, CSA, TUV and CB
System Resources/Memory	
Addresses Supported (CAM)	2,048 MAC addresses
Flash	8 MB
SDRAM	32 MB
SSRAM	1 MB
Ethernet Ports	
Cable Supported	Unshielded twisted-pair (UTP)—100 ohms (Category 5 required when running at 100 Mbps) Shielded twisted-pair (STP)—100 ohms
Data Rate	10 Mbps or 100 Mbps (auto-sensing)
Connector Type	RJ-45, MDI
Connections Supported	Hub or device; half-duplex or full-duplex

*Hardware Specifications continued on next page...*

**0A-408-155FS-T1/E1 Hardware Specifications, continued**

<b>T1/E1 Ports (Circuit Emulation)</b>	
Cable Distance	Short-haul: up to 200 meters maximum Long-haul: up to 1829 meters maximum
Data Rates	T1: 1.544 Mbps E1: 2.048 Mbps
Connector Type	RJ-45
Connections Supported	DTE or DCE
<b>Universal Serial Ports (Circuit Emulation)</b>	
Cable Supported	DTE or DCE in the following types: R2-232, V.35, X.21, RS-530, RS-449
Data Rates	56, 64, 128, 256, 384, 512, 768, 1024, 1536, 1544, 2048 Kbps
Connector Type	USP
Connections Supported	DTE or DCE
<b>Fiber Uplink Port</b>	
Cable Supported	Single mode fiber
Cable Distance	24 km
Data Rate	155 Mbps
Connector Type	SC
Connections Supported	ATM 155 Mbps to backbone or device
Optical Power Output	-15 to -8 dBm
Receiver Sensitivity	-31 to -8 dBm
Power Budget	16 dBm
<b>Console Port</b>	
Data Rates	1.2, 9.6, 19.2, and 38.4 Kbps
Connector Type	DB-9
Connections Supported	DCE; Direct connection to workstation (DTE)

## OA-408-155FS-T1/E1 Software Specifications

Standards Supported	
Ethernet ports:	IEEE 802.3z/2
Circuit Emulation ports:	ATM Forum CES-IS, version 2
ATM uplink port:	ATM Forum User-to-Network Interface, versions 3.1 and 3.0 CCITT Q2931 RFCs 1483, 1577, and 1755 ATM LAN Emulation Client, version 1.0
Additional Software Information	
Virtual Circuits Supported	Permanent Virtual Circuits (PVCs) for circuit emulation traffic; PVCs or Soft Virtual Circuits (SVCs) for LAN traffic.
Frame Formats	T1: Superframe, Extended Superframe, Unframed E1: E1, E1-CRC, E1-MF, E1-CRC-MF, Unframed
Line Coding	T1: B8ZS or AMI E1: HDB3 or AMI
Facility Datalink Protocol	ANSI T1.403 and AT&T 54016
Data Transfer Services	Structured or Unstructured
Clocking	Synchronous, SRTS, Adaptive

## OA-408-155-RFS-T1/E1

The front panel of the OA-408-155-RFS-T1/E1 contains one console management port, eight 10/100 Ethernet ports, four circuit emulation ports (two T1 and two USP), one primary 155 Mbps single mode fiber uplink port, and one backup (redundant) 155 Mbps single mode fiber uplink port.

### ◆ T1/E1 Ports ◆

The switch's T1/E1 ports are software configurable (i.e., you can configure all ports to run at either T1 or E1). By default, all ports are configured to operate at T1. For more information on configuring the T1/E1 ports, refer to Chapter 29, "Managing T1 and E1 Ports."

The console management port can be connected to a management station (e.g., a laptop or desktop computer) in order to monitor and manage the switch via the User Interface (UI) or Command Line Interface (CLI).

### LED Information

The front panel also includes four management LEDs, eight Ethernet port LEDs, four circuit emulation LEDs, and two fiber uplink port LEDs.

The management LEDs are used to monitor the hardware and software status for the switch. The Ethernet port LEDs indicate the link integrity status for each of the eight 10/100 ports. The circuit emulation LEDs provide the link integrity status for each of the T1 and USP circuit emulation ports. The fiber uplink port LEDs indicate the link integrity status for the fiber uplink ports.

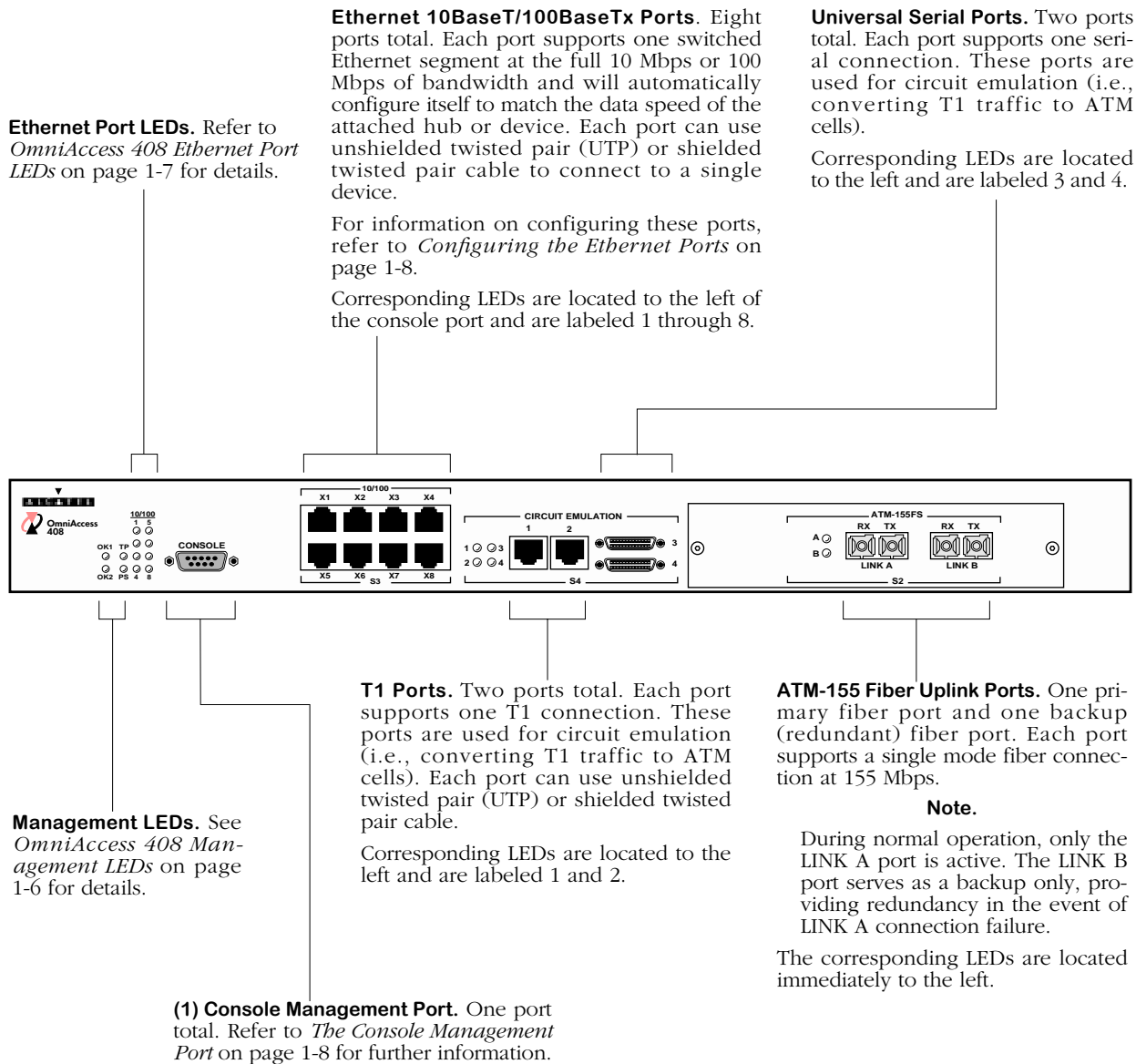
For additional information on management LEDs, refer to *OmniAccess 408 Management LEDs* on page 1-6. For additional information on Ethernet LEDs, refer to *OmniAccess 408 Ethernet Port LEDs* on page 1-7.

### Front Panel Layout

Refer to the illustration on page 1-25 for front panel layout information.



## 0A-408-155-RFS-T1/E1 Front Panel



## 0A-408-155-RFS-T1/E1 Front Panel

## 0A-408-155-RFS-T1/E1 Hardware Specifications

General Chassis Information	
Chassis Configuration	eight 10/100 Ethernet ports two T1/E1 circuit emulation ports two Universal Serial Ports (USPs) for circuit emulation one Primary ATM fiber uplink port one Backup ATM fiber uplink port one Console port for software management
Power Connectors	one AC power connector on rear panel (Backup Power System <i>is not</i> supported)
Physical Dimensions	17 1/4" w, 1 3/4" h, 12" d
Weight	11 lbs.
Voltage Range	90-265 VAC, 47 to 63 Hz auto-ranging and auto-sensing
Current Draw	1.0 Amps at 110 VAC
Watts	60
Current Provided	up to 15 Amps
Operating Temperatures	0 to 50 degrees Celsius 32 to 122 degrees Fahrenheit
Operating Humidity	10% to 95% (non-condensing)
Certification	FCC Class A, CE (EMI, EMS, LVD), UL, CSA, VCCI
System Resources/Memory	
Addresses Supported (CAM)	2,048 MAC addresses
Flash	8 MB
SDRAM	32 MB
SSRAM	1 MB
Ethernet Ports	
Cable Supported	Unshielded twisted-pair (UTP)—100 ohms (Category 5 required when running at 100 Mbps) Shielded twisted-pair (STP)—100 ohms
Data Rate	10 Mbps or 100 Mbps (auto-sensing)
Connector Type	RJ-45, MDI
Connections Supported	Hub or device; half-duplex or full-duplex

*Hardware Specifications continued on next page...*

**0A-408-155-RFS-T1/E1 Hardware Specifications, continued**

<b>T1/E1 Ports (Circuit Emulation)</b>	
Cable Distance	Short-haul: up to 200 meters maximum Long-haul: up to 1829 meters maximum
Data Rates	T1: 1.544 Mbps E1: 2.048 Mbps
Connector Type	RJ-45
Connections Supported	DTE or DCE
<b>Universal Serial Ports (Circuit Emulation)</b>	
Cable Supported	DTE or DCE in the following types: R2-232, V.35, X.21, RS-530, RS-449
Data Rates	56, 64, 128, 256, 384, 512, 768, 1024, 1536, 1544, 2048 Kbps
Connector Type	USP
Connections Supported	DTE or DCE
<b>Fiber Uplink Ports</b>	
Cable Supported	Single mode fiber
Cable Distance	24 km
Data Rate	155 Mbps
Connector Type	SC
Connections Supported	ATM 155 Mbps to backbone or device
Optical Power Output	-15 to -8 dBm
Receiver Sensitivity	-31 to -8 dBm
Power Budget	16 dBm
<b>Console Port</b>	
Data Rates	1.2, 9.6, 19.2, and 38.4 Kbps
Connector Type	DB-9
Connections Supported	DCE; Direct connection to workstation (DTE)

## OA-408-155-RFS-T1/E1 Software Specifications

Standards Supported	
Ethernet ports:	IEEE 802.3z/2
Circuit Emulation ports:	ATM Forum CES-IS, version 2
ATM uplink port:	ATM Forum User-to-Network Interface, versions 3.1 and 3.0 CCITT Q2931 RFCs 1483, 1577, and 1755 ATM LAN Emulation Client, version 1.0
Additional Software Information	
Virtual Circuits Supported	Permanent Virtual Circuits (PVCs) for circuit emulation traffic; PVCs or Soft Virtual Circuits (SVCs) for LAN traffic.
Frame Formats	T1: Superframe, Extended Superframe, Unframed E1: E1, E1-CRC, E1-MF, E1-CRC-MF, Unframed
Line Coding	T1: B8ZS or AMI E1: HDB3 or AMI
Facility Datalink Protocol	ANSI T1.403 and AT&T 54016
Data Transfer Services	Structured or Unstructured
Clocking	Synchronous, SRTS, Adaptive

## OA-408-155FSH-T1/E1

The front panel of the OA-408-155FSH-T1/E1 contains one console management port, eight 10/100 Ethernet ports, four circuit emulation ports (two T1 and two USP), and one 155 Mbps long-haul single mode fiber uplink port.

### ◆ T1/E1 Ports ◆

The switch's T1/E1 ports are software configurable (i.e., you can configure all ports to run at either T1 or E1). By default, all ports are configured to operate at T1. For more information on configuring the T1/E1 ports, refer to Chapter 29, "Managing T1 and E1 Ports."

The console management port can be connected to a management station (e.g., a laptop or desktop computer) in order to monitor and manage the switch via the User Interface (UI) or Command Line Interface (CLI).

### LED Information

The front panel also includes four management LEDs, eight Ethernet port LEDs, four circuit emulation LEDs, and one fiber uplink port LED.

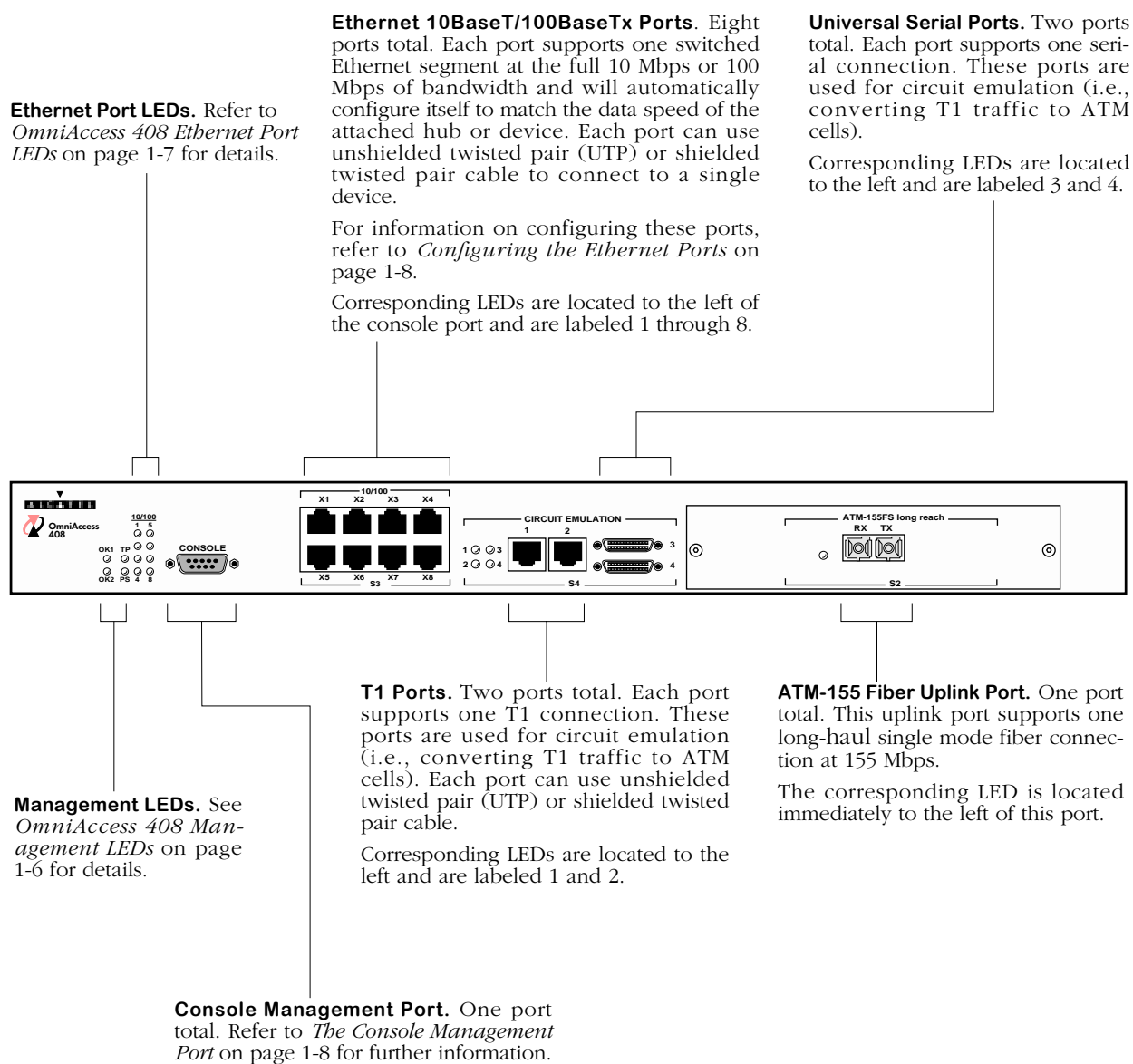
The management LEDs are used to monitor the hardware and software status for the switch. The Ethernet port LEDs indicate the link integrity status for each of the eight 10/100 ports. The circuit emulation LEDs provide the link integrity status for each of the T1 and USP circuit emulation ports. The fiber uplink port LED indicates the link integrity status for the fiber uplink port.

For additional information on management LEDs, refer to *OmniAccess 408 Management LEDs* on page 1-6. For additional information on Ethernet LEDs, refer to *OmniAccess 408 Ethernet Port LEDs* on page 1-7.

### Front Panel Layout

Refer to the illustration on page 1-30 for front panel layout information.

## 0A-408-155FSH-T1/E1 Front Panel



## 0A-408-155FSH-T1/E1 Front Panel

## OA-408-155FSH-T1/E1 Hardware Specifications

General Chassis Information	
Chassis Configuration	eight 10/100 Ethernet ports two T1/E1 circuit emulation ports two Universal Serial Ports (USPs) for circuit emulation one ATM fiber uplink port one Console port for software management
Power Connectors	one AC power connector on rear panel (Backup Power System <i>is not</i> supported)
Physical Dimensions	17 1/4" w, 1 3/4" h, 12" d
Weight	11 lbs.
Voltage Range	90-265 VAC, 47 to 63 Hz auto-ranging and auto-sensing
Current Draw	1.0 Amps at 110 VAC
Watts	60
Current Provided	up to 15 Amps
Operating Temperatures	0 to 50 degrees Celsius 32 to 122 degrees Fahrenheit
Operating Humidity	10% to 95% (non-condensing)
Certification	FCC Class A, CE (EMI, EMS, LVD), UL, CSA, VCCI
System Resources/Memory	
Addresses Supported (CAM)	2,048 MAC addresses
Flash	8 MB
SDRAM	32 MB
SSRAM	1 MB
Ethernet Ports	
Cable Supported	Unshielded twisted-pair (UTP)—100 ohms (Category 5 required when running at 100 Mbps) Shielded twisted-pair (STP)—100 ohms
Data Rate	10 Mbps or 100 Mbps (auto-sensing)
Connector Type	RJ-45, MDI
Connections Supported	Hub or device; half-duplex or full-duplex

*Hardware Specifications continued on next page...*

## 0A-408-155FSH-T1/E1 Hardware Specifications, continued

<b>T1/E1 Ports (Circuit Emulation)</b>	
Cable Distance	Short-haul: up to 200 meters maximum Long-haul: up to 1829 meters maximum
Data Rates	T1: 1.544 Mbps E1: 2.048 Mbps
Connector Type	RJ-45
Connections Supported	DTE or DCE
<b>Universal Serial Ports (Circuit Emulation)</b>	
Cable Supported	DTE or DCE in the following types: R2-232, V.35, X.21, RS-530, RS-449
Data Rates	56, 64, 128, 256, 384, 512, 768, 1024, 1536, 1544, 2048 Kbps
Connector Type	USP
Connections Supported	DTE or DCE
<b>Fiber Uplink Port</b>	
Cable Supported	Long-haul single mode fiber
Cable Distance	40 km
Data Rate	155 Mbps
Connector Type	SC
Connections Supported	ATM 155 Mbps to backbone or device
Optical Power Output	-5 to -0 dBm
Receiver Sensitivity	-34 to -10 dBm
Power Budget	29 dBm
<b>Console Port</b>	
Data Rates	1.2, 9.6, 19.2, and 38.4 Kbps
Connector Type	DB-9
Connections Supported	DCE; Direct connection to workstation (DTE)



## OA-408-155FSH-T1/E1 Software Specifications

Standards Supported	
Ethernet ports:	IEEE 802.3z/2
Circuit Emulation ports:	ATM Forum CES-IS, version 2
ATM uplink port:	ATM Forum User-to-Network Interface, versions 3.1 and 3.0 CCITT Q2931
Additional Software Information	
Virtual Circuits Supported	Permanent Virtual Circuits (PVCs) for circuit emulation traffic; PVCs or Soft Virtual Circuits (SVCs) for LAN traffic.
Frame Formats	T1: Superframe, Extended Superframe, Unframed E1: E1, E1-CRC, E1-MF, E1-CRC-MF, Unframed
Line Coding	T1: B8ZS or AMI E1: HDB3 or AMI
Facility Datalink Protocol	ANSI T1.403 and AT&T 54016
Data Transfer Services	Structured or Unstructured
Clocking	Synchronous, SRTS, Adaptive

## OA-408-155-RFSH-T1/E1

The front panel of the OA-408-155-RFSH-T1/E1 contains one console management port, eight 10/100 Ethernet ports, four circuit emulation ports (two T1 and two USP), one primary 155 Mbps long-haul single mode fiber uplink port, and one backup (redundant) 155 Mbps long-haul single mode fiber uplink port.

### ◆ T1/E1 Ports ◆

The switch's T1/E1 ports are software configurable (i.e., you can configure all ports to run at either T1 or E1). By default, all ports are configured to operate at T1. For more information on configuring the T1/E1 ports, refer to Chapter 29, "Managing T1 and E1 Ports."

The console management port can be connected to a management station (e.g., a laptop or desktop computer) in order to monitor and manage the switch via the User Interface (UI) or Command Line Interface (CLI).

### LED Information

The front panel also includes four management LEDs, eight Ethernet port LEDs, four circuit emulation LEDs, and two fiber uplink port LEDs.

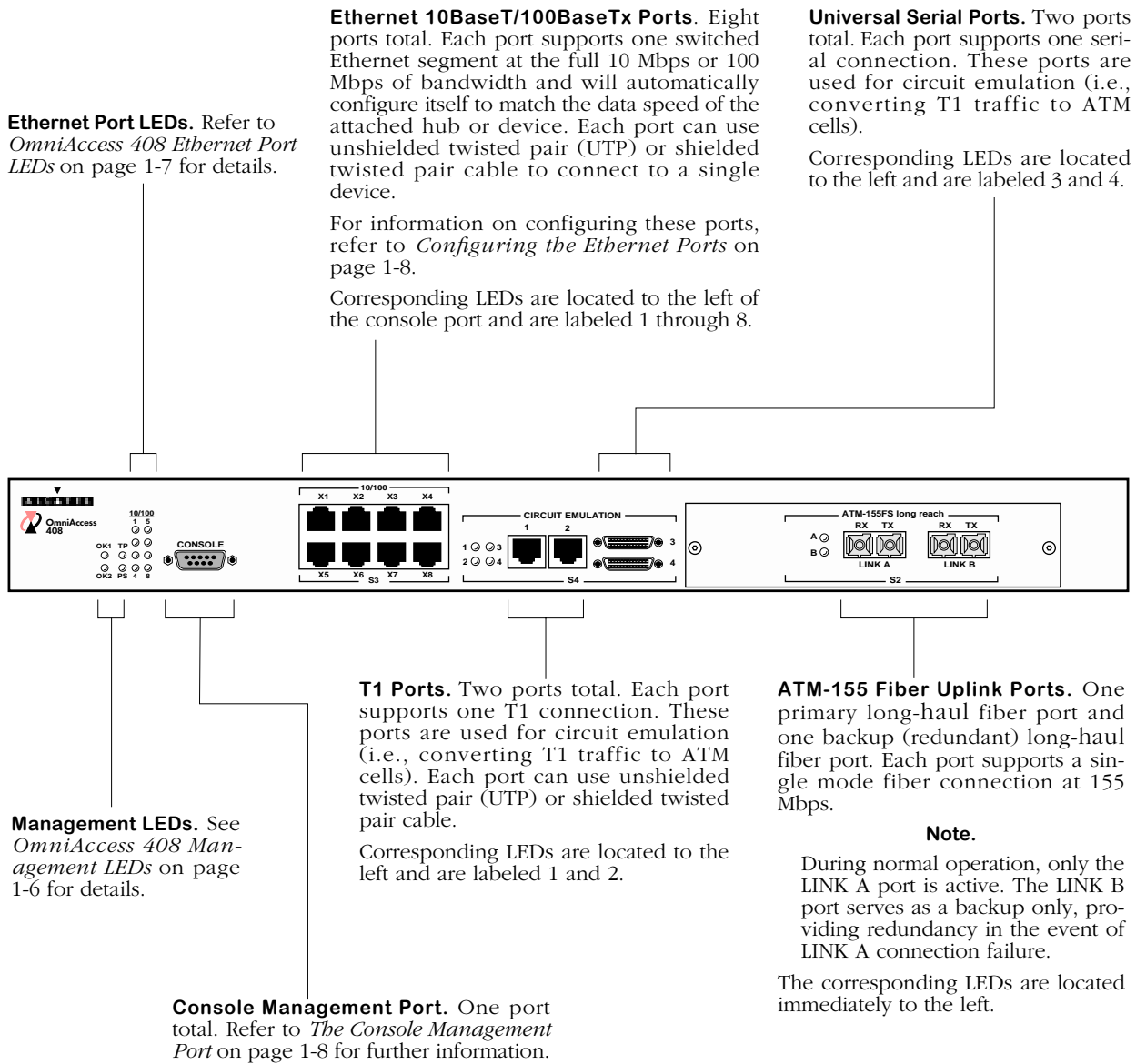
The management LEDs are used to monitor the hardware and software status for the switch. The Ethernet port LEDs indicate the link integrity status for each of the eight 10/100 ports. The circuit emulation LEDs provide the link integrity status for each of the T1 and USP circuit emulation ports. The fiber uplink port LEDs indicate the link integrity status for the fiber uplink ports.

For additional information on management LEDs, refer to *OmniAccess 408 Management LEDs* on page 1-6. For additional information on Ethernet LEDs, refer to *OmniAccess 408 Ethernet Port LEDs* on page 1-7.

### Front Panel Layout

Refer to the illustration on page 1-35 for front panel layout information.

OA-408-155-RFSH-T1/E1 Front Panel



OA-408-155-RFSH-T1/E1 Front Panel

## 0A-408-155-RFSH-T1/E1 Hardware Specifications

General Chassis Information	
Chassis Configuration	eight 10/100 Ethernet ports two T1/E1 circuit emulation ports two Universal Serial Ports (USPs) for circuit emulation one Primary ATM fiber uplink port one Backup ATM fiber uplink port one Console port for software management
Power Connectors	one AC power connector on rear panel (Backup Power System <i>is not</i> supported)
Physical Dimensions	17 1/4" w, 1 3/4" h, 12" d
Weight	11 lbs.
Voltage Range	90-265 VAC, 47 to 63 Hz auto-ranging and auto-sensing
Current Draw	1.0 Amps at 110 VAC
Watts	60
Current Provided	up to 15 Amps
Operating Temperatures	0 to 50 degrees Celsius 32 to 122 degrees Fahrenheit
Operating Humidity	10% to 95% (non-condensing)
Certification	FCC Class A, CE (EMI, EMS, LVD), UL, CSA, VCCI
System Resources/Memory	
Addresses Supported (CAM)	2,048 MAC addresses
Flash	8 MB
SDRAM	32 MB
SSRAM	1 MB
Ethernet Ports	
Cable Supported	Unshielded twisted-pair (UTP)—100 ohms (Category 5 required when running at 100 Mbps) Shielded twisted-pair (STP)—100 ohms
Data Rate	10 Mbps or 100 Mbps (auto-sensing)
Connector Type	RJ-45, MDI
Connections Supported	Hub or device; half-duplex or full-duplex

*Hardware Specifications continued on next page...*

**OA-408-155-RFSH-T1/E1 Hardware Specifications, continued**

<b>T1/E1 Ports (Circuit Emulation)</b>	
Cable Distance	Short-haul: up to 200 meters maximum Long-haul: up to 1829 meters maximum
Data Rates	T1: 1.544 Mbps E1: 2.048 Mbps
Connector Type	RJ-45
Connections Supported	DTE or DCE
<b>Universal Serial Ports (Circuit Emulation)</b>	
Cable Supported	DTE or DCE in the following types: R2-232, V.35, X.21, RS-530, RS-449
Data Rates	56, 64, 128, 256, 384, 512, 768, 1024, 1536, 1544, 2048 Kbps
Connector Type	USP
Connections Supported	DTE or DCE
<b>Fiber Uplink Port</b>	
Cable Supported	Long-haul single mode fiber
Cable Distance	40 km
Data Rate	155 Mbps
Connector Type	SC
Connections Supported	ATM 155 Mbps to backbone or device
Optical Power Output	-5 to -0 dBm
Receiver Sensitivity	-34 to -10 dBm
Power Budget	29 dBm
<b>Console Port</b>	
Data Rates	1.2, 9.6, 19.2, and 38.4 Kbps
Connector Type	DB-9
Connections Supported	DCE; Direct connection to workstation (DTE)

## 0A-408-155-RFSH-T1/E1 Software Specifications

Standards Supported	
Ethernet ports:	IEEE 802.3z/2
Circuit Emulation ports:	ATM Forum CES-IS, version 2
ATM uplink port:	ATM Forum User-to-Network Interface, versions 3.1 and 3.0 CCITT Q2931
Additional Software Information	
Virtual Circuits Supported	Permanent Virtual Circuits (PVCs) for circuit emulation traffic; PVCs or Soft Virtual Circuits (SVCs) for LAN traffic.
Frame Formats	T1: Superframe, Extended Superframe, Unframed E1: E1, E1-CRC, E1-MF, E1-CRC-MF, Unframed
Line Coding	T1: B8ZS or AMI E1: HDB3 or AMI
Facility Datalink Protocol	ANSI T1.403 and AT&T 54016
Data Transfer Services	Structured or Unstructured
Clocking	Synchronous, SRTS, Adaptive

## OA-408-DS3/E3

The front panel of the OA-408-DS3/E3 contains one console management port, eight 10/100 Ethernet ports, four circuit emulation ports (two T1 and two USP), and one DS3 copper uplink port.

### ◆ T1/E1 Ports ◆

The switch's T1/E1 ports are software configurable (i.e., you can configure all ports to run at either T1 or E1). By default, all ports are configured to operate at T1. For more information on configuring the T1/E1 ports, refer to Chapter 29, "Managing T1 and E1 Ports."

The console management port can be connected to a management station (e.g., a laptop or desktop computer) in order to monitor and manage the switch via the User Interface (UI) or Command Line Interface (CLI).

### LED Information

The front panel also includes four management LEDs, eight Ethernet port LEDs, four circuit emulation LEDs, and one DS3 uplink port LED.

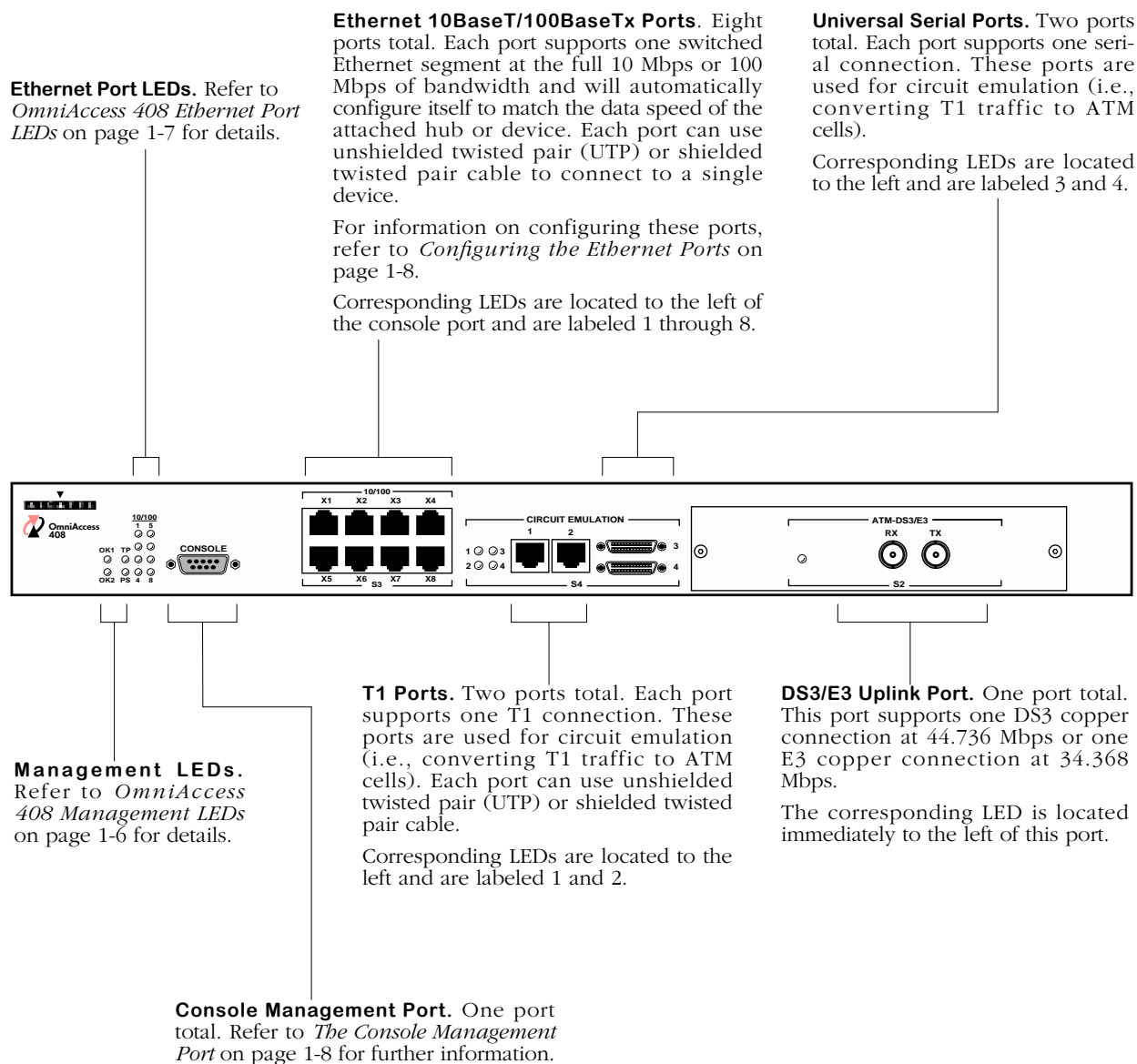
The management LEDs are used to monitor the hardware and software status for the switch. The Ethernet port LEDs indicate the link integrity status for each of the eight 10/100 ports. The circuit emulation LEDs provide the link integrity status for each of the T1 and USP circuit emulation ports. The DS3 copper LED provides the link integrity status for the DS3 copper port.

For additional information on management LEDs, refer to *OmniAccess 408 Management LEDs* on page 1-6. For additional information on Ethernet LEDs, refer to *OmniAccess 408 Ethernet Port LEDs* on page 1-7.

### Front Panel Layout

Refer to the illustration on page 1-40 for front panel layout information.

## 0A-408-DS3/E3 Front Panel



## 0A-408-DS3/E3 Front Panel



## 0A-408-DS3/E3 Hardware Specifications

General Chassis Information	
Chassis Configuration	eight 10/100 Ethernet ports two T1/E1 circuit emulation ports two Universal Serial Ports (USPs) for circuit emulation one DS3/E3 copper uplink port one Console port for software management
Power Connectors	one AC power connector on rear panel (Backup Power System <i>is not</i> supported)
Physical Dimensions	17 1/4" w, 1 3/4" h, 12" d
Weight	11 lbs.
Voltage Range	90-265 VAC, 47 to 63 Hz auto-ranging and auto-sensing
Current Draw	1.0 Amps at 110 VAC
Watts	60
Current Provided	up to 15 Amps
Operating Temperatures	0 to 50 degrees Celsius 32 to 122 degrees Fahrenheit
Operating Humidity	10% to 95% (non-condensing)
Certification	FCC Class A, CE (EMI, EMS, LVD), UL, CSA, VCCI
System Resources/Memory	
Addresses Supported (CAM)	2,048 MAC addresses
Flash	8 MB
SDRAM	32 MB
SSRAM	1 MB
Ethernet Ports	
Cable Supported	Unshielded twisted-pair (UTP)—100 ohms (Category 5 required when running at 100 Mbps) Shielded twisted-pair (STP)—100 ohms
Data Rate	10 Mbps or 100 Mbps (auto-sensing)
Connector Type	RJ-45, MDI
Connections Supported	Hub or device; half-duplex or full-duplex

*Hardware Specifications continued on next page...*

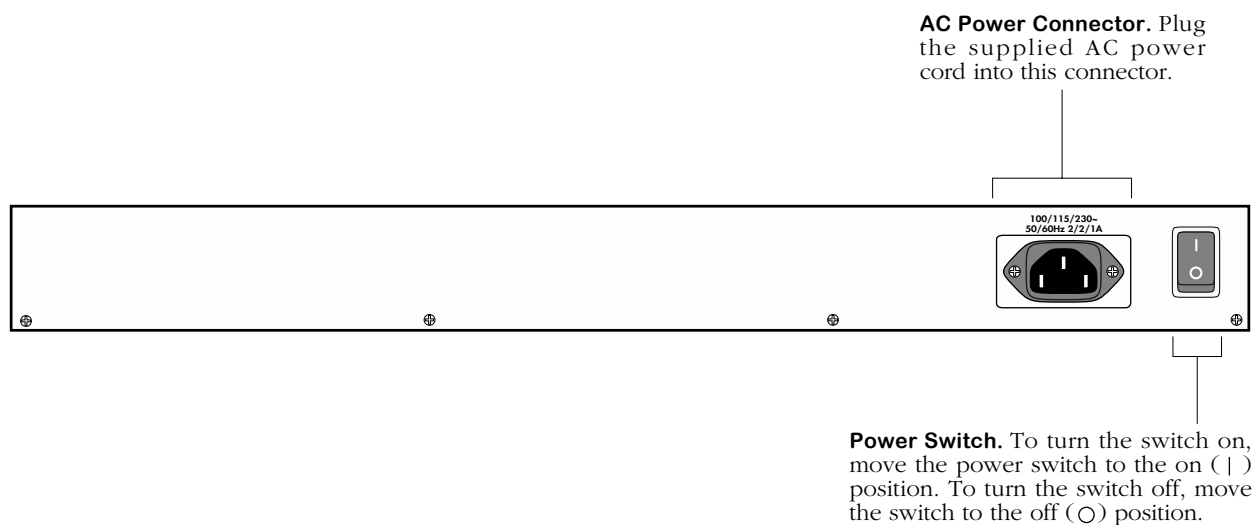
## 0A-408-DS3/E3 Hardware Specifications, continued

<b>T1/E1 Ports (Circuit Emulation)</b>	
Cable Distance	Short-haul: up to 200 meters maximum Long-haul: up to 1829 meters maximum
Data Rates	T1: 1.544 Mbps E1: 2.048 Mbps
Connector Type	RJ-45
Connections Supported	DTE or DCE
<b>Universal Serial Ports (Circuit Emulation)</b>	
Cable Supported	DTE or DCE in the following types: R2-232, V.35, X.21, RS-530, RS-449
Data Rates	56, 64, 128, 256, 384, 512, 768, 1024, 1536, 1544, 2048 Kbps
Connector Type	USP
Connections Supported	DTE or DCE
<b>DS3/E3 Uplink Port</b>	
Cable Supported	Coaxial RG-59 (75 ohm)
Cable Distance	185 m
Data Rate	DS3: 44.736 Mbps E3: 34.368 Mbps
Connector Type	BNC
Connections Supported	DS3 to ATM carrier service
<b>Console Port</b>	
Data Rates	1.2, 9.6, 19.2, and 38.4 Kbps
Connector Type	DB-9
Connections Supported	DCE; Direct connection to workstation (DTE)

## OA-408-DS3/E3 Software Specifications

Standards Supported	
Ethernet ports:	IEEE 802.3z/2
Circuit Emulation ports:	ATM Forum CES-IS, version 2
ATM uplink port:	ATM Forum User-to-Network Interface, versions 3.1 and 3.0 CCITT Q2931
Additional Software Information	
Virtual Circuits Supported	Permanent Virtual Circuits (PVCs) for circuit emulation traffic; PVCs or Soft Virtual Circuits (SVCs) for LAN traffic.
Frame Formats	T1: Superframe, Extended Superframe, Unframed E1: E1, E1-CRC, E1-MF, E1-CRC-MF, Unframed
Line Coding	T1: B8ZS or AMI E1: HDB3 or AMI
Facility Datalink Protocol	ANSI T1.403 and AT&T 54016
Data Transfer Services	Structured or Unstructured
Clocking	Synchronous, SRTS, Adaptive

## Rear Panel



### ◆ Important Note ◆

OmniAccess switches do not support the Alcatel Backup Power System (BPS).

## Power Cords

The power cord is the main disconnect device. It should be plugged into an easily accessible outlet. In the event that your power cord is lost or damaged, refer to the specifications below.

### Specifications

The power cord to be used with 115-Volt configuration is a minimum type SJT (SVT)18/3, rated at 250 Volts ac, 10 Amps with a maximum length of 15 feet. One end terminates in an IEC 320 attachment plug and the other end terminates in a NEMA 5-15P plug.

The power cord to be used with 230-Volt configuration is minimum type SJT (SVT) 18/3, rated 250 Volts ac, 10 Amps with a maximum length of 15 feet. One end terminates in an IEC 320 attachment plug and the other end terminates as required by the country where it will be installed.

European cords *must* be Harmonized (HAR) type.

