Hardware Installation Guide

SA 100 / SA 600 / SA 1200

Ascend Communications, Inc.

Product Code: 80085
Revision 00
September 1998

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FEDERAL COMMUNICATIONS COMMISSION WARNING

This device complies with Part 15 of the FCC Rules and Regulations. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must withstand any interference received, including interference that may cause undesired operation.

The SA 100, SA 600, and SA 1200 have been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules and Regulations. These limits are designed to provide reasonable protection against harmful interference when this equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio-frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio and television communications. Operation of this equipment in a residential area is likely to cause interference in which case the user will be required to correct the interference at his or her own expense.

Shielded cables must be used with this unit to ensure compliance with the FCC Class A limits.

Do not attempt to repair or modify this equipment. Any repairs to the unit must be performed by Ascend Communications Inc. or a Ascend-authorized representative.

Maintenance Agreements

Ascend offers a comprehensive program to provide hardware support, a 24-hour emergency hotline, overnight parts replacement, and an escalation procedure. Non-contract maintenance services are provided at current time-and-materials rates. For more information, contact Ascend Technical Assistance Center at 1-800-DIAL-WAN (in the U.S.) or 1-978-952-7299 (outside the U.S.).

Ascend has adopted a maintenance strategy based on customer-initiated requests to the Ascend Technical Assistance Center. The Ascend Technical Assistance Center coordinates all customer services, including hardware and software technical support, on-site service requirements, and module exchange and repair.

If the Product Is Damaged

If any portion of the switch is damaged, forward an immediate request to the delivering carrier to perform an inspection of the product and to prepare a damage report. Save the container and all packing materials until the contents are verified.

Concurrently, report the nature and extent of the damage to the Ascend Technical Assistance Center so that action can be initiated, either to repair or replace the damaged items.

Do not return any items to Ascend until you obtain instructions from an Ascend Technical Assistance Center representative. Report the problem or deficiency to the Ascend Technical Assistance Center representative, along with the model, type, and serial number. Upon receipt of this information, the Ascend Technical Assistance Center will provide you with service instructions, or a Return Authorization Number and shipping information. All items returned under warranty must be shipped to the manufacturer with the charges prepaid.

If Problems Arise

If any of your telephone equipment is not operating properly, you should immediately remove it from your telephone line, as it may cause harm to the telephone network. If the telephone company notes a problem, they may temporarily discontinue service. When practical, they notify you in advance of this disconnection. If advance notice is not feasible, you will be notified as soon as possible. When you are notified, you will be given the opportunity to correct the problem and informed of your right to file a complaint with the FCC.

In the event that repairs are ever needed on this equipment, they should be performed by Ascend Communications Corporation or an authorized Ascend representative. For information contact the Ascend Technical Assistance Center at 1-800-DIAL-WAN (in the U.S.) or 1-978-952-7299 (outside the U.S.).

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About This Guide

The *Hardware Installation Guide* is a task-oriented manual that describes, step-by-step, how to set up, install, and test the SA 100 Broadband Service Unit, SA 600 Broadband Service Concentrator, and SA 1200 Broadband Service Concentrator. This manual also provides basic troubleshooting solutions for potential hardware-related problems. The *Guide* is intended for systems integrators and other personnel who are responsible for hardware installation.

What You Need to Know

The procedures in this guide require you to understand and follow the safety practices at your site, as well as those identified in this guide.

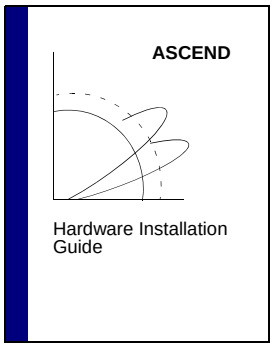
Before installing any hardware, check the installation location for adequate temperature, humidity, and electrical requirements. Chapter 2 describes the electrical, physical, and environmental specifications for the SA units.

You should work closely with the Network Management Station (NMS) operator and other systems integration personnel to ensure a functional installation.

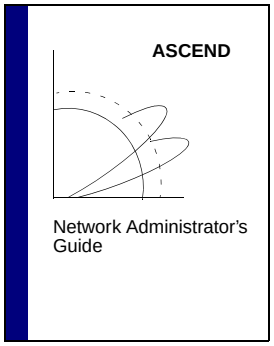
Read the Release Notes which accompanied your SA unit for additional information about this product.

Reading Path

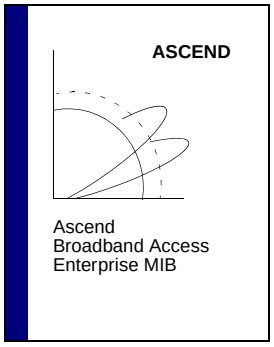
The following Ascend manuals comprise the complete document set for the SA 100, SA 600, and SA 1200:



This guide describes how to set up, install, and test the SA 100 / SA 600 / SA 1200 hardware. It also provides basic troubleshooting solutions for potential hardware-related problems.



This guide describes how to use WebXtend, the built-in Web browser interface, to configure, test and maintain your SA 100, SA 600, or SA 1200.



This guide describes the Ascend Broadband Access Enterprise Management Information Base (MIB), the database containing SA-unit network configuration and performance information.

How to Use This Guide

The following table briefly describes the chapters and appendices that comprise this guide.

Read	To Learn About
Chapter 1	The general functions and features of the SA units.
Chapter 2	The SA 100, SA 600, and SA 1200 product specifications including environmental and electrical considerations. This chapter also lists the Safety Warnings related to the use of the SA units.
Chapter 3	Installation prerequisites, such as unpacking the unit, taking inventory, and gathering the required installation items and equipment.
Chapter 4	Step-by-step setup and installation of SA hardware.
Chapter 5	Completing the hardware installation, powering up, and determining the operating status.
Chapter 6	Installing new modules or replacing existing modules in an SA unit.
Chapter 7	How to troubleshoot the SA 100, SA 600, or SA 1200, and, if necessary, contact the Ascend Technical Assistance Center.
Appendix A	The various PODs available for the SA units.
Appendix B	The various cables used with the SA units including their pinout assignments.
Appendix C	The SA 100, SA 600, and SA 1200 product codes and how to order SA products.
Appendix D	Country-specific regulatory information, including recommended and mandatory requirements of the relevant certification authorities, environmental standards, and compliance information.
Appendix E	The acronyms used throughout this guide.
Glossary	The definitions of the technical terms used throughout this guide.

Related Documents

The following Ascend documents may be useful for reference:

- *Network Administrator's Guide* (Product Code: 80084)
- *Ascend Broadband Access Enterprise MIB* (Product Code: 80055)

Customer Comments

Customer comments are welcome. Please respond in one of the following ways:

- Fill out the Customer Comment Form located at the back of this guide and return it to us.
- E-mail your comments to cspubs@ascend.com.
- FAX your comments to 1-203-949-0703, attention Technical Publications.
- Open a case in CaseView for documentation.

Customer Support

To obtain release notes, technical tips, or support, or to to access the Ascend FTP Server, contact the Technical Assistance Center at:

- 1-800-DIAL-WAN or 1-978-952-7299 (U.S. and Canada)
- 0-800-96-2229 (U.K.)
- 1-978-952-7299 (all other areas)

Conventions

This guide uses the following conventions:

Convention	Indicates	Example
[*bold italics*]	Variable parameters to enter.	**[*your IP address*]**
`Courier Regular`	Screen or system output; command names in text.	`Please wait...`
Bold	User input in body text.	Type **cd install** and ...
`Courier Bold`	User input in a command line.	> **`show ospf names`**
Menu => Option	A selection from a menu.	NavisCore => Logon
Italics	Book titles, new terms, and emphasized text. Also directories, pathnames, and filenames.	*Network Management Station Installation Guide*
Boxes around text	Notes, warnings, cautions.	See examples below.

Notes provide additional information or helpful suggestions that may apply to the subject text.

Cautions notify the reader to proceed carefully to avoid possible equipment damage or data loss.

Warnings notify the reader to proceed carefully to avoid possible personal injury.

1

Overview

This chapter provides the following background and conceptual information to help you prepare for your SA unit installation:

- General functions and features of the SA 100, SA 600, and SA 1200 units
- General functions and features of WebXtend (the SA unit's Web browser interface)

About the SA Units

The SA 100, SA 600, and SA 1200 provide a high mix of applications in a low-cost access system to broadband wide area networks (WANs) and campus backbones. Unique interface modularity provides economical integration of data, voice, video, and ATM cell traffic. High-performance, cross-flow switching supports a wide variety of voice, video, and data connections. Interchangeable modules called *Protocol Option Devices* (PODs) furnish a scalable upgrade path among Ascend's SA broadband access products.

The SA units are ideal for high-mix, low-cost access to broadband WANs. Figure 1-1 shows several SA units providing wide-area ATM access for a combination of video, voice, and LAN-based data traffic. The SA units provide wire-speed translation to and from ATM cells, and third-generation traffic management prevents bursty LAN traffic from degrading voice or video quality.

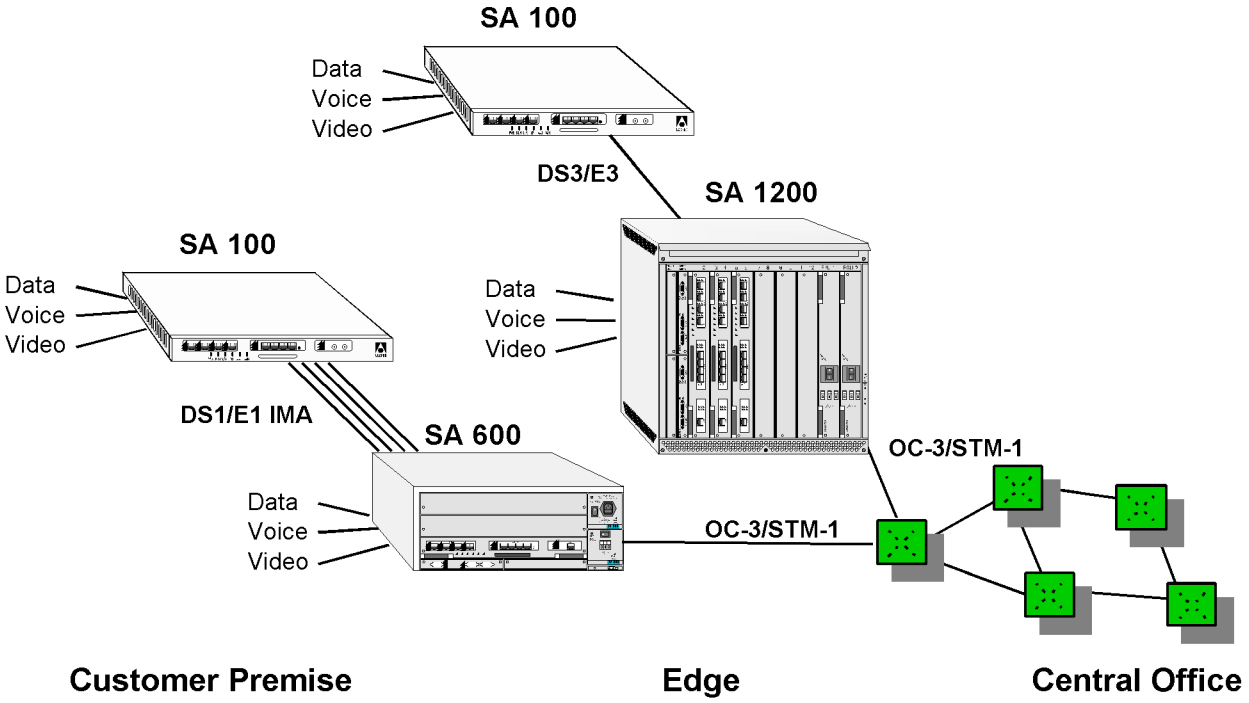


Figure 1-1. SA Products Consolidating Traffic onto a WAN

SA 100 Broadband Service Unit

Figure 1-2 shows the SA 100 Broadband Service Unit.

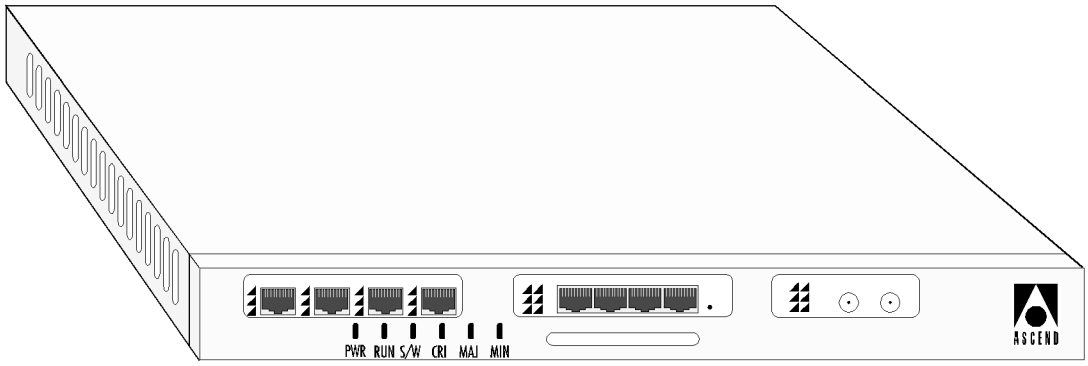


Figure 1-2. SA 100 Broadband Service Unit

The SA 100 supports the following devices in a single chassis:

- One Interface Control Module (ICM)
- Up to two Interface Protocol Option Devices (IPODs)
- One Expansion Protocol Option Device (XPOD)
- One Cell Protocol Option Device (CPOD)
  (The CPOD is an internal component and is not visible from the exterior.)

The SA 100's compact chassis is suitable for rack-mount, wall-mount, or stand-alone configurations. Interchangeable PODs allow flexible configuration of voice, video and data interfaces.

SA 600 Broadband Service Concentrator

Figure 1-3 shows the SA 600 Broadband Service Concentrator.

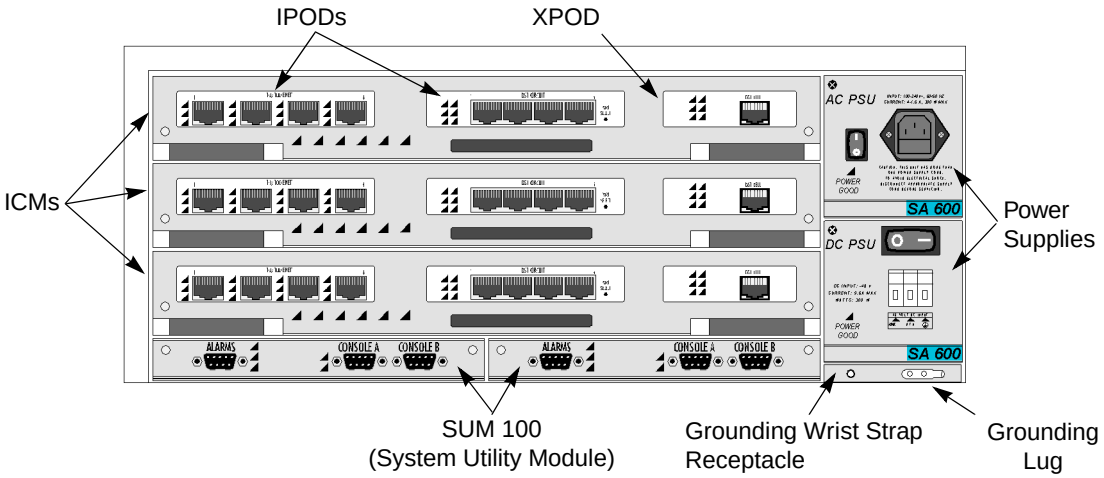


Figure 1-3. SA 600 Broadband Service Concentrator

The SA 600 supports the following devices in a single chassis:

- Up to three Interface Control Modules (ICMs)
- Up to two Interface Protocol Option Devices (IPODs) per ICM
- One Expansion Protocol Option Device (XPOD) per ICM
- One Cell Protocol Option Device (CPOD 200) per ICM
  (The CPOD is an internal component and is not visible from the exterior.)
- Two System Utility Module 100s (SUM 100) to provide craft interface ports and timing loopback functions
- Up to two redundant AC or DC power supplies

The SA 600 chassis is suitable for rack-mount or stand-alone configurations. Interchangeable PODs allow flexible configuration of packet, circuit, and cell interfaces.

SA 1200 Broadband Service Concentrator

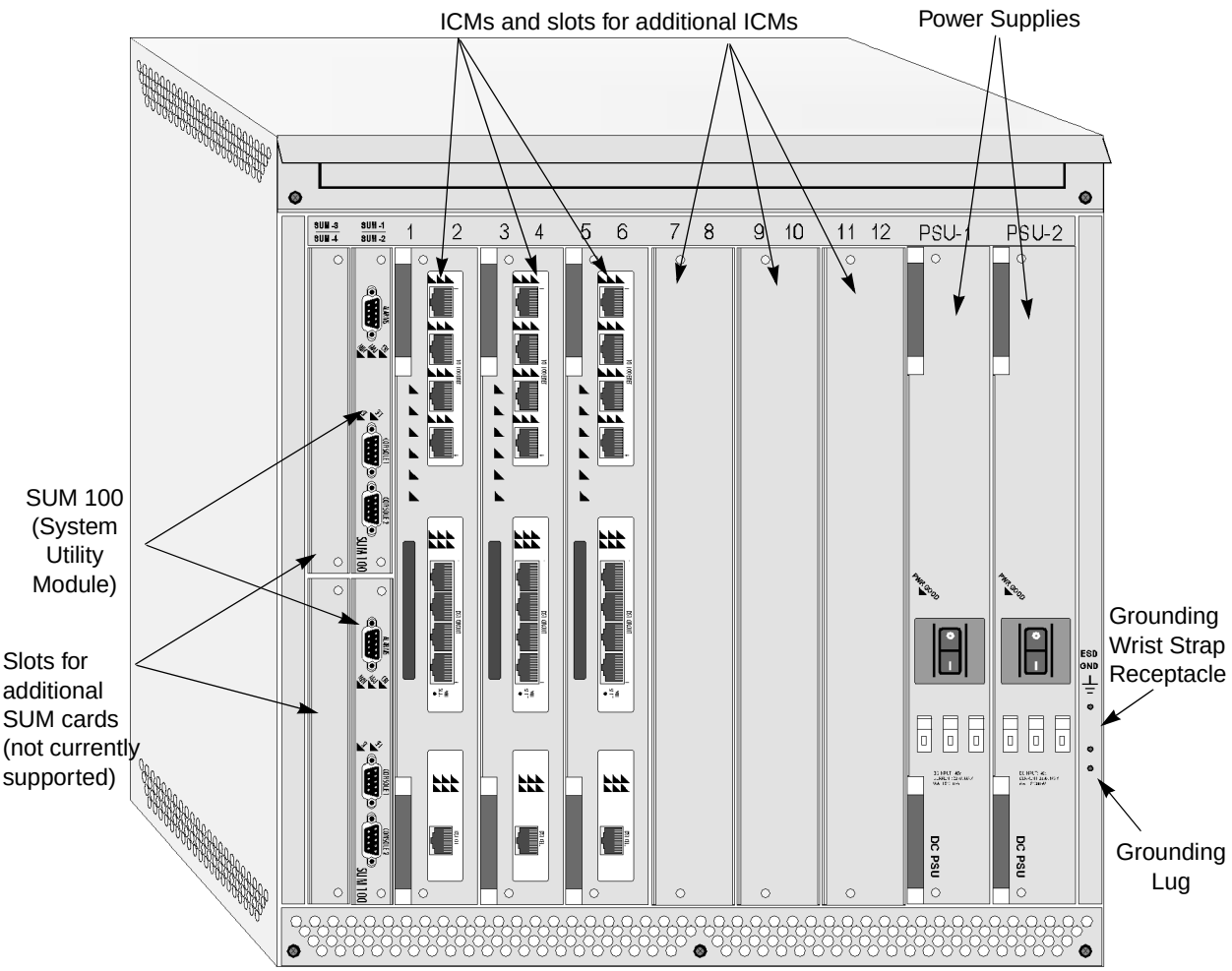


Figure 1-4. SA 1200 Broadband Service Concentrator

The SA 1200 supports the following devices in a single chassis suitable for rack-mount or stand-alone configurations:

- Up to six Interface Control Modules (ICMs)
- Up to two Interface Protocol Option Devices (IPODs) per ICM
- One Expansion Protocol Option Device (XPOD) per ICM
- One Cell Protocol Option Device (CPOD 200) per ICM
  (The CPOD is an internal component and is not visible from the exterior.)
- Two System Utility Module 100s (SUM 100) to provide craft interface ports and timing loopback functions
- Up to two redundant DC power supplies (AC to DC converter available)

Interface Control Module

The Interface Control Module (ICM) is the basic building block of every Ascend broadband access system. Each ICM includes a cell subsystem and a packet subsystem that switch cells and packets simultaneously. Traffic flows can be routed between I/O ports on any installed ICM by way of parallel packet and cell interconnects.

The cell subsystem and associated I/O interfaces support ATM *cell switching* with an aggregate capacity of over one gigabit per second per ICM. A Protocol Accelerator on each ICM translates between flows at multiple levels—including ATM segmentation and reassembly, and protocol encapsulation—at speeds up to 200,000 packets per second. Because the Protocol Accelerator is based on a programmable microcode processor, it can "learn" new protocols through future software downloads.

An industry-standard RISC processor on the ICM supports system control and network management functions. A flash memory file system stores the operating system, all application software, and configuration data. To cost-effectively maintain remote Ascend broadband access systems, standard protocols can be used to download software over network connections.

Protocol Option Devices

PODs are mezzanine boards that attach to the ICM. There are three types of PODs:

- IPODs support service interfaces including Ethernet, universal frame, circuit switching, and ATM UNI.
- XPODs provide additional interface capabilities including ATM wide-area connections, circuit switching, and other future enhancements.
- CPODs provide the cell switching function for each ICM. The SA 100 uses a CPOD 150, capable of switching cells between all interfaces on a single ICM. The SA 600 and SA 1200 require CPOD 200s, which are capable of switching cells between all interfaces on the ICM as well as switching cells across the backplane to other ICMs in the system.

You can easily configure the PODs on an ICM to meet your requirements. The flexible mix-and-match architecture of the ICM and PODs gives you complete control over both fan-out and interface mix.

Management and Configuration of SA Units

You can manage SA units using a variety of management access methods. Each SA unit has a serial craft interface, enabling you to use a VT100 terminal or equivalent to fully configure and manage the device. In addition, you can configure each SA unit with an IP address, enabling you to manage the device using SNMP, FTP, Telnet, and the Java-based WebXtend utility over a direct Ethernet connection, or over an ATM management VPI/VCI.

WebXtend Management Software

WebXtend network management software combines Java and Web technology to deliver secure, user-friendly access to sophisticated management applications.

Modern networks typically comprise an assortment of devices from a number of different vendors. Each vendor offers its own management system, and each management system requires one or more workstations. Consequently, a large wide-area network can require dozens of workstations, each configured to manage a particular version of a particular vendor's product. Furthermore, each management system may present a unique user interface, which requries the network operator to invest considerable time and resources to learn a new system.

World Wide Web browsers are gaining favor as a widely-used and friendly interface to diverse systems. WebXtend is the first Web-based network management architecture to combine the power of Java-based computing with support for standard network management protocols. WebXtend provides a network management approach that emphasizes ease of use, cost-effective platform independence, unlimited access, and enhanced security.

WebXtend provides secure real-time monitoring and control for the entire broadband access system. The WebXtend architecture is based on a standard World Wide Web *client*/*server* model (see Figure 1-5). A Web server is embedded in every SA unit. The recommended Web-browser is Microsoft Internet Explorer version 4.01 with Service Pack 1. Another supported browser is Netscape Communicator, Version 4.0.6.

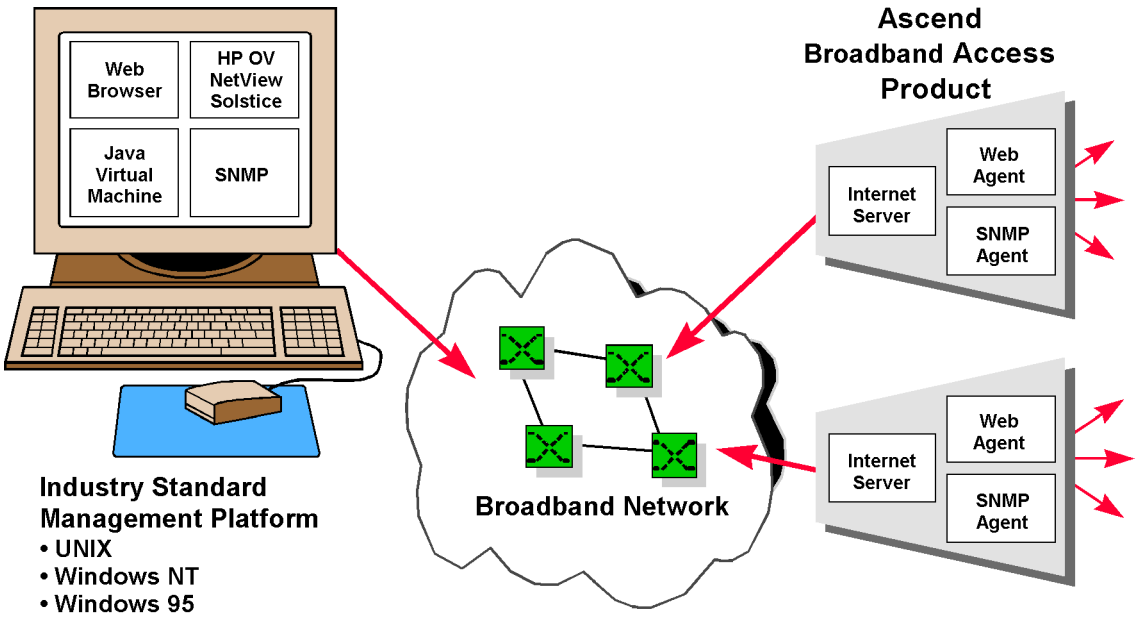


Figure 1-5. WebXtend Web-based Management

You manage SA broadband access systems using friendly point-and-click graphics. When you access a management function, the built-in Web server uploads the appropriate Java *applet* to the client. The Java applets support management functions such as configuration and fault management, and display of real-time data such as traffic statistics. For ease of use, WebXtend's management tools are organized into functional groups such as Administration, Utilities, and Interface Management. In addition, a full complement of utilities supports file management, real-time software upgrades, and other functions necessary for proper system maintenance.

Cost-effective Platform Independence

Web browsers give WebXtend a familiar and easy-to-learn user interface to minimize training costs and maximize user productivity. WebXtend enables you to use a Java-enabled browser on any platform, eliminating the need to dedicate expensive workstations for managing broadband access products.

Every SA unit supports a *craft interface* for on-site configuration, provisioning, and testing. The VT100 interface provides simple, menu-driven commands to facilitate installation while delivering the same rich management functionality as the WebXtend software.

SA units also supports standard protocols for management access and control. Support for Telnet, FTP, IP addressing, and SNMP allows integration with generic MIB browsers and industry-standard management platforms like HP OpenView, NetView 6000, and SunNet Manager.

Secure Access

Adherence to standard protocols permits WebXtend to operate over any type of connection, including LANs, WANs, dial modems, and the Internet. Flexible, robust security mechanisms furnish both service providers and their subscribers with access control and authorization. You can protect management traffic against unauthorized access by restricting it to secure IP connections.

2

Specifications and Safety Warnings

This chapter describes the following SA 100, SA 600, and SA 1200 specifications and safety warnings:

- Electronic and electrical specifications (see page 2-2)
- Physical specifications (see page 2-4)
- Site specifications (see page 2-5)

Electronic/Electrical Specifications

Table 2-1 describes the electronic/electrical specifications for SA units.

Table 2-1. Electronic/Electrical Specifications

SA Unit	Application	Specification
SA 100	100-240 VAC	100-240 VAC, 50/60 Hz, 1.2-0.6 A, 100 W
	-48 VDC	-48 VDC, 2 A, 100 W
	Power Supply Thermal Dissipation	AC: 18.75 W max, 64 BTU/hr DC: 18.75 W max, 64 BTU/hr
SA 600	100-240 VAC	100-240 VAC, 50/60 Hz, 3.0–1.5 A, 270 W
	-48 VDC	-48 VDC, 7.5 A, 270 W
	Power Supply Thermal Dissipation (per power supply)	AC: 75 W max, 256 BTU/hr DC: 75 W max, 256 BTU/hr
SA 1200	-48 VDC	-48 VDC, 22.4 A, 750 W max
	Power Supply Thermal Dissipation (per power supply)	DC: 190 W max, 648 BTU/hr
	100-240 VAC (requires external AC/DC power converter, part # 40066)	AC/DC Converter: 100-240 VAC, 50/60 Hz, 10.5–4.0A, 1000 W

The AC power cord has a three-prong plug that grounds the unit and polarizes the connection. The ground connector must be grounded properly. Table 2-2 lists the country requirements for the plug type and its ratings.

The AC power cord must be terminated with an International Electrotechnical Commission (IEC) 320 receptacle.

Table 2-2. AC Power Cord Requirements

Country	AC Power Cord Type and Rating
USA and Canada	NEMA 5-15 15A/125 VAC, CE
U.K.	BS 1363 10A/240 VAC
Australia	AS 3112 10A/240 VAC
Japan	JIS 8303 15A/125 VAC
Switzerland	SEV 1011 10A/220-240 VAC
Germany	CEE7 VII 16A/250 VAC

Physical Specifications

Table 2-3 describes the physical specifications of the SA 100, SA 600, and SA 1200.

Table 2-3. Physical Specifications

Specification	Description
ATM Standards	ATM Forum UNI (Versions 3.0, 3.1, and 4.0), ATM Forum Interim Inter-Switch Signalling Protocol (IISP)
WAN Interfaces	DS1, E1, DS3, E3, OC-3c, STM-1
Management Interfaces	Ethernet, RS-232 (9 pin), IP/ATM (RFC 1483)
Physical Characteristics	**SA 100:** Includes one power supply, four cooling fans, one XPOD module, one CPOD, and one or two IPOD modules mounted inside a chassis **SA 600:** Includes one or two power supplies, cooling fans, and up to three ICMs (each equipped with one XPOD module, one CPOD, and one or two IPOD modules) and installed in a six-slot chassis **SA 1200:** Includes one or two power supplies, cooling fans, and up to six ICMs (each equipped with one XPOD module, one CPOD, and one or two IPOD modules) and installed in a twelve-slot chassis
Overall Chassis Size[a]	**SA 100:** 17.5 in (44.5 cm) wide x 1.75 in (44.5 mm) high x 11.9 in. (30.2 cm) deep **SA 600:** 17.5 in (44.5 cm) wide x 7 in (17.8 cm) high x 12 in. (30.5 cm) deep **SA 1200:** 17.5 in (44.5 cm) wide x 17.5 in (44.45 cm) high x 12 in. (30.5 cm) deep
Unit Weight	**SA 100:** 14 lb. (6.35 kg) average weight when fully configured **SA 600:** 34 lb. (15.4 kg) average weight when fully configured **SA 1200:** 85 lb. (38.5 kg) average weight when fully configured

[a]Depth size does not include calculations for cable spacing.

Site Specifications

Use the recommendations in this section when planning your installation.

Operating Environment

Table 2-4 describes the environmental requirements for selecting an installation site. The site requirements are based on Network Equipment Building System (NEBS) GR-1063-CORE and GR-1089-CORE.

Table 2-4. Site Specifications

Characteristic	Requirement
Ambient Operating Temperature	32°F to +122°F (0°C to +50°C)
Relative Humidity	5% to 95% (noncondensing)
Operating Altitude	-500 feet to +10,000 ft (-152 m to 3048 m)
Ambient Storage Temperature	-40°F to +149°F (-40°C to +66°C), 95% relative humidity
Storage Altitude	-1,000 to +30,000 ft (-305 to 9150 m)

Space Requirements

The SA units require a minimum of 2 inches (5 cm) of air flow space on both sides of the chassis.

Safety Warnings

To avoid electrical shock, disconnect the power supply cord prior to servicing.

DC power supplies must be installed only in restricted access areas (dedicated equipment rooms, equipment closets, or the like) in accordance with Articles 110-16, 110-17, and 110-18 of the National Electric Code, ANSI/NFPA 70. Connect to a 48V DC source which is electrically isolated from the AC source and which is reliably connected to earth.

This equipment is designed to permit the connection of the grounded conductor of the DC supply circuit to the grounding conductor at the equipment. If this connection is made, all of the following conditions must be met:

- This equipment shall be connected directly to the DC supply system grounding electrode conductor or bonding jumper from a grounding terminal bar or bus to which the DC supply system grounding electrode conductor is connected.
- This equipment shall be located in the same immediate area (such as, adjacent cabinets) as any other equipment that has a connection between the grounded conductor of the same DC supply circuit and the grounding conductor, and also the point of grounding of the DC system. The DC system shall not be grounded elsewhere.
- The DC supply source is to be located within the same premises as the equipment.
- There shall be no switching or disconnecting devices in the grounded circuit conductor between the DC source and the point of connection of the grounding electrode conductor.

A readily accessible disconnect device must be provided in the fixed wiring for a DC power supply. It must be suitable for the rated voltage and current specified.

3

Preparing for Installation

This chapter describes the SA 100, SA 600, and SA 1200 hardware and their respective Accessory Kits. It also describes the preparations and prerequisites for installation.

Selecting the Installation Site

Before you choose a location for the SA unit, be sure to read and follow the site, electrical, and safety requirements described in Chapter 2.

Select the location carefully. Follow proper ventilation and space requirements in Chapter 2 for current and future cabling requirements.

Table 3-1 lists the mounting methods for each SA unit. Each of these installations is described in Chapter 4.

Table 3-1. Mounting Methods

SA Unit	Acceptable Mounting Methods
SA 100	• Rack-mount the SA 100 unit in a standard 19- or 23-inch (48.26 or 58.42 cm) wide equipment cabinet • Place it on a flat surface as a free-standing unit • Mount it on a wall
SA 600	• Rack-mount the SA 600 unit in a standard 19- or 23-inch (48.26 or 58.42 cm) wide equipment cabinet • Place it on a flat surface as a free-standing unit
SA 1200	• Rack-mount the SA 1200 unit in a standard 19- or 23-inch (48.26 or 58.42 cm) wide equipment cabinet • Place it on a flat surface as a free-standing unit

Unpacking the SA Unit

Ascend ships the SA unit in a protective shipping carton. The carton contains the SA unit with all its ordered Protocol Option Devices (PODs) installed, an Accessory Kit, and documentation (see Figure 3-1).

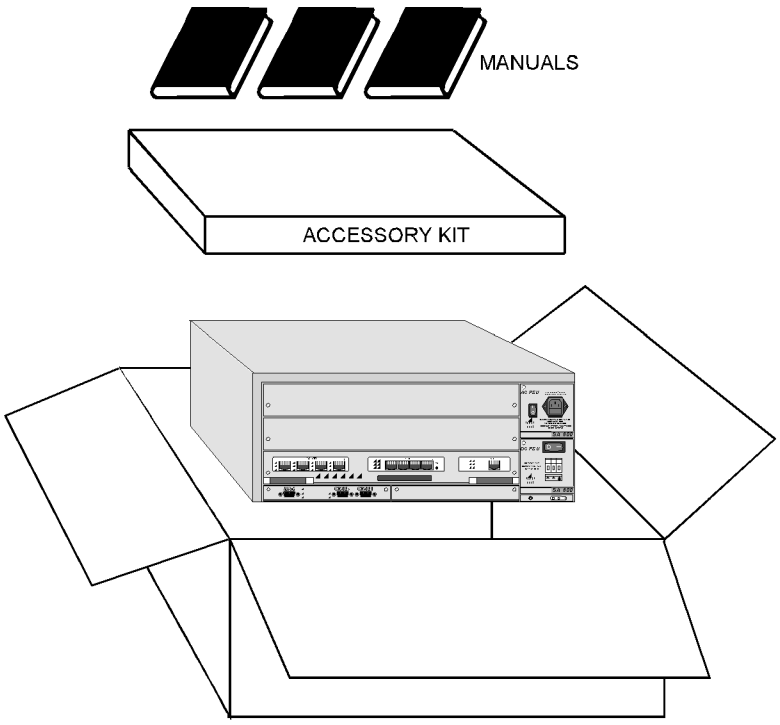


Figure 3-1. Typical Shipping Configuration (SA 600 shown)

Before you remove the SA unit from the shipping carton, check all outside surfaces for signs of damage. If you see any, follow the instructions described in "If the Product Is Damaged" on page v.

To unpack the SA unit:

1. Open its carton and remove all the enclosed packing materials. Save the carton and packing materials in case you need to reship it later.
2. Check the contents of the carton against the items listed on the packing slip.

Unpacking the Accessory Kit

The items in the Accessory Kit vary with each order. Unpack the Accessory Kit and check the contents against the items listed on the packing slip. Table 3-2 lists the contents of each SA unit's accessory kit.

Table 3-2. Accessory Kit Contents

SA 100	SA 600	SA 1200
Power cord (AC only)	Power cord(s) (AC only)	DB-9 male to DB-9 female straight-through cable
DB-9 male to DB-9 female straight-through cable	DB-9 male to DB-9 female straight-through cable	DB-9 male to DB-25 male crossover cable
DB-9 male to DB-25 male crossover cable	DB-9 male to DB-25 male crossover cable	Two 19-inch and two 23-inch rackmount brackets, railmount bolts, and associated hardware
Two 19-inch and two 23-inch rackmount brackets, railmount bolts, and associated hardware (wall-mount brackets are optional)	Two 19-inch and two 23-inch rackmount brackets, railmount bolts, and associated hardware	Grounding lug kit including two male-male standoffs, two #10 nuts, and one ground lug
Four adhesive feet	Grounding lug kit including two male-male standoffs, two #10 nuts, and one ground lug	Four adhesive feet
Anti-static wrist strap	Four adhesive feet	Anti-static wrist strap
Hardware Installation Guide, Product Code: 80085	Anti-static wrist strap	*Hardware Installation Guide*, Product Code: 80085
Network Administrator's Guide, Product Code: 80084	*Hardware Installation Guide*, Product Code: 80085	*Network Administrator's Guide*, Product Code: 80084
Ascend Broadband Access Enterprise MIB, Product Code: 80055	*Network Administrator's Guide*, Product Code: 80084	*Ascend Broadband Access Enterprise MIB*, Product Code: 80055
Release Notes for the SA 100 / SA 600 / SA 1200	*Ascend Broadband Access Enterprise MIB*, Product Code: 80055	Release Notes for the SA 100 / SA 600 / SA 1200
	Release Notes for the SA 100 / SA 600 / SA 1200	

Required Installation Tools and Equipment

To install the SA 100, SA 600, or SA 1200 hardware, you need the following tools and equipment that are not supplied with the unit:

- One #1 Phillips head screwdriver
- One #2 Phillips head screwdriver
- One large flathead screwdriver (SA 100 only)
- One Panduit CT-700 crimp tool or equivalent
- One wrench to fit #10 nuts
- For SA 600 and SA 1200 DC power installations, a 3-wire 12 AWG cable
  For SA 100 DC power installations, a 3-wire 16 AWG cable
- For Web browser interface management, a computer with
  - An ethernet interface
  - Web browser software
- For craft interface management, a VT100 (or equivalent) terminal or a computer running VT100 terminal emulation software (for more information on craft interface management, refer to the *Network Administrator's Guide*)
- A modem (optional; for remote craft interface management)
- Cables for the interface management connections
- Cables for the CPE and network interface connections

Verifying the Hardware Configuration

SA 100 Broadband Service Unit

The IPODs and XPOD ordered with the SA 100 should already be installed in the unit. The front of each POD is labeled with its POD type. Check the front panel of the SA 100 to verify that the system is configured as ordered.

> Use a properly grounded anti-static strap when handling the SA 100.

Figure 3-2 shows the locations of the IPODs, XPOD, and PCMCIA card slot (PCMCIA cards are not currently supported).

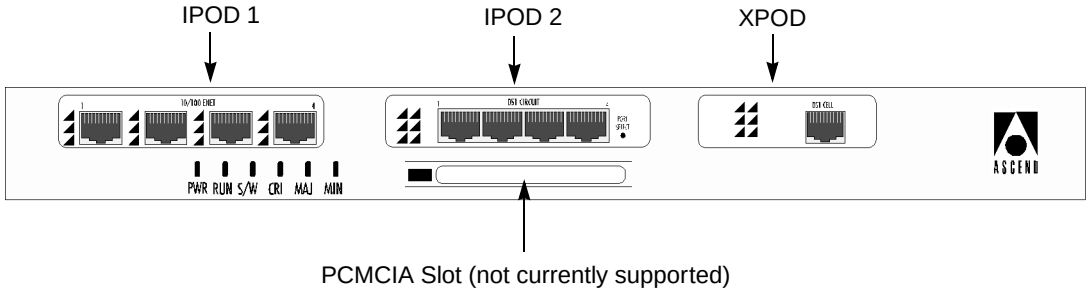


Figure 3-2. POD Locations

Check the rear of the SA 100 to verify that it has the power supply ordered. Figure 3-3 illustrates how the AC and DC power connections appear.

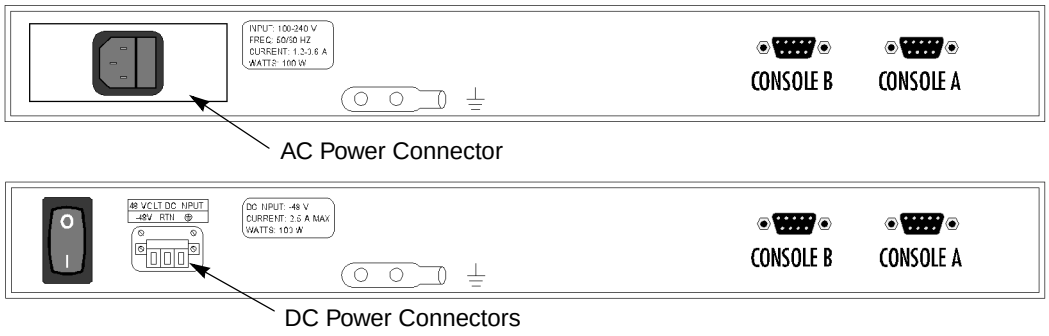


Figure 3-3. AC and DC Power Connectors

SA 600 Broadband Service Concentrator

After unpacking the SA 600, verify that the hardware configuration matches the options ordered.

- The power supplies should be of the correct type. Figure 3-4 illustrates how AC and DC power connections appear.
- The System Utility Module should be installed in the lower left slot position.
- The ICM(s) ordered with the SA 600 should already be installed in the unit, loaded with their respective IPODs and XPODs. The front of each POD is labeled with its POD type.

Use a properly grounded anti-static strap when handling the SA 600.

Figure 3-4 shows an SA 600 with one AC power supply, one DC power supply, a System Utility Module 100 (SUM), and one ICM; the locations of the IPODs, XPOD, and PCMCIA card slot on the ICM are indicated (PCMCIA cards are not currently supported).

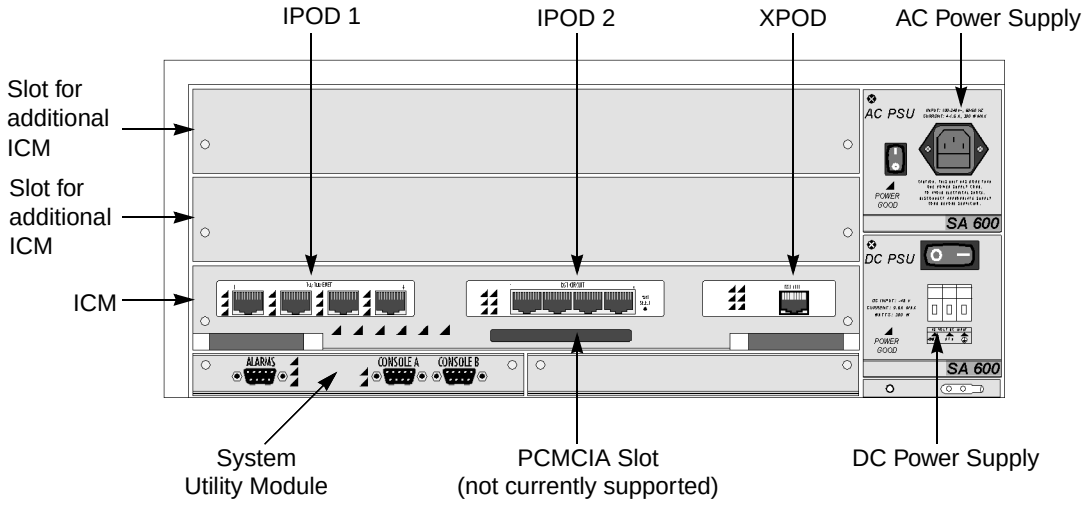


Figure 3-4. SA 600 Typical Hardware Configuration

SA 1200 Broadband Service Concentrator

After unpacking the SA 1200, verify that the hardware configuration matches the options ordered.

- The correct number of power supplies (1 or 2) are installed. Figure 3-5 illustrates how DC power connections appear.
- One or more System Utility Modules should be installed in the slot positions indicated.
- The ICM(s) ordered with the SA 1200 should already be installed in the unit, loaded with their respective IPODs and XPODs. The front of each POD is labeled with its POD type.

Use a properly grounded anti-static strap when handling the SA 1200.

Figure 3-4 shows an SA 1200 with two DC power supplies, two System Utility Module 100s (SUM), and three ICMs.

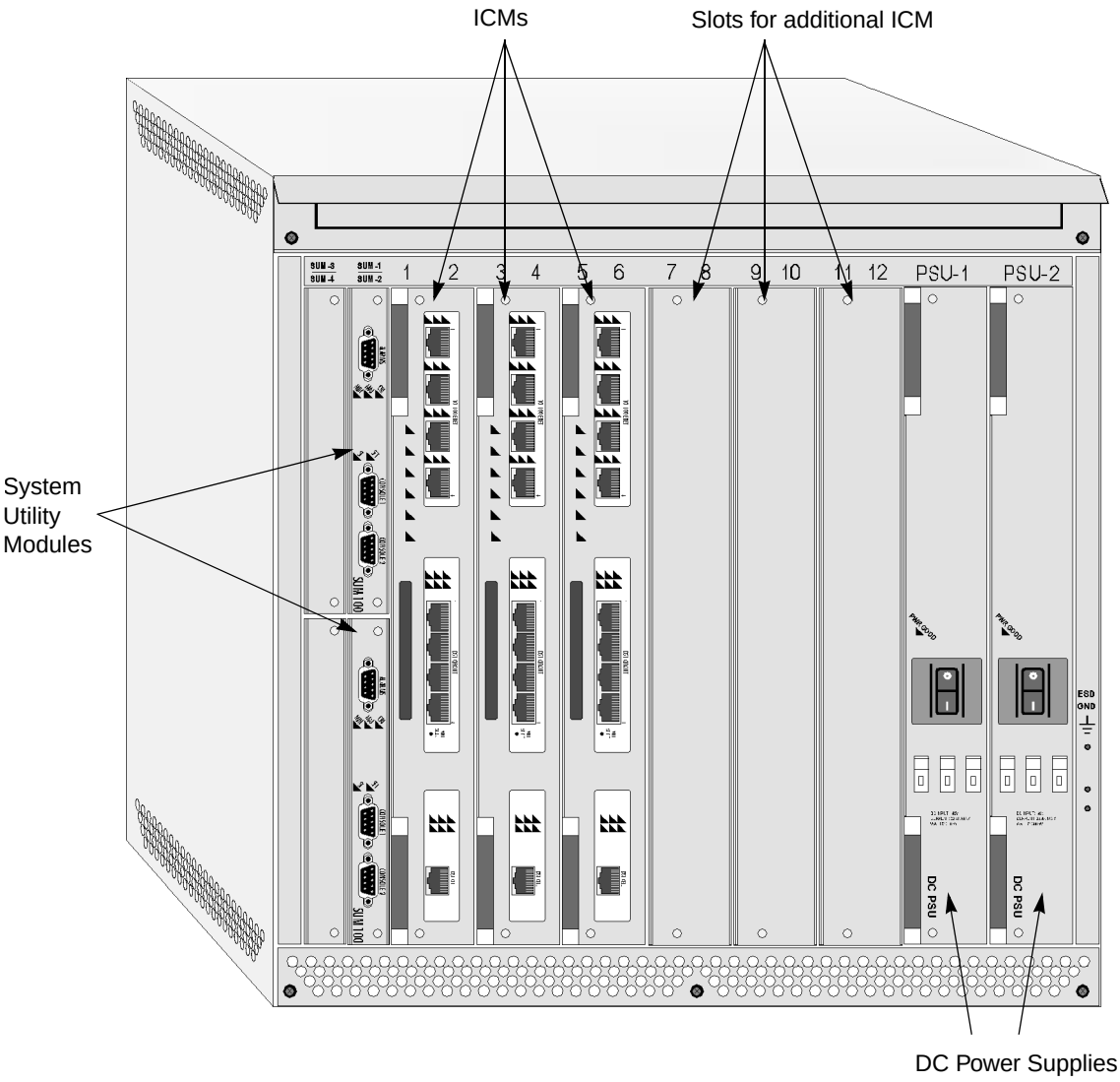


Figure 3-5. SA 1200 Typical Hardware Configuration

What's Next?

When you finish unpacking and taking inventory of the SA unit, its Accessory Kit, and its installed modules, you can begin the installation as described in Chapter 4, "Installing the SA Unit."

4

Installing the SA Unit

This chapter provides step-by-step instructions for mounting, setting up, and installing the SA 100, SA 600, and SA 1200 units:

- Mounting the SA 100 unit – see page 4-2
- Mounting the SA 600 unit – see page 4-11
- Mounting the SA 1200 unit – see page 4-19

Before you begin the installation, verify that you have completed the following tasks:

- ☑ Select the installation site
- ☑ Unpack the SA unit
- ☑ Unpack the Accessory Kit
- ☑ Gather the tools and equipment needed for installation
- ☑ Check the module configuration

Mounting the SA 100

You can install the SA 100 in the following ways:

- Rack-mount the SA 100 unit in a standard 19- or 23-inch (48.26 or 58.42 cm) wide equipment cabinet
- Place it on a flat surface as a free-standing unit
- Mount it on a wall (requires additional hardware)

The following sections describe the steps required for each installation.

Contact your CPE and network service provider documentation for any special instructions regarding this installation.

Installing the SA 100 as a Stand-alone Unit

Use a properly grounded anti-static wrist strap when handling the SA 100.

You may install the SA 100 safely on any firm, level surface provided that the following conditions are met:

- The installation adheres to all the power, environmental, and safety requirements described in Chapter 2, “Specifications and Warnings.”
- The mounting surface is large enough to safely accommodate the dimensions of the SA 100 (18 by 12 inches (46 x 31 cm) minimum).
- The mounting surface is sturdy enough to safely accommodate the weight of the SA 100 (14 pounds (6.35 kg) minimum). For multiple units, ensure that the mounting surface is sturdy enough to safely accommodate the combined weight of all of the SA 100s (assume 14 pounds (6.35 kg) per unit minimum).
- There are no obstructions to the ventilation system located on the left and right side panels of the SA 100. Maintain a minimum clearance of 2 inches on all sides.

The SA 100 or its components may be damaged if appropriate clearance is not maintained for cooling.

To install the SA 100 as a stand-alone unit:

1. Install the four adhesive feet (supplied in the Accessory Kit) in the indentations at each corner of the bottom of the SA 100.
2. Place the SA 100 in your predetermined location.

After completing these steps, you can begin the cabling the SA 100. Go to “Connecting Power to the SA 100” on page 4-8 for the cabling procedures.

Installing the SA 100 as a Rack-mounted Unit

To rack-mount the SA 100:

1. Determine the rack size, i.e., 19 inch or 23 inch, and locate the appropriate brackets. (The Accessory Kit includes both 19-inch and 23-inch brackets.)
2. Determine the preferred rack-mount method, i.e., front-, rear-, or center-mounted. (Center mounting requires a center-mount kit, available separately. Contact your Ascend sales representative.)

Determine that the preferred/desired rack-mount method meets IEC 297-2 and ANSI/EIA-RS-310C standards.

Use a properly grounded anti-static wrist strap when handling the SA 100.

3. Place the SA 100 and its Accessory Kit on a stable, static-protected work area.
4. Use the flathead Phillips screws supplied in the bracket kit to attach the brackets to each side of the SA 100 at the locations illustrated in Figure 4-1.

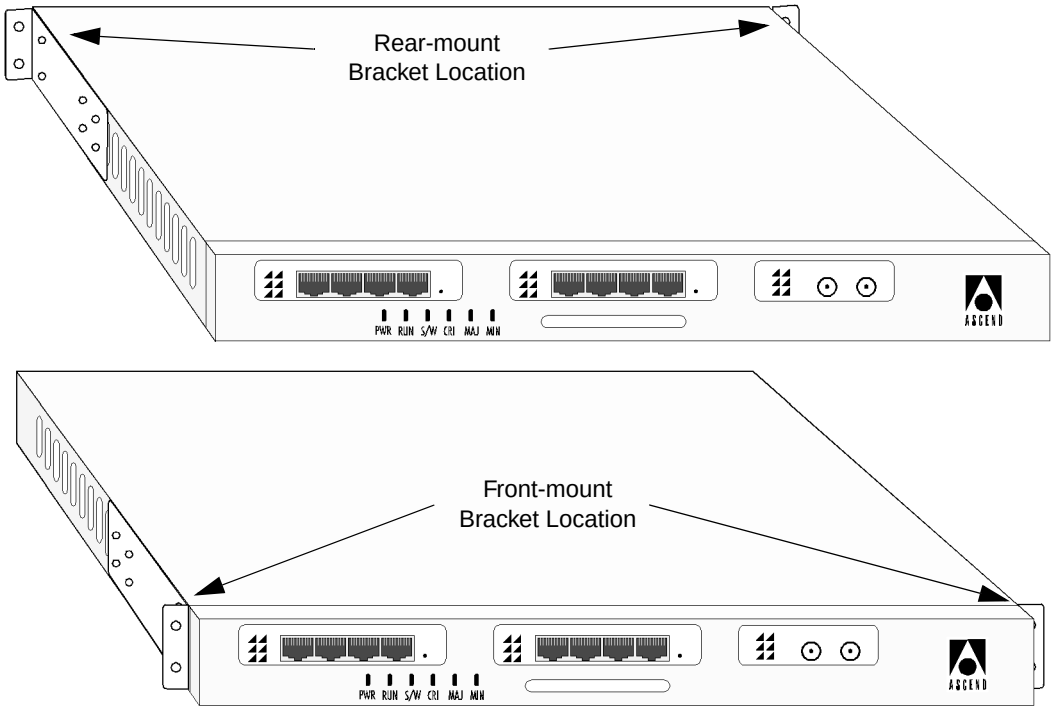


Figure 4-1. Front- and Rear-mount Bracket Locations (19-inch shown)

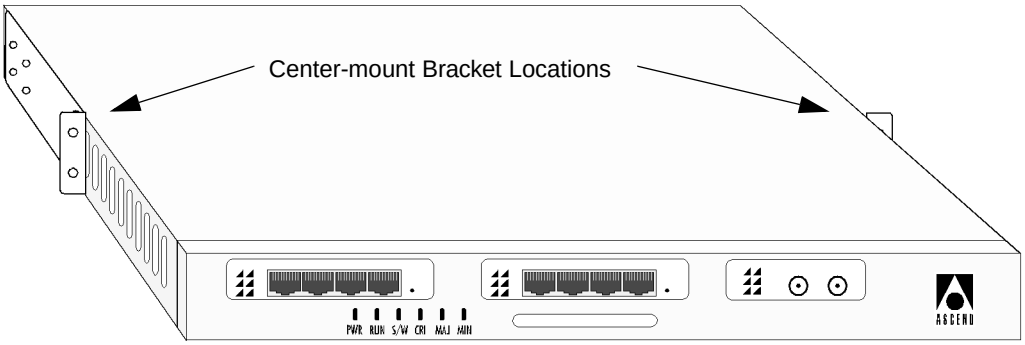


Figure 4-2. Center-mount Bracket Locations (19-inch shown)

Securing the SA 100 to the rack may require help to hold and secure the unit.

5. Position the SA 100 in the rack and attach it to the threaded mounting holes of the rack using the four truss-head screws supplied in the Accessory Kit. (You must acquire additional hardware for racks without threaded mounting holes.)

After completing these steps, you can begin the cabling the SA 100. Go to "Connecting Power to the SA 100" on page 4-8 for the cabling procedures.

Wallmounting the SA 100

The unit weighs approximately 14 pounds. Be sure that the mounting brackets and supports are solidly fixed to the wall studs or framing members. Do not anchor the unit into fiberboard or sheetrock.

Use a properly grounded anti-static wrist strap when handling the SA 100.

Before wallmounting the SA 100, ensure that the following conditions exist:

- You must have two wall-mounting brackets. These are not included in the Accessory Kit, so you will have to acquire them separately. Contact your Ascend sales representative.
- The installation adheres to all the power and environmental requirements described in Chapter 2, “Specifications and Warnings.”
- The mounting surface is large enough to safely accommodate the dimensions of the SA 100 (18 by 12 inches (46 x 31 cm) minimum).
- The mounting surface and the mounting hardware are sturdy enough to safely accommodate the weight of the SA 100 (14 pounds (6.35 kg) minimum).
- There are no obstructions to the ventilation system located on the left and right side panels of the SA 100. Maintain a minimum clearance of 2 inches on all sides.

The SA 100 or its components may be damaged if appropriate clearance is not maintained for cooling.

To wallmount the SA 100:

1. Find studs or support members for attaching the SA 100 mounting barckets.
2. As illustrated in Figure 4-3, attach a wall-mount bracket to the center of each side of the SA 100 using the flathead Phillips screws supplied.

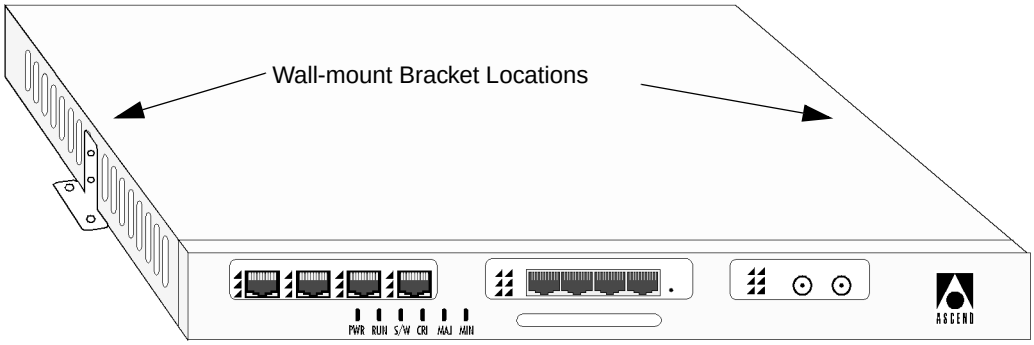


Figure 4-3. Bracket Locations for Wall-Mounting

Securing the SA 100 to the wall may require help to hold and secure the unit.

3. Position the SA 100 on the wall and attach it using two screws in each bracket.

After completing these steps, you can begin the cabling the SA 100. Go to "Connecting Power to the SA 100" on page 4-8 for the cabling procedures.

Connecting Power to the SA 100

The SA 100 has an AC or a DC power supply depending on what type was ordered. The following procedures describe how to connect an SA 100 with either an AC or DC power supply.

Connecting the SA 100 to Ground

Verify that power is off or disconnected at the source before beginning this procedure.

To connect the SA 100 to ground:

1. Make sure the unit's power switch is toggled off (DC only) or remove the IEC cord (AC only).
2. Using a small wrench, remove the nuts securing the grounding lug. Remove the washers and lock-washers from each stud and set aside.
3. Connect one end of a grounding wire to earth ground, usually at the mounting rack.
4. Insert the other end of the grounding wire into the grounding lug. Crimp the ground wire into the grounding lug securely using a Panduit CT-700 crimp tool (or equivalent).
5. Replace the grounding lug on the rear of the SA 100 (as shown in Figure 4-4) and replace the washer, lock-washer and nuts onto each standoff. Tighten the nuts to secure the grounding lug.

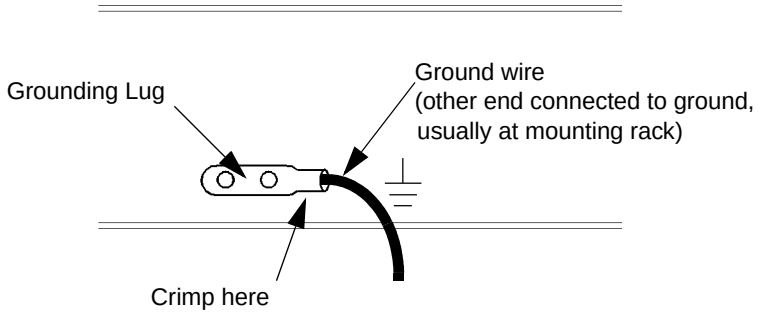


Figure 4-4. Grounding the SA 100

Connecting AC Power

> Before connecting the AC power cord, refer to the electrical specifications in Chapter 2 and the regulatory information in Appendix D.

To connect AC power to the SA 100:

1. Plug the AC power cord into the AC power cord receptacle on the rear of the SA 100.

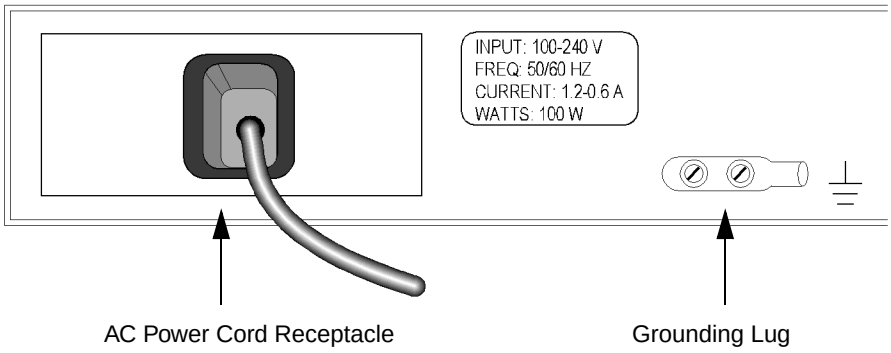


Figure 4-5. AC Connector and Grounding Nuts

2. Install cables to the SA 100 PODs as described in "Connecting CPE and Network Interfaces" on page 4-27.
3. Plug the other end of the AC power cord into a grounded power outlet.

Connecting DC Power

> Verify that power is off or disconnected at the source before beginning this procedure.

Before connecting DC power to the SA 100, you must acquire 3-wire 16 AWG cable long enough to connect the DC power source to the rear panel DC power connectors of the SA 100.

To connect DC power to the SA 100:

1. Toggle the SA 100 circuit breaker off. See Figure 4-6.
2. Strip 1/2 inch of insulation from each of the wires at one end of the cable.
3. Loosen each screw in the Terminal Block Connector. See Figure 4-6.

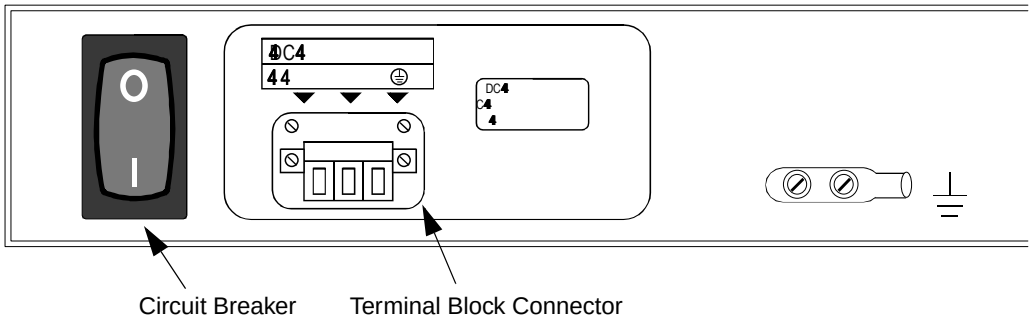


Figure 4-6. Power Switch, Terminal Block Connector, and Grounding Nuts

4. Slide the black wire into the block opening labeled -48 V and tighten the locking screw.
5. Slide the white wire into the block opening labeled RTN and tighten the locking screw.
6. Slide the green wire into the block opening labeled “ground” and tighten the locking screw.
7. Attach the other end of the cable to the DC power source according to premise requirements.
8. Do not toggle the circuit breaker on at this time. Instead, install cables to the SA 100 PODs as described in “Connecting CPE and Network Interfaces” on page 4-27.

Mounting the SA 600

You can install the SA 600 in one of two ways:

- Rack-mount the SA 600 unit in a standard 19- or 23-inch (48.26 or 58.42 cm) wide equipment cabinet
- Place it on a flat surface as a free-standing unit

The following sections describe the steps required for each installation.

Contact your CPE and network service provider documentation for any special instructions regarding this installation.

Installing the SA 600 as a Stand-alone Unit

Use a properly grounded anti-static wrist strap when handling the SA 600.

You may install the SA 600 safely on any firm, level surface provided that the following conditions are met:

- The installation adheres to all the power, environmental, and safety requirements described in Chapter 2, “Specifications and Warnings.”
- The mounting surface is large enough to safely accommodate the dimensions of the SA 600 (18 by 12 inches (46 x 31 cm) minimum).
- The mounting surface is sturdy enough to safely accommodate the weight of the SA 600 (34 pounds (15.4 kg) minimum). For multiple units, ensure that the mounting surface is sturdy enough to safely accommodate the combined weight of all of the SA 600s (assume 34 pounds (15.4 kg) per unit minimum).
- There are no obstructions to the ventilation system located on the left and right side panels of the SA 600. Maintain a minimum clearance of 2 inches.

The SA 600 or its components may be damaged if appropriate clearance is not maintained for cooling.

To install the SA 600 as a stand-alone unit:

1. Install the four adhesive feet (supplied in the Accessory Kit) in the indentations at each corner of the bottom of the SA 600.
2. Place the SA 600 in your predetermined location.

After completing these steps, you can begin the cabling the SA 600. Go to “Connecting Power to the SA 600” on page 4-14 for the cabling procedures.

Installing the SA 600 as a Rack-mounted Unit

To rack-mount the SA 600:

1. Determine the rack size, i.e., 19 inch or 23 inch.
2. Determine the preferred rack-mount method, i.e., front-, rear-, or mid-mount. The Accessory Kit includes mounting brackets for both 19-inch and 23-inch racks. The same brackets are used for all mounting methods, front-, rear-, or mid-mount..

Determine that the preferred/desired rack-mount method meets IEC 297-2 and ANSI/EIA-RS-310C standards.

Use a properly grounded anti-static wrist strap when handling the SA 600.

3. Place the SA 600 and its Accessory Kit on a stable, static-protected work area.
4. Use the flathead Phillips screws supplied in the bracket kit to attach the brackets to each side of the SA 600 at the locations illustrated in Figure 4-7.

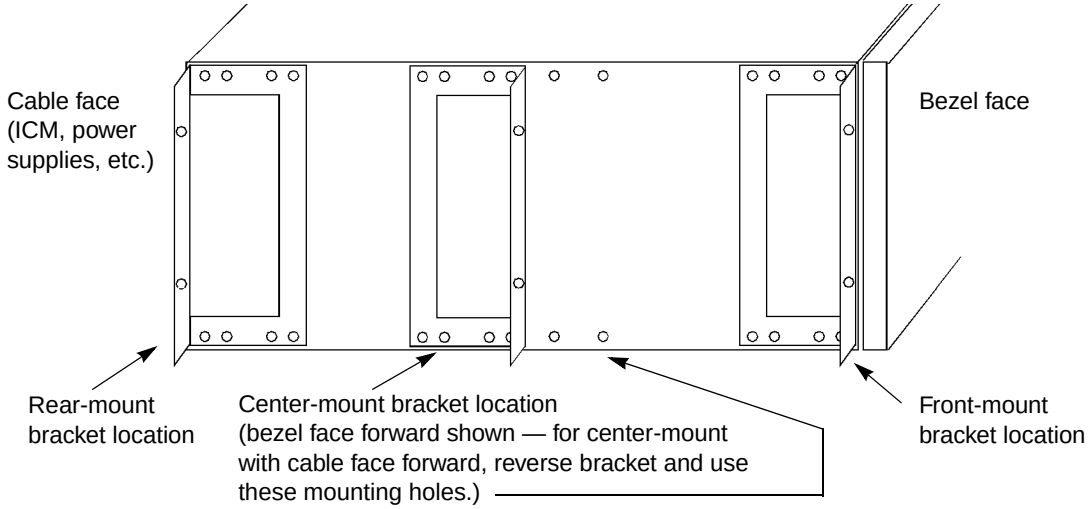


Figure 4-7. Bracket Locations (19-inch Brackets Shown)

Securing the SA 600 to the rack may require help to hold and secure the unit.

5. Position the SA 600 in the rack and attach it to the threaded mounting holes of the rack using the four flathead Phillips screws supplied in the Accessory Kit. (You must acquire additional hardware for racks without threaded mounting holes.)

After completing these steps, you can begin the cabling the SA 600. Go to "Connecting Power to the SA 600" on page 4-14 for the cabling procedures.

Connecting Power to the SA 600

The SA 600 supports up to two power supplies, which operate redundantly. Depending on the configuration ordered, your SA 600 may have one of the following setups:

- A single AC or DC power supply
- Two power supplies, both AC
- Two power supplies, both DC
- Two power supplies, one AC and one DC

The following procedures describe how to connect the SA 600 to ground, and how to connect AC and DC power supplies. A procedure for replacing a failed power supply is also provided.

See "Power Supply Status Indicators (SA 600 and SA 1200 only)" on page 5-6 for instructions on reading the power supply indicator lights.

Before making any power connections to the SA 600, refer to the electrical specifications in Chapter 2 and the regulatory information in Appendix D.

Connecting the SA 600 to Ground

Verify that power is off or disconnected at the source before beginning this procedure.

To connect the SA 600 to ground:

1. Make sure the unit's power switches are toggled off (see Figure 4-9 for switch location).
2. Screw the two male-male standoffs into the locations shown in Figure 4-8.
3. Insert one end of the grounding wire into the grounding lug and crimp using a Panduit CT-700 crimp tool (or equivalent).
4. Mount the ground lug on the male-male standoffs (as shown in Figure 4-8) and secure using the included washers and lock nuts.
5. Connect the other end of a grounding wire to earth ground, usually at the mounting rack.

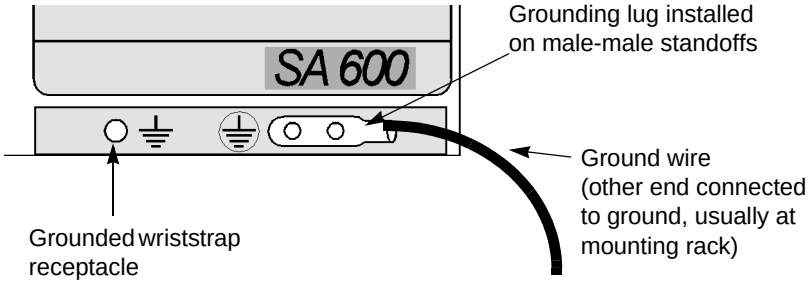


Figure 4-8. SA 600 Grounding Lug

With the SA 600 grounded, you can plug an anti-static wrist strap into the grounded wrist strap receptacle to help avoid static-related damage when working on the SA 600.

Connecting AC Power

> Before connecting the AC power cord, refer to the electrical specifications in Chapter 2 and the regulatory information in Appendix D.

To connect AC power:

1. Toggle the power supply's power switch off (see Figure 4-9).

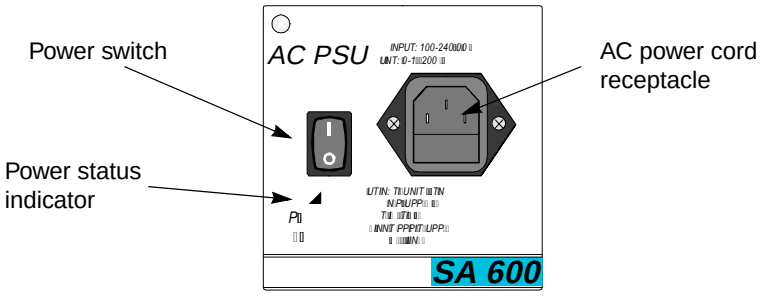


Figure 4-9. SA 600 AC Power Supply

2. Plug the AC power cord into the AC power cord receptacle and snap the retaining clip down over the plug to secure it in place (see Figure 4-10).

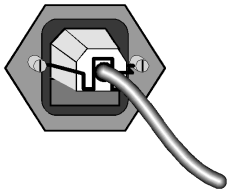


Figure 4-10. Power Cord Retaining Clip

3. Plug the other end of the power cord into a grounded power outlet.
4. Do not toggle the power switch on at this time. Instead, install cables to the SA 600 PODs as described in "Connecting CPE and Network Interfaces" on page 4-27.

Connecting DC Power

> Verify that power is off or disconnected at the source before beginning this procedure.

Before connecting DC power to the SA 600, you must acquire 3-wire 12 AWG cable long enough to connect the power source to the connectors of the DC power supply.

To connect DC power:

1. Toggle the power supply's power switch off. See Figure 4-11 for switch location.
2. Strip 1/2 inch of insulation from each of the wires at one end of the cable.
3. Loosen each screw in the Phoenix Block connector. See Figure 4-11.

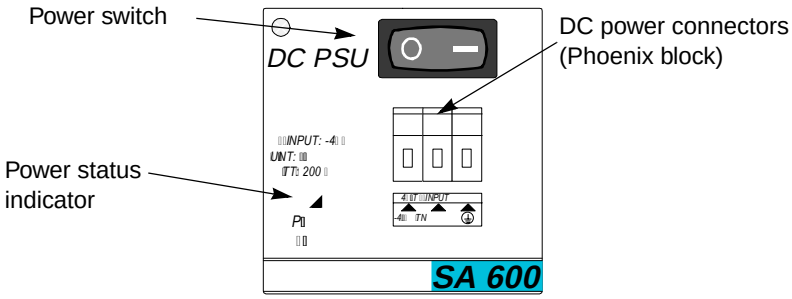


Figure 4-11. SA 600 DC Power Supply

4. Slide the black wire into the block opening labeled -48 V and tighten the locking screw.
5. Slide the white wire into the block opening labeled RTN and tighten the locking screw.
6. Slide the green wire into the block opening labeled "ground" and tighten the locking screw.
7. Attach the other end of the cable to the DC power source according to premise requirements.
8. Do not toggle the power switch on at this time. Instead, install cables to the SA 600 PODs as described in "Connecting CPE and Network Interfaces" on page 4-27.

Replacing a Power Supply

Verify that power is off or disconnected at the source before beginning this procedure.

To replace an SA 600 power supply:

1. Make sure the power switch on the failed unit is toggled off.
2. Disconnect the AC or DC power to the unit.
3. Use a #1 Phillips screwdriver to unscrew the power supply locking screw.
4. Gently but firmly pull the handle on the front of the power supply to disengage it from the SA 600 and remove it from the chassis (see Figure 4-12).

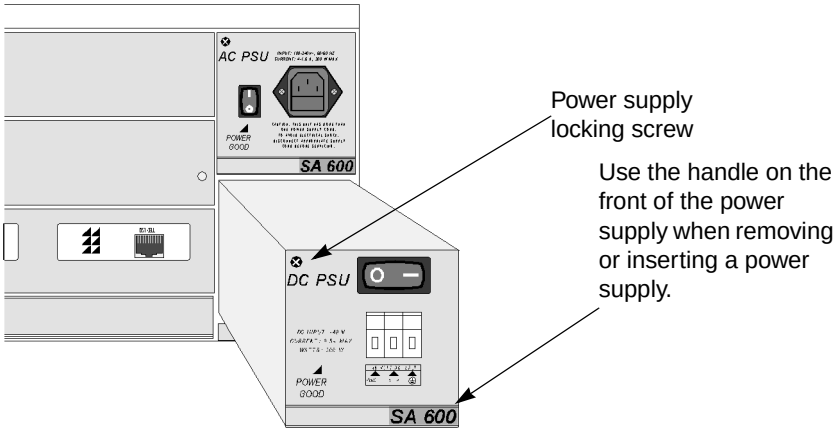


Figure 4-12. Removing or Installing an SA 600 Power Supply

5. Slide the new power supply into the chassis until it is fully engaged.
6. Use a #1 Phillips screwdriver to tighten the power supply locking screw to secure the power supply in place.
7. Reconnect the AC or DC power to the unit, as described earlier in this chapter.
8. Toggle the power supply switch to on and check the power supply's indicator light; if it is green, the power supply is functioning properly. If the indicator is not lit green, see "Power Supply Status Indicators (SA 600 and SA 1200 only)" on page 5-6.

Mounting the SA 1200

You can install the SA 1200 in one of two ways:

- Rack-mount the SA 1200 unit in a standard 19- or 23-inch (48.26 or 58.42 cm) wide equipment cabinet
- Place it on a flat surface as a free-standing unit

The following sections describe the steps required for each installation.

Contact your CPE and network service provider documentation for any special instructions regarding this installation.

Installing the SA 1200 as a Stand-alone Unit

Use a properly grounded anti-static wrist strap when handling the SA 1200.

You may install the SA 1200 safely on any firm, level surface provided that the following conditions are met:

- The installation adheres to all the power, environmental, and safety requirements described in Chapter 2, “Specifications and Safety Warnings.”
- The mounting surface is large enough to safely accommodate the dimensions of the SA 1200 (18 by 12 inches (46 x 31 cm) minimum).
- The mounting surface is sturdy enough to safely accommodate the weight of the SA 1200 (85 pounds (38.5 kg) minimum). For multiple units, ensure that the mounting surface is sturdy enough to safely accommodate the combined weight of all of the SA 1200s (assume 85 pounds (38.5 kg) per unit minimum).
- There are no obstructions to the ventilation system located on the left and right side panels of the SA 1200. Maintain a minimum clearance of 2 inches.

The SA 1200 or its components may be damaged if appropriate clearance is not maintained for cooling.

To install the SA 1200 as a stand-alone unit:

1. Install the four adhesive feet (supplied in the Accessory Kit) in the indentations at each corner of the bottom of the SA 1200.
2. Place the SA 1200 in your predetermined location.

After completing these steps, you can begin the cabling the SA 1200. Go to “Connecting Power to the SA 1200” on page 4-23 for the cabling procedures.

Installing the SA 1200 as a Rack-mounted Unit

To rack-mount the SA 1200:

1. Determine the rack size, i.e., 19 inch or 23 inch.
2. Determine the preferred rack-mount method, i.e., front-, rear-, or mid-mount. The Accessory Kit includes mounting brackets for both 19-inch and 23-inch racks. The same brackets are used for all mounting methods, front-, rear-, or mid-mount..

Determine that the preferred/desired rack-mount method meets IEC 297-2 and ANSI/EIA-RS-310C standards.

Use a properly grounded anti-static wrist strap when handling the SA 1200.

3. Place the SA 1200 and its Accessory Kit on a stable, static-protected work area.
4. Use the flathead Phillips screws supplied in the bracket kit to attach the brackets to each side of the SA 1200 at the locations illustrated in Figure 4-13.

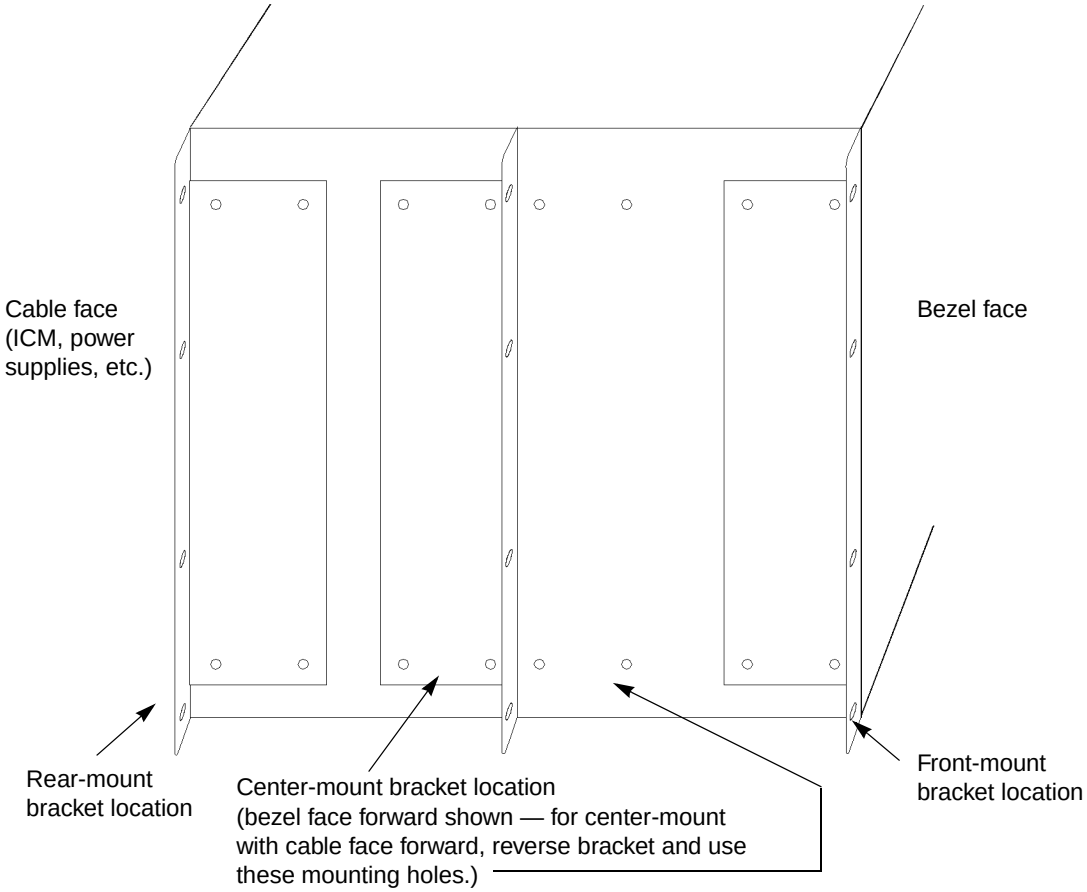


Figure 4-13. Bracket Locations (19-inch Brackets Shown)

Securing the SA 1200 to the rack may require help to hold and secure the unit.

5. Position the SA 1200 in the rack and attach it to the threaded mounting holes of the rack using the four flathead Phillips screws supplied in the Accessory Kit. (You must acquire additional hardware for racks without threaded mounting holes.)

After completing these steps, you can begin the cabling the SA 1200. Go to "Connecting Power to the SA 1200" on page 4-23 for the cabling procedures.

Connecting Power to the SA 1200

The SA 1200 supports up to two power supplies, which operate redundantly. Depending on the configuration ordered, your SA 1200 may have one or two DC power supplies. (There is currently no internal AC power supply available for the SA 1200; an external AC/DC converter is available to satisfy AC power requirements. The AC/DC converter can supply power to one or two DC power supplies.)

The following procedures describe how to connect the SA 1200 to ground, and how to connect the DC power supplies. A procedure for replacing a failed power supply is also provided.

See "Power Supply Status Indicators (SA 600 and SA 1200 only)" on page 5-6 for instructions on reading the power supply indicator lights.

Before making any power connections to the SA 1200, refer to the electrical specifications in Chapter 2 and the regulatory information in Appendix D.

Using AC Power with the SA 1200

Currently the SA 1200 supports onboard DC power only. AC applications of the SA 1200 require an external AC/DC power converter (part #40066), which should be rack-mounted directly below the SA 1200 unit (the converter fits a standard 19" rack; contact Ascend for other applications). The AC/DC converter can supply DC voltage to one or two SA 1200 DC power supplies. Power supply redundancy requires that two DC power supplies be installed in the SA 1200. The paragraphs below provide examples of AC power usage. Follow the instructions accompanying the converter for mounting and connecting power to the converter unit. See "Connecting DC Power" on page 4-25 for instructions on applying DC power to the SA 1200 unit.

To use an SA 1200 With AC Power Only

If your application requires that only AC power be supplied to one or two SA 1200 internal DC PSUs, connect the -48 volt output rail from the AC/DC converter to the DC PSU. If two DC PSUs are installed in the SA 1200, connect the converter's -48 volt output rail to both SA 1200 DC PSUs in parallel.

To use an SA 1200 With AC Power and a DC Power Backup

If your application requires that AC power into a SA 1200 be backed up with DC power input, two DC PSU must be installed in the SA 1200. Connect the -48 volt output rail from the AC/DC converter to one of the two DC PSUs. The other DC PSU should be connected to a separate secondary -48 volt source such as a battery bank.

Connecting the SA 1200 to Ground

Verify that power is off or disconnected at the source before beginning this procedure.

To connect the SA 1200 to ground:

1. Make sure the unit's power switches are toggled off (see Figure 4-15 for switch location).
2. Screw the two male-male standoffs into the pretapped holes on the right side of the chassis as shown in Figure 4-14.
3. Insert one end of the grounding wire into the grounding lug and crimp using a Panduit CT-700 crimp tool (or equivalent).
4. Mount the ground lug on the male-male standoffs (as shown in Figure 4-14) and secure using the included washers and lock nuts.
5. Connect the other end of a grounding wire to earth ground, usually at the mounting rack.

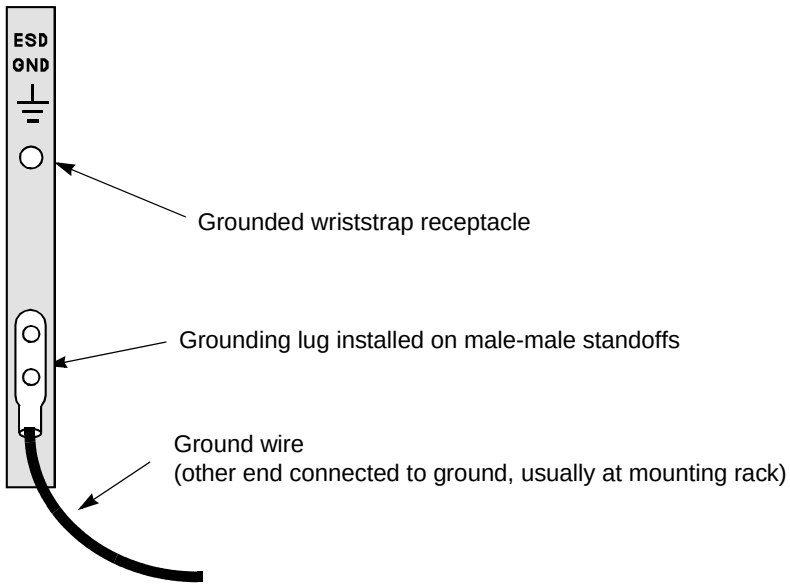


Figure 4-14. SA 1200 Grounding Lug

With the SA 1200 grounded, you can plug an anti-static wrist strap into the grounded wrist strap receptacle to help avoid static-related damage when working on the SA 1200.

Connecting DC Power

> Verify that power is off or disconnected at the source before beginning this procedure.

Before connecting DC power to the SA 1200, you must acquire 3-wire 12 AWG cable long enough to connect the power source to the connectors of the DC power supply.

To connect DC power:

1. Toggle the power supply's power switch off. See Figure 4-15 for switch location.
2. Strip 1/2 inch of insulation from each of the wires at one end of the cable.
3. Loosen each screw in the Phoenix Block connector. See Figure 4-15.

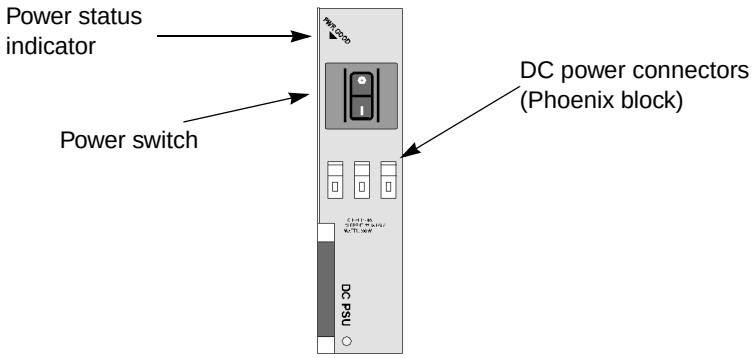


Figure 4-15. SA 1200 DC Power Supply

4. Slide the black wire into the block opening labeled -48 V and tighten the locking screw.
5. Slide the white wire into the block opening labeled RTN and tighten the locking screw.
6. Slide the green wire into the block opening labeled "ground" and tighten the locking screw.
7. Attach the other end of the cable to the DC power source according to premise requirements.
8. Do not toggle the power switch on at this time. Instead, install cables to the SA 1200 PODs as described in "Connecting CPE and Network Interfaces" on page 4-27.

Replacing a Power Supply

Verify that power is off or disconnected at the source before beginning this procedure.

The SA 1200 power supplies have the same form factor as ICMs, and replacing an SA 1200 power supply follows the same procedures.

To replace an SA 1200 power supply:

1. Make sure the power switch on the failed unit is toggled off.
2. Disconnect the DC power to the unit.
3. Use a #1 Phillips screwdriver to unscrew the power supply locking screws.
4. Place your thumbs under the card ejectors and gently but firmly pull them away from the unit. The power supply will disengage and pop free of its connection to the chassis backplane, sliding out of the chassis.
5. Slowly slide the power supply straight out of the chassis and place it on a static-protected work surface.
6. Slide the new power supply into the chassis, carefully inserting the board into the internal guides, until it is fully engaged.
7. Press the card-ejector hinges back down flush with the face of the power supply to secure the power supply to the backplane.
8. Use a #1 Phillips screwdriver to tighten the power supply locking screw to secure the power supply in place.
9. Reconnect the DC power to the unit.
10. Toggle the power supply switch to on and check the power supply's indicator light; if it is green, the power supply is functioning properly. If the indicator is not lit green, see "Power Supply Status Indicators (SA 600 and SA 1200 only)" on page 5-6.

Connecting CPE and Network Interfaces

The front panels of the IPODs and XPODs provide connectors for customer premise equipment (CPE) and network interfaces (see Figure 4-16). Table 4-1 lists the IPOD and XPOD connectors. Make all the necessary cable connections to the PODs, then proceed to "Making the Management Connections" on page 4-30.

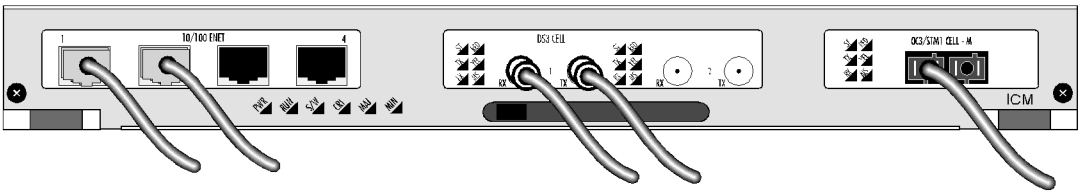


Figure 4-16. Typical POD Connectors

OC-3c/STM-1 Cell PODs utilize laser optical sub-assemblies complying with Class 1 safety limits defined in the IEC 825 standard on laser safety. You should understand the implications of these safety limits prior to working with this equipment. Do not look into the ends of fiber optic cables or at light reflected from the cables, as the transmit laser beam can cause personal injury.

Table 4-1. IPOD and XPOD Connectors

POD Type	Ports	Connector Type	Pinouts
IPODs			
Ethernet 10/100	4	RJ-48	See Figure A-32
DS1 Circuit Emulation	4	RJ-48	See Figure A-31
E1 Circuit Emulation	4	RJ-48	See Figure A-31
DS1 Voice Compression	1	RJ-48	See Figure A-31
DS1 ATM	4	RJ-48	See Figure A-31
E1 ATM	4	RJ-48	See Figure A-31
DS3 ATM	2	75 ohm (BNC)	(not applicable)
E3 ATM	2	120 ohm (BNC)	(not applicable)
OC-3c/STM-1 ATM	1 or 2	SC Duplex	(not applicable)
IMA DS1/E1 Cell	4 ports/connector, 2 connectors/POD	68-pin mini-D style	See Figure A-34
Universal Serial POD (Frame or CES)	2	68-pin mini-D style	

Table 4-1. IPOD and XPOD Connectors (Continued)

POD Type	Ports	Connector Type	Pinouts
XPODs			
DS1 ATM	1	RJ-48	See Figure A-31
E1 ATM	1	RJ-48	See Figure A-31
DS3 ATM	1	75-ohm (BNC)	(not applicable)
E3 ATM	1	120-ohm (BNC)	(not applicable)
OC-3c/STM-1 ATM	1	SC Duplex	(not applicable)
IMA DS1/E1 Cell	4 ports/connector, 1 connector/POD	68-pin mini-D style	See Figure A-34

Special Considerations for IMA PODs — Cables and Breakout Box

The high port density of the IMA connector (four ports per Molex connector) requires a special “breakout box” which converts the single Molex connector to four RJ-48c connectors. Each Molex connector on an IMA POD requires its own breakout box. All breakout boxes must be mounted in a Breakout Cable Bracket (19” and 23” varieties available) close to the SA unit.

An example of the IMA configuration using the breakout box is shown in Figure 4-17. Follow the instructions below to connect the ports of an IMA POD to an IMA breakout box.

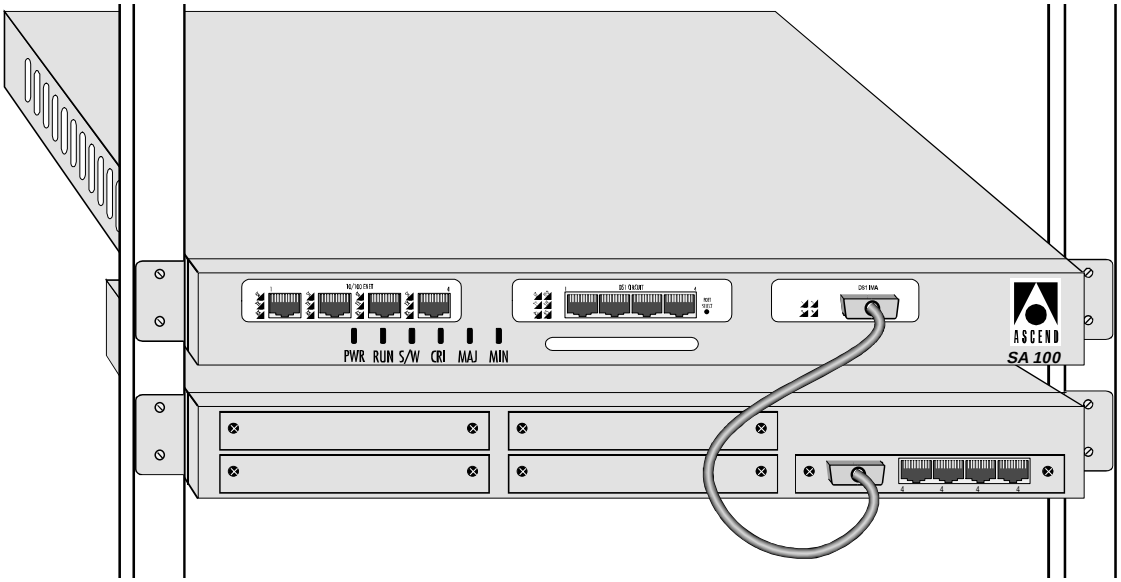


Figure 4-17. IMA POD to IMA Breakout Box Connection

1. Mount the IMA Breakout Cable Bracket (19” or 23”) in the equipment rack. The breakout bracket must be close enough to the SA unit that the IMA cable will reach between the two comfortably.
2. Remove a blank panel from the Breakout Bracket, and insert an IMA Breakout Box into the slot. Tighten the thumbscrews to secure the Breakout Box in position.
3. Connect one end of the correct Molex cable (DS1 or E1) to the Molex connector on the IMA POD.
4. Connect the other end of the Molex cable to the Molex connector on the IMA Breakout Box.
5. Finally, connect the RJ-48c cables from the CPE to the RJ-48c connectors on the IMA Breakout Box.

Making the Management Connections

There are two ways of configuring and managing an SA unit:

- Via WebXtend, its built-in Web browser interface, with the physical connection between host and PC made through an ethernet port
- Via its craft interface, with the physical connection made through the craft port (SA 100) or System Utility Module (SA 600 or SA 1200).

The following sections describe how to make connections to the SA unit for each type of management interface.

Before you use WebXtend for the first time, you must program your SA unit with the IP address assigned to the node where your SA unit resides. See "Changing the IP address" on page 2-6 of the *Network Administrators Guide* for instructions.

Making the Ethernet Management Connection

You can configure and manage an SA unit via WebXtend, its built-in Web browser interface, using one of the Ethernet ports of the Ethernet IPOD installed in the SA unit.

> WebXtend permits remote management of units to which Ethernet connections cannot be made, either due to distance or lack of an Ethernet port. Refer to the *Network Administrators Guide*, Appendix G, "Managing SA Units Remotely," for details.

To make the Ethernet connection, connect a cross-over Ethernet cable between the left-most Ethernet port (port 1) on the 10/100 Ethernet IPOD installed in the SA unit and the Ethernet interface of the computer you plan to use for Web browser management. Figure 4-18 illustrates this connection.

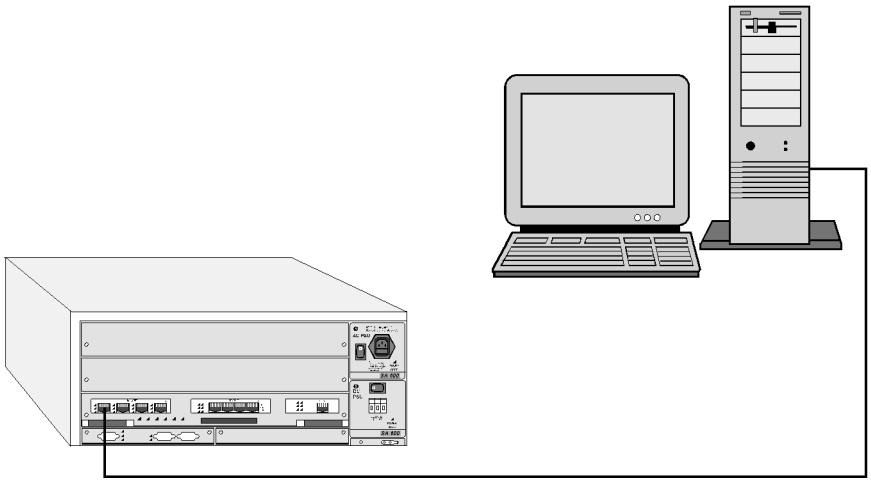


Figure 4-18. Web Browser Interface Connection (SA 600 shown)

Making Craft Interface Connections

SA 100 Craft Interface

To configure and manage an SA 100 via its built-in craft interface, you must use the rear-panel serial port labeled Console A (see Figure 4-19). Console A provides a data terminal equipment (DTE) interface using a DB-9 female connector. By default, it is programmed for local/direct connection to a terminal.

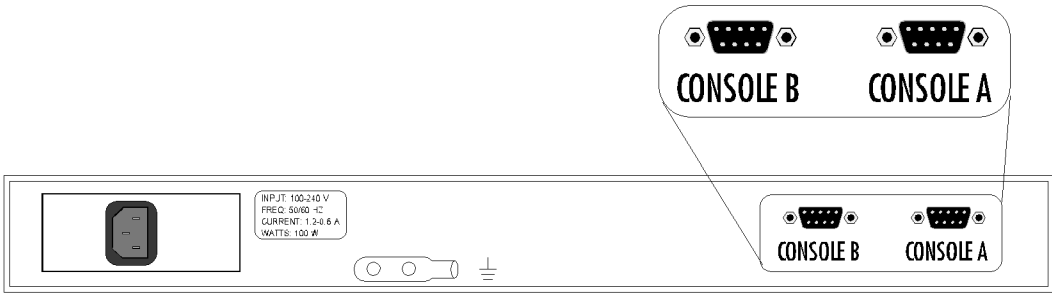


Figure 4-19. Rear Panel Console (Serial) Ports on an SA 100

SA 600 and SA 1200 Craft Interface

To configure and manage an SA 600 or SA 1200 via its built-in craft interface, you must use the serial port labeled Console A on the System Utility Module (see Figure 4-20). Console A provides a data terminal equipment (DTE) interface using a DB-9 female connector. By default, it is programmed for local/direct connection to a terminal.

> The SA 600 and SA 1200 default shipping configuration is two SUM 100s installed. This provides for system timing redundancy between SUM modules. However, if your SA 600 has two SUM 100s installed, be sure to use only the left-hand SUM 100 for craft interface connections. Never connect cables to both SUM 100 modules simultaneously.

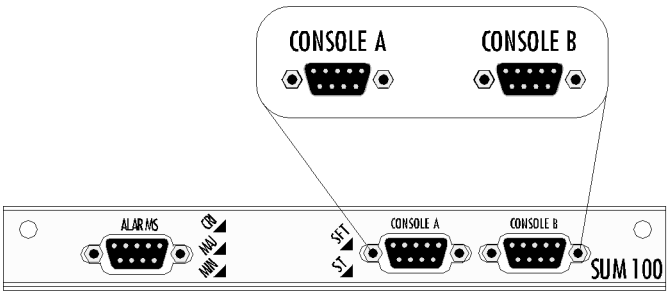


Figure 4-20. SUM 100 Console (Serial) Ports

Table 4-2. Console A Pinout

Pin No.	Signal Designation	Source
1	Data Carrier Detector (DCD)	DCE
2	Received Data (RD)	DCE
3	Transmitted Data (TD)	DTE
4	Data Terminal Ready (DTR)	DTE
5	Signal Ground (GND)	Common
6	Data Set Ready (DSR)	DCE
7	Request to Send (RTS)	DTE
8	Clear to Send (CTS)	DCE
9	Ring Indicator (RI)	DCE

To make this connection:

1. Connect the Console A port to a terminal or PC running terminal emulation software using a DB-9M to DB-9F straight-through cable (provided in the Accessory Kit).

IMPORTANT: Any equipment being connected to the craft port of an SA unit must utilize a floating ground.

2. Tighten the two screws on the flanges of the connector to secure it to the SA unit.
3. Mate the other end of the straight-through cable to the serial port of a VT100 or compatible terminal (or a computer running terminal emulation software).
4. After you finish the craft interface management connection, the hardware installation is complete.

What's Next?

After completing the hardware installation, you can power on the SA unit and determine its operating status as described in the next chapter, "Determining Operating Status."

5

Determining Operating Status

This chapter describes how to power up the SA unit and determine its operating status. Before you do this, verify that you have completed the following steps:

- ☑ Mount the SA unit
- ☑ Connect the SA unit to the appropriate power supply
- ☑ Connect the SA unit to the CPE and network interfaces
- ☑ Connect the SA unit to a local or remote terminal

Powering Up the SA 100

To power up an SA 100 with DC power supply, toggle on the circuit breaker located on the rear panel of the unit.

To power up an SA 100 with AC power supply, plug the AC IEC power cord into the power cord receptacle located on the rear panel of the unit.

- After connecting power, the SA 100 initializes.
- The PWR indicator light illuminates and remains lit as long as the SA 100 is powered.
- For approximately 15 seconds, the chassis front panel indicator lights turn on and off as they run through their power-up sequence.
- Then, for approximately one minute, RUN blinks once per second, while MIN is lit.
- Finally, the S/W LED is lit, and ST is lit *on the front panel of each IPOD and XPOD* indicating that the unit is ready for normal operation.

Now, you can access the SA 100 from your Web browser software or via the craft interface.

Powering Up the SA 600

To power up the SA 600, toggle on the power switch located on the upper power supply, then (if a second power supply is installed) toggle on the power switch on the lower power supply. Upon power-up, the SA 600 boot sequence is initiated.

The SA 600 Boot Sequence

The SA 600 power up sequence may take several minutes, depending on the number of connections configured. The boot procedure is:

1. The SCM (the ICM installed in slot 1) boots first, with the following sequence:
   a. The factory boot information (factory.bin) loads into the SCM.
   b. The lzrom.bin file loads into the SCM.
   c. The full-featured software set loads into the SCM.
2. When the SCM is fully initialized, the SCM copies the lzrom.bin file to the remaining installed ICMs in turn. After receiving the lzrom.bin file, each ICM boots and requests the full-featured software from the SCM.
3. When all installed ICMs have received the full-featured software, the unit looks for an nv_db.dat file, which stores all configuration data including IP address, system identification data, and any configured connection data.

   If no nv_db.dat is found, the unit completes its boot sequence with default settings based on installed hardware.

   If an nv_db.dat file is found, the unit begins loading the saved configuration and restoring connections. The process of restoring connections varies in duration based on how many connections must be restored. For example, a heavily-configured unit with hundreds of connections may take up to five minutes to complete initialization and restore all connections.
4. When the SA 600 is fully initialized, the Login prompt becomes available, along with access to the unit's built-in FTP server. At this point, it is possible to access WebXtend or the craft-based user interface.

Powering Up the SA 1200

To power up the SA 1200, toggle on the power switch located on one power supply, then (if a second power supply is installed) toggle on the power switch on the second power supply. Upon power-up, the SA 1200 boot sequence is initiated.

The SA 1200 Boot Sequence

The SA 1200 power up sequence may take several minutes, depending on the number of connections configured. The boot procedure is:

1. The SCM (the ICM installed in slot 1) boots first, with the following sequence:
   a. The factory boot information (factory.bin) loads into the SCM.
   b. The lzrom.bin file loads into the SCM.
   c. The full-featured software set loads into the SCM.
2. When the SCM is fully initialized, the SCM copies the lzrom.bin file to the remaining installed ICMs in turn. After receiving the lzrom.bin file, each ICM boots and requests the full-featured software from the SCM.
3. When all installed ICMs have received the full-featured software, the unit looks for an nv_db.dat file, which stores all configuration data including IP address, system identification data, and any configured connection data.

   If no nv_db.dat is found, the unit completes its boot sequence with default settings based on installed hardware.

   If an nv_db.dat file is found, the unit begins loading the saved configuration and restoring connections. The process of restoring connections varies in duration based on how many connections must be restored. For example, a heavily-configured unit with hundreds of connections may take up to five minutes to complete initialization and restore all connections.
4. When the SA 1200 is fully initialized, the Login prompt becomes available, along with access to the unit's built-in FTP server. At this point, it is possible to access WebXtend or the craft-based user interface.

Status Indicators

The bezel face of each SA unit provides a set of six status indicators that offer status information on the SA system as a whole. Each ICM has a similar set of indicators that display the operating state of each ICM. (In the case of the SA 100, which supports only one ICM, there is only one set of status indicators.) Finally, each IPOD and XPOD provide indicators that display the operating state of individual PODs and ports.

The Web browser management software (WebXtend) reflects the state of each indicator in its graphical representation of the SA unit's front panel. See the *Network Administrator's Guide* for details.

Power-Up Indicator Lights

When power is applied to the SA unit, the LEDs on each ICM are lit in a defined sequence:

- The PWR indicator light illuminates and remains lit as long as the SA unit is powered.
- For approximately 15 seconds, the ICM front panel indicator lights turn on and off as they run through their power-up sequence.
- Then, for approximately one minute, RUN blinks once per second, while MIN is lit.
- Finally, the S/W LED is lit, and ST is lit *on the front panel of each IPOD and XPOD* indicating that the unit is ready for normal operation.

Power Supply Status Indicators (SA 600 and SA 1200 only)

You can read the status of an SA 600 or SA 1200 power supply by checking the LED indicator on its front panel. The LED indicator is labeled “POWER GOOD” and is green if the power supply is operating properly. An LED that is not lit indicates a problem with the power supply.

If a power supply’s LED is not lit, first check the power connections. If the connections are secure, try turning the power supply off and then on again. If this does not resolve the problem, contact the Ascend Technical Assistance Center. See “Contacting the Ascend Technical Assistance Center” on page 7-4 for contact information.

Additionally, power supply status can be accessed from WebXtend. See “Viewing Power Supply Status Information (SA 600 and SA 1200 only)” on page 6-9 of the *Network Administrators Guide* for details.

System and ICM Status Indicators

The system status indicators (located on the bezel face) and the indicators on any ICMs installed consist of a bank of six LEDs. The system status indicators provide information on the state of the SA unit as a whole. The ICM indicators provide corresponding information on individual ICMs. Figure 5-1 shows the status indicators on an ICM. The SA system status indicators have the same configuration and labels, and corresponding interpretations as shown in Table 5-1.

The system status CRI/MAJ/MIN indicators reflect the highest alarm condition present on any system component, while an ICM's CRI/MAJ/MIN indicators reflect the highest alarm condition present on any POD installed on that ICM. The CRI/MAJ/MIN indicators on the SUM mirror the corresponding system status indicators on the bezel face.

Table 5-1. System Status Indicators

Indicator	Name	Color	Description
PWR	Power	green	On when the SA unit or ICM has power.
RUN	Running	green	Blinks to indicate the SA unit or ICM is running.
S/W	Software	green	Blinks to indicate the SA unit or ICM software is running.
CRI	Critical Alarm	red	On when a critical alarm is detected on the SA system or individual ICM.
MAJ	Major Alarm	red	On when a major alarm is detected on the SA system or individual ICM.
MIN	Minor Alarm	yellow	On when a minor alarm is detected on the SA system or individual ICM.

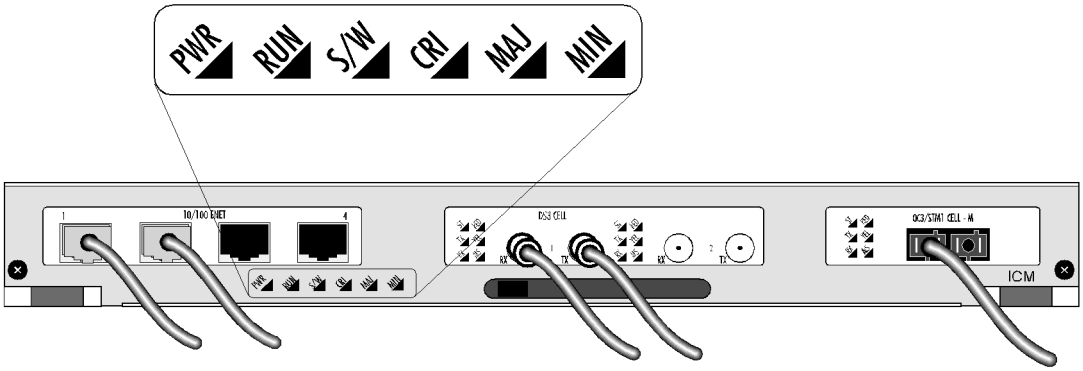


Figure 5-1. System Status Indicators

POD Port Status Indicators

Each IPOD and XPOD has front panel indicators. The type and number of indicators varies depending on the type of IPOD or XPOD. Three port indicators are common to all POD types. Figure 5-2 illustrates these indicators and Table 5-2 describes them.

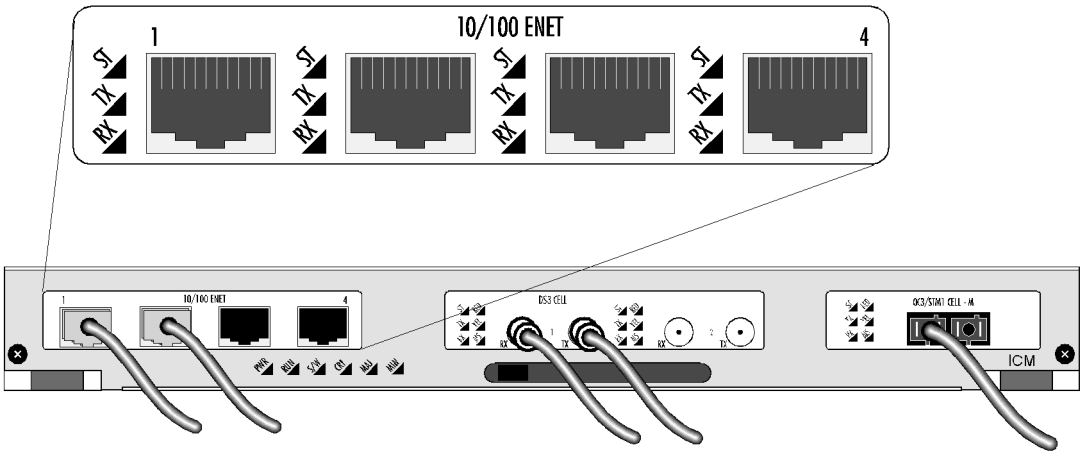


Figure 5-2. Typical POD Status Indicators

Table 5-2. Common IPOD and XPOD Status Indicators

Indicator	Name	Color	Description
ST	POD Status	green	On when the POD is programmed and in service. Off when the POD is not programmed or link is off. Blinks slowly when the POD is programmed and in the standby mode. Blinks quickly when the POD is in a test or loopback mode.
TX	Data Transmitted	green	On when the POD is in service and sending data.
RX	Data Received	green	On when the POD is in service and receiving data.

Some IPODs and XPODs have additional front panel indicators and a Port Select pushbutton. Each time you press the Port Select pushbutton, it displays the state of a different port on that POD. The green indicator at the lower left corner of each port connector lights when that port is reporting its status.

Figure 5-3 illustrates a POD with a Port Select pushbutton and Table 5-3 describes the additional indicators found on some PODs. Refer to Appendix A for descriptions of the indicators and pushbuttons available on all the PODs offered by Ascend.

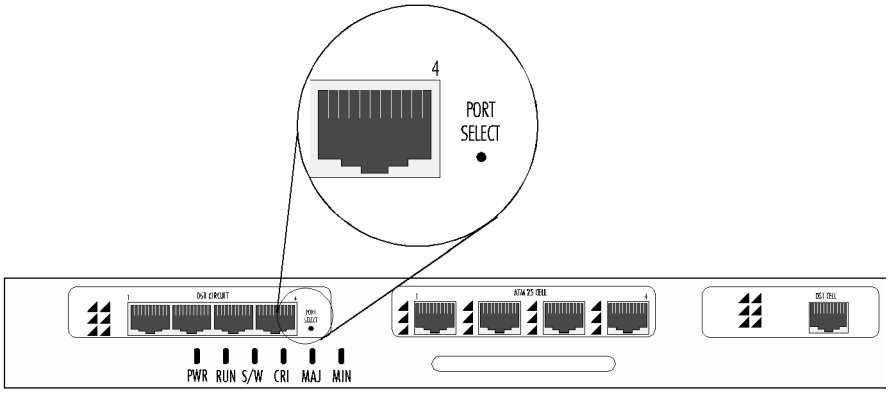


Figure 5-3. Typical Port Select Button

Table 5-3. Additional IPOD and XPOD Status Indicators

Indicator	Name	Color	Description
AIS	Alarm Indication Signal	yellow	On when the POD detects an alarm indication signal (AIS) in the received signal.
RED	Red Alarm	red	On when the POD detects a red alarm condition in the received signal.
REM	Remote Alarm Indication	yellow	On when the POD detects a remote alarm indication in the received signal.
SYN	Sync Alarm	red	On when the POD detects a sync alarm condition.
YEL	Yellow Alarm	yellow	On when the POD detects a yellow alarm condition in the received signal.
(lower left corner of port connector)		green	On when the front panel indicators are reporting the status of that port (as chosen via the Port Select pushbutton).
(lower right corner of port connector)		yellow	On when the link is down for that port.

What's Next?

After installing and powering up the SA unit, you can begin configuring and managing it as described in the *Network Administrator's Guide*, which is included in the Accessory Kit.

6

Installing or Removing Modules

This chapter describes how to remove and install the following modules from an SA 100, SA 600, or SA 1200:

- ICMs
- IPODs
- XPODs
- CPODs

In addtion, this chapter also describes how to remove and replace the following SA 1200-specific components:

- Fan tray
- Air filter

Differences between the SA 100 and the SA 600 / SA 1200

The architecture of the SA 100 hardware is substantially different from the SA 600 and SA 1200 hardware. The SA 600 and SA 1200 hardware are designed for quick and easy removal and replacement of ICMs, with thumb-lock hinges and locking screws securing the ICMs in their slots. The SA 100 hardware supports only a single ICM as an integral part of the chassis.

These differences require removal and replacement procedures which are significantly different between the SA 100 and the SA 600 / SA 1200. This chapter is divided into two sections, one section for the SA 100 procedures and a second section for the SA 600 and SA 1200 procedures.

Required Preliminary Steps

Before removing or installing an SA-subassembly:

1. Verify that the network management operator has taken the SA unit off the network and out of service.
2. Toggle the SA unit's power switch(es) off.
3. Tag all cables to clearly indicate where they are connected to the SA unit in order to simplify reconnection.
4. Disconnect the SA unit from the power supply.
5. Disconnect the SA unit from CPE and network services by removing the cables from the POD connectors.
6. Disconnect the SA unit from the Web browser management interface computer, if used, by removing its cable from the Ethernet POD connector.
7. Disconnect the SA unit from the craft management interface terminal, if used, by removing its cable from the System Utility Module connector or (in the case of an SA 100) from the craft inteface on the rear panel.
8. Prepare a static-protected work area to place any components removed from the SA unit.

At this point, if you are working on an SA 100 unit, skip to "Additional steps required for SA 100 only" on page 6-3.

9. Attach your anti-static wrist strap to the anti-static mat or other grounded receptacle before performing any further service.

Never attempt to remove or install subassemblies without wearing a grounded anti-static wrist strap.

Never attempt to repair parts or modules yourself. Return all defective modules to Ascend for repair. Only Ascend-trained service representatives are authorized to service parts.

At this point, if you are working on an SA 600 or SA 1200 unit, you should turn to "SA 600 and SA 1200 Procedures" on page 6-17.

Additional steps required for SA 100 only

10. If the SA 100 is rack-mounted or wall-mounted, remove the SA 100 from its rack or the wall.

11. Place the SA 100 in a static protected work area.

12. Attach your anti-static wrist strap to the anti-static mat or other grounded receptacle before performing any further service.

Never attempt to remove or install subassemblies without wearing a grounded anti-static wrist strap.

13. Remove all rack- or wall-mounting brackets from the sides of the SA 100.

Never attempt to repair parts or modules yourself. Return all defective modules to Ascend for repair. Only Ascend-trained service representatives are authorized to service parts.

14. Remove the cover of the SA 100:

a. Position the SA 100 with its rear panel facing you.

b. Use a #1 Phillips head screwdriver to loosen the four black captive screws on the rear of the SA 100 (see Figure 6-1).

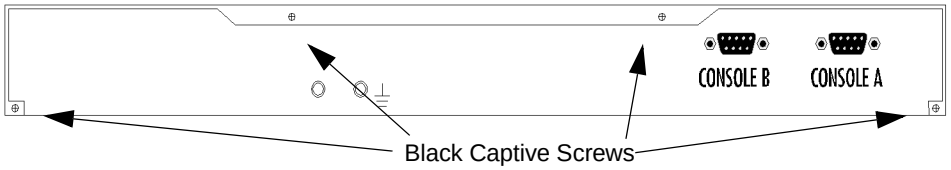


Figure 6-1. Location of Black Captive Screws

c. Slide the cover towards the rear of the SA 100 approximately 1 inch, then lift the cover up and away. This exposes the field-replaceable subassemblies of the SA 100 (see Figure 6-2).

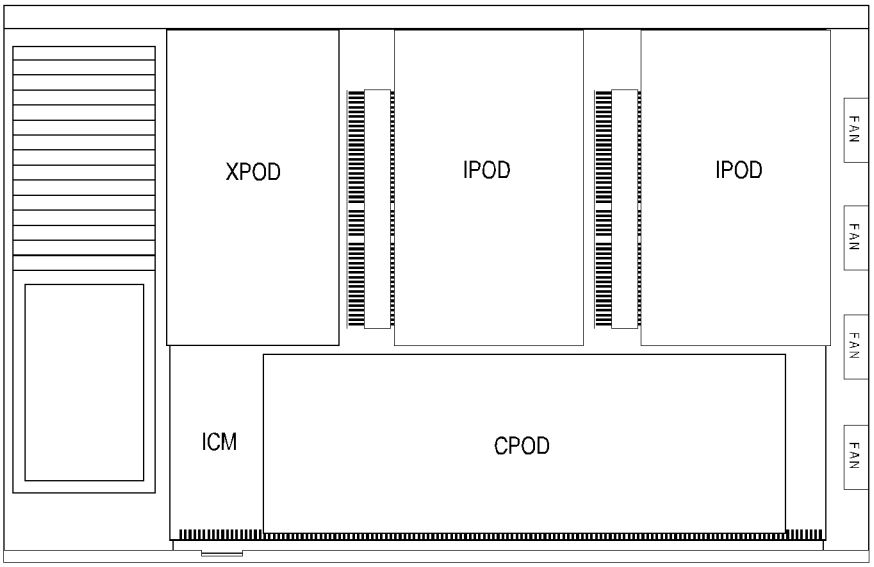


Figure 6-2. SA 100 Field-Replaceable Subassemblies

SA 100 Procedures

IPOD Removal and Installation

The SA 100 may have one or two IPODs, which are located in the left front and center front of its chassis above the ICM (see Figure 6-2).

Removing IPODs

To remove an IPOD:

1. Perform the preliminary steps described on page 6-2.
2. Use a #1 Phillips head screwdriver to loosen the two black captive screws that attach each of the IPODs and the XPOD to the front bezel (see Figure 6-12). All of the IPODs and the XPOD must be disengaged from the bezel before it can be removed.

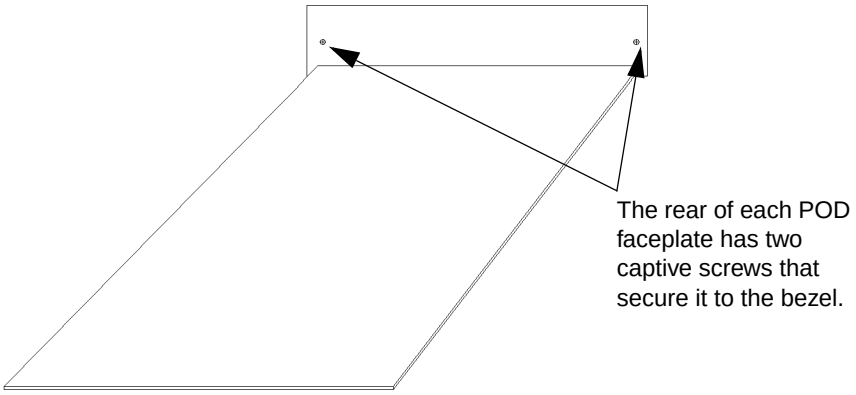


Figure 6-3. POD-Bezel screw locations

3. Use a #1 Phillips head screwdriver to remove the four screws on the bottom of SA 100 that attach the bezel to the SA 100 chassis. See Figure 6-13 for screw locations.
4. Use a #2 Phillips head screwdriver to remove the two recessed screws that attach the bezel to the ICM. See Figure 6-13 for the screw locations.

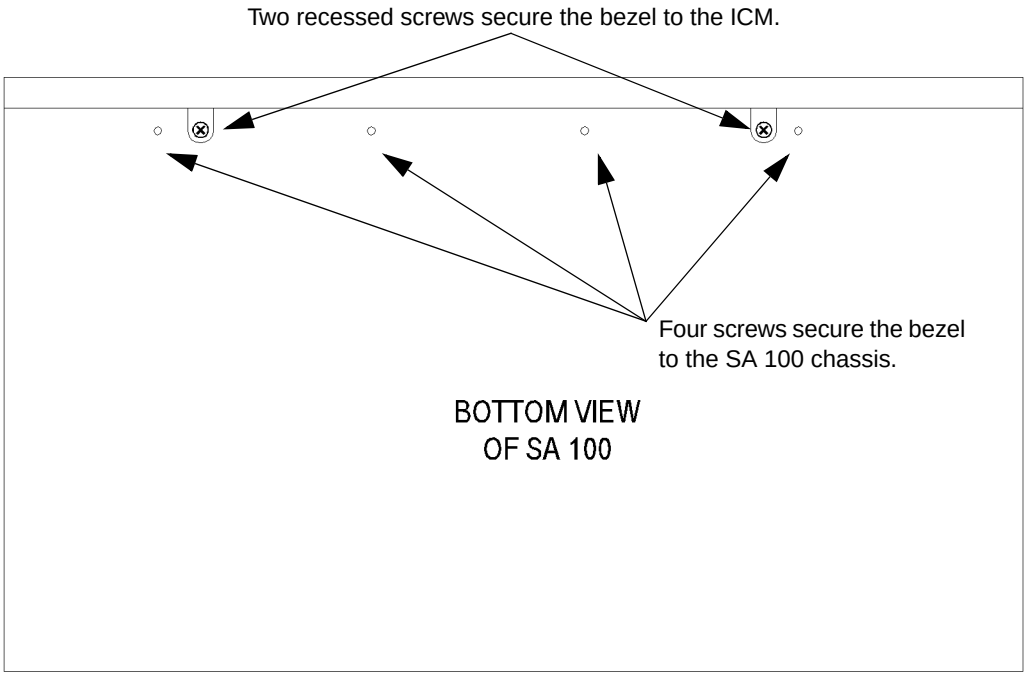


Figure 6-4. Bottom view of SA-100

5. Remove the bezel from the front of the SA 100.
6. If present, loosen the captive screw on the rear corner of the IPOD using a #1 Phillips screwdriver.
7. Disengage the IPOD from its socket by using both hands to grasp the IPOD at the edge of each corner and gently pulling it out of its socket. Be careful not to damage the ICM below it while you disengage the IPOD from its socket.

Do not use tools to disengage IPODs from their sockets. If a tool slips, it may damage an IPOD or another component in the SA 100.

8. After the IPOD is disengaged from its socket, lift it straight up away from the ICM (see Figure 6-14)

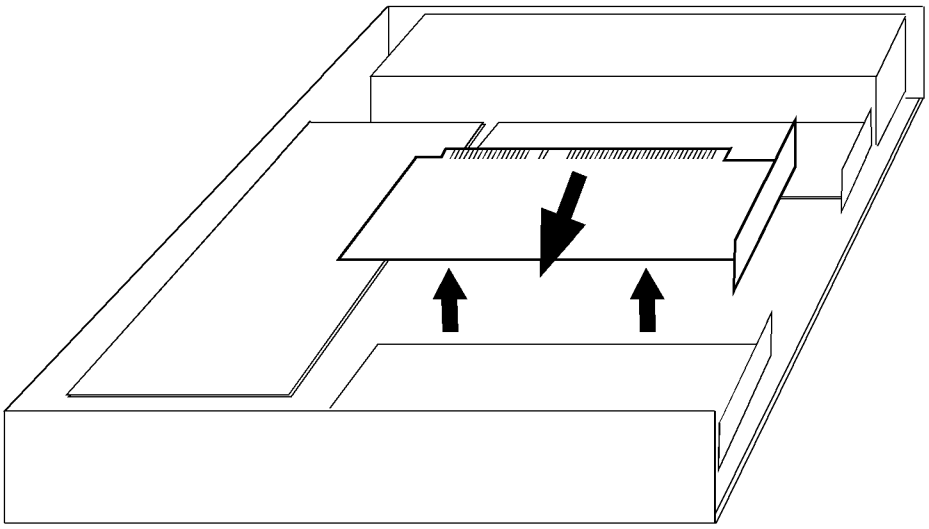


Figure 6-5. Removing the Center IPOD

9. If you are finished removing and installing SA 100 subassemblies, perform the follow-up steps described on page 6-26.

Installing IPODs

To install an IPOD:

1. Perform the preliminary steps described on page 6-2.
2. Align the pins of the IPOD with the socket on the ICM (reversing the procedures illustrated in Figure 6-14).
3. Using both hands, place your thumbs behind the socket and grasp the opposite edge of the IPOD with your remaining fingers and “squeeze” the IPOD into its socket.

Do not use tools to engage IPODs with their sockets. If a tool slips, it may damage an IPOD or another component in the SA 100.

4. If present, retighten the captive screw in the rear corner of the IPOD, securing the IPOD to the ICM.
5. Replace the bezel on the front of the SA 100.
6. Use a #2 Phillips head screwdriver to replace the two recessed screws that attach the bezel to the ICM.
7. Use a #1 Phillips head screwdriver to replace the four screws on the bottom of SA 100 that attach the bezel to the SA 100 chassis.
8. Use a #1 Phillips head screwdriver to tighten the two black captive screws that attach each of the IPODs and the XPOD to the front bezel. All of the IPODs and the XPOD must be secured to the bezel.
9. If you are finished removing and installing SA 100 subassemblies, perform the follow-up steps described on page 6-26.

XPOD Removal and Installation

The SA 100 has one XPOD, which is located in the right front of its chassis, to the left of the power supply assembly and above the ICM (see Figure 6-2).

Removing the XPOD

To remove the XPOD:

1. Perform the preliminary steps described on page 6-2.
2. Use a #1 Phillips head screwdriver to loosen the two black captive screws that attach each of the IPODs and the XPOD to the front bezel. All of the IPODs and the XPOD must be disengaged from the bezel before it can be removed. Also remove the screw at the rear of the XPOD, if it is installed.
3. Use a #1 Phillips head screwdriver to remove the four screws on the bottom of SA 100 that attach the bezel to the SA 100 chassis.
4. Use a #2 Phillips head screwdriver to remove the two recessed screws that attach the bezel to the ICM.
5. Remove the bezel from the front of the SA 100.
6. Disengage the XPOD from its socket by grasping the XPOD at its rear edge and gently lifting it straight up out of its socket (see Figure 6-15). Be careful not to damage the ICM below it while you disengage the XPOD from its socket.

Do not use tools to disengage the XPODs from its socket. If a tool slips, it may damage the XPOD or another subassembly in the SA 100.

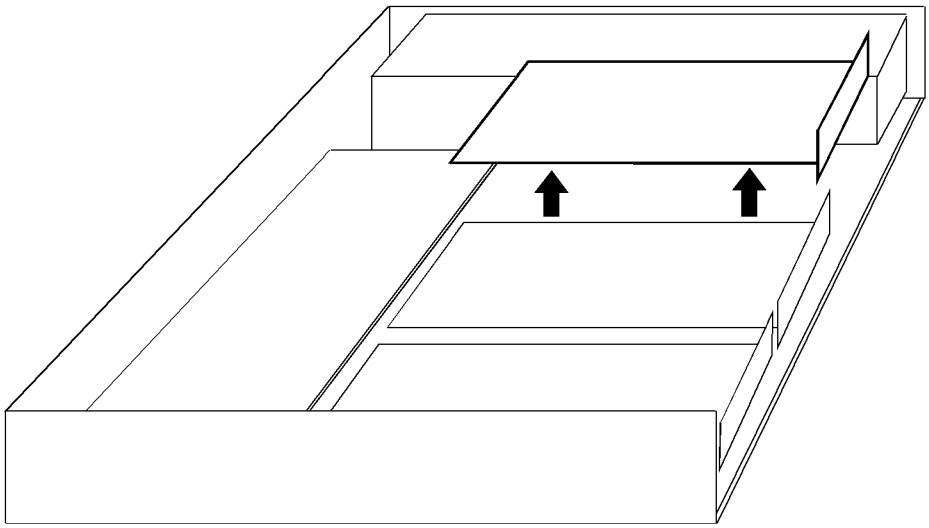


Figure 6-6. Removing the XPOD

7. If you are finished removing and installing SA 100 subassemblies, perform the follow-up steps described on page 6-26.

Installing the XPOD

To install the XPOD:

1. Perform the preliminary steps described on page 6-2.
2. Once the front panel and connectors are in place, lower the rear of the XPOD and line up the XPOD's connectors with its socket (reversing the procedures illustrated in Figure 6-15).
3. While avoiding the components installed on the XPOD, place one or two fingers at each corner of its rear edge and press down on the XPOD in order to engage its connectors with their sockets.

Do not use tools to engage the XPOD with its sockets. If a tool slips, it may damage the XPOD or another subassembly in the SA 100.

4. Replace the bezel on the front of the SA 100.
5. Use a #2 Phillips head screwdriver to replace the two recessed screws that attach the bezel to the ICM.
6. Use a #1 Phillips head screwdriver to replace the four screws on the bottom of SA 100 that attach the bezel to the SA 100 chassis.
7. Use a #1 Phillips head screwdriver to tighten the two black captive screws that attach each of the IPODs and the XPOD to the front bezel. All of the IPODs and the XPOD must be secured to the bezel. Also install the screw at the rear of the XPOD, if provided.
8. If you are finished removing and installing SA 100 subassemblies, perform the follow-up steps described on page 6-26.

CPOD Removal and Installation

The SA 100 has one CPOD, which is located in the rear of its chassis above the ICM (see Figure 6-2).

Removing the CPOD

To remove the CPOD:

1. Perform the preliminary steps described on page 6-2.
2. Remove the ICM as described in "ICM Removal and Installation" on page 6-13 and place it on an anti-static foam pad to protect the bottom of the ICM.
3. If present, loosen the two captive screws on the CPOD with a #1 Phillips screwdriver.
4. While placing your fingers between the CPOD and the ICM, start with the front, then move to the sides of the CPOD carefully using upward pressure to disengage the CPOD from its sockets (see Figure 6-16).

Do not bend or twist the CPOD while disengaging it, otherwise you may damage its connectors. Also, do not use tools to disengage the CPOD from its sockets. If a tool slips, it may damage a CPOD or another subassembly in the SA 100.

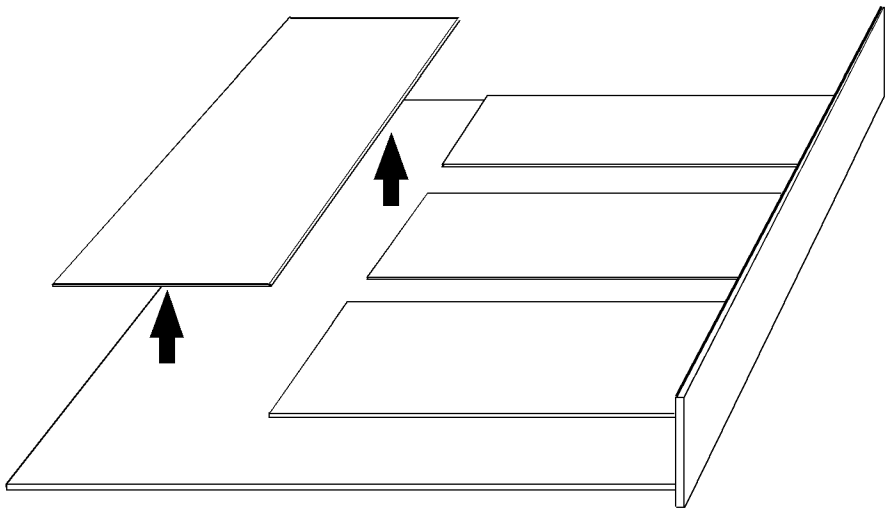


Figure 6-7. Removing the CPOD

Installing the CPOD

To install the CPOD:

1. Perform the preliminary steps described on page 6-2.
2. Position the CPOD directly over the sockets and use a firm, even pressure to seat it (reversing the procedures illustrated in Figure 6-16). Press down directly over the socket locations only.

> ⚠ Do not bend or twist the CPOD while engaging it with its sockets, otherwise you may damage its connectors. Also, do not use tools to engage the CPOD with its sockets. If a tool slips, it may damage a CPOD or another subassembly in the SA 100.

3. If present, tighten the black captive screws securing the CPOD using a #1 Phillips screwdriver.
4. If you are finished removing and installing SA 100 subassemblies, perform the follow-up steps described on page 6-26.

ICM Removal and Installation

The SA 100 has one ICM, which is located below the CPOD, XPOD, and IPOD(s) (see Figure 6-2).

Removing the ICM

To remove the ICM:

1. Perform the preliminary steps described on page 6-2.
2. Use a #1 Phillips head screwdriver to remove the row of four screws located on the bottom of the SA 100 chassis, which connect the bezel to the SA 100 chassis.
3. While grasping the bezel with one hand and the rear of the chassis with the other hand, disengage the ICM backplane connector from the backplane socket (see Figure 6-8). You can use the lip of the chassis directly above the backplane for leverage if necessary. If the ICM does not come away from the backplane easily, use a large, flat-head screwdriver placed in the notch in the chassis lip to gently pry the ICM out of the backplane connection.

Do not pry the ICM loose by using the backplane itself for leverage, otherwise you may damage it.

If necessary, use a large, flat-head screwdriver as shown to gently pry the ICM free of the backplane.

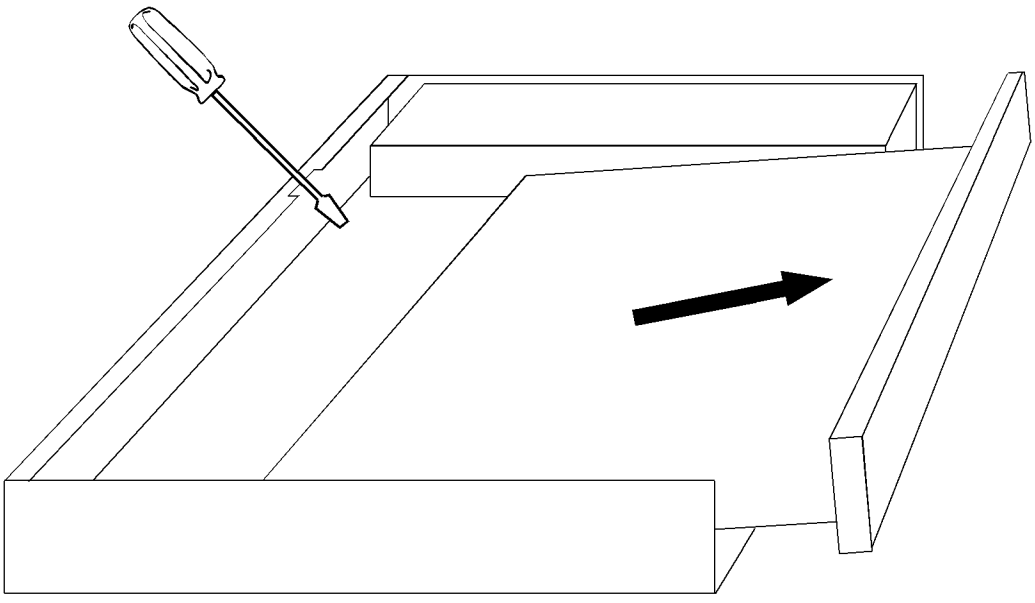


Figure 6-8. Removing the ICM

4. Once the ICM is released from the backplane, raise the bezel slightly before sliding the ICM out of the chassis to avoid damaging the components on the bottom of the ICM.
5. Use a #2 Phillips head screwdriver to remove the two screws on the bottom of the bezel that attach the bezel to the ICM.
6. Remove the bezel from the ICM.
7. After removing the ICM, perform the steps described on the next page to install a replacement ICM.

Installing the ICM

To install the ICM:

1. Perform the preliminary steps described on page 6-2.
2. Mate the ICM with the bezel and line up the screw holes used to hold them together.
3. Use a #2 Phillips head screwdriver to install the two screws on the bottom of the bezel to reattach the bezel to the ICM.
4. While grasping the bezel with one hand and the rear of the chassis with the other hand, engage the ICM backplane connector with the backplane socket (reversing the procedures illustrated in Figure 6-8).
5. Use a #1 Phillips head screwdriver to install the row of four screws located along the bezel on the bottom of the SA 100 chassis.
6. If you are finished removing and installing SA 100 subassemblies, perform the follow-up steps described on page 6-26.

Required Follow-up Steps

After removing or installing an SA 100 subassembly:

1. Replace the cover of the SA 100:
   a. Position the SA 100 with its rear panel facing you.
   b. Place the cover on the base of the SA 100 with approximately 1 inch of space between the front edge of the cover and the rear of the front bezel (see Figure 6-9).

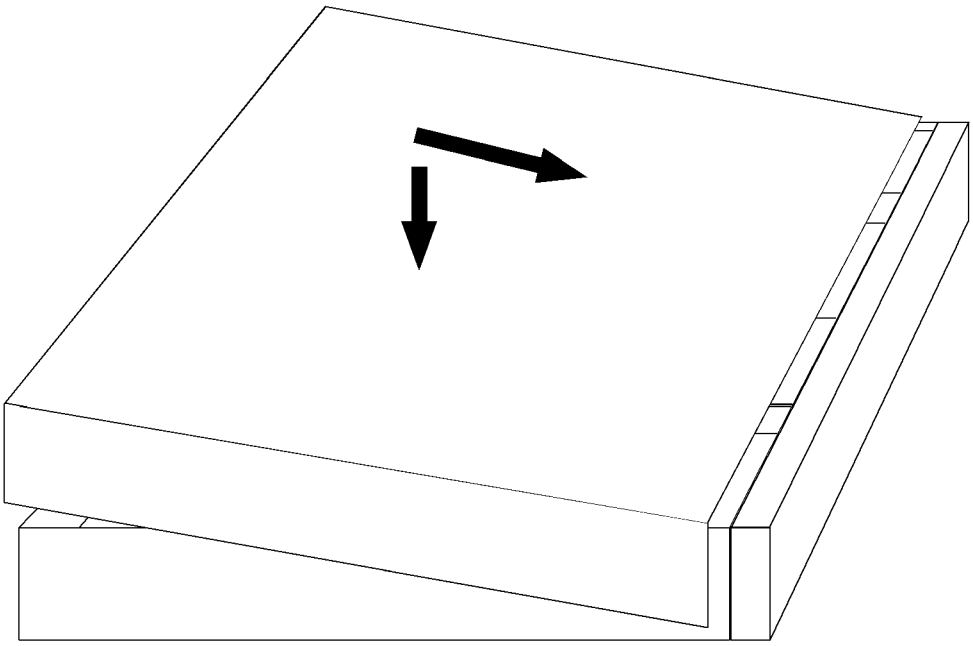


Figure 6-9. Replacing the SA 100 Cover

   c. Slide the cover forward until it is seated firmly against the bezel. Be sure that the clips on the inside of the cover slide around the bezel to secure the front of the cover.
   d. Use a #1 Phillips head screwdriver to tighten the four black captive screws on the rear of the cover.
2. If the SA 100 is rack- or wall-mounted, reattach the rack- or wall-mounting brackets to the sides of the SA 100.
3. If the SA 100 is rack-mounted, reinstall it in the rack. If the SA 100 is wall-mounted, reinstall it on the wall.
4. Using the cable tags as a guide, reconnect the all the cables to the SA 100 including:
   - CPE cables
   - Network services cables

- Web browser management interface computer cables, if used
- Craft management interface terminal cables, if used
- Power cables

5. You can toggle the rear-panel circuit breaker of the SA 100 to On at this time or insert the AC power cord, and the network administration operator can configure and test it as described in the *Network Administrator's Guide*.

If the SA 100 does not function properly after installing a subassembly, it is possible that the subassembly is not mated to its connector(s) correctly. To correct the problem, reinstall the subassembly in its connector(s). If the SA 100 still does not function properly, refer to Chapter 7, "Resolving Problems".

SA 600 and SA 1200 Procedures

The SA 600 and SA 1200 use common ICM modules; the differences between the two chassis are simply size and orientation. The SA 600 accomodates up to three horizontally-mounted ICMs; the SA 1200 accomodates up to six vertically-mounted ICMs. The procedures for removing ICMs from either unit and replacing sub-assemblies are identical, so a single set of instructions is provided. The illustrations may show an SA 600 or SA 1200, but the procedures apply to either chassis.

ICM Removal

To remove the ICM from an SA 600 or SA 1200:

1. Using a #1 Phillips screwdriver, loosen the locking screws at the corners of the ICM.
2. Place your thumbs under the card ejectors and gently but firmly pull them away from the unit. The ICM will disengage and pop free of its connection to the chassis backplane, sliding out of the chassis as shown in Figure 6-10:

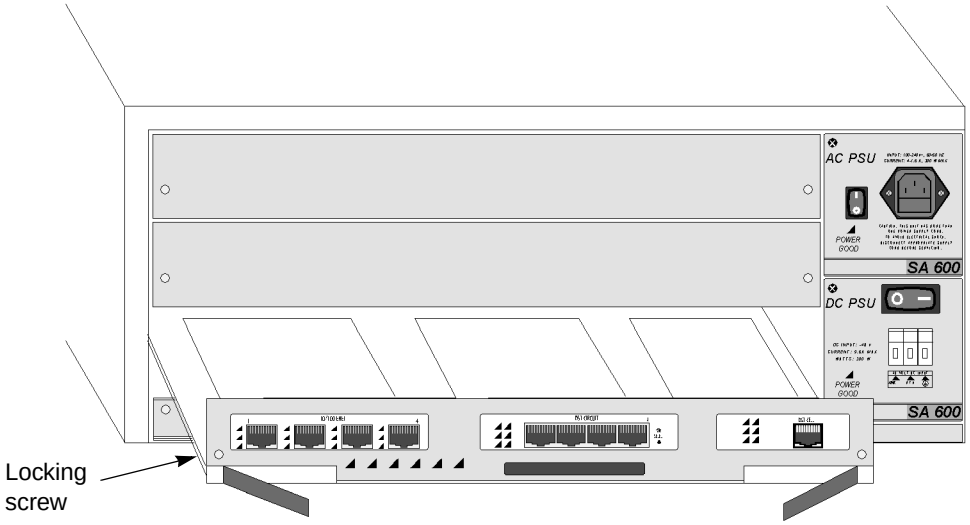


Figure 6-10. Removing an ICM (SA 600 shown)

3. Slowly slide the ICM straight out of the chassis and place it on a static-protected work surface. This exposes the field-replaceable subassemblies of the ICM (see Figure 6-11).

⚠ Be careful when removing or replacing an ICM from the chassis. Removing a board too quickly or at an angle rather than straight out may damage components mounted on the bottom of the ICM board. If you feel any resistance when moving an ICM into or out of the chassis, STOP. Do NOT force the ICM into or out of the chassis. Slide the board back into or out of the chassis and re-attempt removal or insertion.

⚠ Never attempt to remove or install subassemblies without wearing a grounded anti-static wrist strap.

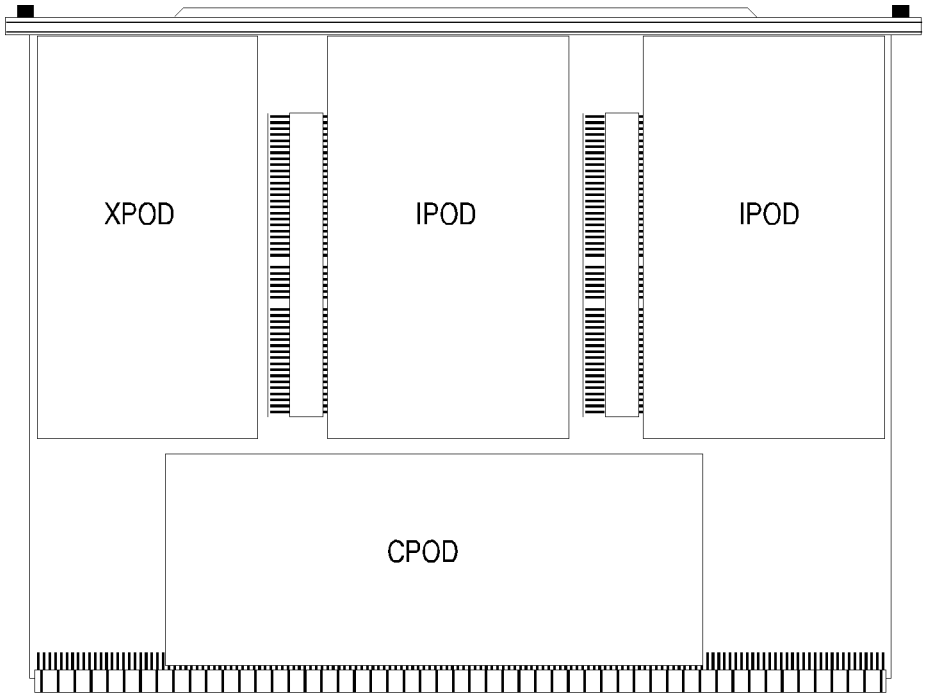


Figure 6-11. ICM Field-Replaceable Subassemblies

IPOD Removal and Installation

The ICM may have one or two IPODs, which are located in the left front and center front of its chassis (see Figure 6-11).

Removing IPODs

To remove an IPOD:

1. Perform the preliminary steps described on page 6-2 and remove the ICM as described on page 6-17.
2. Use a #1 Phillips head screwdriver to loosen the two black captive screws that attach each of the IPODs and the XPOD to the front faceplate (see Figure 6-12). All of the IPODs and the XPOD must be disengaged from the faceplate before it can be removed.

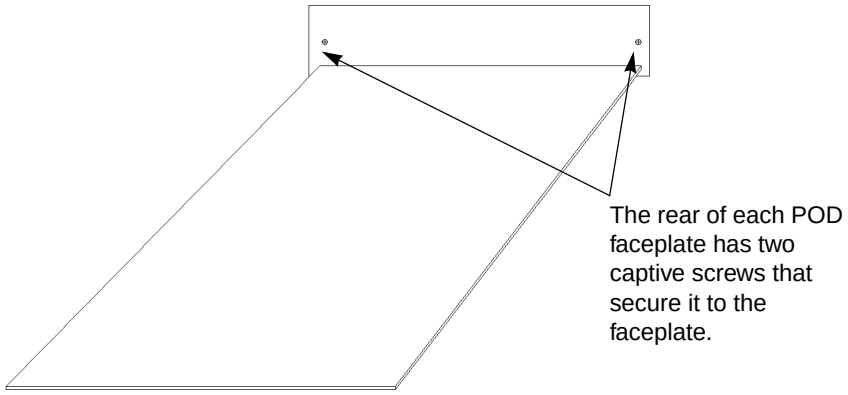


Figure 6-12. POD-Faceplate screw locations

3. Use a #2 Phillips head screwdriver to remove the two recessed screws that attach the faceplate to the ICM. See Figure 6-13 for the screw locations

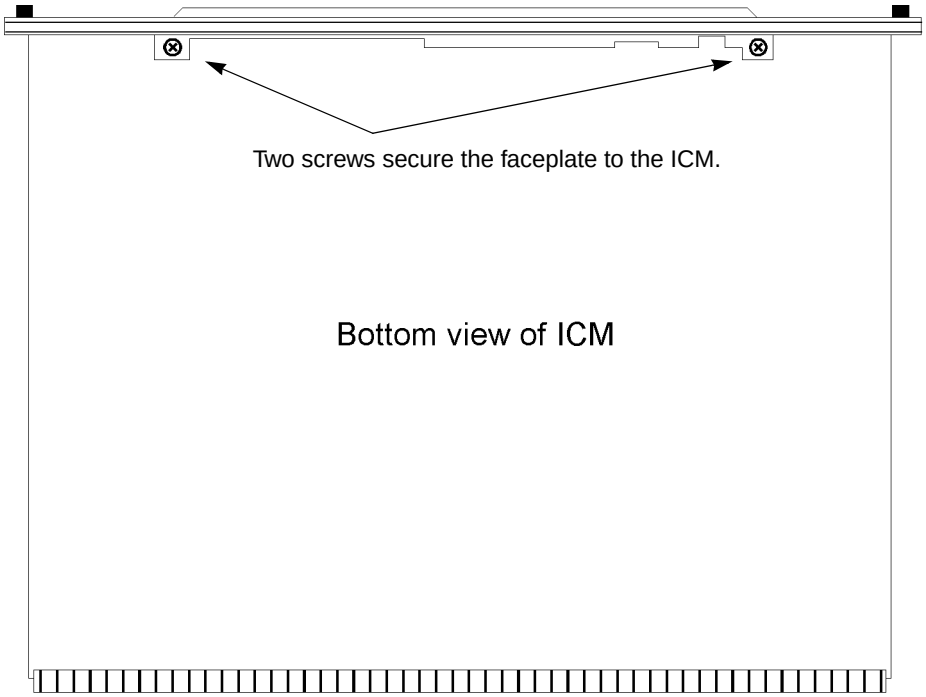


Figure 6-13. Bottom view of ICM

4. Remove the faceplate from the front of the ICM.
5. If present, loosen the captive screw on the rear corner of the IPOD using a #1 Phillips screwdriver.
6. Disengage the IPOD from its socket by using both hands to grasp the IPOD at the edge of each corner and gently pulling it out of its socket. Be careful not to damage the ICM below it while you disengage the IPOD from its socket.

Do not use tools to disengage IPODs from their sockets. If a tool slips, it may damage an IPOD or another component on the ICM.

7. After the IPOD is disengaged from its socket, lift it straight up away from the ICM (see Figure 6-14).

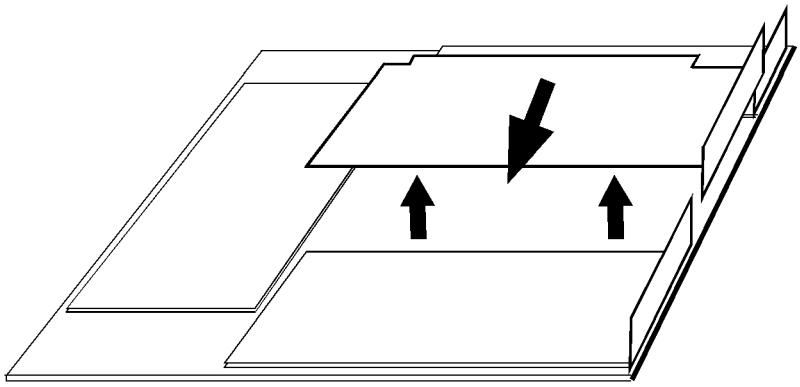


Figure 6-14. Removing the Center IPOD

8. If you are finished removing and installing ICM subassemblies, perform the follow-up steps described on page 6-26.

Installing IPODs

To install an IPOD:

1. Perform the preliminary steps described on page 6-2.
2. Align the pins of the IPOD with the socket on the ICM (reversing the procedures illustrated in Figure 6-14).
3. Using both hands, place your thumbs behind the socket and grasp the opposite edge of the IPOD with your remaining fingers and “squeeze” the IPOD into its socket.

Do not use tools to engage IPODs with their sockets. If a tool slips, it may damage an IPOD or another component on the ICM.

4. If present, retighten the captive screw in the rear corner of the IPOD, securing the IPOD to the ICM.
5. Align the faceplate on the front of the ICM, and use a #2 Phillips head screwdriver to replace the two recessed screws that attach the faceplate to the ICM. See Figure 6-13 for screw locations.
6. Use a #1 Phillips head screwdriver to tighten the two black captive screws that attach each of the IPODs and the XPOD to the faceplate. All of the IPODs and the XPOD must be secured to the faceplate.
7. If you are finished removing and installing ICM subassemblies, perform the follow-up steps described on page 6-26.

XPOD Removal and Installation

An ICM has one XPOD, which is located in the right front of the ICM (see Figure 6-11) when viewed from the faceplate side.

Removing the XPOD

To remove the XPOD:

1. Perform the preliminary steps described on page 6-2 and remove the ICM as described on page 6-17.
2. Use a #1 Phillips head screwdriver to loosen the two black captive screws attaching each IPOD and the XPOD to the faceplate. All IPODs and the XPOD must be disengaged from the faceplate before it can be removed. Also remove the screw at the rear of the XPOD, if it is installed.
3. Use a #2 Phillips head screwdriver to remove the two recessed screws that attach the faceplate to the ICM. See Figure 6-13 for screw locations.
4. Remove the faceplate from the front of the ICM.
5. Disengage the XPOD from its socket by grasping the XPOD at its rear edge and gently lifting it straight up out of its socket (see Figure 6-15). Be careful not to damage the ICM while disengaging the XPOD.

Do not use tools to disengage the XPODs from its socket. If a tool slips, it may damage the XPOD or another subassembly on the ICM.

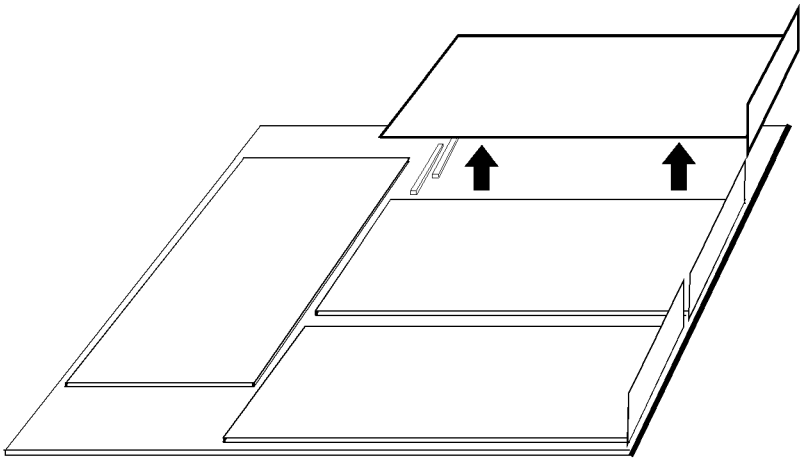


Figure 6-15. Removing the XPOD

6. If you are finished removing and installing ICM subassemblies, perform the follow-up steps described on page 6-26.

Installing the XPOD

To install the XPOD:

1. Perform the preliminary steps described on page 6-2.
2. Align the XPOD's connectors with its socket (reversing the procedures illustrated in Figure 6-15).
3. While avoiding the components installed on the XPOD, place one or two fingers at each corner of its rear edge and press down on the XPOD in order to engage its connectors with their sockets.

> ⚠ Do not use tools to engage the XPOD with its sockets. If a tool slips, it may damage the XPOD or another subassembly on the ICM.

4. Align the faceplate on the front of the ICM, and use a #2 Phillips head screwdriver to replace the two recessed screws that attach the faceplate to the ICM. See Figure 6-13 for the screw locations.
5. Use a #1 Phillips head screwdriver to tighten the two black captive screws that attach each of the IPODs and the XPOD to the faceplate. All of the IPODs and the XPOD must be secured to the faceplate. Also install the screw at the rear of the XPOD, if provided.
6. If you are finished removing and installing ICM subassemblies, perform the follow-up steps described on page 6-26.

CPOD Removal and Installation

The ICM has one CPOD, which is located in the rear of its chassis (see Figure 6-11).

Removing the CPOD

To remove the CPOD:

1. Perform the preliminary steps described on page 6-2 and remove the ICM as described on page 6-17. Place it on an anti-static foam pad to protect the bottom of the ICM.
2. If present, loosen the two captive screws on the CPOD with a #1 Phillips screwdriver.
3. While placing your fingers between the CPOD and the ICM, start with the front, then move to the sides of the CPOD carefully using gentle upward pressure to disengage the CPOD from its sockets (see Figure 6-16).

Do not bend or twist the CPOD while disengaging it, otherwise you may damage its connectors. Also, do not use tools to disengage the CPOD from its sockets. If a tool slips, it may damage a CPOD or another subassembly on the ICM.

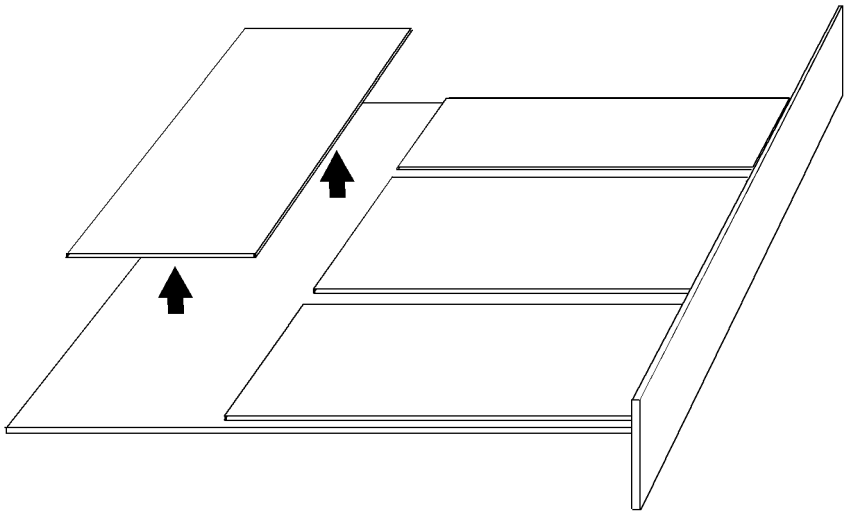


Figure 6-16. Removing the CPOD

Installing the CPOD

To install the CPOD:

1. Perform the preliminary steps described on page 6-2.
2. Position the CPOD directly over the sockets and use a firm, even pressure to seat it (reversing the procedures illustrated in Figure 6-16). Press down directly over the socket locations only.

> ⚠ Do not bend or twist the CPOD while engaging it with its sockets, otherwise you may damage its connectors. Also, do not use tools to engage the CPOD with its sockets. If a tool slips, it may damage a CPOD or another subassembly on the ICM.

3. If present, tighten the black captive screws securing the CPOD using a #1 Phillips screwdriver.
4. If you are finished removing and installing ICM subassemblies, perform the follow-up steps described on page 6-26.

Required Follow-up Steps

After removing or installing an ICM subassembly:

1. Replace the ICM in its slot, carefully inserting the board into the internal guides, following the procedures described in "ICM Removal" on page 6-17. Press the card-ejector hinges back down flush with the face of the ICM to secure the ICM to the backplane. Finally, tighten the locking screws to secure the ICM in place in the chassis.
2. Using the cable tags as a guide, reconnect the all the cables to the ICM including:
   - CPE cables
   - Network services cables
   - Web browser management interface computer cables, if used
   - Craft management interface terminal cables, if used
   - Power cables
3. You can toggle the power switch(es) of the SA unit to On at this time and the network administrator can configure and test it as described in the *Network Administrator's Guide*.

If the SA unit does not function properly after installing a subassembly, it is possible that the subassembly is not mated to its connector(s) correctly. To correct the problem, reinstall the subassembly in its connector(s). If the SA unit still does not function properly, refer to Chapter 7, "Resolving Problems".

SA 1200 Fan Tray Removal and Installation

The SA 1200's cooling fans are located at the top of the unit in an easily removable tray. The fan tray should be checked periodically to ensure that all eight fans are operating properly.

It is not necessary to power down the unit when removing and replacing the fan tray. However, the SA 1200 should not be operated for more than 30 minutes without the fan tray installed or overheating and misoperation may occur.

To remove the SA 1200 fan tray:

1. Using a #1 Phillips screwdriver, loosen the locking screws at the corners of the fan tray (see Figure 6-17 for screw locations).
2. Grasp the handle of the fan tray and pull it away from the unit, as shown in Figure 6-17. The fan tray will disengage from the chassis backplane.

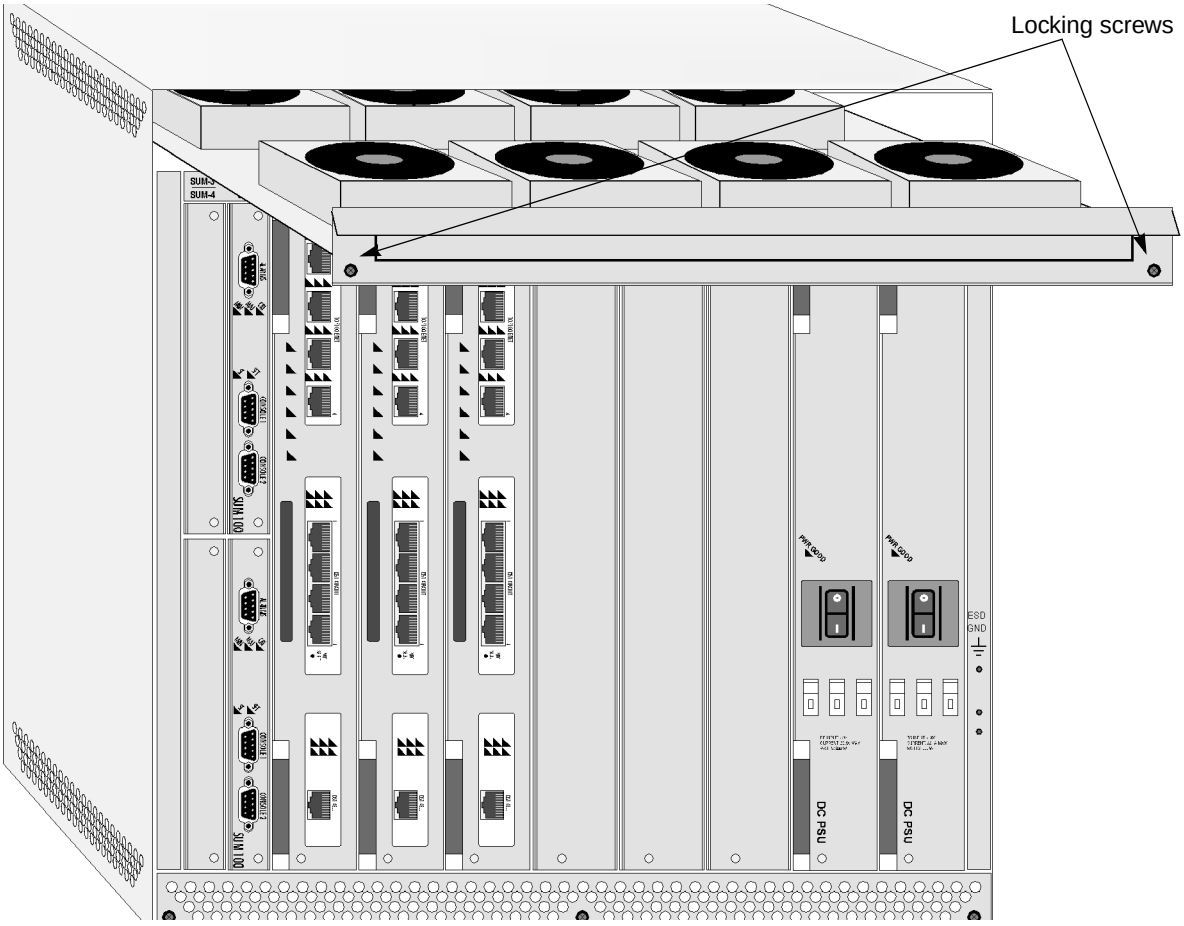


Figure 6-17. Removing the SA 1200 Fan Tray

3. Slowly slide the fan tray straight out of the chassis and place it on a static-protected work surface.

To replace the SA 1200 fan tray:

1. Place the edges fan tray in the guides and gently push the fan tray into the chassis, reversing the procedure shown in Figure 6-17. A little additional pressure may be required to engage the fan tray with the chassis backplane; however, do not force the fan tray into the backplane. If it is not engaging with a moderate amount of pressure, remove the fan tray and reseat it in its guides.
2. Using a #1 Phillips screwdriver, tighten the locking screws at the corners of the fan tray (see Figure 6-17).

SA 1200 Air Filter Removal and Installation

The SA 1200 is equipped with an air filter to purify the air drawn through the unit by the fan tray. The air filter should be changed and cleaned at regular intervals to ensure that the interior of the SA 1200 remains dust-free.

To remove and replace the SA 1200 air filter:

1. Using a #1 Phillips screwdriver, loosen the locking screws at the corners of the air filter grille, and place the grille to one side (see Figure 6-18).

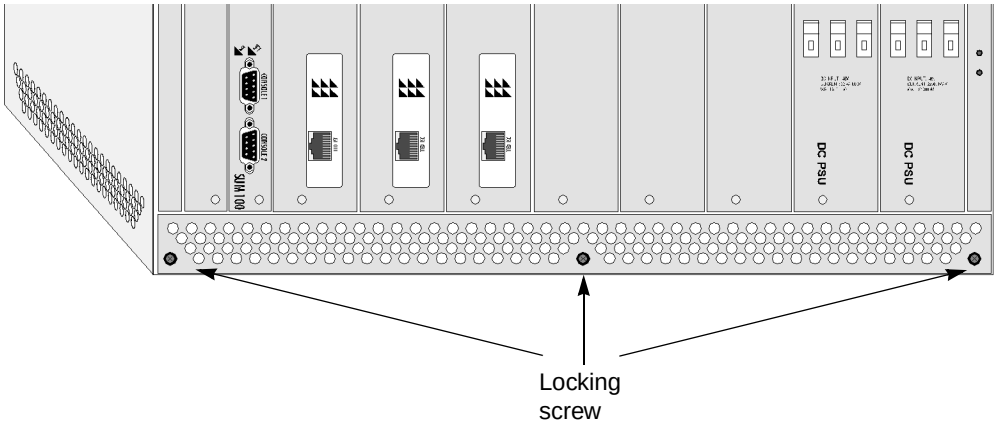


Figure 6-18. Removing the SA 1200 Air Filter Grille

2. Loosen the two thumbscrews and retract the air filter retaining bracket.
3. Remove the air filter from the SA 1200 as shown in Figure 6-19, and replace it with a clean air filter.

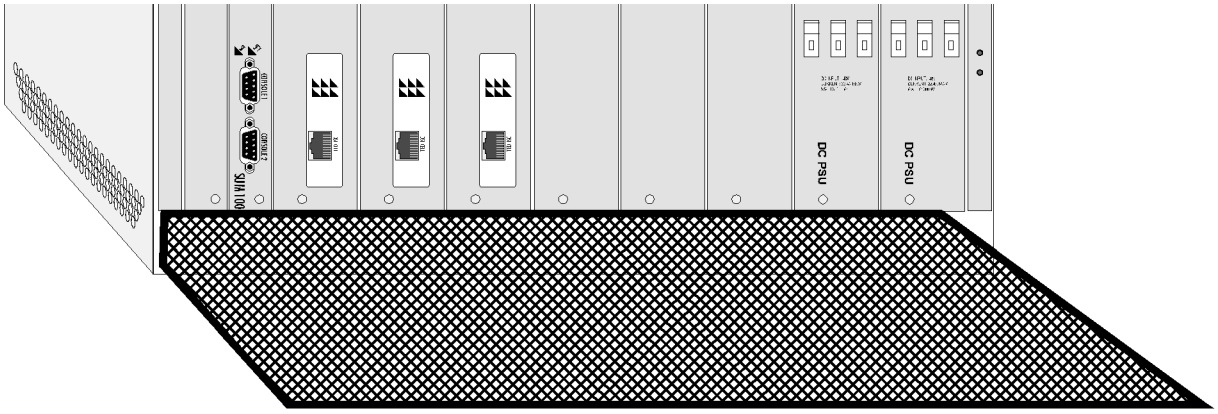


Figure 6-19. Removing the SA 1200 Air Filter

4. Re-seat the air filter retaining bracket and tighten the two thumbscrews to secure it.
5. Replace the air filter grille and use a #1 Phillips screwsdriver to tighten the locking screws at the corners and center of the grille.

6. SA 1200 air filters are reusable. You can clean the air filter using mild soapy water. Rinse the filter well and allow it to dry completely before using it in an SA 1200.

7

Resolving Problems

This chapter describes how to:

- Troubleshoot the SA hardware
- Contact the Ascend Technical Assistance Center, if necessary

To troubleshoot the SA operating system, refer to the *Network Administrator's Guide*.

Power-up Diagnostics

The SA unit runs diagnostics each time the power switch is toggled on. The front panel indicators light and blink while the system performs the diagnostics.

- If the SA unit passes all the power-up diagnostics, the RUN front panel indicator blinks once per second, while PWR remains lit continuously.
- If the SA unit fails the power-up diagnostics, you can use the front panel indicators to diagnose the problem. Table 7-1 describes the probable cause of a power-up diagnostics failure, as indicated by the front panel indicators.

Table 7-1. Power-Up Diagnostic Failure Indications

Indication	Description	Probable Cause
PWR is off	No power to the SA unit	Loose power connection Power source failure Power supply failure*
S/W is off, while the other indicators are on	DRAM initialization failed	Loose SIMM Defective SIMM*
All indicators are on	Checksum failure	Invalid application code* Electrical problem on address lines*
CRI is on	Critical alarm	Software configurable critical alarm*
MAJ is on	Major alarm	Software configurable major alarm*
MIN is on	Minor alarm	Software configurable minor alarm*
All indicators flashing SOS pattern	Serious hardware error with ICM	(SA 600 or SA 1200) ICM or CPOD is not multislot compatible, or ICM is not inserted in an odd-numbered slot (1, 3, or 5).*

* Contact the Ascend Technical Assistance Center. See "Contacting the Ascend Technical Assistance Center" on page 7-4.

POD Status Indicators

Each IPOD and XPOD has status indicators. The type and number of indicators varies depending on the type of IPOD or XPOD.

You may use these indicators to diagnose IPOD and XPOD problems. Table 7-2 and Table 7-3 describe how the abnormal behavior of the front panel indicators can denote the probable cause of a problem. Table 7-2 lists the indicators that are common to all IPODs and XPODs; Table 7-3 lists the indicators that are unique to some IPODs and XPODs.

Table 7-2. Problems Denoted by Common POD Status Indicators

Indication	Description	Probable Cause
ST is off	POD Status indication is off.	POD is not programmed. Link is off.
TX is off	Cell Transmitted indication is off.	POD is not transmitting.
RX is off	Cell Received indication is off.	POD is not receiving.

Table 7-3. Problems Denoted by Unique POD Status Indicators

Indication	Description	Probable Cause
AIS is on	Alarm Indication Signal	POD detects an alarm indication signal (AIS) in the received signal.
RED is on	Red alarm	POD detects a red alarm condition in the received signal.
REM is on	Remote Alarm Indication	POD detects a remote alarm indication in the received signal.
SYN	Sync alarm	POD detects a sync alarm condition.
YEL	Yellow alarm	POD detects a yellow alarm condition in the received signal.

Contacting the Ascend Technical Assistance Center

Ascend provides a full range of support to ensure that maximum network uptime is achieved with low equipment cost. The staff at Ascend's Technical Assistance Center can assist you with any problems you may encounter when using an SA unit. Contact Ascend's Technical Assistance Center by phone, electronic mail (email), or fax.

Phone

Ascend offers support 24 hours a day, 7 days a week. To contact Ascend's Technical Assistance Center by phone, call:

1-800-DIAL-WAN or 1-978-692-2600 (in the U.S. and Canada)

0-800-96-2229 (in the United Kingdom)

1-978-952-7299 (all other areas)

E-mail and Fax

Include the following information when requesting assistance electronically (by email or fax):

- Your name, your company name, and your telephone number
- Name of contact person and their telephone number (if different from above)
- Your time-zone and the best time to reach you
- Your Ascend service contract number
- Brief description of the problem
- List of identifiable symptoms

To contact Ascend's Technical Assistance Center by email, address your email to:

cs@casc.com

To contact Ascend's Technical Assistance Center by fax, call:

1-978-392-9768

A

XPOD and IPOD Modules

This appendix contains the following information concerning each currently available IPOD and XPOD:

- Brief description
- Front panel diagram
- Front panel indicator description
- Product code
- Technical specifications

This appendix may reflect planned developments not available at the time this manual was printed. Please contact your Ascend sales representative for a list of currently available SA PODs and accessories.

XPODs

ATM DS1 XPOD Enhanced

The ATM DS1 XPOD Enhanced provides a single DS1 interface running at 1.544 Mbps via a single RJ-48 connector. It supports G.804 framing and includes buffering, enhanced traffic management, and hardware OAM capabilities. Figure A-1 shows the module's front panel, Table A-1 describes the front panel indicators, and Table A-2 lists the module's technical specifications.

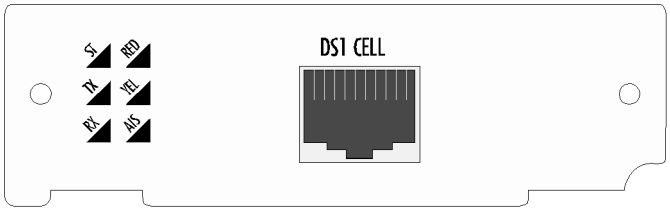


Figure A-1. ATM DS1 XPOD Enhanced Front Panel

Table A-1. ATM DS1 XPOD Enhanced Front Panel Indicators

Indicator	Name	Color	Description
ST	POD Status	green	On when the POD is programmed and in service.
TX	Cells Transmitted	green	On when the POD sends ATM cells.
RX	Cells Received	green	On when the POD receives ATM cells.
RED	Red Alarm	red	On when the POD detects a red alarm condition in the received signal, perhaps due to loss of frame, delineation, or pointer.
YEL	Yellow Alarm	yellow	On when the POD detects a yellow alarm condition in the received signal, i.e., a remote alarm indication exists in the incoming path, perhaps due to a remote defect indication (RDI) condition or yellow path layer indication on the incoming signal.
AIS	Alarm Indication Signal	yellow	On when the POD detects an alarm indication signal (AIS) in the received signal, which indicates a service interruption failure due to a loss of signal (LOS), out-of-frame (OOF) condition, or internal equipment failure.

Table A-2. ATM DS1 XPOD Enhanced Specifications

Product code	B750A020150
Height	0.75 in (1.9 cm)
Width	2.85 in (7.2 cm)
Depth	6.88 in (17.5 cm)
Weight	5 oz (141.7 g)
Power requirement	7.5 W maximum
Temperature range	23°–122° F (-5°–+50° C)
Agency approval	*EMI*: FCC Part 15A, CISPR 22, VCCI, EN55022, AS3548, EN50082 (1997) *Telecom:* FCC Part 68, CS-003 *NEBS:* GR-1089-CORE, GR-63-CORE (pending)
Interface standard	ANSI T1.102, ANSI T1.107, ANSI T1.403, G.804, TR-TSY-000499
Physical interface	One RJ-48 connector (see Figure A-31 for connector pinouts)

ATM E1 XPOD Enhanced

The ATM E1 XPOD Enhanced provides a single E1 interface running at 2.048 Mbps via a single RJ-48 connector. It supports G.804 framing and includes buffering, enhanced traffic management, and hardware OAM capabilities. Figure A-2 shows the module's front panel, Table A-3 describes the front panel indicators, and Table A-4 lists the module's technical specifications.

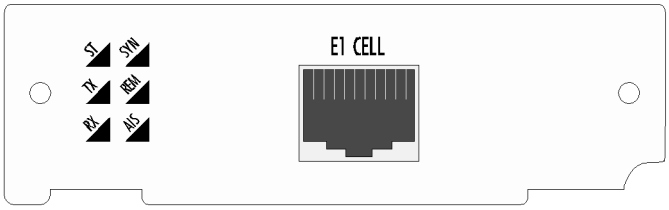


Figure A-2. ATM E1 XPOD Enhanced Front Panel

Table A-3. ATM E1 XPOD Front Panel Indicators

Indicator	Name	Color	Description
ST	POD Status	green	On when the POD is programmed and in service.
TX	Cells Transmitted	green	On when the POD sends ATM cells.
RX	Cells Received	green	On when the POD receives ATM cells.
SYN	Sync Alarm	red	On when the POD detects a sync alarm condition, i.e., the POD is not receiving a signal, perhaps due to loss of frame or delineation.
REM	Remote Alarm Indication	yellow	On when the POD detects a remote alarm indication in the received signal.
AIS	Alarm Indication Signal	yellow	On when the POD detects an alarm indication signal (AIS) in the received signal, which indicates a service interruption failure due to a loss of signal (LOS), out-of-frame (OOF) condition, or internal equipment failure.

Table A-4. ATM E1 XPOD Enhanced Specifications

Product code	B750A020160
Height	0.75 in (1.9 cm)
Width	2.85 in (7.2 cm)
Depth	6.88 in (17.5 cm)
Weight	5 oz (141.7 g)
Power requirement	7.5 W maximum
Temperature range	23°–122° F (-5°–+50° C)
Agency approval	*EMI*: FCC Part 15A, CISPR 22, VCCI, EN55022, AS3548, BCIQ, EN50082 (1997) *Telecom:* CTR-12, CTR-13, TS-016, NTR-4, ETS 300 046 *NEBS:* GR-1089-CORE, GR-63-CORE (pending)
Interface standard	ANSI T1.102, ANSI T1.107, ANSI T1.403, G.804, TR-TSY-000499
Physical interface	One RJ-48 connector (see Figure A-31 for connector pinouts)

DS1 ATM XPOD with Integral CSU

The DS1 ATM XPOD with Integral CSU provides a single DS1 interface running at 1.544 Mbps via a single RJ-48 connector. The module's integral CSU provides short- and long-haul operation with support for loopback generation and detection. Figure A-3 shows the module's front panel, Table A-5 describes the front panel indicators, and Table A-6 lists the module's technical specifications.

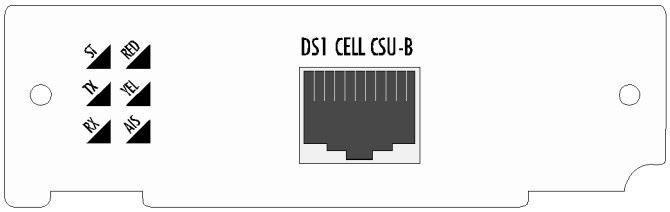


Figure A-3. DS1 ATM XPOD with CSU Front Panel

Table A-5. DS1 ATM XPOD with CSU Front Panel Indicators

Indicator	Name	Color	Description
ST	POD Status	green	On when the POD is programmed and in service.
TX	Cells Transmitted	green	On when the POD sends ATM cells.
RX	Cells Received	green	On when the POD receives ATM cells.
RED	Red Alarm	red	On when the POD detects a red alarm condition in the received signal, perhaps due to loss of frame, delineation, or pointer.
YEL	Yellow Alarm	yellow	On when the POD detects a yellow alarm condition in the received signal, i.e., a remote alarm indication exists in the incoming path, perhaps due to a remote defect indication (RDI) condition or yellow path layer indication on the incoming signal.
AIS	Alarm Indication Signal	yellow	On when the POD detects an alarm indication signal (AIS) in the received signal, which indicates a service interruption failure due to a loss of signal (LOS), out-of-frame (OOF) condition, or internal equipment failure.

Table A-6. DS1 ATM XPOD with CSU Specifications

Product code	B750A020190
Height	0.75 in (1.9 cm)
Width	2.85 in (7.2 cm)
Depth	6.88 in (17.5 cm)
Weight	5 oz (141.7 g)
Power requirement	7.5 W maximum
Temperature range	23°–122° F (-5°–+50° C)
Agency approval	*EMI*: FCC Part 15A, CISPR 22, VCCI, EN55022, AS3548, BCIQ, EN50082 (1997) *Telecom:* FCC Part 68, CS-003 *NEBS:* GR-1089-CORE, GR-63-CORE (pending)
Interface standard	ANSI T1.102, ANSI T1.107, ANSI T1.403, G.804, TR-TSY-000499
Physical interface	One RJ-48 connector (see Figure A-31 for connector pinouts)

ATM DS3 XPOD Enhanced

The ATM DS3 XPOD Enhanced provides a single DS3 interface running at 44.736 Mbps. It supports Physical Layer Convergence Protocol (PLCP) and G.804 framing and includes buffering, enhanced traffic management, and hardware OAM capabilities. Figure A-4 shows the module's front panel, Table A-7 describes the front panel indicators, and Table A-8 lists the module's technical specifications.

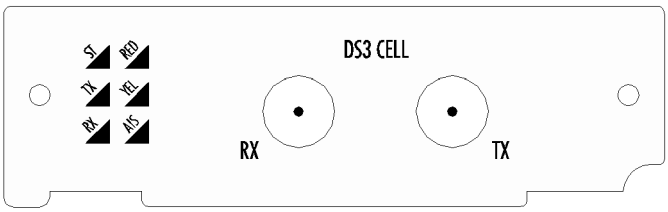


Figure A-4. ATM DS3 XPOD Enhanced Front Panel

Table A-7. ATM DS3 XPOD Enhanced Front Panel Indicators

Indicator	Name	Color	Description
ST	POD Status	green	On when the POD is programmed and in service.
TX	Cells Transmitted	green	On when the POD sends ATM cells.
RX	Cells Received	green	On when the POD receives ATM cells.
RED	Red Alarm	red	On when the POD detects a red alarm condition in the received signal, perhaps due to loss of frame, delineation, or pointer.
YEL	Yellow Alarm	yellow	On when the POD detects a yellow alarm condition in the received signal, i.e., a remote alarm indication exists in the incoming path, perhaps due to a remote defect indication (RDI) condition or yellow path layer indication on the incoming signal.
AIS	Alarm Indication Signal	yellow	On when the POD detects an alarm indication signal (AIS) in the received signal, which indicates a service interruption failure due to a loss of signal (LOS), out-of-frame (OOF) condition, or internal equipment failure.

Table A-8. ATM DS3 XPOD Enhanced Specifications

Product code	B750A020120
Height	0.75 in (1.9 cm)
Width	2.85 in (7.2 cm)
Depth	6.88 in (17.5 cm)
Weight	5 oz (141.7 g)
Power requirement	7.5 W maximum
Temperature range	23°–122° F (-5°–+50° C)
Agency approval	*EMI*: FCC Part 15A, CISPR 22, VCCI, EN55022, AS3548, EN50082 (1997) *Telecom* (pending): UK Telecom *NEBS:* GR-1089-CORE, GR-63-CORE (pending)
Interface standard	ANSI T1.102, G.703, G.804, G.832, TR-TSY-000499
Physical interface	Two (TX and RX) 75-ohm BNC connectors

ATM E3 XPOD Enhanced

The ATM E3 XPOD Enhanced provides a single E3 interface running at 34 Mbps. It supports Physical Layer Convergence Protocol (PLCP) and G.804 framing and includes buffering, enhanced traffic management, and hardware OAM capabilities. Figure A-5 shows the module's front panel, Table A-9 describes the front panel indicators, and Table A-10 lists the module's technical specifications.

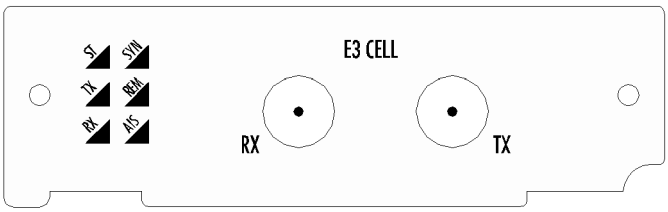


Figure A-5. ATM E3 XPOD Enhanced Front Panel

The E3 XPOD is shipped with a floating ground on the Receive (RX) BNC connector. If you wish to connect the receive BNC negative signal to chassis ground, follow the procedure described in "Connecting the Receive BNC Negative Signal to Chassis Ground" on page A-12.

Table A-9. ATM E3 XPOD Enhanced Front Panel Indicators

Indicator	Name	Color	Description
ST	POD Status	green	On when the POD is programmed and in service.
TX	Cells Transmitted	green	On when the POD sends ATM cells.
RX	Cells Received	green	On when the POD receives ATM cells.
SYN	Sync Alarm	red	On when the POD detects a sync alarm condition, i.e., the POD is not receiving a signal, perhaps due to loss of frame or delineation.
REM	Remote Alarm Indication	yellow	On when the POD detects a remote alarm indication in the received signal.
AIS	Alarm Indication Signal	yellow	On when the POD detects an alarm indication signal (AIS) in the received signal, which indicates a service interruption failure due to a loss of signal (LOS), out-of-frame (OOF) condition, or internal equipment failure.

Table A-10. ATM E3 XPOD Enhanced Specifications

Product code	B750A020125
Height	0.75 in (1.9 cm)
Width	2.85 in (7.2 cm)
Depth	6.88 in (17.5 cm)
Weight	5 oz (141.7 g)
Power requirement	7.5 W maximum
Temperature range	23°–122° F (-5°–+50° C)
Agency approval	*EMI*: FCC Part 15A, CISPR 22, VCCI, EN55022, AS3548, EN50082 (1997) *Telecom:* CTR-24, TS-016 *NEBS:* GR-1089-CORE, GR-63-CORE (pending)
Interface standard	ANSI T1.102, G.703, G.804, G.832, TR-TSY-000499
Physical interface	Two (TX and RX) 120-ohm BNC connectors

Connecting the Receive BNC Negative Signal to Chassis Ground

To connect the receive BNC negative signal to the SA unit's chassis ground:

1. Remove the metal nut and lock washer on the RX BNC connector (shown in Figure A-6).
2. Remove the plastic standoff washer, which serves to isolate the connector from ground.
3. Replace the metal lock washer and nut.

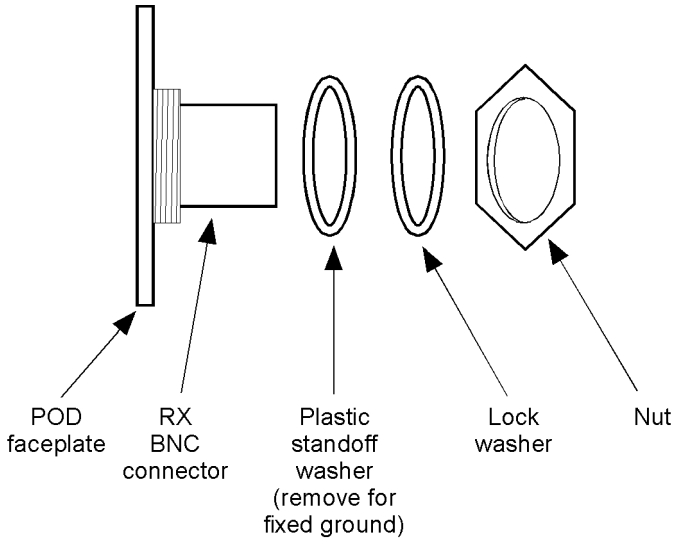


Figure A-6. RX BNC Connector

ATM OC-3c/STM-1 XPOD Enhanced

The ATM OC-3c/STM-1 XPOD Enhanced provides a single ATM interface operating at 155.52 Mbps with an SC duplex connector. It includes buffering, enhanced traffic management, and hardware OAM capabilities. This XPOD is available in three models: Multimode, Single-Mode (Intermediate-Reach), and Single-Mode (Long-Reach). In addition, the Single-Mode (IR) POD is also available in a version which supports port-level egress cell-shaping, from 1 to 127 Mbps in 1 Mbps increments.

Figure A-7 shows the module's front panel, Table A-11 describes the front panel indicators, and Table A-12 lists the module's technical specifications.

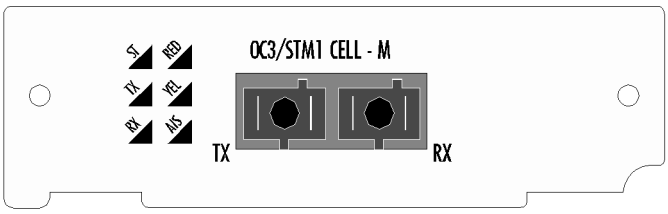


Figure A-7. ATM OC-3c/STM-1 XPOD Enhanced Front Panel

OC-3c/STM-1 Cell PODs utilize laser optical subassemblies complying with Class 1 safety limits defined in the IEC 825 standard on laser safety. You should understand the implications of these safety limits prior to working with this equipment. Do not look into the ends of fiber optic cables or at light reflected from the cables, as the transmit laser beam can cause personal injury.

Table A-11. ATM OC-3c/STM-1 XPOD Enhanced Front Panel Indicators

Indicator	Name	Color	Description
ST	POD Status	green	On when the POD is programmed and in service.
TX	Cells Transmitted	green	On when the POD sends ATM cells.
RX	Cells Received	green	On when the POD receives ATM cells.
RED	Red Alarm	red	On when the POD detects a red alarm condition in the received signal, i.e., the POD is receiving a signal that is not synchronized to the incoming SONET/SDH signal, perhaps due to loss of frame, delineation, or pointer.

Table A-11. ATM OC-3c/STM-1 XPOD Enhanced Front Panel Indicators

Indicator	Name	Color	Description
YEL	Yellow Alarm	yellow	On when the POD detects a yellow alarm condition in the received signal, i.e., a remote alarm indication exists in the incoming path, perhaps due to a remote defect indication (RDI) condition or yellow path layer indication on the incoming signal.
AIS	Alarm Indication Signal	yellow	On when the POD detects an alarm indication signal (AIS) in the received signal, which indicates a service interruption failure due to a loss of signal (LOS), out-of-frame (OOF) condition, or internal equipment failure.

Table A-12. ATM OC-3c/STM-1 XPOD Enhanced Specifications*

Product code	Without Bulk Cell Shaping capability Multimode: B750A020100 Single-mode, Intermediate-reach: B750A020102 Single-mode, Long-reach: B750A020105 With Bulk Cell Shaping capability Single-mode, Intermediate-reach: B750A020212
Height	0.75 in (1.9 cm)
Width	2.85 in (7.2 cm)
Depth	6.88 in (17.5 cm)
Weight	5 oz (141.7 g)
Power requirement	7.5 W maximum
Temperature range	23°–122° F (-5°–+50° C)
Agency approval	*EMI*: FCC Part 15A, CISPR 22, VCCI, EN55022, AS3548, EN50082 (1997) *Telecom:* UK STM1 Test (pending) *NEBS:* GR-1089-CORE, GR-63-CORE (pending) *Safety*: IEC 825, FDA CDRH (pending)
Interface standard	ITU I.432, B-ISDN UNI-Physical Layer Specification
Physical interface	One SC duplex connector

* Also refer to Table A-64 for physical layer, ATM layer, and optical specifications.

IMA DSX1 XPOD

The IMA DSX1 XPOD provides IMA trunking of up to 4 DS1 ports each running at 1.544 Mbps. This configuration enables the XPOD to achieve a maximum trunk rate of approximately 6.0 Mbps via a 60-pin mini-D style connector. Figure A-8 shows the module's front panel, Table A-13 describes the front panel indicators, and Table A-14 lists the module's technical specifications.

IMA PODs require special cables and a breakout box mounted in a breakout cable bracket. See "Special Considerations for IMA PODs — Cables and Breakout Box" on page 4-28 for mounting instructions and Appendix C for product codes.

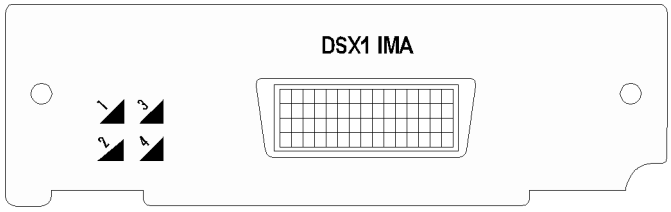


Figure A-8. IMA DSX1 XPOD Front Panel

Table A-13. IMA DSX1 XPOD Front Panel Indicators

Indicator	Name	Color	Description
1-2-3-4	Port Status	green or red	Normally green; red when the POD detects an error condition.

Table A-14. IMA DSX1 XPOD Enhanced Specifications

Product code	B750A020171
Height	0.75 in (1.9 cm)
Width	2.85 in (7.2 cm)
Depth	6.88 in (17.5 cm)
Weight	5 oz (141.7 g)
Power requirement	7.5 W maximum
Temperature range	23°–122° F (-5°–+50° C)

Table A-14. IMA DSX1 XPOD Enhanced Specifications

Agency approval	*EMI* (pending): FCC Part 15A, CISPR 22, VCCI, EN55022, AS3548, EN50082 (1997) *Telecom* (pending): FCC Part 68, CS-003 *NEBS* (pending): GR-1089-CORE, GR-63-CORE
Interface standard	ANSI T1.102, ANSI T1.107, ANSI T1.403, G.804, TR-TSY-000499
Physical interface	One DB-60 connector jack. See Figure A-34 for pinout.

IMA DS1 XPOD with Integral CSU

The IMA DS1 XPOD with Integral CSU provides IMA trunking of up to 4 DS1 ports each running at 1.544 Mbps. This configuration enables the XPOD to achieve a maximum trunk rate of approximately 6.0 Mbps via a 60-pin mini-D style connector. The integral CSU provides short- and long-haul operation with support for loopback generation and detection. Figure A-9 shows the module's front panel, Table A-15 describes the front panel indicators, and Table A-16 lists technical specifications.

IMA PODs require special cables and a breakout box mounted in a breakout cable bracket. See "Special Considerations for IMA PODs — Cables and Breakout Box" on page 4-28 for mounting instructions and Appendix C for product codes.

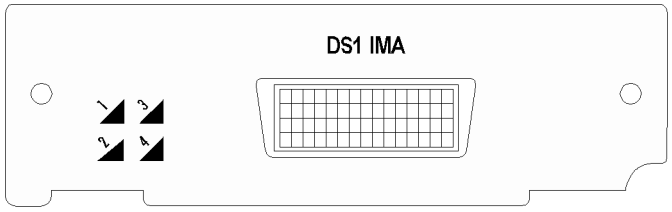


Figure A-9. IMA DS1 XPOD with Integral CSU Front Panel

Table A-15. IMA DS1 XPOD with Integral CSU Front Panel Indicators

Indicator	Name	Color	Description
1-2-3-4	Port Status	green or red	Normally green; red when the POD detects an error condition.

Table A-16. IMA DS1 XPOD with Integral CSU Enhanced Specifications

Product code	B750A020173
Height	0.75 in (1.9 cm)
Width	2.85 in (7.2 cm)
Depth	6.88 in (17.5 cm)
Weight	5 oz (141.7 g)
Power requirement	7.5 W maximum
Temperature range	23°–122° F (-5°–+50° C)

Table A-16. IMA DS1 XPOD with Integral CSU Enhanced Specifications

Agency approval	*EMI* (pending): FCC Part 15A, CISPR 22, VCCI, EN55022, AS3548, EN50082 (1997) *Telecom* (pending): FCC Part 68, CS-003 *NEBS* (pending): GR-1089-CORE, GR-63-CORE
Interface standard	ANSI T1.102, ANSI T1.107, ANSI T1.403, G.804, TR-TSY-000499
Physical interface	One DB-60 connector jack. See Figure A-34 for pinout.

IMA E1 XPOD

The IMA E1 XPOD provides IMA trunking of up to 4 E1 ports each running at 2.048 Mbps. This configuration enables the XPOD to achieve a maximum trunk rate of approximately 7.6 Mbps via a 60-pin mini-D style connector. Figure A-10 shows the module's front panel, Table A-17 describes the front panel indicators, and Table A-18 lists the module's technical specifications.

IMA PODs require special cables and a breakout box mounted in a breakout cable bracket. See "Special Considerations for IMA PODs — Cables and Breakout Box" on page 4-28 for mounting instructions and Appendix C for product codes.

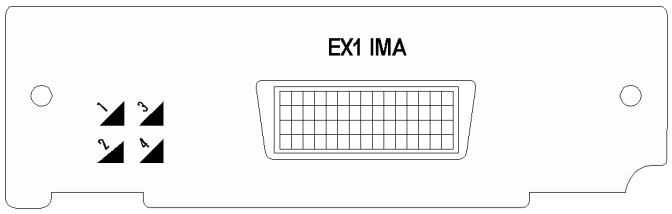


Figure A-10. IMA E1 XPOD Front Panel

Table A-17. IMA E1 XPOD Front Panel Indicators

Indicator	Name	Color	Description
1-2-3-4	Port Status	green or red	Normally green; red when the POD detects an error condition.

Table A-18. IMA E1 XPOD Enhanced Specifications

Product code	B750A020172
Height	0.75 in (1.9 cm)
Width	2.85 in (7.2 cm)
Depth	6.88 in (17.5 cm)
Weight	5 oz (141.7 g)
Power requirement	7.5 W maximum
Temperature range	23°–122° F (-5°–+50° C)

Table A-18. IMA E1 XPOD Enhanced Specifications

Agency approval	*EMI* (pending): FCC Part 15A, CISPR 22, VCCI, EN55022, AS3548, EN50082 (1997) *Telecom* (pending): CTR-12, CTR-13, TS-016, NTR-4, ETS 300 046 *NEBS* (pending): GR-1089-CORE, GR-63-CORE
Interface standard	ANSI T1.102, ANSI T1.107, ANSI T1.403, G.804, TR-TSY-000499
Physical interface	One DB-60 connector jack. See Figure A-34 for pinout.

IMA E1 XPOD with Integral CSU

The IMA E1 XPOD with Integral CSU provides IMA trunking of up to 4 E1 ports each running at 2.048 Mbps. This configuration enables the XPOD to achieve a maximum trunk rate of approximately 6.0 Mbps via a 60-pin mini-D style connector. The integral CSU provides short- and long-haul operation with support for loopback generation and detection. Figure A-11 shows the module's front panel, Table A-19 describes the front panel indicators, and Table A-20 lists technical specifications.

IMA PODs require special cables and a breakout box mounted in a breakout cable bracket. See "Special Considerations for IMA PODs — Cables and Breakout Box" on page 4-28 for mounting instructions and Appendix C for product codes.

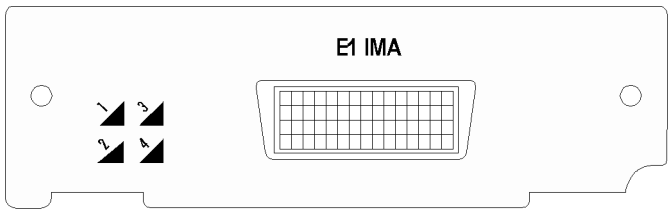


Figure A-11. IMA E1 XPOD with Integral CSU Front Panel

Table A-19. IMA E1 XPOD with Integral CSU Front Panel Indicators

Indicator	Name	Color	Description
1-2-3-4	Port Status	green or red	Normally green; red when the POD detects an error condition.

Table A-20. IMA E1 XPOD with Integral CSU Enhanced Specifications

Product code	B750A020174
Height	0.75 in (1.9 cm)
Width	2.85 in (7.2 cm)
Depth	6.88 in (17.5 cm)
Weight	5 oz (141.7 g)
Power requirement	7.5 W maximum
Temperature range	23°–122° F (-5°–+50° C)

Table A-20. IMA E1 XPOD with Integral CSU Enhanced Specifications

Agency approval	*EMI* (pending): FCC Part 15A, CISPR 22, VCCI, EN55022, AS3548, EN50082 (1997) *Telecom* (pending): CTR-12, CTR-13, TS-016, NTR-4, ETS 300 046 *NEBS* (pending): GR-1089-CORE, GR-63-CORE
Interface standard	ANSI T1.102, ANSI T1.107, ANSI T1.403, G.804, TR-TSY-000499
Physical interface	One DB-60 connector jack. See Figure A-34 for pinout.

Dual DS1 CES XPOD

The Dual DS1 CES XPOD provides two ports of DS1 (1.544 Mbps) circuit emulation with one RJ-48 physical connector per port. The connections may be configured as structured or unstructured. The XPOD includes buffering, enhanced traffic management, and hardware OAM capabilities. Figure A-12 shows the module's front panel, Table A-21 describes the front panel indicators, and Table A-22 lists the module's technical specifications.

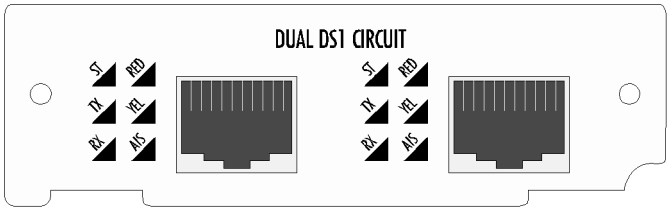


Figure A-12. Dual DS1 CES XPOD Front Panel

Table A-21. Dual DS1 CES XPOD Front Panel Indicators

Indicator	Name	Color	Description
ST	POD Status	green	Flashing when the POD is programmed and in service.
TX	Cells Transmitted	green	On when the POD sends ATM cells across the indicated port.
RX	Cells Received	green	On when the POD receives ATM cells across the indicated port.
RED	Red Alarm	red	On when the POD detects a red alarm condition in the received signal, perhaps due to loss of frame, delineation, or pointer.
YEL	Yellow Alarm	yellow	On when the POD detects a yellow alarm condition in the received signal, i.e., a remote alarm indication exists in the incoming path, perhaps due to a remote defect indication (RDI) condition or yellow path layer indication on the incoming signal.
AIS	Alarm Indication Signal	yellow	On when the POD detects an alarm indication signal (AIS) in the received signal, which indicates a service interruption failure due to a loss of signal (LOS), out-of-frame (OOF) condition, or internal equipment failure.

Table A-22. Dual DS1 CES XPOD Enhanced Specifications

Product code	B750A020200
Height	0.75 in (1.9 cm)
Width	2.85 in (7.2 cm)
Depth	6.88 in (17.5 cm)
Weight	5 oz (141.7 g)
Power requirement	7.5 W maximum
Temperature range	23°–122° F (-5°–+50° C)
Agency approval	*EMI*: FCC Part 15A, CISPR 22, VCCI, EN55022, AS3548, BCIQ, EN50082 (1997) *Telecom:* FCC Part 68, CS-003 *NEBS:* GR-1089-CORE, GR-63-CORE (pending)
Interface standard	ANSI T1.102, ANSI T1.107, ANSI T1.403, G.804, TR-TSY-000499
Physical interface	Two-port RJ-48 connector jack (see Figure A-31 for connector pinouts)

Dual E1 CES XPOD

The Dual E1 CES XPOD provides two ports of E1 (2.048 Mbps) circuit emulation with one RJ-48 physical connector per port. The connections may be configured as structured or unstructured. The XPOD includes buffering, enhanced traffic management, and hardware OAM capabilities. Figure A-13 shows the module's front panel, Table A-23 describes the front panel indicators, and Table A-24 lists the module's technical specifications.

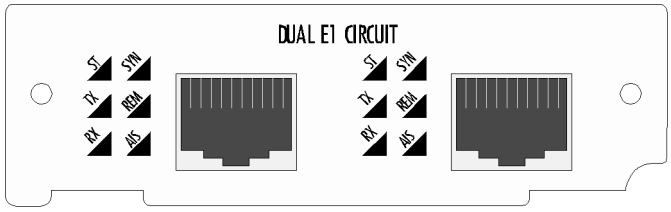


Figure A-13. Dual E1 CES XPOD Front Panel

Table A-23. Dual E1 CES XPOD Front Panel Indicators

Indicator	Name	Color	Description
ST	POD Status	green	Flashing when the POD is programmed and in service.
TX	Cells Transmitted	green	On when the POD sends ATM cells across the indicated port.
RX	Cells Received	green	On when the POD receives ATM cells across the indicated port.
SYN	Sync Alarm	red	On when the POD detects a sync alarm condition, i.e., the POD is not receiving a signal, perhaps due to loss of frame or delineation.
REM	Remote Alarm Indication	yellow	On when the POD detects a remote alarm indication in the received signal.
AIS	Alarm Indication Signal	yellow	On when the POD detects an alarm indication signal (AIS) in the received signal, which indicates a service interruption failure due to a loss of signal (LOS), out-of-frame (OOF) condition, or internal equipment failure.

Table A-24. Dual E1 CES XPOD Enhanced Specifications

Product code	B750A020205
Height	0.75 in (1.9 cm)
Width	2.85 in (7.2 cm)
Depth	6.88 in (17.5 cm)
Weight	5 oz (141.7 g)
Power requirement	7.5 W maximum
Temperature range	23°–122° F (-5°–+50° C)
Agency approval	*EMI*: FCC Part 15A, CISPR 22, VCCI, EN55022, AS3548, BCIQ, EN50082 (1997) *Telecom:* CTR-12, CTR-13, TS-016, NTR-4, ETS 300 046 *NEBS:* GR-1089-CORE, GR-63-CORE (pending)
Interface standard	ANSI T1.102, ANSI T1.107, ANSI T1.403, G.804, TR-TSY-000499
Physical interface	Two-port RJ-48 connector jack (see Figure A-31 for connector pinouts)

IPODs

10/100 Ethernet IPODs

The 10/100 Ethernet IPODs provide flexible high-speed interfaces for connecting ethernet users to an ATM network and supports wireline speed across the ATM network. There are two versions of the 10/100 Ethernet IPOD, a quad-port version providing four ports of 10/100 BaseT via four RJ-48 connectors, and a single-port version providing one port of 10/100 BaseT via one RJ-48 connector. The modules also support RFC 1483-based tunneling. Figure A-14 shows the module's front panel, Table A-25 describes the front panel indicators, and Table A-26 lists the module's technical specifications.

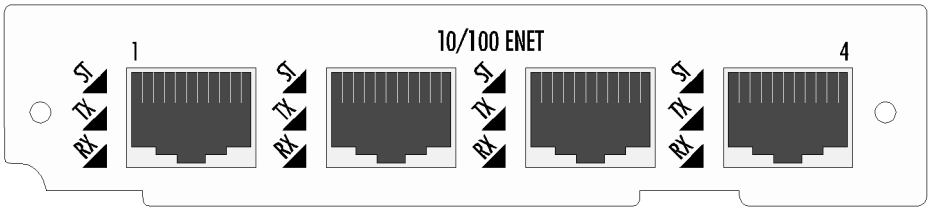


Figure A-14. 10/100 Ethernet IPOD Front Panel (quad-port shown)

Table A-25. 10/100 Ethernet IPOD Front Panel Indicators

Indicator	Name	Color	Description
ST	POD Status	green	On when POD is programmed and in service.
TX	Data Transmitted	green	On when POD is in service and sending data.
RX	Data Received	green	On when POD is in service and receiving data.

Table A-26. 10/100 Ethernet IPOD Specifications

Product code	Quad-port: B750A040120 Single-port: B750A040125
Height	0.75 in (1.9 cm)
Width	4.2 in (10.7 cm)
Depth	6.88 in (17.5 cm)
Weight	6.5 oz (184.3 g)
Power requirement	7.5 W maximum
Temperature range	23°–122° F (-5°–+50° C)
Agency approval	*EMI*: FCC Part 15A, CISPR 22, VCCI, EN55022, AS3548, EN50082 (1997) *NEBS:* GR-1089-CORE, GR-63-CORE (pending)
Physical interface	One or four RJ-48 connectors (see Figure A-32 for connector pinouts)

Circuit Emulation Quad DS1 IPOD

The Circuit Emulation Quad DS1 IPOD provides four ports of DS1 structured 1.544 Mbps circuit emulation with one RJ-48 physical connector per port. It supports four ports per IPOD. Figure A-15 shows the module's front panel, Table A-27 describes the front panel indicators, and Table A-28 lists the module's technical specifications.

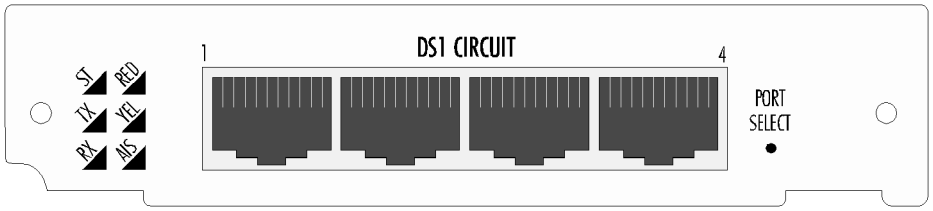


Figure A-15. Circuit Emulation Quad DS1 IPOD Front Panel

Table A-27. Circuit Emulation Quad DS1 IPOD Front Panel Indicators

Indicator	Name	Color	Description
ST	POD Status	green	On when the POD is programmed and in service.
TX	Cells Transmitted	green	On when the POD sends ATM cells.
RX	Cells Received	green	On when the POD receives ATM cells.
RED	Red Alarm	red	On when the POD detects a red alarm condition in the received signal, perhaps due to loss of frame, delineation, or pointer.
YEL	Yellow Alarm	yellow	On when the POD detects a yellow alarm condition in the received signal, i.e., a remote alarm indication exists in the incoming path, perhaps due to a remote defect indication (RDI) condition or yellow path layer indication on the incoming signal.
AIS	Alarm Indication Signal	yellow	On when the POD detects an alarm indication signal (AIS) in the received signal, which indicates a service interruption failure due to a loss of signal (LOS), out-of-frame (OOF) condition, or internal equipment failure.

Table A-27. Circuit Emulation Quad DS1 IPOD Front Panel Indicators (Continued)

Indicator	Name	Color	Description
(lower left corner of port connector)		green	On when the front panel indicators are reporting the status of that port (as chosen via the PORT SELECT pushbutton).
(lower right corner of port connector)		yellow	On when the link is down for that port.

Table A-28. Circuit Emulation Quad DS1 IPOD Specifications

Product code	B750A040150
Height	0.75 in (1.9 cm)
Width	4.2 in (10.7 cm)
Depth	6.88 in (17.5 cm)
Weight	6.5 oz (184.3 g)
Power requirement	7.5 W maximum
Temperature range	23°–122° F (-5°–+50° C)
Agency approval	*EMI*: FCC Part 15A, CISPR 22, VCCI, EN55022, AS3548, EN50082 (1997) *Telecom* (pending): FCC Part 68, CS-003 *NEBS:* GR-1089-CORE, GR-63-CORE (pending)
Interface standard	ANSI T1.102, ANSI T1.107, ANSI T1.403, G.804, TR-TSY-000499
Physical interface	Four RJ-48 connector jacks (see Figure A-31 for connector pinouts)

Circuit Emulation Quad E1 IPOD

The Circuit Emulation Quad E1 IPOD provides four ports of E1 structured 2.048 Mbps circuit emulation with one RJ-48 physical connector per port. It supports four ports per IPOD. Figure A-16 shows the module's front panel, Table A-29 describes the front panel indicators, and Table A-30 lists the module's technical specifications.

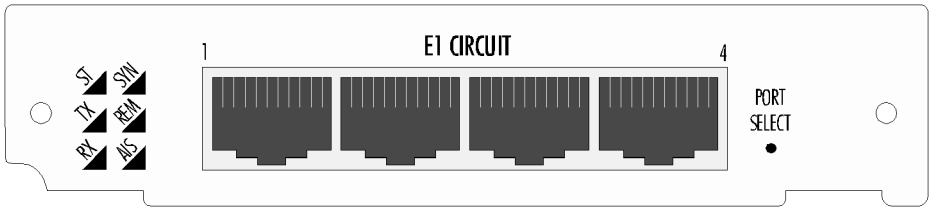


Figure A-16. Circuit Emulation Quad E1 IPOD Front Panel

Table A-29. Circuit Emulation Quad E1 IPOD Front Panel Indicators

Indicator	Name	Color	Description
ST	POD Status	green	On when the POD is programmed and in service.
TX	Cells Transmitted	green	On when the POD sends ATM cells.
RX	Cells Received	green	On when the POD receives ATM cells.
SYN	Sync Alarm	red	On when the POD detects a sync alarm condition, i.e., the POD is not receiving a signal, perhaps due to loss of frame or delineation.
REM	Remote Alarm Indication	yellow	On when the POD detects a remote alarm indication in the received signal.
AIS	Alarm Indication Signal	yellow	On when the POD detects an alarm indication signal (AIS) in the received signal, which indicates a service interruption failure due to a loss of signal (LOS), out-of-frame (OOF) condition, or internal equipment failure.
(lower left corner of port connector)		green	On when the front panel indicators are reporting the status of that port (as chosen via the PORT SELECT pushbutton).

Table A-29. Circuit Emulation Quad E1 IPOD Front Panel Indicators (Continued)

Indicator	Name	Color	Description
(lower right corner of port connector)		yellow	On when the link is down for that port.

Table A-30. Circuit Emulation Quad E1 IPOD Specifications

Product code	B750A040155
Height	0.75 in (1.9 cm)
Width	4.2 in (10.7 cm)
Depth	6.88 in (17.5 cm)
Weight	6.5 oz (184.3 g)
Power requirement	7.5 W maximum
Temperature range	23°–122° F (-5°–+50° C)
Agency approval	*EMI*: FCC Part 15A, CISPR 22, VCCI, EN55022, AS3548, EN50082 (1997) *Telecom:* CTR-12, CTR-13, TS-016, NTR-4, ETS 300 046 *NEBS:* GR-1089-CORE, GR-63-CORE (pending)
Interface standard	ANSI T1.102, ANSI T1.107, ANSI T1.403, G.804, TR-TSY-000499
Physical interface	Four RJ-48 connector jacks (see Figure A-31 for connector pinouts)

DS1 Voice Compression IPOD

The DS1 Voice Compression IPOD provides 8 (IPOD only, no mezzanine cards), 16 (IPOD+1 mezzanine card), or 24 (IPOD+2 mezzanine cards) channels (DS0s) on a single DS1 1.544 Mbs connection with one RJ-45 physical connector. One or two optional mezzanine cards may be added, each providing an additional 8 DS0s. The POD provides toll-quality voice compression, Group III fax relay, and other voiceband processing functions. Figure A-17 shows the module's front panel, Table A-31 describes the front panel indicators, and Table A-32 lists the module's technical specifications.

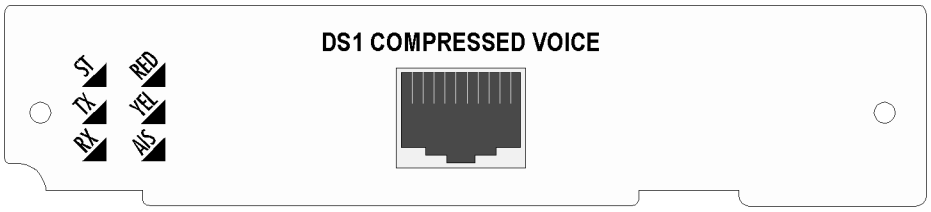


Figure A-17. DS1 Compressed Voice IPOD Front Panel

Table A-31. DS1 Compressed Voice IPOD Front Panel Indicators

Indicator	Name	Color	Description
ST	POD Status	green	On when the POD is programmed and in service.
TX	Cells Transmitted	green	On when the POD sends ATM cells.
RX	Cells Received	green	On when the POD receives ATM cells.
RED	Red Alarm	red	On when the POD detects a red alarm condition in the received signal, perhaps due to loss of frame, delineation, or pointer.
YEL	Yellow Alarm	yellow	On when the POD detects a yellow alarm condition in the received signal, i.e., a remote alarm indication exists in the incoming path, perhaps due to a remote defect indication (RDI) condition or yellow path layer indication on the incoming signal.
AIS	Alarm Indication Signal	yellow	On when the POD detects an alarm indication signal (AIS) in the received signal, which indicates a service interruption failure due to a loss of signal (LOS), out-of-frame (OOF) condition, or internal equipment failure.

Table A-31. DS1 Compressed Voice IPOD Front Panel Indicators (Continued)

Indicator	Name	Color	Description
(lower left corner of port connector)		green	On when the front panel indicators are reporting the status of that port (as chosen via the PORT SELECT pushbutton).
(lower right corner of port connector)		yellow	On when the link is down for that port.

Table A-32. DS1 Compressed Voice IPOD Specifications

Product code	IPOD with no mezzanine cards – B750A040180 IPOD with one mezzanine card – B750A040182 IPOD with two mezzanine cards – B750A040188 Mezzanine card only – B750A040181
Height	0.75 in (1.9 cm)
Width	4.2 in (10.7 cm)
Depth	6.88 in (17.5 cm)
Weight	6.5 oz (184.3 g)
Power requirement	7.5 W maximum
Temperature range	23°–122° F (-5°– +50° C)
Agency approval	*EMI* (pending): FCC Part 15A, CISPR 22, VCCI, EN55022, AS3548, EN50082 (1997) *Telecom* (pending): FCC Part 68, CS-003 *NEBS* (pending): GR-1089-CORE, GR-63-CORE
Interface standard	Voice: G.729 Annex A, G.723.1, G.727, G.726, G.711/G.764 Fax: G3@2400-14400 bps
Physical interface	One RJ-45 connector jacks (see Figure A-31 for connector pinouts)

Universal Serial Frame IPOD

The Universal Serial Frame IPOD provides transport for all HDLC/SDLC-based protocols over the ATM network. The IPOD provides two data ports, each supporting a variety of physical serial interfaces and data throughput rates. The following physical serial interfaces are supported:

- V.35
- X.21
- RS-449
- RS-232
- EIA-530

Figure A-18 shows the module's front panel, Table A-33 describes the front panel indicators and Table A-34 lists the module's technical specifications.

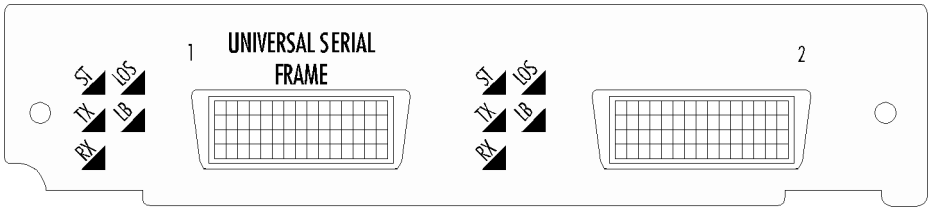


Figure A-18. Universal Serial Frame IPOD Front Panel

Table A-33. Universal Serial Frame IPOD Front Panel Indicators

Indicator	Name	Color	Description
ST	POD Status	green	On when the POD is programmed and in service.
TX	Cells Transmitted	green	On when the POD is transmitting data out the serial interface.
RX	Cells Received	green	On when the POD is receiving data from the serial interface.
LOS	Loss of Signal	red	On when the POD detects a loss of DTR and/or RTS if the port is DCE; or loss of DSR and /or CTS if the port is DTE .
LB	Loopback	yellow	On is control signal LL(141) is on, or if line or local loopback is intitiated by the user.

Table A-34. Universal Serial Frame IPOD Specifications

Product code	B750A040380
Height	0.75 in (1.9 cm)
Width	4.2 in (10.7 cm)
Depth	6.88 in (17.5 cm)
Weight	6.5 oz (184.3 g)
Power requirement	7.5 W maximum
Temperature range	23°–122° F (-5°–+50° C)
Agency approval	*EMI* (pending): FCC Part 15A, CISPR 22, VCCI, EN55022, AS3548, EN50082 (1997) *Telecom* (pending): CTR-1, CTR-2, Green Book *NEBS* (pending): GR-1089-CORE, GR-63-CORE
Interface standard	X.21, V.35, RS-449, RS-232, EIA-530
Physical interface	Two DB-60 connector jacks. The Universal Serial PODs automatically sense the type of cable connected. See “Universal Serial Cable Pinouts” on page A-65 for connector pinouts. Note: Special cables are required for this POD, each of which enables a different interface type to be supported by the DB-60 connector jacks. See Appendix C, “Product Codes” for details.

Universal Serial Circuit Emulation Service IPOD

The Universal Serial CES IPOD provides transport for all HDLC/SDLC-based protocols over the ATM network. The IPOD provides two data ports, each supporting a variety of physical serial interfaces and data throughput rates. The following physical serial interfaces and data rates are supported:

- V.35 at 64 kbps–1.544 Mbps (cable length up to 160 feet)
- RS-449 at 64 kbps–1.544 Mbps

Figure A-19 shows the module's front panel, Table A-35 describes the front panel indicators and Table A-36 lists the module's technical specifications.

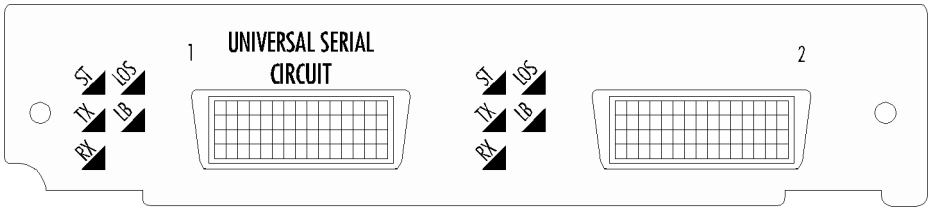


Figure A-19. Universal Serial Circuit IPOD Front Panel

Table A-35. Universal Serial Circuit IPOD Front Panel Indicators

Indicator	Name	Color	Description
ST	POD Status	green	On when the POD is programmed and in service.
TX	Cells Transmitted	green	On when the POD is transmitting data out the serial interface.
RX	Cells Received	green	On when the POD is receiving data from the serial interface.
LOS	Loss of Signal	red	On when the POD detects a loss of DTR and/or RTS if the port is DCE; or loss of DSR and /or CTS if the port is DTE .
LB	Loopback	yellow	On is control signal LL(141) is on, or if line or local loopback is intitiated by the user.

Table A-36. Universal Serial Circuit IPOD Specifications

Product code	B750A040410
Height	0.75 in (1.9 cm)
Width	4.2 in (10.7 cm)
Depth	6.88 in (17.5 cm)
Weight	6.5 oz (184.3 g)
Power requirement	7.5 W maximum
Temperature range	23°–122° F (-5°–+50° C)
Agency approval	*EMI* (pending): FCC Part 15A, CISPR 22, VCCI, EN55022, AS3548, EN50082 (1997) *Telecom* (pending): CTR-1, CTR-2, Green Book *NEBS* (pending): GR-1089-CORE, GR-63-CORE
Interface standard	X.21 and V.35
Physical interface	Two DB-60 connector jacks. The Universal Serial PODs automatically sense the type of cable connected. See “Universal Serial Cable Pinouts” on page A-65 for connector pinouts. Note: Special cables are required for this POD, each of which enables a different interface type to be supported by the DB-60 connector jacks. See Appendix C, “Product Codes” for details.

IMA DSX1 IPOD

The IMA DSX1 IPOD provides IMA trunking of up to 8 DS1 ports each running at 1.544 Mbps. This configuration enables the IPOD to achieve a maximum trunk rate of approximately 12 Mbps via two 60-pin mini-D style connectors. Figure A-20 shows the module's front panel, Table A-37 describes the front panel indicators, and Table A-38 lists the module's technical specifications.

IMA PODs require special cables and a breakout box mounted in a breakout cable bracket. See "Special Considerations for IMA PODs — Cables and Breakout Box" on page 4-28 for mounting instructions and Appendix C for product codes.

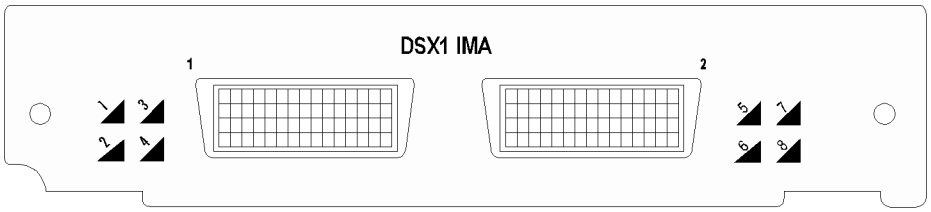


Figure A-20. IMA DSX1 IPOD Front Panel

Table A-37. IMA DSX1 IPOD Front Panel Indicators

Indicator	Name	Color	Description
1-2-3-4 5-6-7-8	Port Status	green or red	Normally green; red when the POD detects an error condition.

Table A-38. IMA DSX1 IPOD Enhanced Specifications

Product code	B750A040323
Height	0.75 in (1.9 cm)
Width	2.85 in (7.2 cm)
Depth	6.88 in (17.5 cm)
Weight	5 oz (141.7 g)
Power requirement	7.5 W maximum
Temperature range	23°–122° F (-5°–+50° C)

Table A-38. IMA DSX1 IPOD Enhanced Specifications

Agency approval	*EMI* (pending): FCC Part 15A, CISPR 22, VCCI, EN55022, AS3548, EN50082 (1997) *Telecom* (pending): FCC Part 68, CS-003 *NEBS* (pending): GR-1089-CORE, GR-63-CORE
Interface standard	ANSI T1.102, ANSI T1.107, ANSI T1.403, G.804, TR-TSY-000499
Physical interface	Two DB-60 connector jacks. See Figure A-34 for pinout.

IMA DS1 IPOD with Integral CSU

The IMA DS1 IPOD with Integral CSU provides IMA trunking of up to 8 DS1 ports each running at 1.544 Mbps. This configuration enables the IPOD to achieve a maximum trunk rate of approximately 12.0 Mbps via two 60-pin mini-D style connectors. The integral CSU provides short- and long-haul operation with support for loopback generation and detection. Figure A-21 shows the module's front panel, Table A-39 describes the front panel indicators, and Table A-40 lists technical specifications.

IMA PODs require special cables and a breakout box mounted in a breakout cable bracket. See "Special Considerations for IMA PODs — Cables and Breakout Box" on page 4-28 for mounting instructions and Appendix C for product codes.

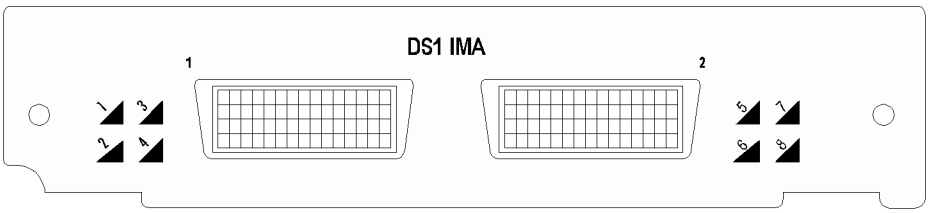


Figure A-21. IMA DS1 IPOD with Integral CSU Front Panel

Table A-39. IMA DS1 IPOD with Integral CSU Front Panel Indicators

Indicator	Name	Color	Description
1-2-3-4 5-6-7-8	Port Status	green or red	Normally green; red when the POD detects an error condition.

Table A-40. IMA DS1 IPOD with Integral CSU Enhanced Specifications

Product code	B750A040321
Height	0.75 in (1.9 cm)
Width	2.85 in (7.2 cm)
Depth	6.88 in (17.5 cm)
Weight	5 oz (141.7 g)
Power requirement	7.5 W maximum
Temperature range	23°–122° F (-5°–+50° C)

Table A-40. IMA DS1 IPOD with Integral CSU Enhanced Specifications

Agency approval	*EMI* (pending): FCC Part 15A, CISPR 22, VCCI, EN55022, AS3548, EN50082 (1997) *Telecom* (pending): FCC Part 68, CS-003 *NEBS* (pending): GR-1089-CORE, GR-63-CORE
Interface standard	ANSI T1.102, ANSI T1.107, ANSI T1.403, G.804, TR-TSY-000499
Physical interface	Two DB-60 connector jacks. See Figure A-34 for pinout.

IMA E1 IPOD

The IMA E1 IPOD provides IMA trunking of up to 8 E1 ports each running at 2.048 Mbps. This configuration enables the IPOD to achieve a maximum trunk rate of approximately 15 Mbps via two 60-pin mini-D style connectors. Figure A-22 shows the module's front panel, Table A-41 describes the front panel indicators, and Table A-42 lists the module's technical specifications.

IMA PODs require special cables and a breakout box mounted in a breakout cable bracket. See "Special Considerations for IMA PODs — Cables and Breakout Box" on page 4-28 for mounting instructions and Appendix C for product codes.

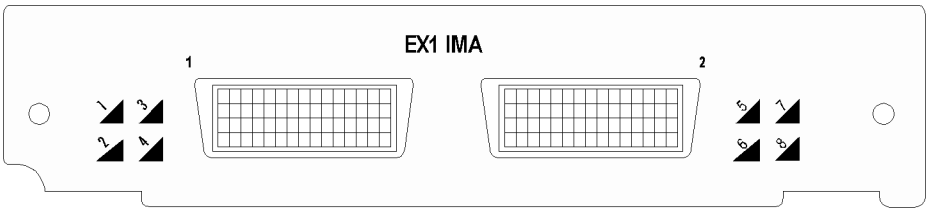


Figure A-22. IMA E1 IPOD Front Panel

Table A-41. IMA E1 IPOD Front Panel Indicators

Indicator	Name	Color	Description
1-2-3-4 5-6-7-8	Port Status	green or red	Normally green; red when the POD detects an error condition.

Table A-42. IMA E1 IPOD Enhanced Specifications

Product code	B750A040324
Height	0.75 in (1.9 cm)
Width	2.85 in (7.2 cm)
Depth	6.88 in (17.5 cm)
Weight	5 oz (141.7 g)
Power requirement	7.5 W maximum
Temperature range	23°–122° F (-5°–+50° C)

Table A-42. IMA E1 IPOD Enhanced Specifications

Agency approval	*EMI* (pending): FCC Part 15A, CISPR 22, VCCI, EN55022, AS3548, EN50082 (1997) *Telecom* (pending): CTR-12, CTR-13, TS-016, NTR-4, ETS 300 046 *NEBS* (pending): GR-1089-CORE, GR-63-CORE
Interface standard	ANSI T1.102, ANSI T1.107, ANSI T1.403, G.804, TR-TSY-000499
Physical interface	Two DB-60 connector jacks. See Figure A-34 for pinout.

IMA E1 IPOD with Integral CSU

The IMA E1 IPOD with Integral CSU provides IMA trunking of up to 8 E1 ports each running at 2.048 Mbps. This configuration enables the IPOD to achieve a maximum trunk rate of approximately 15.0 Mbps via two 60-pin mini-D style connectors. The integral CSU provides short- and long-haul operation with support for loopback generation and detection. Figure A-23 shows the module's front panel, Table A-43 describes the front panel indicators, and Table A-44 lists technical specifications.

IMA PODs require special cables and a breakout box mounted in a breakout cable bracket. See "Special Considerations for IMA PODs — Cables and Breakout Box" on page 4-28 for mounting instructions and Appendix C for product codes.

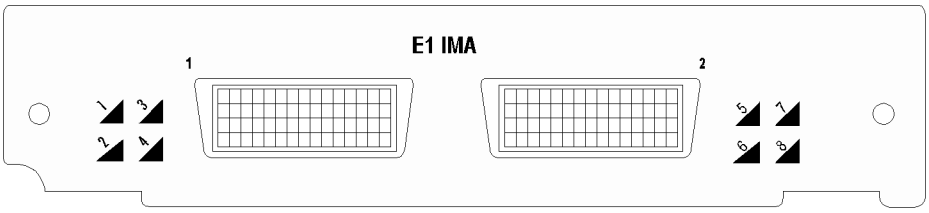


Figure A-23. IMA E1 IPOD with Integral CSU Front Panel

Table A-43. IMA E1 IPOD with Integral CSU Front Panel Indicators

Indicator	Name	Color	Description
1-2-3-4 5-6-7-8	Port Status	green or red	Normally green; red when the POD detects an error condition.

Table A-44. IMA E1 IPOD with Integral CSU Enhanced Specifications

Product code	B750A040322
Height	0.75 in (1.9 cm)
Width	2.85 in (7.2 cm)
Depth	6.88 in (17.5 cm)
Weight	5 oz (141.7 g)
Power requirement	7.5 W maximum
Temperature range	23°–122° F (-5°–+50° C)

Table A-44. IMA E1 IPOD with Integral CSU Enhanced Specifications

Agency approval	*EMI* (pending): FCC Part 15A, CISPR 22, VCCI, EN55022, AS3548, EN50082 (1997) *Telecom* (pending): CTR-12, CTR-13, TS-016, NTR-4, ETS 300 046 *NEBS* (pending): GR-1089-CORE, GR-63-CORE
Interface standard	ANSI T1.102, ANSI T1.107, ANSI T1.403, G.804, TR-TSY-000499
Physical interface	Two DB-60 connector jacks. See Figure A-34 for pinout.

ATM Quad DS1 IPOD Enhanced

The ATM Quad DS1 IPOD Enhanced provides a native ATM cell interface operating at 1.544 Mbps. It provides one RJ-48 DSX-1 interface per port, four ports per IPOD. The module includes buffering, enhanced traffic management, and hardware OAM capabilities. Figure A-24 shows the module's front panel, Table A-45 describes the front panel indicators, and Table A-46 lists the module's technical specifications.

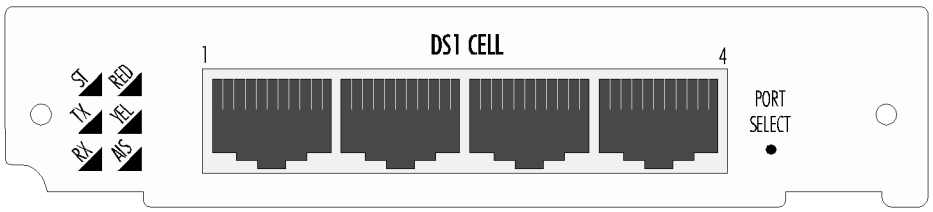


Figure A-24. ATM Quad DS1 IPOD Enhanced Front Panel

Table A-45. ATM Quad DS1 IPOD Enhanced Front Panel Indicators

Indicator	Name	Color	Description
ST	POD Status	green	On when the POD is programmed and in service.
TX	Cells Transmitted	green	On when the POD sends ATM cells.
RX	Cells Received	green	On when the POD receives ATM cells.
RED	Red Alarm	red	On when the POD detects a red alarm condition in the received signal, perhaps due to loss of frame, delineation, or pointer.
YEL	Yellow Alarm	yellow	On when the POD detects a yellow alarm condition in the received signal, i.e., a remote alarm indication exists in the incoming path, perhaps due to a remote defect indication (RDI) condition or yellow path layer indication on the incoming signal.

Table A-45. ATM Quad DS1 IPOD Enhanced Front Panel Indicators (Continued)

Indicator	Name	Color	Description
AIS	Alarm Indication Signal	yellow	On when the POD detects an alarm indication signal (AIS) in the received signal, which indicates a service interruption failure due to a loss of signal (LOS), out-of-frame (OOF) condition, or internal equipment failure.
(lower left corner of port connector)		green	On when the front panel indicators are reporting the status of that port (as chosen via the PORT SELECT pushbutton).
(lower right corner of port connector)		yellow	On when the link is down for that port.

Table A-46. ATM Quad DS1 IPOD Enhanced Specifications

Product code	B750A040170
Height	0.75 in (1.9 cm)
Width	4.2 in (10.7 cm)
Depth	6.88 in (17.5 cm)
Weight	6.5 oz (184.3 g)
Power requirement	7.5 W maximum
Temperature range	23°–122° F (-5°–+50° C)
Agency approval	*EMI*: FCC Part 15A, CISPR 22, VCCI, EN55022, AS3548, EN50082 (1997) *Telecom:* FCC Part 68, CS-003 *NEBS:* GR-1089-CORE, GR-63-CORE (pending)
Interface standard	ANSI T1.102, ANSI T1.107, ANSI T1.403, G.804, TR-TSY-000499
Physical interface	Four RJ-48 connector jacks (see Figure A-31 for connector pinouts)

ATM Quad E1 IPOD Enhanced

The ATM Quad E1 IPOD Enhanced provides a native ATM cell interface operating at 2.048 Mbps. It provides one RJ-48 interface per port, four ports per IPOD. The module includes buffering, enhanced traffic management, and hardware OAM capabilities. Figure A-25 shows the module's front panel, Table A-47 describes the front panel indicators, and Table A-48 lists the module's technical specifications.

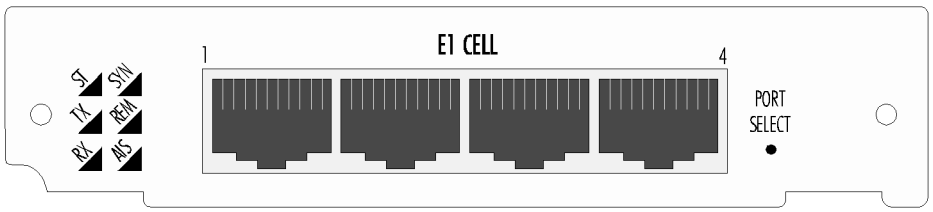


Figure A-25. ATM Quad E1 IPOD Enhanced Front Panel

Table A-47. ATM Quad E1 IPOD Enhanced Front Panel Indicators

Indicator	Name	Color	Description
ST	POD Status	green	On when the POD is programmed and in service.
TX	Cells Transmitted	green	On when the POD sends ATM cells.
RX	Cells Received	green	On when the POD receives ATM cells.
SYN	Sync Alarm	red	On when the POD detects a sync alarm condition, i.e., the POD is not receiving a signal, perhaps due to loss of frame or delineation.
REM	Remote Alarm Indication	yellow	On when the POD detects a remote alarm indication in the received signal.
AIS	Alarm Indication Signal	yellow	On when the POD detects an alarm indication signal (AIS) in the received signal, which indicates a service interruption failure due to a loss of signal (LOS), out-of-frame (OOF) condition, or internal equipment failure.
(lower left corner of port connector)		green	On when the front panel indicators are reporting the status of that port (as chosen via the PORT SELECT pushbutton).

Table A-47. ATM Quad E1 IPOD Enhanced Front Panel Indicators (Continued)

Indicator	Name	Color	Description
(lower right corner of port connector)		yellow	On when the link is down for that port.

Table A-48. ATM Quad E1 IPOD Enhanced Specifications

Product code	B750A040171
Height	0.75 in (1.9 cm)
Width	4.2 in (10.7 cm)
Depth	6.88 in (17.5 cm)
Weight	6.5 oz (184.3 g)
Power requirement	7.5 W maximum
Temperature range	23°–122° F (-5°–+50° C)
Agency approval	*EMI*: FCC Part 15A, CISPR 22, VCCI, EN55022, AS3548, EN50082 (1997) *Telecom:* CTR-12, CTR-13, TS-016, NTR-4, ETS 300 046 *NEBS:* GR-1089-CORE, GR-63-CORE (pending)
Interface standard	ANSI T1.102, ANSI T1.107, ANSI T1.403, G.804, TR-TSY-000499
Physical interface	Four RJ-48 connector jacks (see Figure A-31 for connector pinouts)

ATM 25 IPOD

The ATM 25 IPOD provides four ATM 25 interfaces running at 25.6 Mbps. There are four RJ-48 ports per IPOD. The module includes input and output cell buffering. Figure A-26 shows the module's front panel, Table A-49 describes the front panel indicators, and Table A-50 lists the module's technical specifications.

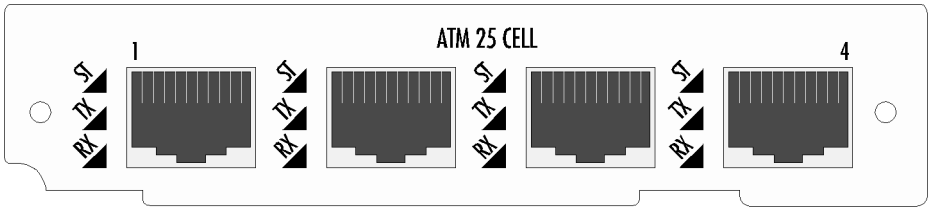


Figure A-26. ATM 25 IPOD Front Panel

Table A-49. ATM 25 IPOD Front Panel Indicators

Indicator	Name	Color	Description
ST	POD Status	green	On when the POD is programmed and in service.
TX	Cells Transmitted	green	On when the POD sends ATM cells.
RX	Cells Received	green	On when the POD receives ATM cells.

Table A-50. ATM 25 IPOD Specifications

Product code	B750A040300
Height	0.75 in (1.9 cm)
Width	4.2 in (10.7 cm)
Depth	6.88 in (17.5 cm)
Weight	6.5 oz (184.3 g)
Power requirement	7.5 W maximum
Temperature range	23°–122° F (-5°–+50° C)
Agency approval	*EMI* (pending): FCC Part 15A, CISPR 22, VCCI, EN55022, AS3548, EN50082 (1997) *NEBS* (pending): GR-1089-CORE, GR-63-CORE
Interface standard	ATM Forum Technical Committee: Physical Interface Specification for 25.6 Mb/s over Twisted Pair Cable (af-phy-0040.000)
Physical interface	Four RJ-48 connector jacks (see Figure A-33 for connector pinouts)

ATM DS3 IPOD Enhanced

The ATM DS3 IPOD Enhanced provides dual DS3 interfaces running at 44.736 Mbps. It provides two 75-ohm connections per port, two ports per IPOD. The module supports Physical Layer Convergence Protocol (PLCP) and G.804 framing and includes buffering, enhanced traffic management, and hardware OAM. Figure A-27 shows the module's front panel, Table A-51 describes the front panel indicators, and Table A-52 lists the module's technical specifications.

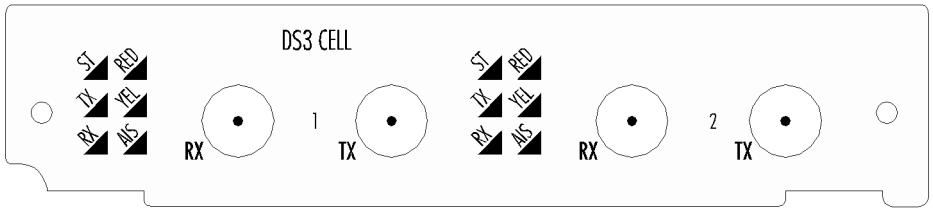


Figure A-27. ATM DS3 IPOD Enhanced Front Panel

Table A-51. ATM DS3 IPOD Enhanced Front Panel Indicators

Indicator	Name	Color	Description
ST	POD Status	green	On when the POD is programmed and in service.
TX	Cells Transmitted	green	On when the POD sends ATM cells.
RX	Cells Received	green	On when the POD receives ATM cells.
RED	Red Alarm	red	On when the POD detects a red alarm condition in the received signal, perhaps due to loss of frame, delineation, or pointer.
YEL	Yellow Alarm	yellow	On when the POD detects a yellow alarm condition in the received signal, i.e., a remote alarm indication exists in the incoming path, perhaps due to a remote defect indication (RDI) condition or yellow path layer indication on the incoming signal.
AIS	Alarm Indication Signal	yellow	On when the POD detects an alarm indication signal (AIS) in the received signal, which indicates a service interruption failure due to a loss of signal (LOS), out-of-frame (OOF) condition, or internal equipment failure.

Table A-52. ATM DS3 IPOD Enhanced Specifications

Product code	B750A040220
Height	0.75 in (1.9 cm)
Width	4.2 in (10.7 cm)
Depth	6.88 in (17.5 cm)
Weight	6.5 oz (184.3 g)
Power requirement	7.5 W maximum
Temperature range	23°–122° F (-5°–+50° C)
Agency approval	*EMI*: FCC Part 15A, CISPR 22, VCCI, EN55022, AS3548, EN50082 (1997) *Telecom:* UK Telecom (pending) *NEBS:* GR-1089-CORE, GR-63-CORE (pending)
Interface standard	ANSI T1.102, ANSI T1.107, ANSI T1.403, G.804, TR-TSY-000499
Physical interface	Two pairs (TX and RX) of 75-ohm BNC connectors

ATM E3 IPOD Enhanced

The ATM E3 IPOD Enhanced provides dual E3 interfaces running at 34 Mbps. It provides two 120-ohm connections per port, two ports per IPOD. The module supports Physical Layer Convergence Protocol (PLCP) and G.804 framing and includes buffering, enhanced traffic management, and hardware OAM. Figure A-28 shows the module's front panel, Table A-53 describes the front panel indicators, and Table A-54 lists the module's technical specifications.

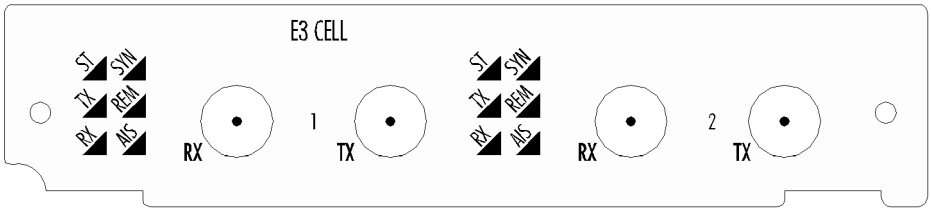


Figure A-28. ATM E3 IPOD Enhanced Front Panel

The E3 IPOD is shipped with a floating ground on the Receive (RX) BNC connector. If you wish to connect the receive BNC negative signal to chassis ground, follow the procedure described in "Connecting the Receive BNC Negative Signal to Chassis Ground" on page A-12.

Table A-53. ATM E3 IPOD Enhanced Front Panel Indicators

Indicator	Name	Color	Description
ST	POD Status	green	On when the POD is programmed and in service.
TX	Cells Transmitted	green	On when the POD sends ATM cells.
RX	Cells Received	green	On when the POD receives ATM cells.
SYN	Sync Alarm	red	On when the POD detects a sync alarm condition, i.e., the POD is not receiving a signal, perhaps due to loss of frame or delineation.
REM	Remote Alarm Indication	yellow	On when the POD detects a remote alarm indication in the received signal.
AIS	Alarm Indication Signal	yellow	On when the POD detects an alarm indication signal (AIS) in the received signal, which indicates a service interruption failure due to a loss of signal (LOS), out-of-frame (OOF) condition, or internal equipment failure.

Table A-54. ATM E3 IPOD Enhanced Specifications

Product code	B750A040221
Height	0.75 in (1.9 cm)
Width	4.2 in (10.7 cm)
Depth	6.88 in (17.5 cm)
Weight	6.5 oz (184.3 g)
Power requirement	7.5 W maximum
Temperature range	23°–122° F (-5°–+50° C)
Agency approval	*EMI*: FCC Part 15A, CISPR 22, VCCI, EN55022, AS3548, EN50082 (1997) *Telecom:* CTR-24, TS-016 *NEBS:* GR-1089-CORE, GR-63-CORE (pending)
Interface standard	ANSI T1.102, ANSI T1.107, ANSI T1.403, G.804, TR-TSY-000499
Physical interface	Two pairs (TX and RX) of 120-ohm BNC connectors

ATM OC-3c/STM-1 IPOD Enhanced

The ATM OC-3c/STM-1 IPOD Enhanced provides a native ATM cell interface operating at 155.52 Mbps with one SC duplex connector. The module includes buffering, enhanced traffic management, and hardware OAM capabilities. This IPOD is available in two models, Multimode and Single-Mode (Intermediate-Reach). Figure A-29 shows the module's front panel, Table A-55 describes its front panel indicators, and Table A-56 lists the module's technical specifications.

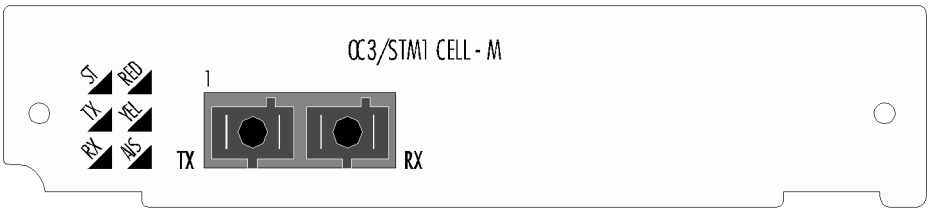


Figure A-29. ATM OC-3c/STM-1 IPOD Enhanced Front Panel

OC-3c/STM-1 Cell PODs utilize laser optical subassemblies complying with Class 1 safety limits defined in the IEC 825 standard on laser safety. You should understand the implications of these safety limits prior to working with this equipment. Do not look into the ends of fiber optic cables or at light reflected from the cables, as the transmit laser beam can cause personal injury.

Table A-55. ATM OC-3c/STM-1 IPOD Enhanced Front Panel Indicators

Indicator	Name	Color	Description
ST	POD Status	green	On when the POD is programmed and in service.
TX	Cells Transmitted	green	On when the POD sends ATM cells.
RX	Cells Received	green	On when the POD receives ATM cells.
RED	Red Alarm	red	On when the POD detects a red alarm condition in the received signal, i.e., the POD is receiving a signal that is not synchronized to the incoming SONET/SDH signal, perhaps due to loss of frame, delineation, or pointer.
YEL	Yellow Alarm	yellow	On when the POD detects a yellow alarm condition in the received signal, i.e., a remote alarm indication exists in the incoming path, perhaps due to a remote defect indication (RDI) condition or yellow path layer indication on the incoming signal.
AIS	Alarm Indication Signal	yellow	On when the POD detects an alarm indication signal (AIS) in the received signal, which indicates a service interruption failure due to a loss of signal (LOS), out-of-frame (OOF) condition, or internal equipment failure.

Table A-56. ATM OC-3c/STM-1 IPOD Enhanced Specifications

Product code	Multimode: B750A040280 Single-mode (Intermediate-reach): B750A040275
Height	0.75 in (1.9 cm)
Width	4.2 in (10.7 cm)
Depth	6.88 in (17.5 cm)
Weight	6.5 oz (184.3 g)
Power requirement	7.5 W maximum
Temperature range	23°–122° F (-5°–+50° C)
Agency approval	*EMI*: FCC Part 15A, CISPR 22, VCCI, EN55022, AS3548, EN50082 (1997) *Telecom* (pending): UK STM1 Test *NEBS:* GR-1089-CORE, GR-63-CORE (pending) *Safety* (pending): IEC 825, FDA CDRH
Interface standard	ITU-T I.432, B-ISDN UNI-Physical Layer Specification
Physical interface	One SC duplex connector

* Also refer to Table A-64 for physical layer, ATM layer, and optical specifications.

ATM OC-3c/STM-1 Dual-Port IPOD Basic

This ATM OC-3c/STM-1 Dual-Port IPOD Basic provides a native ATM cell interface operating at 155.52 Mbps with one SC duplex connector per port. This IPOD is available in two models, Multimode and Single-Mode (Intermediate-Reach). Figure A-30 shows the module's front panel, Table A-57 describes the front panel indicators and Table A-58 lists the module's technical specifications.

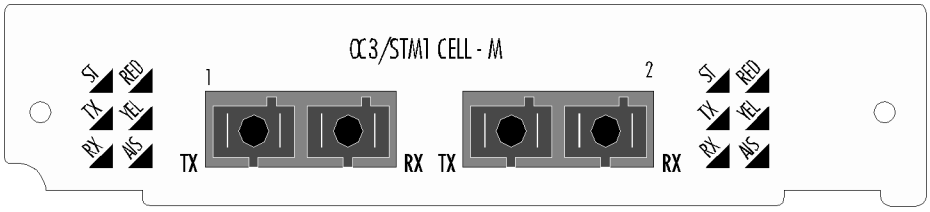


Figure A-30. ATM OC-3c/STM-1 Dual-Port IPOD Basic Front Panel

OC-3c/STM-1 Cell PODs utilize laser optical subassemblies complying with Class 1 safety limits defined in the IEC 825 standard on laser safety. You should understand the implications of these safety limits prior to working with this equipment. Do not look into the ends of fiber optic cables or at light reflected from the cables, as the transmit laser beam can cause personal injury.

Table A-57. ATM OC-3c/STM-1 Dual-Port IPOD Front Panel Indicators

Desig.	Name	Color	Description
ST	POD Status	green	On when the POD is programmed and in service.
TX	Cells Transmitted	green	On when the POD sends ATM cells.
RX	Cells Received	green	On when the POD receives ATM cells.
RED	Red Alarm	red	On when the POD detects a red alarm condition in the received signal, i.e., the POD is receiving a signal that is not synchronized to the incoming SONET/SDH signal, perhaps due to loss of frame, delineation, or pointer.
YEL	Yellow Alarm	yellow	On when the POD detects a yellow alarm condition in the received signal, i.e., a remote alarm indication exists in the incoming path, perhaps due to a remote defect indication (RDI) condition or yellow path layer indication on the incoming signal.
AIS	Alarm Indication Signal	yellow	On when the POD detects an alarm indication signal (AIS) in the received signal, which indicates a service interruption failure due to a loss of signal (LOS), out-of-frame (OOF) condition, or internal equipment failure.

Table A-58. ATM OC-3c/STM-1 Dual-Port IPOD Basic Specifications

Product code	Multimode: B750A040101 Single-mode, Intermediate-reach: B750A040100
Height	0.75 in (1.9 cm)
Width	4.2 in (10.7 cm)
Depth	6.88 in (17.5 cm)
Weight	6.5 oz (184.3 g)
Power requirement	7.5 W maximum
Temperature range	23°–122° F (-5°–+50° C)
Agency approval	*EMI*: FCC Part 15A, CISPR 22, VCCI, EN55022, AS3548, EN50082 (1997) *Telecom* (pending): UK STM1 Test *NEBS:* GR-1089-CORE, GR-63-CORE (pending) *Safety* (pending): IEC 825, FDA CDRH
Interface standard	ITU-T I.432, B-ISDN UNI-Physical Layer Specification
Physical interface	Two SC duplex connectors

* Also refer to Table A-64 for physical layer, ATM layer, and optical specifications.

Connector Jack Pinouts

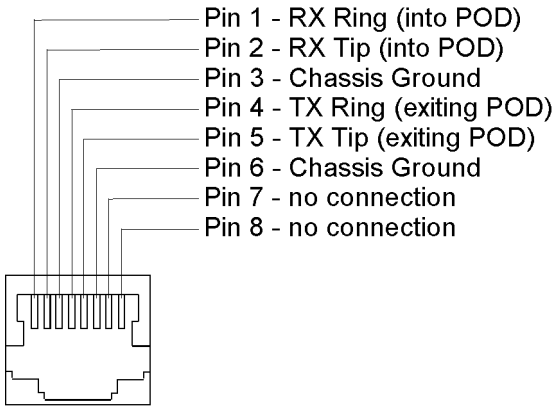


Figure A-31. DS1/E1 XPOD/IPOD RJ-48 Connector Jack Pinouts

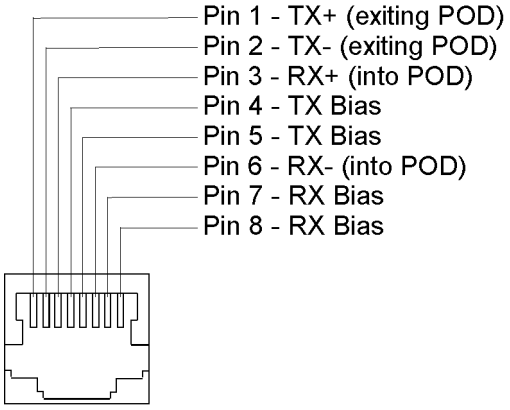


Figure A-32. Ethernet IPOD 8-Position Modular Connector Jack Pinout

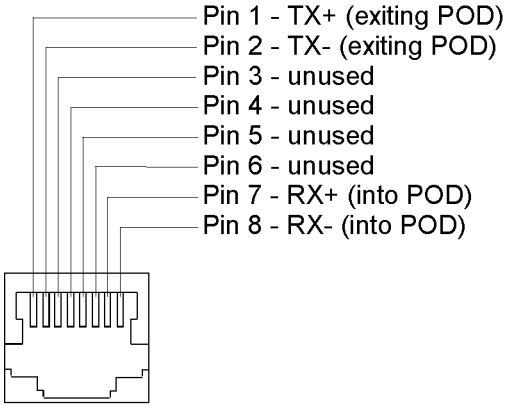


Figure A-33. ATM 25 IPOD UTP Connector Jack Pinout

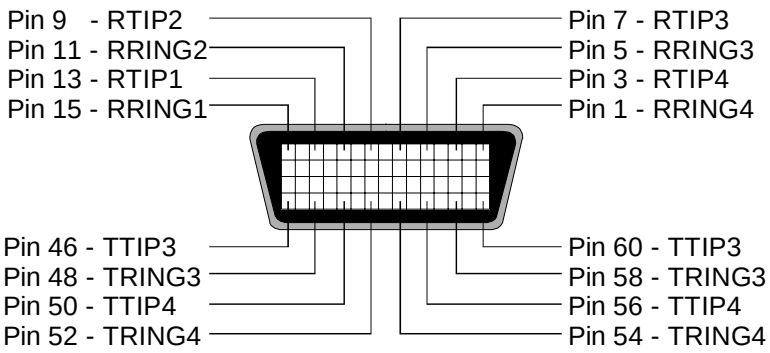


Figure A-34. IMA DS1/E1 POD Connector Jack Pinout

Universal Serial Cable Pinouts

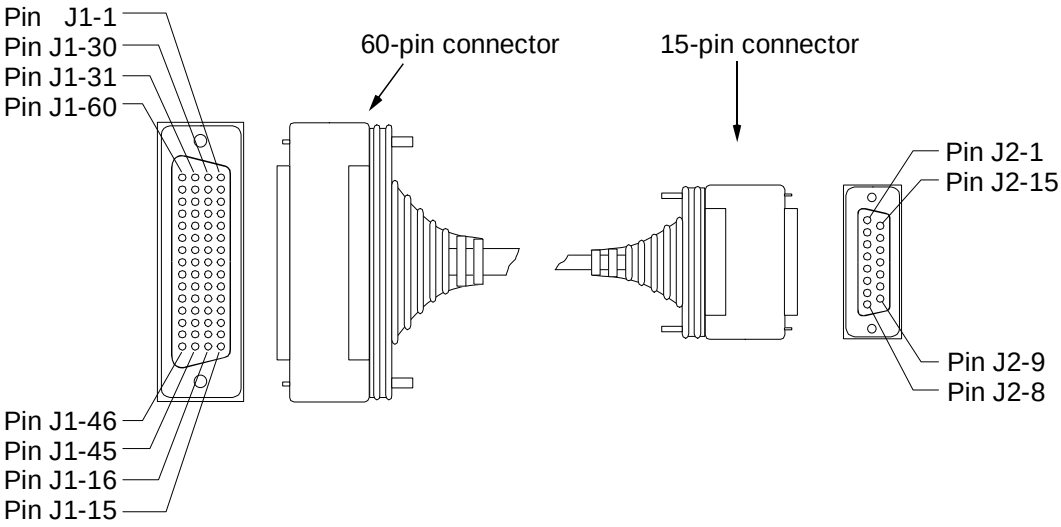


Figure A-35. X.21 DCE Cable Pinout

Table A-59. X.21 DCE Cable Detail

60 Pin (M)	Direction	15 Pin (M)	Signal (DTE)
J1-46	-	J2-1	Shield GND
J1-18	<--	J2-9	Transmit Data +
J1-17	<--	J2-2	Transmit Data -
J1-28	-->	J2-11	Receive Data +
J1-27	-->	J2-4	Receive Data -
J1-2	-->	J2-12	CTRL+
J1-1	-->	J2-5	CTRL-
J1-33	<--	J2-10	Ind-
J1-38	<--	J2-3	Ind-
J1-26	-->	J2-13	Timing +
J1-25	-->	J2-6	Timing -
J1-24	<--	J2-14	Ext Clk +
J1-23	<--	J2-7	Ext Clk -
J1-45	-	J2-8	Signal GND

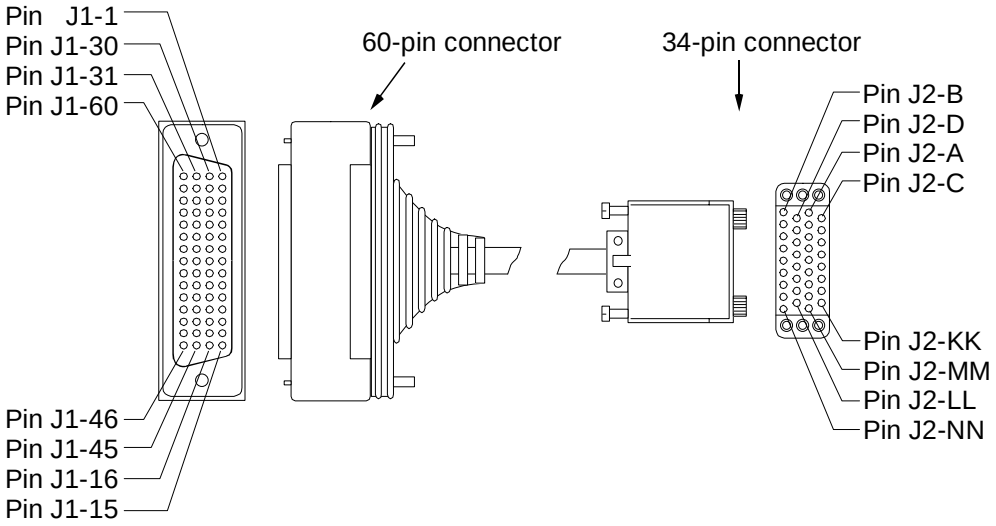


Figure A-36. V.35 DCE Cable Pinout

Table A-60. V.35 DCE Cable Details

60 Pin (M)	Direction	35 Pin (M)	Signal (DTE)
J1-46	-	J2-A	Frame
J1-16		J2-B	Signal Ground
J1-27	-->	J2-R	RxD
J1-28	-->	J2-T	
J1-17	<--	J2-P	TxD
J1-18	<--	J2-S	-
J1-2	-->	J2-D	CTS
J1-33	<--	J2-C	RTS
J1-43	<--	J2-H	DTR
J1-6	-->	J2-NN	Test Mode
J1-23	<--	J2-U	Ext Clk
J1-24	<--	J2-W	
J1-44	-->	J2-F	RLSD
J1-25	-->	J2-Y	TxC
J1-26	-->	J2-AA	-

Table A-60. V.35 DCE Cable Details

60 Pin (M)	Direction	35 Pin (M)	Signal (DTE)
J1-34	-->	J2-E	DSR
J1-19	-->	J2-V	RxC
J1-20	-->	J2-X	
J1-7	<--	J2-L	LL
J1-32	<--	J2-N	RL

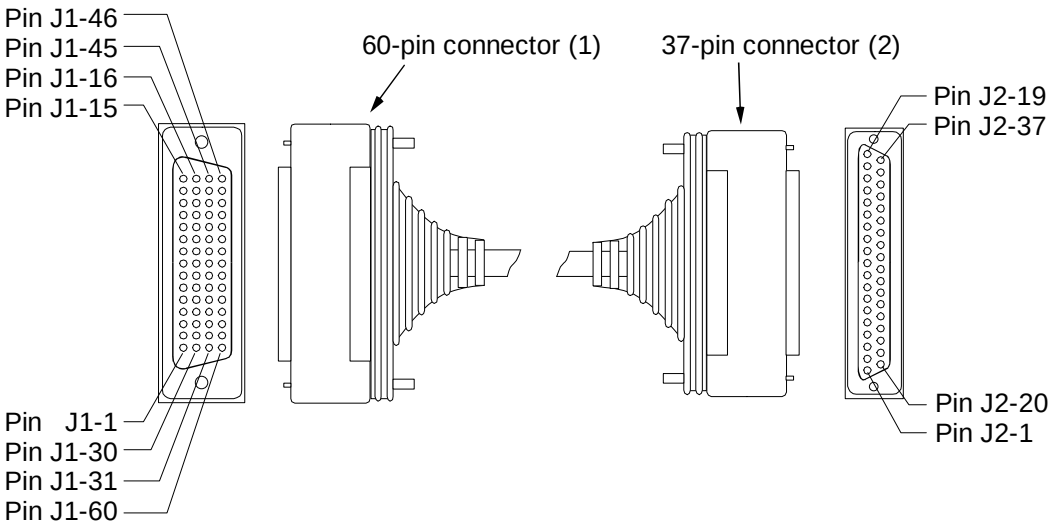


Figure A-37. RS-449 DCE Cable Pinout

Table A-61. RS-449 DCE Cable Details

60 Pin (M)	Direction	35 Pin (M)	Signal (DTE)
J1-46	-	J2-1	Frame
J1-16, 51, 60		J2-19, 20, 37	Signal Ground
J1-27	-->	J2-6	RxD
J1-28	-->	J2-24	
J1-17	<--	J2-4	TxD
J1-18	<--	J2-22	
J1-2	-->	J2-9	CTS
J1-1	-->	J2-27	
J1-33	<--	J2-7	RTS
J1-38	<--	J2-25	
J1-43	<--	J2-12	Tx Ready
J1-13	<--	J2-30	
J1-6	-->	J2-18	Test Mode
J1-23	<--	J2-17	Ext Clk

Table A-61. RS-449 DCE Cable Details

60 Pin (M)	Direction	35 Pin (M)	Signal (DTE)
J1-24	<--	J2-35	
J1-44	-->	J2-15	RI
J1-25	-->	J2-5	TxC
J1-26	-->	J2-23	-
J1-34	-->	J2-11	DataMode
J1-39	-->	J2-29	
J1-19	-->	J2-8	RxC
J1-20	-->	J2-26	
J1-35	-->	J2-13	DCD
J1-40	-->	J2-31	
J1-7	<--	J2-10	LL
J1-32	<--	J2-14	RL

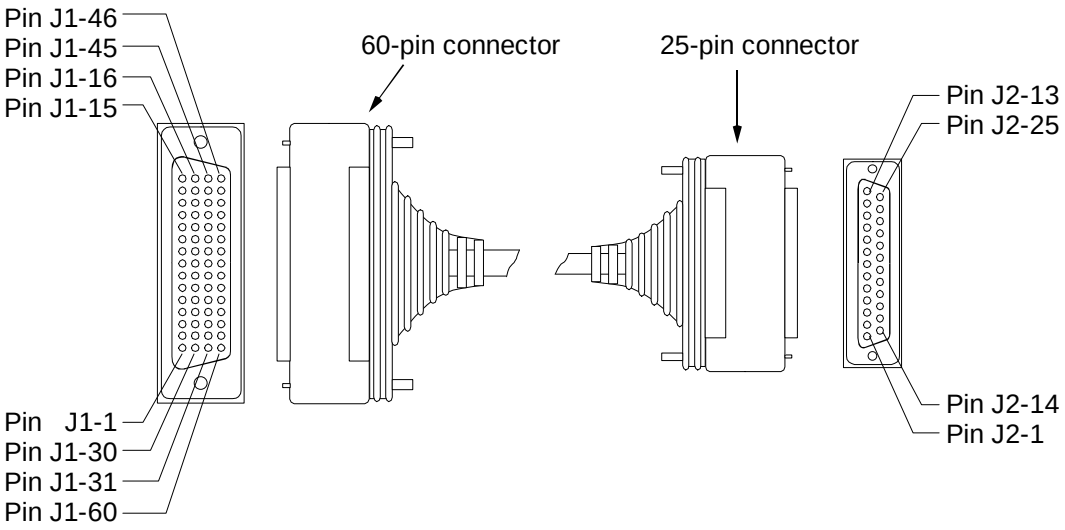


Figure A-38. EIA-530 DCE Cable Pinout

Table A-62. EIA-530 DCE Cable Details

60 Pin (M)	Direction	25 Pin (M)	Signal (DTE)
J1-46	-	J2-1	Frame
J1-51		J2-7	Signal Ground
J1-27	-->	J2-3	RxD
J1-28	-->	J2-16	
J1-17	<--	J2-2	TxD
J1-18	<--	J2-14	
J1-2	-->	J2-5	CTS
J1-1	-->	J2-13	
J1-33	<--	J2-4	RTS
J1-38	<--	J2-19	
J1-43	<--	J2-20	DTR
J1-13	<--	J2-23	
J1-6	-->	J2-25	Test Mode
J1-23	<--	J2-11	SCTE
J1-24	<--	J2-24	

Table A-62. EIA-530 DCE Cable Details

60 Pin (M)	Direction	25 Pin (M)	Signal (DTE)
J1-25	-->	J2-12	TxC
J1-26	-->	J2-15	-
J1-34	-->	J2-6	DSR
J1-39	-->	J2-22	
J1-19	-->	J2-9	RxC
J1-20	-->	J2-17	
J1-35	-->	J2-8	DCD
J1-40	-->	J2-10	
J1-7	<--	J2-18	LL
J1-32	<--	J2-21	RL

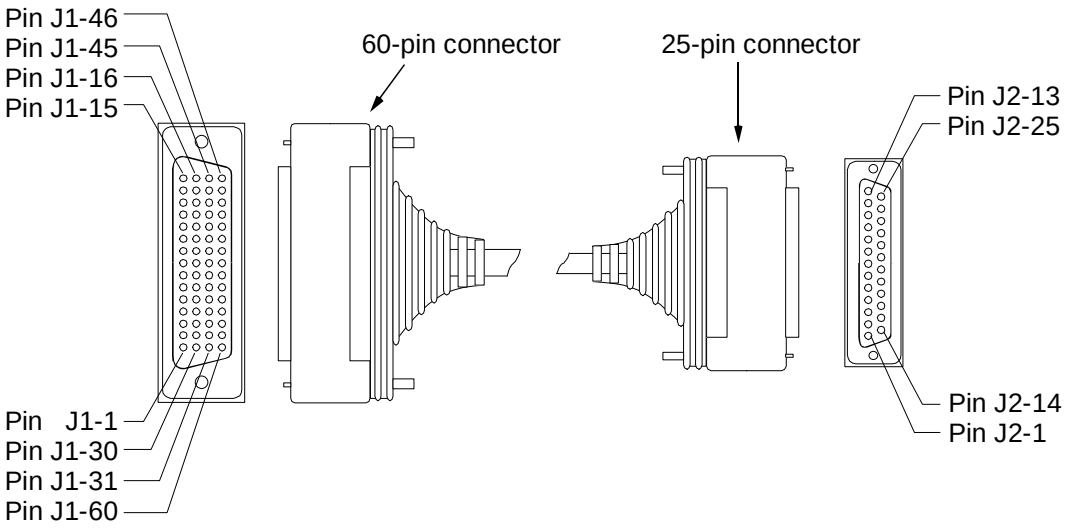


Figure A-39. RS-232 DCE Cable Pinout

Table A-63. RS-232 DCE Cable Details

60 Pin (M)	Direction	25 Pin (M)	Signal (DTE)
J1-46	-	J2-1	Frame
J1-51		J2-7	Signal Ground
J1-27	-->	J2-3	RxD
J1-17	<--	J2-2	TxD
J1-2	-->	J2-5	CTS
J1-33	<--	J2-4	RTS
J1-43	<--	J2-20	DTR
J1-6	-->	J2-25	Test Mode
J1-23	<--	J2-24	SCTE
J1-25	-->	J2-15	TxC
J1-34	-->	J2-6	DSR
J1-19	-->	J2-17	RxC
J1-35	-->	J2-8	DCD
J1-7	<--	J2-18	LL

OC-3c/STM-1 XPOD and IPOD Specifications

Table A-64. OC-3c/STM-1 XPOD and IPOD Specifications

General Specifications		
Physical layer	Standard	Based on ITU-T Recommendation I.432: B-ISDN UNI-Physical Layer Specification
	Transmission Rate	155.52 Mbps ±20 ppm
	Bandwidth	Unchannelized payload of STM1 ATM 149.76 Mbps available for ATM cell transmission
	Free-run accuracy	Free-run ±20 ppm
	Interface reach	Long-reach, single-mode: 25 miles (40 km) or more on single-mode fiber Intermediate-reach, single-mode: 9.3 miles (15 km) or more on single-mode fiber Multimode: 1.2 miles (2 km) on a multimode fiber (optical loss budget: 0 to 11 dB with an optical path penalty of 1 dB)
	Optical connector	SC duplex
ATM layer	Standard	ATM Forum UNI Specification B-ICI specification
Receiver Optical Specifications		
LR	Average received power	-34 dBm minimum -10 dBm maximum
	Optical path penalty	1 dB maximum
Intermediate-Reach, Single-Mode	Average received power	-28 dBm minimum -8 dBm maximum
	Optical path penalty	1 dB maximum
Multimode	Average received power	-30 dBm minimum -14 dBm maximum
	Optical path penalty	1 dB maximum
Transmitter Optical Specifications		
Long-Reach, Single-Mode	Center wavelength	1280 nm minimum 1335 nm maximum

Table A-64. OC-3c/STM-1 XPOD and IPOD Specifications (Continued)

	RMS spectral width	30 dB minimum
	Coupled transmit power	-5 dBm minimum 0 dBm maximum
	Extinction ratio	10 dB minimum
Intermediate-Reach, Single-Mode	Center wavelength	1260 nm minimum 1360 nm maximum
	RMS spectral width	7.7 nm maximum
	Coupled transmit power	-15 dBm minimum -8 dBm maximum
	Extinction ratio	8.2 dB minimum
Multimode	Center wavelength	1260 nm minimum 1360 nm maximum
	RMS spectral width	176 nm maximum
	Coupled transmit power	-18.5 dBm minimum -14 dBm maximum
	Extinction ratio	10 dB minimum

B

Cables and Pinout Assignments

This appendix provides cable diagrams and pinout assignments for the following cables, which are included in the Accessory Kit:

- DB-9 male to DB-9 female straight-through cable
- DB-9 male to DB-25 male crossover cable

All cables must be shielded, except for Ethernet and fiber-optic cables.

DB-9 Male to DB-9 Female Straight-through Cable

The DB-9 male to DB-9 female straight-through cable connects the craft-interface Console A port (by default) to a terminal to provide a local/direct management connection. Figure B-1 shows the cable and Table B-1 lists the pinouts of the cable connectors.

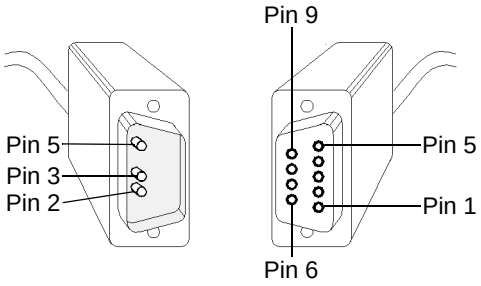


Figure B-1. DB-9 Male to DB-9 Female Straight-through Cable

Table B-1. Pinout: DB-9 Male to DB-9 Female Straight-through Cable

DB-9 Male		DB-9 Female	
Pin No.	**Signal Designation**	**Pin No.**	**Signal Designation**
2	Received Data (RD)	2	Received Data (RD)
3	Transmitted Data (TD)	3	Transmitted Data (TD)
5	Signal Ground (GND)	5	Signal Ground (GND)

⚠ Any equipment connected to the craft port of an SA unit must utilize a floating ground.

DB-9 Male to DB-25 Male Crossover Cable

The DB-9 male to DB-25 male crossover cable connects the craft-interface Console B port (by default) to a modem to provide a remote/SLIP management connection to a terminal. Figure B-2 shows the cable and Table B-2 lists the pinouts of the cable connectors.

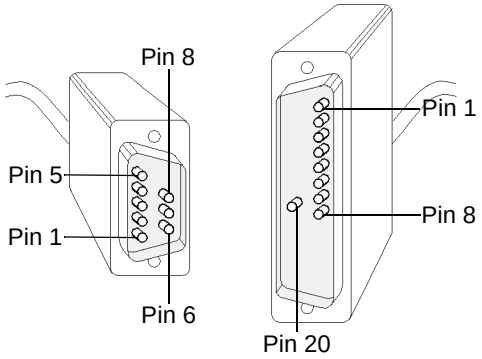


Figure B-2. DB-9 Male to DB-25 Male Crossover Cable

Table B-2. Pinout: DB-9 Male to DB-25 Male Crossover Cable

DB-9 Male		DB-25 Male	
Pin	**Signal Designation**	**Pin**	**Signal Designation**
2	Received Data (RD)	2	Transmitted Data (TD)
3	Transmitted Data (TD)	3	Received Data (RD)
5	Signal Ground (GND)	7	Signal Ground (GND)

Any equipment connected to the craft port of an SA unit must utilize a floating ground.

C

Product Codes

This appendix provides a reference of SA product codes for convenience only. Refer to the current Ascend product price list when placing an order for the most up-to-date information.

Table C-1 lists the Ascend product codes for the SA 100 Broadband Service Unit.

Table C-2 lists the Ascend product codes for the SA 600 Broadband Service Concentrator.

Table C-3 lists the Ascend product codes for the SA 1200 Broadband Service Concentrator.

Table C-4 lists the Ascend product codes for XPODs, IPODs, special cables, and manuals.

This appendix reflects the products available at the time this manual was printed. Due the rapid product development cycles of Ascend Broadband Access products, additional new products may be available or products listed here may no longer be available. Please contact your Ascend sales representative for a list of currently available SA PODs and accessories.

Table C-1. SA 100 Product Codes

Product Code	Product Description
SA 100 Chassis, Components, and Accessories	
B650E010110	SA 100 Chassis with 120/240 VAC auto-sensing power supply and (1) Interface Control Module (ICM). Fans, Accessory Kit, and User's Guides included.
B650E010048	SA 100 Chassis with -48 VDC power supply and (1) Interface Control Module (ICM). Fans, Accessory Kit, and User's Guides included.
B750A030150	Cell POD 150, full-featured CPOD that provides the cell switching engine for the POD interfaces in an SA 100 system.
BSA100ACKit	Accessory kit for SA 100 equipped with AC power supply.
BSA100DCKit	Accessory kit for SA 100 equipped with DC power supply.
B650A010100	SA 100 wall mount accessory kit. Includes wall-mounting brackets and hardware.
13500	36 Megabyte Memory Upgrade Kit for ICMs shipped prior to 9/23/98. To run the version 3.0 SA software, any SA 100 or SA 600 shipped prior to 9/23/98 must be upgraded to 36 megabytes of RAM with this kit. (Not required for any SA unit shipped after 9/23/98.)

Table C-2. SA 600 Product Codes

Product Code	Product Description
SA 600 Chassis	
B650E060000	SA 600 Chassis that can accomodate up to three ICMs and up to two load-sharing power supplies.
SA 600 Power Supplies	
B550A060110	SA 600 AC Power Supply Unit (PSU). A 200 watt (max.) autosensing unit.
B550A060048	SA 600 DC PSU. A 200 watt (max.) -48VDC unit, providing 36 to 76 volts DC power.
SA 600 Additional Components	
B650E060200	SA 600 Fan Assembly.
B750A050200	System Utility Module 200 (future release.)
B750A050100	System Utility Module 100. The SUM 100 provides two RS-232 ports for craft interface, and alarm relay contacts for audio and visual representation of critical, major, and minor alarms. A timing loopback function allows network synchronization to a single timing source. If two SUM 100s are installed in the SA 600, only the left SUM 100 should be used for serial interface connections. A SUM 100 is required for the second SUM bay to provide a secondary timing source for the system.
B750A010120	Interface Control Module (ICM). System base card, includes processor, memory, Protocol Accelerator, software license, connections for switch fabric (Cell POD 200) and User/Network Interfaces (IPODs/XPODs).
B750A030200	Cell POD 200, full-featured CPOD. For applications that require pure cell IPOD interfaces.
B650A060045	SA 600 Accessory Kit, including 19” and 23” EIA mounting brackets, diagnostic cable, modem cable, hardware, grounding wriststrap, rubber feet and users guides.
13500	20 Megabyte Memory Upgrade Kit for ICMs shipped prior to 6/1/98. To run the version 3.0 SA software, any SA 100 or SA 600 shipped prior to 6/1/98 must be upgraded to 20 megabytes of RAM with this kit.

Table C-3. SA 1200 Product Codes

Product Code	Product Description
SA 1200 Chassis	
B650E120000	SA 1200 Chassis that can accomodate up to six ICMs and up to two load-sharing power supplies.
SA 1200 Power Supplies	
B550A120048	SA 1200 DC PSU. A 200 watt (max.) -48VDC unit, providing 36 to 76 volts DC power.
40066	SA 1200 AC Power Converter. Redundant AC-to-DC power converter. 19” Rack mountable. For AC operation of the SA 1200, one converter plus 2 DC PSUs (above) are required.
SA 1200 Additional Components	
B650E060200	SA 1200 Fan Assembly.
B750A050200	System Utility Module 200 (future release.)
B750A050100	System Utility Module 100. The SUM 100 provides two RS-232 ports for craft interface, and alarm relay contacts for audio and visual representation of critical, major, and minor alarms. A timing loopback function allows network synchronization to a single timing source. If two SUM 100s are installed in the SA 1200, only the SUM 100 in the “SUM 1” position should be used for serial interface connections. A SUM 100 is required for the second SUM bay to provide a secondary timing source for the system.
B750A010120	Interface Control Module (ICM). System base card, includes processor, memory, Protocol Accelerator, software license, connections for switch fabric (Cell POD 200) and User/Network Interfaces (IPODs/XPODs).
B750A030200	Cell POD 200, full-featured CPOD. For applications that require pure cell IPOD interfaces.
B650A120530	SA 1200 Accessory Kit, including 19” and 23” EIA mounting brackets, diagnostic cable, modem cable, hardware, grounding wriststrap, rubber feet and users guides.
B650E120200	SA 1200 Fan Assembly. Contains six fans, automatically controlled (RPM) depending on unit temperature. For use as a replacement part or spare for the fan tray included with the SA 1200 chassis.
B650P120528	SA 1200 Filter. The SA 1200 contains a reusable air filter, which may be cleaned or replaced completely. This part is to be used as a replacement or spare for the filter included with the SA 1200 chassis.

Table C-4. XPOD, IPOD, and Other Product Codes

Product Code	Product Description	
XPODs		
B750A020100	ATM OC-3c/STM-1 Multimode XPOD, Enhanced	1 port
B750A020102	ATM OC-3c/STM-1 IR Single-Mode XPOD, Enhanced	1 port
B750A020105	ATM OC-3c/STM-1 LR Single-Mode XPOD, Enhanced	1 port
B750A020212	ATM OC-3/STM-1 IR Single-Mode XPOD Enhanced, with Bulk Cell Shaping	1 port
B750A020120	ATM DS3 XPOD, Enhanced	1 port
B750A020125	ATM E3 XPOD, Enhanced	1 port
B750A020150	ATM DS1 XPOD, Enhanced	1 port
B750A020160	ATM E1 XPOD, Enhanced	1 port
B750A020190	DS1 ATM XPOD with integral CSU	1 port
B750A020200	Dual DS1 CES XPOD	2 ports
B750A020205	Dual E1 CES XPOD	2 ports
B750A020171	IMA DSX1 XPOD (note: this POD requires a special cable, mounting bracket, and breakout box- see *IMA Cables* later in this table)	4 ports
B750A020172	IMA EX1 XPOD (note: this POD requires a special cable, mounting bracket, and breakout box - see *IMA Cables* later in this table)	4 ports
B750A020173	IMA DS1 XPOD with integral CSU (note: this POD requires a special cable, mounting bracket, and breakout box - see *IMA Cables* later in this table)	4 ports
IPODs		
B750A040275	ATM OC-3c/STM-1 IR Single-Mode IPOD, Enhanced	1 port
B750A040280	ATM OC-3c/STM-1 Multimode IPOD, Enhanced	1 port
B750A040101	ATM OC-3c/STM-1 Multimode Dual-Port IPOD	2 ports
B750A040100	ATM OC-3c/STM-1 IR Single-Mode Dual-Port IPOD	2 ports
B750A040220	ATM Dual DS3 IPOD, Enhanced	2 ports
B750A040221	ATM Dual E3 IPOD, Enhanced	2 ports

B750A040170	ATM Quad DS1 IPOD, Enhanced	4 ports
B750A040171	ATM Quad E1 IPOD, Enhanced	4 ports
B750A040120	Quad Ethernet IPOD	4 ports
B750A040125	Single-port Ethernet IPOD	1 port
B750A040150	Circuit Emulation Quad DS1 IPOD	4 ports
B750A040155	Circuit Emulation Quad E1 IPOD	4 ports
B750A040380	Universal Serial Frame IPOD	2 ports
B750A040410	Universal Serial Circuit Emulation Service IPOD	2 ports
B750A040180	DS1 Voice Compression IPOD - no DSP mezzanine cards.	1 port.
B750A040182	DS1 Voice Compression IPOD - 1 DSP mezzanine card.	1 port.
B750A040188	DS1 Voice Compression IPOD - 2 DSP mezzanine cards.	1 port.
B750A040181	DS1 Voice Compression Mezzanine Card for expansion of DS1 Voice Compression IPOD equipped with fewer than two DSP mezzanine cards.	n/a
B750A040321	IMA DS1 IPOD with CSU. (note: this POD requires a special cable, mounting bracket, and breakout box - see *IMA Cables* later in this table)	2 ports
B750A040323	IMA DSX1 IPOD. (note: this POD requires a special cable, mounting bracket, and breakout box - see *IMA Cables* later in this table)	2 ports
IMA Cables (Each IMA POD requires one IMA cable, one IMA breakout box, and one breakout cable bracket.)		
B500C000150	3-foot DS1 IMA Molex to Molex cable (must be used to connect DS1 IMA ports to the IMA breakout box, below).	
B500C000151	6-foot DS1 IMA Molex to Molex cable (must be used to connect DS1 IMA ports to the IMA breakout box, below).	
B500C000155	3-foot E1 IMA Molex to Molex cable (must be used to connect E1 IMA ports to the IMA breakout box, below).	
B500C000156	6-foot E1 IMA Molex to Molex cable (must be used to connect E1 IMA ports to the IMA breakout box, below).	
B650E000190	Breakout cable bracket for 19” rack; comes with five blank panels and mounting hardware. Supports up to five IMA 4-port breakout boxes (B500A000150).	

B650E000230	Breakout cable bracket for 23” rack; comes with five blank panels and mounting hardware. Supports up to five IMA 4-port breakout boxes (B500A000150).
B500A000150	IMA 4-port breakout box for DS1 IMA PODs. Accepts a Molex connector cable from one DS1 IMA port and connects it to four RJ-48 connectors. Each IMA port (IMA IPODs have two ports, IMA XPODs have one port) requires a breakout box to be mounted in a breakout cable panel (above).
B650E000155	IMA 4-port breakout box for E1 IMA PODs. Accepts a Molex connector cable from one E1 IMA port and connects it to four RJ-48 connectors. Each IMA port (IMA IPODs have two ports, IMA XPODs have one port) requires a breakout box to be mounted in a breakout cable panel (above).
B500C320176	5 foot IMA cable 4-port Molex connector for E1 IMA PODs.
B500C420176	10 foot IMA cable 4-port Molex connector for E1 IMA PODs.
Universal Serial Cables for use with Universal Serial Frame POD and Universal Circuit Emulation Service POD	
B500C041380	X.21 interface cable.
B500C042380	V.35 interface cable.
B500C043380	RS-232 interface cable.
B500C044380	RS-449 interface cable.
B500C045380	RS-530 interface cable.
SA Product Documentation	
80085	*Hardware Installation Guide*
80084	*Network Administrator’s Guide*
80055	*Ascend Broadband Access Enterprise MIB*

D

Regulatory Information

This appendix lists the regulatory agencies that have approved the SA 100, SA 600, and SA 1200.

Regulatory Standards Compliance

The SA 100, SA 600, and SA 1200 are fully compliant with the following environmental, safety, and emissions standards.

Safety Standards

- Underwriter's Laboratory (UL) — Safety and Factory Compliance UL 1950
- CE — Safety and Factory Compliance to EN60950

Emissions & Physical Requirements

- Federal Communications Commission (FCC) — EMC compliance (Part 15 Class A)
- Network Equipment Building System (NEBS) GR-1063-CORE (approval pending) and GR-1089-CORE
- EN55022 Class A (CISPR)
- VCCI Class 1
- British Approval Board for Telecommunications (BABT) — Factory Compliance

In addition, the SA units meet the following Country Standards:

- Australia Safety - Austel (contact the Ascend Technical Assistance Center for compliance details on individual PODs; see "Contacting the Ascend Technical Assistance Center" on page 7-4 for contact information.)
- New Zealand (EMC and Telecommunications Function)

Canadian IC CS-03 Requirements

The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements as prescribed in the appropriate Terminal Equipment Technical Requirements documents. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, user should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be coordinated by a representative designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

To contact an authorized Ascend representative in Canada, call: (613) 566-7039.

Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

Avis D'Industrie Canada

L'étiquette d'Industrie Canada identifie le matériel homologué. Cette étiquette certifie que le matériel est conforme aux normes de protection, d'exploitation et de sécurite des réseaux de télécommunications, comme le prescrivent les documents concernant les exigences techniques relatives au matériel terminal. Le Ministère n'assure toutefois pas que le matériel fonctionnera à la satisfaction de l'utilisateur.

Avant d'installer ce matériel, l'utilisateur doit s'assurer qu'il est permis de le raccorder aux installations de l'entreprise locale de télécommunication. Le matériel doit également étre installé en suivant une méthode acceptée de raccordement. L'abonné ne doit pas oublier qu'il est possible que la comformité aux conditions énoncées ci-dessus n'empêche pas la dégradation du service dans certaines situations.

Les réparations de matériel homologué doivent être coordonnées par un représentant désigné par le fournisseur. L'entreprise de télécommunications peut demander a l'utilisateur de débrancher un appareil a la suite de réparations ou de modifications effectuées par l'utilisateur ou à cause de mauvais fonctionnement.

Pour sa propre protection, l'utilisateur doit s'assurer que tous les fils de mise a la terre de la source d'énergie électrique, des lignes téléphoniques et des canalisations d'eau métalliques, s'il y en a, sont raccordés ensemble. Cette précaution est particulièrement importante dans les régions rurales. Avertissement: L'utilisateur ne doit pas tenter de faire ces raccordements lui-méme; il doit avoir recours a un service d'inspection des installations électriques, ou à un électricien, selon le cas.

AVIS: L'indice d' équivalence de la sonnerie (IES) assigné à chaque dispositif terminal indique le nombre maximal de terminaux qui peuvent étre raccordés a une interface. La terminaison d' une interface téléphonique peut consister en une combinaison de quelques dispositifs, a la seule condition que la somme d'indices d'équivalence de la sonnerie de tous les dispositifs n'excède pas 5.

FCC Part 68 General Information

Read the following FCC Part 68 information before you connect any SA unit to the public telecommunications network.

- This equipment complies with Part 68 of the FCC rules. On the back of this equipment is a label that contains (among other information) the FCC registration number and ringer equivalence number (REN) for this equipment. If requested, this information must be provided to the telephone company.
- This equipment uses the following USOC jacks as defined in Table D-1.

Table D-1. FCC Information (SA 100, SA 600, and SA 1200)

Type of Interface	USOC Jack Connector	Service Code	Facility Code
1.544 Mbps Superframe format (SF) without line power	RJ-48C	6.0N	04DU9-BN
1.544 Mbps Superframe format (SF) and B8ZF without line power	RJ-48C	6.0N	04DU9-DN
1.544 Mbp ANSI ESF without line power	RJ-48C	6.0N	04DU9-1KN
1.544 Mbp ANSI ESF and B8ZF without line power	RJ-48C	6.0N	04DU9-1SN

- An FCC compliant telephone cord and modular plug is provided with this equipment. This equipment is designed to be connected to the telephone network or premises wiring using a compatible modular jack which is Part 68 compliant.
- This equipment cannot be used on telephone company-provided coin service. Connection to Party Line Service is subject to state tariffs.
- If this equipment causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. If advance notice is not practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC, if you believe it is necessary.
- The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice for you to make the necessary modifications to maintain uninterrupted service.

- If you experience trouble with this equipment, please contact the Ascend Technical Assistance Center for repair and warranty information (see "If Problems Arise" on page D-8). If the trouble is causing harm to the telephone network, the telephone company may request you remove the equipment from the network until the problem is resolved.

- It is recommended that the customer install an AC surge protector in the AC outlet to which this device is connected. This is to avoid damage to the equipment caused by local lightning strikes and other electrical surges.

FCC and Telephone Company Procedures and Requirements

In order to connect this system to the network, you must provide the local operating company with the registration number of this equipment, and you must order the proper connections.

To order the proper service, provide the telephone company with the following information:

- Quantities and USOC numbers of the required jacks
- Trunk connection sequence
- Facility interface codes, by position
- Ringer equivalence number or service code, as applicable, by position

Radio Frequency Interference

The SA 100, SA 600, and SA 1200 are designed for Class A use only. Do not attempt to use this equipment in a domestic environment, which requires Class B distinction. These switches may cause interference with domestic products.

In accordance with FCC Part 15 Subpart B requirements, changes or modifications made to this equipment not expressly approved by Ascend Communications, Inc., could void user's authority to operate this equipment.

This equipment produces electromagnetic energy at radio frequencies and, if not installed and operated in accordance with the manufacturer's instructions as contained in this document, could cause interference to radio communications and/or interfere with the operation of other RF devices. The equipment has been tested and found to comply with the limits for a Class A Computing Device pursuant to Subpart B of Part 15 of the FCC Rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment.

Operation of the equipment in a residential area may cause interference. Should this occur, the user may be required to discontinue operation of the equipment, or take other such measures as may be adequate to rectify the condition at the user's expense.

VCCI Statement

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＡ情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

Translation:
This is a Class A product based on the standards of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may arise. When such trouble occurs, the user may be required to take corrective actions.

If Problems Arise

If any of your telephone equipment is not operating properly, you should immediately remove it from your telephone line, as it may cause harm to the telephone network.

The telephone operating company must be notified before removal of equipment that is connected to 1.544 Mbps digital services. If the telephone company notes a problem, it may temporarily discontinue service. When practical, the telephone company will notify you in advance of this disconnection. If advance notice is not feasible, you will be notified as soon as possible. When you are notified, you will be given the opportunity to correct the problem and informed of your right to file a complaint with the FCC.

In the event repairs are needed on this equipment, they should be performed by Ascend Communications Inc. or an authorized representative of Ascend Communications. You can contact the Technical Assistance Center 24 hours a day, 7 days a week at:

1-800-DIAL-WAN (in the USA and Canada)

0-800-96-2229 (in the United Kingdom)

1-978-952-7299 (all other areas)

E

Acronyms

AAL1	ATM adaptation layer type 1
AIS	alarm indication signal
AIS-L	alarm indication signal line
AMI	alternate mark inversion
ANSI	American National Standards Institute
ATM	asynchronous transfer mode
B8ZS	bipolar with 8 zero substitutions
BES	bursty errored seconds
BIP	bit interleaved parity
BOM	bill of material
BPV	bipolar violation
BSU	broadband service unit
CAC	connection admission control
CAS	channel associated signaling
CBR	constant bit rate
CCS	common channel signaling
CCV	C-bit coding violation

CDV	cell delay variation
CDVT	cell delay variation tolerance
CES	C-bit errored seconds or circuit emulation service
CLEI	common-language equipment identification
CLP	cell loss priority
CPE	customer provisioned equipment
CPOD	cell protocol option device
CRC	cyclic redundancy check
CRCLOMF	cyclic redundancy check loss of multiframe
CSES	C-bit severely errored seconds
CSS	controlled slip seconds
DS1	digital service type 1
DS3	digital service type 3
EFCI	explicit forward congestion indicator
ES	errored seconds
ESB	errored seconds type B
ESF	extended superframe format
ETSI	European Telecommunications Standards Institute
EXZ	excessive zeros
FBR	fixed bit rate
FBW	fixed bandwidth
FC	failure count
FCS	frame check sequence
FEBE	far end block errors

FERF	far end receive failure
FTP	file transfer protocol
GCRA	generic cell rate algorithm
HCS	header checksum sequence
HP	Hewlett-Packard
ICM	interface control module
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronic Engineers
IP	internet protocol
IPOD	interface protocol option device
ITU-T	International Telecommunication Union Telecommunication Standard Sector
IWF	interworking function
LAN	local area network
LCD	loss of cell delineation
LCV	line code violation or line coding violation
LES	line errored seconds
LOF	loss of frame
LOS	loss of signal
MAP	management access path
Mbps	Megabits per second
MBS	maximum burst size
MCR	minimum cell rate
MIB	management interface base

NLS	native LAN service
NNI	network-to-network interface
NRT-VBR	non-real time variable bit rate
OAM	operations administration and maintenance
OC	optical carrier
OOF	out of frame
PCMCIA	Personal Computer Memory Card International Association
PCR	peak cell rate
PCV	path code violation, path coding violation, or P-bit coding violation
PES	P-bit errored seconds
PID	protocol identification
PLCP	phase layer convergence protocol
POD	protocol option device
PSES	P-bit severely errored seconds
RDI	remote defect indication
RDI-L	remote defect indication line
RFC	request for comment
RISC	reduced instruction set computer
RT-VBR	real time variable bit rate
RX	receive or received
SCM	system control module
SCR	sustainable cell rate
SDH	synchronous digital hierarchy
SEF	severely errored frame

SEFS	severely errored framing seconds
SES	severely errored seconds
SF	superframe format
SNMP	simple network management protocol
SNP	sequence number protection
SONET	synchronous optical network
STM	synchronous transfer mode
TS16AIS	time slot 16 alarm indication signal
TS16LOMF	time slot 16 loss of multiframe
TX	transmit or transmitted
UAS	unavailable seconds
UBR	unspecified bit rate
UNI	user-to-network interface
UPC	usage parameter control
VBR	variable bit rate
VBW	variable bandwidth
VCI	virtual channel identifier
VPI	virtual path identifier
WAN	wide area network
XPOD	expansion protocol option device

Glossary

A

address

The logical location or identifier of a network node, terminal, pc, peripheral device, or location in memory where information is stored.

alarm

A message notifying an operator or administrator of a network problem.

Alarm Indication Signal (AIS)

An error or alarm signal transmitted in lieu of the normal signal to maintain transmission continuity to the receiving node. The signal indicates that there is a transmission fault located either at the sending node or upstream of the sending node.

Alterable Mark Inversion (AMI)

A signaling format used in T1 lines that provides for the “one” pulses to have an alternating priority. Thus, if the nth-one bit is represented by a positive pulse, the nth T1 line would be a negative pulse.

American National Standards Institute (ANSI)

A private, non-governmental, non-profit organization that develops US standards required for commerce.

applet

A small software module that runs on a Java virtual machine inside a Web browser.

Asynchronous Transfer Mode (ATM)

A method used for transmitting voice, video, and data over high-speed LAN and WAN networks.

attenuation

The decrease in power of a signal over distance. Attenuation is measured in decibels.

B

backbone

The part of a network that carries the bulk of the network traffic, e.g., over Ethernet cabling or fiber-optic cabling.

backplane

A circuit board assembly that provides a means of transferring signals between other circuit board assemblies that are connected to it.

bandwidth

The transmission capacity of a computer or a communications channel.

Bipolar with 8 Zero Substitution (B8ZS)

A T1 encoding scheme where eight consecutive zeros are replaced with the sequence 000-+0+- (if the preceding pulse was +), and with the sequence 000-+0+- (if the preceding value was -), where + represents a positive pulse, - represents a negative pulse, and 0 represents no pulse.

bit

A binary unit of measurement, which may be either a one or a zero.

bits per second (bps)

The number of bits transmitted every second during a data transfer.

broadband network

A type of network that transmits large amounts of information, including voice, data, and video, over long distances using the same cable.

broadband service unit (BSU)

A broadband Wide Area Network device that consolidates wide-area ATM access for a combination of video, voice, and LAN-based data traffic.

browser

A software program for navigating and viewing the World Wide Web.

burst

A method of data transmission in which information is collected and then sent in a single high-speed transmission, rather than one character at a time.

C

cell

Any fixed-length data packet. For example, ATM uses fixed-length, 53-byte cells.

cell highway

Circuits in the SA 600 that are used to relay packets between the CPOD and the IPOD(s), XPOD, and ICM.

Cell Loss Priority (CLP)

A field in the ATM cell header that indicates the cell's eligibility for discard by the network under congested conditions.

Cell Protocol Option Device (CPOD)

An ICM subsystem that provides cell switching.

cell switching

An operational feature of cellular networks that enables callers to move from one location to another without losing the call connection. The cellular system is designed to switch calls to a new cell with no noticeable drop in the conversation. Cell switching is sometimes called "handing off." While not noticeable in voice communications, the approximate 300 milliseconds this switching requires can be a problem in data transmission.

channel

Any connecting path that carries information from a sending device to a receiving device. May refer to a physical medium (e.g., coaxial cable) or a specific frequency within a larger channel.

circuit

A communications channel or path between two devices.

circuit switching

A temporary communications connection that is established as needed between a sending node and a receiving node.

client

A device or software application that makes use of the services provided by a server device or software application.

congestion

The point at which devices in the network are operating at their highest capacity. Congestion is handled by employing a congestion avoidance mechanism.

connection admission control (CAC)

Tasks performed by the network to determine whether to accept or reject a request for a connection or requests for reallocation of bandwidth

Constant Bit Rate (CBR)

A Quality of Service class defined by the ATM Forum for ATM networks. CBR is used for connections that depend on precise clocking to ensure undistorted delivery of bits.

craft interface

An interface that allows the user to locally or remotely configure, monitor, and control the SA 600 using a series of menu-driven screens on a VT100 terminal or on a computer running VT100 terminal emulation software.

CRC error

A condition that occurs when the Cyclic Redundancy Check (CRC) in a frame does not agree with the CRC frame received from the network.

CSU (Channel Service Unit)

A device that functions as a certified safe electrical circuit, acting as a buffer between the customer's equipment and a public carrier's WAN.

Cyclic Redundancy Check (CRC)

A calculation method used to check the accuracy of digital transmission over a communications link.

D

D4-format

In T1 transmission, 24 channels per T1 line, where channels are assigned sequentially.

DCE (Data Communications Equipment)

Any device that connects a terminal or computer to a communications channel or public network.

Digital Signal (Digital Service) (DS)

A classification of digital circuits. The DS defines the level of common carrier digital transmission service. DS-0 = 64 kbps (Fractional T1), DS-1 = 1.544 Mbps (T1), DS-2 = 6.312 Mbps (T2), DS-3 = 44.736 Mbps (T3), and DS-4 =274.176 Mbps (T4).

DS1

A standard digital transmission facility, operating at 1.544 Mbps.

DTE (Data Terminal Equipment)

Any device, such as a terminal or computer, that is connected to a communications device, channel, or public network.

E

E1

The European counterpart to the North American T1 transmission speed. Adopted by the Conference of European Posts and Telecommunications Administrations, the E1 standard carries data at the rate of 2.048 Mbps.

error rate

In communications, the ratio between the number of bits received incorrectly and the total number of bits in the transmission.

ethernet

A popular LAN protocol and cabling scheme with a transfer rate of 10 or 100 Mbps.

Expansion Protocol Option Device (XPOD)

An ICM subsystem that provides expansion capabilities, including an additional ATM wide-area connection.

Extended Superframe Format (ESF)

In Frame Relay, a frame structure that extends the DS1 superframe structure from 12 to 24 frames, for a total of 4632 bits. This format redefines the 8-kbps channel, which consists of framing bits previously used only for terminal and robbed-bit signaling synchronization.

F

fail count

A statistic that displays the number of tests that produced an error condition.

File Transfer Protocol (FTP)

A method of transferring information from one computer to another, either over a modem and telephone line or over a network. FTP is a TCP/IP application utility.

Frame Check Sequence (FCS)

In a frame, a field that contains the standard 16-bit cyclic redundancy check used to detect errors in HDLC and LAPD frames.

G

Gbps

Abbreviation for gigabits (1 billion bits) per second. See also *bps*.

H

header

The initial part of a data block, packet, or frame, which provides basic information about the handling of the rest of the block, packet, or frame.

HP OpenView

The UNIX-based network management application used with CascadeView/UX on an NMS to manage a Ascend-switch network.

I

Institute of Electrical and Electronic Engineers (IEEE)

A professional organization that defines network standards.

Interface Control Module (ICM)

An SA 600 subsystem with a cell subsystem and a packet subsystem that switches cells and packets simultaneously.

Interface Protocol Option Device (IPOD)

An ICM subsystem that supports service interfaces including Ethernet, circuit switching, and ATM UNI/NNI.

Interim Local Management Interface (ILMI)

A management information base (MIB) that provides status and communication information to ATM UNI devices and provides for a port keep alive protocol. ILMI provides status information and statistics about virtual paths, connections, and address registration. It also determines the operational status of the logical port.

internal clocking

A hardware function that provides the transmit and receive clocks to the user equipment.

International Telecommunication Union Telecommunication Standard Sector (ITU-T)

An advisory committee established under the United Nations to recommend worldwide standards for voice and data. One of the four main organizations of the International Telecommunications Union.

Internet Protocol (IP)

The TCP/IP session-layer protocol that regulates packet forwarding.

Internet Protocol address

A 32-bit address assigned to hosts using TCP/IP. The address is written as four octets separated with periods (dotted decimal format), which are made up of a network section, an optional subnet section, and a host section.

IP address

See *Internet Protocol address*.

J

Java

An object-oriented programming language that creates distributed, executable applications.

jitter

A type of distortion found on analog communications lines, resulting in data transmission errors.

K

kbps

Abbreviation for kilobits (1000 bits) per second. See *bps*.

keepalive message

This message is used in the Link Management Interface of a frame relay port to verify link integrity.

L

Local Area Network (LAN)

Any physical network technology that connects a number of devices and operates at high speeds (10 Mbps through several gigabits per second) over short distances.

loopback

A diagnostic that directs signals back toward the transmitting source to test a communications path.

loss of frame (LOF)

A T1 error condition when an out-of-frame condition exists for a normal period of 2 1/2 seconds.

loss of signal (LOS)

A T1 error condition when j175+_75 consecutive zeros are received.

M

Management Information Base (MIB)

The set of variables forming a database contained in a CMIP or SNMP-managed node on a network. Network management stations can fetch/store information from/to this database.

Mbps

Abbreviation for megabits (1 million bits) per second. See *bps*.

multiplexer (mux)

A device that merges several lower-speed transmission channels into one high-speed channel at one end of the link Another mux reverses this process at the opposite end.

multiplexing

A technique that transmits several signals over a single communications channel.

N

Network-to-Network Interface (NNI)

The standard that defines the interface between ATM switches and Frame Relay switches. In an SMDS network, an NNI is referred to as Inter-Switching System Interface (ISSI).

node

Any device such as a pc, terminal, workstation, etc., connected to a network and capable of communicating with other devices.

O

OASOS

The internal operating system of the SA 600.

out of frame (OOF)

A T1 error condition where two or three framing bits of any five consecutive frames are in error.

P

packet

Any block of data sent over a network. Each packet contains sender, receiver, and error-control information in addition to the actual message; sometimes called payload or data bits.

packet-switched network

A network that consissts of a series of interconnected circuits that route individual packets of data over one of several routes and services.

packet switching

Type of networking in which nodes share bandwidth with each other by intermittently sending logical information units (packets). In contrast, a circuit-switched network dedicates one circuit at a time to data transmission.

payload

The portion of a frame that contains the actual data.

PDN

see *Public Data Network.*

Peak Cell Rate (PCR)

In ATM transmission, the maximum cell transmission rate. PCR defines the shortest time period between two cells.

Permanent Virtual Circuit

A logical connection across a packet-switched network that is always in place and always available along a predetermined path. See also *Virtual Circuit*.

Permanent Virtual Path

A logical connection across a packet-switched network that is always in place and always available along a predetermined path. See also *Virtual Path*.

protocol

A set of rules governing communication between two entities or systems to provide interoperability between services and vendors. Protocols operate at different layers of the network, e.g., data link, network, and session.

Protocol Accelerator™

A subsystem on each ICM (Interface Control Module) that translates between flows at multiple levels at up to 200,000 packets per second.

Public Data Network

Any government-owened or controlled commercial packet-switched network, offering WAN services to data processing users.

PVC

See *Permanent Virtual Circuit*.

PVP

See *Permanent Virtual Path.*

R

red alarm

A T1 alarm condition indicating a loss of signal or loss of frame at the device's local termination point.

Request For Comment (RFC)

A series of notes and documents available online that describe surveys, measurements, ideas, techniques, and observations, as well as proposed and accepted Internet protocol standards, such as Telnet and FTP.

router

An intelligent LAN connection device that routes packets to the correct LAN segment destination address(es). The extended LAN segments may or may not use the same protocols. Routers link LAN segments at the ISO/OSI network layer.

S

server

A device or software application that provides information or services based on requests from client devices or programs.

Simple Network Management Protocol (SNMP)

A standard network management protocol used to manage and monitor nodes and devices on a network.

Sustainable Cell Rate (SCR)

The average cell transmission rate in ATM transmission. Equivalent to CIR for Frame Relay, SCR is measured in cells per second and converted internally to bits per second Usually, SCR is a fraction of the peak cell rate. Cells are sent at this rate if there is no credit.

T

T1

A long-distance, point-to-point circuit that provides 24 channels at 64 kbps each (for a total of 1.544 Mbps). See also *E1*.

T3

A long-distance, point-to-point circuit that provides up to 28 T1 channels. T3 can carry 672 channels of 64 kbps (for a total of 44.736 Mbps).

telnet

The Internet standard protocol for remote terminal-connection services.

throughput

The actual speed of the network.

transceiver

A device that connects a host interface to a LAN. A transceiver transmits and receives data.

U

User-to-Network Interface (UNI)

A standard defined by the ATM Forum for public and private ATM network access. UNI connects an ATM end system (such as a router) and an ATM switch, and is also used in Frame Relay. UNI is called SNI (Subscriber Network Interface) in SMDS.

V

Virtual Channel

A connection between two communicating ATM networks.

Virtual Circuit

A logical circuit set up to ensure reliable communication between two network devices. See also *PVCs and SVCs*.

Virtual Circuit Identifier (VCI)

A 16-bit field in the ATM cell header that is used as an addressing identifier to route cell traffic.

Virtual Path

A group of VCs carried between two points. VP provides a way to bundle traffic headed in the same direction.

Virtual Path Identifier (VPI)

An 8-bit field in the ATM cell header that is used as an addressing identifier to route cell traffic.

W

WebXtend™

The Web browser user interface built into Ascend broadband access products.

Wide Area Network (WAN)

A network that usually consists of packet-switching nodes over a large geographical area.

Y

yellow alarm

A T1 alarm that is generated when the interface receives a red alarm signal from the remote end.

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