SA 100
Hardware Installation Guide

Ascend Communications, Inc.

Product Code: 80053
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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 *[Product Name]* has 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 Response Center at 1-800-DIAL-WAN (in the U.S.) or 1-508-692-2600 (outside the U.S.).

Ascend has adopted a maintenance strategy based on customer-initiated requests to the Ascend Technical Response Center. The Ascend Technical Response 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 Response 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 a Ascend Technical Response Center representative. Report the problem or deficiency to the Ascend Technical Response Center representative, along with the model, type, and serial number. Upon receipt of this information, the Ascend Technical Response 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 Response Center at 1-800-DIAL-WAN or 1-508-692-2600

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About This Guide

The *SA 100 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 (BSU). 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 100.

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 for the SA 100 Broadband Service Unit *for additional information about this product.*

Documentation Reading Path

The following Ascend manuals provide the complete document set for the SA 100:

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

This guide describes how to use WebXtend™, the built-in SA 100 Web browser interface, to configure, test and maintain the BSU.

This guide describes the Ascend Broadband Access Enterprise MIB (Management Information Base), the database containing SA 100 network configuration and performance information.

How to Use This Guide

This section briefly describes the chapters and appendices that comprise this guide.

Read	To Learn About
Chapter 1	The general functions and features of the SA 100.
Chapter 2	The product specifications of the SA 100 including its environmental and electrical considerations. This chapter also provides the Safety Warnings related to the use of the SA 100.
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 100 hardware.
Chapter 5	Completing the installation of the SA 100 hardware, powering up the BSU, and determining its operating status.
Chapter 6	Installing new modules or replacing existing modules in an SA 100.
Chapter 7	How to troubleshoot the SA 100 and, if necessary, contact the Ascend Technical Assistance Center.
Appendix A	The various PODs available for the SA 100.
Appendix B	The various cables used with the SA 100 including their pinout assignments.
Appendix C	The SA 100 product codes and how to order SA 100 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:

- *SA 100 Network Administrator's Guide* (Product Code: 80054)
- *Ascend Broadband Access Enterprise MIB* (Product Code: 80055)

Conventions

This guide uses the following conventions to emphasize certain information, such as user input, screen prompts and output, and menu selections. For example:

Convention	Indicates	Example
Gray boxes surrounding text	Notes and warnings.	See examples below.
Italics	Book titles, new terms, and emphasized text.	*CascadeView/UX Network Management Station Installation Guide*

Provides helpful suggestions or reference to materials not contained in this manual.

Warns the reader to proceed carefully in order to avoid equipment damage or personal harm.

1

Overview

This chapter provides some useful background and conceptual information that will help prepare you for your SA 100 installation. It describes:

- The general functions and features of the SA 100 Broadband Service Unit (BSU)
- The general functions and features of WebXtend, the SA 100 Web browser interface

SA 100 Broadband Service Unit Description

The SA 100 BSU (see Figure 1-1) provides 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 10/100-Mbps local area networks (LANs) at full wire speed, circuit switching, and high-speed *ATM* connections. Interchangeable modules called Protocol Option Devices (PODs) furnish a scalable upgrade path to other members of the Ascend broadband access product family.

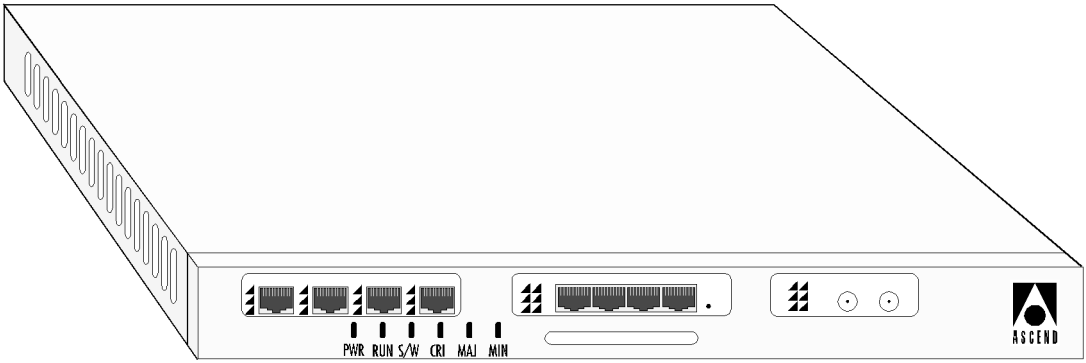

Figure 1-1. SA 100 Broadband Service Unit

The SA 100 supports the following devices in a single, compact chassis suitable for rack-mount, wall-mount, or stand-alone configurations:

- One Interface Control Module (ICM)
- Up to two Interface Protocol Option Devices (IPODs)
- One Expansion Protocol Option Devices (XPOD)
- One Cell Protocol Option Device (CPOD)

Interchangeable PODs allow flexible configuration of packet, circuit, and cell interfaces.

The SA 100 is ideal for high-mix, low-cost access to broadband WANs. In Figure 1-2, an SA 100 consolidates wide-area ATM access for a combination of video, voice, and LAN-based data traffic. Its Protocol Accelerator™ provides wire-speed translation to and from ATM cells, while third-generation traffic management prevents bursty LAN traffic from degrading voice or video quality.

Figure 1-2. SA 100 Consolidating Traffic onto a WAN

Interface Control Module

ICMs are 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 the same ICM by way of parallel packet and cell interconnects or between ports.

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, 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. For cost-effective maintenance of remote Ascend broadband access systems, software can be downloaded over any network connection using standard protocols.

Protocol Option Devices (PODs)

PODs are mezzanine boards that attach to the ICM. IPODs support service interfaces including Ethernet, circuit switching, and ATM UNI/NNI. XPODs provide expansion capabilities including ATM wide-area connections and other future enhancements. CPODs provide switching of cells. The CPOD 150 used by the SA 100 is a full cell switch on a mezzanine card and is used to support circuit emulation or ATM UNI/NNI switching functions. Every IPOD and XPOD has equal access to both packet and cell subsystems. The PODs on an ICM are easily configured 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 the SA 100

The SA 100 may be managed using a variety of management access methods. Each SA 100 has a serial craft interface, enabling you to use a VT100 terminal or equivalent to fully configure and manage the device. In addition, each SA 100 can be configured with an IP address, enabling you to manage the device with a combination of SNMP, FTP, Telnet, and a flexible Java-based utility called WebXtend.

WebXtend Management Software

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

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, so the network operator must invest considerable time and resources to master a new system.

World Wide Web browsers are gaining favor as a friendly, unifying 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. It provides a network management approach that emphasizes ease of use, cost-effective platform independence, unlimited access, and enhanced security.

Flexible Ease-of-Use

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 1-3). A Web Server is embedded in every SA 100 broadband service unit. The recommended Web browser client is Netscape Navigator Gold version 3.0.1 or later.

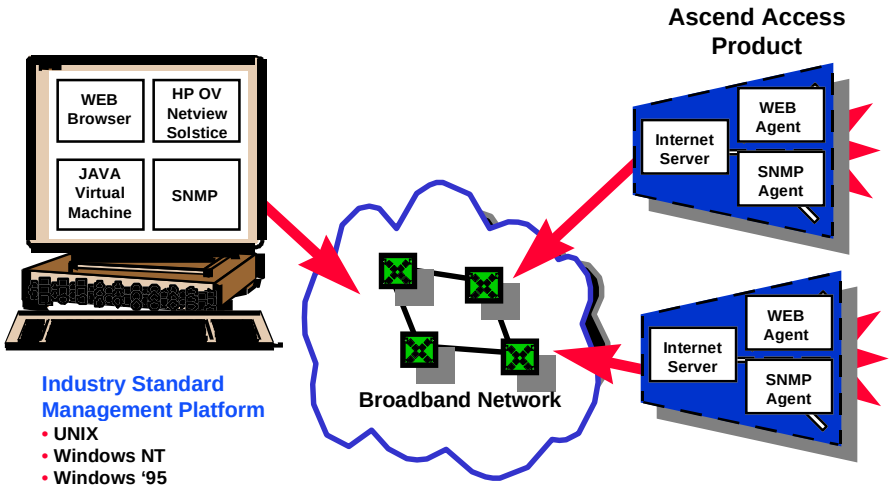

Figure 1-3. WebXtend Web-based Management

Network operators manage SA 100 broadband access systems using friendly point-and-click graphics. A Java *applet* is uploaded from the Web server to support management functions and display of real-time data such as traffic statistics. The management tools are grouped into functional areas such as Administration, Utilities, and Interface Management for simple access. 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

The use of Web browsers gives WebXtend a familiar and easy-to-learn user interface, minimizing training costs and maximizing user productivity. Moreover, in future software releases, you will be able to use a Java-enabled browser on any platform, eliminating the need to dedicate expensive workstations for managing broadband access products.

The SA 100 BSU also supports a *craft interface* for on-site configuration, provisioning, and testing. The ANSI-compliant VT100 interface provides simple, menu-driven commands that meet the needs of the installation technician, yet delivers the same rich management functionality as the WebXtend software.

The SA 100 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, Ubiquitous 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. All management traffic can be protected against unauthorized access by restricting it to secure IP connections.

2

Specifications and Safety Warnings

This chapter describes the SA 100 specifications and safety warnings related to the use of this equipment, including:

- Electronic and electrical specifications (see page 2-2)
- Physical specifications (see page 2-3)
- Site specifications (see page 2-4)

Electronic/Electrical Specifications

Table 2-1 describes the SA 100 electronic/electrical specifications.

Table 2-1. Electronic/Electrical Specifications

Application	Specification
100-240 VAC	100-240 VAC, 50/60 Hz, 2-1 A, 100 W
-48 VDC	-48 VDC, 4 A, 100 W
Power Supply Thermal Dissipation	AC: 18.75 W max, 64 BTU/hr DC: 18.75 W max, 64 BTU/hr

The SA 100 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 SA 100 physical specifications.

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	Includes one power supply, four cooling fans, one XPOD module, one CPOD, and one or two IPOD modules mounted inside a chassis
Overall Chassis Size[a]	17.5 in (44.5 cm) wide x 1.75 in (44.5 mm) high x 11.9 in. (30.2 cm) deep
Unit Weight	14 lb. 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 SA 100 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. SA 100 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 100 requires a minimum of 2 in (5 cm) of air flow space on both sides of the chassis.

DC Power Supply Warnings

The DC power supply 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.

Safety Warnings

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

3

Preparing for Installation

This chapter describes the SA 100 hardware and its Accessory Kit. It also describes the preparations and prerequisites for installation.

Selecting the Installation Site

Before you choose a location for the SA 100, be sure to read and follow the site and electrical requirements described in Chapter 2.

Select the location carefully. Keep in mind that it requires proper ventilation and space for current and future cabling requirements.

There are three possible methods for installing the 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

Each of these installations is described in Chapter 4.

Unpacking the SA 100

Ascend ships the SA 100 in a protective shipping carton. The carton contains the SA 100 with all its ordered Protocol Option Devices (PODs) installed, an Accessory Kit, and documentation (see Figure 3-1).

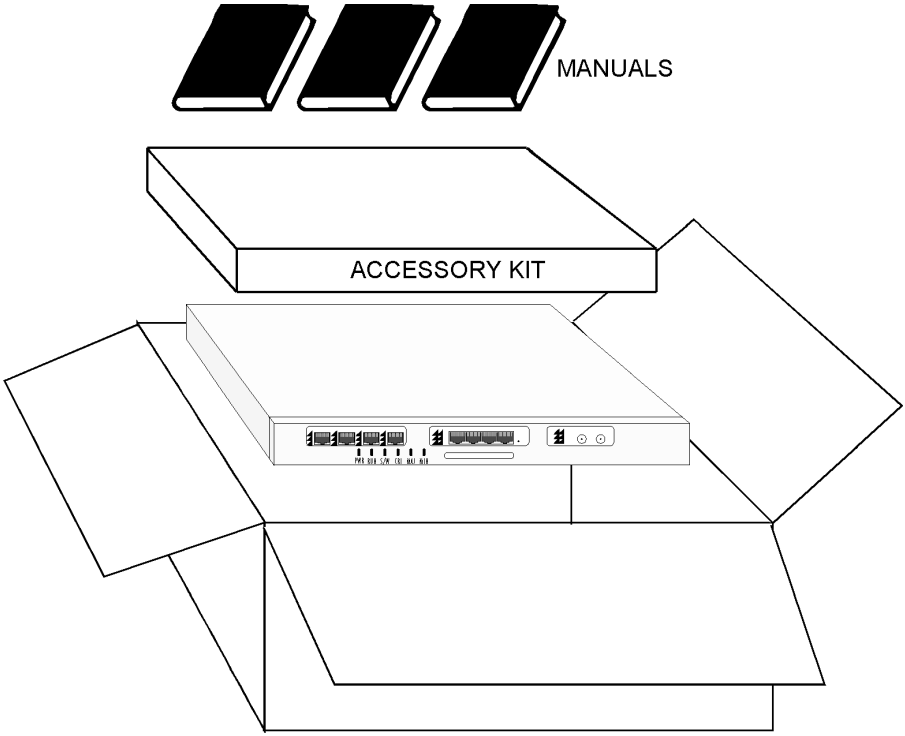

Figure 3-1. SA 100 Typical Shipping Configuration

Before you remove the SA 100 from the shipping carton, check for damage. If you see any, follow the instructions described in "If the Product Is Damaged" on page v.

To unpack the SA 100:

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 to see that you have the items listed below.

The following required items are shipped with each SA 100:

- Power cord (AC only)
- DB-9 male to DB-9 female straight-through cable
- DB-9 male to DB-25 male crossover cable
- Two 19-inch rackmount brackets, two 23-inch rackmount brackets, railmount bolts, and associated hardware (additional brackets are optional)
- Four adhesive feet
- Electrostatic discharge wrist strap
- *SA 100 Hardware Installation Guide*, Product Code: 80053
- *SA 100 Network Administrator's Guide*, Product Code: 80054
- *Ascend Broadband Access Enterprise MIB*, Product Code: 80055
- *SA 100 Release Notes*

Required Installation Tools and Equipment

To install the SA 100 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
- One Panduit CT-700 crimp tool or equivalent
- One wrench to fit #10 nuts
- For 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 *SA 100 Network Administrator's Guide*)
- A modem (for remote craft interface management)
- Cables for the interface management connections
- Cables for the CPE and network interface connections

Verifying the Hardware Configuration

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).

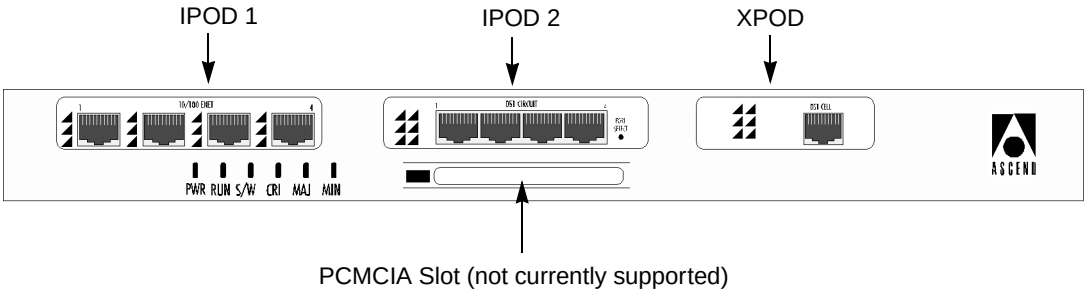

Figure 3-2. POD Locations

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.

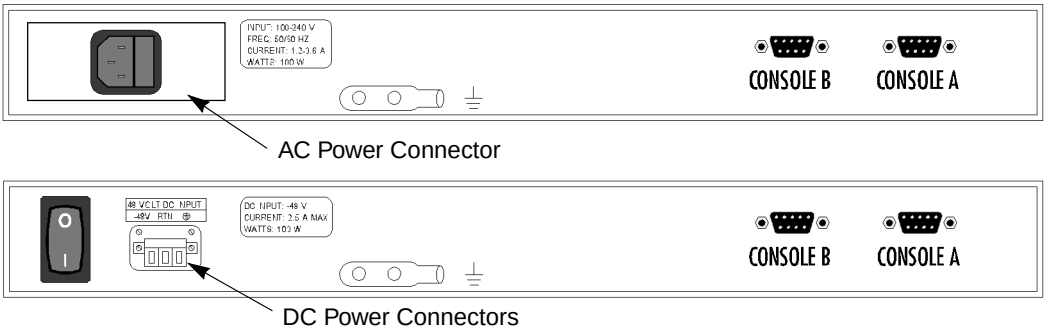

Figure 3-3. AC and DC Power Connectors

What's Next?

When you finish unpacking and taking inventory of the SA 100, its Accessory Kit, and its installed modules, you can begin the installation as described in Chapter 4, "Installing the SA 100."

4

Installing the SA 100

This chapter provides step-by-step instructions for mounting, setting up, and installing the SA 100.

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

- ☑ Select the installation site
- ☑ Unpack the SA 100
- ☑ Unpack the Accessory Kit
- ☑ Gather the tools and equipment needed for installation
- ☑ Check the module configuration

Mounting the Unit

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 Standalone 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 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 minimum).
- The mounting surface is sturdy enough to safely accommodate the weight of the SA 100 (14 pounds 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 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 standalone 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 4-9 for the cabling procedures.

Rackmounting the SA 100

To rackmount the SA 100:

1. Determine the rack size, i.e., 19 inch or 23 inch. (The Accessory Kit includes both 19-inch and 23-inch brackets.)
2. Determine the preferred means of rackmounting, 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 means of rackmounting 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.

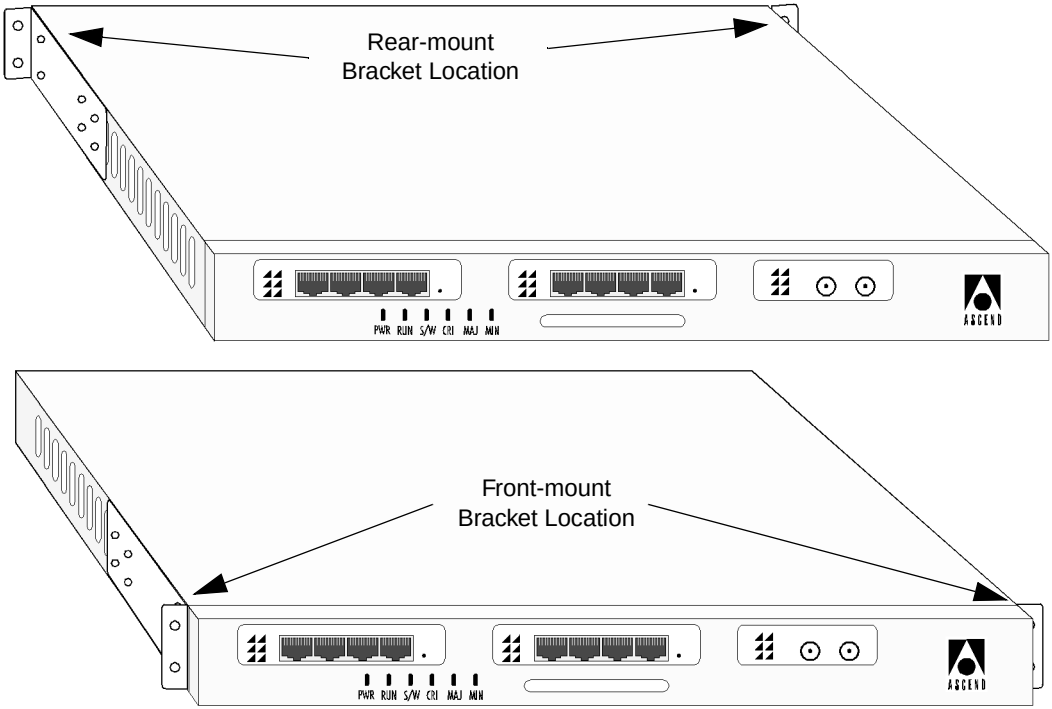

Figure 4-1. Front- and Rear-mount Bracket Locations (19-inch Brackets Shown)

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

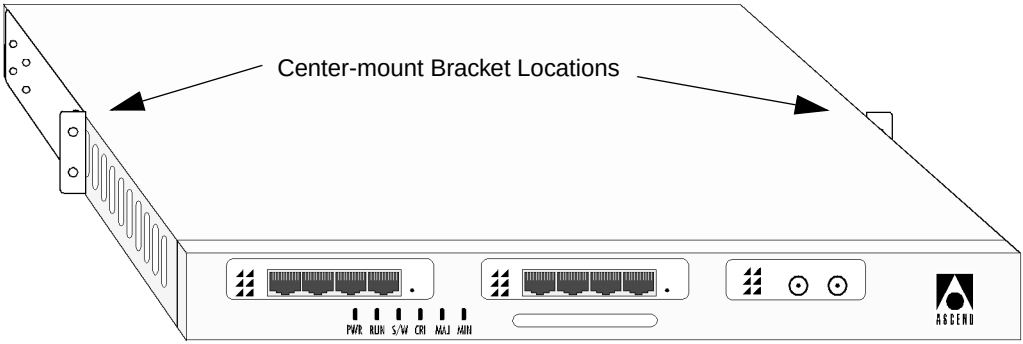

Figure 4-2. Center-mount Bracket Locations (19-inch Brackets Shown)

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 4-9 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 (12 by 18 inches minimum).
- The mounting surface and the mounting hardware are sturdy enough to safely accommodate the weight of the SA 100 (14 pounds 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.

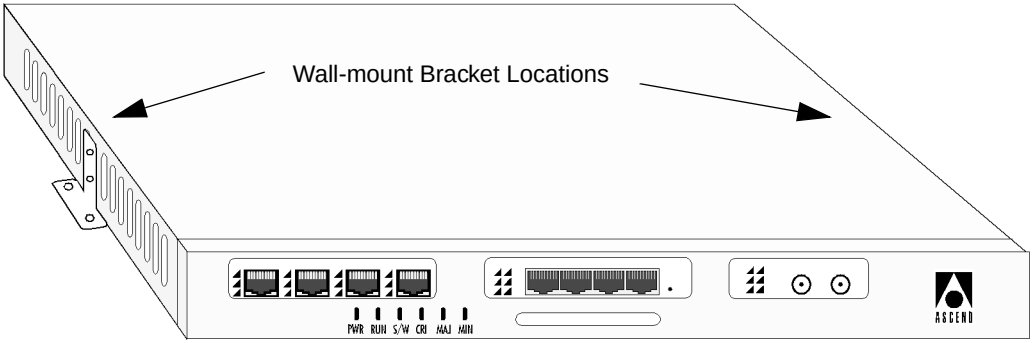

Figure 4-3. Bracket Locations for Wall-Mounting

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 4-9 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.

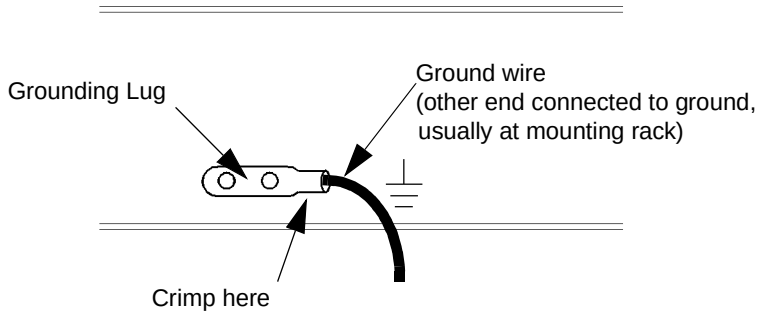

Figure 4-4. Grounding the SA 100

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.

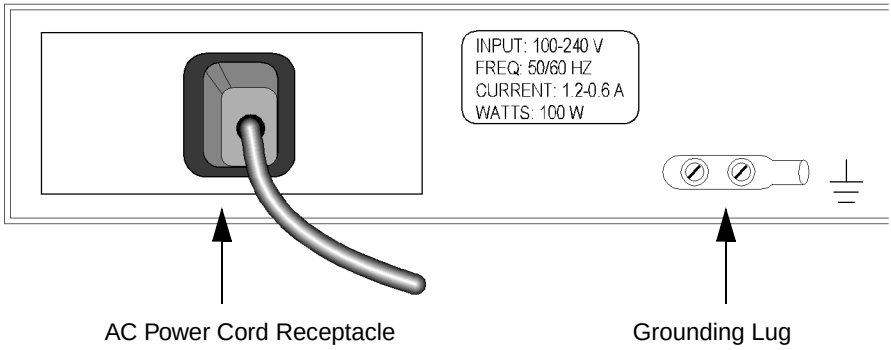

Figure 4-5. AC Connector and Grounding Nuts

2. Install cables to the SA 100 PODs as described in "Connecting CPE and Network Interfaces" on page 4-14.

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 the wires at one end of the cable.
3. Loosen each screw in the Terminal Block Connector. See Figure 4-6.

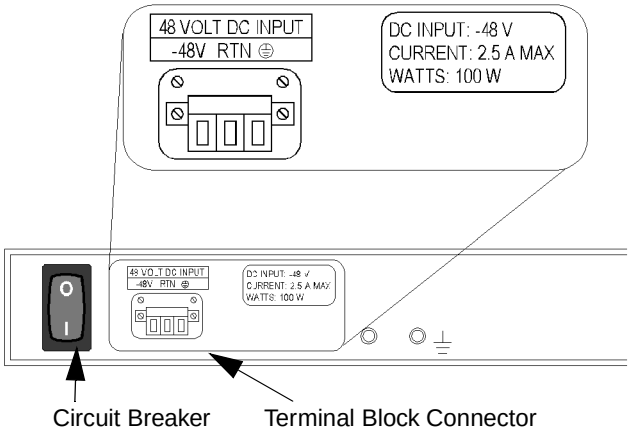

Figure 4-6. Power Switch, Terminal Block Connector, and Grounding Nuts

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 4-14.

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 4-7). 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 4-16.

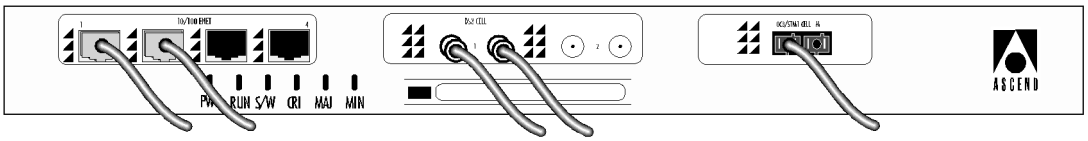

Figure 4-7. Typical POD Connectors (Ethernet, DS3 Cell, and OC-3c/STM-1 Cell PODs Shown)

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-19
DS1 Circuit Emulation	4	RJ-48	See Figure A-18
E1 Circuit Emulation	4	RJ-48	See Figure A-18
DS1 ATM	4	RJ-48	See Figure A-18
E1 ATM	4	RJ-48	See Figure A-18
DS3 ATM	2	75 ohm (BNC)	(not applicable)

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

POD Type	Ports	Connector Type	Pinouts
E3 ATM	2	75 ohm (BNC)	(not applicable)
OC-3c/STM-1 ATM	1 or 2	SC Duplex	(not applicable)
XPODs			
DS1 ATM	1	RJ-48	See Figure A-18
E1 ATM	1	RJ-48	See Figure A-18
DS3 ATM	1	75-ohm (BNC)	(not applicable)
E3 ATM	1	75-ohm (BNC)	(not applicable)
OC-3c/STM-1 ATM	1	SC Duplex	(not applicable)

Making the Management Connections

There are two ways of configuring and managing the SA 100:

- Via WebXtend, its built-in Web browser interface, with the physical connection between host and PC made through an ethernet port
- Via its built-in craft interface, with the physical connection made through the SA 100's craft interface port

The following sections describe how to make connections to the SA 100 for each type of management interface.

Before you use WebXtend for the first time, you must program your SA 100 with the IP address assigned to the node where your SA 100 resides. See "Changing the IP address" on page 2-3 of the SA 100 Network Administrators Guide for instructions.

Making the Ethernet Management Connection

In order to configure and manage the SA 100 via WebXtend, its built-in Web browser interface, you must use one of the ethernet ports of the ethernet IPOD installed in the SA 100.

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 100 and the ethernet interface of the computer you plan to use for Web browser management. Figure 4-8 illustrates this connection.

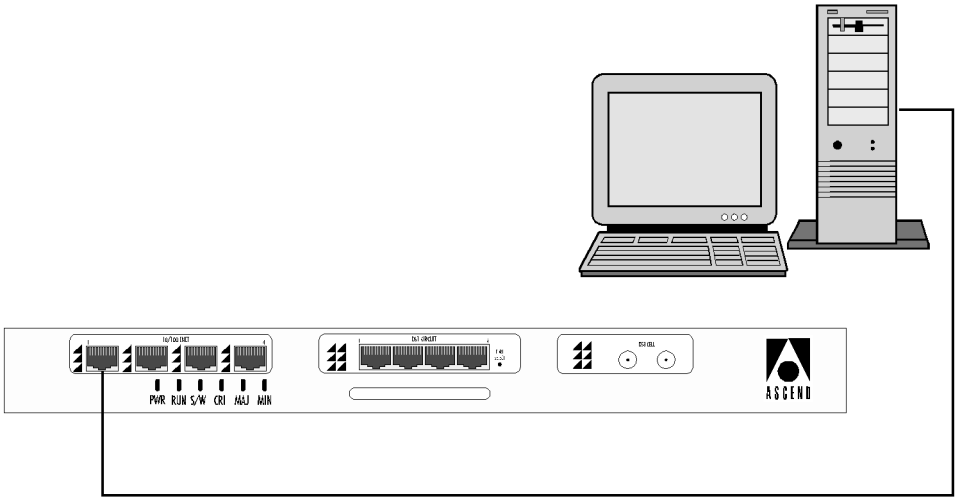

Figure 4-8. Web Browser Interface Connection

Making Craft Interface Connections

To configure and manage the SA 100 via its built-in craft interface, you must use the serial port on its rear panel labeled Console A (see Figure 4-9). 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.

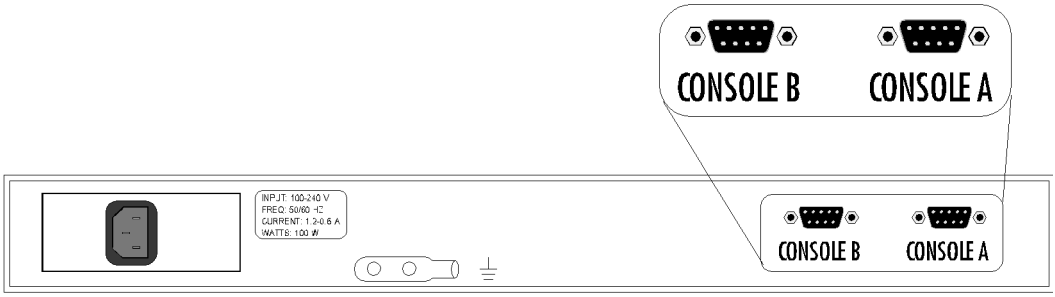

Figure 4-9. Rear Panel Console (Serial) Ports

Connect Console A to a terminal or PC running terminal emulation software using a DB-9M to DB-9F straight-through cable (provided in the SA 100 Accessory Kit).

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	Ground (GND)	Common
6	Data Set Ready (DSR	DCE
7	Request to Send (RTS)	DTE
8	Clear to Send (CTS)	DCE

Table 4-2. Console A Pinout

Pin No.	Signal Designation	Source
9	Ring Indicator (RI)	DCE

To make this connection:

1. Mate the 9-pin connector of the cable with console port A.
2. Tighten the two screws on the flanges of the connector to secure it to the SA 100.
3. Mate the 25-pin connector of the cable the serial port of a VT100 or compatible terminal or a computer running terminal emulation software.
4. After completing the craft interface management connection, you are finished installing the SA 100 hardware.

What's Next?

After completing the hardware installation, you can power on the SA 100 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 100 and determine its operating status. Before you do this, verify that the following steps are complete:

- ☑ Mounting the SA 100
- ☑ Connecting the SA 100 to the appropriate power supply
- ☑ Connecting the SA 100 to the CPE and network interfaces
- ☑ Connecting the SA 100 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.
- PWR turns on and remains on as long as the SA 100 is powered.
- For approximately 15 seconds, the chassis front panel indicators 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.

Status Indicators

The indicators on the front of the SA 100 display the operating state of the ICM, whereas the indicators on the IPODs and XPOD display the operating state of the PODs.

The Web browser management software (WebXtend) reflects the state of each indicator in its graphical representation of the SA 100 front panel. See the SA 100 Network Administrators Guide for details.

SA 100 Chassis Status Indicators

The six status indicators on the front of the SA 100 indicate the state of the unit.

Table 5-1. SA 100 Chassis Front Panel Indicators

Indicator	Name	Color	Description
PWR	Power	green	On when the SA 100 has power.
RUN	Running	green	Blinks to indicate the SA 100 is running.
S/W	Software	green	Blinks to indicate the SA 100 software is running.
CRI	Critical Alarm	red	On when the SA 100 detects a critical alarm.
MAJ	Major Alarm	red	On when the SA 100 detects a major alarm.
MIN	Minor Alarm	yellow	On when the SA 100 detects a minor alarm.

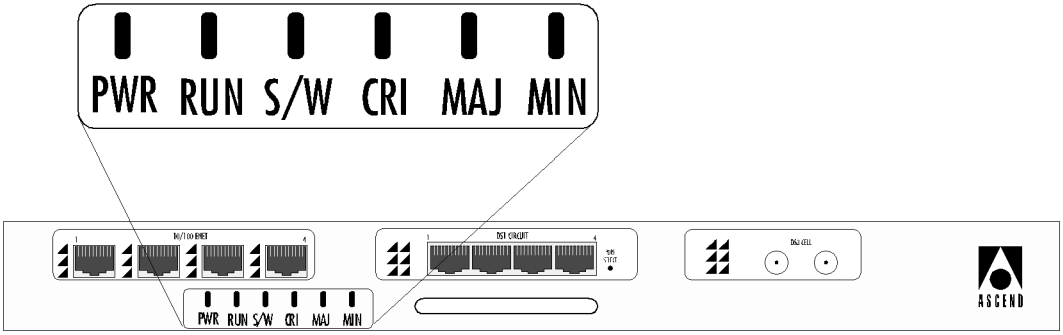

Figure 5-1. SA 100 Status Indicators

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.

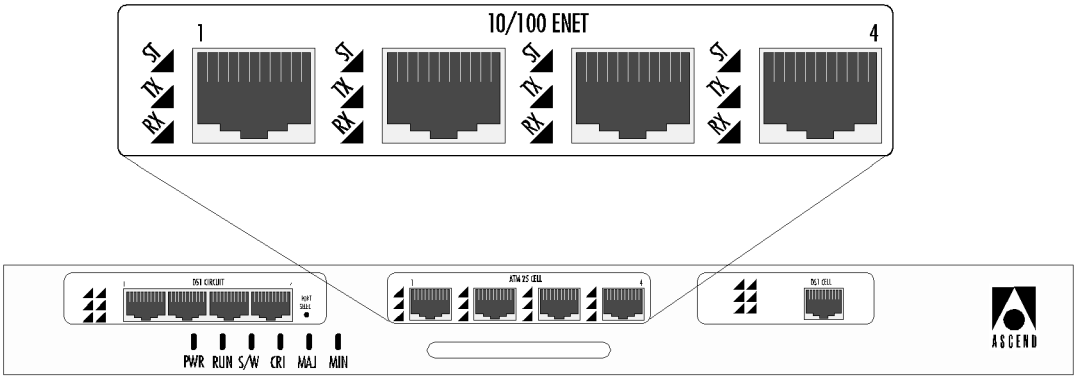

Figure 5-2. Typical POD Status Indicators (DS1 Circuit, Ethernet, and DS1 Cell PODs Shown)

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.

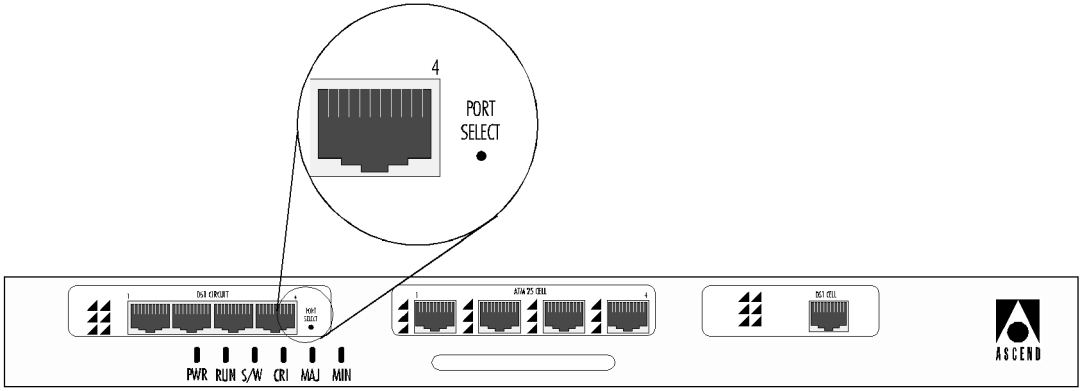

Figure 5-3. Typical Port Select Button

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 100, you can begin configuring and managing it as described in the *SA 100 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 SA 100 modules:

- IPODs (refer to page 6-4)
- XPODs (refer to page 6-8)
- CPODs (refer to page 6-11)
- ICMs (refer to page 6-14)

Required Preliminary Steps

Before removing or installing an SA 100 subassembly:

1. Verify that the network management operator has taken the SA 100 off the network and out of service.
2. Toggle the SA 100 circuit breaker off (DC power supply) or disconnect the AC IEC power cord (AC power supply).
3. Tag all cables to clearly indicate where they are connected to the SA 100 in order to simplify reconnection.
4. Disconnect the SA 100 from CPE and network services by removing the cables from the SA 100 POD connectors.
5. Disconnect the SA 100 from the Web browser management interface computer, if used, by removing its cable from the SA 100 Ethernet POD connector.
6. Disconnect the SA 100 from the craft management interface terminal, if used, by removing its cable from the SA 100 rear panel console connector.
7. If the SA 100 is rack-mounted, you must remove it from its rack.
8. If the SA 100 is wall-mounted, you must remove it from the wall.
9. Place the SA 100 in a static protected work area.
10. 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.

11. 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.

12. 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).

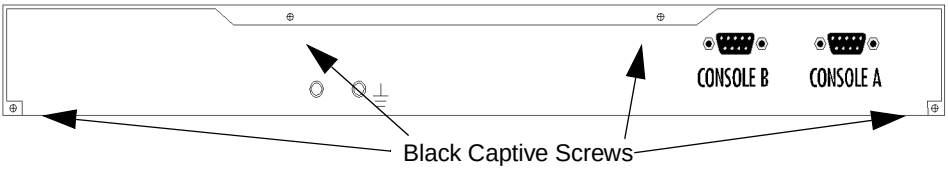

Figure 6-1. Location of Black Captive Screws

    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).

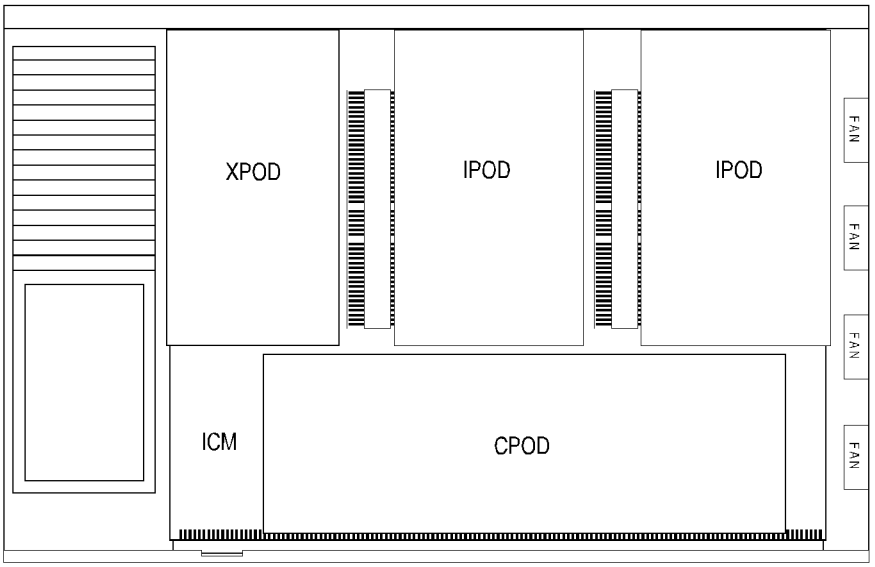

Figure 6-2. SA 100 Field-Replaceable Subassemblies

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 6-3). All of the IPODs and the XPOD must be disengaged from the bezel before it can be removed.

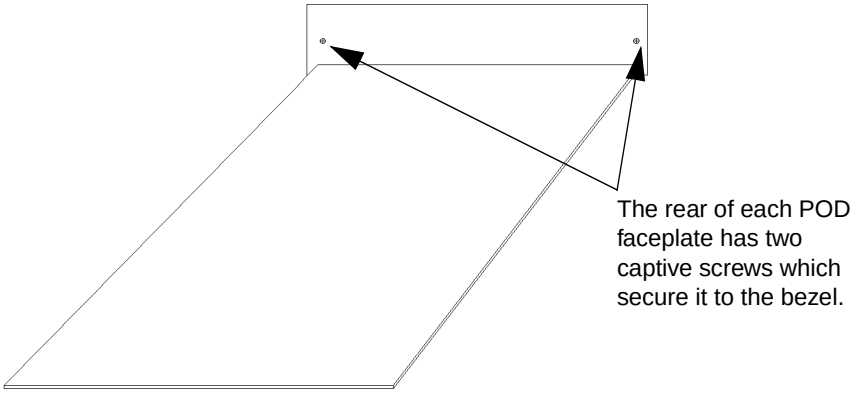

Figure 6-3. POD-Bezel screw locations

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 6-4 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 6-4 for screw locations.

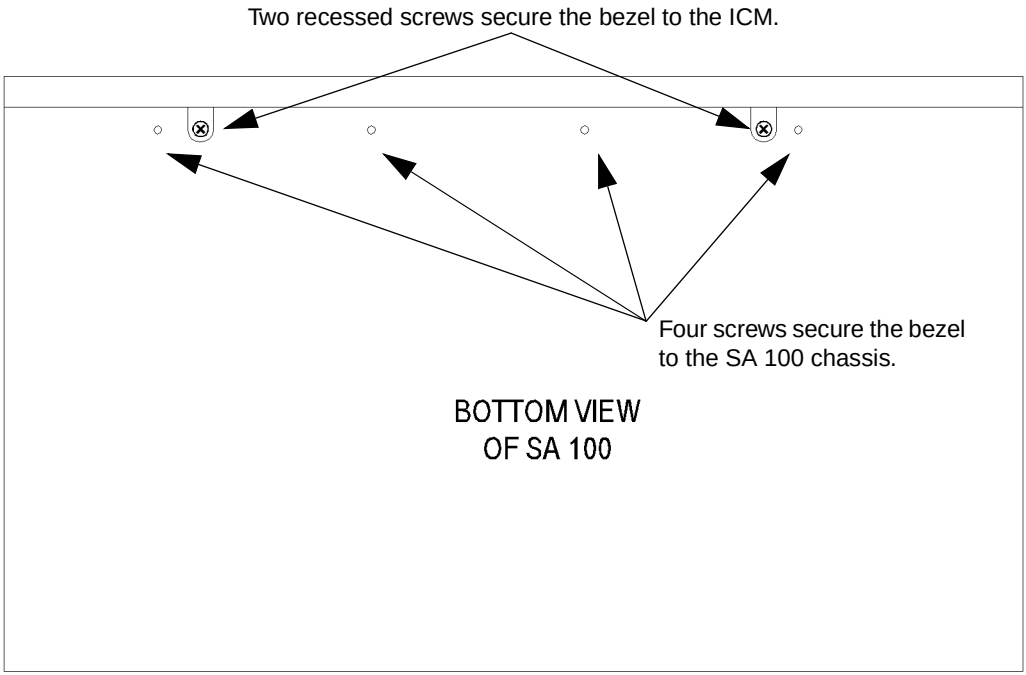

Figure 6-4. Bottom view of SA-100

5. Remove the bezel from the 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 pushing 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 6-5)

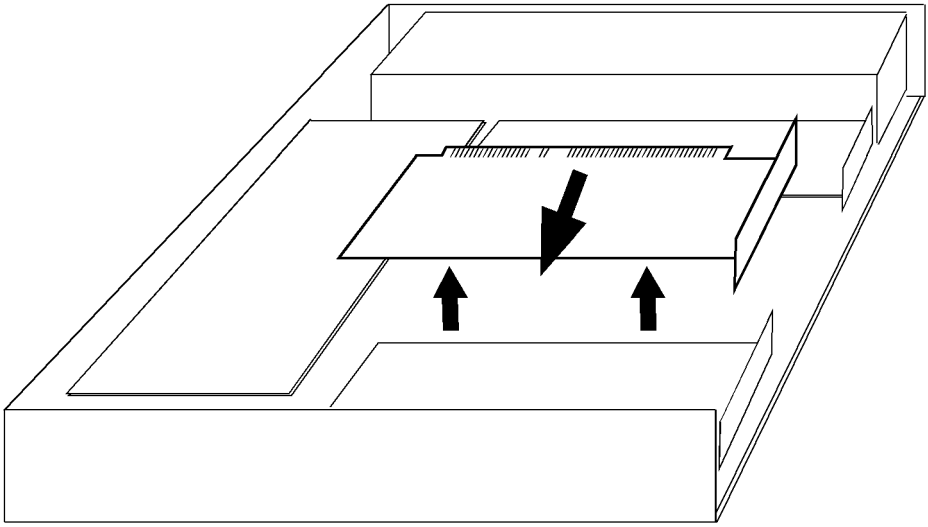

Figure 6-5. Removing the Center IPOD

9. If you are finished removing and installing SA 100 subassemblies, perform the follow-up steps described on page 6-17.

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 6-5).
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, re-tighten 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 6-17.

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 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 6-6). 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.

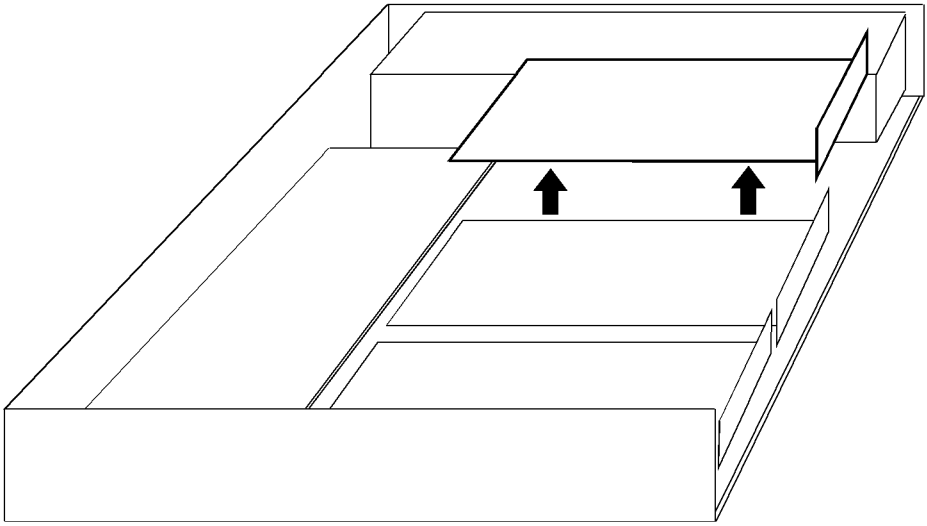

Figure 6-6. Removing the XPOD

7. If you are finished removing and installing SA 100 subassemblies, perform the follow-up steps described on page 6-17.

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 6-6).
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 6-17.

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 6-14 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 6-7).

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.

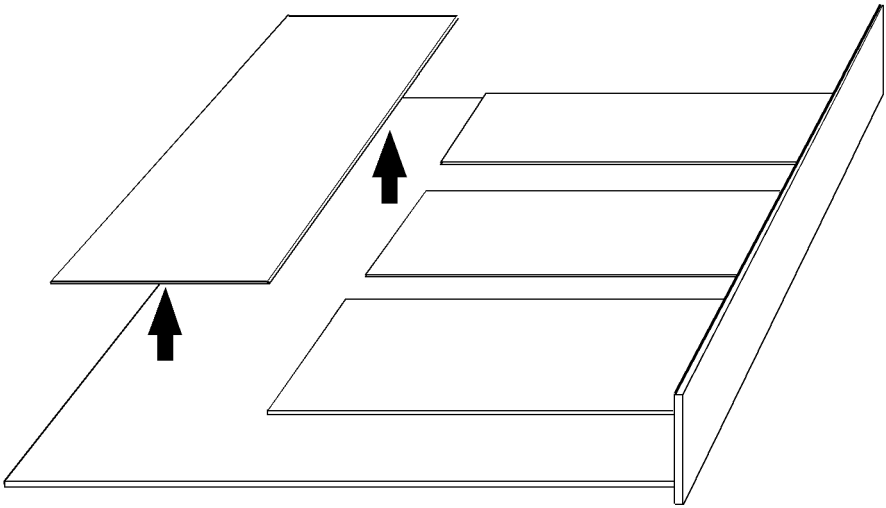

Figure 6-7. Removing the CPOD

5. After removing the CPOD, perform the steps described on the next page to install a replacement 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 6-7). 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 6-17.

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.

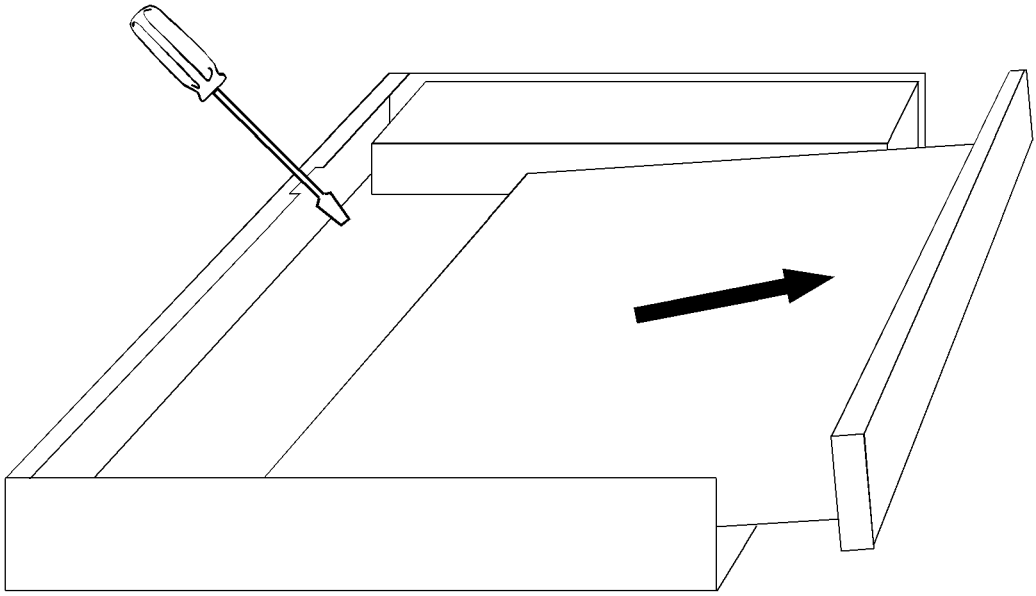

Figure 6-8. Removing the ICM

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 6-17.

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).

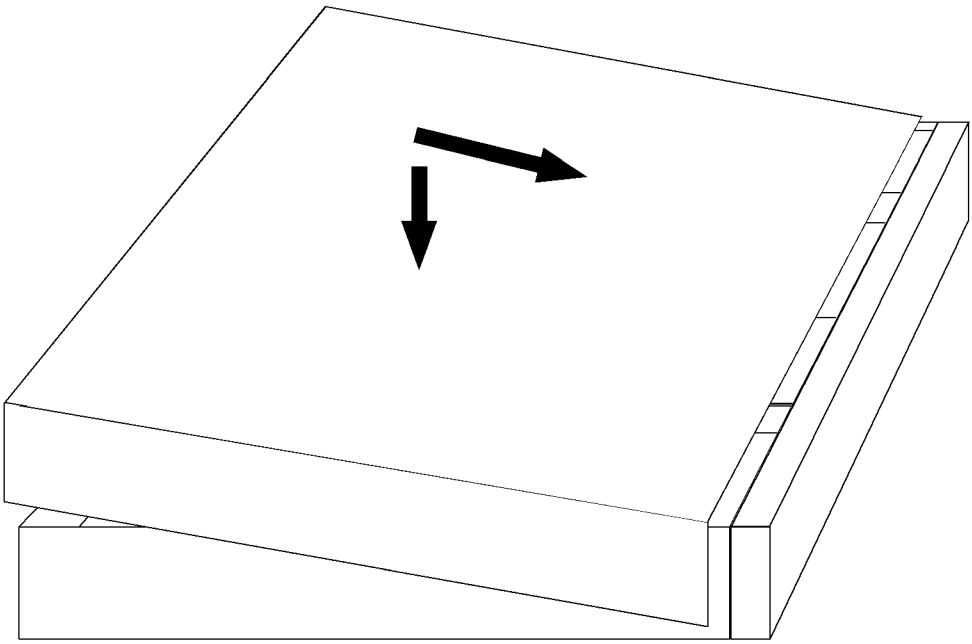

Figure 6-9. Replacing the SA 100 Cover

   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 cables 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 *SA 100 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).

7

Resolving Problems

This chapter describes how to:

- Troubleshoot the SA 100 hardware
- Contact the Ascend Technical Assistance Center, if necessary

To troubleshoot the SA 100 operating system, refer to the *SA 100 Network Administrator's Guide*.

Power-Up Diagnostics

The SA 100 runs diagnostics each time power is applied. The front panel indicators light and blink while the system performs the diagnostics.

If the SA 100 passes all the power-up diagnostics, RUN front panel indicator blinks once per second, while PWR remains lit continuously.

If the SA 100 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(s)
PWR is off	No power to the SA 100	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*

* Contact the Ascend Technical Assistance Center.

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 IPOD and XPOD 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 IPOD and XPOD 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.

Table 7-3. Problems Denoted by Unique IPOD and XPOD Status Indicators (Continued)

Indication	Description	Probable Cause
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 the SA 100. 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)

1-978-952-1299 (outside the U.S., Canada, and United Kingdom)

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

E-mail and Fax

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

- Your name and telephone number
- Name of contact person and their telephone number (if different from you)
- 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 SA 100 IPOD and XPOD currently available:

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

XPODs

ATM DS1 XPOD Enhanced

This XPOD 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 its front panel, Table A-1 describes its front panel indicators and Table A-2 lists its technical specifications.

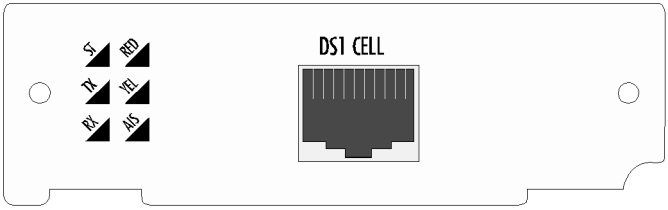

Figure A-1. ATM DS1 XPOD Enhanced Front Panel

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.

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

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 condition (RDI) 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, EN55022, AUSTEL, JATE *Telecom:* FCC Part 68, IC, AUSTEL (pending), JATE (pending) *Safety:* UL per UL1950, CE per EN60950, AUSTEL, IEC950
Interface standard	ANSI T1.102, ANSI T1.107, ANSI T1.403, G.804, TR-TSY-000499
Physical interface	RJ-48 connector (see Figure A-18 for connector pin-outs)

ATM E1 XPOD Enhanced

This XPOD 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 its front panel, Table A-3 describes its front panel indicators and Table A-4 lists its technical specifications.

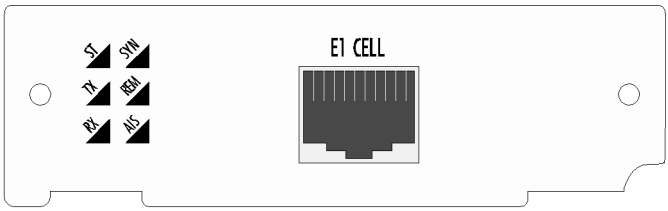

Figure A-2. ATM E1 XPOD Enhanced Front Panel

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.

Table A-3. ATM E1 XPOD 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.

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, EN55022, AUSTEL, JATE (pending) *Telecom:* FCC Part 68, IC, AUSTEL, JATE *Safety:* UL per UL1950, CE per EN60950, AUSTEL, IEC950
Interface standard	ANSI T1.102, ANSI T1.107, ANSI T1.403, G.804, TR-TSY-000499
Physical interface	RJ-48 connector (see Figure A-18 for connector pin-outs)

ATM DS3 XPOD Enhanced

This XPOD 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-3 shows its front panel, Table A-5 describes its front panel indicators and Table A-6 lists its technical specifications.

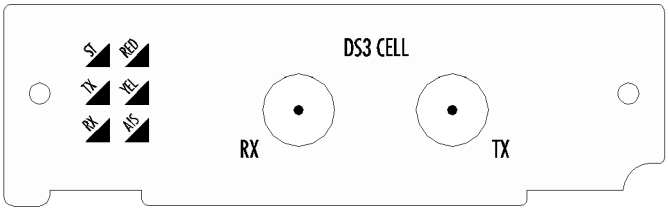

Figure A-3. ATM DS3 XPOD Enhanced Front Panel

Table A-5. 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.

Table A-5. ATM DS3 XPOD Enhanced Front Panel Indicators (Continued)

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 condition (RDI) 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. 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, EN55022, AUSTEL, JATE *Telecom*: FCC Part 68, IC, AUSTEL, JATE (pending) *Safety*: UL per UL1950, CE per EN60950, AUSTEL, IEC950
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

This XPOD 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-4 shows its front panel, Table A-7 describes its front panel indicators and Table A-8 lists its technical specifications.

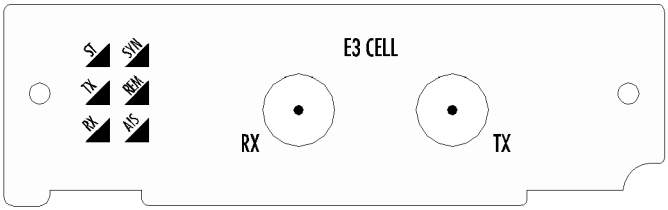

Figure A-4. ATM E3 XPOD Enhanced Front Panel

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-7. 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.

Table A-7. ATM E3 XPOD Enhanced Front Panel Indicators (Continued)

Indicator	Name	Color	Description
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-8. 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, EN55022, AUSTEL, JATE *Telecom*: FCC Part 68, IC, AUSTEL, JATE (pending) *Safety*: UL per UL1950, CE per EN60950, AUSTEL, IEC950
Interface standard	ANSI T1.102, G.703, G.804, G.832, TR-TSY-000499
Physical interface	Two (TX and RX) 75-ohm BNC connectors

Connecting the Receive BNC Negative Signal to Chassis Ground

To connect the receive BNC negative signal to the SA 100 chassis ground:

1. Remove the metal nut and lock washer on the RX BNC connector (shown in Figure A-5).
2. Remove the plastic standoff washer, which serves to isolate the connector from ground.
3. Replace the metal lock washer and nut.

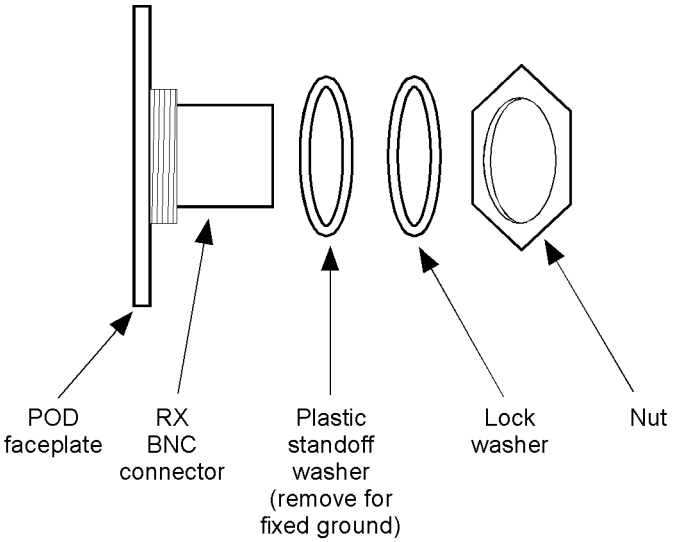

Figure A-5. RX BNC Connector

ATM OC-3c/STM-1 IR Multimode XPOD Enhanced

This XPOD 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. It is available in three models: Intermediate-Reach Multimode, Intermediate-Reach Single-Mode and Long Reach Single-Mode. Figure A-6 shows its front panel, Table A-9 describes its front panel indicators and Table A-10 lists its technical specifications.

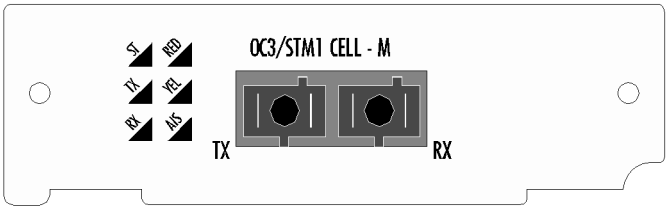

Figure A-6. ATM OC-3c/STM-1 XPOD Enhanced Front Panel

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 A-9. 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.
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 condition (RDI) 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-10. ATM OC-3c/STM-1 XPOD Enhanced Specifications*

Product code	Intermediate-reach, multimode: B750A020100 Intermediate-reach, single-mode: B750A020102 Long-reach, single-mode: B750A020105
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, EN55022, AUSTEL, JATE *Safety*: UL per UL1950, CE per EN60950, AUSTEL, IEC950
Interface standard	ITU I.432, B-ISDN UNI-Physical Layer Specification
Physical interface	SC duplex connector

* Also refer to Table A-33 for physical layer, ATM layer, and optical specifications.

IMA DS1 XPOD

This XPOD provides IMA trunking of up to 4 DS1 ports each running at 1.544 Mbps to achieve a maximum trunk rate of approximately 6.0 Mbps via a 26-pin mini-D style connector. Figure A-1 shows the IMA DS1 XPOD's front panel, Table A-1 describes its front panel indicators and Table A-2 lists its technical specifications.

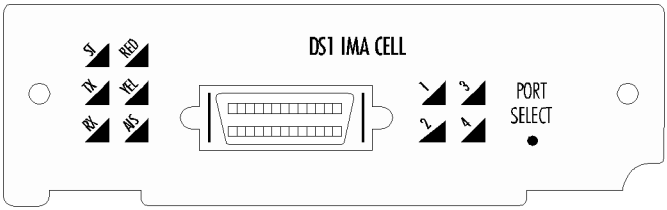

Figure A-7. IMA DS1 XPOD Front Panel

Table A-11. IMA DS1 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 on the indicated port, perhaps due to loss of frame, delineation, or pointer.

Table A-11. IMA DS1 XPOD Front Panel Indicators (Continued)

Indicator	Name	Color	Description
YEL	Yellow Alarm	yellow	On when the POD detects a yellow alarm condition in the received signal on the indicated port, i.e., a remote alarm indication exists in the incoming path, perhaps due to a remote defect indication condition (RDI) 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 on the indicated port. This alarm indicates a service interruption failure due to a loss of signal (LOS), out-of-frame (OOF) condition, or internal equipment failure.
Port Select 1-2-3-4	Port Select	green	The green LED indicates the currently selected port to which the signal indicators pertain. A red LED indicates an alarm condition on the indicated port.

Table A-12. IMA DS1 XPOD Enhanced Specifications

Product code	B750A020175
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*: (pending) *Telecom:* (pending) *Safety:* (pending)
Interface standard	ANSI T1.102, ANSI T1.107, ANSI T1.403, G.804, TR-TSY-000499
Physical interface	26-pin mini-D style connector. See Figure A-20 for pinout.

IMA E1 XPOD

This XPOD provides IMA trunking of up to 4 E1 ports each running at 1.920 Mbps to achieve a maximum trunk rate of approximately 7.6 Mbps via a 26-pin mini-D style connector. Figure A-1 shows the IMA E1 XPOD's front panel, Table A-1 describes its front panel indicators and Table A-2 lists its technical specifications.

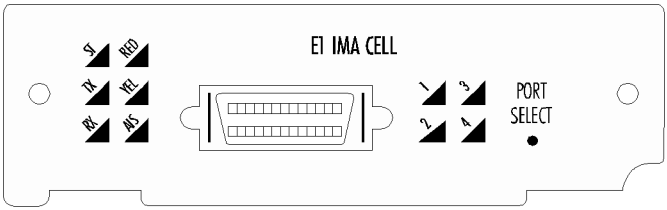

Figure A-8. IMA E1 XPOD Front Panel

Table A-13. IMA E1 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 on the indicated port, perhaps due to loss of frame, delineation, or pointer.

Table A-13. IMA E1 XPOD Front Panel Indicators (Continued)

Indicator	Name	Color	Description
YEL	Yellow Alarm	yellow	On when the POD detects a yellow alarm condition in the received signal on the indicated port, i.e., a remote alarm indication exists in the incoming path, perhaps due to a remote defect indication condition (RDI) 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 on the indicated port. This alarm indicates a service interruption failure due to a loss of signal (LOS), out-of-frame (OOF) condition, or internal equipment failure.
Port Select 1-2-3-4	Port Select	green	The green LED indicates the currently selected port to which the signal indicators pertain. A red LED indicates an alarm condition on the indicated port.

Table A-14. IMA E1 XPOD Enhanced Specifications

Product code	B750A020180
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*: (pending) *Telecom:* (pending) *Safety:* (pending)
Interface standard	ANSI T1.102, ANSI T1.107, ANSI T1.403, G.804, TR-TSY-000499
Physical interface	26-pin mini-D style connector. See Figure A-20 for pinout.

IPODs

Quad 10/100 Ethernet IPOD

This IPOD provides flexible high-speed interfaces for connecting ethernet users to an ATM network and supports wireline speed across the ATM network. It supports 4 ports of 10/100 BaseT via four RJ-48 connectors (provided). It also supports RFC 1483-based tunneling. Figure A-9 shows its front panel, Table A-15 describes its front panel indicators and Table A-16 lists its technical specifications.

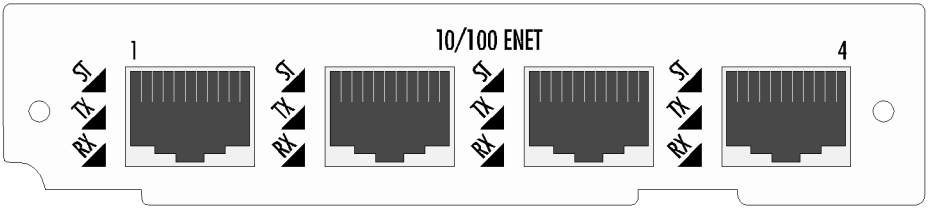

Figure A-9. Quad 10/100 Ethernet IPOD Front Panel

Table A-15. Quad 10/100 Ethernet IPOD Front Panel Indicators

Indicator	Name	Color	Description
ST	POD Status	green	On when the POD is programmed and in service.
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.

Table A-16. Quad 10/100 Ethernet IPOD Specifications

Product code	B750A040120
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, EN55022, AUSTEL, JATE *Safety*: UL per UL1950, CE per EN60950, AUSTEL, IEC950
Physical interface	four RJ-48 connectors (see Figure A-19 for connector pin-outs)

Circuit Emulation Quad DS1 IPOD

This IPOD provides four ports of DS1 structured 1.544 Mbps circuit emulation with an RJ-48 physical connector per port. It supports four ports per IPOD. Figure A-10 shows its front panel, Table A-17 describes its front panel indicators and Table A-18 lists its technical specifications.

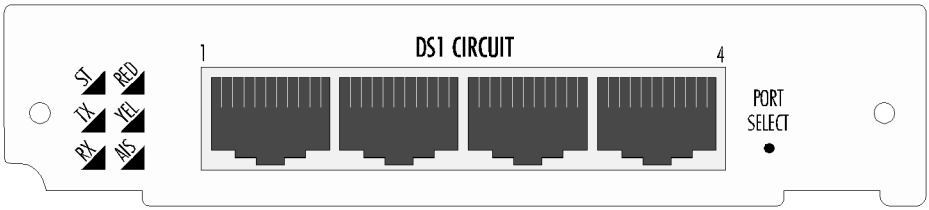

Figure A-10. Circuit Emulation Quad DS1 IPOD Front Panel

Table A-17. 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.

Table A-17. Circuit Emulation Quad DS1 IPOD Front Panel Indicators (Continued)

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 condition (RDI) 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.
(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 push-button).
(lower right corner of port connector)		yellow	On when the link is down for that port.

Table A-18. 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, EN55022, AUSTEL, JATE (pending) *Telecom*: FCC Part 68, IC, AUSTEL, JATE (pending) *Safety*: UL per UL1950, CE per EN60950, AUSTEL, IEC950
Interface standard	ANSI T1.102, ANSI T1.107, ANSI T1.403, G.804, TR-TSY-000499
Physical interface	four-port RJ-48 connector jack (see Figure A-18 for connector pin-outs)

Circuit Emulation Quad E1 IPOD

This IPOD provides four ports of E1 structured 2.048 Mbps circuit emulation with an RJ-48 physical connector per port. It supports four ports per IPOD. Figure A-11 shows its front panel, Table A-19 describes its front panel indicators and Table A-20 lists its technical specifications.

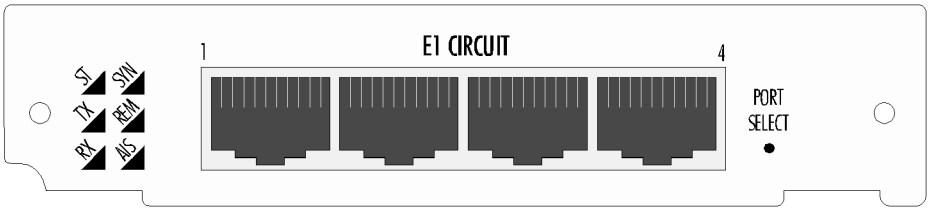

Figure A-11. Circuit Emulation Quad E1 IPOD Front Panel

Table A-19. 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.

Table A-19. Circuit Emulation Quad E1 IPOD 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 push-button).
(lower right corner of port connector)		yellow	On when the link is down for that port.

Table A-20. 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, EN55022, AUSTEL, JATE *Telecom*: FCC Part 68, IC, AUSTEL, JATE (pending) *Safety*: UL per UL1950, CE per EN60950, AUSTEL, IEC950
Interface standard	ANSI T1.102, ANSI T1.107, ANSI T1.403, G.804, TR-TSY-000499
Physical interface	four-port RJ-48 connector jack (see Figure A-18 for connector pin-outs)

ATM Quad DS1 IPOD Enhanced

This IPOD provides a native ATM cell interface and operates at 1.544 Mbps with an RJ-48 DSX-1 interface per port, four ports per IPOD. It includes buffering, enhanced traffic management, and hardware OAM capabilities. Figure A-12 shows its front panel, Table A-21 describes its front panel indicators and Table A-22 lists its technical specifications.

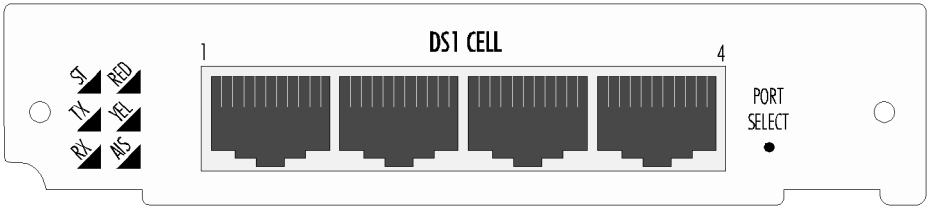

Figure A-12. ATM Quad DS1 IPOD Enhanced Front Panel

Table A-21. 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.

Table A-21. ATM Quad DS1 IPOD Enhanced Front Panel Indicators (Continued)

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 condition (RDI) 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.
(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 push-button).
(lower right corner of port connector)		yellow	On when the link is down for that port.

Table A-22. 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, EN55022, AUSTEL, JATE *Telecom*: FCC Part 68, IC, AUSTEL, JATE (pending) *Safety*: UL per UL1950, CE per EN60950, AUSTEL, IEC950
Interface standard	ANSI T1.102, ANSI T1.107, ANSI T1.403, G.804, TR-TSY-000499
Physical interface	four-port RJ-48 connector jack (see Figure A-18 for connector pin-outs)

ATM Quad E1 IPOD Enhanced

This IPOD provides a native ATM cell interface and operates at 2.048 Mbps with an RJ-48 interface per port, four ports per IPOD. It includes buffering, enhanced traffic management, and hardware OAM capabilities. Figure A-13 shows its front panel, Table A-23 describes its front panel indicators and Table A-24 lists its technical specifications.

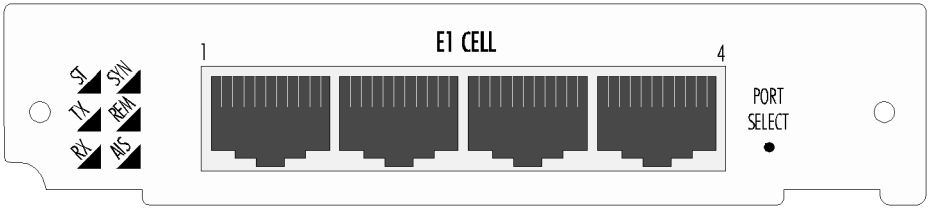

Figure A-13. ATM Quad E1 IPOD Enhanced Front Panel

Table A-23. 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.

Table A-23. ATM Quad E1 IPOD Enhanced Front Panel Indicators (Continued)

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

Table A-24. 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, EN55022, AUSTEL, JATE *Telecom*: FCC Part 68, IC, AUSTEL, JATE (pending) *Safety*: UL per UL1950, CE per EN60950, AUSTEL, IEC950
Interface standard	ANSI T1.102, ANSI T1.107, ANSI T1.403, G.804, TR-TSY-000499
Physical interface	four-port RJ-48 connector jack (see Figure A-18 for connector pin-outs)

ATM DS3 IPOD Enhanced

This IPOD provides dual DS3 interfaces running at 44.736 Mbps with two 75-ohm connections per port, two ports per IPOD. It supports Physical Layer Convergence Protocol (PLCP) and G.804 framing and includes buffering, enhanced traffic management, and hardware OAM. Figure A-14 shows its front panel, Table A-25 describes its front panel indicators and Table A-26 lists its technical specifications.

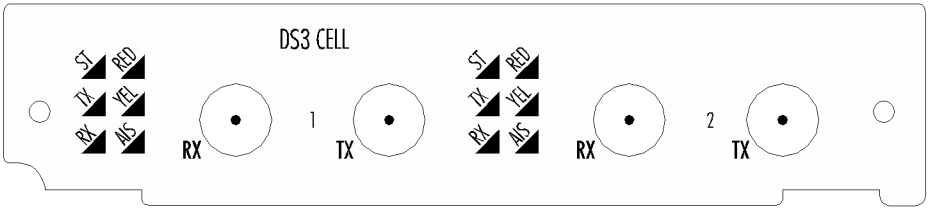

Figure A-14. ATM DS3 IPOD Enhanced Front Panel

Table A-25. 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.

Table A-25. ATM DS3 IPOD Enhanced Front Panel Indicators (Continued)

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 condition (RDI) 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-26. 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, EN55022, AUSTEL, JATE *Telecom*: FCC Part 68, IC, AUSTEL, JATE (pending) *Safety*: UL per UL1950, CE per EN60950, AUSTEL, IEC950
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

This IPOD provides dual E3 interfaces running at 34 Mbps with two 75-ohm connections per port, two ports per IPOD. It supports Physical Layer Convergence Protocol (PLCP) and G.804 framing and includes buffering, enhanced traffic management, and hardware OAM. Figure A-15 shows its front panel, Table A-27 describes its front panel indicators and Table A-28 lists its technical specifications.

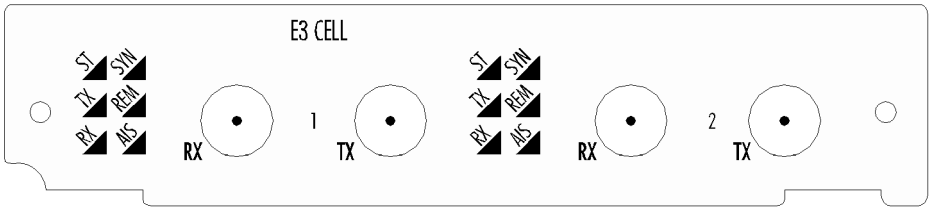

Figure A-15. ATM E3 IPOD Enhanced Front Panel

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-27. 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.

Table A-27. ATM E3 IPOD Enhanced Front Panel Indicators (Continued)

Indicator	Name	Color	Description
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-28. 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, EN55022, AUSTEL, JATE *Telecom*: FCC Part 68, IC, AUSTEL, JATE (pending) *Safety*: UL per UL1950, CE per EN60950, AUSTEL, IEC950
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 OC-3c/STM-1 IPOD Enhanced

This IPOD provides a native ATM cell interface and operates at 155.52 Mbps with a SC duplex connector. It includes buffering, enhanced traffic management, and hardware OAM capabilities. It is available in three models: Intermediate-Reach Multimode, Intermediate-Reach Single-Mode and Long Reach Single-Mode. Figure A-16 shows its front panel, Table A-29 describes its front panel indicators and Table A-30 lists its technical specifications.

Figure A-16. ATM OC-3c/STM-1 IPOD Enhanced Front Panel

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 A-29. 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 condition (RDI) 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-30. ATM OC-3c/STM-1 IPOD Enhanced Specifications

Product code	Intermediate-reach, multimode: B750A040280 Intermediate-reach, single-mode: B750A040275 Long-reach, single-mode: B750A040xxx
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, EN55022, AUSTEL, JATE *Safety*: UL per UL1950, CE per EN60950, AUSTEL, IEC950
Interface standard	ITU-T I.432, B-ISDN UNI-Physical Layer Specification
Physical interface	SC duplex connector

* Also refer to Table A-33 for physical layer, ATM layer, and optical specifications.

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

This IPOD provides a native ATM cell interface and operates at 155.52 Mbps with one SC duplex connector per port. It is available in three models: Intermediate-Reach Multimode, Intermediate-Reach Single-Mode and Long Reach Single-Mode. Figure A-17 shows its front panel, Table A-31 describes its front panel indicators and Table A-32 lists its technical specifications.

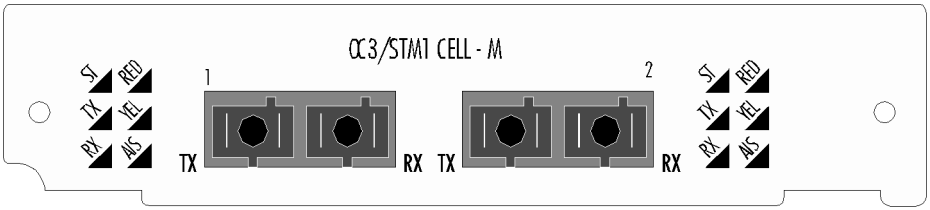

Figure A-17. ATM OC-3c/STM-1 Dual-Port IPOD Basic Front Panel

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 A-31. ATM OC-3c/STM-1 Dual-Port IPOD Basic 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 condition (RDI) 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-32. ATM OC-3c/STM-1 Dual-Port IPOD Basic Specifications

Product code	Intermediate-reach, multimode: B750A040101 Intermediate-reach, single-mode: B750A040100 Long-reach, single-mode: B750A040xxx
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, EN55022, AUSTEL, JATE *Safety*: UL per UL1950, CE per EN60950, AUSTEL, IEC950
Interface standard	ITU-T I.432, B-ISDN UNI-Physical Layer Specification
Physical interface	two SC duplex connectors

* Also refer to Table A-33 for physical layer, ATM layer, and optical specifications.

Connector Jack Pin-Outs

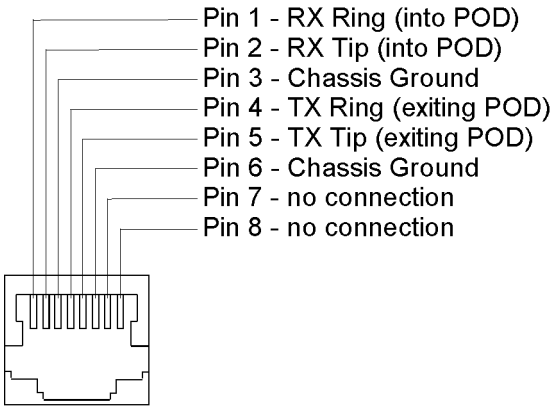

Figure A-18. DS1/E1 XPOD/IPOD RJ-48 Connector Jack Pin-Outs

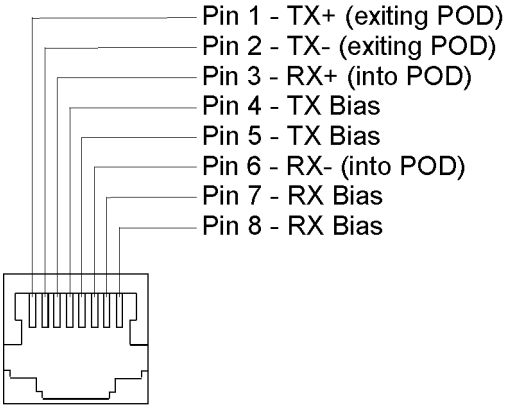

Figure A-19. Ethernet IPOD 8-Position Modular Connector Jack Pin-Out

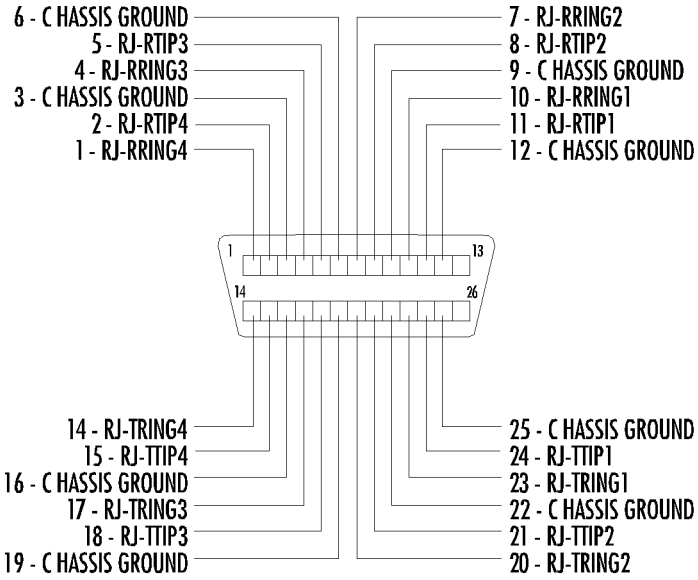

Figure A-20. IMA DS1/E1 XPOD Connector Jack Pin-Out

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

Table A-33. 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

Table A-33. OC-3c/STM-1 XPOD and IPOD Specifications (Continued)

	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
	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 SA 100 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

DB-9 male to DB-9 female straight-through cable connects the SA 100 Console A (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.

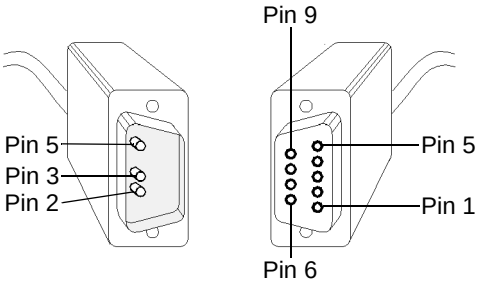

Figure B-1. DB-9 Male to DB-9 Female Straight-Through Cable

Table B-1. DB-9 Male to DB-9 Female Straight-Through Cable Connector Pinouts

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	Ground (GND)	5	Ground (GND)

DB-9 Male to DB-25 Male Crossover Cable

DB-9 male to DB-25 male crossover cable connects the SA 100 Console B (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.

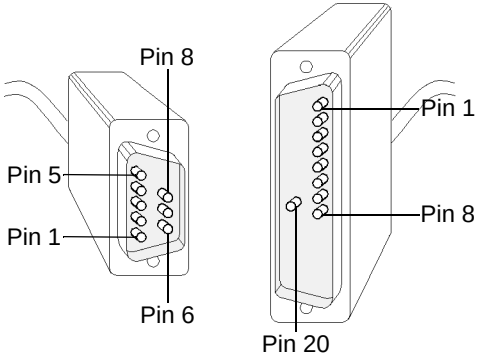

Figure B-2. DB-9 Male to DB-25 Male Crossover Cable

Table B-2. DB-9 Male to DB-25 Male Crossover Cable Connector Pinouts

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	Ground (GND)	7	Ground (GND)

C

Product Codes

Table C-1 lists the Ascend product codes for various SA 100 hardware and software components. Please refer to this table when you place an order.

Table C-1. SA 100 Product Codes

Product Code	Product Description	
SA 100 Chassis		
B650E010110	SA 100 Chassis with 120/240 VAC auto-sensing power supply	
B650E010048	SA 100 Chassis with -48 VDC power supply	
B750A010120	Interface Control Module (ICM) - 12, includes software license and 12 Mbytes RAM (standard). Other configurations may be available — contact your Ascend representative.	
B750A030150	Cell POD 150, full-featured CPOD except that it does not communicate with the backplane, a feature that is not required with the SA 100.	
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	
B750A020100	ATM OC-3c/STM-1 IR 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
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
B750A040280	ATM OC-3c/STM-1 IR Multimode IPOD, Enhanced	1 port
B750A040275	ATM OC-3c/STM-1 IR Single-Mode IPOD, Enhanced	1 port

Table C-1. SA 100 Product Codes (Continued)

Product Code	Product Description	
B750A040101	ATM OC-3c/STM-1 IR Multimode Dual-Port IPOD, Basic	2 ports
B750A040100	ATM OC-3c/STM-1 IR Single-Mode Dual-Port IPOD, Basic	2 ports
B750A040220	ATM DS3 IPOD, Enhanced	2 ports
B750A040221	ATM 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
B750A040150	Circuit Emulation Quad DS1 IPOD	4 ports
B750A040155	Circuit Emulation Quad E1 IPOD	4 ports
SA 100 Documentation		
80053	*SA 100 Hardware Installation Guide*	
80054	*SA 100 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.

Regulatory Standards Compliance

The SA 100 is 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 100 meets the following Country Standards:

- Australia Safety - Austel (contact Ascend Technical Assistance Center for compliance details on individual PODs)
- 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 the SA 100 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. SA 100 FCC Information

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 trouble is experienced with this equipment, please contact Ascend Communications for repair and warranty information. 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
- Sequence in which the trunks are to be connected
- Facility interface codes, by position
- Ringer equivalence number or service code, as applicable, by position

Radio Frequency Interference

The SA 100 is 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 or 1-978-692-2600 (in the USA and Canada)

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

1-978-952-1299 (outside the USA, Canada, and United Kingdom)

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 tolerance
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

F

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.

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 100 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 SA 100 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.

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 100 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 CRC in a frame does not agree with the CRC frame received from the network.

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.

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.

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 SA 100 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 *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 100 subsystem with a cell subsystem and a packet subsystem that switches cells and packets simultaneously.

Interface Protocol Option Device (IPOD)

An SA 100 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*.

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*.

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 100.

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.

payload

The portion of a frame that contains the actual data.

Peak Cell Rate (PCR)

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

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 SA 100 Interface Control Module that translates between flows at multiple levels at up to 200,000 packets per second.

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 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 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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