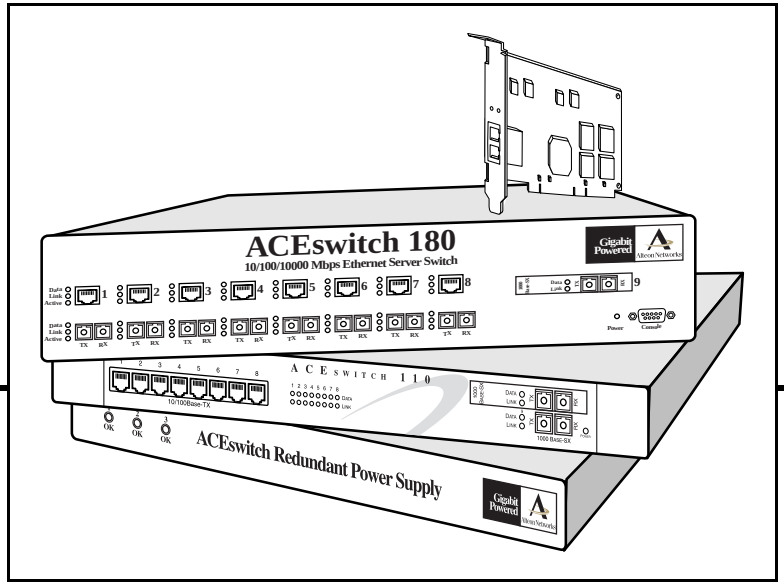
Installation and User's Guide



ACEdirector™ 2

10/100 Session Switch

Part Number: 050030, Revision B

Alteon Networks
THE SERVER SWITCHING COMPANY

50 Great Oaks Boulevard
San Jose, California 95119
408-360-5500 Main
408-360-5501 Fax
www.alteon-networks.com

February 1999

Regulatory Compliance

FCC Class A Notice: This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: 1. This device may not cause harmful interference. 2. This device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the 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 communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Do not make mechanical or electrical modifications to the equipment.

VCCI Class 1: The equipment is Type 1 Data Processing Equipment and is intended for use in commercial and industrial districts. It has been tested and found to comply with VCCI technical requirements for the purpose of protection against electronic interference. When used in residential districts or their peripheral areas, radio, and TV receiver units may be subject to radio interference. The operation should be done in accordance with the Instruction Manual.

CE Notice: The CE mark on this equipment indicates that this equipment meets or exceeds the following technical standards: EN50082-1, EN55022, EN60555-2, EN61000-4-1, EN61000-4-2, EN61000-4-3, EN61000-4-4, and EN61000-4-5.

Safety Information

Caution—Product Contains a Lithium Battery. Batteries are not customer replaceable parts. They may explode if mishandled. Do not dispose of the battery in fire. Do not disassemble or recharge.

Caution—Alteon Networks products are designed to work with single-phase power systems having a grounded neutral conductor. To reduce the risk of electric shock, do not plug Alteon Networks products into any other type of power system. Contact your facilities manager or a qualified electrician if you are not sure what type of power is supplied to your building.

Caution—Not all power cords have the same ratings. Household extension cords do not have overload protection and are not meant for use with computer systems. Do not use household extension cords with your Alteon Networks product.

Caution—Your Alteon Networks product is shipped with a grounding type (three-wire) power cord. To reduce the risk of electric shock, always plug the cord into a grounded power outlet.

Caution—The ACEdirector 2 uses a 3A/250V fast-acting fuse. For continued protection against the risk of fire, replace only with the same type and rating fuse.

Attention—Utiliser un fusible de rechange de meme type.

Nordic Lithium Battery Cautions

(Norge) A D V A R S E L—Litiumbatteri - Eksplosjonsfare. Ved utskifting benyttes kun batteri som anbefalt av apparatfabrikanten. Brukt batteri returneres apparatleverandøren.

(Sverige) VARNING—Explosionsfara vid felaktigt batteribyte. Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren. Kassera använt batteri enligt fabrikantens instruktion.

(Danmark) ADVARSEL! Litiumbatteri - Eksplosionsfare ved fejlagtig håndtering. Udskiftning må kun ske med batteri af samme fabrikat og type. Levér det brugte batteri tilbage til leverandøren.

(Suomi) VAROITUS—Paristo voi räjähtää, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

Taiwan EMC Statement:

警告使用者：
這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

Contents

Preface

This manual describes the features and installation process of the ACEdirector 2 10/100 Session Switch hardware.

For full documentation on configuring and using the switch's many software features (such as Server Load Balancing and Application Redirection), see the *ACElerate Software User's Guide.*

NOTE – The software configuration of the ACEdirector 2 is slightly different from that shown in the *ACElerate Software User's Guide.* See Chapter 4, "Configuring the ACEdirector 2," in this manual for an explanation of any significant differences.

Who Should Use This Book

This manual is intended for network installers and system administrators engaged in configuring and maintaining a network. It assumes that you are familiar with Ethernet concepts, IP addressing, the IEEE 802.1d Spanning-Tree Protocol, and SNMP configuration parameters.

How This Book Is Organized

Chapter 1, "Preparing for Installation," provides a brief overview of the ACEdirector 2, including a description of switch features, ports, and LEDs.

Chapter 2, "Installing the ACEdirector 2," describes how to install the switch, and how to connect network cables.

Chapter 3, "Testing the ACEdirector 2," describes how to connect a terminal for viewing system messages, and provides suggestions for troubleshooting.

Chapter 4, "Configuring the ACEdirector 2," describes any important differences you may find when using the *ACElerate Software User's Guide* to configure the ACEdirector 2.

Appendix A, "Specifications," describes the physical characteristics of the ACEdirector 2.

Contacting Alteon Networks

Use the following information to access Alteon Networks Online, customer support, or sales.

- Web access:

  `http://www.alteon-networks.com`

  This is the URL of Alteon Networks Online Information. This web site includes product information, software updates, release notes, and white papers. The web site also includes access to Alteon Networks Customer Support for accounts under warranty or that are covered by a maintenance contract.

- E-mail access:

  `support@alteon-networks.com`

  E-mail access to Alteon Networks Customer Support is available to accounts that are under warranty or covered by a maintenance contract.

- Telephone access to Alteon Networks Customer Support:

  1-888-Alteon0 (or 1-888-258-3660)
  1-408-360-5695

  Telephone access to Alteon Networks Customer Support is available to accounts that are under warranty or covered by a maintenance contract. Normal business hours are 8 a.m. to 6 p.m. PST.

- Telephone access to Alteon Networks Sales:

  1-888-Alteon2 (or 1-888-258-3662), and press 2 for Sales
  1-408-360-5600, and press 2 for Sales

  Telephone access is available for information regarding product sales and upgrades.

CHAPTER 1

Preparing for Installation

The ACEdirector 2 10/100 Session Switch provides innovative value-added services such as Server Load Balancing and IP Filtering and Redirection, while simultaneously functioning as a 10/100 Mbps network switch. This chapter lists the features of the ACEdirector 2.

Features

- Eight ports selectable between 10 and 100 Mbps Ethernet at half- or full-duplex
- Concurrent Layer 2, Layer 3, and Layer 4 switching
- With ACElerate Server Load Balancing software, thousands of IP address destinations can be hosted on up to 256 load-balanced real servers
- Application Redirection allows the interception and redirection of client IP requests
- Layer 3 IP Routing software forwards frames between subnets
- Layer 3 and Layer 4 Filtering helps you create secure server networks
- Cisco EtherChannel compatible Trunk Groups support, allowing the creation of up to four Trunk Groups each with between two and four configured switch ports
- VLAN support for up to 256 VLANs per switch
- Configuration and management is performed via local console port (DCE), Telnet, or through the ACEview web-based user interface for direct browser-to-switch interaction.
- Command line interface setup facility reduces the initial setup time
- TFTP download to Flash memory for software updates and upgrades
- Switching Processor (SP) capability to learn up to 4095 MAC addresses
- Master Forwarding Database supports up to 8192 MAC address entries per switch
- IEEE 802.1d Spanning-Tree Protocol support
- IEEE 802.3x Flow Control support for full-duplex ports
- IEEE 802.1Q Frame Tagging on all ports when VLANs are enabled
- SNMP support: RFC 1213 MIB-II, RFC 1493 Bridge MIB, RFC 1398 Ethernet-like MIB, RFC 1757 RMON1 (groups 1-4), and RFC 1573 Interface Extensions MIB compliant. Alteon Networks Enterprise MIB supporting the configuration and monitoring of all Alteon Networks specific features.
- Hot Standby Support for L4 Switching

Physical Description

Front Panel

Figure 1-1 ACEdirector 2 Front Panel

The front panel of the ACEdirector 2 has eight RJ-45 ports for connecting 10/100 Mbps Ethernet segments. The ports are auto-negotiating and support half- or full-duplex operation.

Each port has three LEDs. The following table describes the LED states:

Table 1-1 Front Panel Port LEDs

LED	State	Description
Data	Blinking	Data detected on the port
	Off	No data detected on the port
Link	On	Good link
	Off	No link; could be a result of a bad cable or bad connector
	Blinking	Port has been disabled by software
Status	On/Off	Reserved for future functions. Currently same as Link.
All three port LEDs	Flashing in sequence	When no connection is detected on the port, the port LEDs will light in sequence, from the bottom LED to the top.

The green Power LED lights when the ACEdirector is on and receiving proper power.

There is also a female DB-9 serial connector labeled "Console" for the console (DCE) connection to the switch.

Rear Panel

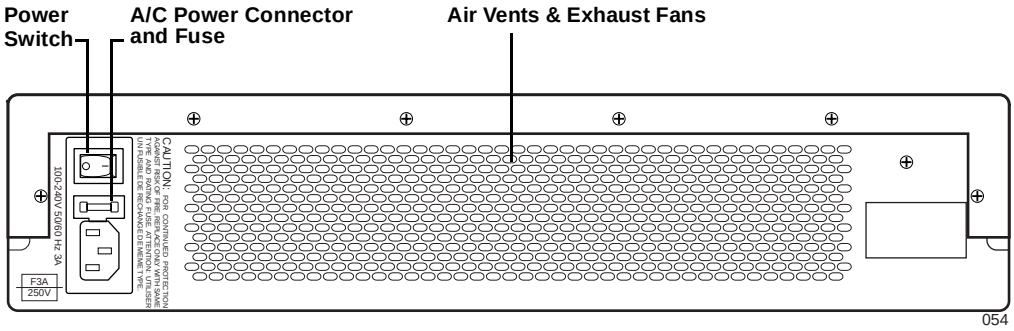


Figure 1-2 ACEdirector 2 Rear Panel

The rear panel of the ACEdirector 2 has the following components:

- A power switch
- A fuse housing
- An A/C power connector

Planning a Network with the ACEdirector 2

The ACEdirector 2 includes a full suite of ACElerate server switching services in software. Some of the more significant software features are outlined below.

NOTE – Switch software features are subject to change. For detailed information about the switch software features, refer to your *ACElerate Software User's Guide*.

ACElerate Server Switching Software

Built-in ACElerate Server Switching software features Server Load Balancing as well as Application Redirection. These features benefit your network in a number of ways:

- Increased efficiency for server utilization and network bandwidth

  With Server Load Balancing, the ACEdirector 2 is aware of the shared services provided by your server pool. The switch can then spread user session traffic among the available servers. For even greater control, traffic is distributed according to a variety of user-selectable rules.

  Redirection further increases network efficiency by storing high-demand HTTP or application data on local servers.

  By helping to eliminate server over-utilization and increasing network bandwidth, important session traffic gets through more easily, reducing user competition for connections on overworked servers.

- Increased reliability of services to users

  With Server Load Balancing, if any server in a service pool fails, the remaining servers continue to provide access to vital applications and data. The downed server can be brought back up transparently.

- Increased scalability of services

  Server Load Balancing lets you scale seamlessly. As users are added and the server pool's capabilities are saturated, new servers can be added to the pool without interrupting access to services.

IP Routing

IP Routing allows the network administrator to seamlessly connect server IP subnets to the rest of the backbone network, using a combination of configurable IP switching interfaces and IP routing options.

Filtering

Layer 3 (IP) and Layer 4 (Application/Protocol) filtering gives the network administrator a powerful tool to protect their server networks. Filters can allow or deny traffic and can optionally log results, based on a variety of user-specified address, protocol, and port criteria.

The ACEvision Web-User Interface

With ACElerate Switching Software (Release 4.0 and higher), the network administrator may access all switch configuration and monitoring functions through ACEvision, a web-based switch management interface. ACEvision has all of the same configuration and monitoring functions as the command-line interface, with an intuitive and easy-to-use interface structure.

Port Trunk Groups

Ports in a trunk group combine their bandwidth to create a single, larger virtual link. Trunk connections support third-party devices such as Cisco routers and switches with EtherChannel technology, and Sun's Quad Fast Ethernet Adapter.

VLANs

Virtual Local Area Networks (VLANs) are commonly used to split up groups of network users into manageable broadcast domains, to create logical segmentation of workgroups, and to enforce security policies among logical segments.

The ACEdirector software (Release 2.0 or greater) supports up to 256 VLANs per switch. IEEE 802.1Q VLAN *tagging* is also supported to allow multiple VLANs per port, and to provide standards-based VLAN support for Ethernet systems.

See the *ACElerate Software User's Guide* for implementation details.

RFC 1573 Interface Extension MIB Compliance

Without the RFC 1573 MIB, high-speed LAN technologies such as Fast Ethernet and Gigabit Ethernet can cause frame and octet counters within the MIB-II interface to roll over in a short period of time, ruining their statistical significance.

The ACEdirector software, version 2.0 and greater, supports the RFC 1573 MIB. This IF Extensions MIB allows for higher speed networking environments, providing 64-bit counters on many MIB-II statistics, plus roll-over counters for 32-bit counters.

Spanning Tree

When Spanning Tree is enabled on the switch it detects and eliminates logical loops in a bridged or switched network. When multiple paths exist, Spanning Tree configures the network so that a switch uses only the most efficient path. If the path fails, Spanning Tree automatically sets up another active path on the network to sustain network operations.

802.3x Flow Control

The ACElerate software supports 802.3x flow control on a per-port basis, on full duplex links. 802.3x flow control provides a mechanism for Ethernet end-stations or networking devices to signal a neighbor on a full-duplex link to pause the data transmission for a short period of time. Flow control provides rudimentary capabilities for allowing a device to temporarily suspend data reception so that it can handle any data already in queues.

Port Mirroring

Port mirroring provides a powerful network debugging tool. When this feature is configured, network packets being sent and/or received on a target port are duplicated and sent to a monitor port. By attaching a network analyzer to the monitor port, you can collect detailed information about your network performance and usage.

Alteon Networks SNMP MIB

All configuration and monitoring data is now accessible via an enterprise Alteon Networks MIB, which can be compiled into MIB-based systems such as HP-OpenView.

RMON Lite Support

The ACEdirector 2 provides support to RMON applications for collecting and presenting information about your network performance. Through the use of an RMON console application (available separately), you can access the following switch performance information:

- EtherStats: Real-time counters for packet and octet rates, error rates, and frame size distribution.
- History: If enabled, this option saves periodic measurements of the EtherStats in switch memory. These performance snap-shots can then be retrieved and displayed by your RMON application.
- Alarms and Events: Measures special user-selected conditions of which the administrator wishes to be informed (such as excessive FCS errors or high broadcast rates).

CHAPTER 2

Installing the ACEdirector 2

This chapter tells you how to install the ACEdirector 2. It also gives suggestions for trouble-shooting.

The ACEdirector 2 is shipped with the following items:

- An A/C power cord
- Two mounting brackets (for rack mounting)
- Four rubber feet (for tabletop placement of the switch)
- Six Phillips screws for installing the mounting brackets

Switch installation involves these tasks:

- Unpacking the switch
- Mounting the switch
- Connecting the power cord and plugging it into a power outlet
- Connecting network cables to the switch
- Powering on the switch

Preparing for Installation

Before installing the ACEdirector 2:

1. **Unpack the switch from the box.**
2. **Turn the power switch to the OFF (O) position.**
3. **Choose a suitable location to install the switch.**

CAUTION—Observe the following precautions when selecting a site and installing the switch:

The ambient temperature of an operating ACEdirector 2 must not exceed 40°C. When installing the switch in a closed or multi-unit rack assembly, please consider that the operating ambient temperature of the switch may be higher than the ambient temperature of the room. Take any appropriate steps to ensure that the switch does not overheat.

For proper air circulation, the vents on the front, back, and sides of the switch should not be blocked or obstructed by cables, panels, rack frames, or other materials.

Do not place or rack-mount the switch in any way which would exceed the maximum weight bearing capacity of the surface or rack, or which would cause potentially hazardous uneven mechanical loading.

Avoid overloading your electrical supply circuits. Electrical ratings are printed on all your equipment. Be sure that your supply circuits and wiring can support the rated power draw of whatever equipment is used.

Make sure the equipment is properly grounded electrically, and that power connections are safe, particularly when using power strips.

ACEdirector 2 Installation Procedure

1. **Always observe the precautions outlined in the manuals for this and all other equipment you are installing (see above).**

2. **Determine where the unit will be mounted from the following options:**

   - To mount the unit into an equipment rack, connect the two mounting brackets to the switch using the supplied screws as shown in Figure 2-1, and install the switch as shown in Figure 2-2 using the appropriate screws for your rack-mount system (four 10-32, 12-24, M5X.8-6H, or M6X1-6H type screws).

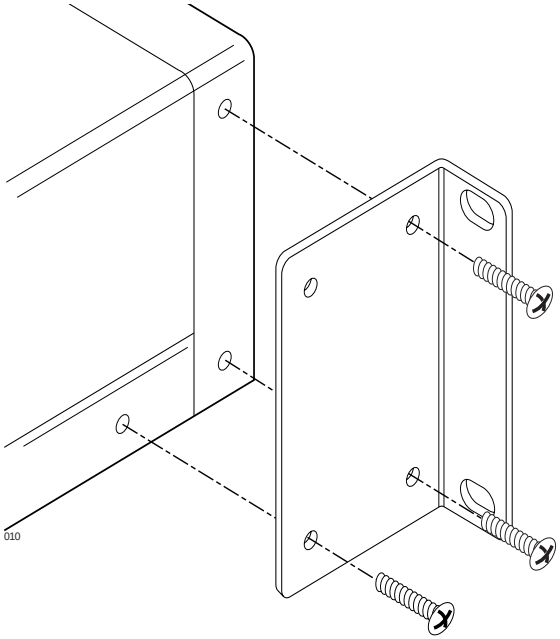


Figure 2-1 Position Mounting Brackets for Rack Mount

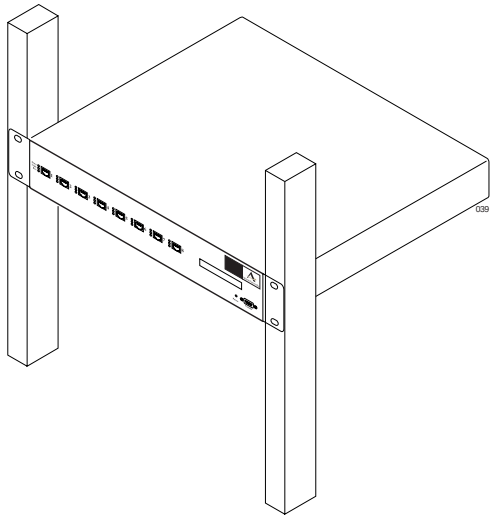


Figure 2-2 Rack Mounted ACEdirector 2

- To place the unit on a tabletop, attach the four rubber feet to the bottom of the switch.

NOTE – Do not use the rubber feet for a rack mount installation.

---

3. **Connect the power cord to the ACEdirector 2, verify that the power switch is in the off position, and plug the cord into a properly fused outlet.**

CAUTION—The switch uses a 3A/250V fast-acting fuse. For continued protection against risk of fire, replace only with the same type and rating fuse. French: *Attention–Utiliser un fusible de rechange de meme type.*

---

4. **Connect the Ethernet cables to the switch.**

   See "Connecting Cables to Network Ports" on page 2-5 for specifics.

5. **Power on (|) the switch.**

NOTE – All three LEDs will flash in an animated sequence on any port where no connection is detected on the jack. This is normal behavior, and indicates that the switch is ready to detect port connections.

Connecting Cables to Network Ports

The RJ-45 jacks are used for connecting 10/100 Mbps Ethernet segments. All ports are auto-negotiating and support half- and full-duplex operation. The port LEDs light to indicate various port connection conditions (see Table 1-1 on page 1-2).

Use a straight-through cable on the 10/100 Mbps ports if the device attached to the port is a computer. If the device is a switch, hub, or router, use a crossover cable. See Figure 2-3 for cabling details. You can use a straight-through cable with a switch, hub, or router if it has an "uplink" enable/disable switch that you can set.

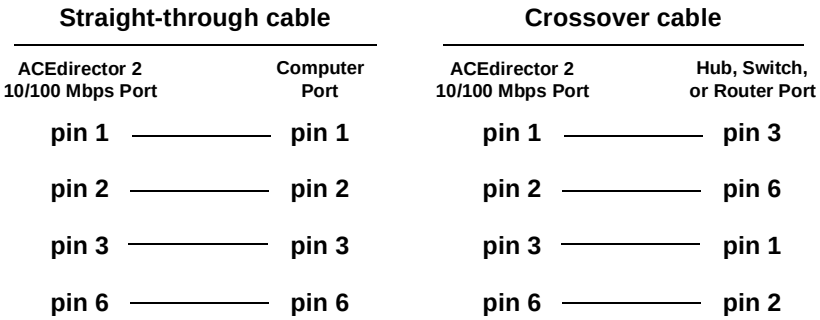


Figure 2-3 Pin assignments for 10/100 Mbps port cables

CHAPTER 3

Testing the ACEdirector 2

The ACEdirector 2 console port is used for receiving important system information and for configuring the switch. This chapter explains how to connect a terminal to collect system information. For instructions on using the console to view and configure switch settings, see Chapter 4, "Configuring the ACEdirector 2" and also the *ACElerate Software User's Guide.*

Connecting a Terminal to the Switch

To establish a console (DCE) connection with the ACEdirector 2, the following is required:

- An ASCII terminal or a computer running ASCII terminal emulation software set to the parameters shown in Table 3-1.

Table 3-1 Console Configuration Parameters

Parameter	Value
Baud Rate	9600
Data Bits	8
Parity	None
Stop Bits	1

- A standard serial cable with a male DB9 connector (see Table 3-2).

Table 3-2 Pinouts for DB9 Serial Connector

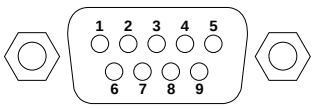
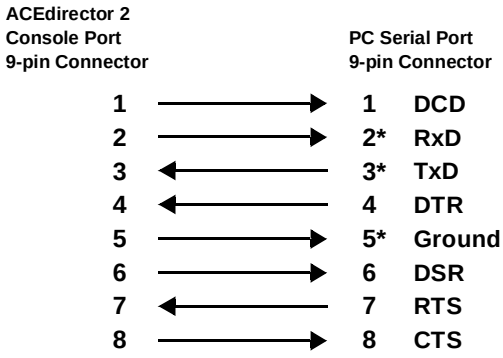
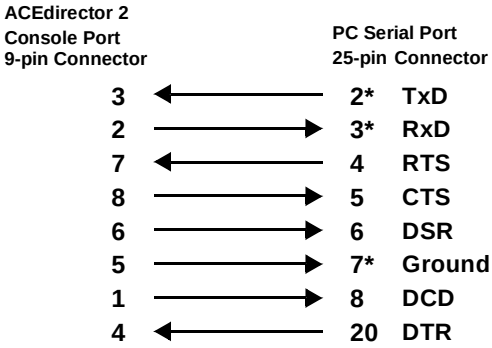
DB9 Serial Connector	Pin	Description
	1	DCD
	2	RxD
	3	TxD
	4	DTR
	5	Ground
	6	DSR
	7	RTS
	8	CTS
	9	Not used

Figure 3-1 and Figure 3-2 show the pin assignments for the console to use to configure serial cables to terminal connectors with 9-pin or 25-pin connectors.



Note: Only the pins for RxD, TxD, and Ground are required.

Figure 3-1 9-pin to 9-pin Connector Pin Assignments



Note: Only the pins for RxD, TxD, and Ground are required.

Figure 3-2 9-pin to 25-pin Connector Pin Assignments

Establishing a Console Connection

1. **Connect the terminal to the Console port using the serial cable.**
2. **Power on the terminal.**
3. **To establish the connection, press <Enter> a few times on your terminal.**
4. **Enter the password when prompted.**

   The default administrator password is `admin`. Once your password is verified, the Main menu is displayed. For instructions on using the menus to configure the switch, see Chapter 4, "Configuring the ACEdirector 2" and also the *ACElerate Software User's Guide*.

Troubleshooting

This section contains information about possible problems that may occur or error messages that might display if the switch is not properly installed or configured.

Link LED Does Not Light

Symptom: The "Link" LED (green) does not light. When you check the Link state (see the *ACElerate Software User's Guide*), the status is reported as "down."

Cause: A port configuration mismatch between two devices or a cable problem.

- Port configuration mismatch. If the switch port is configured with a specific speed or duplex mode (for example, 100 Mbps, full duplex) check to see that the other device is set to the same configuration. If the switch port is configured to auto-negotiate, check to see that the other device is also set to auto-negotiate. Refer to the *ACElerate Software User's Guide* for more information about setting speed and mode.
- Cable problem. Make sure you are using the correct type of cable to connect the switch to other devices. Refer to Figure 2-3 for information about crossover cables for connecting switches, hubs, or routers to the ACEdirector 2.

Temperature Sensor Error Message

The following message is displayed on the console if the ACEdirector 2 temperature exceeds the temperature threshold. Immediate attention is required.

```
Temperature at sensor xxx exceeds threshold
Current temperature is xx °C   Threshold is xx°C
```

Actions:

- Make sure that the air circulation vents on the front, back, and sides of the switch are free from obstruction by cables, panels, rack frames, or other materials.
- Make sure that all four cooling fans inside the switch are running. The fans are located behind the ventilation grill at the rear of the switch. The exhaust from all four fans should be blowing outward with roughly equal air pressure (although it is normal for the exhausts to have different temperatures). You can also use a flashlight to check whether the fan blades are moving. If any fan stops during switch operation, contact customer support.
- Remember that units in a closed or multi-unit rack assembly may have an operating ambient temperature higher than the ambient temperature of the room. The ambient temperature of an operating ACEdirector 2 must not exceed 40°C. If the operating ambient temperature cannot be lowered before this maximum is reached, turn off the switch and let it cool.
- It may be necessary to cool the room to a lower temperature or provide a fan for greater air circulation. Resolve the room's cooling and circulation problems before turning the switch back on.

CHAPTER 4

Configuring the ACEdirector 2

Instructions on using the console port to view and configure switch software settings are contained in the *ACElerate Software User's Guide.*

NOTE – Although the operation of the ACEdirector 2 is similar to the ACEswitch 180, some commands and menu screens for the ACEdirector 2 may not appear exactly as shown in the *ACElerate Software User's Guide.*

The following text defines the major differences for configuration between the ACEdirector 2 and ACEswitch 180.

Additional Features

ACElerate Software for Layer 4 Server Load Balancing and Application Redirection is included as a standard feature on the ACEdirector 2. There is no need to purchase optional software or to activate it by entering a software key password.

Limitations

The following features discussed in the *ACElerate Software User's Guide* are not supported by the ACEdirector 2 at this time:

- Gigabit Ethernet ports 9 and 10 (SC fiber-optic ports)
- Server Dual Homing

APPENDIX A

Specifications

Supported Standards

- Spanning Tree Protocol (IEEE 802.1d)
- Logical Link Control (IEEE 802.2)
- 10Base-T/100Base-TX (IEEE 802.3, 802.3u)
- Flow Control (IEEE 802.3x)
- Frame Tagging (IEEE 802.1Q) on all ports when VLANs are enabled
- RMON (RFC 1757, groups 1-4)
- SNMP (RFC 1213 MIB-II, RFC 1493 Bridge MIB, RFC 1398 Ethernet-like MIB, RFC 1573 Interface Extensions MIB compliant)

Port Specifications

Port	Connector	Media	Maximum Distance
10Base-T	RJ-45	Cat. 3, 4, or 5 UTP	100 meters (325 feet)
100Base-TX	RJ-45	Cat. 5 UPT	100 meters (325 feet)
Console (DCE)	Female DB-9	RS-232C (serial)	25 meters (80 feet)

Physical Characteristics

Characteristic	Measurement
Width	43.18 cm (17.00 inches) (Standard 19" EIA rack mountable)
Height	8.81 cm (3.47 inches)
Depth	45.72 cm (18.00 inches)
Weight	8 kg (18 lb)

Power Requirements

Specification	Measurement
Auto-ranging power supply	100-240VAC @ 50-60 Hz, 3A
Maximum power consumption	80 Watts 3A @ +5VDC

Environmental Specifications

Condition	Operating Specification	Storage Specification
Temperature	0° to 40° C (+32° to +104° F)	–40° to +85° C (–40° to +185° F)
Relative humidity	5 to 85% non-condensing (40° C, 16 hour dwells at extremes)	5 to 95% non-condensing 10° C/hour
Altitude	up to 3,050 meters (10,000 feet)	up to 10,750 meters (35,000 feet)
Shock	10g, 1/2 sine wave, 11 msec	60g, 1/2 sine wave, 11 msec
Vibration, peak to peak displacement	0.005 in. max (5 to 32 Hz)	0.1 in. max (5 to 17 Hz)
Vibration, peak acceleration	0.25g (5 to 500 Hz) (Sweep Rate = 1 octave/minute)	0.25g (5 to 500 Hz) (Sweep Rate = 1 octave/minute)

Certifications

Category	Compliance
Emmisions	FCC, CFR 47 Part 15, Subpart A ANSI C63.4D11.4 1991 FCC OST 55 VCCI Class 1 CISPR 16, CISPR 22 CSA C108.8-M1983 (R1989) EN55022 CE EN6100-3-2, EN60555-2
Safety	UL 1950, CUL DIN/VDE 0805 CSA 22.2, No. 950-93 IEC 950 EN 60950 TUV EMKO-TSE (74-SEC) 207/94 Nordic Deviations to EN 60950