

Accton

Making Partnership Work

CheetahSwitch Workgroup-3726M

Quick Installation Guide



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*Intelligent/Stackable Fast Ethernet Switch
with 24 10BASE-T / 100BASE-TX (RJ-45) Ports,
and Optional Media Expansion and Stack Modules*



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Contents

Introduction	1
Installing the Switch	2
Package Contents	2
Description of Hardware	2
Mounting the Switch	3
Stacking Switches on a Flat Surface	3
Mounting Switches in a Rack	4
Installing a Management Module	4
Installing Optional Media and Stacking Modules	4
Connecting to the Stack's Backplane	5
Connecting the Switch System	6
Making a Connection to an RJ-45 Port	6
Connecting to a 100BASE-FX Port	7
Connecting to a Gigabit Fiber Optic Port	7
Powering On the Switch	8
Verifying Port Status	9
Verifying System Operation	9
Applications	10
Product Specifications	11
Base Unit	11
Physical Characteristics	11
Switching Criteria	12
Traffic Control	12
Modules	12
Management Module (AC-ES3726M-AGENT)	12
100BASE-FX Module (EM3582-FX-SC)	12
1000BASE-SX Module (EM4582-SX-SC)	13
1000BASE-LX Module (EM4582-LX-SC)	13
Stacking Module (EM3580-STACK)	13
Troubleshooting	13
Diagnosing Switch Indicators	13
Power and Cooling Problems	14
Installation	14
Port and Cable Assignments	15
RJ-45 Port Description	15
Straight-Through Wiring	15
Crossover Wiring	15
EMI Certification	16
FCC Class A Certification (USA)	16

Contents

Canada Department of Communications - Class A	16
BSMI Class A (Taiwan)	16
VCCI Class A Compliance (Japan)	16
CE Mark Declaration of Conformance for EMI and Safety (EEC)	17
Safety Compliance	18
Warning: Fiber Optic Port Safety	18
Avertissement: Ports pour fibres optiques - sécurité sur le plan optique	18
Warnhinweis: Faseroptikanschlüsse - Optische Sicherheit	18
Underwriters Laboratories Inc. (USA)	18
Wichtige Sicherheitshinweise (Germany)	19
Optional Hardware Modules	20

Introduction

The CheetahSwitch Workgroup-3726M is perfect for moving workgroups from conventional 10 Mbps Ethernet to multiple-segment 100 Mbps Fast Ethernet, and for consolidating your network equipment into a single, clean, efficient, and super-fast switch stack. This switch system delivers dedicated 100 Mbps links to each attached LAN segment (independent collision domain) or to any PC attached directly to the stack – all with conventional cabling and adapters. It completely eliminates the bottlenecks of shared 10 Mbps Ethernet networks by providing a wide bandwidth of up to 8.8 Gbps per switch, and a stack backplane that can operate at up to 9.6 Gbps. This makes it ideal for increasing the throughput of interconnected Ethernet and Fast Ethernet hubs or server farms.

This switch includes three slots on the rear panel for various modules:

- The upper slot is for an SNMP/RMON Management Module. The stack supports only one management agent.
- The lower right slot is for optional media expansion modules, including a dual-port 100 Mbps fiber optic module that can be connected to a remote site up to 2 kilometers (1.24 miles) away, or a single-port Gigabit module that can be used to uplink to a collapsed Gigabit backbone or for a high-speed server connection.
- The lower left slot is for either an optional media expansion module or Stacking Module. (Up to four switch units can be stacked together using Stacking Modules.)

When the Management Module is installed, this system can provide a wide array of advanced features:

- Master agent module manages entire stack in-band or out-of-band
- Backup agent module provides fault tolerance*
- Supports Telnet, SNMP/RMON and Web-based interface
- Four-group RMON (including Statistics, History, Alarms and Events)
- Spanning Tree Algorithm for redundant paths between switches
- VLAN support for up to 256 groups, port-based or with 802.1Q VLAN tagging
- GVRP for automatic VLAN learning*
- IGMP multicast filtering
- Quality of Service supports two levels of priority with Weighted Fair Queueing
- Configurable broadcast storm control
- Port mirroring (for real-time debugging without affecting the target port)
- Port trunking (up to 5 trunks per switch or 12 trunks for the entire stack, each trunk contains 2~4 ports)

* This feature is not supported in the current firmware release.

The agent module allows you to configure or monitor the switch using the embedded management program or SNMP/RMON applications. To manage the switch, you can make a direct connection to the console port. You can also make a network connection to manage the switch using Telnet, the Web agent, or AccTon's free Windows-based network management software called AccView/Open.

Installing the Switch

Before installing the switch verify that you have all the items listed under “Package Contents.” If any of the items are missing or damaged, contact your local Accton distributor. Also be sure you have all the necessary tools and cabling before installing the switch. Note that this switch can be installed on any suitably large flat surface or in a standard EIA 19-inch rack. After installing the switch, refer to the Management Guide to set up its more advanced features, such as Spanning Tree Protocol or VLAN port groups.

Package Contents

This package includes:

- CheetahSwitch Workgroup-3726M (Model No. AC-ES3726M)
- Four rubber foot pads
- Rack mount bracket kit
- AC power cord
- This Quick Installation Guide
- Owner registration card

Description of Hardware

The base unit contains 24 10BASE-T/100BASE-TX ports, plus three slots on the rear panel for various modules. A Management Module can be installed in the upper slot on the rear panel (see “Installing a Management Module” on page 4). The lower-left slot can be used for an optional media expansion module or Stacking Module, while the lower-right slot can be used for a media expansion module. Note that the media expansion modules include a Fast Ethernet fiber optic module with two 100BASE-FX (SC type) ports or a one port Gigabit 1000BASE-SX (SC type), or 1000BASE-LX uplink module.

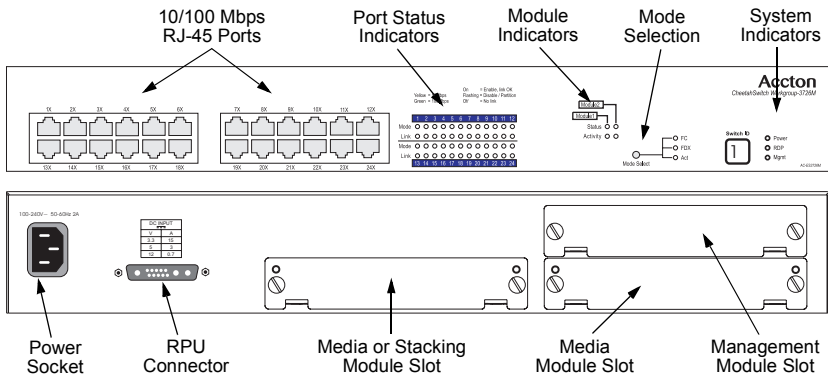
All RJ-45 ports on the base unit operate at 10 or 100 Mbps, and support auto-negotiation of speed, duplex mode (i.e., half or full duplex), and flow control.

The 1000BASE-SX and 1000BASE-LX ports are fixed at 1000 Mbps but auto-negotiate duplex mode. The 100BASE-FX module is fixed at the 100 Mbps, full duplex. All media types can auto-negotiate flow control.

Note that when using auto-negotiation, the speed, transmission mode and flow control can be automatically set if this feature is also supported by the attached device. Otherwise, these items can be manually configured for any connection.

The base unit also includes a display panel for key system and port indications that simplify installation and network troubleshooting.

The following figure shows the components of this switch system:



Mounting the Switch

This switch can be placed directly on your desktop, or mounted in a rack.

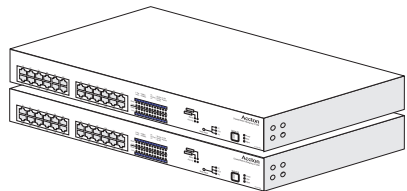
Before you start installing the switch, make sure you can provide the right operating environment, including power requirements, sufficient physical space, and proximity to other network devices that are to be connected. Verify the following installation requirements:

- Power requirements: 100 to 240 VAC ($\pm 10\%$) at 50 to 60 Hz ($\pm 3\text{Hz}$). The switch's power supply automatically adjusts to the input voltage level.
- The switch should be located in a cool dry place, with at least 10 cm. (4 in.) of space on the sides for ventilation.
- Place the switch out of direct sunlight, and away from heat sources or areas with a high amount of electromagnetic interference.
- If you intend to mount the switch in a rack, make sure you have all the necessary mounting screws, brackets, bolts and nuts, and the right tools.
- Check if network cables and connectors needed for installation are available.

Stacking Switches on a Flat Surface

The CheetahSwitch can be stacked anywhere there is enough flat space, such as on a table or desktop.

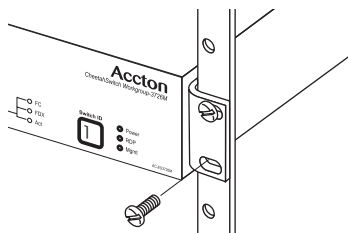
1. Stick the self-adhesive rubber foot pads (that come with this package) on each of the 4 concave spaces located on the bottom of the first switch.
2. Place the first switch on a firm flat surface where you want to install the stack.
3. Repeat step 1 for each switch before stacking them. The rubber foot pads cushion the switch against shock/vibrations and provide space between each switch for ventilation.



Mounting Switches in a Rack

Please comply with the following instructions to ensure that your switch is securely mounted in the rack.

1. Use a standard EIA 19-inch rack.
2. Use the brackets and screws supplied in the rack mounting kit.
3. Use a cross-head screwdriver to attach the brackets to the side of the switch.
4. Position the switch in the rack by lining up the holes in the attached brackets with the appropriate holes on the rack, and then use the rack-mount screws to mount the switch in the rack.



Installing a Management Module

One Management Module is required to manage all of the switches in the stack. A Management Module only installs in a switch's rear-panel upper slot, do not try to install it in either of the two lower slots.

You can install a Management Module as described below:

1. Disconnect power to the switch (the modules are **not** hot-swappable).
2. Remove the face plate on the switch's upper slot by removing the two screws with a flat-head screwdriver.
3. Before opening the package that contains the module, touch the bag to the switch casing to discharge any potential static electricity.
4. Remove the module from the anti-static shielded bag.
5. Holding the module level, gently push it all the way into the slot along the guide rails, ensuring that it firmly engages with the connector.
6. If you are sure the module is properly mated with the connector, tighten the retainer screws to secure the module in the slot.

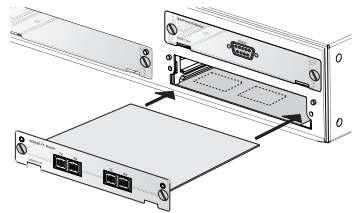
Caution: The slide-in modules are **not** hot-swappable. Be sure you power off the switch before installing any of these modules.

Installing Optional Media and Stacking Modules

The two lower slots on the rear panel of the switch are provided for various optional media expansion modules (100BASE-FX or Gigabit) or Stacking Modules. The 100BASE-FX fiber optic module can be used to connect to remote sites, and a Gigabit module can be used as a network backbone. You can install the media expansion modules in either of the two lower slots, but the Stacking Module must only be installed in the lower-left slot.

You can install a module as described below:

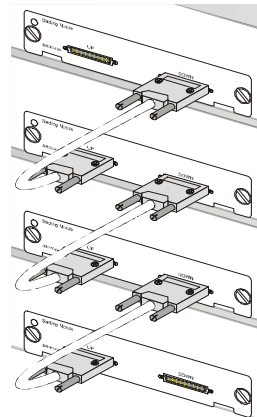
1. Disconnect power to the switch (the modules are **not** hot-swappable).
2. Remove the face plate on the appropriate slot by removing the two screws with a flat-head screwdriver.
3. Before opening the package that contains the module, touch the bag to the switch casing to discharge any potential static electricity.
4. Remove the module from the anti-static shielded bag.
5. Holding the module level, gently push it all the way into the slot along the guide rails, ensuring that it firmly engages with the connector.
6. If you are sure the module is properly mated with the connector, tighten the retainer screws to secure the module in the expansion slot.



The slide-in modules are **not** hot-swappable. Be sure you power off the switch before installing any of these modules.

Connecting to the Stack's Backplane

Plug one end of the stack cable (provided with the package) in the "Down" port of the top unit and the other end to the "Up" port of the next unit. Repeat this step for each unit in the stack. Form a simple chain starting at the Down port on the top switch and ending at the Up port on the bottom switch (stacking up to 4 units).



Connecting the Switch System

The CheetahSwitch Workgroup-3726M provides 24 RJ-45 ports on the base unit. Each of these ports supports a connection to 10 Mbps Ethernet or 100 Mbps Fast Ethernet, and supports full or half-duplex operation. The transmission speed for each port is automatically set by the switch to match the highest speed supported by the connected device. The transmission mode can be set for each port using auto-negotiation (if also supported by the attached device). However, if the device attached to any port on the switch does not support auto-negotiation, you can manually configure the transmission mode via the console port on the rear panel, or via an in-band connection (including Telnet, the Web agent or management software).

Making a Connection to an RJ-45 Port

You can use straight-through twisted-pair cable to connect any RJ-45 (MDI-X) port on the switch to any device that uses a standard network interface such as a workstation or server, or to a network interconnection device such as a bridge or router (depending on the port type implemented).

1. Prepare the network devices you wish to network. Make sure you have installed 10BASE-T or 100BASE-TX network interface cards for connecting to the switch's RJ-45 (MDI-X) station ports.
2. Prepare straight-through shielded or unshielded twisted-pair cables with RJ-45 plugs at both ends. Use 100-ohm Category 3, 4 or 5 cable for standard 10 Mbps Ethernet connections, or 100-ohm Category 5 cable for 100 Mbps Fast Ethernet connections.
3. Connect one end of the cable to the RJ-45 port of the network interface card, and the other end to any available RJ-45 port on the switch. All RJ-45 ports support 10 Mbps and 100 Mbps Ethernet connections. When inserting an RJ-45 plug, be sure the tab on the plug clicks into position to ensure that it is properly seated. Using the switch in a stand-alone configuration, you can network up to 24 end nodes.

Caution: Do not plug a phone jack connector into any RJ-45 port. This may damage the switch. Instead, use only twisted-pair cables with RJ-45 connectors that conform with FCC standards.

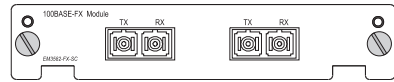
- Notes:**
1. When connecting to another compatible switch or hub, use straight-through cable to connect to an MDI port on the other device. You may also attach to MDI-X station ports at both ends if you use crossover cabling. (Refer to "Port and Cable Assignments" on page 15 for a description of crossover cable.)
 2. Make sure each twisted-pair cable does not exceed 100 meters (328 feet).
 3. We advise using Category 5 cable for all network connections to avoid any confusion or inconvenience in the future when you upgrade attached devices to Fast Ethernet.

Restrictions on Cascade Length - The IEEE 802.3 standard recommends restricting the number of hubs (i.e., repeaters) cascaded via twisted-pair cable to 4; while IEEE 802.3u provides even stricter recommendations for Fast Ethernet. Therefore, when cascading devices other than this switch, please refer to the accompanying documentation for cascade restrictions. However, note that because

switches break up the path for connected devices into separate collision domains, you should not include the switch or connected cabling in your calculations for cascade length involving other devices.

Connecting to a 100BASE-FX Port

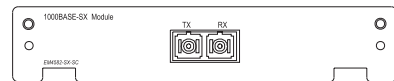
If you connect fiber cable to the 100BASE-FX module, be sure you use an SC-type connector. When inserting the cable, be sure the tab on the plug clicks into position to ensure that it is properly seated. If you use an SC-to-ST converter, run cable from the Rx (Tx) port on the module to the Tx (Rx) port on the target device. Note that the fiber optic ports operate only at 100 Mbps, full duplex. In this mode, you can run a fiber optic link up to 2 kilometers (1.24 miles).



Caution: The media expansion modules are not hot-swappable. Be sure you power off the switch before installing any of these modules.

Note: As a general rule, the length of fiber optic cable for a single switched link should not exceed 2 kilometers (1.24 miles). However, budget constraints must also be considered when calculating the maximum cable length for your specific environment.

Connecting to a Gigabit Fiber Optic Port



When connecting fiber cable to a Gigabit fiber-optic port on the switch, be sure you use an SC-type connector. Follow the steps below.

Warning: This switch uses lasers to transmit signals over fiber optic cable. The lasers are compliant with the requirements of a Class 1 Laser Product and are inherently eye safe in normal operation. However, you should never look directly at a transmit port when it is powered on.

1. Remove and keep the SC port's rubber cover. When not connected to a fiber cable, the rubber cover should be replaced to protect the optics.
2. Check that the fiber terminators are clean. You can clean the cable plugs by wiping them gently with a clean tissue or cotton ball moistened with a little ethanol. Dirty fiber terminators on fiber optic cables will impair the quality of the light transmitted through the cable and lead to degraded performance on the port.
3. Connect one end of the cable to the SC port on the switch and the other end to the SC port on the other device. Since SC connectors are keyed, the cable can be attached in only one orientation. When inserting the cable, be sure the tab on the plug clicks into position to ensure that it is properly seated.

All the SC-type ports operate at 1000 Mbps with support for auto-negotiation of duplex mode (full/half) and flow control. Also note the maximum length for

1000BASE-SX and 1000BASE-LX fiber optic cable depends on the core size and the rating of the cable, as shown in the following tables.

Maximum 1000BASE-SX Gigabit Ethernet Cable Length		
Fiber Size	Fiber Bandwidth	Maximum Cable Length
62.5/125 micron multimode fiber	160 MHz/km	2-220 m (7-722 ft)
	200 MHz/km	2-275 m (7-902 ft)
50/125 micron multimode fiber	400 MHz/km	2-500 m (7-1641 ft)
	500 MHz/km	2-550 m (7-1805 ft)

Maximum 1000BASE-LX Gigabit Ethernet Cable Length		
Fiber Size	Fiber Bandwidth	Maximum Cable Length
9/125 micron singlemode fiber	N/A	2 m - 5 km (7 - 16404 ft)

Powering On the Switch

1. Plug the power cord into the power socket on the rear of the switch, and the other end into a power outlet. (If you have purchased a redundant power supply, plug it into the “DC INPUT” receptacle on the rear of the switch.)
2. Check the LED marked Power on the front panel to see if it is on. The unit will automatically select the setting that matches the connected input voltage. Therefore, no additional adjustments are necessary when connecting it to any input voltage within the range marked on the rear panel.
3. The switch performs a self-diagnostic test upon power-on. (Note that this test takes several minutes to complete.)

Note: The unit supports a “hot remove” feature which permits you to connect or disconnect twisted-pair or fiber cables without powering off the switch and without disrupting the operation of the devices attached to the switch.

Verifying Port Status

Check each connection by viewing the port indicators on the base unit front panel. Their status is shown in the following table.

LED	Status	Indication
<i>System</i>		
Power	On	Switch is receiving power.
RDP	On	Redundant power unit on.
Mgmt	On	Management agent operational.
<i>RJ-45 Ports</i>		
Link	On	Port has established a valid network connection.
	Yellow	Communications have been set to 10 Mbps.
	Green	Communications have been set to 100 Mbps.
	Flashing	Port has been manually disabled, or partitioned by the system due to excessive errors.
Activity*	On	Traffic is passing through the port.
FDX*	On	Port has been set to full duplex.
FC*	On	Flow control enabled.
<i>Module Ports</i>		
Status	On	A valid module is correctly installed in the slot.
Activity	On	Traffic is passing through the port.

* Use the Mode Select button to select LED display mode.

Verifying System Operation

Verify that the stack has at least one Management Module correctly installed and operating. The “Mgmt” LED on the switch that contains the Management Module should be on, indicating that the module is installed and operating correctly.

Verify that the stack connections are operating correctly. Each switch in the stack has its own unique unit ID (a number from 1 to 4) displayed by the front-panel LCD labeled “Switch ID.” If any switch in the stack displays a flashing or unstable unit ID for more than 30 seconds, you should check the following items:

- Reset the stack by powering off all switches and then powering them back on.
- Be sure that all Stacking Modules are correctly installed in each switch’s lower-left slot and the stacking cables are properly attached.

Verify that any optional modules are installed correctly. The Module 1 or Module 2 “Status” LEDs on the switch panel should be on, indicating that the modules are installed and operating correctly.

Verify that all attached devices have a valid connection. The switch monitors the link status for each port. If any device is properly connected to the switch and transmitting a link signal, the Link indicator will light up for the corresponding port. If the Link indicator fails to light when you connect a device to the switch, check the following items:

- Be sure all network cables and connectors are properly attached to the connected device and the switch.

- See if your cable is functioning properly by using it for another port and attached device that displays valid indications when connected to the network.
- Be sure no twisted-pair cable exceeds 100 meters (328 feet). 100 Mbps fiber cable should be under 2 kilometers (1.24 miles). The maximum length for fiber optic Gigabit connections is listed in the table on the preceding page.

Applications

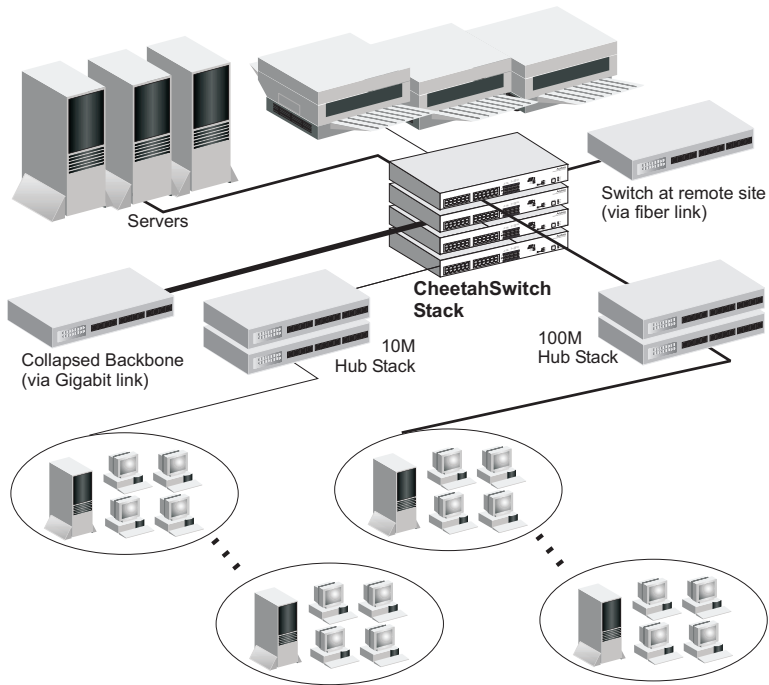
This switch segments your network, significantly increasing both bandwidth and throughput. Any port on the switch can be attached to a hub (a shared collision domain) or provide a dedicated link to a single network device (such as a workstation or server). When a port on the switch is connected to a hub (a 10 or 100 Mbps repeater), the bandwidth provided by that port is shared by all the devices connected to the attached hub. However, when a port is connected to an end node or to a device that breaks up the collision domain (e.g., another switch, bridge or router), the attached device has access to the full bandwidth provided by that port.

Bridging Functions - This switch provides fully transparent bridging functions. It automatically learns node addresses, that are subsequently used to filter and forward all traffic based on the destination address. When traffic passes between devices attached to the same shared collision domain, those packets are filtered from the switch. But when traffic must be passed between unique segments (i.e., different ports on the switch), the high-speed switching fabric forwards the packets at near zero latency.

Switching Functions - Store-and-forward switching is used to forward traffic to other ports. This scheme ensures data integrity and provides a clean data stream.

Flexible Configuration - This switch is not only designed to segment your network, but also to provide a wide range of options in setting up network connections. It can be used as a simple stand-alone switch; stacked up to four high; or connected with standard repeater hubs, switches, or other network interconnection devices in various configurations.

Media Expansion Options - You can use a Fast Ethernet fiber module to connect to remote sites up to 2 kilometers (1.24 miles) away, or a Gigabit module to support applications such as high-speed file servers, or for connecting to a collapsed Gigabit backbone switch.



Product Specifications

Base Unit

Physical Characteristics

Access Method	CSMA/CD
Standards Conformance	IEEE 802.3, IEEE 802.3u
Communication Rate	10/100 Mbps
Communication Mode	Full or half duplex
Media Supported	10BASE-T - 100-ohm Category 3,4,5 twisted-pair cable 100BASE-TX - 100-ohm Category 5 twisted-pair cable
Number of Ports	24 RJ-45 100BASE-TX ports
Indicator Panel	System: Power, RDP, Mgmt; Ports: link/speed/disabled/ partitioned, activity, duplex, flow control
Dimensions	440 x 285 x 64 mm (17.37 x 11.22 x 2.53 in.)
Weight	4.5 kg (9.92 lb)
Input Power	Full range: 100 to 240 V (±10%), 50 to 60 Hz (±3 Hz)
Maximum Current	0.80 A _{RMS} max. @110 V, 0.50 A _{RMS} max. @240 V
Power Consumption	70 Watts max. @ 100-240 VAC
Heat Dissipation	239 BTU/hr max. @ 100-240 VAC

Quick Installation Guide

Temperature	Operating: 0~50 °C / 32~122 °F Storage: -40~70 °C / -40~158 °F
Humidity	5% to 95% (noncondensing)
Certification	CE Mark
Emissions	FCC Class A, VCCI Class A, CISPR Class A, EN 61000-3-2/3
Immunity	IEC 61000-4-2/3/4/5/6/11
Safety	CSA/NRTL, TÜV/GS

Switching Criteria

Network Bridging Function	Filtering, forwarding and learning
Switching Method	Store-and-forward
Address Table	8K entries total
Queue Buffer	128K bytes per 10/100 Mbps port 2M bytes for 1000 Mbps port
Address Resolution	Fast hashing scheme

Traffic Control

Flow Control	Back pressure for half duplex IEEE 802.3x for full duplex
Broadcast Suppression	Broadcast traffic suppressed at configurable threshold

Modules

Management Module (AC-ES3726M-AGENT)

System Configuration	Configuration via console connection to serial port or via Telnet; Web-based management via HTTP protocol to access embedded management program; Full-featured SNMP/RMON management using network management software
Management Agent	MIB support: MIB II (RFC1213), Bridge MIB (RFC 1493), Ethernet-like MIB (RFC1643), RMON MIB (RFC1757), and Accton 's private MIB
RMON	Groups 1,2,3,9 (Statistics, History, Alarm, Event)

100BASE-FX Module (EM3582-FX-SC)

Access Method	CSMA/CD
Standards Conformance	IEEE 802.3u 100BASE-FX
Communication Rate	100 Mbps
Communication Mode	Full duplex
Media Supported	50/125 micron or 62.5/125 micron multimode fiber
Output Power	Minimum: -19 dBm, Maximum: -14 dBm
Receiver Sensitivity	Minimum: -33 dBm, Saturation: -14 dBm
Power Budget	19 dBm
Number of Ports	2 100BASE-FX SC-type ports
Indicator Panel	Included on base unit

1000BASE-SX Module (EM4582-SX-SC)

Access Method	CSMA/CD
Standards Conformance	IEEE 802.3z
Communication Rate	1000 Mbps
Communication Mode	Full or half duplex
Media Supported	50/125 micron or 62.5/125 micron multimode fiber
Output Power	Minimum: -9.5 dBm, Maximum: -4 dBm
Receiver Sensitivity	Minimum: -20 dBm, Saturation: -3 dBm
Power Budget	16 dBm
Number of Ports	1 1000BASE-SX (SC-type) port
Indicator Panel	Included on base unit

1000BASE-LX Module (EM4582-LX-SC)

Access Method	CSMA/CD
Standards Conformance	IEEE 802.3z
Communication Rate	1000 Mbps
Communication Mode	Full or half duplex
Output Power	Minimum: -9.5 dBm, Maximum: -3 dBm
Receiver Sensitivity	Minimum: -20 dBm, Saturation: -3 dBm
Power Budget	17 dBm
Media Supported	9/125 micron singlemode fiber
Number of Ports	1 1000BASE-LX (SC-type) port
Indicator Panel	Included on base unit

Stacking Module (EM3580-STACK)

Number of Ports	Two 68-pin, SCSI connectors
Cable Type	SCSI Type 4, length 30 cm
Backplane Bandwidth	9.6 Gbps

Troubleshooting

Diagnosing Switch Indicators

The switch can be easily monitored through panel indicators to assist the network manager in identifying problems. This table below describes common problems you may encounter and possible

Symptom	Cause	Solution
Power indicator does not light up after power on.	Power outlet, power cord, or internal power supply may be defective.	Check the power outlet by plugging in another device that is functioning properly. Check the power cord with another device. If these measures fail to resolve the problem, contact your Accton distributor.
Link indicator does not light up after making a connection.	Network interface (e.g., a network adapter card on the attached device), network cable, or switch port may be defective.	Verify that the switch and attached device are powered on. Be sure the cable is plugged into both the switch and corresponding device. Verify that the proper cable type is used and its length does not exceed specified limits. Check the adapter on the attached device and cable connections for possible defects. Replace the defective adapter or cable if necessary.
Mgmt indicator does not light up after power on.	A Management Module is not installed correctly, or may have failed.	Check that the Management Module is correctly installed in the upper slot on the switch rear panel (at least one Management Module is required in a switch stack). Test the Management Module by installing it in another switch unit. If these measures fail to resolve the problem, contact your Accton distributor.
Module 1/2 Status indicator does not light up after power on.	A optional module is not installed correctly, or may have failed.	Check that the module is correctly installed in one of the two lower slots on the switch rear panel. Test the module by installing it in another switch unit. If these measures fail to resolve the problem, contact your Accton distributor.
Switch ID LCD does not display a stable unit number.	The switch stack has not initiated properly.	Reset the stack by powering off each switch unit in the stack and then powering them back on. Check all Stacking Modules are installed correctly in the lower-left slot on the rear panel of each switch. Check that all stacking cables are connected correctly. If these measures fail to resolve the problem, contact your Accton distributor.

Power and Cooling Problems

If the power indicator does not turn on when the power cord is plugged in, you may have a problem with the power outlet, power cord, or internal power supply as explained in the previous section. However, if the unit powers off after running for a while, check for loose power connections, power losses or surges at the power outlet, and verify that the fans on the right side of the unit are unobstructed and running prior to shutdown. If you still cannot isolate the problem, then the internal power supply may be defective. In this case, contact your Accton distributor for assistance.

Installation

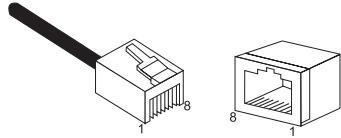
Verify that all system components have been properly installed. If one or more components appear to be malfunctioning (e.g., the power cord or network cabling), test them in an alternate environment where you are sure that all the other components are functioning properly.

Port and Cable Assignments

RJ-45 Port Description

RJ-45 station ports (MDI-X) can be attached to any devices that use a standard network interface (e.g., a workstation, server, bridge or router). RJ-45 daisy-chain ports (MDI) can be cascaded to a station port on similar

networking devices (e.g., another switch or hub). Use unshielded twisted-pair (UTP) or shielded twisted-pair (STP) cable for RJ-45 connections: 100-ohm Category 3, 4 or 5 cable for 10 Mbps connections or 100-ohm Category 5 cable for 100 Mbps connections. Also be sure that the length of any twisted-pair connection does not exceed 100 meters (328 feet).



Pin	MDI-X Signal Name	MDI Signal Name
1	Receive Data plus (RD+)	Transmit Data plus (TD+)
2	Receive Data minus (RD-)	Transmit Data minus (TD-)
3	Transmit Data plus (TD+)	Receive Data plus (RD+)
6	Transmit Data minus (TD-)	Receive Data minus (RD-)
4,5,7,8	Not Used	Not Used

Straight-Through Wiring

If the twisted-pair cable is to join two ports and only one of the ports has an internal crossover (MDI-X), the two pairs of wires must be straight-through.

Straight-Through RJ-45 Pin Assignments	
End 1	End 2
1 (RD+)	1 (TD+)
2 (RD-)	2 (TD-)
3 (TD+)	3 (RD+)
6 (TD-)	6 (RD-)

Crossover Wiring

If the twisted-pair cable is to join two ports and either both ports are labeled with an "X" (MDI-X) or neither port is labeled with an "X" (MDI), a crossover must be implemented in the wiring.

Crossover RJ-45 Pin Assignments	
End 1	End 2
1 (TD+)	3 (RD+)
2 (TD-)	6 (RD-)
3 (RD+)	1 (TD+)
6 (RD-)	2 (TD-)

EMI Certification

FCC Class A Certification (USA)

Warning: This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A digital device pursuant to Subpart B of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user, at his own expense, will be required to take whatever measures are required to correct the interference.

You may use unshielded twisted-pair (UTP) for RJ-45 connections - Category 3 or greater for 10Mbps connections, and Category 5 for 100Mbps connections. For fiber optic connections, you may use 50/125 or 62.5/125 micron fiber.

Canada Department of Communications - Class A

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled "Digital Apparatus," ICES-003 of the Department of Communications.

Cet appareil numérique respecte les limites de bruits radioélectriques applicables aux appareils numériques de Classe A prescrites dans la norme sur le matériel brouilleur : "Appareils Numériques," NMB-003 édictée par le ministère des Communications.

BSMI Class A (Taiwan)

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。

VCCI Class A Compliance (Japan)

この装置は、情報技術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。

CE Mark Declaration of Conformance for EMI and Safety (EEC)

This information technology equipment complies with the requirements of the Council Directive 89/336/EEC on the Approximation of the laws of the Member States relating to Electromagnetic Compatibility and 73/23/EEC for electrical equipment used within certain voltage limits and the Amendment Directive 93/68/EEC. For the evaluation of the compliance with these Directives, the following standards were applied:

- RFI Emission:
- Limit class A according to EN 55022:1998
 - Limit class A for harmonic current emission according to EN 61000-3-2:1995
 - Limitation of voltage fluctuation and flicker in low-voltage supply system according to EN 61000-3-3:1995
- Immunity:
- Product family standard according to EN 55024:1998
 - Electrostatic Discharge according to EN 61000-4-2:1995 (Contact Discharge: ± 4 kV, Air Discharge: ± 8 kV)
 - Radio-frequency electromagnetic field according to EN 61000-4-3:1996 (80 - 1000 MHz with 1 kHz AM 80% Modulation: 3 V/m)
 - Electrical fast transient/burst according to EN 61000-4-4:1995 (AC/DC power supply: ± 1 kV, Data/Signal lines: ± 0.5 kV)
 - Surge immunity test according to EN 61000-4-5:1995 (AC/DC Line to Line: ± 1 kV, AC/DC Line to Earth: ± 2 kV)
 - Immunity to conducted disturbances, Induced by radio-frequency fields: EN 61000-4-6:1996 (0.15 - 80 MHz with 1 kHz AM 80% Modulation: 3 V/m)
 - Power frequency magnetic field immunity test according to EN 61000-4-8:1993 (1 A/m at frequency 50 Hz)
 - Voltage dips, short interruptions and voltage variations immunity test according to EN 61000-4-11:1994 (>95% Reduction @10 ms, 30% Reduction @500 ms, >95% Reduction @5000 ms)
- LVD:
- EN 60950 (A1/1992; A2/1993; A3/1993; A4/1995; A11/1997)

Warning! Do not plug a phone jack connector in the RJ-45 port. This may damage this device. Les raccordeurs ne sont pas utilisé pour le système téléphonique!

Safety Compliance



Warning: Fiber Optic Port Safety



When using a fiber optic media expansion module, never look at the transmit laser while it is powered on. Also, never look directly at the fiber TX port and fiber cable ends when they are powered on.

Avertissement: Ports pour fibres optiques - sécurité sur le plan optique



Ne regardez jamais le laser tant qu'il est sous tension. Ne regardez jamais directement le port TX (Transmission) à fibres optiques et les embouts de câbles à fibres optiques tant qu'ils sont sous tension.

Warnhinweis: Faseroptikanschlüsse - Optische Sicherheit



Niemals ein Übertragungslaser betrachten, während dieses eingeschaltet ist. Niemals direkt auf den Faser-TX-Anschluß und auf die Faserkabelenden schauen, während diese eingeschaltet sind.

Underwriters Laboratories Inc. (USA)

Important! Before making connections, make sure you have the correct Cord Set. Check it (read the label on the cable) against the following specification list.

Operating Voltage	Cord Set Specifications
120 Volts	UL Listed/CSA Certified Cord Set
	Minimum 18 AWG
	Type SVT or SJT three conductor cord
	Maximum length of 15 feet
	Parallel blade, grounding type attachment plug rated 15A, 125V
240 Volts (Europe only)	Cord Set with H05VV-F cord having three conductors with minimum diameter of 0.75 mm ²
	IEC-320 receptacle
	Male plug rated 10A, 250V

Wichtige Sicherheitshinweise (Germany)

1. Bitte lesen Sie diese Hinweise sorgfältig durch.
2. Heben Sie diese Anleitung für den späteren Gebrauch auf.
3. Vor jedem Reinigen ist das Gerät vom Stromnetz zu trennen. Verwenden Sie keine Flüssigoder Aerosolreiniger. Am besten eignet sich ein angefeuchtetes Tuch zur Reinigung.
4. Die Netzanschlußsteckdose soll nahe dem Gerät angebracht und leicht zugänglich sein.
5. Das Gerät ist vor Feuchtigkeit zu schützen.
6. Bei der Aufstellung des Gerätes ist auf sicheren Stand zu achten. Ein Kippen oder Fallen könnte Beschädigungen hervorrufen.
7. Die Belüftungsöffnungen dienen der Luftzirkulation, die das Gerät vor Überhitzung schützt. Sorgen Sie dafür, daß diese Öffnungen nicht abgedeckt werden.
8. Beachten Sie beim Anschluß an das Stromnetz die Anschlußwerte.
9. Verlegen Sie die Netzanschlußleitung so, daß niemand darüber fallen kann. Es sollte auch nichts auf der Leitung abgestellt werden.
10. Alle Hinweise und Warnungen, die sich am Gerät befinden, sind zu beachten.
11. Wird das Gerät über einen längeren Zeitraum nicht benutzt, sollten Sie es vom Stromnetz trennen. Somit wird im Falle einer Überspannung eine Beschädigung vermieden.
12. Durch die Lüftungsöffnungen dürfen niemals Gegenstände oder Flüssigkeiten in das Gerät gelangen. Dies könnte einen Brand bzw. elektrischen Schlag auslösen.
13. Öffnen sie niemals das Gerät. Das Gerät darf aus Gründen der elektrischen Sicherheit nur von autorisiertem Servicepersonal geöffnet werden.
14. Wenn folgende Situationen auftreten ist das Gerät vom Stromnetz zu trennen und von einer qualifizierten Servicestelle zu überprüfen:
 - a. Netzkabel oder Netzstecker sind beschädigt.
 - b. Flüssigkeit ist in das Gerät eingedrungen.
 - c. Das Gerät war Feuchtigkeit ausgesetzt.
 - d. Wenn das Gerät nicht der Bedienungsanleitung entsprechend funktioniert oder Sie mit Hilfe dieser Anleitung keine Verbesserung erzielen.
 - e. Das Gerät ist gefallen und/oder das Gehäuse ist beschädigt.
 - f. Wenn das Gerät deutliche Anzeichen eines Defektes aufweist.
15. Zum Netzanschluß dieses Gerätes ist eine geprüfte Leitung zu verwenden. Für einen Nennstrom bis 6A und einem Gerätegewicht größer 3kg ist eine Leitung nicht leichter als H05VV-F, 3G, 0.75mm² einzusetzen.

Der arbeitsplatzbezogene Schalldruckpegel nach DIN 45 635 Teil 1000 beträgt 70dB(A) oder weniger.

Optional Hardware Modules

AC-ES3726M-AGENT:	SNMP/RMON Management Module with RS-232 Port
EM3582-FX-SC:	Media Module with 2 100BASE-FX (SC-type) Ports
EM4582-SX-SC:	Media Module with 1 1000BASE-SX (SC-type) Port
EM4582-LX-SC:	Media Module with 1 1000BASE-LX (SC-type) Port
EM3580-STACK:	Stacking Module kit including 30 cm stacking cable
RPU150W:	Redundant Power Supply
ST5002:	SC to ST Plug Converter for Fiber Optic Module (for 62.5/125 micron cable only)

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