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**User manual SMC 6724L2**  
**User guide SMC 6724L2**  
**Operating instructions SMC 6724L2**  
**Instructions for use SMC 6724L2**  
**Instruction manual SMC 6724L2**



## 24-Port Fast Ethernet Switch

- ◆ 24 10BASE-T/100BASE-TX auto MDI/MDI-X ports
- ◆ Optional 1000BASE-X or 100BASE-FX modules
- ◆ 8.8 Gbps of aggregate bandwidth
- ◆ Non-blocking switching architecture
- ◆ Spanning Tree Protocol
- ◆ Up to eight port trunks
- ◆ Port mirroring for non-intrusive analysis
- ◆ QoS support for two-level priority
- ◆ Full support for VLANs with GVRP
- ◆ IP Multicasting with IGMP Snooping
- ◆ Manageable via console, Web, SNMP/RMON



**Installation Guide**  
*SMC6724L2*



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**Manual abstract:**

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\* SMC will provide warranty service for one year following discontinuance from the active SMC price list. Under the limited lifetime warranty, internal and external power supplies, fans, and cables are covered by a standard one-year warranty from date of purchase. SMC Networks, Inc. 6 Hughes Irvine, CA 92618 ii COMPLIANCES FCC - Class A 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 computing 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 may be required to correct the interference. You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment. You may use unshielded twisted-pair (UTP) cable for RJ-45 connections--Category 3 or greater for 10 Mbps connections, Category 5 for 100 Mbps connections, and Category 5 or 5e for 1000 Mbps. Use 50/125 or 62.5/125 micron multimode fiber optic cable, or 9/125 micron single-mode fiber optic cable, for SC or ST-type connections.

Warnings: 1. Wear an anti-static wrist strap or take other suitable measures to prevent electrostatic discharge when handling this equipment. 2. When connecting this switch to a power outlet, connect the field ground lead on the tri-pole power plug to a valid earth ground line to prevent electrical hazards.



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Industry Canada - 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. iii COMPLIANCES EC Conformance Declaration - Class A SMC contact for these products in Europe is: SMC Networks Europe, Edificio Conata II, Calle Fructuós Gelabert 6-8, 2o, 4a, 08970 - Sant Joan Despí, Barcelona, Spain. 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! iv COMPLIANCES Japan VCCI Class A Taiwan BSMI Class A Australia AS/NZS 3548 (1995) - Class A SMC contact for products in Australia is: SMC Communications Pty. Ltd. Suite 18, 12 Tryon Road, Lindfield NSW2070, Phone: 61-2-94160437 Fax: 61-2-94160474 v COMPLIANCES Safety Compliance Warning: Fiber Optic Port Safety CLASS I LASER DEVICE When using a fiber optic port, 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 DISPOSITIF LASER DE CLASSE I 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 LASERGERÄT DER KLASSE I 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 Compliance Statement Important! Before making connections, make sure you have the correct cord set. Check it (read the label on the cable) against the following: Operating Voltage 120 Volts Cord Set Specifications 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 15 A, 125 V 240 Volts (Europe only) Cord Set with H05VV-F cord having three conductors with minimum diameter of 0.75 mm2 IEC-320 receptacle Male plug rated 10 A, 250 V The unit automatically 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. vi COMPLIANCES Supply Receptacle .

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..... D-1 Glossary Index xi TABLE OF CONTENTS xii CHAPTER 1 ABOUT THE TIGERSWITCH 10/100 Overview SMC's TigerSwitch™ 10/100 is a Fast Ethernet switch with 24 10BASE-T/100BASE-TX ports, plus two slots for optional slide-in 100BASE-FX or Gigabit modules. There is also an SNMP-based management agent embedded on the main board. This agent supports both in-band and out-of-band access for managing the switch. 10/100 Mbps RJ-45 Ports Port Status Indicators Link - On: link/enable; Off: no link; Status - Depends on mode selection Mode Selection Display selection includes: Collision, activity, duplex mode, speed 1 2 3 4 5 6 7 8 9 10 11 12 Link Status Link Status 13 14 15 16 17 18 19 20 21 22 23 24 M2 1 2 3 4 5 6 7 8 9 10 11 12 M1 COL ACT FDX 100M Power Tiger Switch 10/100 6724L2 SNMP Status Console 13 14 15 16 17 18 19 20 21 22 23 24 Power Socket Media Slots Console Port System Indicators Use this port for console 1000BASE-LX, 1000BASE-SX, Power, SNMP, Console 1000BASE-T or 100BASE-FX modules or modem connection M1 M2 100-240 V 50-60 Hz 3 A Figure 1-1.

*SMC6724L2 Front and Rear Panels 1-1 ABOUT THE TIGERSWITCH 10/100 Switch Architecture The TigerSwitch is perfect for moving workgroups from conventional 10 Mbps Ethernet to multiple-segment 100 Mbps Fast Ethernet. This switch delivers dedicated 100 Mbps links to each attached LAN segment (independent collision domain) or to any PC attached directly to the switch, 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. This makes it ideal for increasing the throughput of interconnected Ethernet and Fast Ethernet hubs or server farms. This switch includes two slots on the rear panel for optional 100BASE-FX or Gigabit modules. The 100BASE-FX module can be used for backbone and remote connections. The Gigabit modules can be used to uplink to a collapsed Gigabit backbone or for a high-speed server connection. Management Options This switch contains a comprehensive array of LEDs for "at-a-glance" monitoring of network and port status. It also includes a management agent that allows the switch to be managed in-band via SNMP or RMON (Groups 1, 2, 3 and 9) protocols, with a Web browser, or remotely via Telnet.*

*The switch also provides a serial port on the front panel for out-of-band management. 1-2 DESCRIPTION OF HARDWARE Description of Hardware Ethernet Ports The base unit contains 24 10BASE-T / 100BASE-TX ports. It also has two slots on the rear panel for optional 100BASE-FX or Gigabit uplink modules. The 100BASE-FX modules have one single-mode (SC-type) or multimode (SC-type) port. The Gigabit modules have one 1000BASE-SX (SC-type), 1000BASE-LX (SC-type), or 1000BASE-T (RJ-45) port.*

*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 RJ-45 ports also feature automatic MDI/MDI-X operation, so you can use straight-through cables for all connections. The 100BASE-FX modules operate at 100 Mbps, full duplex.*

*The 1000BASE-SX, 1000BASE-LX and 1000BASE-T modules operate at 1 Gbps, full duplex. All modules support auto-negotiation for 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. 1-3 ABOUT THE TIGERSWITCH 10/100 Status LEDs The LEDs, which are located on the front panel for easy viewing, are shown below and described in the following table. Link Status Link Status 13 14 15 16 17 18 19 20 21 22 23 24 M2 1 2 3 4 5 6 7 8 9 10 11 12 M1 COL ACT FDX 100M Power SNMP Status Console Figure 1-2. Port and System LEDs Port and System Status LEDs LED Power Condition On Flashing SNMP Console RJ-45 Ports Link On Off Status\* COL\* ACT\* FDX\* Flashing Flashing On Off 100M\* On Off Port has established a valid network connection. Port has no connection. Displays state for selected status mode.*

*Indicates collision on half-duplex links. Shows that traffic is crossing the port. Port is operating at full duplex. Port is operating at half duplex. Port is operating at 100 Mbps. Port is operating at 10 Mbps. Flashing On Status Switch is receiving power. Firmware download or POST in progress. Switch is processing an SNMP command. One or more management connections established (console or Telnet).*

*\* Use the Status button to select LED display mode. 1-4 DESCRIPTION OF HARDWARE Port and System Status LEDs LED Module Ports Status On Off Link On Off A module is installed in this slot. No module is installed in this slot. Module has established a valid network connection. Module has no connection.*

*Condition Status Switch Management This switch includes a built-in management agent that offers a variety of management options, including SNMP, RMON and a Web-based interface. The switch also includes an RS-232 serial port for out-of-band management. A PC may be connected to this port for configuration and monitoring purposes out-of-band via a null-modem cable. The management agent provides a wide range of advanced performance-enhancing features. Multicast filtering provides support for real-time network applications.*



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Port-based and tagged VLANs, plus support for automatic GVRP VLAN registration provide traffic security and efficient use of network bandwidth. QoS priority queueing ensures the minimum delay for moving real-time multimedia data across the network. Flow control eliminates the loss of packets due to bottlenecks caused by port saturation. And broadcast storm control prevents broadcast traffic storms from engulfing the network. Some of the switch's advanced features are described below. For a detailed description, refer to the Management Guide. 1-5 ABOUT THE TIGERSWITCH 10/100 Spanning Tree Protocol The TigerSwitch 10/100 supports IEEE 802.1D Spanning Tree Protocol. This protocol adds a level of fault tolerance by allowing two or more redundant connections to be created between a pair of LAN segments. When there are multiple physical paths between segments, this protocol will choose a single path and disable all others to ensure that only one route exists between any two stations on the network.

This prevents the creation of network loops. However, if the chosen path should fail for any reason, an alternate path will be activated to maintain the connection. The default setting for the Spanning Tree Protocol is "enabled." This protocol may be configured out-of-band via the serial console port, or in-band via the Web interface, Telnet, or SNMP network management software. VLANs The TigerSwitch 10/100 supports up to 256 VLANs. A Virtual LAN is a collection of network nodes that share the same collision domain regardless of their physical location or connection point in the network. By segmenting your network into VLANs, you can:

- Eliminate broadcast storms which severely degrade performance in a flat network. Simplify network management for node changes/moves by remotely configuring VLAN membership for any port, rather than having to manually change the node's IP address. Provides data security by restricting all traffic to the originating VLAN, except where a connection has been configured between separate VLANs using a router or Layer 3 switch.

1-6 DESCRIPTION OF HARDWARE Multicast Switching Specific multicast traffic can be assigned to its own VLAN to ensure that it does not interfere with normal network traffic and to guarantee real-time delivery by setting the required priority level for the designated VLAN.

The switch uses IGMP Snooping and IGMP to manage multicast group registration. Traffic Priority This switch provides Quality of Service (QoS) by prioritizing each packet based on the required level of service, using two priority queues with Weighted Round Robin Queuing. It uses IEEE 802.1p and 802.1Q tags to prioritize incoming traffic based on input from the end-station application.

These functions can be used to provide independent priorities for delay-sensitive data and best-effort data. Optional Media Extender Modules Optional 1000BASE-SX Module (SMC6724L2GSSC) 1000BASE SX-SC Expansion Module SMC6724L2GSSC TX RX Figure 1-3. Single-Port 1000BASE-SX Gigabit Module Using fiber optic cable, the 1000BASE-SX port can be connected to a remote site up to 550 m (1805 ft) away. The 1000BASE-SX Gigabit module operates at 1 Gbps, with support for full-duplex mode and flow control. This module is fitted with an SC connector, but you can attach an ST plug to the switch using the SC-ST Converter (Part Number: 99-012034-091).

1-7 ABOUT THE TIGERSWITCH 10/100 Optional 1000BASE-LX Module (SMC6724L2GLSC) 1000BASE LX-SC Expansion Module SMC6724L2GLSC TX RX Figure 1-4. Single-Port 1000BASE-LX Gigabit Module Using fiber optic cable, the 1000BASE-LX port can be connected to a remote site up to 5 km (16404 ft) away. The 1000BASE-LX Gigabit module operates at 1 Gbps, with support for full-duplex mode and flow control. This module is fitted with an SC connector. Optional 1000BASE-T Module (SMC6725L2GT) 1000BASE-T Module SMC6725L2GT Figure 1-5. Single-Port 1000BASE-T Gigabit Module Using Category 5 or 5e twisted-pair cable, the maximum cable length is 100m (328 ft). You should test the cable installation for IEEE 802.3ab compliance.

Note that this module operates at 1 Gbps, full duplex, and supports auto-negotiation for flow control. 1-8 DESCRIPTION OF HARDWARE Optional 100BASE-FX Module (SMC6725L2FSSC) 100BASE-FX Singlemode Module TX SMC6725L2FSSC RX Figure 1-6.

Single-Port 100BASE-FX Single-Mode Module Using fiber optic cable, the 100BASE-FX port can be connected to a remote site up to 20 km (12.43 miles) away. The 100BASE-FX module operates at 100 Mbps, with support for full-duplex mode and flow control. This module is fitted with an SC connector.

Optional 100BASE-FX Module (SMC6725L2FMSC) 100BASE-FX Multimode Module TX SMC6725L2FMSC RX Figure 1-7. Single-Port 100BASE-FX Multimode Module Using fiber optic cable, the 100BASE-FX port can be connected to a remote site up to 2 km (1.24 miles) away. The 100BASE-FX module operates at 100 Mbps, with support for full-duplex mode and flow control. This module is fitted with an SC connector, but you can attach an ST plug to the switch using the SC-ST Converter (Part Number: 99-012034-091). 1-9 ABOUT THE TIGERSWITCH 10/100 Power Supply Receptacle The power receptacle is located on the rear panel of the switch.

The standard power receptacle is for the AC power cord. 100-240 V 50-60 Hz 2 A Figure 1-8. Power Supply Receptacle Features and Benefits Connectivity N N 24 dual-speed ports for easy Fast Ethernet integration and for protection of your investment in legacy LAN equipment Auto-negotiation enables each RJ-45 port to automatically select the optimum communication mode (half or full duplex) if this feature is supported by the attached device; otherwise the port can be configured manually Independent RJ-45 10BASE-T/100BASE-TX ports with support for auto MDI/MDI-X Unshielded (UTP) cable supported on all RJ-45 ports: Category 3, 4 or 5 for 10 Mbps connections and Category 5 for 100 Mbps connections IEEE 802.3 Ethernet and 802.3u Fast Ethernet compliance ensures compatibility with standards-based hubs, network cards and switches from any vendor N N N 1-10 FEATURES AND BENEFITS Expandability N

Optional single-port 1000BASE-SX Gigabit module that can run up to 550 meters (using 50/125 micron, 500 MHz/km multimode fiber cable), and operates at 1 Gbps, full duplex, with auto-negotiation for flow control.

Optional single-port 1000BASE-LX Gigabit module that can run up to 5 km (using 9/125 micron single-mode fiber cable), and operates at 1 Gbps, full duplex, with auto-negotiation for flow control. Optional single-port 1000BASE-T Gigabit module that can run up to 100 meters (using 100-ohm Category 5 or 5e unshielded twisted-pair (UTP) or shielded twisted-pair (STP) cable), and operates at 1 Gbps, full duplex, with auto negotiation for flow control. Optional single-port 100BASE-FX modules that can run up to 2 km (using 62.5/125 or 50/125 micron, multimode fiber cable), or 20 km (using 9/125 micron single-mode fiber cable) and operate at 100 Mbps, full duplex, with auto-negotiation for flow control.



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Grounding: Rack-mounted equipment should be properly grounded.

Particular attention should be given to supply connections other than direct connections to the mains. **3-3 INSTALLING THE SWITCH** To rack-mount devices: 1. Attach the brackets to the device using the screws provided in the Bracket Mounting Kit. 2. 3. 4. 5. 6. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. Link Status Link Status 13. 14. 15. 1. 2. 3. 4. 7. 8. 9. 10. 11. 12. 5. 6. 7. 8. 9. 10. 11. 12. M1. COL. 16. 17. 18. 19. 20. 21. ACT. 22. 23. 24. FDX. M2. 100. M. Stat. us. Pow. er. Tig. er. Sw. itch. 10/672100. 4L2. SNM. Con. P. sole. Figure 3-1. Attaching the Brackets 2.

Mount the device in the rack, using four rack-mounting screws (not provided). 1. 2. 3. 4. 5. 6. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. Link Status Link Status 13. 14. 15. 1. 2. 3. 4. 7. 8. 9. 10. 11. 12. 5. 6. 7. 8. 9. 10. 11. 12. M1. COL. 16. 17. 18. 19. 20. 21. ACT. 22. 23. 24. FDX. M2. 100. M. Stat. us. Pow. er. Tig. er. Sw. itch. 10/672100. 4L2. SNM. Con. P. sole. Figure 3-2. Installing the Switch in a Rack 3-4 **MOUNTING** 3. If installing a single switch only, turn to "Connecting to a Power Source" at the end of this chapter. 4. If installing multiple switches, mount them in the rack, one below the other, in any order. Desktop or Shelf Mounting 1. Attach the four adhesive feet to the bottom of the first switch. Figure 3-3. Attaching the Adhesive Feet 2.

Set the device on a flat surface near an AC power source, making sure there are at least two inches of space on all sides for proper air flow. 3. If installing a single switch only, go to "Connecting to a Power Source" at the end of this chapter. 4. If installing multiple switches, attach four adhesive feet to each one. Place each device squarely on top of the one below, in any order. 13. 1. 14. 2. 15. 3. 16. 4. 17. 5. 18. 6. 19. 7. 20. 8. 21. 9. 10. 22. 11. 23. 12. 24. Status Status Link Link 13. 1. 14. 2. 15. 3. 16. 4. 17. 5. 18. 6. 19. 7. 20. 8. 21. 9. 10. 22. 23. 11. 24. 12. M1. M2. 100. M. FDX. ACT. COL. Status. Con. SNMP. Pow. er. Tig. er. sole. Sw. itch. 10/10. 6724. 0. L2. 3-5. **INSTALLING THE SWITCH** Installing an Optional Module into the Switch 1000 BASE SX-SC Expansion Module SMC6 724L2G SSC TX RX Figure 3-4. Installing an Optional Module Caution: DO NOT install slide-in modules with the switch powered on. Be sure you power off the switch before installing any module. To install an optional module into the switch, do the following: 1.

Disconnect power to the switch. 2. Remove the blank metal plate (or a previously installed module) from 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.

Also, it is recommended to use an ESD wrist strap during installation. 4. Remove the module from the anti-static shielded bag. 5. Holding the module level, guide it into the carrier rails on each side and gently push it all the way into the slot, ensuring that it firmly engages with the connector.

**3-6 CONNECTING TO A POWER SOURCE** Connecting to a Power Source To connect a device to a power source: 1. Insert the power cable plug directly into the receptacle located at the back of the device. 100-240 V 50-60 Hz 2 A Figure 3-5. Power Receptacle 2. Plug the other end of the cable into a grounded, 3-pin socket. Note: For International use, you may need to change the AC line cord. You must use a line cord set that has been approved for the receptacle type in your country. 3. Check the front-panel LEDs as the device is powered on to be sure the Power LED is lit. If not, check that the power cable is correctly plugged in.

**3-7 INSTALLING THE SWITCH** **3-8 CHAPTER 4 MAKING NETWORK CONNECTIONS** Connecting Network Devices The TigerSwitch 10/100 is designed to interconnect multiple segments (or collision domains). It may be connected to 10 or 100 Mbps network cards in PCs and servers, as well as to Ethernet and Fast Ethernet hubs, switches or routers. It may also be connected to remote devices using the optional 100BASE-FX or Gigabit modules. Note: Before connecting cables, you may want to first configure the Spanning Tree Protocol to avoid network loops. Refer to the Management Guide for more information.

Twisted-Pair Devices Each device requires an unshielded twisted-pair (UTP) cable with RJ-45 connectors at both ends. For 100BASE-TX connections, Category 5 cable is required; for 10BASE-T, Category 3, 4 or 5 cable can be used. **4-1 MAKING NETWORK CONNECTIONS** Cabling Guidelines The RJ-45 ports on the switch support automatic MDI/MDI-X operation, so you can use standard straight-through twisted-pair cables to connect to any other network device (PCs, servers, switches, routers, or hubs). See Appendix B for further information on cabling. Caution: Do not plug a phone jack connector into an RJ-45 port.

This will damage the switch. Use only twisted-pair cables with RJ-45 connectors that conform to FCC standards. **4-2 TWISTED-PAIR DEVICES** Connecting to PCs, Servers, Hubs and Switches 1. Attach one end of a twisted-pair cable segment to the device's RJ-45 connector. Figure 4-1.

Making Twisted-Pair Connections 2. If the device is a PC card and the TigerSwitch is in the wiring closet, attach the other end of the cable segment to a modular wall outlet that is connected to the wiring closet (see "Wiring Closet Connections" on the next page). Otherwise, attach the other end to an available port on the switch. 3. Make sure each twisted pair cable does not exceed 100 meters (328 ft) in length.

Note: When connected to a shared collision domain (such as a hub with multiple workstations), switch ports must be set to half-duplex mode and back pressure flow control disabled. 4. As each connection is made, the green Link LED (on the TigerSwitch) corresponding to each port will light to indicate that the connection is valid. **4-3 MAKING NETWORK CONNECTIONS** Wiring Closet Connections Today, the punch-down block is an integral part of many of the newer equipment racks. It is actually part of the patch panel. Instructions for making connections in the wiring closet with this type of equipment follows. 1. Attach one end of a patch cable to an available port on the switch, and the other end to the patch panel. 2. If not already in place, attach one end of a cable segment to the back of the patch panel where the punch-down block is located, and the other end to a modular wall outlet.

3. Label the cables to simplify future troubleshooting. SMC TigerSwitch 10/100 Equipment Rack (side view) Punch-Down Block Patch Panel Wall Figure 4-2. Wiring Closet Connections **4-4 FIBER OPTIC DEVICES** Fiber Optic Devices An optional slide-in 100BASE-FX module can be used for backbone and long distance connections.



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A 1000BASE-SX or 1000BASE-LX module can also be used for a backbone connection between switches, or for connecting to a high-speed server. Each multimode fiber optic port requires 50/125 or 62.5/125 micron multimode fiber optic cabling with an SC connector at both ends. If you need to connect to a device with 62.5/125 micron cable that has ST-type connectors, SMC provides an optional SC-ST Converter (Part Number: 99-012034-091). Each single-mode fiber port requires 9/125 micron single-mode fiber optic cable with an SC connector at both ends.

**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.

4-5 MAKING NETWORK CONNECTIONS 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. SC fiber connector Figure 4-3. Making SC Port Connections 4. As a connection is made, check the Activity LED on the switch's front panel for the corresponding module to be sure that the connection is valid. Note: If you use the optional SC-ST Converter, be sure to connect the converter's Tx (Rx) port to the Rx (Tx) port on the other device. The 100BASE-FX fiber optic ports operate only at 100 Mbps, full duplex. You can run a single-mode fiber link up to 20 kilometers (12.43 miles).

However, note that power budget constraints must also be considered when calculating the maximum cable length for your specific environment. The 1000BASE-SX and 1000BASE-LX fiber optic ports operate at 1 Gbps full duplex, with auto-negotiation of flow control. The maximum length for fiber optic cable operating at Gigabit speed will depend on the fiber type as listed under "1000 Mbps Gigabit Ethernet Collision Domain" on page 2-5. 4-6 APPENDIX A TROUBLESHOOTING Diagnosing Switch Indicators Troubleshooting Chart Symptom Power LED is Off Action . . . Internal power supply has failed or is disconnected. Check connections between the switch, the power cord, the wall outlet. If the switch is installed in a rack, check the connections to the punch-down block and patch panel. Contact SMC Technical Support. The switch is either downloading firmware or running the Power-On Self-Diagnostics Test (POST). If this LED does not stop flashing, then POST has failed, and you should contact SMC Technical Support. 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. Power LED is Flashing Link LED is Off . . . A-1 TROUBLESHOOTING 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.

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 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 SMC Technical Support for assistance. Installation Verify that all system components have been properly installed. If one or more components appear to be malfunctioning (such as the power cord or network cabling), test them in an alternate environment where you are sure that all the other components are functioning properly.

In-Band Access You can access the management agent in the switch from anywhere within the attached network using Telnet, a Web browser, or other network management software such as EliteView. However, you must first configure the switch with a valid IP address, subnet mask, and default gateway. If you have trouble establishing a link to the management agent, check to see if you have a valid network connection. Then verify that you entered the correct IP address. Also, be sure the port through which you are connecting to the switch has not been disabled. If it has not been disabled, then check the network cabling that runs between your remote location and the switch. A-2 IN-BAND ACCESS Note: You can configure the management agent to accept from one to four simultaneous Telnet sessions. If the maximum number of sessions already exists, an additional Telnet connection will not be able to log into the system. A-3 TROUBLESHOOTING A-4 APPENDIX B CABLES Specifications Cable Types and Specifications Cable 10BASE-T 100BASE-TX 100BASE-FX Type Cat. 5 100-ohm UTP Max.

Length 100 m (328 ft) Connector RJ-45 RJ-45 Cat. 3, 4, 5 100-ohm UTP 100 m (328 ft) 50/125 or 62.5/125 micron 2 km (1.24 miles) SC or ST core multimode fiber (MMF) 9/125 micron core single-mode fiber (SMF) 20 km (12.43 miles) SC 100BASE-FX 1000BASE-SX 50/125 or 62.5/125 micron See the following SC or ST core MMF table 1000BASE-LX 9/125 micron SMF 1000BASE-T Cat. 5, 5e 100-ohm UTP 5 km (3.12 miles) SC 100 m (328 ft) RJ-45 1000BASE-SX Fiber Specifications Fiber Diameter 62.5/125 micron MMF 50/125 micron MMF Fiber Bandwidth 160 MHz/km 200 MHz/km 400 MHz/km 500 MHz/km Maximum Cable Length 2-220 m (7-722 ft) 2-275 m (7-902 ft) 2-500 m (7-1641 ft) 2-550 m (7-1805 ft) Note: If you need to connect to a device with 62.5/125 micron cable that has ST-type connectors, SMC provides an optional SC-ST Converter (Part Number: 99-012034-091).

B-1 CABLES Twisted-Pair Cable and Pin Assignments Caution: DO NOT plug a phone jack connector into any RJ-45 port. Use only twisted-pair cables with RJ-45 connectors that conform with FCC standards. For 100BASE-TX/10BASE-T connections, a twisted-pair cable must have two pairs of wires. Each wire pair is identified by two different colors. For example, one wire might be red and the other, red with white stripes.

Also, an RJ-45 connector must be attached to both ends of the cable. Caution: Each wire pair must be attached to the RJ-45 connectors in a specific orientation. (See "Cabling Guidelines" on page 4-2 for an explanation.) Figure B-1 illustrates how the pins on the RJ-45 connector are numbered.



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Be sure to hold the connectors in the same orientation when attaching the wires to the pins.

10BASE-T/100BASE-TX Pin Assignments 1 8 8 1 Figure B-1. RJ-45 Connector Pin Numbers 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). B-2 TWISTED-PAIR CABLE AND PIN ASSIGNMENTS 100BASE-TX/10BASE-T Pin Assignments With 100BASE-TX/10BASE-T cable, pins 1 and 2 are used for transmitting data, and pins 3 and 6 for receiving data. RJ-45 Pin Assignments Pin Number 1 2 3 6 Assignment 1 Tx+ TxRx+ Rx- 1: The "+" and "-" signs represent the polarity of the wires that make up each wire pair. Because all ports on this switch support automatic MDI/MDI-X operation, you can use straight-through cables for all network connections to PCs or servers, or to other switches or hubs. In straight-through cable, pins 1, 2, 3, and 6, at one end of the cable, are connected straight through to pins 1, 2, 3 and 6 at the other end of the cable. The table below shows the 10BASE-T/ 100BASE-TX MDI and MDI-X port pinouts. Pin MDI-X Assignment 1 Input Receive Data + 2 Input Receive Data 3 Output Transmit Data + 6 Output Transmit Data No other pins are used. MDI Assignment Output Transmit Data + Output Transmit Data Input Receive Data + Input Receive Data - B-3 CABLES 1000BASE-T Pin Assignments 1000BASE-T ports switch support automatic MDI/MDI-X operation, so you can use straight-through cables for all network connections to PCs or servers, or to other switches or hubs.

The table below shows the 1000BASE-T MDI and MDI-X port pinouts. These ports require that all four pairs of wires be connected. Note that for 1000BASE-T operation, all four pairs of wires are used for both transmit and receive. Use 100-ohm Category 5 or 5e unshielded twisted-pair (UTP) or shielded twisted-pair (STP) cable for 1000BASE-T connections. Also be sure that the length of any twisted-pair connection does not exceed 100 meters (328 feet). Pin 1 2 3 4 5 6 7 8 MDI Signal Name Transmit Data plus (TD1+) Receive Data minus (RD1-) Transmit Data plus (TD2+) Transmit Data plus (TD3+) Receive Data minus (RD3-) Receive Data minus (RD2-) Transmit Data plus (TD4+) Receive Data minus (RD4-) MDI-X Signal Name Transmit Data plus (TD2+) Receive Data minus (RD2-) Transmit Data plus (TD1+) Transmit Data plus (TD4+) Receive Data minus (RD4-) Receive Data minus (RD1-) Transmit Data plus (TD3+) Receive Data minus (RD3-) B-4 TWISTED-PAIR CABLE AND PIN ASSIGNMENTS 1000BASE-T Cable Requirements All Category 5 UTP cables that are used for 100BASE-TX connections should also work for 1000BASE-T, providing that all four wire pairs are connected. However, it is recommended that for all critical connections, or any new cable installations, Category 5e (enhanced Category 5) cable should be used. The Category 5e specification includes test parameters that are only recommendations for Category 5. Therefore, the first step in preparing existing Category 5 cabling for running 1000BASE-T is a simple test of the cable installation to be sure that it complies with the IEEE 802.3ab standards.

Cable Testing for Existing Category 5 Cable Installed Category 5 cabling must pass tests for Attenuation, Near-End Crosstalk (NEXT), and Far-End Crosstalk (FEXT). This cable testing information is specified in the ANSI/TIA/EIA-TSB-67 standard. Additionally, cables must also pass test parameters for Return Loss and Equal-Level Far-End Crosstalk (ELFEXT). These tests are specified in the ANSI/TIA/EIA-TSB-95 Bulletin, "The Additional Transmission Performance Guidelines for 100 Ohm 4-Pair Category 5 Cabling." Note: When testing your cable installation, be sure to include all patch cables between switches and end devices.

Adjusting Existing Category 5 Cabling If your existing Category 5 installation does not meet one of the test parameters for 1000BASE-T, there are basically three measures that can be applied to try to correct the problem: 1. Replace any Category 5 patch cables with high-performance Category 5e cables. 2. Reduce the number of connectors used in the link. 3.

Reconnect some of the connectors in the link. B-5 CABLES Console Port Pin Assignments The DB-9 serial port on the switch's front panel is used to connect to the switch for out-of-band console configuration. The on-board menu-driven configuration program can be accessed from a terminal or a PC running a terminal emulation program. The pin assignments used to connect to the serial port are provided in the following tables. Pin 1 Pin 9 Figure B-2. DB-9

Console Port Pin Numbers DB-9 Port Pin Assignments EIA CCITT Description Circuit Signal BB BA AB 104 103 102 RxD (Received Data) TxD (Transmitted Data) SGND (Signal Ground) Switch's DB9 DTE Pin # 2 3 5 PC DB9 DTE Pin # 2 3 5 No other pins are used. Console Port to 9-Pin DTE Port on PC Switch's 9-Pin Serial Port 2 RXD 3 TXD 5 SGND Null Modem <-----TXD -----RXD -----> -----SGND -----PC's 9-Pin DTE Port 3 TXD 2 RXD 5 SGND No other pins are used. B-6 CONSOLE PORT PIN ASSIGNMENTS Console Port to 25-Pin DTE Port on PC Switch's 9-Pin Serial Port 2 RXD 3 TXD 5 SGND Null Modem <-----TXD -----RXD -----> -----SGND -----PC's 25-Pin DTE Port 2 TXD 3 RXD 7 SGND No other pins are used. B-7 CABLES B-8 APPENDIX C SPECIFICATIONS Physical Characteristics Base Unit Ports 24 10BASE-T/100BASE-TX, with auto-negotiation 2 slots for optional 100BASE-FX or Gigabit modules Network Interface 10BASE-T: RJ-45 (100-ohm, UTP cable; Categories 3, 4, 5) 100BASE-TX: RJ-45 (100-ohm, UTP cable; Category 5) Ports 1-24: RJ-45 connectors, auto MDI/MDI-X Buffer Architecture 1 Mbyte per system Aggregate Bandwidth 8.8 Gbps Switching Database 32K MAC address entries LEDs System: Power; SNMP, Console Port: Link, Status (COL, ACT, FDX, 100M) Weight 3.

74 kg (8 lbs 4 oz) Size 44.0 x 28.5 x 4.3 cm (17.32 x 11.22 x 1.7 in.) C-1 SPECIFICATIONS Temperature Operating: 0 to 50 °C (32 to 122 °F) Storage: -40 to 70 °C (-40 to 158 °F) Humidity Operating: 10% to 90% AC Input 80 to 264 V, 50 to 60 Hz Power Supply Internal, auto-ranging transformer: 100 to 240 VAC, 50 to 60 Hz Power Consumption 60 Watts maximum Heat Dissipation 205 BTU/hr maximum Maximum Current 3.0 A @ 115 VAC, 2.0 A @ 240 VAC C-2 MANAGEMENT FEATURES Management Features In-Band Management Telnet, Web-based HTTP, or SNMP manager (EliteView Network Management software provided free) Out-of-Band Management RS-232 DB-9 console port Software Loading TFTP in-band or XModem out-of-band MIB Support MIB II (RFC 1213), Bridge MIB (RFC 1493), Ethernet-Like MIB (RFC 1643), RMON MIB (RFC 1757), SMC's private MIB RMON Support Groups 1, 2, 3, 9 (Statistics, History, Alarm, Event) Additional Features Port Trunks Port Mirroring C-3 SPECIFICATIONS Standards IEEE 802.



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3 Ethernet, IEEE 802.3u Fast Ethernet, IEEE 802.3ab Gigabit Ethernet, IEEE 802.3z Gigabit Ethernet IEEE 802.1D Spanning Tree Protocol and traffic priorities IEEE 802.

1p priority tags IEEE 802.3ab CSMA/CD and physical layer specs for 1000BASE-T IEEE 802.3ac VLAN tagging IEEE 802.1Q VLAN Bridge Management IEEE 802.3x full-duplex flow control ISO/IEC 8802-3 SNMP (RFC 1157), RMON (RFC 1757), ARP (RFC 826), IGMP (RFC 1112), MIB II (RFC 1213), Bridge MIB (RFC 1493) Compliances CE Mark Emissions FCC Class A Industry Canada Class A EN55022 (CISPR 22) Class A EN 61000-3-2/3 VCCI Class A C-Tick - AS/NZS 3548 (1995) Class A Immunity EN 61000-4-2/3/4/5/6/8/11 Safety CSA/NRTL (CSA 22.

2.950 & UL 1950) EN60950 (TÜV/GS) Warranty Limited Lifetime C-4 SLIDE-IN MODULES Slide-in Modules 100BASE-FX Extender Modules Models SMC6725L2FSSC, SMC6725L2FMSC Ports 1 100BASE-FX Network Interface SMC6725L2FSSC: 9/125 micron single-mode fiber cable SMC6725L2FMSC 50/125 or 62.5/125 micron multimode fiber cable Standards IEEE 802.3u Fast Ethernet ISO/IEC 8802-3 1000BASE-SX Extender Module Model SMC6724L2GSSC Ports 1 1000BASE-SX SC-type port Network Interface SC connector, 50/125 or 62.5/125 micron multimode fiber cable Standards IEEE 802.3z Gigabit Ethernet C-5 SPECIFICATIONS 1000BASE-LX Extender Module Model SMC6724L2GLSC Ports 1 1000BASE-LX SC-type port Network Interface SC connector, 9/125 micron single-mode fiber Standards IEEE 802.3z Gigabit Ethernet 1000BASE-T Extender Module Model SMC6725L2GT Ports 1 1000BASE-T (RJ-45) port Network Interface RJ-45 Connector, 100-ohm, Category 5, 5e twisted-pair cable Standards IEEE 802.3ab Gigabit Ethernet C-6 APPENDIX D ORDERING INFORMATION TigerSwitch 10/100 Products and Accessories Product Number SMC6724L2 SMC6724L2GSSC SMC6724L2GSST SMC6724L2GLSC SMC6725L2GT SMC6725L2FSSC SMC6725L2FMSC 99-012034-091 Description 24-port Fast Ethernet switch with two media expansion slots Gigabit module with one 1000BASE-SX multimode fiber port (SC-type connector) SMC6724L2GSSC + SC-ST converter Gigabit Module with one 1000BASE-LX single-mode port (SC-type connector) Gigabit module with one 1000BASE-T port (RJ-45 connector) Extender module with one 100BASE-FX single-mode fiber port (SC-type connector) Extender module with one 100BASE-FX multimode fiber port (SC-type connector) SC to ST plug converter for fiber optic module D-1 ORDERING INFORMATION D-2 GLOSSARY 10BASE-T IEEE 802.3 specification for 10 Mbps Ethernet over two pairs of Category 3, 4, or 5 UTP cable. 100BASE-TX IEEE 802.

3u specification for 100 Mbps Fast Ethernet over two pairs of Category 5 UTP cable. 100BASE-FX IEEE 802.3u specification for 100 Mbps Fast Ethernet over two strands of 50/125 or 62.5/125 micron core fiber cable. 1000BASE-SX IEEE 802.3z specification for Gigabit Ethernet over two strands of 50/125 or 62.5/125 micron core fiber cable. 1000BASE-LX IEEE 802.3z specification for Gigabit Ethernet over one strand of 9/125 micron core fiber cable. 1000BASE-T IEEE 802.

3ab specification for Gigabit Ethernet over two pairs of Category 5, 5e 100-ohm UTP cable. Auto-Negotiation Signalling method allowing each node to select its optimum operational mode (e.g., 10 Mbps or 100 Mbps and half or full duplex) based on the capabilities of the node to which it is connected. Glossary-1 Bandwidth The difference between the highest and lowest frequencies available for network signals.

Also synonymous with wire speed, the actual speed of the data transmission along the cable. Class I Repeater Fast Ethernet repeater that is principally used to connect different physical signaling systems (e.g., 100BASE-TX, 100BASE-FX) and that has an internal delay such that only one repeater of this type can reside within a single collision domain when maximum cable lengths are used. Class II Repeater Fast Ethernet repeater that typically supports a single physical signaling system (e.

g., 100BASE-TX, or 100BASE-FX) and that has a smaller internal delay so that two such repeaters can reside within a single collision domain when maximum cable lengths are used. @@Their interference makes both signals unintelligible. Collision Domain Single CSMA/CD LAN segment.

@@@Fast Ethernet A 100 Mbps network communication system based on Ethernet and the CSMA/CD access method. Fast Ethernet Switch Device that provides a full 100 Mbps bandwidth (or either 10 or 100 Mbps bandwidth with Auto-Negotiation) to each port (LAN segment). Full Duplex Transmission method that allows switch and network card to transmit and receive concurrently, effectively doubling the bandwidth of that link. Gigabit Ethernet A 1000 Mbps network communication system based on Ethernet and the CSMA/CD access method. IEEE 802.3 Defines carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications.

Glossary-3 IEEE 802.3ab Defines CSMA/CD access method and physical layer specifications for 1000BASE-T Fast Ethernet. IEEE 802.3u Defines CSMA/CD access method and physical layer specifications for 100BASE-TX Fast Ethernet. IEEE 802.3x Defines Ethernet frame start/stop requests and timers used for flow control on full-duplex links. IEEE 802.3z Defines CSMA/CD access method and physical layer specifications for 1000BASE Gigabit Ethernet. LAN Segment Separate LAN or collision domain. LED Light emitting diode used for monitoring a device or network condition.

Link Segment Length of twisted-pair or fiber cable joining a pair of repeaters or a repeater and a PC. Local Area Network (LAN) A group of interconnected computer and support devices. Glossary-4 Media Access Control (MAC) A portion of the networking protocol that governs access to the transmission medium, facilitating the exchange of data between network nodes. MIB An acronym for Management Information Base. It is a set of database objects that contains information about the device.

MII Media Independent Interface, the standard interface for Fast Ethernet--similar to the AUI interface for traditional Ethernet. Network Diameter Wire distance between two end stations in the same collision domain. RJ-45 Connector A connector for twisted-pair wiring. Straight-through Port An RJ-45 port which does not cross the receive and transmit signals internally so it can be connected with straight-through twisted-pair cable to any device having a crossover port. Also referred to as a "Daisy-Chain" port.

Switched Ports Ports that are on separate collision domains or LAN segments. Transmission Control Protocol/Internet Protocol (TCP/IP) Protocol suite that includes TCP as the primary transport protocol, and IP as the network layer protocol. UTP Unshielded twisted-pair cable. Glossary-5 Glossary-6 INDEX Numerics 10 Mbps connectivity rules 2-7 100 Mbps connectivity rules 2-6 1000 Mbps connectivity rules 2-5 1000BASE-LX connections 4-5 fiber cable lengths 2-5 modules 1-8 1000BASE-SX connections 4-5 fiber cable lengths 2-5 modules 1-7, 1-9 1000BASE-T cable lengths 2-5 modules 1-8 100BASE-FX connections 4-5 fiber cable lengths 2-6 modules 1-9 100BASE-TX cable lengths 2-6 100BASE-TX ports 1-3 10BASE cable lengths 2-7 10BASE-T ports 1-3 B brackets, attaching 3-4 broadcast storm control 1-5 buffer size C-1 C cable lengths 2-5, 2-6, 2-7 specifications B-1 CE Mark iv cleaning fiber terminators 4-5 compliances iii EMC C-4 safety C-4 connectivity rules 10 Mbps 2-7 100 Mbps 2-6 1000 Mbps 2-5 console port pin assignments B-6 contents of package 3-2 cooling problems A-2 cord sets, international 3-7 A accessories, ordering D-1 address table size C-1 adhesive feet, attaching 3-5 air flow requirements 3-1 applications 2-2 collapsed backbone 2-2 remote connections with fiber 2-3 VLAN connections 2-4 D desktop mounting 3-5 device connections 4-1 E EC conformance iv electrical interference, avoiding 3-1 EMC/safety compliance iii equipment checklist 3-2 Ethernet connectivity rules 2-7 Index-1 F Fast Ethernet connectivity rules 2-6 fault tolerance, Spanning Tree 1-6 FCC compliance iii features C-3 management 1-12 switch 1-10 fiber cables 4-5 front and rear panels of switch 1-1 full-duplex connectivity 2-1 problems A-1 limited warranty C-4 location requirements 3-1 M management agent 1-2 features 1-12, C-3 out-of-band 1-2, 1-5 SNMP 1-2 Telnet 1-6 Web-based 1-2 MIB support C-3 modules 1000BASE-LX 1-8, C-6 1000BASE-SX 1-7, 1-9, C-5 1000BASE-T 1-8 100BASE-FX 1-9 slide-in C-5 mounting the switch in a rack 3-3 on a desktop or shelf 3-5 multicast switching 1-7 IGMP 1-7 IGMP Snooping 1-7 multimode fiber optic cables 4-5 G Gigabit Ethernet cable lengths 2-5 grounding for racks 3-3 GVRP 1-5 I indicators, LED 1-4 installation connecting

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