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You can read the recommendations in the user guide, the technical guide or the installation guide for SMC 6248M INT. You'll find the answers to all your questions on the SMC 6248M INT in the user manual (information, specifications, safety advice, size, accessories, etc.). Detailed instructions for use are in the User's Guide.

User manual SMC 6248M INT
User guide SMC 6248M INT
Operating instructions SMC 6248M INT
Instructions for use SMC 6248M INT
Instruction manual SMC 6248M INT

TigerStack 10/100

48-Port 10/100Mbps Stackable Managed Switch

- ◆ 48 auto-MDI/MDI-X 10BASE-T/100BASE-TX ports
- ◆ 2 Gigabit RJ-45 ports shared with 2 SFP transceiver slots
- ◆ 2 Gigabit stacking ports that act as Ethernet ports in standalone mode
- ◆ Stacks up to 4 units
- ◆ 17.6 Gbps of aggregate bandwidth
- ◆ Non-blocking switching architecture
- ◆ Spanning Tree Protocol and Rapid STP
- ◆ Up to four LACP or static 8-port trunks
- ◆ RADIUS and TACACS+ authentication
- ◆ Rate limiting for bandwidth management
- ◆ CoS support for four-level priority
- ◆ Full support for VLANs with GVRP
- ◆ IP Multicasting with IGMP Snooping
- ◆ Manageable via console, Web, SNMP/RMON

SMC[®]
Networks

Installation Guide
SMC6248M



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Manual abstract:

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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 or greater for 100 Mbps connections and Category 5, 5e or 6 for 1000 Mbps connections. Use 50/125 or 62.

5/125 micron multimode fiber optic cable, or 9/125 micron single-mode cable, for SFP transceiver 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. Japan VCCI Class A iii COMPLIANCES CE Mark Declaration of Conformance for EMI and Safety (EEC) 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: · EN60950:2000 Warning: Do not plug a phone jack connector in the RJ-45 port. This may damage this device. Attention: Les raccordeurs ne sont pas utilisés pour le système téléphonique! iv 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. Power Cord Safety Please read the following safety information carefully before installing the switch: WARNING: Installation and removal of the unit must be carried out by qualified personnel only.

· The unit must be connected to an earthed (grounded) outlet to comply with international safety standards. · Do not connect the unit to an A.C. outlet (power supply) without an earth (ground) connection. · The appliance coupler (the connector to the unit and not the wall plug) must have a configuration for mating with an EN 60320/IEC 320 appliance inlet.

· The socket outlet must be near to the unit and easily accessible. You can only remove power from the unit by disconnecting the power cord from the outlet. · This unit operates under SELV (Safety Extra Low Voltage) conditions according to IEC 609circ;tre du type à mise à la terre (mise à la masse) et respecter la configuration NEMA 5-15P (15 A, 125 V) ou NEMA 6-15P (15 A, 250 V). Danemark: Suisse: Europe La prise mâle d'alimentation doit respecter la section 107-2 D1 de la norme DK2 1a ou DK2 5a. La prise mâle d'alimentation doit respecter la norme SEV/ASE 1011.

La prise secteur doit être conforme aux normes CEE 7/7 ("SCHUKO") LE cordon secteur doit porter la mention <HAR> ou <BASEC> et doit être de type HO3VVF3GO.75 (minimum). Bitte unbedingt vor dem Einbauen des Switches die folgenden Sicherheitsanweisungen durchlesen: WARNUNG: Die Installation und der Ausbau des Geräts darf nur durch Fachpersonal erfolgen. · Das Gerät sollte nicht an eine ungeerdete Wechselstromsteckdose angeschlossen werden. · Das Gerät muß an eine geerdete Steckdose angeschlossen werden, welche die internationalen Sicherheitsnormen erfüllt. · Der Gerätestecker (der Anschluß an das Gerät, nicht der Wandsteckdosenstecker) muß einen gemäß EN 60320/IEC 320 konfigurierten Geräteeingang haben. · Die Netzsteckdose muß in der Nähe des Geräts und leicht zugänglich sein. Die Stromversorgung des Geräts kann nur durch Herausziehen des Gerätenetzkabels aus der Netzsteckdose unterbrochen werden. · Der Betrieb dieses Geräts erfolgt unter den SELV-Bedingungen (Sicherheitskleinstspannung) gemäß IEC 60950. Diese Bedingungen sind nur gegeben, wenn auch die an das Gerät angeschlossenen Geräte unter SELV-Bedingungen betrieben werden.

vii COMPLIANCES Stromkabel. Dies muss von dem Land, in dem es benutzt wird geprüft werden: Schweiz Europe Dieser Stromstecker muß die SEV/ASE 1011 Bestimmungen einhalten. Das Netzkabel muß vom Typ HO3VVF3GO.75 (Mindestanforderung) sein und die Aufschrift <HAR> oder <BASEC> tragen. Der Netzstecker muß die Norm CEE 7/7 erfüllen ("SCHUKO"). Warnings and Cautionary Messages Warning: Warning: Warning: This product does not contain any serviceable user parts. Installation and removal of the unit must be carried out by qualified personnel only. When connecting this device 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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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. Wear an anti-static wrist strap or take other suitable measures to prevent electrostatic discharge when handling this equipment. Do not plug a phone jack connector in the RJ-45 port. This may damage this device. Les raccordeurs ne sont pas utilisés pour le système téléphonique! Use only twisted-pair cables with RJ-45 connectors that conform to FCC standards.

Warning: Caution: Caution: Caution: Warnings (in German) Achtung: Achtung: Achtung: Dieses Produkt enthält keine Teile, die eine Wartung vom Benutzer benötigen. Installation und Deinstallation des Gerätes müssen von qualifiziertem Servicepersonal durchgeführt werden. Wenn das Gerät an eine Steckdose angeschlossen wird, muß der Masseanschluß am dreipoligen Netzstecker mit Schutzterde verbunden werden, um elektrische Gefahren zu vermeiden. Dieses Gerät nutzt Laser zur Signalübertragung über Glasfasern. Die Laser entsprechen den Anforderungen an eine Lasereinrichtung der Klasse 1 und sind durch ihre Bauart im normalen Betrieb sicher für die Augen.

Trotzdem sollte niemals direkt in den einen Übertragungskanal geblickt werden, wenn er eingeschaltet ist. Achtung: viii COMPLIANCES Environmental Statement The manufacturer of this product endeavours to sustain an environmentally-friendly policy throughout the entire production process. This is achieved through the following means: Adherence to national legislation and regulations on environmental production standards. Conservation of operational resources. Waste reduction and safe disposal of all harmful un-recyclable by-products. Recycling of all reusable waste content. Design of products to maximize recyclables at the end of the product's life span. Continual monitoring of safety standards. End of Product Life Span This product is manufactured in such a way as to allow for the recovery and disposal of all included electrical components once the product has reached the end of its life. Manufacturing Materials There are no hazardous nor ozone-depleting materials in this product.

Documentation All printed documentation for this product uses biodegradable paper that originates from sustained and managed forests. The inks used in the printing process are non-toxic. Purpose This guide details the hardware features of the switch, including its physical and performance-related characteristics, and how to install the switch. Audience The guide is intended for use by network administrators who are responsible for installing and setting up network equipment; consequently, it assumes a basic working knowledge of LANs (Local Area Networks). Diese Anleitung ist für die Benutzung durch Netzwerkadministratoren vorgesehen, die für die Installation und das Einstellen von Netzwerkkomponenten verantwortlich sind; sie setzt Erfahrung bei der Arbeit mit LANs (Local Area Networks) voraus. Related Publications The following publication gives specific information on how to operate and use the management functions of the switch: The SMC6248M Management Guide Also, as part of the switch's firmware, there is an online web-based help that describes all management related features. ix COMPLIANCES x TABLE OF CONTENTS 1 About the TigerStack 10/100

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B-4 xv FIGURES xvi CHAPTER 1 ABOUT THE TIGERSTACK 10/100 Overview SMC's TigerStack SMC6248M is a stackable Fast Ethernet switch with 48 10BASE-T/100BASE-TX ports and two 1000BASE-T ports that operate in combination with two Small Form Factor Pluggable (SFP) transceiver slots (see Figure 1-1, Ports 49-50). The switch also provides two 1 Gbps built-in stacking ports for connecting up to four units in a stack. The stacking ports can also be used as normal Ethernet ports in standalone mode. The switch includes an SNMP-based management agent embedded on the main board, which supports both in-band and out-of-band access for managing the switch stack. The switch provides a broad range of powerful features for Layer 2 switching, delivering reliability and consistent performance for your network traffic.

It brings order to poorly performing networks by segregating them into separate broadcast domains with IEEE 802.1Q compliant VLANs, and empowers multimedia applications with multicast switching and CoS services. 1. If an SFP transceiver is plugged in, the corresponding RJ-45 port is disabled for ports 49-50. 1-1 ABOUT THE TIGERSTACK 10/100 Port Status Indicators 1 2 3 4 5 6 7 8 9 10 11 12 Stacking Ports 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 System Indicators 46 47 48 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 Slave Stack Master Uplink 51/Down 52/Up 49 50 51 PWR Diag RPU Master 52 Stack 49 50 10/100 Mbps RJ-45 Ports 1000BASE-T/SFP Ports Console DC 12V 4.5A RPU Console Port Redundant Power Socket2 Power Socket Figure 1-1 Front and Rear Panels Switch Architecture The SMC6248M switch employs a wire-speed, non-blocking switching fabric. This permits simultaneous wire-speed transport of multiple packets at low latency on all ports. The switch also features full-duplex capability on all ports, which effectively doubles the bandwidth of each connection.2 The switch uses store-and-forward switching to ensure maximum data integrity. With store-and-forward switching, the entire packet must be received into a buffer and checked for validity before being forwarded.

This prevents errors from being propagated throughout the network. The switch includes built-in stacking ports that enable up to four units to be connected together through a 4 Gbps stack backplane. The switch stack can be managed from a master unit using a single IP address. 2. An RPU is not yet available for this product. 1-2 DESCRIPTION OF HARDWARE Network Management Options The SMC6248M 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 you to configure or monitor the switch using its embedded management software, or via SNMP applications. To manage the switch, you can make a direct connection to the RS-232 console port (out-of-band), or you can manage it through a network connection (in-band) using Telnet, the on-board Web agent, or SNMP-based network management software. For a detailed description of the advanced features, refer to the Management Guide. Description of Hardware 10BASE-T/100BASE-TX Ports The SMC6248M contains 48 10BASE-T/100BASE-TX RJ-45 ports that operate at 10 Mbps or 100 Mbps, half or full duplex.

Because all RJ-45 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.



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(See "1000BASE-T Pin Assignments" on page B-5.) Each of these ports support auto-negotiation, so the optimum transmission mode (half or full duplex), and data rate (10 or 100 Mbps) can be selected automatically. If a device connected to one of these ports does not support auto-negotiation, the communication mode of that port can be configured manually. Each port also supports IEEE 802.

3x auto-negotiation of flow control, so the switch can automatically prevent port buffers from becoming saturated. 1-3 ABOUT THE TIGERSTACK 10/100 1000BASE-T/SFP Ports The SMC6248M contains two combination Gigabit RJ-45 ports that are shared with Small Form Factor Pluggable (SFP) transceiver slots (Ports 49-50, Figure 1-1 on page 1-2). If an SFP transceiver (purchased separately) is installed in a slot, the associated RJ-45 port is disabled. The switch can be configured to force the use of an RJ-45 port or SFP slot, as required. The 1000BASE-T RJ-45 ports 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.

(See "1000BASE-T Pin Assignments" on page B-5.) Stacking Ports The unit provides two stacking ports that provide a 4 Gbps stack backplane connection. Up to four switches can be connected together using Category 5 Ethernet cables (purchased separately). The Master button enables one switch in the stack to be selected as the master. This is the unit through which you manage the entire stack. The stacking ports can also be used as normal Ethernet ports in standalone mode by pressing the Uplink button. Master Button Uplink Button 47 48 Slave Stack Master Uplink 51/Down 52/Up 49 50 51 PWR Diag RPU Master 52 Stack 49 50 Stacking Ports Figure 1-2 Stacking Ports 1-4 DESCRIPTION OF HARDWARE Port and System Status LEDs The SMC6248M includes a display panel for key system and port indications that simplify installation and network troubleshooting. The LEDs, which are located on the front panel for easy viewing, are shown below and described in the following tables. Port Status LEDs 1 2 3 4 5 6 7 8 9 10 11 12 Figure 1-3 Port LEDs Table 1-1 LED Condition Port Status LEDs Status Fast Ethernet Ports (Ports 1-48) (Link/ Activity) On/Flashing Amber On/Flashing Green Off Flashing Green Port has established a valid 10 Mbps network connection. Flashing indicates activity.

Port has established a valid 100 Mbps network connection. Flashing indicates activity. There is no valid link on the port. When the "light unit" command is entered in the Command Line Interface, the LED corresponding to the switch's ID will flash for about 15 seconds. 1-5 ABOUT THE TIGERSTACK 10/100 Table 1-1 LED Condition Port Status LEDs Status Gigabit Ethernet Ports (Ports 49-50, and Ports 51-52 when stacking is not implemented) (Link/ Activity) On/Flashing Amber On/Flashing Green Off Port has established a valid 10/100 Mbps network connection. Flashing indicates activity. Port has established a valid 1000 Mbps network connection. Flashing indicates activity. There is no valid link on the port. System LEDs 52/Up 49 50 51 PWR Diag RPU Master 52 Stack 50 Figure 1-4 System LEDs 1-6 DESCRIPTION OF HARDWARE Table 1-2 LED PWR Condition On Green On Amber Off Diag Flashing Green On Green On Amber RPU On Green On Amber Off Stack Master Flashing Amber On Green On Amber Flashing Green System Status LEDs Status The unit's internal power supply is operating normally.

The unit's internal power supply has failed. The unit has no power connected or the power supply has failed. The system diagnostic test is in progress. The system diagnostic test has completed successfully. The system diagnostic test has detected a fault.

A redundant power unit is attached and is in backup or active mode. There is a fault in the redundant power unit. There is no redundant power unit currently attached. An initial on state during which the stack configuration is detected. This switch is acting as the Master unit in the stack.

This switch is acting as a Slave unit in the stack. When the user enters the light unit command in the CLI, the unit ID of each switch in the stack will be displayed by the port LEDs 1 to 8. System in standalone mode. Off 1-7 ABOUT THE TIGERSTACK 10/100 Power Supply Receptacles There are two power receptacles on the rear panel of the switch. The standard power receptacle is for the AC power cord. The receptacle labeled "RPU" is for the optional Redundant Power Unit3. RPU DC 12V 4.5A 100-240V~ 50-60Hz; 2A Figure 1-5 Power Supply Receptacles Features and Benefits Connectivity · · 48 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. Two 1000BASE-T Gigabit Ethernet ports shared with two SFP slots.

RJ-45 10/100BASE-TX ports support auto MDI/MDI-X. · · 3. An RPU is not yet available for this product. 1-8 FEATURES AND BENEFITS · Unshielded (UTP) cable supported on all RJ-45 ports: Category 3 or better for 10 Mbps connections, Category 5 or better for 100 Mbps connections, and Category 5, 5e or 6 for 1000 Mbps connections. IEEE 802.3-2002 Ethernet, Fast Ethernet, Gigabit Ethernet compliance ensures compatibility with standards-based hubs, network cards and switches from any vendor. Provides stacking capability via RJ-45 ports with 4 Gbps stacking bandwidth. Up to 4 units can be stacked together. The SMC6248M can also be stacked together with the SMC6224M 24-port switch. When combining these switches in the same stack, up to 4 units can be stacked together .

· · · Expandability · Supports 1000BASE-SX, 1000BASE-LX, and 1000BASE-ZX SFP transceivers. Performance · · · · · Transparent bridging Aggregate duplex bandwidth of up to 17.6 Gbps Switching table with a total of 8K MAC address entries Provides store-and-forward switching Wire-speed filtering and forwarding Supports flow control, using back pressure for half duplex and IEEE 802.3x for full duplex Broadcast storm control 1-9 ABOUT THE TIGERSTACK 10/100 Management · · "At-a-glance" LEDs for easy troubleshooting Network management agent: · Manages switch in-band or out-of-band Supports console, Telnet, SSH, SNMP, RMON 4 groups and web-based interface Slave units provide backup stack management. 1-10 CHAPTER 2 NETWORK PLANNING Introduction to Switching A network switch allows simultaneous transmission of multiple packets via non-crossbar switching.

This means that it can partition a network more efficiently than bridges or routers.



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The switch has, therefore, been recognized as one of the most important building blocks for today's networking technology. When performance bottlenecks are caused by congestion at the network access point (such as the network card for a high-volume file server), the device experiencing congestion (server, power user, or hub) can be attached directly to a switched port. And, by using full-duplex mode, the bandwidth of the dedicated segment can be doubled to maximize throughput. When networks are based on repeater (hub) technology, the distance between end stations is limited by a maximum hop count. However, a switch turns the hop count back to zero. So subdividing the network into smaller and more manageable segments, and linking them to the larger network by means of a switch, removes this limitation. A switch can be easily configured in any Ethernet, Fast Ethernet, or Gigabit Ethernet network to significantly boost bandwidth while using conventional cabling and network cards. 2-1 NETWORK PLANNING Application Examples The SMC6248M is not only designed to segment your network, but also to provide a wide range of options in setting up network connections. Some typical applications are described below. Collapsed Backbone The SMC6248M is an excellent choice for mixed Ethernet, Fast Ethernet, and Gigabit Ethernet installations where significant growth is expected in the near future. In a basic stand-alone configuration, it can provide direct full-duplex connections for up to 52 workstations or servers. You can easily build on this basic configuration, adding direct full-duplex connections to workstations or servers. When the time comes for further expansion, just connect to another switch using one of the Gigabit Ethernet ports built into the front panel or a Gigabit Ethernet port on a plug-in SFP transceiver. In the figure below, the switch is operating as a collapsed backbone for a small LAN.

It is providing dedicated 10 Mbps full-duplex connections to workstations, 100 Mbps full-duplex connections to power users, and 1 Gbps full-duplex connections to servers. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 Slave Stack Master Uplink 51/Down 52/Up 49 50 51 PWR Diag RPU Master 52 Stack 49 50 ... Servers 1 Gbps Full Duplex ... Workstations 100 Mbps Full Duplex ...

Workstations 10 Mbps Full Duplex Figure 2-1 Collapsed Backbone 2-2 APPLICATION EXAMPLES Network Aggregation Plan When used in standalone mode, this switch provides 52 parallel bridging ports (i.e., 52 distinct collision domains), which can be used to collapse a complex network down into a single efficient bridged node, increasing overall bandwidth and throughput. When up to four switch units are stacked together, they form a single "virtual" switch containing up to 200 ports. The whole stack can be managed through the Master unit using a single IP address.

In the figure below, the 10BASE-T/100BASE-TX ports are providing 100 Mbps connectivity through stackable switches. In addition, the switches are also connecting several servers at 1000 Mbps. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 Slave Stack Master Uplink 51/Down 52/Up 49 50 51 PWR Diag RPU Master 52 Stack 49 50 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 Slave Stack Master Uplink 51/Down 52/Up 49 50 51 PWR Diag RPU Master 52 Stack 49 50 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 Slave Stack Master Uplink 51/Down 52/Up 49 50 51 PWR Diag RPU Master 52 Stack 49 50 Server Farm 10/100/1000 Mbps Segments Figure 2-2 Network Aggregation Plan 2-3 NETWORK PLANNING Remote Connections with Fiber Cable Fiber optic technology allows for longer cabling than any other media type. A 1000BASE-SX (MMF) link can connect to a site up to 550 meters away, a 1000BASE-LX (SMF) link up to 5 km, and a 1000BASE-ZX link up to 100 km.

This allows a Gigabit Ethernet stack to serve as a collapsed backbone, providing direct connectivity for a widespread LAN. A 1000BASE-SX SFP transceiver can be used for a high-speed connection between floors in the same building and a 1000BASE-LX SFP transceiver can be used for core connections between buildings in a campus setting. And for long-haul connections, a 1000BASE-ZX SFP transceiver can be used to reach another site up to 100 kilometers away. The figure below illustrates three TigerStacks interconnecting multiple segments with fiber cable. Headquarters 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 Slave Stack Master Uplink 51/Down 52/Up 49 50 51 PWR Diag RPU Master 52 Stack 49 50 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 Slave Stack Master Uplink Warehouse 1000BASE-LX (5 kilometers) 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 Slave Stack Master Uplink Slave Stack Master Uplink 51/Down 52/Up 49 50 51 PWR Diag RPU Master 51/Down 52/Up 49 50 51 PWR Diag RPU Master 52 Stack 49 50 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 Slave Stack Master Uplink 52 Stack 49 50 51/Down 52/Up 49 50 51 PWR Diag RPU Master 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 52 Stack Slave Stack Master Uplink 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 Slave Stack Master Uplink 51/Down 52/Up 49 50 51 PWR Diag RPU 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 51/Down 52/Up 49 50 51 PWR Diag RPU Master 52 Stack 49 50 52 Stack 49 50 Master 51/Down Slave Stack Master Uplink 52/Up 49 50 51 PWR Diag RPU Master 52 Stack 49 50 Server Farm Remote Switch 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 1000BASE-SX MMF (500 meters) 1000BASE-LX (5 kilometers) 1000BASE-ZX (100 kilometers).



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2. Insert the transceiver with the optical connector facing outward and the slot connector facing down. Note that SFP transceivers are keyed so they can only be installed in one orientation. 3. Slide the SFP transceiver into the slot until it clicks into place. Note: SFP transceivers are hot-swappable. The switch does not need to be powered off before installing or removing a transceiver. However, always first disconnect the network cable before removing a transceiver.

Note: SFP transceivers are not provided in the switch package.

3-8 CONNECTING SWITCHES IN A STACK Connecting Switches in a Stack Figure 3-6 shows how the stack cables are connected between switches in a stack. Each stacking connection is a 2 Gbps full-duplex link using Category 5 Ethernet cables. The switch supports a line- and ring-topology stacking configuration, or can be used stand alone. In line-topology stacking there is a single stack cable connection between each switch that carries two-way communications across the stack. In ring-topology stacking, an extra cable is connected between the top and bottom switches forming a "ring" or "closed-loop."

The closed-loop cable provides a redundant path for the stack link, so if one link fails, stack communications can be maintained. Figure 3-6 illustrates a ring-topology stacking configuration. To connect up to four switches in a stack, perform the following steps: 1. Enable the stacking ports on each unit (i.e. leave the Stack button out). Note: Pressing the Stack button during normal operation will cause the system to reboot. 2. Plug one end of a stack cable into the "Down" port of the top unit (see Figure 3-6, Port 27). 3. Plug the other end of the stack cable into the "Up" port of the next unit (see Figure 3-6, port 28). 4. Repeat steps 1 and 2 for each unit in the stack. Form a simple chain starting at the "Down" port on the top unit and ending at the "Up" port on the bottom unit (stacking up to 4 units). 3-9 INSTALLING THE SWITCH 5.

(Optional) To form a ring topology stack, complete the connections by plugging one end of a stack cable into the Up port on the bottom unit and the other end into the Down port on the top unit. This forms a wrap-around topology. For a simple top to bottom chain topology ignore this step. 42 43 44 45 46 47 48 Slave Stack Master Uplink 51/Down 52/Up 49 50 51 PWR Diag RPU Master 52 Stack 49 50 42 43 44 45 46 47 48 Slave Stack Master Uplink 51/Down 52/Up 49 50 51 PWR Diag RPU Master 52 Stack 49 50 42 43 44 45 46 47 48 Slave Stack Master Uplink 51/Down 52/Up 49 50 51 PWR Diag RPU Master 52 Stack 49 50 Figure 3-6 Connecting Switches in a Ring-topology Stack 6. Select the Master unit in the stack by pressing in the Master button on only one of the switches. Only one switch in the stack can operate as the Master, all other units operate in slave mode. If more than one switch in the stack is selected as Master, or if no switches are selected, the stack will not function. 3-10 CONNECTING SWITCHES IN A STACK Stacking Topologies Line Topology All units in the stack must be connected via stacking cable. You can connect units in a simple cascade configuration, connecting Down ports to Up ports, from the top to bottom unit. Using this "line" topology, if any link or unit in the stack fails, the stack is split into two separate segments.

The new stack segments will then reboot and resume normal operation if a new segment contains the original Master unit, or if a new segment now contains only one switch. In other words, a new segment will resume normal operation unless it contains more than one switch and the Master button is not depressed on any of these switches. If the later case is true, and a segment fails to resume operation, you can either replace the failed connection to restore operation to the original stack, or depress the Master button on one of the switches in this segment. When the stack reboots and resumes operations, the IP address will be set either using DHCP (according to the factory defaults), or may be set to a static address if you have configured one in the switch's startup file. To avoid conflicting IP addresses on different segments, you can configure each of the switches in the stack to boot up using DHCP, or set a unique IP address in the startup file for each switch.

Refer to the Management Guide for further information on configuring the switch. Ring Topology If you are using a wrap-around stack topology, a single point of failure in the stack will not cause the stack to fail. It would take two or more points of failure to break the stack apart. The stack will merely reboot to detect the new stack's topology, and then resume normal operation. 3-11 INSTALLING THE SWITCH Connecting to a Power Source To connect a switch to a power source: 1.

Insert the power cable plug directly into the AC receptacle located at the back of the switch. RPU DC 12V 4.5A 100-240V~ 50-60Hz 2A Figure 3-7 Power Receptacles 2. Plug the other end of the cable into a grounded, 3-pin, AC power source. 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 PWR LED is lit. If not, check that the power cable is correctly plugged in. 4.

If you have purchased a Redundant Power Unit, connect it to the switch and to an AC power source now, following the instructions included with the package. 4. An RPU is not yet available for this product. 3-12 CONNECTING TO THE CONSOLE PORT Connecting to the Console Port The DB-9 serial port on the switch's rear panel is used to connect to the switch for out-of-band console configuration. The command-line-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 table. 1 5 6 9 Figure 3-8 Serial Port (DB-9 DTE) Pin-Out Wiring Map for Serial Cable Table 3-1 Serial Cable Wiring Switch's 9-Pin Serial Port 2 RXD (receive data) 3 TXD (transmit data) 5 SGND (signal ground) No other pins are used. Null Modem <----->

-----PC's 9-Pin DTE Port 3 TXD (transmit data) 2 RXD (receive data) 5 SGND (signal ground) The serial port's configuration requirements are as follows: Default Baud rate--9,600 bps Character Size--8 Characters Parity--None Stop bit--One Data bits--8 Flow control--none 3-13 INSTALLING THE SWITCH 3-14 CHAPTER 4 MAKING NETWORK CONNECTIONS Connecting Network Devices The SMC6248M switch is designed to interconnect multiple segments (or collision domains).



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It can be connected to network cards in PCs and servers, as well as to hubs, switches or routers. It may also be connected to remote devices using the optional 1000BASE-SX, 1000BASE-LX, or 1000BASE-ZX SFP transceivers.

Twisted-Pair Devices Each device requires an unshielded twisted pair (UTP) cable with RJ-45 connectors at both ends. Use Category 5, 5e or 6 cable for 1000BASE-T connections, Category 5 or better for 100BASE-TX connections, and Category 3 or better for 10BASE-T connections. Cabling Guidelines The RJ-45 ports on the switch support automatic MDI/MDI-X pinout configuration, 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. 4-1 MAKING NETWORK CONNECTIONS 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 network card and the switch 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 the section "Network Wiring Connections.") Otherwise, attach the other end to an available port on the switch. Make sure each twisted pair cable does not exceed 100 meters (328 ft) in length. Note: Avoid using flow control on a port connected to a hub unless it is actually required to solve a problem. Otherwise back pressure jamming signals may degrade overall performance for the segment attached to the hub. 3. As each connection is made, the Link LED (on the switch) corresponding to each port will light to indicate that the connection is valid. 4-2 TWISTED-PAIR DEVICES Network Wiring 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. See "Cable Labeling and Connection Records" on page 4-8. Switch Equipment Rack (side view) 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 Slave Stack Master Uplink 51/Down 52/Up 49 50 51 PWR Diag RPU Master 52 Stack 49 50 Punch-Down Block Patch Panel Wall Figure 4-2 Network Wiring Connections 4-3 MAKING NETWORK CONNECTIONS Fiber Optic SFP Devices An optional Gigabit SFP transceiver (1000BASE-SX, 1000BASE-LX, or 1000BASE-ZX) can be used for a backbone connection between switches, or for connecting to a high-speed server. Each single-mode fiber port requires 9/125 micron single-mode fiber optic cable with an LC connector at both ends.

Each multimode fiber optic port requires 50/125 or 62.5/125 micron multimode fiber optic cabling with an LC 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.

Note: When selecting a fiber SFP device, considering safety, please make sure that it can function at a temperature that is not less than the recommended maximum operational temperature of the product. You must also use an approved Laser Class 1 SFP transceiver. Hinweis: Bei der Wahl eines Glasfasertransceivers muß für die Beurteilung der Gesamtsicherheit beachtet werden, das die maximale Umgebungstemperatur des Transceivers für den Betrieb nicht niedriger ist als die für dieses Produkts. Der Glasfasertransceiver muß auch ein überprüfetes Gerät der Laser Klasse 1 sein. 1.

Remove and keep the LC port's rubber plug. When not connected to a fiber cable, the rubber plug 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. 4-4 FIBER OPTIC SFP DEVICES 3. Connect one end of the cable to the LC port on the switch and the other end to the LC port on the other device. Since LC connectors are keyed, the cable can be attached in only one orientation. Slave Stack Master Uplink 49 50 51 PWR Diag RPU Master 52 Stack Figure 4-3 Making Fiber Port Connections 4.

As a connection is made, check the Link LED on the switch corresponding to the port to be sure that the connection is valid. The 1000BASE-SX, 1000BASE-LX, 1000BASE-ZX 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 4-6. 4-5 MAKING NETWORK CONNECTIONS Connectivity Rules When adding hubs (repeaters) to your network, please follow the connectivity rules listed in the manuals for these products. 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. 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) or Category 6 cable should be used. The Category 5e and 6 specifications include 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 802.3-2002 standards.

1000 Mbps Gigabit Ethernet Collision Domain Table 4-1 Maximum 1000BASE-T Gigabit Ethernet Cable Length Cable Type Category 5, 5e, or 6 100-ohm UTP or STP Maximum Cable Length 100 m (328 ft) Connector RJ-45 Table 4-2 Maximum 1000BASE-SX Gigabit Ethernet Cable Lengths Fiber Size 62.



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