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User manual SMC 6608T-INT
User guide SMC 6608T-INT
Operating instructions SMC 6608T-INT
Instructions for use SMC 6608T-INT
Instruction manual SMC 6608T-INT

TigerSwitch 100
User Guide

From SMC's Tiger line of feature-rich workgroup LAN solutions

SMC

March 1998
900.168 Rev. B



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Manual abstract:

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.trennen. Verwenden Sie keine Flüssigoder Aerosolreiniger. Am besten eignet sich ein angefeuchtetes Tuch zur Reinigung. 4. Die Netzanschluß steckdose soll nahe dem Gerät angebracht und leicht zugänglich sein. 5. Das Gerät ist vor Feuchtigkeit zu schützen. 6. Bei der Aufstellung des Gerätes ist auf sicheren Stand zu achten.

Ein Kippen oder Fallen könnte Beschädigungen hervorrufen. 7. Die Belüftungsöffnungen dienen der Luftzirkulation, die das Gerät vor Überhitzung schützt. Sorgen Sie dafür, daß diese Öffnungen nicht abgedeckt werden. 8. Beachten Sie beim Anschluß an das Stromnetz die Anschlußwerte. 9. Verlegen Sie die Netzanschlußleitung so, daß niemand darüber fallen kann. Es sollte auch nichts auf der Leitung abgestellt werden. 10.

Alle Hinweise und Warnungen, die sich am Gerät befinden, sind zu beachten. 11. Wird das Gerät über einen längeren Zeitraum nicht benutzt, sollten Sie es vom Stromnetz trennen. Somit wird im Falle einer Überspannung eine Beschädigung vermieden. 12.

Durch die Lüftungsöffnungen dürfen niemals Gegenstände oder Flüssigkeiten in das Gerät gelangen. Dies könnte einen Brand bzw. elektrischen Schlag auslösen. vii COMPLIANCES 13. Öffnen sie niemals das Gerät.

Das Gerät darf aus Gründen der elektrischen Sicherheit nur von autorisiertem Servicepersonal geöffnet werden. 14. Wenn folgende Situationen auftreten ist das Gerät vom Stromnetz zu trennen und von einer qualifizierten Servicestelle zu überprüfen: a. Netzkabel oder Netzstecker sind beschädigt. b. Flüssigkeit ist in das Gerät eingedrungen. c. Das Gerät war Feuchtigkeit ausgesetzt. d. Wenn das Gerät nicht der Bedienungsanleitung entsprechend funktioniert oder Sie mit Hilfe dieser Anleitung keine Verbesserung erzielen.

e. Das Gerät ist gefallen und/oder das Gehäuse ist beschädigt. f. Wenn das Gerät deutliche Anzeichen eines Defektes aufweist. Der arbeitsplatzbezogene Schalldruckpegel nach DIN 45 635 Teil 1000 beträgt 70dB(A) oder weniger. viii CHAPTER 1 ABOUT THE TIGERSWITCH 100 TigerSwitch 100 Overview .

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1-2 ABOUT THE TIGERSWITCH 100 TigerSwitch 100 Overview SMC's TigerSwitch™ 100 units are intelligent Fast Ethernet switches. There are two TigerSwitch 100 models available. The first, the TigerSwitch 100T (SMC6608T), features 8 fixed 10BASE-T/100BASE-TX ports. The predominance of dual-speed, Auto-Negotiating ports on the SMC6608T make this unit ideally suited for Fast Ethernet migration.

The ports on the other TigerSwitch 100 model, the TigerSwitch 100M (SMC6608M), are distributed among two slide-in, removable modules. The modules are sold separately from the base unit and feature various combinations of 10BASE-T/ 100BASE-TX and 100BASE-FX ports. This modular design allows for numerous variations in port configuration, making this switch highly versatile and adaptable to any number of different network applications. The TigerSwitch 100 models employ a high-speed, nonblocking switching fabric. This design allows for simultaneous wire-speed transport of multiple packets at low latency on all ports. They also feature full-duplex capability on all ports, which effectively doubles the bandwidth of each connection. These switches also provide for effective system management. In addition to "at a glance" LEDs, the TigerSwitch 100 models are equipped with system configuration software that can be accessed out-of-band via an RS-232 console port or in-band via Telnet. Also included is an on-board SNMP agent, which can be used to manage the switch with SMC's EliteView™ or any other SNMP-based management application. The TigerSwitch 100 units support an optional Redundant Power Unit to minimize downtime in the event of an AC power failure.

1-3 ABOUT THE TIGERSWITCH 100 Figure 1-1. TigerSwitch 100T with 8 10BASE-T/100BASE-TX Ports (Model SMC6608T) Figure 1-2. TigerSwitch 100M Base Unit (Model SMC6608M) Figure 1-3. 4-port Fast Ethernet Modules 1-4 ABOUT THE TIGERSWITCH 100 4-Port Fast Ethernet Modules for Model SMC6608M The available slide-in modules are listed below: Module SMC6600T Ports 1-3 4 SMC6600F SMC6600FSCT 1-4 1-2 3 4 SMC6600FSTT 1-2 3 4 Connectors RJ-45 RJ-45 SC SC RJ-45 RJ-45 ST RJ-45 RJ-45 Description 100BASE-TX, fixed crossover 100BASE-TX, switchselectable crossover 100BASE-FX, fiber 100BASE-FX, fiber 100BASE-TX, fixed crossover 100BASE-TX, switchselectable crossover 100BASE-FX fiber 100BASE-TX, fixed crossover 100BASE-TX, switchselectable crossover 1-5 ABOUT THE TIGERSWITCH 100 Switch Ports 10BASE-T/100BASE-TX Ports These ports are dual-speed RJ-45 ports with built-in wiring crossovers.



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Each TigerSwitch 100 equipped with 10BASE-T/100BASE-TX ports will contain at least one straight-through (daisy-chain) port. This port is used for straight-through cable connections to other devices (i.e., hubs or switches) which have ports with built-in crossovers. Figure 1-4. 10BASE-T/100BASE-TX Ports Each 10BASE-T/100BASE-TX port supports Auto-Negotiation, so the optimum transmission mode (half or full duplex) and data rate (10 Mbps or 100 Mbps) are selected automatically.

If a device connected to one of these ports does not support AutoNegotiation, the communication mode of that port can be configured manually. 100BASE-FX Ports (SMC6608M only) The 100BASE-FX ports are fitted with SC or ST connectors (depending on the module) and operate exclusively at 100 Mbps.

However, the transmission mode for these ports is adjustable to full- or half-duplex and must be set manually. Figure 1-5. 100BASE-FX Ports 1-6 ABOUT THE TIGERSWITCH 100 Status LEDs The LEDs on the TigerSwitch 100 models are located on the front panel for easy viewing.

For a more complete discussion of the front-panel LEDs, see Chapter 4, "Configuration and Management." Figure 1-6. Front Panel LEDs Figure 1-7. Front Panel LED Array 1-7 ABOUT THE TIGERSWITCH 100 Console Port Both TigerSwitch 100 units contain a Console port on the front panel. This is an RS-232 serial port with a DB-9 connector.

A PC may be connected to this port for configuration and monitoring purposes out-of band via a full-handshaking null modem cable. (See Appendix B) Figure 1-8. Console Port Configure Button The Configure button is located on the left-front panel of the TigerSwitch 100 and is used in conjunction with the LEDs to display a wide range of performance and status data for every port. The Configure button can also be used to manually set port communication modes and initiate diagnostic tests. Figure 1-9. Configure Button 1-8 ABOUT THE TIGERSWITCH 100 Optional Redundant Power Unit SMC's Redundant Power Units (RPUs) are separate devices and each has its own power cord. These devices can supply power to the unit in the event of a failure of the internal power supply. The available RPUs are listed in the table below. Contact your reseller for advice regarding the appropriate RPU for your specific application. Redundant Power Units (RPUs) Order Number SMC-RPUX1 SMC-RPUX5 Description Supports one SMC device Supports up to 5 SMC devices Power Supply Receptacles There are two power receptacles on the rear-panel of each TigerSwitch 100.

The standard receptacle labeled "Power" is for the AC power cord. The 14-pin receptacle labeled "DC Input" is for the optional Redundant Power Unit (RPU). Figure 1-10. Power Supply Receptacles 1-9 ABOUT THE TIGERSWITCH 100 Switch Architecture Switching Methods Adaptive Cut-Through SMC's TigerSwitch 100 models employ a dynamic forwarding architecture that enables them to support adaptive cut-through frame forwarding mode. This approach allows the switch to automatically alternate between three different switching methods to provide the best possible performance in response to current network conditions. Cut-Through Also known as "on-the-fly" switching, the cut-through switching technique involves forwarding each data packet as soon as the 6 byte destination address in the header has been read. It does not wait until the entire packet has been received. This method, which takes up the least processing time, reduces the latency of each packet to twenty microseconds (20 μ sec) or less. Cut-through switching mode is the default setting of each port on the TigerSwitch 100. Fragment-Free This switching method is similar to cut-through, but it requires that the first 64 bytes of the data packet be received before it is forwarded.

This enables the switch to discard runt packets smaller than legal size packets which are collision byproducts and effectively clean up the data stream. This method provides the greatest benefit when the collision rate is high (e.g., when the switch is used to interconnect several shared segments, each having a large number of end stations.) Store-and-Forward In store-and-forward switching mode, 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. 1-10 ABOUT THE TIGERSWITCH 100 Spanning Tree Protocol The TigerSwitch 100 switches support the ANSI/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, the 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 Spanning Tree Protocol is "enabled". This protocol may be configured (enabled or disabled) out-of-band via the serial console port or in-band via the SNMP agent or Telnet. 1-11 ABOUT THE TIGERSWITCH 100 Management Options The TigerSwitch 100 units may be managed using any one of the following three methods: Out-of-band via the RS-232 console port In-band via Telnet In-band via any SNMP-based network management program that includes a compiler Serial Console Port The switches may be managed out-of-band using a PC connected to the console port with an RS-232 full-handshaking null modem cable. The console port operates at 9600 baud (default value) or 19,200 baud and can be password-protected. A terminal application for use on the PC, such as Windows Terminal, is also required. See Chapter 4, "Configuration and Management," for further information regarding out-of-band management. Telnet The switches can also be managed in-band via a Telnet connection using TCP/IP protocol. The Telnet user interface is menu-driven and the switch's operating parameters can be password-protected.

See Chapter 4, "Configuration and Management," for further information regarding in-band management. SNMP Another method by which these switches may be managed is in-band from a workstation via an SNMP-based manager (i.e., SMC's EliteView). Simple Network Management Protocol (SNMP) is the most popular management protocol in use today. It defines the structure of information maintained on a device being managed and the operations used to access that information. See Chapter 5, "SNMP Management," for further information regarding in-band SNMP. 1-12 ABOUT THE TIGERSWITCH 100 Key Features and Benefits Connectivity · Slide-in, replaceable 4-port modules for added flexibility (Model SMC6608M only) · 100BASE-FX ports with SC or ST connectors (Model SMC6608M only) · Auto-Negotiation on 10BASE-T/100BASE-TX ports automatically selects optimum communication mode (half or full duplex and 10 Mbps or 100 Mbps) if this feature is supported by the attached device; otherwise port can be configured manually · IEEE 802.



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3 Ethernet and 802.3u Fast Ethernet compliance ensures compatibility with standards-based hubs, cards and switches from any vendor · Independent RJ-45 10BASE-T/100BASE-TX ports with built-in wiring crossovers for straight-through cable connections · 10BASE-T/100BASE-TX daisy-chain port(s) for network device connections with straight-through cable · Half- or full-duplex operation on each port · 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 · One RS-232 serial console port for local or remote out-of-band management Performance · Aggregate bandwidth of 1.

6 Gbps · Minimum latency of packet transmission less than 20 microseconds (cut-through switching mode) · Transparent bridging function supported 1-13 ABOUT THE TIGERSWITCH 100 · Operates at maximum packet filtering and forwarding rate · Supports cut-through, store-and-forward, fragment-free and adaptive cut-through packet transport techniques · Routing table with over 4 K MAC address entries for attached network nodes · Automatically learns MAC addresses to build the routing information database · Fast hashing scheme quickly retrieves information from routing table · Filters and forwards packets at line-rate speed on all ports · Non-blocking cross-bar switching matrix allows concurrent operation of up to 8 LAN segments · Back pressure Flow Control eliminates frame loss · Automatically filters local traffic · Transparent to all higher level protocols Practical Management · "At-a-Glance" LEDs for monitoring all segments · Configure button simplifies basic configuration and monitoring · Console Interface for more advanced configuration and port control Easy Installation · Desktop and rack-mountable (standard 19-inch rack) · Self-diagnostics · Automatic polarity detection and correction 1-14

CHAPTER 2 PLANNING Introduction to Switching

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2-2 Sample Applications

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This is known as the 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 or Fast Ethernet network to significantly boost bandwidth while using conventional cabling and network cards. *Note: When connected to a shared collision domain (such as a hub with multiple workstations), each switched port may operate only in half-duplex mode. 2-2 PLANNING Sample Applications The TigerSwitch 100 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 for the TigerSwitch 100 are described below. Collapsed Backbone The TigerSwitch 100 is an excellent choice for Ethernet installations where significant growth is expected in the near future. 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 cascade the TigerSwitch 100 to an Ethernet or Fast Ethernet hub or switch. In the figure below, the TigerSwitch 100T (Model SMC6608T) is operating as a collapsed backbone for a small LAN.

It provides dedicated 10 Mbps and 100 Mbps half-duplex connections to workstations and 200 Mbps full-duplex connections to power users and servers. Figure 2-1. Collapsed Backbone 2-3 PLANNING Multiport Bridging With 8 parallel bridging ports (i.e., 8 distinct collision domains), the TigerSwitch 100 can collapse a complex network down into a single efficient bridged node, increasing overall bandwidth and throughput.

In the figure below, the 10BASE-T/100BASE-TX ports on the TigerSwitch 100T (Model SMC6608T) are providing 100 Mbps connectivity for up to 16 segments through SMC's TigerStack™ 100 hubs. In addition, the switch is also connecting servers at 200 Mbps. Figure 2-2. Multiple Port Bridging Connections 2-4 PLANNING Server Farm Aggregation The advantages of mixed-media can also be easily exploited with the TigerSwitch 100M because of the various port configurations available among its 4-port modules. In the following example, a TigerSwitch 100M, equipped with modules featuring 10BASE-T/100BASE-TX and 100BASE-FX ports, is providing localized Fast Ethernet connectivity between an expanding server farm and associated LANs.

Figure 2-3. Server Farm Connectivity and Expansion 2-5 PLANNING High-Speed Switch Links Most common LAN implementations use a combination of hubs, bridges and routers. The bridges and routers quickly become bottlenecks, reducing overall network throughput. Using switches instead of bridges and routers allows you to tie together LAN segments and retain a cohesive LAN structure in which any node can freely communicate with any other node in the network. In the following figure, the TigerSwitch 100M (Model SMC6608M) is cascaded via the 10BASE-T/100BASE-TX daisy-chain port to an 8-port Fast Ethernet switch, SMC's EZ Switch™ 100, forming a high-speed 200 Mbps, full-duplex backbone. The other 10BASE-T/100BASE-TX ports are connected to power users, and the 100BASE-FX ports are connected to servers. Figure 2-4. Cascading to a Fast Ethernet Switch 2-6 PLANNING Collapsed Backbone with Fiber Cable Fiber optic technology allows for a longer cable run distance (up to 2 km in full-duplex) than any other media type. The TigerSwitch 100M, used

as a collapsed backbone to interconnect multiple Fast Ethernet segments with fiber cable, is a convenient way to provide direct connectivity for a wide-spread LAN.



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The figure below illustrates a TigerSwitch 100M connecting multiple segments with up to 2 km of fiber cable.

Figure 2-5. Collapsed Backbone Using Fiber Cable 2-7 PLANNING High-Speed Fiber Backbone When maximum network reach is required, the TigerSwitch 100M (Model SMC6608M) can be used to help create a highspeed fiber backbone. In the figure below, a TigerSwitch 100M employed as a collapsed backbone is also part of a full-duplex, 200 Mbps fiber backbone. Figure 2-6. High-Speed Fiber Backbone 2-8 PLANNING Application Notes 1. Full-duplex operation only applies to point-to-point access (e.g., when the switch is attached to a workstation, server or another switch). When the switch is connected to a hub, both devices must operate in half-duplex mode. 2.

For network applications that actually require routers (e.g., interconnecting dissimilar network types), attaching switches directly to a router can significantly improve overall network performance. 2-9 CHAPTER 3 INSTALLATION Selecting a Site . .

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3-9 3-9 3-11 3-12 3-12 3-12 3-13 3-1 INSTALLATION Selecting a Site Before you start actual hardware installation, make sure you can provide the right operating environment, including power requirements, sufficient physical space and proximity to other network devices. Verify the following installation requirements: x The site should: · be located in a cool, dry place, with at least 4 in. (10 cm) of space at the front and back for ventilation · be located out of direct sunlight and away from heat sources or areas with a high amount of electromagnetic interference · allow the status LEDs to be clearly visible x Make sure twisted-pair cable is always routed away from power lines, fluorescent lighting fixtures and other sources of electrical interference (i.e. radios, transmitters, etc.). x Make sure that a separate grounded power outlet that provides 100 to 240 VAC, 50 to 60 Hz, is within 8 feet (2.44 m) of the unit.

The switch's power supply automatically detects the input voltage level.

And, as with any electronic equipment, using a filter or surge suppressor is recommended. 3-2 INSTALLATION Equipment Checklist Package Contents In addition to this user guide, the package should contain: x one (1) TigerSwitch 100 switch · Model SMC6608T (8 10BASE-T/100BASE-TX ports) or · Model SMC6608M (2 4-port module slots with protective covering plates)* x two (2) brackets with screws for rack mounting the unit x four (4) rubber foot pads x appropriate power cord(s) x SMC Warranty Registration Card -- be sure to complete and return this card within 90 days Required Rack-Mounting Equipment Be sure to have the following equipment available when mounting your switch in a rack: x Four rack-mounting screws x A screwdriver (Phillips-head or flathead, depending on the type of screws used) *Note: Be sure to install the module(s) you are planning to use in this unit before you proceed with mounting the switch and applying power. Please refer to the installation guide included with each module for specific installation instructions. 3-3 INSTALLATION

Mounting The TigerSwitch 100 is suitable for desktop or rack-mount installation. A good location is at the center of all the devices you want to link and near a power outlet. This switch can also be stacked with other switches on a flat surface or in a rack. Refer to the following sections: "Mounting the Switch in a Rack" and "Mounting and Stacking the Switch on a Flat Surface" for a description of these methods. Mounting the Switch in a Rack Before rack mounting the switch, pay particular attention to the following factors: x Temperature: Since the temperature within a rack assembly may be higher than the ambient room temperature, check that the rack-environment temperature is within the specified operating temperature range. (See Appendix C) x Mechanical Loading: Do not place any equipment on top of a rack-mounted unit. x Circuit Overloading: Be sure that the supply circuit to the rack assembly is not overloaded.

x Grounding: Rack-mounted equipment should be properly grounded. Particular attention should be given to supply connections other than direct connections to AC power mains. 3-4 INSTALLATION To rack mount the switch: 1. Attach the brackets to the device using the screws provided. Figure 3-1. Attaching the Brackets 2. Mount the device in the rack, using four rack-mounting screws. Figure 3-2. Installing the Switch in a Rack 3-5 INSTALLATION Mounting and Stacking the Switch on a Flat Surface 1. Attach the four adhesive feet to the hollow spaces on the bottom of the switch.

Figure 3-3. Attaching the Adhesive Feet 2. Set the switch on a flat surface near an AC power source, making sure there are at least 4 inches (10 cm) of space in the front and back for proper air flow. 3. To stack switches, repeat Step 1 for every subsequent switch and then gently place each new switch on top of the previous switch.

3-6 INSTALLATION Powering Up Connecting to a Power Source 1. Power on the switch by plugging one end of the power cord into the power socket on the rear panel, and the other end into a power outlet. (See Chapter 2 for a description of the rear-panel power receptacles) North America: Each switch is shipped with one standard AC line cord for North America (UL and CSA approved). International: The international version of each switch is shipped with AC line cords for Continental Europe and the UK. If you need to change the line cord, you must use a line cord set that has been approved for the receptacle type in your country.

Any cord used must be HAR certified, and must have "HAR" stamped on the outside of the cord jacket to comply with the CENELEC Harmonized Document HD-21. the female receptacle must meet CEE-22 requirements and IEC 320-030 specifications. The switch automatically selects the setting that matches the connected input voltage. Therefore, no additional adjustments are necessary when connecting it to any input voltage within the range marked on the rear panel of the unit. Caution: The 4-port modules for the TigerSwitch 100M are not hot-swappable. If you plan to replace one of the modules, you must disconnect the power to prevent damaging the switch and/or the module.



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2. If you have purchased a Redundant Power Unit (RPU), plug the 14-pin connector from the RPU into the mating connector on the rear panel of the switch (See the guide supplied with the RPU). 3-7 INSTALLATION 3. Check to insure that the front-panel Power LED is lit.

If not, check that the power cable is correctly plugged in. (Refer to Chapters 1 and 4 for detailed explanations of the LEDs.) Diagnostics Upon power up, the system performs an internal self-diagnostic test of major switch components. If any component fails during the test, the switch will try to complete the diagnostic procedure. Otherwise, the system will hang.* The components tested include: x System ROM x System EEPROM x Ports * Note: If the system should hang, take note of the LED indicators and contact SMC Technical Support. 3-8 INSTALLATION Making Network Connections Switches are designed to interconnect multiple segments, or collision domains. Each segment may contain a single server or workstation, or multiple workstations that are connected to a hub. Connectivity Rules An overview of the rules for both Ethernet and Fast Ethernet collision domains is provided below. 10 Mbps Ethernet Collision Domain SMC 5 - 4 - 3 Rule Between any two PCs or other stations in the same 10 Mbps collision domain, there may be: · up to 5 cable segments in series, · up to 4 repeaters (hubs), · up to 3 populated cable segments, that is, segments attached to two or more PCs (coax networks only).

** The remaining two segments are unpopulated; these are known as inter-repeater links or IRLs. This distinction between populated and unpopulated segments is significant for coax networks only. Maximum Cable Length Cable Type Twisted Pair, Categories 3, 4, 5 Maximum Length 100 m (328 ft.) 3-9 INSTALLATION 100 Mbps Fast Ethernet Collision Domain SMC 3 - 2 Rule for Class II Repeater Between any two PCs or other stations in the same 100BASE-T collision domain, there may be: · up to 3 link segments and · up to 2 Class II repeaters (hubs) SMC 2 - 1 Rule for Class I and Class II Repeater Between any two PCs or other stations in the same 100BASE-T collision domain, there may be: · up to 2 link segments and · only 1 Class I or Class II repeater (hub) Maximum 100BASE-T Network Diameter Repeater Type Twisted Pair Twisted Pair/Fiber and Number 100BASE-TX/T4 100BASE-T4/FX 100BASE-TX/FX 1 Class I 1 Class II 2 Class II 200 m (656 ft.) 200 m (656 ft.) 205 m (672.4 ft.) 231 m (757.7 ft.) 304 m (997.1 ft.) 260.8 m (855.4ft.) 308.8 m (1012.9 ft.) 236.3 m (775.1 ft.)

) 216.2 m (709.1 ft.) Maximum 100BASE-T Cable Distance Cable Type Twisted Pair Fiber Connecting Any two devices Switch to Switch, Server or PC Half duplex Full duplex Max. Distance 100 m (328 ft.) 412 m (1,351.4 ft.) 2 km (1.24 mi.) 0.

5 m (1.6 ft.) MII Any two devices 3-10 INSTALLATION Twisted-Pair Cabling Guidelines Each 10BASE-T or 100BASE-TX connection requires an unshielded twisted-pair (UTP) cable with RJ-45 connectors at both ends. For 10BASE-T connections, two pairs of 100 Ohm Category 3, 4 or 5 cable are required. 100BASE-TX connections require two pairs of certified Category 5 cable.

Every twisted-pair connection must have a wiring crossover to transmit and receive data. For convenience, this crossover is built into the 10BASE-T/100BASE-TX ports on the TigerSwitch 100 units*. Network cards do not have a built-in crossover, so PCs can be connected to crossover ports with straight-through cable. Hubs (and other switches) may have either crossover or straight-through ports. For this reason, the type of cable used to connect these devices to the TigerSwitch 100 is determined by the port on the other device, as shown in the table below.

Crossover/Straight-Through Wiring Requirements If the TigerSwitch 100 port is... Crossover (x) Crossover (x) Straight-through Straight-through And the port on the other device is Straight-through Crossover (x) Straight-through Crossover (x) Then use...cable Straight-through Crossover Crossover Straight-through

Warning: 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. * Note: Each TigerSwitch 100 unit equipped with 10BASE-T/100BASE-TX ports will also have at least one daisy-chain port that does not have a built-in wiring crossover.

3-11 INSTALLATION Connecting 10BASE-T/100BASE-TX Ports Fixed Crossover Ports Insert the RJ-45 connector on one end of a twisted-pair cable into an unused 10BASE-T/100BASE-TX port on the TigerSwitch 100, and the RJ-45 connector on the other end into a port on the other device. 1. Always use straight-through cable when connecting a server or workstation to the switch. 2. When connecting a hub, switch or other network device, the type of cable to be used (i.e., crossover or straight-through) depends upon the port on the device. (See "Twisted-Pair Cabling Guidelines" in this chapter.) 3. Make sure each twisted pair cable does not exceed 100 meters (328 ft.)

) in length. (See "Connectivity Rules" in this chapter.) 4. As each connection is made, the green Select/Link LED (in the LED array) corresponding to each port will light to indicate that the connection is valid. Daisy-Chain Port All TigerSwitch 100T units come with one daisy-chain (straightthrough) port. It is an alternate for port 8. Every 4-port module for the TigerSwitch 100M with 10BASE-T/100BASE-TX ports contains a switch-selectable daisy-chain port (See Figure 3-4). Items 2, 3 and 4 listed in the above section also apply to the daisy-chain port. Figure 3-4. SwitchSelectable Daisy-Chain Port 3-12

INSTALLATION Connecting 100BASE-FX Ports TigerSwitch 100M fiber modules are equipped with either SC or ST connectors. Connect one end of a fiber optic cable to the appropriate fiber connector on the front panel of the TigerSwitch 100M, and the other end to the connector on the other device. 1. The 100BASE-FX ports require 50/125 or 62.5/125 μ core multimode fiber optic cable with an SC or ST connector at each end. 2. Maximum fiber distance depends upon the transmission mode. In full-duplex mode, the maximum length of a fiber cable segment is 2 km (1.24 mi.); in half-duplex mode, it is 412 meters (0.25 mi).

(See the "Maximum 100BASE-T Cable Distance" chart on page 3-10.) 3. The TigerSwitch 100 features Flow Control to prevent frame loss due to port saturation. If Flow Control is enabled for a 100BASE-FX port operating in half-duplex mode, the cabling distance from that port is limited to 180 m. (See "Port Configuration" in Chapter 4 for further information regarding Flow Control.) Figure 3-5. Fiber Cable Connectors 3-13 CHAPTER 4

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4-30 4-2 CONFIGURATION AND MANAGEMENT Configuration Options Basic port communication modes can be configured manually through the use of the front-panel Configure button. For more advanced management capability, the TigerSwitch 100 provides a menu-driven System Configuration Program which can be accessed through the Console Interface (out-of-band) or by a Telnet connection (in-band) over the network. The TigerSwitch 100 also comes with an on-board management software module based on SNMP (Simple Network Management Protocol). This SNMP agent permits the switch to be managed from any PC in the network using optional in-band management software (i.e., SMC's EliteView). The System Configuration Program and the SNMP agent support management functions such as: · Enabling/Disabling of any port · Communication Mode Configuration (Full-, Half-duplex or Auto-Negotiation) · Switching Mode Configuration (adaptive cut-through, cutthrough, fragment-free or store-and-forward) · SNMP Parameter Configuration · Virtual LAN (VLAN) Port Grouping Configuration · Enabling/Disabling and Configuration of the Spanning Tree Algorithm · System Restart

4-3 CONFIGURATION AND MANAGEMENT Basic Port Settings When using the Configure button to set port communication modes: 1. Use a long press (>2 seconds) to begin function selection. The Status LED will start to flash to indicate that functions may be selected. Use short presses (<2 seconds) to cycle through the status LEDs until

the Full/Half LED lights.

Use a long press to initiate port communication mode selection. After the button is released, the Full-Duplex LED for Port 1 will begin to flash. 2. Use long presses to cycle through to the chosen port. The selection of the targeted port will be indicated by the lighting of the Tx/Rx LED for that port. 3. Use a short press to change the communication mode for the targeted port. The chosen mode will be indicated by the Full-Duplex LED for the port (Lit = Full*, Unlit = Half). 4. Use a long press to enable the selection. 5. Repeat Steps 2 through 4 for each chosen port. The default communication mode setting for all ports is AutoNegotiation, which dynamically selects either half- or full-duplex mode and 10 or 100 Mbps operating speed in response to the operating mode of the attached device. Auto-Negotiation can be re-established after a manual port configuration by removing the RJ-45 connector from the corresponding port on the switch and then reinserting it. *Note: Full-duplex mode can be used only for a dedicated link. When connecting to a shared collision domain (e.g., a hub), be sure the transmission mode is set for half-duplex mode. 4-4 CONFIGURATION AND MANAGEMENT Advanced System Configuration Required Connections and Switch Access Console Port (Out-of-Band) Connections 1. Plug the female end of a standard RS-232 null-modem cable into the switch connector labeled "Console".

Plug the other end of the cable into the serial connector on either a PC (typically COM1 or COM2) running a terminal emulation program or a VT100-compatible Terminal. See Appendix B for Console connector pin assignments. 2. If using a PC, power up the switch and set the terminal emulation type to VT100 and specify the PC port used (i.e., COM1, etc.). @@The default baud rate is 9600 bps. Then, open the connection to the switch. @@Most modems have a 25-pin port.

@@@@@@@@@@@@@@@@The default rate is 9600 bps. Then, dial into the switch. Use a terminal emulation package to connect over the modem.

@@@@This must be done via an out-of-band connection. @@Telnet into the switch using its assigned IP address.

@@@@@@@@Type "admin" and press <ENTER> to open the Main Menu. @@@@@@@@@Address Table... System Information.

.. Statistics... Spanning Tree Information... Configuration : System Configuration..

. Port Configuration... SNMP Configuration... Spanning Tree Configuration Console Configuration...

Virtual LAN Configuration... Download & Reset : TFTP Download..

. Reset... LOGOFF Use cursor keys to choose item.

Press <ENTER> to confirm choice. @@@@Statistics: Shows statistics for overall switch or each port. Spanning Tree Information: Displays Spanning Tree Protocol parameter listing. Port Status: Shows the operational state of each port. Address Table: Shows the current addresses associated with each port. 4-8 CONFIGURATION AND MANAGEMENT Configuration: System Configuration: Shows basic IP setup and identifies system by name, location and contact.

SNMP Configuration: Configures communities and trap managers. Password Configuration: Sets Administrator and User passwords. Virtual LAN Configuration: Assigns switch ports to form up to 8 independent LAN groups. Port Configuration: Disables/enables any port; sets communication mode for any port; sets aging time for address table entries; sets switching mode: enables/disables flow control.

Spanning Tree Configuration: Enables/disables Spanning Tree Algorithm. Also sets Spanning Tree parameters, port priority and path cost. Console Configuration: Sets communication parameters for console port. Download & Reset: TFTP Download: In-band download of updated firmware. Serial Download: On-board download of updated firmware. Reset: Resets hardware or configuration parameters, clears MAC address table. LOGOFF: Exits program and discontinues communications. 4-9 CONFIGURATION AND MANAGEMENT Setting Passwords 1. Highlight "Password Configuration" in the Main Menu and press <ENTER>. This will access the Password Configuration Screen (See below).

Password Configuration Set Administrator Password Set Normal User Password Return to Previous Menu Use cursor keys to choose item. Press <ENTER> to confirm choice. Press <CTRL><N> to return to Main Menu. Figure 4-3. Password Configuration Screen 2.

Highlight "Set Administrator Password" and press <ENTER> to password protect administrator rights (Read/Write privileges). Enter the default administrator password ("admin") in the space provided.



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The system will then request a new password and verification. 3. Choose set "Normal User Password" and press <ENTER> to assign a password for Read privileges only.

The system will ask only for the new password. After assigning passwords, you must exit the System Configuration program (LOGOFF on the Main Menu) for the changes to take effect. If the user does not exit the program after setting new passwords, the interface will not be password protected. It is recommended that you assign an administrator password as soon as possible to prevent unauthorized switch re-configuration. If a password is set and then forgotten, contact SMC Tech support to regain system access. 4-10 CONFIGURATION AND MANAGEMENT Console Port Configuration The communications parameters for the RS-232 port can be set using the System Configuration Program. Figure 4-3 (below) illustrates the factory default settings. Console Configuration 9600 Console Time-Out (In Minutes) Return to Previous Menu 5 Use cursor keys to choose item. Press <ENTER> to confirm choice. Press <CTRL><N> to return to Main Menu Figure 4-4.

Console Configuration Screen 1. Highlight "Console Configuration" in the Main Menu and press <ENTER>. This will access the Console Configuration Screen. 2. Highlight "Console Baud Rate" to set the rate at which data is sent between the terminal or PC and the switch. Press <ENTER> and use the arrow keys to cycle through baud rates of 2400, 4800, 9600 and 19200. Choose either 9600 or 19200. Press <ENTER> again to confirm the chosen rate. 3.

Highlight "Console Time-Out (In Minutes)" to set the timeout interval of the connection.

Once this interval is exceeded, the connection "times-out" and returns the user to the Login screen. Press <ENTER> to input a value between 0* and 60 seconds. Press <ENTER> again to confirm the chosen interval. *Note: An entry of 0 in this field will disable the console time-out function. 4-11

CONFIGURATION AND MANAGEMENT System Parameter Configuration 1.

Highlight "System Configuration" in the Main Menu and press <ENTER>. This will access the System Configuration Screen (See below). System Configuration System Name System Location System Contact SMC TigerSwitch 100 MIS SMC Technical Support Dept. 192.72.

24.31 192.72.24.202 255.255.255.0 BootP When Needed Default Gateway Subnet Mask IP State Send Ping Return to Previous Menu Use cursor keys to choose item. Press <ENTER> to confirm choice. Press <CTRL><N> to return to Main Menu Figure 4-5.

System Configuration Screen 2. Highlight "System Name" and press <ENTER> to assign a name to identify the switch if the default entry (see above) is not suitable. Press <ENTER> again to confirm entry. 3. Highlight "System Location" and press <ENTER> to input the physical location of the switch. Press <ENTER> again to confirm entry. 4. Highlight "System Contact" and press <ENTER> to specify the party to contact in the event of a switch malfunction.

Press <ENTER> again to confirm entry. 5.

Highlight "IP Address" and press <ENTER> to assign an IP address to the switch. Press <ENTER> again to confirm entry. 4-12 CONFIGURATION AND MANAGEMENT 6. Highlight "Default Gateway" and press <ENTER> to set the default gateway IP address to which the unit will send IP packets destined for a different subnet. Press <ENTER> again to confirm entry.

7. Highlight "Subnet Mask" and press <ENTER> to set the subnet mask corresponding to the assigned IP address. Press <ENTER> again to confirm entry. 8. Highlight "IP State" and press <ENTER> to specify whether the switch's IP address is set by the Boot Protocol (BOOTP).

The options are: IP Disabled: Prevents the switch from processing any IP information it receives. BOOTP When Needed: This is the default option. Will only try to set the IP address if the address stored in the EEPROM is 0.0.0.0 BOOTP Always: Will clear any non-zero IP address from the EEPROM to zero when the switch is booted. 9. Highlight "Send Ping" and press <ENTER> to issue an ICMP echo request to a specified IP address. Press <ENTER> again to send the echo request to the IP address specified. Used to verify validity of address (i.

e., that a device can be reached). 4-13 CONFIGURATION AND MANAGEMENT Port Configuration 1. Highlight "Port Configuration" in the Main Menu and press <ENTER>. This will access the Port Configuration Screen illustrated below. Port Configuration Port 1 2 3 4 5 6 7 8 Enabled Yes Yes Yes Yes Yes

Yes Yes Yes Duplex Auto Auto Auto Auto Half Auto Auto AgingTime 300 300 300 300 300 300 300 300 SwitchingMode CT CT CT CT CT CT CT CT FlowControl Yes Yes Yes Yes Yes Yes Yes Yes Return to Previous Menu Selecting Half or Full Duplex? Use cursor keys to choose item. Press <ENTER> to confirm choice. Press <CTRL><N> to return to the Main Menu Figure 4-6. Port Configuration Screen 2. Highlight the setting under the "Enabled" column for the chosen port and press <ENTER> to use the arrow keys to toggle between enabling and disabling the port.

Press <ENTER> again to confirm the choice. 3. Highlight the setting under the "Duplex" column to adjust the communication mode for the chosen port. Press <ENTER> to use the arrow keys to cycle through Full-duplex, Half-duplex or Auto-Negotiation modes. * Press <ENTER> again to confirm the choice.

4. Highlight the setting under the "AgingTime" column to adjust Address Aging for the chosen port. Address Aging is the amount of time addresses will remain in the address table before being deleted. Press <ENTER> to input a value between 0 and 43200 seconds. Press <ENTER> again to confirm the chosen value.

4-14 CONFIGURATION AND MANAGEMENT 5. Highlight the setting under the "SwitchingMode" column to adjust the switching method for the chosen port. Press <ENTER> to use the arrow keys to cycle through Cut-through (CT), Store-and-forward (S&F), Adaptive cutthrough (A-CT) or Fragment-free (FgFree) modes. Press <ENTER> again to confirm the choice. 6. Highlight the setting under the "FlowControl" column for the chosen port and press <ENTER> to use the arrow keys to toggle between enabling and disabling Flow Control for the port. Flow Control allows a port that is receiving data to signal the sender when its buffer is full, thereby ending the transmission. ** Press <ENTER> again to confirm the choice. *Note: Auto-Negotiation will appear as a choice under the "Duplex" column only for 10BASE-T/100BASE-TX ports. If a 10BASE-T/100BASE-TX port is not being used, its default duplex setting will appear as Half.

When a connection is made, the port will default to Auto. **Note: The type of flow control employed by the TigerSwitch 100 uses packet collisions as the method by which the receiving port signals the sender.



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