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INSTALLATION GUIDE

EZ Switch™ 10/100/1000
Web Smart 10-Port Gigabit Ethernet PoE Switch

SMCGS10P-Smart

EZ Switch™ 10/100/1000 Installation Guide

From SMC's EZ line of low-cost workgroup LAN solutions

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Trademarks:

WARRANTY AND PRODUCT REGISTRATION

To register SMC products and to review the detailed warranty statement, please refer to the Support Section of the SMC Website at http://www.smc.com.

COMPLIANCES AND SAFETY STATEMENTS

FCC - CLASS A

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

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

◆ This device may not cause harmful interference.

◆ This device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

CE MARK DECLARATION OF CONFORMANCE FOR EMI AND SAFETY (EEC)

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

RFI Emission:
- Limit according to EN 55022:2007, Class A/B
- Limit for harmonic current emission according to EN 61000-3-2:2006, Class A
- Limitation of voltage fluctuation and flicker in low-voltage supply system according to EN 61000-3-3:2005

Immunity:
- Product family standard according to EN 55024:2001 + A2:2003
- Electrostatic Discharge according to IEC 61000-4-2:2008
- Radio-frequency electromagnetic field according to IEC 61000-4-3:2007
- Electrical fast transient/burst according to IEC 61000-4-4:2004
- Surge immunity test according to IEC 61000-4-5:2005
- Immunity to conducted disturbances, Induced by radio-frequency fields: IEC 61000-4-6:2008
- Power frequency magnetic field immunity test according to IEC 61000-4-8:2001
- Voltage dips, short interruptions and voltage variations immunity test according to IEC 61000-4-11:2004

LVD:
- EN60950-1:2006+A11:2009

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.

Avertissment: 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.

PSE ALARM

本製品に同梱いたしております電源コードセットは、
本製品専用です。本電源コードセットは、本製品以外の
製品並びに他の用途でご使用いただくことは出来ません。
製品本体に同梱された電源コードセットを利用し、他製品
の電源コードセットを使用しないで下さい。

BSMI (TAIWAN)

警告使用者： 此為甲類資訊技術設備，於居住環境中使用時，可能會造成射頻擾動，在此種
情況下，使用者會被要求採取某些適當的對策。

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 60950. The conditions are only maintained if the equipment to which it is connected also operates under SELV conditions.

France and Peru only
This unit cannot be powered from IT[†] supplies. If your supplies are of IT type, this unit must be powered by 230 V (2P+T) via an isolation transformer ratio 1:1, with the secondary connection point labelled Neutral, connected directly to earth (ground).

[†] Impédance à la terre

IMPORTANT! Before making connections, make sure you have the correct cord set. Check it (read the label on the cable) against the following:

Power Cord Set	
U.S.A. and Canada	The cord set must be UL-approved and CSA certified.
	The minimum specifications for the flexible cord are: - No. 18 AWG - not longer than 2 meters, or 16 AWG. - Type SV or SJ - 3-conductor
	The cord set must have a rated current capacity of at least 10 A
	The attachment plug must be an earth-grounding type with NEMA 5-15P (15 A, 125 V) or NEMA 6-15P (15 A, 250 V) configuration.
Denmark	The supply plug must comply with Section 107-2-D1, Standard DK2-1a or DK2-5a.
Switzerland	The supply plug must comply with SEV/ASE 1011.
U.K.	The supply plug must comply with BS1363 (3-pin 13 A) and be fitted with a 5 A fuse which complies with BS1362.
	The mains cord must be <HAR> or <BASEC> marked and be of type HO3VVF3GO.75 (minimum).
Europe	The supply plug must comply with CEE7/7 ("SCHUKO").
	The mains cord must be <HAR> or <BASEC> marked and be of type HO3VVF3GO.75 (minimum).
	IEC-320 receptacle.

Veuillez lire à fond l'information de la sécurité suivante avant d'installer le Switch:

AVERTISSEMENT: L'installation et la dépose de ce groupe doivent être confiés à un personnel qualifié.

◆ Ne branchez pas votre appareil sur une prise secteur (alimentation électrique) lorsqu'il n'y a pas de connexion de mise à la terre (mise à la masse).

◆ Vous devez raccorder ce groupe à une sortie mise à la terre (mise à la masse) afin de respecter les normes internationales de sécurité.

◆ Le coupleur d'appareil (le connecteur du groupe et non pas la prise murale) doit respecter une configuration qui permet un branchement sur une entrée d'appareil EN 60320/IEC 320.

◆ La prise secteur doit se trouver à proximité de l'appareil et son accès doit être facile. Vous ne pouvez mettre l'appareil hors circuit qu'en débranchant son cordon électrique au niveau de cette prise.

◆ L'appareil fonctionne à une tension extrêmement basse de sécurité qui est conforme à la norme IEC 60950. Ces conditions ne sont maintenues que si l'équipement auquel il est raccordé fonctionne dans les mêmes conditions.

France et Pérou uniquement:
Ce groupe ne peut pas être alimenté par un dispositif à impédance à la terre. Si vos alimentations sont du type impédance à la terre, ce groupe doit être alimenté par une tension de 230 V (2 P+T) par le biais d'un transformateur d'isolement à rapport 1:1, avec un point secondaire de connexion portant l'appellation Neutre et avec raccordement direct à la terre (masse).

Cordon électrique - Il doit être agréé dans le pays d'utilisation	
Etats-Unis et Canada:	Le cordon doit avoir reçu l'homologation des UL et un certificat de la CSA.
	Les spécifications minimales pour un cable flexible sont AWG No. 18, ouAWG No. 16 pour un cable de longueur inférieure à 2 mètres. - type SV ou SJ - 3 conducteurs
	Le cordon doit être en mesure d'acheminer un courant nominal d'au moins 10 A.
	La prise femelle de branchement doit être 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:	La prise mâle d'alimentation doit respecter la section 107-2 D1 de la norme DK2 1a ou DK2 5a.
Suisse:	La prise mâle d'alimentation doit respecter la norme SEV/ASE 1011.
Europe	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.

Stromkabel. Dies muss von dem Land, in dem es benutzt wird geprüft werden:	
Schweiz	Dieser Stromstecker muß die SEV/ASE 1011Bestimmungen einhalten.
Europe	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: This product does not contain any serviceable user parts.

WARNING: Installation and removal of the unit must be carried out by qualified personnel only.

WARNING: 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.

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.

CAUTION: Wear an anti-static wrist strap or take other suitable measures to prevent electrostatic discharge when handling this equipment.

CAUTION: Do not plug a phone jack connector in the RJ-45 port. This may damage this device.

CAUTION: Use only twisted-pair cables with RJ-45 connectors that conform to FCC standards.

ENVIRONMENTAL STATEMENTS

The manufacturer of this product endeavours to sustain an environmentally-friendly policy throughout the entire production process. This is achieved though 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.

COMPLIANCES AND SAFETY STATEMENTS

ABOUT THIS GUIDE

PURPOSE

This guide details the hardware features of the switch, including the 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).

CONVENTIONS

The following conventions are used throughout this guide to show information:

NOTE: Emphasizes important information or calls your attention to related features or instructions.

CAUTION: Alerts you to a potential hazard that could cause loss of data, or damage the system or equipment.

WARNING: Alerts you to a potential hazard that could cause personal injury.

REVISION HISTORY

This section summarizes the changes in each revision of this guide.

AUGUST 2013 REVISION

This is the third revision of this guide. It includes the following changes:

◆ New mounting bracket design

◆ New wall mount procedure

◆ Updated graphics

OCTOBER 2012 REVISION

This is the second revision of this guide. It includes the following change:

◆ Added BSMI (Taiwan) statement.

MAY 2012 REVISION

This was the first revision of this guide.

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1 INTRODUCTION

OVERVIEW

The SMCGS10P-Smart is a Gigabit Ethernet Layer 2 PoE switch with 8 10/100/1000BASE-T ports, and 2 Small Form Factor Pluggable (SFP) transceiver slots, (see , Ports 9-10). The SMCGS10P-Smart also provides PoE power to connected devices.

The switch also includes an SNMP-based management agent, which provides in-band access for managing the switch.

Both switches provide 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.

Figure 1: Front Panel

Port Status Indicators
SFP Port Status Indicators
Reset Button
10/100/1000 Mbps RJ-45 PoE Ports
1000BASE-T/SFP Ports
System Indicators
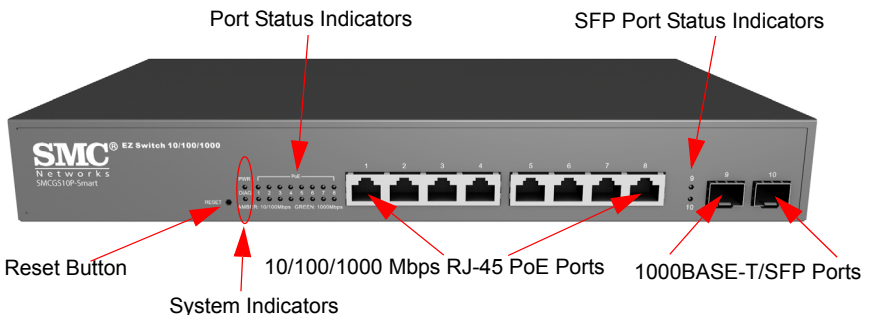
Figure 2: Rear Panel
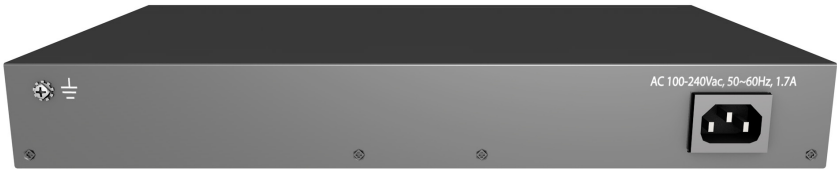
SWITCH ARCHITECTURE

This 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.

This 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.

NETWORK MANAGEMENT OPTIONS

With a comprehensive array of LEDs, the switch provides "at a glance" monitoring of network and port status. The switch can be managed over the network with a web browser.

For a detailed description of the management features, refer to the *Management Guide*.

POWER-OVER-ETHERNET

All eight RJ-45 ports (1~8) of the SMCGS10P-Smart switch support the IEEE 802.3at standard that enables DC power to be supplied to attached devices using wires in the connecting Ethernet cable. The total PoE power delivered by all ports cannot exceed the 75 W power budget.

Any PoE-compliant device attached to a port can directly draw power from the switch over the Ethernet cable without requiring its own separate power source. This capability gives network administrators centralized power control for

devices such as IP phones and wireless access points, which translates into greater network availability.

For each attached PoE-compliant device, the switch automatically senses the load and dynamically supplies the required power. The switch delivers power to a device using the wire pairs in UTP or STP cable. Any RJ-45 port on the switch can provide up to 30 W of power, but only two ports can deliver 30 W simultaneously to attached devices without exceeding the switch power budget.

DESCRIPTION OF HARDWARE

10/100/1000BASE-T PORTS

The switch contains 8 RJ-45 ports that operate at 10 Mbps or 100 Mbps, half or full duplex, and 1000 Mbps full duplex. 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. (See "1000BASE-T Cable Requirements" on page 55.)

Each of these ports support auto-negotiation, so the optimum transmission mode (half or full duplex), and data rate (10, 100, or 1000 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.

SFP TRANSCIEVER SLOTS

The Small Form Factor Pluggable (SFP) transceiver slots are independent ports.

The following table shows a list of transceiver types that have been tested with the switch. For an updated list of vendors supplying these transceivers, contact your local dealer. For information on the recommended standards for fiber optic cabling, see "Fiber Optic SFP Devices" on page 53.

Table 1: Supported SFP Transceivers

Media Standard	Fiber Diameter (microns)	Wavelength (nm)	Maximum Distance*
1000BASE-SX	50/125	850	700 m
	62.5/125	850	400 m
1000BASE-LX	50/125	1300	550 m
	62.5/125	1300	550 m
	9/125	1300	10 km
1000BASE-LH	9/125	1310	35 km
		1550	80 km
100BASE-FX	50/125 or 62.5/125	1300	2 km
	9/125	1300	20 km
1000BASE-T			100 m

*   Maximum distance may vary for different SFP vendors.

PORT AND SYSTEM LEDS

This switch 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.

Figure 3: Port and System LEDs
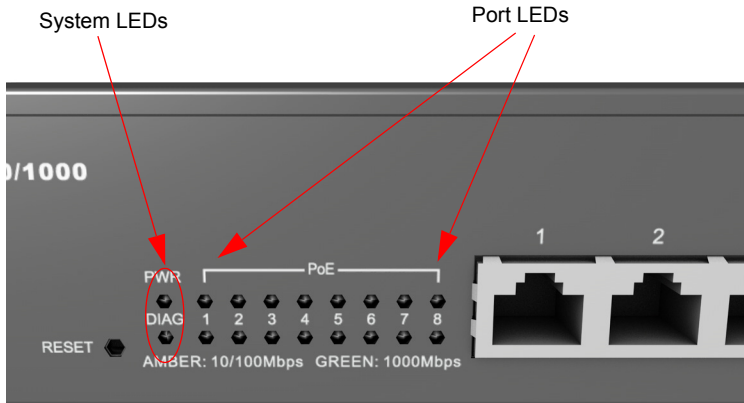
Table 2: Port Status LEDs

LED	Condition	Status
RJ-45 Gigabit Ethernet Ports (Ports 1-8)		
Link/Activity/Speed	On/Flashing Amber	Port has established a valid 10/100 Mbps network connection. Flashing indicates activity.
	On/Flashing Green	Port has established a valid 1000 Mbps network connection. Flashing indicates activity.
	Off	There is no valid link on the port.
SFP Gigabit Ethernet Ports (Ports 9-10)		
(Link/Activity)	On/Flashing Amber	Port has established a valid 10 or 100 Mbps network connection. Flashing indicates activity.
	On/Flashing Green	Port has established a valid 1000 Mbps network connection. Flashing indicates activity.
	Off	There is no valid link on the port.

Table 3: System Status LEDs

LED	Condition	Status
Power	On Green	The unit's internal power supply is operating normally.
	Off	The unit has no power connected.

Table 3: System Status LEDs

LED	Condition	Status
Diag	On Green	The system diagnostic test has completed successfully.
	Flashing Green	The system boot up is in progress.
	On Amber / Flashing Amber	The system diagnostic test is in progress.
	Off	The system diagnostic has completed.
PoE	On Amber	Powered device connected.
	Off	No powered device connected.

POWER SUPPLY INLET

There is one power inlet on the rear panel of the switch. The standard power inlet is for the AC power cord.

Figure 4: Power Supply Inlet

AC 100-240Vac, 50~60Hz, 1.7A

Power Supply Inlet

GROUNDING POINT

To prevent accidental electrical shock or damage to your switch, it is recommended that you ground the switch to an earth point by attaching a grounding wire (not supplied) to the grounding point located on the rear panel, with a metal screw. If located in a tall building, grounding points include metal

drain pipes, and other electrostatic conductive devices that lead to the ground, or if located on the first floor of a building, the ground outside itself.

Figure 5: Grounding Point
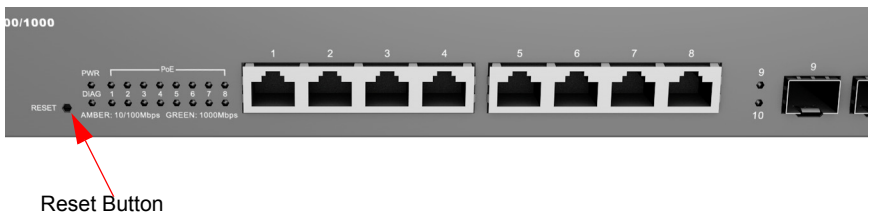

Grounding Point

RESET BUTTON

If you encounter any switch malfunctions, such as a hang or non-recoverable error, you might want to reset the switch to its default configuration by pressing and holding the reset button for more than 10 seconds. The reset button is located on the front panel.

Figure 6: Reset Button

Reset Button

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. 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.

APPLICATION EXAMPLES

The switch 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 Gigabit Ethernet Switch 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 10 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 hub or 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 100 Mbps full-duplex connections to workstations and 1000 Mbps full-duplex connections to power users, and 1000 Mbps full-duplex connections to servers.

Figure 7: Collapsed Backbone
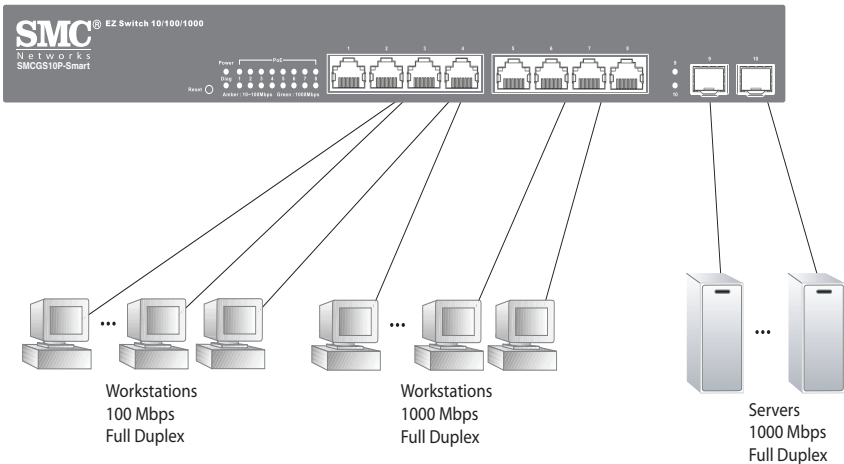
POE CONNECTIONS

The switch is an excellent choice for supplying power to connected PoE devices such as web cameras, IP telephones, or access points.

The eight RJ-45 ports on the switch can provide up to 30 W of power to a connected device. The switch can supply 9.37 W simultaneously to eight PoE devices among the eight Gigabit Ethernet ports, or 30 W simultanesously to two connected PoE devices. The total power cannot exceed the 75 W PoE power budget.

In the figure below, the switch is supplying power to three PoE devices. It is also providing dedicated 1000 Mbps full-duplex data connections to these devices. In addition, other non-PoE devices can be connected to the switch.

Figure 8: Supplying PoE Power

Power-over-Ethernet Devices

Web Camera   IP Telephone   Access Point
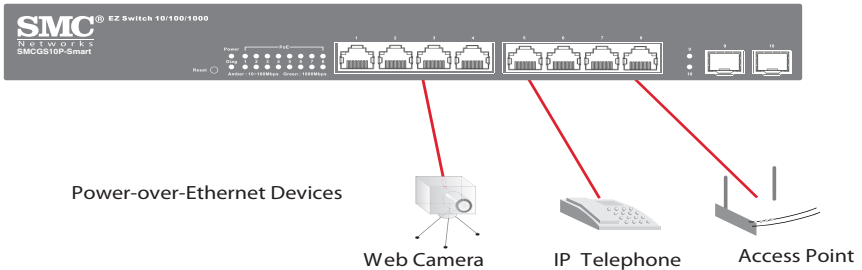
NETWORK AGGREGATION PLAN

With 10 parallel bridging ports (i.e., 10 distinct collision domains), this switch can collapse a complex network down into a single efficient bridged node, increasing overall bandwidth and throughput.

In the figure below, the 10/100/1000BASE-T ports on the switch are providing 1000 Mbps connectivity for up to eight segments, while the 1000BASE-SFP ports are providing connectivity for two Gigabit segments.

Figure 9: Network Aggregation Plan
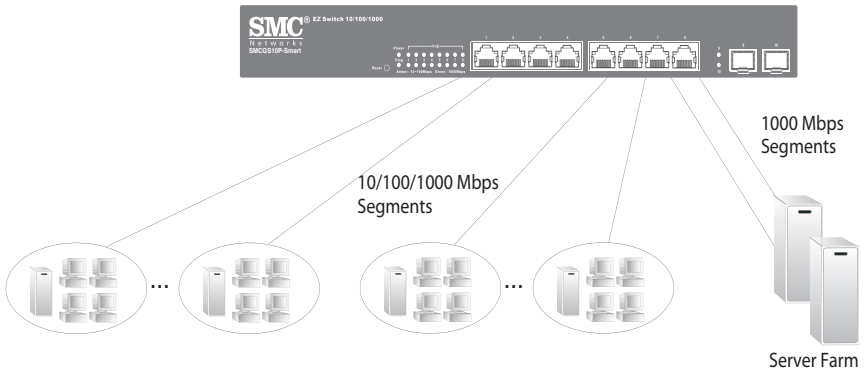
REMOTE CONNECTIONS WITH FIBER CABLE

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 10 km, a 1000BASE-LH link up to 80 km, and a 100BASE-FX (SMF) link up to 20 km. This allows the switch to serve as a collapsed backbone, providing direct connectivity for a widespread LAN.

The figure below illustrates the switch connecting multiple segments with fiber cable.

Figure 10: Remote Connections with Fiber Cable
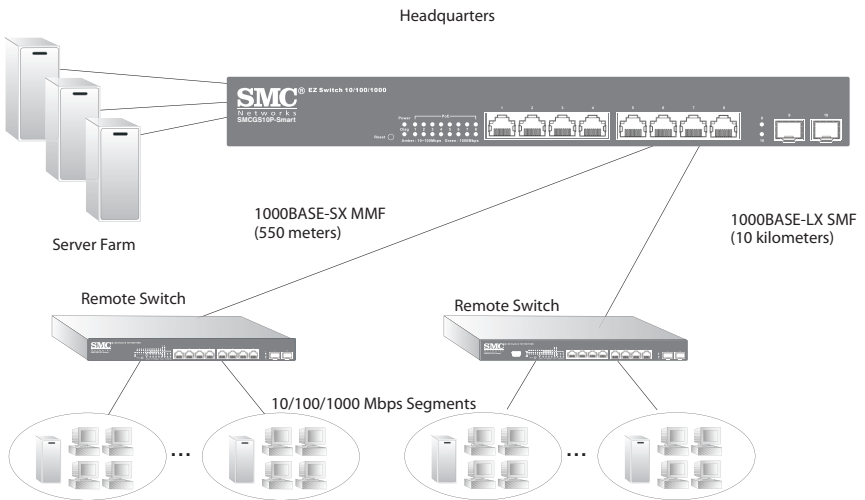
MAKING VLAN CONNECTIONS

This switch supports VLANs which can be used to organize any group of network nodes into separate broadcast domains. VLANs confine broadcast traffic to the originating group, and can eliminate broadcast storms in large networks. This provides a more secure and cleaner network environment.

VLANs can be based on untagged port groups, or traffic can be explicitly tagged to identify the VLAN group to which it belongs. Untagged VLANs can be used for small networks attached to a single switch. However, tagged VLANs should be used for larger networks, and all the VLANs assigned to the inter-switch links.

Figure 11: Making VLAN Connections
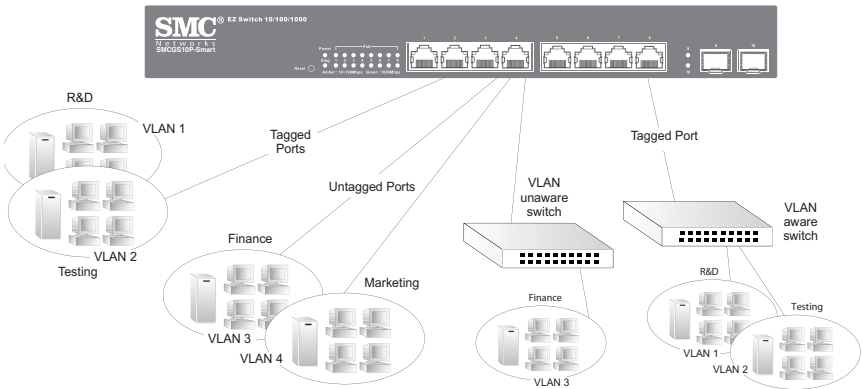
NOTE: When connecting to a switch that does not support IEEE 802.1Q VLAN tags, use untagged ports.

APPLICATION NOTES

1. Full-duplex operation only applies to point-to-point access (such as when a 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. 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 a general rule the length of fiber optic cable for a single switched link should not exceed:

   - 1000BASE-SX: 550 m (1805 ft) for multimode fiber.

   - 1000BASE-LX: 10 km (6.2 miles) for single-mode fiber.

   - 1000BASE-LH: 80 km (50 miles) for single-mode fiber.

   - 100BASE-FX: 20 km (12 miles) for single-mode fiber.

However, power budget constraints must also be considered when calculating the maximum cable length for your specific environment.

3 INSTALLING THE SWITCH

This chapter describes how to install the switch.

SELECTING A SITE

◆ The site should:

- be at the center of all the devices you want to link and near a power outlet.

- be able to maintain its temperature within 0 to 50 °C (32 to 122 °F) and its humidity within 10% to 90%, non-condensing

- provide adequate space (approximately two inches) on all sides for proper air flow

- be accessible for installing, cabling and maintaining the devices

- allow the status LEDs to be clearly visible

◆ Make sure twisted-pair cable is always routed away from power lines, fluorescent lighting fixtures and other sources of electrical interference, such as radios and transmitters.

◆ Make sure that the unit is connected to a separate grounded power outlet that provides 100 to 240 VAC, 50 to 60 Hz, is within 2 m (6.6 feet) of each device and is powered from an independent circuit breaker. As with any equipment, using a filter or surge suppressor is recommended.

ETHERNET CABLING

To ensure proper operation when installing the switch into a network, make sure that the current cables are suitable for 10BASE-T, 100BASE-TX, or 1000BASE-T operation. Check the following criteria against the current installation of your network:

◆ Cable type: Unshielded twisted pair (UTP) or shielded twisted pair (STP) cables with RJ-45 connectors; Category 3 or better for 10BASE-T, Category 5 or better for 100BASE-TX, and Category 5, 5e, or 6 for 1000BASE-T.

◆ Protection from radio frequency interference emissions

◆ Electrical surge suppression

◆ Separation of electrical wires (switch related or other) and electromagnetic fields from data based network wiring

◆ Safe connections with no damaged cables, connectors or shields

Figure 12: RJ-45 Connections
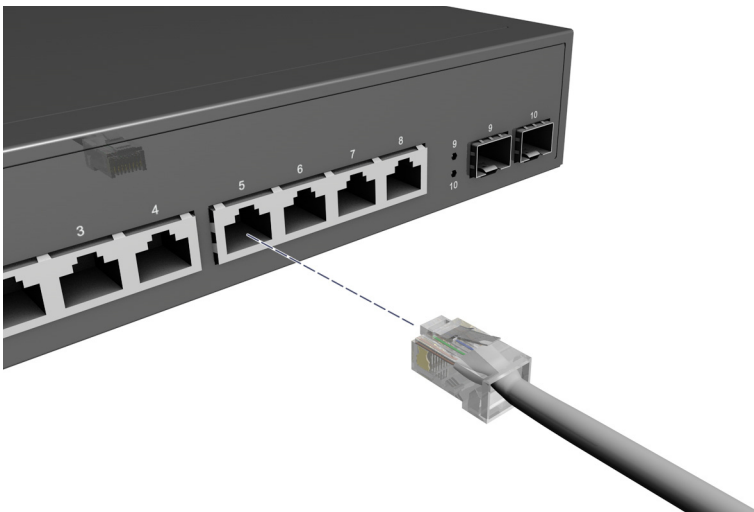
EQUIPMENT CHECKLIST

After unpacking this switch, check the contents to be sure you have received all the components. Then, before beginning the installation, be sure you have all other necessary installation equipment.

◆ Web Smart 10-Port GE PoE Switch

◆ Four adhesive foot pads

◆ Grounding screw

◆ Bracket Mounting Kit containing two brackets and eight screws for attaching the brackets to the switch

◆ Power Cord

◆ This Installation Guide

◆ Documentation CD (Includes Management Guide)

OPTIONAL RACK-MOUNTING AND WALL-MOUNTING EQUIPMENT

If you plan to rack-mount or wall-mount the switch, be sure to have the following equipment available:

◆ Four mounting screws for each device you plan to install in a rack—these are not included

◆ A screwdriver (Phillips or flathead, depending on the type of screws used)

MOUNTING

The switch can be mounted in a standard 19-inch equipment rack, wall mounted, or on a desktop or shelf. Mounting instructions for each type of site follow.

RACK-MOUNTING

Before rack mounting the switch, pay particular attention to the following factors:

◆ 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. ("Physical Characteristics" on page 61.)

◆ Mechanical Loading: Do not place any equipment on top of the rack-mounted unit.

◆ Circuit Overloading: Be sure that the supply circuit to the rack assembly is not overloaded.

◆ Grounding: Rack-mounted equipment should be properly grounded. Particular attention should be given to supply connections other than direct connections to the mains.

Figure 13: Grounding

2. Terminate the wire to an earthed grounding point.

1. Attach an insulated grounding wire with the screw onto the grounding point.
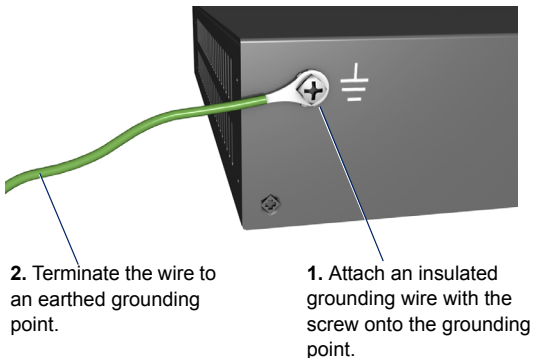
To rack-mount devices:

1. Attach the brackets to the device using the screws provided in the Bracket Mounting Kit.

Figure 14: Attaching the Brackets
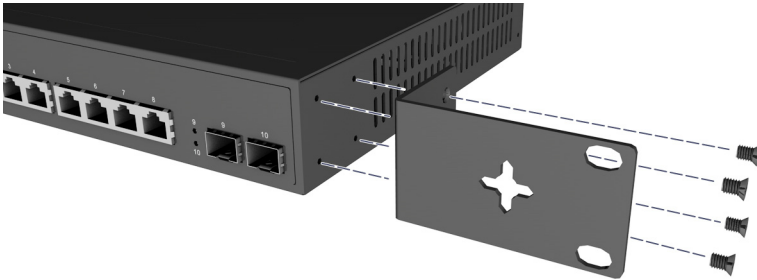
2. Mount the device in the rack, using four rack-mounting screws (not provided). Be sure to secure the lower rack-mounting screws first to prevent the brackets being bent by the weight of the switch.

Figure 15: Installing the Switch in a Rack
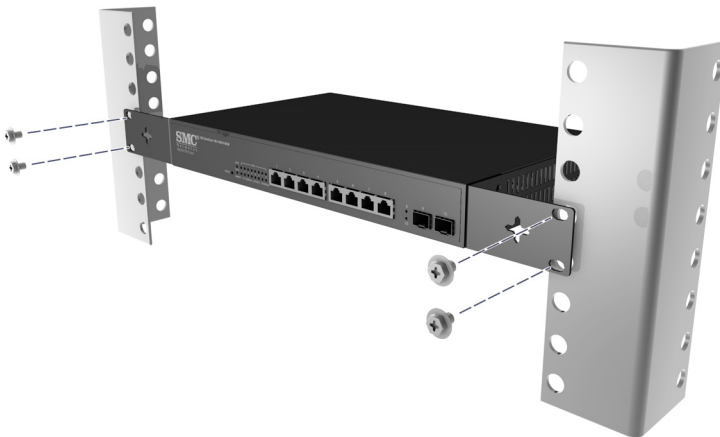
3. If installing a single switch only, turn to "Connecting to a Power Source" on page 48.

4. If installing multiple switches, mount them in the rack, one below the other.

WALL MOUNTING

The switch can be wall mounted by using the brackets in the bracket mounting kit. Compared with the rack mount, the brackets must be rotated 90 degress when attached to the switch.

1. Attach the brackets to the device using the screws provided in the bracket mounting kit. The bracket ears should be flat on the same plane as the switch bottom panel.

2. Fasten the switch to the wall by utilizing suitable screws and if necessary, anchor plugs.

Figure 16: Wall Mounting
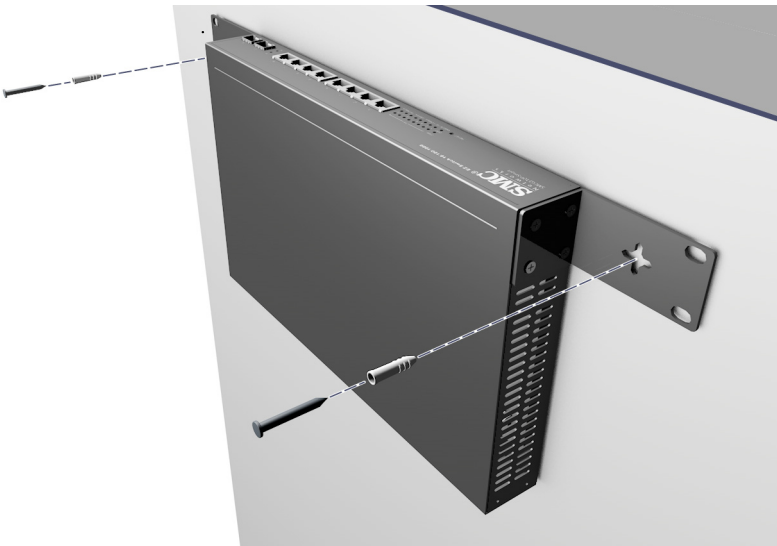
⚠️ **CAUTION:** The wall must be sufficiently strong to bear the weight of the switch.

3. Continue installing switches, or if finished go to "Connecting to a Power Source" on page 48.

DESKTOP OR SHELF MOUNTING

1. Attach the four adhesive feet to the bottom of the first switch.

Figure 17: 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" on page 48.

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.

CONNECTING TO A POWER SOURCE

To connect a switch to a power source:

1. Insert the power cable plug directly into the AC inlet located at the back of the switch.

Figure 18: Power Inlet
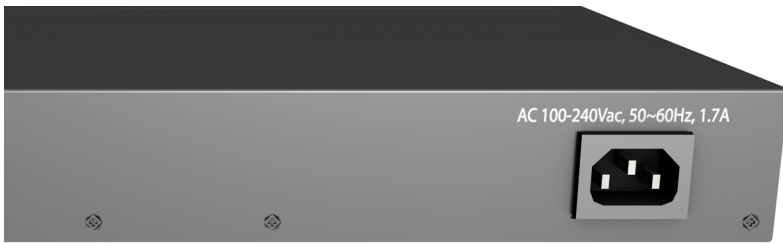
2. Plug the other end of the cable into a grounded, 3-pin, AC power source.

> **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 wall socket type in your country.

3. Check the front-panel LEDs as the device is powered on to be sure the Power LED is on green. If not, check that the power cable is correctly plugged in.

INSTALLING AN OPTIONAL SFP TRANSCEIVER

Figure 19: Installing an Optional SFP Transceiver into a Slot

This switch supports 1000BASE-SX, 1000BASE-LX, 1000BASE-LH, and 100BASE-FX SFP-compatible transceivers.

To install an SFP transceiver, do the following:

1. Consider network and cabling requirements to select an appropriate SFP transceiver type.

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 the transceiver. However, always first disconnect the network cable before removing the transceiver.

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

4 MAKING NETWORK CONNECTIONS

CONNECTING NETWORK DEVICES

This switch is designed to be connected to 10, 100, or 1000 Mbps network cards in PCs and servers, as well as to other switches and hubs. It may also be connected to remote devices using optional 1000BASE-SX, 1000BASE-LX, 1000BASE-LH, or 100BASE-FX 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.

POWER-OVER-ETHERNET CONNECTIONS

The switch automatically detects a PoE-compliant device by its authenticated PoE signature and senses its required load before turning on DC power to the port. This detection mechanism prevents damage to other network equipment that is not PoE compliant.

NOTE: Power-over-Ethernet connections work with all existing Category 3, 4, 5, 5e, or 6 network cabling, including patch cables and patch-panels, outlets, and other connecting hardware, without requiring modification.

The switch delivers power to a device using the wire pairs in UTP or STP cable (RJ-45 pins 1, 2, 3, and 6). The switch can provide up to 30 W of power continuously on each of the eight RJ-45 ports. If a device tries to draw more than 30 W from a port, an overload condition occurs and the port disables the power.

The switch controls the power and data on a port independently. Power can be requested from a device that already has a data link to the switch. Also, the switch can supply power to a device even if the port's data connection has been disabled. The power on a port is continuously monitored by the switch and it will be turned off as soon as a device connection is removed.

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.
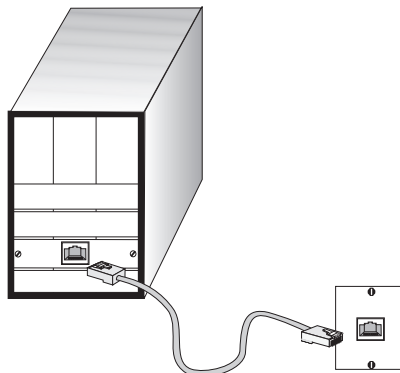
Do not plug a phone jack connector into an RJ-45 port. This will damage the switch. Use only twisted-pair cables with RJ-45 connectors that conform to FCC standards.

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 19: 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" on page 51.") 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.

3. As each connection is made, the Link LED (on the switch) corresponding to each port will light green or amber to indicate that the connection is valid.

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 57.

Figure 20: Network Wiring Connections
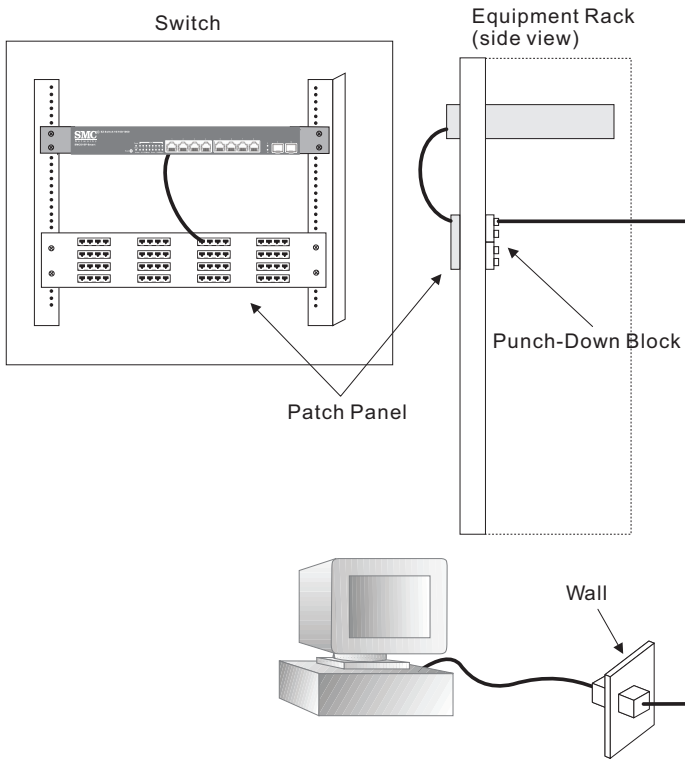
FIBER OPTIC SFP DEVICES

An optional SFP transceiver (1000BASE-SX, 1000BASE-LX, 1000BASE-LH, or 100BASE-FX) 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.

WARNING: 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.

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.

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.

Figure 21: Making Fiber Port Connections
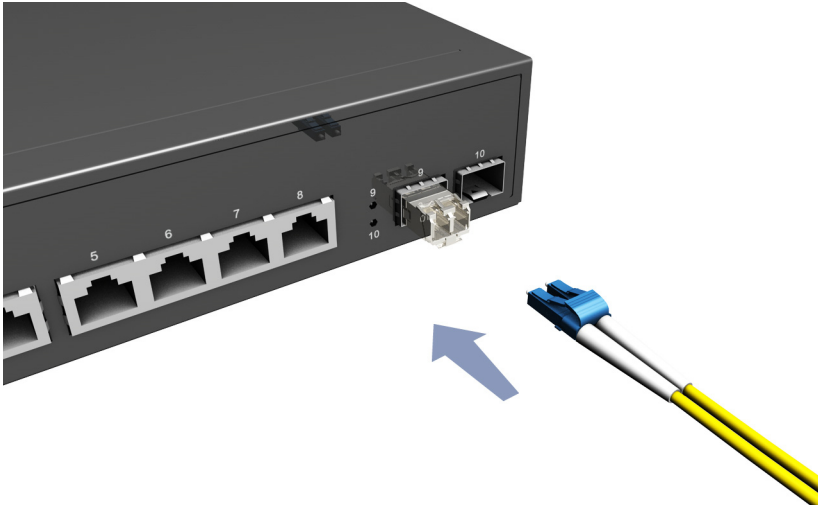
4. As a connection is made, check the Link LED on the switch corresponding to the port to be sure that the connection is valid.

The 1000BASE-SX/LX/LH fiber optic ports operate at 1 Gbps full duplex. The 100BASE-FX fiber optic ports operate at 100 Mbps full duplex. The maximum length for fiber optic cable depend on the fiber type as listed under "1000 Mbps Gigabit Ethernet Collision Domain" on page 55. and "100 Mbps Fast Ethernet Collision Domain" on page 56.

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 802.3-2005 standards.

1000 MBPS GIGABIT ETHERNET COLLISION DOMAIN

Table 4: Maximum 1000BASE-T Gigabit Ethernet Cable Length

Cable Type	Maximum Cable Length	Connector
Category 5, 5e, or 6 100-ohm UTP or STP	100 m (328 ft)	RJ-45

Table 5: Maximum 1000BASE-SX Gigabit Ethernet Cable Lengths

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

Table 6: Maximum 1000BASE-LX Gigabit Ethernet Cable Length

Fiber Size	Fiber Bandwidth	Maximum Cable Length	Connector
9/125 micron single-mode fiber	N/A	2 m - 10 km (7 ft - 6.4 miles)	LC

Table 7: Maximum 1000BASE-LH Gigabit Ethernet Cable Length

Fiber Size	Fiber Bandwidth	Maximum Cable Length	Connector
9/125 micron single-mode fiber	N/A	2 m - 70 km (7 ft - 43.5 miles)	LC

100 MBPS FAST ETHERNET COLLISION DOMAIN

Table 8: Maximum 100BASE-FX Cable Length

Type	Cable Type	Max. Cable Length	Connector
100BASE-FX	9/125 micron single-mode fiber	2 m - 20 km (7ft - 12.43 miles)	LC
	62.5/125 or 50/125 multimode fiber	up to 2 km (1.24 miles)	LC

Table 9: Maximum Fast Ethernet Cable Lengths

Type	Cable Type	Max. Cable Length	Connector
100BASE-TX	Category 5 or better 100-ohm UTP or STP	100 m (328 ft)	RJ-45

10 MBPS ETHERNET COLLISION DOMAIN
Table 10: Maximum Ethernet Cable Length

Type	Cable Type	Max. Cable Length	Connector
10BASE-T	Category 3 or better 100-ohm UTP	100 m (328 ft)	RJ-45

CABLE LABELING AND CONNECTION RECORDS

When planning a network installation, it is essential to label the opposing ends of cables and to record where each cable is connected. Doing so will enable you to easily locate inter-connected devices, isolate faults and change your topology without need for unnecessary time consumption.

To best manage the physical implementations of your network, follow these guidelines:

◆ Clearly label the opposing ends of each cable.

◆ Using your building's floor plans, draw a map of the location of all network-connected equipment. For each piece of equipment, identify the devices to which it is connected.

◆ Note the length of each cable and the maximum cable length supported by the switch ports.

◆ For ease of understanding, use a location-based key when assigning prefixes to your cable labeling.

◆ Use sequential numbers for cables that originate from the same equipment.

◆ Differentiate between racks by naming accordingly.

◆ Label each separate piece of equipment.

◆ Display a copy of your equipment map, including keys to all abbreviations at each equipment rack.

A TROUBLESHOOTING

DIAGNOSING LED INDICATORS

Table 11: LED Indicators

LED Status	Action
Power LED is Off	◆ Check connections between the switch, the power cord, and the wall outlet. ◆ Contact your dealer for assistance.
Diag LED is Flashing Amber	◆ Power cycle the switch to try and clear the condition. ◆ If the condition does not clear, contact your dealer for assistance.
Link LED is Off	◆ Verify that the switch and attached device are powered on. ◆ Be sure the cable is plugged into both the switch and corresponding device. ◆ If the switch is installed in a rack, check the connections to the punch-down block and patch panel. ◆ 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 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. If you still cannot isolate the problem, the internal power supply may be defective.

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 a web browser, or other network management software tools. 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 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.

CAUTION: The management agent can accept up 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.

B SPECIFICATIONS

PHYSICAL CHARACTERISTICS

PORTS
8 10/100/1000BASE-T, with auto-negotiation
2 10/100/1000BASE-SFP transceiver slots

NETWORK INTERFACE
Ports 1-8: RJ-45 connector, auto MDI/MDI-X
   10BASE-T: RJ-45 (100-ohm, UTP cable; Category 3 or better)
   100BASE-TX: RJ-45 (100-ohm, UTP cable; Category 5 or better)
   1000BASE-T: RJ-45 (100-ohm, UTP cable; Category 5, 5e or better)
   *Maximum Cable Length - 100 m (328 ft)

Ports 9-10: SFP transceiver slots
   100BASE-FX, 1000BASE-SX,1000BASE-LX, 1000BASE-LH, 1000BASE-T
   *The maximum length for fiber optic cable operating at Gigabit speed
   will depend on the fiber type as listed under:

BUFFER ARCHITECTURE
4 Mbit

AGGREGATE BANDWIDTH
20 Gbps

SWITCHING DATABASE
8K MAC address entries

LEDs
System: Power, Diag, PoE
Port: Status (link, speed, activity)

WEIGHT
2.2 kg (4.85 lbs)

SIZE
(W x D x H)
33 x 20.4 x 4.3 cm (12.99 x 8.03 x 1.69 in.)

TEMPERATURE
Operating: 0°C to 50°C (32°F to 122°F)
Storage: -40°C to 70°C (-40°F to 158°F)

HUMIDITY
Operating: 10% to 90% (non-condensing)

AC INPUT
AC 100-240V, 50-60Hz, 1.7A

POWER SUPPLY
Internal, auto-ranging SMPS: AC 100-240V, 47-63 Hz

POWER CONSUMPTION
100 Watts (Maximum power consumption from AC inlet)

MAXIMUM CURRENT
1.7A

SWITCH FEATURES

FORWARDING MODE
Store-and-forward

THROUGHPUT
Wire speed

FLOW CONTROL
Full Duplex: IEEE 802.3x
Half Duplex: Back pressure

MANAGEMENT FEATURES

IN-BAND MANAGEMENT
Web, or SNMP manager

STANDARDS

IEEE 802.3-2005
    Ethernet, Fast Ethernet, Gigabit Ethernet
    Full-duplex flow control
Link Aggregation Control Protocol
IEEE802.3at Power-over-Ethernet
IEEE 802.1Q
IEEE 802.1P
ISO/IEC 8802-3

COMPLIANCES

CE MARK

EMISSIONS
FCC Class A
EN 55022 (CISPR 22) Class A
EN 61000-3-2/3
VCCI Class A

IMMUNITY
EN 61000-4-2/3/4/5/6/8/11

SAFETY
CSA (CSA 22.2 No 60950-1 & UL60950-1)
CB (IEC 60950-1/ EN60950-1)

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Deutsch: Technischer Support und weitere Information unter www.smc.com

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Nederlands: Technische ondersteuningsinformatie beschikbaar op www.smc.com

Polski: Informacje o wsparciu technicznym sa dostepne na www.smc.com

Čeština: Technicka podpora je dostupna na www.smc.com

Magyar: Műszaki tamogat informacio elerhető -on www.smc.com

简体中文：技术支持讯息可通过www.smc-prc.com查询

繁體中文：產品技術支援與服務請上 www.smcnetworks.com.tw

ไทย: สามารถหาข้อมูลทางด้านเทคนิคได้ที่ www.smc-asis.com

한국어: 기술지원관련 정보는 www.smcnetworks.co.kr 을 참고하시기 바랍니다

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CE

Declaration of Conformity (DoC) can be obtained from www.smc.com -> support -> download

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