



USER GUIDE



**EZ Switch™ 10/100/1000
16/24-Port Gigabit Ethernet Plus Switch**

SMCGS1610/SMCGS2410



EZ Switch™ 10/100/1000 User Guide

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

SMC[®]

N e t w o r k s
No. 1, Creation Road III,
Hsinchu Science Park,
30077, Taiwan, R.O.C.
TEL: +886 3 5638888
Fax: +886 3 6686111

SMCGS1610/SMCGS2410
E112013-AP-R02

Information furnished by SMC Networks, Inc. (SMC) is believed to be accurate and reliable. However, no responsibility is assumed by SMC for its use, nor for any infringements of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of SMC. SMC reserves the right to change specifications at any time without notice.

Copyright © 2013 by

SMC Networks, Inc.

No. 1, Creation Road III,

Hsinchu Science Park,

30077, Taiwan, R.O.C.

All rights reserved

Trademarks:

SMC is a registered trademark; and EZ Switch, TigerStack and TigerSwitch are trademarks of SMC Networks, Inc. Other product and company names are trademarks or registered trademarks of their respective holders.

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 is a class A product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.



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

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.

NOVEMBER 2013 REVISION

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

- ◆ Updated the front panel image.

OCTOBER 2013 REVISION

This is the first revision of this guide.

CONTENTS

	WARRANTY AND PRODUCT REGISTRATION	4
	COMPLIANCES AND SAFETY STATEMENTS	5
	ABOUT THIS GUIDE	6
	CONTENTS	8
1	INTRODUCTION	10
	Overview	10
	Features	11
2	HARDWARE DESCRIPTION	15
	Front Panel	15
	Port and System Status LEDs	15
	RJ-45 Ports	16
	Smart Button	16
	Rear Panel	17
	AC Power Socket	17
3	INSTALLING THE SWITCH	18
	Package Contents	18
	Precautions	19
	Safety Requirements	19
	Location Requirements	19
	Installation	20
	Desktop Installation	20
	Rack Installation	21
	How to Connect to AC Power	22
	Powering On	23

	Connecting Network Devices	24
	Cabling Guidelines	24
	Connecting to PCs, Servers, Hubs and Switches	24
A	TROUBLESHOOTING	25
	Diagnosing Switch Indicators	25
	The Power LED is Off	25
	The Link/Act LED is Off when a Device is Connected to the Corresponding Port	25
	Power and Cooling Problems	25
	Installation	26
B	SPECIFICATIONS	27
	Physical Characteristics	27

OVERVIEW

The SMCGS1610 and SMCGS2410 are the first available unmanaged switches that can be transformed into a smart switch with the use of a single button. DHCP prevention combined with loopback detection and prevention, improves the network environment and reduces network maintenance costs. The switches also provide DoS attack protection, minimizing virus attacks and increasing network uptime.

The SMCGS1610 and SMCGS2410 switches feature a non-blocking switching architecture that forwards and filters packets at full wire-speed for maximum throughput. The switches are compatible with all 10, 100, and 1000 Mbps Ethernet devices because they are standard-based. The switches protect your existing network investments while providing you with a straightforward migration path to faster Gigabit speeds.

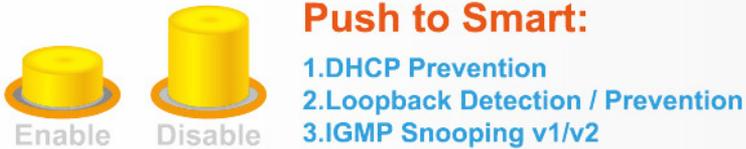
The SMCGS1610 and SMCGS2410 switches are plug-and-play devices; no configuration is required. Auto MDI/MDI-X cable detection on all ports eliminates the need for crossover cables. Each port can be used as an end-node or uplink port, and any port can be simply plugged into a server, hub, router, or switch, using straight-through or crossover cable. Diagnostic LEDs, which display link status and activity, allow you to quickly detect and correct problems on the network.

FEATURES

SMART BUTTON

The SMC GS1610 and SMC GS2410 are the first available switches that use a single button to give your unmanaged switch smart switch capability.

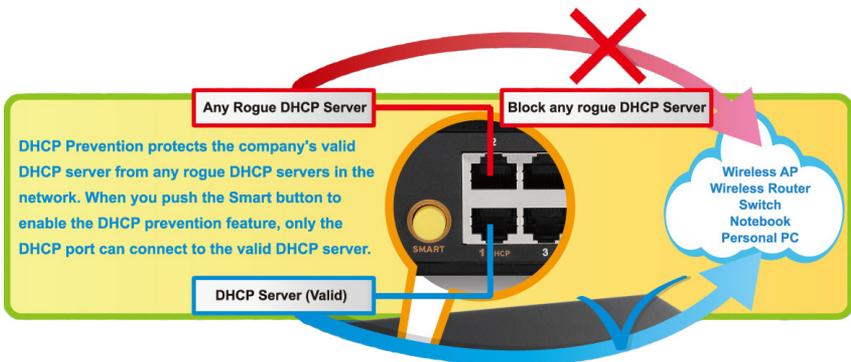
Figure 1: Push to Smart Button



DHCP PREVENTION

DHCP Prevention protects your company's network DHCP Server. When the Smart button is pressed in, it enables a DHCP port restriction feature. The DHCP Prevention feature restricts the DHCP server to the DHCP Port only (port 1). If, on the remaining ports, other DHCP servers are added to the network, the switch will prevent them providing DHCP service.

Figure 2: DHCP Prevention



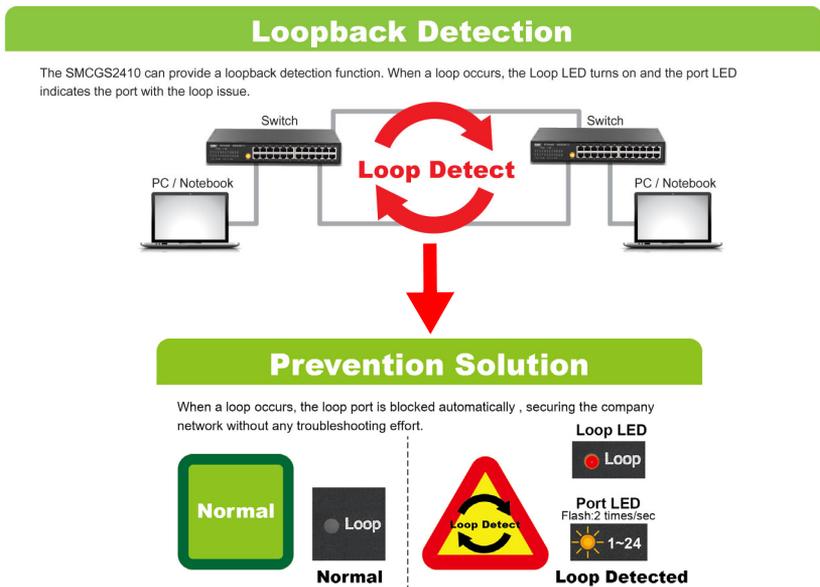
LOOPBACK DETECTION AND PREVENTION

When a loop occurs at a port, the switch will

- Block the loop port, automatically protecting the switch.
- Flash the port LED twice every second.
- Turn the Loop LED on red.

When the loop clears the port LED will cease flashing and the Loop LED will turn off.

Figure 3: Loopback Detection and Prevention



IGMP SNOOPING v1/v2

The switches support IGMP snooping v1/v2, improving multicast services such as video streaming, resulting in smoother video reproduction.

DOS ATTACK PROTECTION

The switches can detect multiple DOS attack scenarios and initiate appropriate protection algorithms. DOS attack scenarios that can be protected against are:

- DoS - Land Attack
- DoS - IP Spoofing Attack
- DoS - TCP SYN Attack
- DoS - TCP NULL scan DoS Attack

EEE SUPPORT

The switches support green 802.3az Energy-Efficient Ethernet to reduce power consumption and energy costs.

FAN-LESS DESIGN

The switches utilize a fan-less design for a noise-free operation that will not disturb anyone nearby.

IEEE 802.1P QoS

When the switch receives a frame tagged with an 802.1p QoS priority tag, it is placed in an appropriate priority queue.

OTHER FEATURES

- ◆ Complies with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab standards.
- ◆ 16/24 10/100/1000 Mbps auto-sensing RJ-45 ports supporting Auto-MDI/MDIX.
- ◆ All ports support full/half-duplex transfer mode for 10/100 Mbps and full-duplex transfer mode for 1000 Mbps.
- ◆ Supports IEEE 802.3x flow control for full-duplex mode and backpressure for half-duplex transfer mode.
- ◆ Non-blocking switching architecture that forwards and filters packets at full wire-speed for maximum throughput.
- ◆ Supports MAC address auto-learning and auto-aging.
- ◆ Supports IEEE 802.1p QoS.

- ◆ LED indicators for displaying power, link, speed, activity and loop disabled.
- ◆ Desktop and rack-mountable steel case.
- ◆ Internal power supply.

2

HARDWARE DESCRIPTION

This chapter describes the front panel, rear panel, and LED indicators of the switch. The SMCGS1610 and SMCGS2410 only differ in the number of ports. All figures in this guide are of the SMCGS2401.

FRONT PANEL

The front panel of SMCGS2401 consists of switch LED indicators, 24 10/100/1000 Mbps RJ-45 ports, and a Smart button.

Figure 4: SMCGS2401 Switch Front Panel



PORT AND SYSTEM STATUS LEDs

The switches include a display panel for key system and port indications that simplify installation and network troubleshooting. The LEDs, which are located on the front panel, are described in the following table.

Table 1: System and Port Status LEDs

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

Table 1: System and Port Status LEDs (Continued)

LED	Condition	Status
Loop	On Red	The switch has detected a loop condition and disabled the appropriate port. When the loop clears, the LED will turn off.
	Off	The switch has not detected a loop condition or the current loop condition has cleared.
1 to 24	On/Blinking Green	Port has established a valid 100 Mbps connection. Blinking indicates activity.
	On/Blinking Amber	Port has established a valid 1000 Mbps connection. Blinking indicates activity.
	Flashing Amber (two flashes per second)	The port is in a looped state and has been disabled. When the loop clears, the port LED will cease flashing.
	Off	There is no valid link on the port.

RJ-45 PORTS

The switch contains 16/24 100BASE-T RJ-45 ports. All ports support automatic MDI/MDI-X operation, so you can use straight-through cables for all network connections to PCs or servers, or to other switches or hubs.

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

Each port also supports IEEE 802.3x auto-negotiation of flow control, so the switch can automatically prevent port buffers from becoming saturated.

SMART BUTTON

When the Smart button is engaged, the unmanaged switch automatically initiates smart switch functionality. The Smart button enables the following functions:

- ◆ DHCP Prevention - restricts installation of a DHCP server to port 1 only, preventing rogue DOS servers from being connected to the network.
- ◆ Loopback Detection and Prevention - The switch checks all ports for a loopback condition every 2 seconds. Upon detection of a loopback condition, the switch blocks the affected port's traffic for 3 seconds and flashes the

port LED twice every second. The Loop LED will also turn on when a loop condition exists. When the loop condition has been cleared, the Loop LED will turn off and the port LED will stop flashing.

- ◆ IGMP Snooping V1/V2 - With IGMP snooping turned on, multicast traffic is filtered from ports that do not need the multicast packets, thus freeing up switch bandwidth.

REAR PANEL

The rear panel of the switch features a power socket.

Figure 5: SMCGS2401 Switch Rear Panel



AC POWER SOCKET

Connect the female connector of the power cord here, and the male connector to the AC power outlet. Note that the socket includes the PE (Protective Earth) pole to connect the switch to ground through an AC power cord. Make sure the voltage of the power supply meets the requirement of the input voltage and use an appropriate AC power outlet that includes a Protective Earth pole.

3

INSTALLING THE SWITCH

Before installing the switch, verify that you have all the items listed under "Package Contents." If any of the items are missing or damaged, contact your local SMC distributor. Also be sure you have all the necessary tools and cabling before installing the switch.

PACKAGE CONTENTS

The following contents should be found in your package:

- ◆ One SMCGS1610 or SMCGS2410 Switch
- ◆ Power Cord
- ◆ This User Guide
- ◆ Rackmount Kit
- ◆ Quick Installation Guide
- ◆ SMC Warranty Card
- ◆ Four Rubber Foot Pads



NOTE: Make sure that the package contains the above items. If any of the listed items are damaged or missing, please contact your distributor.



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

Les raccordeurs ne sont pas utilisé pour le système téléphonique!

PRECAUTIONS

To ensure a long-term and stable performance of the switch, pay attention to the following before installation.

SAFETY REQUIREMENTS

- ◆ Before cleaning the switch, disconnect the power supply. Do not clean the switch using a wet cloth, and never use any other liquid for cleaning.
- ◆ Take waterproof measures during storage, transportation and operation of the equipment.
- ◆ Use only the power cord provided with the switch.
- ◆ Make sure the voltage of the power supply meets the requirement of the input voltage of the switch.
- ◆ Do not push any objects into the openings of the switch.
- ◆ Ensure the vent holes are well ventilated and unblocked.
- ◆ Do not open or remove the cover of the switch.

LOCATION REQUIREMENTS

When you choose a location for the switch, follow these guidelines:

- ◆ Install the switch on a flat and stable surface that can support the entire weight of the switch with all fittings.
- ◆ Locate the switch far from strong electromagnetic field generators (such as motors), vibration, dust, and direct exposure to sunlight.
- ◆ To ensure adequate air flow around the switch. At least 10 cm (4 inches) of space at the front and rear of the switch is needed for ventilation.
- ◆ Make sure that the switch will be accessible and that the cables can be easily connected.

- ◆ Position the switch away from water and moisture sources, be sure to provide an acceptable temperature and humidity operating environment.

INSTALLATION

This switch can be either installed in a standard 19-inch mountable rack or located on a desktop.



CAUTION: Please unplug the power cord before installing or removing the switch.

DESKTOP INSTALLATION

To install the switch on the desktop, follow these steps:

1. Set the switch on a flat surface strong enough to support the entire weight of the switch with all fittings.
2. Remove the adhesive backing papers from the rubber feet.
3. Turn the switch over and attach the supplied rubber feet to the recessed areas on the bottom at each corner of the switch.

Figure 6: Attaching Rubber Feet



4. Upright the switch and set it in the desired location, making sure there is enough ventilation space on all sides for proper air flow
5. Connect the switch to a power source with the provided power cord. See [“Powering On” on page 23](#).



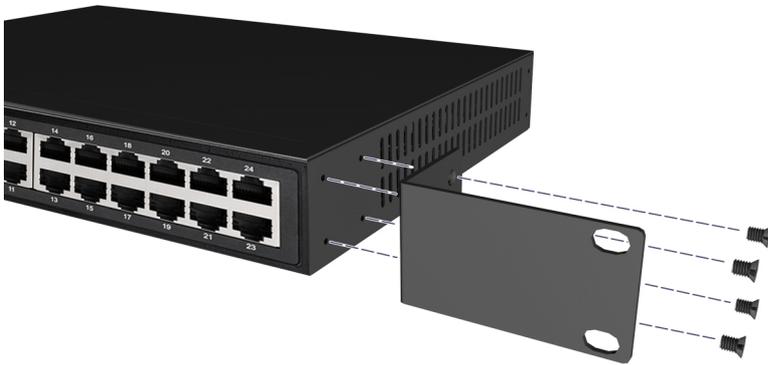
CAUTION: Avoid placing anything heavy on the switch.

RACK INSTALLATION

To install the switch in an EIA standard-sized, 19-inch rack, follow the instructions described below:

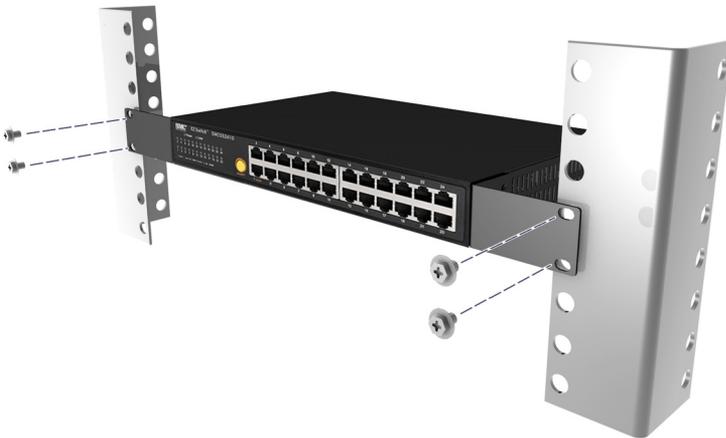
1. Secure the supplied rack-mounting brackets to each side of the switch with supplied screws, as illustrated in the following figure.

Figure 7: Attaching Brackets



2. Use suitable screws (not provided) to secure the brackets to the rack, as illustrated in the following figure.

Figure 8: Mounting the Switch



3. Connect the switch to a power source with the provided power cord. See [“Powering On” on page 23](#).

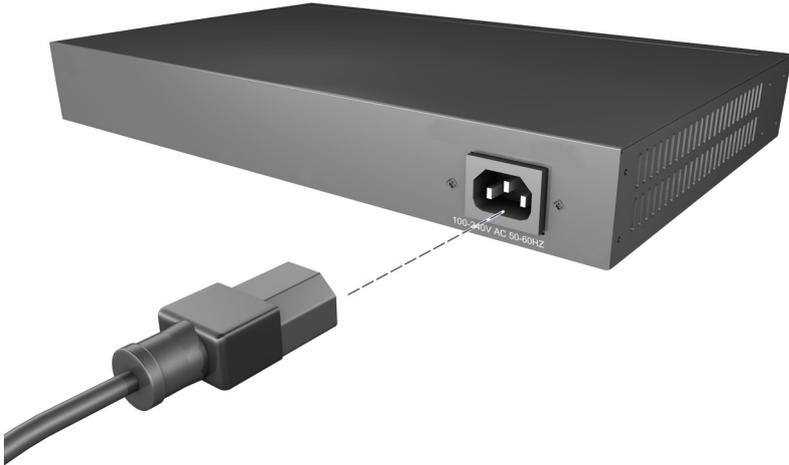
HOW TO CONNECT TO AC POWER

To supply AC power to the switch, first verify that the external AC power supply can provide 100 to 240 VAC, 50-60 Hz.

To connect the switch to a power source:

1. Plug the power cord into a grounded, 3-pin, AC power source.

Figure 9: AC Power Cord and Power Socket



2. Insert the plug on the other end of the power cord directly into the AC input socket on the back of the switch.



NOTE: Your country's AC power outlet standards may not match the power plug of the included AC power cord, you may need to change the AC power cord. You must use a cord set that has been approved for the socket type in your country.

3. Check the LED indicators on the switch front panel as the unit is powered on to verify that power is being received. If not, recheck the power cord connections at the AC supply source and back panel power input connector.

POWERING ON

The SMC GS1610 and SMC GS2410 switches are powered by connecting to an AC power supply using a power cord. When powering on the switch, it automatically initializes and the LED indicators respond as follows:

1. All of the LED indicators flash momentarily for one second, which represents a resetting of the system.
2. The Power LED indicator turns on green.

CONNECTING NETWORK DEVICES

The switches are designed to be connected to 10, 100, or 1000 Mbps network cards in PCs and servers, as well as to other switches and hubs.

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).

Each device requires an unshielded twisted-pair (UTP) cable with RJ-45 connectors at both ends. Use Category 5 or better for 100BASE-TX connections, and Category 3 or better for 10BASE-T connections.

CONNECTING TO PCs, SERVERS, HUBS AND SWITCHES

1. Attach one end of a twisted-pair cable segment to the device's RJ-45 connector.
2. Attach the other end of the cable segment 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 relevant port LED (on the switch) corresponding to each port will turn on green to indicate that the connection is valid.

A

TROUBLESHOOTING

DIAGNOSING SWITCH INDICATORS

THE POWER LED IS OFF

- ◆ Make sure the AC power cord is connected to the switch and power source properly.
- ◆ Make sure the power source is ON.

THE LINK/ACT LED IS OFF WHEN A DEVICE IS CONNECTED TO THE CORRESPONDING PORT

- ◆ Make sure that the cable connectors are firmly plugged into the switch and the device.
- ◆ Make sure the connected device is turned on and working properly.
- ◆ The cable must be less than 100 meters long (328 feet).
- ◆ Check the port on the attached device and cable connections for possible defects. Replace the defective 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.

B

SPECIFICATIONS

PHYSICAL CHARACTERISTICS

STANDARDS

IEEE 802.3 10BASE-T
IEEE 802.3u 100BASE-TX
IEEE 802.3ab 1000BASE-T

TOPOLOGY

Star

PROTOCOL

CSMA/CD

DATA TRANSFER RATE

Ethernet: 10 Mbps (half/full duplex)
Fast Ethernet: 100 Mbps (half/full duplex)
Gigabit Ethernet: 1000 Mbps (full duplex)

NETWORK MEDIA (CABLE)

10BASE-T: UTP Category 3, 4, 5 cable (maximum 100 m)
EIA/TIA-568 100 STP (maximum 100 m)
100BASE-TX: UTP Category 5, 5e cable (maximum 100 m)
EIA/TIA-568 100 STP (maximum 100 m)
1000BASE-T: UTP Category 5e, 6 cable (maximum 100 m)
EIA/TIA-568 100 STP (maximum 100 m)

NUMBER OF PORTS

16/24 10/100/1000 Mbps auto-negotiation RJ-45 ports

LED INDICATORS

POWER, LOOP, Link/Act, 1000 Mbps

TRANSFER METHOD

Store-and-Forward

MAC ADDRESS LEARNING

Automatically learning, automatically aging

FRAME FILTER RATE

10BASE-T: 14881 pps/port

100BASE-TX: 148810 pps/port

1000BASE-T: 1488095 pps/port

FRAME FORWARD RATE

10BASE-T: 14881 pps/port

100BASE-TX: 148810 pps/port

1000BASE-T: 1488100 pps/port

SWITCHING DATABASE

16K MAC address entries

BUFFER MEMORY

Internal Memory: 64 KB

Flash: 2 MB

SWITCHING CAPACITY

SMCGS1610: 32 Gbps

SMCGS2410: 48 Gbps

POWER ADAPTER

SMCG1601/2401: 100 ~240 V, 50-60 Hz

DIMENSIONS

SMCGS1610: 28.0 x 18.0 x 4.4 cm (11.0 x 7.1 x 1.73 in.)

SMCGS2410: 28.0 x 18.0 x 4.4 cm (11.0 x 7.1 x 1.73 in.)

WEIGHT

SMCGS1610: 1.54 Kg (3.54 lbs)

SMCGS2410: 1.66 Kg (3.65 lbs)

FEATURE

Smart Button

DHCP Prevention

Loopback Detection/Prevention

IGMP Snooping v1/v2

DoS Attack Protection

Energy Efficient Ethernet IEEE P802.3az

IEEE 802.1p QoS

Jumbo Frames: 9216 Bytes

TEMPERATURE

Operating: 0 to 40 °C (32 to 104 °F)

Storage: -40 to 70 °C (-40 to 158 °F)

HUMIDITY

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

Storage: 10% to 90% (non-condensing)

ELECTROMAGNETIC COMPATIBILITY

CE

FCC

BSMI

IMMUNITY

EN55024

IEC61000-4/2/3/4/5/6/8/11

EMISSIONS

FCC Class A, EN55022/EN61000-3-2/3

SAFETY

LVD (EN60950)

Headquarters

No. 1, Creation Rd. III
Hsinchu Science Park
Taiwan 30077
Tel: +886 3 563 8888
Fax: +886 3 668 6111

Singapore

15 Enggor Street
#10-04, Realty Centre
Singapore 079716
Tel: +65-63387667
Fax: +65-63387767

English: Technical Support information available at www.smc.com

English: (for Asia-Pacific): Technical Support information at www.smc-asia.com

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

Español: En www.smc.com Ud. podrá encontrar la información relativa a servicios de soporte técnico

Français: Informations Support Technique sur www.smc.com

Português: Informações sobre Suporte Técnico em www.smc.com

Italiano: Le informazioni di supporto tecnico sono disponibili su www.smc.com

Svenska: Information om Teknisk Support finns tillgängligt på www.smc.com

Nederlands: Technische ondersteuningsinformatie beschikbaar op www.smc.com

Polski: Informacje o wsparciu technicznym są dostępne na www.smc.com

Čeština: Technická podpora je dostupná na www.smc.com

Magyar: Műszaki támogatás információ elérhető-en 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-asia.com

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

INTERNET

E-mail address: www.smc.com → Support → By email

Driver updates: www.smc.com → Support → Downloads



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