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USER GUIDE

EZ Switch™ 10/100/1000
5/8-Port Gigabit Ethernet Switches

SMCGS501/SMCGS801

EZ Switch™ 10/100/1000 User Guide

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

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FEDERAL COMMUNICATION COMMISSION INTERFERENCE STATEMENT

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.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. SMC is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

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

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

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This information technology equipment complies with the requirements of the Council Directive 2004/108/EC on the Approximation of the laws of the Member States relating to Electromagnetic Compatibility and 2006/95/EC for electrical equipment used within certain voltage limits and the Amendment Directive 2006/95/EC. For the evaluation of the compliance with these Directives, the following standards were applied:

RFI Emission:

◆ Limit class A according to EN 55022: 2006 (EMC)

◆ Limit class A for harmonic current emission according to EN 61000-3-2/ 2000+A2:2005

◆ Limitation of voltage fluctuation and flicker in low-voltage supply system according to EN 61000-3-3/1995+A1:2001+A2:2005

Immunity:

◆ Product family standard according to EN 55024:1998+A1:2001+A2:2003

◆ Electrostatic Discharge according to EN 61000-4-2: 2001 ED.1.2 (Contact Discharge: ±4 kV, Air Discharge: ±8 kV)

◆ Radio-frequency electromagnetic field according to EN 61000-4-3: 2006 ED.3.0 (80 - 1000 MHz with 1 kHz AM 80% Modulation: 3 V/m)

◆ Electrical fast transient/burst according to EN 61000-4-4: 2004 ED.2.0 (AC/ DC power supply: ±1 kV, Data/Signal lines: ±0.5 kV)

◆ Surge immunity test according to EN 61000-4-5: 2005 ED.2.0 (AC/DC Line to Line: ±1 kV, AC/DC Line to Earth: ±2 kV)

◆ Immunity to conducted disturbances, Induced by radio-frequency fields: EN 61000-4-6: 2006 ED.2.2 (0.15 - 80 MHz with 1 kHz AM 80% Modulation: 3 V/m)

◆ Power frequency magnetic field immunity test according to EN 61000-4-8: 2001 ED.1.1 (1 A/m at frequency 50 Hz)

◆ Voltage dips, short interruptions and voltage variations immunity test according to EN 61000-4-11: 2004 ED.2.0 (>95% Reduction @10 ms, 30% Reduction @500 ms, >95% Reduction @5000 ms)

LVD:

◆ EN 60950-1:2006

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This equipment complies with the requirements relating to electromagnetic compatibility, EN 55022 class A for ITE, the essential protection requirement of Council Directive 2004/108/EC on the approximation of the laws of the Member States relating to electromagnetic compatibility.

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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.

MAY 2011 REVISION

This is the first revision of this guide.

ABOUT THIS GUIDE

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1 INTRODUCTION

OVERVIEW

The EZ Switch 10/100/1000, SMCGS501 and SMCGS801, are powerful, high-performance Gigabit Ethernet switches with 5 or 8 ports. The switches support auto-negotiation on all ports, which means they automatically negotiate with connected partners to determine the network speed (10/100/1000 Mbps) and duplex mode (full or half duplex).

The auto-sensing ability of the ports provides an easy way to migrate from 10/100 Mbps to a 1000 Mbps network. The switches also support Auto-MDI/ MDIX, so each port can be connected to PCs or other switches using only strait-through cables. Crossover cables are not needed.

Store-and-forward switching provides low latency while eliminating error packets on the network. Also, the switches support pre-standard IEEE 802.3az Energy Efficient Ethernet that saves power consumption.

PACKAGE CONTENTS

Before installing the switch, verify that you have all the items listed in the 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.

The following contents should be found in your package:

◆   One SMCGS501 or SMCGS801 switch

◆   One external power adapter

◆   Four rubber foot pads

◆   This User Guide

◆ SMC Warranty Card

◆ Quick Install Guide

FEATURES

◆ Complies with 10BASE-T specifications of the IEEE 802.3 standard

◆ Complies with 100BASE-TX specifications of the IEEE 802.3u standard

◆ Complies with 1000BASE-T specifications of the IEEE 802.3ab standard

◆ 5 or 8 10/100/1000 Mbps RJ-45 ports

◆ Supports MDI/MDI-X auto crossover

◆ Supports full- and half-duplex operation on all ports

◆ Supports back-pressure (half duplex) and full-duplex flow control (IEEE 802.3x)

◆ Wire-speed packet filtering and forwarding rate

◆ Store-and-forward architecture filters fragment & CRC error packets

◆ Supports LED indicators for network diagnostics

◆ Supports IEEE 802.1p QoS

◆ Supports pre-standard IEEE 802.3az

IEEE 802.1P QOS

The SMCGS501 and SMCGS801 switches support 802.1p priority queuing Quality of Service, which is an implementation of the IEEE 802.1p standard. With the 802.1p QoS function, you can reserve bandwidth for important functions that require a lot of bandwidth or have a high priority, such as VoIP (Voice-over Internet Protocol), web browsing applications, or video conferencing. The Switches have separate hardware queues on on each physical port to which packets from various applications are mapped and priorities assigned.

The illustration below shows how 802.1p priority queuing is implemented on the switches.

Figure 1: Mapping QoS on the Switches
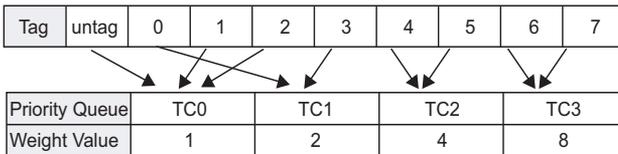
There are four priority queues labeled TC0, TC1, TC2 and TC3. The untagged packets and the eight IEEE 802.1p priority values (defined by the standard) are mapped to the four priority queues on the switch. TC3 has the highest priority of the four priority queues, while TC0 has the lowest priority. The untagged packets and eight priority values, specified in IEEE 802.1p, are mapped to the switch's priority queues as follows:

◆   Untagged packets, and packets with priority 1 and 2 are assigned to the switch's TC0 queue.

◆   Packets with priority 0 and 3 are assigned to the switch's TC1 queue.

◆   Packets with priority 4 and 5 are assigned to the switch's TC2 queue.

◆   Packets with priority 6 and 7 are assigned to the switch's TC3 queue.

The switches use Weighted Robin Round (WRR) for scheduling. The WRR queue-scheduling algorithm schedules all the queues in turn with every queue assured a certain service time. For WRR mode, the default weight values of TC0, TC1, TC2 and TC3 are 1:2:4:8.

2 HARDWARE DESCRIPTION

PORT AND SYSTEM STATUS LEDS

The switch contains one power LED for the device and LINK/ACT LEDs for each port.

Please refer to the following table for LEDs definition:

Figure 2: Front Panels
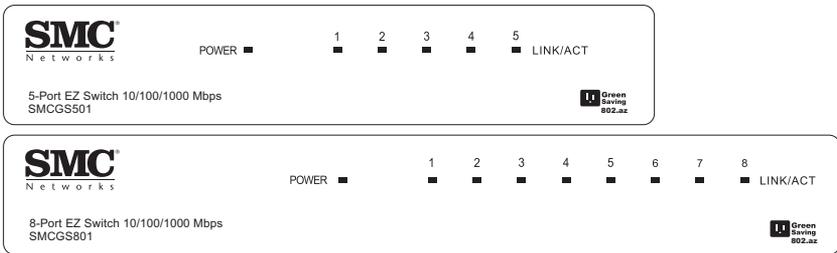
Table 1: System and Port Status LEDs

LED	Condition	Status
POWER	On Green	The internal power supply is operating normally.
	Off	The unit has no power connected.
LINK/ACT	On Green	Port has established a valid network connection.
	Flashing Green	The port is transmitting or receiving data.
	Off	There is no valid link on the port.

INSTALLATION

When installing the switch, follow these guidelines:

◆ Place the switch with appropriate ventilation environment. A minimum of 25 mm space around the unit is recommended.

◆ Place the switch and connected cables away from sources of electrical noise, such as radios, transmitters, and broadband amplifiers.

◆ Be sure the switch is placed away from moisture and locations that are beyond its recommended environmental specifications.

PC CONNECTIONS

Connect each PC to the switch using twisted-pair Ethernet cables with RJ-45 connectors at each end. Plug one RJ-45 connector into an RJ-45 port on the switch, and plug the other RJ-45 connector into a PC's network port.

SWITCH CONNECTIONS

When making switch interconnections, you can use any port on the switch to connect to another switch using straight-through or crossover cable. As all ports on the switch support Auto MDI/MDIX, you can use straight-through cables for all connections.

For cable selection, refer to the following table

Table 2: LED Indicators

Network Speed	Cable Type	Max. Length
10 Mbps	Cat. 3, 4, 5 UTP/STP	100 meters
100 Mbps	Cat. 5 UTP/STP	100 meters
1000 Mbps	Cat. 5e, 6 UTP/STP	100 meters

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
IEEE802.3 10BASE-T
IEEE802.3u 100BASE-TX
IEEE802.3ab 1000BASE-T
IEEE802.3x full duplex flow control
IEEE 802.3az
IEEE 802.1p QoS

INTERFACE
SMCGS501: 5 10/100/1000BASE-T RJ-45 ports
SMCGS801: 8 10/100/1000BASE-T RJ-45 ports

NETWORK DATA RATE
10/100/1000 Mbps Auto-negotiating

TRANSMISSION MODE
10/100 Mbps: Full-duplex, Half-duplex
1000 Mbps: Full-duplex

SWITCHING CAPACITY
SMCGS501: 10 Gbps
SMCGS801: 16 Gbps

THROUGHPUT
SMCGS501: 7.4 Mpps
SMCGS801: 11.9 Mpps

POWER SAVING

SMCGS501: up to 68% Power Saving
SMCGS801: up to 75% Power Saving

BUFFER MEMORY

128K bytes

MAC ADDRESS TABLE

8K

JUMBO FRAME

9K bytes

TEMPERATURE

Operating: 0 °C to 40 °C (32 °F to 104 °F)

HUMIDITY

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

LED INDICATIONS

System: Power
Ports: Link/Act

POWER SUPPLY

External power adapter 5V/1A

DIMENSIONS

SMCGS501: 121.0 x 75.0 x 26.0 mm (4.84 x 3.0 x 1.0 in.)
SMCGS801: 154.5 x 85.0 x 26.0 mm (6.18 x 3.4 x 1.0 in.)

WEIGHT
SMCGS501: 253 g (0.12 lbs)
SMCGS801: 355 g (0.16 lbs)

EMISSIONS
FCC, CE

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