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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.

CE Mark Warning

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.

Revision

PLANET Gigabit Ethernet Switch User's Manual

FOR MODELS: GSW-1600/GSW-2400

Part No.: EM-GSW24_16v1

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Chapter 1

INTRODUCTION

1.1 Package Contents

Check the contents of your package for following parts:

- Gigabit Ethernet Switch x1
- User's manual x1
- Power cord x1

If any of these are missing or damaged, please contact your dealer immediately, if possible, retain the carton including the original packing material, and use them against to repack the product in case there is a need to return it to us for repair.

1.2 How to Use This Manual

This Gigabit Ethernet Switch User Manual is structured as follows:

- Section 2. Installation
It explains the functions of GSW-1600/2400 and how to physically install the GSW-1600/2400.
- Section 3. Switch operation
It contains specifications of GSW-1600/2400.
- Section 4. Troubleshooting
It contains troubleshooting of GSW-1600/2400.
- Appendices
It contains cable information of GSW-1600/2400.

1.3 Product Features

- Complies with IEEE802.3, 10Base-T, IEEE802.3u, 100Base-TX and IEEE802.3ab, 1000Base-T
- 16/24-port 10/100/1000 Mbps Ethernet ports and 2 Mini-GBIC interface for GSW-2400
- Features Store-and-Forward mode with wire-speed filtering and forwarding rates
- Hardware based 10/100Mbps, half/full duplex and 1000Mbps full duplex mode, flow control and auto-negotiation
- IEEE802.3x flow control for full duplex operation and back-pressure for half duplex operation
- Integrated address look-up engine, support 4K/32K absolute MAC addresses
- Automatic address learning and address aging
- Supports Auto MDI/MDI-X function
- Support CSMA/CD protocol
- 100~240VAC, 50~60Hz universal Power input
- FCC, CE class A compliant

1.4 Product Specifications

| Model | GSW-1600 | GSW-2400 |
|------------------------|--|---------------------------|
| Hardware Specification | | |
| Network ports | 16 | 24 |
| Mini-GBIC interface * | NA | 2, shared with port 12/24 |
| Switch architecture | Store-and-Forward | |
| Switch Fabric | 32Gbps | 44Gbps |
| Switch throughput | 23.8Mpps | 38.6Mpps |
| Address Table | 4K entries | 32K entries |
| Share data Buffer | 272KB | 2MB |
| Flow Control | Back pressure for half duplex, IEEE 802.3x Pause Frame for full duplex | |
| Dimensions (mm) | 240 x 44.5 x 430 | 430 x 350 x 45 |
| Flow Control | Back pressure for half duplex, IEEE 802.3x for Pause Frame on full duplex | |
| Weight | 2.9kg | 4.2kg |
| Power Requirement | 100-240V AC, 50-60 Hz | |
| Power Consumption | 60 watts, 204 BTU | 100 watts, 341 BTU |
| Standards Conformance | | |
| Network Standards | IEEE 802.3 (Ethernet), IEEE 802.3u (Fast Ethernet) IEEE 802.3ab (Gigabit Ethernet) IEEE 802.3x (full-duplex flow control) | |
| Operating Temperature | 0~50 degree C | |
| Storage Temperature | -30~70 degree C | |
| Humidity | 5% to 90% (Non-condensing) | |
| Regulation Compliance | FCC, CE | |

* Note: PLANET model MGB-SX and MGB-LX can be deployed for these two interfaces.



Chapter 2

INSTALLATION

This section describes the functionalities of GSW-1600/2400's components and guides how to install it on the desktop or shelf. Basic knowledge of networking is assumed. Please read this chapter completely before continuing.

2.1 Product Description

The PLANET GSW-1600/GSW-2400 is a 16/24-port 10/100/1000Mbps Ethernet switch with non-blocking wire-speed performance. With 32/44Gbps internal switching fabric, the GSW-1600/GSW-2400 can handle extremely large amounts of data transmission in a secure topology linking to a backbone or high-power servers. The GSW-1600 /GSW-2400 could recognize up to 4K/32K MAC Address table and provides 272 KB /2MB on-chip frame buffer. The GSW-1600 /GSW-2400 offers wire-speed packet transfer performance without risk of packet loss. The high data throughput, it can provide the most convenient for user to upgrade their network to Gigabit environment.

The GSW-2400 also provides 2 Mini-GBIC interfaces for fiber extension to uplink to a server or network backbone.

2.1.1 Product Overview

PLANET GSW-1600/2400 is a gigabit Ethernet switch with 16/24 RJ-45 10/100/1000 Mbps ports for high-speed network connectivity. The GSW-1600/2400 can also automatically identify and determine the correct transmission speed and half/full duplex mode of the attached devices with its 16/24 ports. The Gigabit port can handle large amounts of data transmission in a secure topology linking to a backbone or high-power servers.

This products also supports store-and-forward forwarding scheme to ensure low latency and high data integrity, eliminates unnecessary traffic and relieves congestion on critical network paths. With an intelligent address recognition algorithm, GSW-1600/2400 could recognize up to 4K/32K different MAC address and enables filtering and forwarding at full wire speed.

2.1.2 FNSW-2402S Front Panel

Figure 2-1 & 2-2 shows a front panel of GSW-1600/2400.

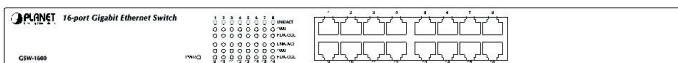


Figure 2-1 PLANET GSW-1600 Front Panel

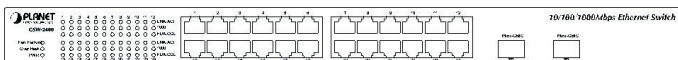


Figure 2-2 PLANET GSW-2400 Front Panel

2.1.3 LED Indicators

| LED | Color | Function |
|--------------------------------------|-------|---|
| PWR | Green | Lights to indicate that the Switch has power. |
| Over Heat *1 (GSW-2400 only) | Red | Lights to indicate that the Switch exceeds its operational temperature. |
| Fan Failure *2 (GSW-2400 only) | Red | Lights to indicate that the fans are not active. |

| LED | Color | Function |
|---------|--------|---|
| LNK/ACT | Green | Lights to indicate that the Switch is successfully connecting to the network. Blinks to indicate the Switch is actively receiving or sending the data over the port. |
| 1000 | Green | Lights to indicate that the port is operating at 1000 Mbps. Off to indicate that the port is operating at 100Mbps or 10 Mbps while the port's Link is on. |
| FDX/COL | Yellow | Lights to indicate that the port is operating in full-duplex mode. Blinks periodically to indicate that the connection is experiencing collisions. |

*1 When the internal temperature is equal to or higher than 60 degree C, the Over Heat LED will light on. Once the temperature is equal to or higher than 70 degree C, the buzzer makes continuously alarm noise. Users can press the buzzer On/Off to turn it off.

*2 There are five fans in the GSW-2400. Normally, all of the fans are running. Once the running fan is failed, the Fan Failure LED will light on and the buzzer makes continuously alarm noise. Users can press the buzzer On/Off button to turn off the buzzer.

2.1.4 GSW-1600/2400 Rear Panel

The rear panel of the Switch indicates an AC inlet power socket, which accepts input power from 100 to 240VAC, 50-60Hz.



Figure 2-3 Rear Panel of GSW-1600

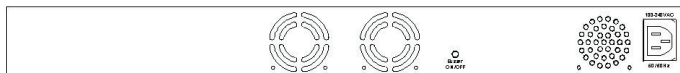


Figure 2-4 Rear Panel of GSW-2400

Note: To press the button to enable the buzzer (Buzzer on, default), the buzzer makes continuously alarm noise, as the system is overheating or Fan failure. If the button is released (Buzzer off), the buzzer will not work even if the system overheats or Fan failure.

Power Notice:

1. The device is a power-required device, it means, it will not work till it is powered. If your networks should active all the time, please consider using UPS (Uninterrupted Power Supply) for your device. It will prevent you from network data loss or network downtime.
2. In some area, installing a surge suppression device may also help to protect your switch from being damaged by unregulated surge or current to the Switch or the power adapter.

2.2 Installing a GSW-1600/2400

This part describes how to install your GSW-1600/2400 Gigabit Ethernet Switch and make connections to the switch. Please read the following topics and perform the procedures in the order being presented. PLANET GSW-1600/2400 Gigabit Ethernet Switch do not need software configuration. To install your GSW-1600/2400 on a desktop or shelf, simply complete the following steps.

2.2.1 Desktop Installation

To install a GSW-1600/2400 on a desktop or shelf, simply complete the following steps:

- Step1: Attach the rubber feet to the recessed areas on the bottom of the switch.
- Step2: Place the GSW-1600/2400 on a desktop or shelf near an AC power source.
- Step3: Keep enough ventilation space between the switch and the surrounding objects.

Note: When choosing a location, please keep in mind the environmental restrictions discussed in Chapter 1, Section 4, Specification.

Step4: Connect your GSW-1600/2400 to network devices.

-
- A. Connect one end of a standard network cable to the 10/100/1000 RJ-45 ports on the front of the GSW-1600/2400.
 - B. Connect the other end of the cable to the network devices such as printer servers, workstations or routers...etc.

Note: Connection to the Switch requires UTP Category 5 network cabling with RJ-45 tips. For more information, please see the Cabling Specification in Appendix A.

Step5: Supply power to the Switch.

- A. Connect one end of the power cable to the GSW-1600/2400.
- B. Connect the power plug of the power cable to a standard wall outlet.

When the GSW-1600/2400 receives power, the Power LED should remain solid Green.

Chapter 3

SWITCH OPERATION

3.1 Address Table

The Switch is implemented with an address table. This address table composed of many entries. Each entry is used to store the address information of some node in network, including MAC address, port no, etc. This information comes from the learning process of Ethernet Switch.

3.2 Learning

When one packet comes in from any port, the Switch will record the source address, port no. And the other related information in address table. This information will be used to decide either forwarding or filtering for future packets.

3.3 Forwarding & Filtering

When one packet comes from some port of the Ethernet Switching, it will also check the destination address besides the source address learning. The Ethernet Switching will lookup the address-table for the destination address. If not found, this packet will be forwarded to all the other ports except the port, which this packet comes in. And these ports will transmit this packet to the network it connected. If found, and the destination address is located at different port from this packet comes in, the Ethernet Switching will forward this packet to the port where this destination address is located according to the information from address table. But, if the destination address is located at the same port with this packet comes in, then this packet will be filtered. Thereby increasing the network throughput and availability.

3.4 Store-and-Forward

Store-and-Forward is one type of packet-forwarding techniques. A Store-and-Forward Ethernet Switching stores the incoming frame in an internal buffer, do the complete error checking before transmission. Therefore, no error packets occurrence, it is the best choice when a network needs efficiency and stability.

The Ethernet Switch scans the destination address from the packet-header, searches the routing table provided for the incoming port and forwards the packet, only if required. The fast forwarding makes the switch attractive for connecting servers directly to the network, thereby increasing throughput and availability. However, the switch is most commonly used to segment existing hubs, which nearly always improves overall performance. An Ethernet Switching can be easily configured in any Ethernet network environment to significantly boost bandwidth using conventional cabling and adapters.

Due to the learning function of the Ethernet switching, the source address and corresponding port number of each incoming and outgoing packet are stored in a routing table. This information is subsequently used to filter packets whose destination address is on the same segment as the source address. This confines network traffic to its respective domain, reducing the overall load on the network.

The Switch performs “Store and forward” therefore, no error packets occur. More reliably, it reduces the re-transmission rate. No packet loss will occur.

3.5 Auto-Negotiation

The STP ports on the Switch have built-in “Auto-negotiation”. This technology automatically sets the best possible bandwidth when a connection is established with another network device (usually at Power On or Reset). This is done by detect the modes and speeds at the second of both device is connected and capable of, both 10Base-T and 100Base-TX devices can connect with the port in either Half- or Full-Duplex mode. 1000Base-T can be only connected in Full-duplex mode.

Chapter 4

TROUBLESHOOTING

This chapter contains information to help you solve problems. If Giga Switch is not functioning properly, make sure the Ethernet Switch was set up according to instructions in this manual.

The Link LED is not lit

Solution:

Check the cable connection and its quality.

Some stations cannot talk to other stations located on the other port

Solution:

The address table may contain older information than of the address table of that node. Please power down to refresh the address information.

Performance is bad

Solution:

Check the full duplex status of the partner Switch. The Gigabit Ethernet Switch is run at full duplex and the partner is set to half duplex, then the performance will be poor.



APPENDIX A

A.1 Switch's RJ-45 Pin Assignments

1000Mbps, 1000Base T

| Contact | MDI | MDI-X |
|---------|--------|--------|
| 1 | BI_DA+ | BI_DB+ |
| 2 | BI_DA- | BI_DB- |
| 3 | BI_DB+ | BI_DA+ |
| 4 | BI_DC+ | BI_DD+ |
| 5 | BI_DC- | BI_DD- |
| 6 | BI_DB- | BI_DA- |
| 7 | BI_DD+ | BI_DC+ |
| 8 | BI_DD- | BI_DC- |

Implicit implementation of the crossover function within a twisted-pair cable, or at a wiring panel, while not expressly forbidden, is beyond the scope of this standard.

A.2 10/100Mbps, 10/100Base-TX

| Contact | MDI | MDI-X |
|---------|-----|-------|
| 1 | 1 | 3 |
| 2 | 2 | 6 |
| 3 | 3 | 1 |
| 6 | 6 | 2 |



Part No.:EM-GSW24_16v1

