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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 24-port 10/100Mbps + 2-port Gigabit Ethernet Switch User's Manual

FOR MODEL: FGSW-2620

REV: 1.0 (March.2004)

Part No.: 2010-000032-000

Table of Contents

1.1 Package Contents

Check the contents of your package for following parts:

- 24-port 10/100Mbps + 2-port Gigabit Ethernet Switch x1

- User's manual x1

- Power cord x1

- Two Rack-Mounting Brackets with Attachment Screws 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 return to it to us for repairing.

1.2 How to Use This Manual

This FGSW-2620 User's Manual is structured as follows:

- Section 2, Installation

  It explains the functions of FGSW-2620 and how to physically install the FGSW-2620.

- Section 3, Switch operation

  It explains the Switch operation of FGSW-2620.

- Section 4 Troubleshooting

  It contains troubleshooting guide of FGSW-2620.

- Appendix A

  It contains cable information of FGSW-2620. In the following section, the term "Switch" means the Switch, i.e. FGSW-2620, term of "switch" can be any third part Switches.

1.3 Product Features

- Comply with IEEE802.3, IEEE802.3u 10/100Base-TX, IEEE802.3ab 1000Base-T Ethernet Standard

- 24 (10/100Mbps), 2 (10/100/1000Mbps) Gigabit Ethernet Switch

- Each Switching Fast Ethernet ports support auto-negotiation-10/20, 100/200Mbps,supported

- Each Switching Gigabit ports support auto-negotiation- 10/20,100/200Mbps, 1000/2000Mbps supported

- Auto-MDI/MDI-X detection on each RJ-45 port

- Prevents packet loss with back pressure (half-duplex) and 802.3x PAUSE frame flow control (full-duplex)

- High performance Store and Forward architecture, broadcast storm control, runt/CRC filtering eliminates erroneous packets to optimize the network bandwidth

- Provide 8.8Gbps switch fabric, non-blocking switch architecture

- 8K MAC address table, automatic source address learning and ageing

- 2.5Mbit for packet buffer

- 19-inch rack mount size

1.4 Product Specifications

Model	FGSW-2620
Hardware Specification	
Ports	24 10/ 100Base-TX RJ-45 Auto-MDI/MDI-X ports
Gigabit ports	2 10/100/1000Base-T RJ-45 Auto-MDI/MDI-X ports
Switch architecture	Store-and-forward
Switch Fabric	8.8Gbps
Throughput (packet per second)	6.547Mpps
Address Table	8K entries
Share data Buffer	2.5Mbit
Flow Control	Back pressure for half duplex, IEEE 802.3x Pause Frame for full duplex
Dimensions	440 x 120 x 44 mm, 1U height
Weight	2kg
Power Requirement	100~240 VAC, 0.5A, 50-60 Hz
Power Consumption / Dissipation	30 Watts maximum / 100 BTU/hr maximum
Temperature	Operating: 0~50 degree C, Storage -40~70 degree C
Humidity Operating:	10% to 90%, Storage: 5% to 95% (Non-condensing)
Standards Conformance	
Regulation Compliance	FCC Part 15 Class A, CE
Standards Compliance	IEEE 802.3 (Ethernet) IEEE 802.3u (Fast Ethernet) IEEE 802.3ab(Gigabit Ethernet) IEEE 802.3x (full-duplex flow control)

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This section describes the functionalities of FGSW-2620 components and guides how to install it on the desktop or shelf. Basic knowledge of net-working is assumed. Please read this chapter completely before continuing.

2.1 Product Description

The PLANET FGSW-2620 provides 24 10/100Mbps Fast Ethernet ports and 2 10/100/1000Mbps Gigabit Ethernet ports. The two Gigabit Ethernet ports support 10/100/1000Mbps as well as half/full mode by auto-negotiation and can be easily connected to corporate backbones and servers.

The PLANET FGSW-2620 is with 8.8Gbps non-blocking switch fabric; the FGSW-2620 offers wire-speed packet transfer performance without risk of packet loss.

2.1.1 Product Overview

PLANET FGSW-2620 is 24-port 10/100Mbps + 2-port Gigabit Ethernet Switch, with 24 RJ-45 10/100Mbps ports and 2 RJ-45 10/100/1000Mbps TP ports for cost effective high-performance network connectivity. With its 8.8Gbps non-blocking switch fabric, the PLANET FSGW-2620 can also provide a local, high bandwidth.

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, FGSW-2620 could recognize up to 8K different MAC address and enables filtering and forwarding at full wire speed.

2.1.2 FGSW-2620 Front Panel

Figure 2-1 shows front panel of FGSW-2620.

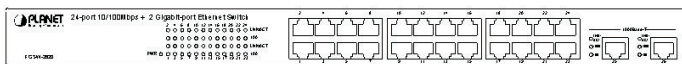Figure 2-1 PLANET FGSW-2620 Front Panel

2.1.3 FGSW-2620 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 2-2 shows rear panel of FGSW-2620.

Figure 2-2 PLANET FGSW-2620 Rear Panel

	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.
✎ Power Notice:	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.

2.1.4 LED Indicators

System

PWR	This indicator lights green when the Switch is receiving power. Otherwise, it is off.

Per 10/100Mbps ports

LNK/ ACT	This indicator light green when the port is connected to an Ethernet or Fast Ethernet station, if the indicator is blinking green, it will be transmitting or receiving data on the network.
100	This LED indicator light orange when a Fast Ethernet station is connected. It remains OFF, if an Ethernet station is connected.

Per 10/100/1000Mbps ports

LNK/ ACT	This indicator light green when the port is connected to an Ethernet, Fast and Gigabit Ethernet station, if the indicator is blinking green, it will be transmitting or receiving data on the network.
1000	This LED indicator light green when a Gigabit Ethernet station is connected. It remains OFF, if an Ethernet or Fast Ethernet station is connected.
100	This LED indicator light green when a Fast Ethernet station is connected. It remains OFF, if an Ethernet station or Gigabit Ethernet station is connected.

2.2 Installing a Switch

This part describes how to install your FGSW-2620 and make connections to the Switch. Please read the following topics and perform the procedures in the order being

presented.

To install your Switch on a desktop or shelf, simply complete the following steps.

2.2.1 Desktop Installation

To install a Switch 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 Switch 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 Switch to network devices

A. Connect one end of a standard network cable to the 10/100 or 10/100/1000Mbps RJ-45 ports on the front of the Switch.

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 Switch.

B. Connect the power plug of the power cable to a standard wall outlet then power on the Switch.

When the Switch receives power, the Power LED should remain solid Green.

2.2.2 Rack Mounting

To install the Switch in a 19-inch standard rack, follow the instructions described below.

Step1: Place your Switch on a hard flat surface, with the front panel positioned towards your front side.

Step2: Attach a rack-mount bracket to each side of the Switch with supplied screws attached to the package. Figure 2-3 shows how to attach brackets to one side of Switch.
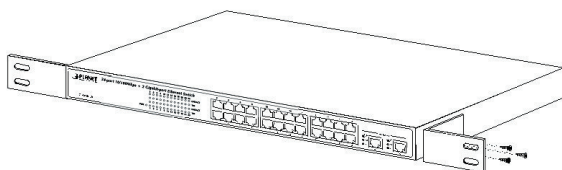
Figure 2-3 Attaching the brackets to the FGSW-2620

Caution:

You must use the screws supplied with the mounting brackets. Damage caused to the parts by using incorrect screws would invalidate your warranty.

Step3: Secure the brackets tightly.

Step4: Follow the same steps to attach the second bracket to the opposite side.

Step5: After the brackets are attached to the switch, use suitable screws to se-curely attach the brackets to the rack, as shown in Figure 2-4.
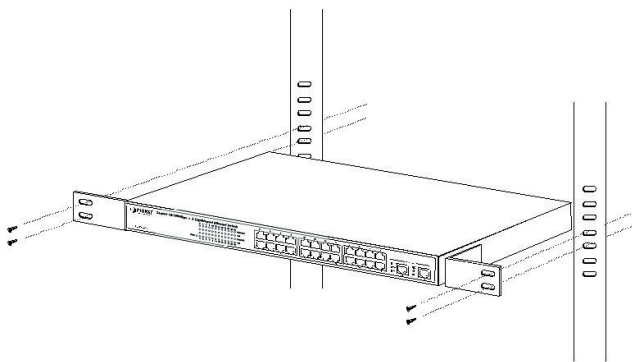

Figure 2-4 Mounting the FGSW-2620 in a Rack

Step6: Proceed with the steps 4 and steps 5 of section 2.2.1 Desktop Installation to connect the network cabling and supply power to your Switch.

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 packetheader, 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. For non auto-negotiation devices, the Switch will only runs in Half-duplex mode. 1000Base-T can be only connected in Full-duplex mode.

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

The LNK 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 Ethernet Switch. If the switch is set to full duplex and the partner is set to half duplex, then the performance will be poor. For the Switch, if the partner do not support auto-negotiation, please set to 100 or 10Mbps half-duplex mode.

Why the Switch doesn't connect to the network

Solution:

> Check the LNK/ACT LED on the switch
>
> Try another port on the Switch
>
> Make sure the cable is installed properly
>
> Make sure the cable is the right type
>
> Turn off the power. After a while, turn on power again

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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.

10/100Mbps, 10/100Base-TX

When connecting your 10/100Mbps Ethernet Switch to another switch, a bridge or a hub, a straight or crossover cable is necessary. Each port of the Switch supports auto-MDI/MDI-X detection. That means you can directly connect the Switch to any Ethernet devices without making a crossover cable. The following table and diagram show the standard RJ-45 receptacle/ connector and their pin assignments:

RJ-45 Connector pin assignment		
Contact	MDI Media Dependant Interface	MDI-X Media Dependant Interface -Cross
1	Tx + (transmit)	Rx + (receive)
2	Tx - (transmit)	Rx - (receive)
3	Rx + (receive)	Tx + (transmit)
4, 5	Not used	
6	Rx - (receive)	Tx - (transmit)
7, 8	Not used	

The standard cable, RJ-45 pin assignment
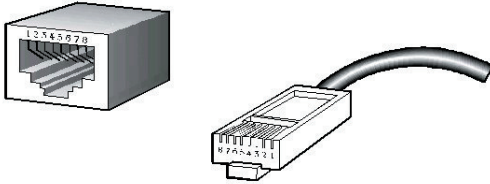
The standard RJ-45 receptacle/connector

There are 8 wires on a standard UTP/STP cable and each wire is color-coded. The following shows the pin allocation and color of straight cable and crossover cable connection:

Straight Cable

	SIDE 1	SIDE 2
1	White/Orange	White/Orange
2	Orange	Orange
3	White/Green	White/Green
4	Blue	Blue
5	White/Blue	White/Blue
6	Green	Green
7	White/Brown	White/Brown
8	Brown	Brown

Cross Over Cable

	SIDE 1	SIDE 2
1	White/Orange	White/Green
2	Orange	Green
3	White/Green	White/Orange
4	Blue	Blue
5	White/Blue	White/Blue
6	Green	Orange
7	White/Brown	White/Brown
8	Brown	Brown

Figure A-1: Straight-Through and Crossover Cable

Please make sure your connected cables are with same pin assignment and color as above picture before deploying the cables into your network.

CE