

**16/24-Port 10/100/1000Mbps
Gigabit Ethernet Switch**

GSW-1601/GSW-2401

User's Manual

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Revision

PLANET 16/24-Port 10/100/1000Mbps Gigabit Ethernet Switch User's Manual

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1. INTRODUCTION

1.1 Package Contents

Check the contents of your package for following parts:

- Gigabit Ethernet Switch x 1
- User's manual x 1
- Power cord x 1
- Rubber feet x 4
- Two rack-mounting brackets with attachment screws x 1

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:

Chapter 2 Installation

The chapter explains the feature, functionality and the physical installation of the Gigabit Ethernet Switch.

Chapter 3 Switch operation

The chapter explains the Gigabit Ethernet Switch transmit operation.

Chapter 4 Troubleshooting

The chapter explains the troubleshooting of the Gigabit Ethernet Switch.

Appendix A

This chapter contains cable information of the Gigabit Ethernet Switch.

In the following section, the term "**Gigabit Ethernet Switch**" means the GSW-1601 / GSW-2401.

1.3 Product Features

- Comply with IEEE 802.3, 10Base-T, IEEE 802.3u 100Base-TX, IEEE 802.3ab 1000Base-T Ethernet standard
- 16 / 24-Port 10/100/1000Mbps Gigabit Ethernet ports
- 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

- IEEE 802.3x flow control for full duplex operation and Backpressure for half duplex operation
- Integrated address look-up engine, support 8K absolute MAC addresses
- 9K Jumbo packet support
- Automatic address learning and address aging
- Supports Auto MDI/MDI-X function
- Support CSMA/CD protocol
- 100~240VAC, 0.6A, 50~60Hz universal Power input
- FCC, CE class A compliant

1.4 Product Specifications

Product	GSW-1601	GSW-2401
Hardware Specification		
10/100/1000Base-T MDI/MDIX Ports	16	24
Throughput (packet per second)	23.8Mpps	35.7Mpps
Switch fabric	32Gbps	48Gbps
Weight	2.50kg	2.71kg
Power Consumption / Dissipation	21 watts / 71 BTU	34 watts / 116 BTU
Power Requirement	100~240 VAC, 0.6A, 50-60 Hz	
Dimensions (W x D x H)	440 x 180 x 45mm, 1U height	
Switch Processing Scheme	Store-and-Forward	
Address Table	8K entries	
Jumbo packet size	9K	
Flow Control	Back pressure for half duplex, IEEE 802.3x Pause Frame for full duplex	
Temperature	Operating: 0~50 degree C Storage -40~70 degree	
Humidity Operating:	5% to 90%, Storage: 5% to 90% (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)	

2. INSTALLATION

This section describes the functionalities of the Gigabit Ethernet Switch's components and guides how to install it on the desktop. Basic knowledge of networking is assumed. Please read this chapter completely before continuing.

2.1 Product Description

The PLANET Gigabit Ethernet Switch is 10/100/1000Mbps Gigabit Ethernet Switch with 16/24 ports respectively, and non-blocking wire-speed performance. With a 32/48Gbps internal switching fabric, the Gigabit Ethernet Switch can handle extremely large amounts of data in a secure topology linking to a backbone or high capacity servers.

The Gigabit Ethernet Switch has 8K MAC Address table. The Gigabit Ethernet Switch offers wire-speed packets transfer performance without risk of packet loss. The high data throughput of Gigabit Ethernet Switch makes it ideal for most Gigabit environments, especially while network upgrades to a Gigabit environment.

All RJ-45 copper interfaces support 10/100/1000Mbps Auto-Negotiation for optimal speed detection through RJ-45 Category 6, 5 or 5e cables. Support standard for Auto-MDI/MDI-X that can detect the type of connection to any Ethernet device without requiring special straight or crossover cables.

The Flow Control function allows your Gigabit Ethernet Switch supported routers and Servers to directly connect to this Switch for fast, reliable data transfer.

2.1.1 Product Overview

The PLANET Gigabit Ethernet Switch with 16/24 RJ-45 10/100/1000Mbps ports for high-speed network connectivity. The Gigabit Ethernet Switch 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 with jumbo frame feature supported, can handle extremely large amounts of data transmission in a secure topology linking to a backbone or high-power servers.

The Gigabit Ethernet Switch 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, the Gigabit Ethernet Switch could recognize up to 8K different MAC address and enables filtering and forwarding at full wire speed.

2.1.2 Switch Front Panel

Figure 2-1 & 2-2 shows a front panel of Gigabit Ethernet Switch.

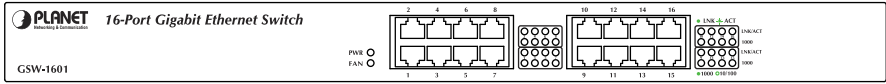


Figure 2-1 GSW-1601 front panel

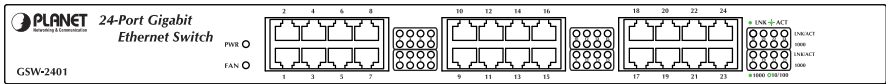


Figure 2-2 GSW-2401 front panel

2.1.3 LED Indicators

GSW-1601 / GSW-2401

System

LED	Color	Function
PWR	Green	Lights to indicate that the Switch has power.
FAN	Green	Lights to indicate that FAN is operating.

Per 10/100/1000Mbps port

LED	Color	Function
LNK / ACT	Green	Lights to indicate the link through that port is established successfully. Blinks indicate that the Switch is actively sending or receiving data over that port.
1000	Green	Lights to indicate the port is run at 1000Mbps. Off: indicate that the port is operating at 10/100Mbps.

2.1.4 Switch Rear Panel

Figure 2-3 & 2-4 shows a rear panel of Gigabit Ethernet Switch.



Figure 2-3 GSW-1601 rear panel

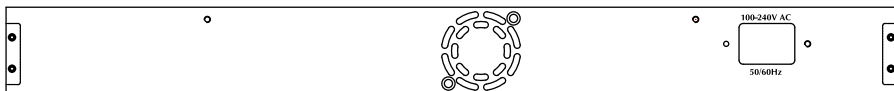


Figure 2-4 GSW-2401 rear panel



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 Gigabit Ethernet Switch from being damaged by unregulated surge or current to the Switch or the power adapter.

2.2 Installing the Switch

This part describes how to install your Gigabit Ethernet Switch and make connections to it. Please read the following topics and perform the procedures in the order being presented.



Note

This Gigabit Ethernet Switch does not need software configuration.

2.2.1 Desktop Installation

To install the Gigabit Ethernet Switch on desktop, simply follow the next steps:

- Step 1: Attach the rubber feet to the recessed areas on the bottom of the Gigabit Ethernet Switch.
- Step 2: Place the Gigabit Ethernet Switch on desktop near an AC power source.
- Step 3: Keep enough ventilation space between the Gigabit Ethernet Switch and the surrounding objects.



Note

When choosing a location, please keep in mind the environmental restrictions discussed in Chapter 1, Section 1.4 Product Specifications.

- Step 4: Connect your Gigabit Ethernet Switch 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 Gigabit Ethernet Switch.
- B. Connect the other end of the cable to the network devices such as printer servers, workstations or routers...etc.



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

Step 5: Supply power to the Gigabit Ethernet Switch.

- A. Connect one end of the power cable to the Gigabit Ethernet Switch.
- B. Connect the power plug of the power cable to a standard wall outlet.

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

2.2.2 Rack Mounting

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

- Step 1: Place your Gigabit Ethernet Switch on a hard flat surface, with the front panel positioned towards your front side.
- Step 2: Attach a rack-mount bracket to each side of the Switch with supplied screws attached to the package. Figure 2-5 shows how to attach brackets to one side of the Gigabit Ethernet Switch.

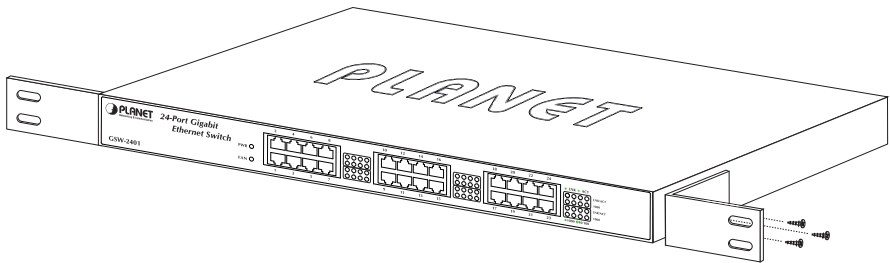


Figure 2-5 Attaching the brackets to the Gigabit Ethernet Switch



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

Step 3: Secure the brackets tightly.

- Step 4: Follow the same steps to attach the second bracket to the opposite side.
- Step 5: After the brackets are attached to the Gigabit Ethernet Switch, use suitable screws to securely attach the brackets to the rack, as shown in Figure 2-6.

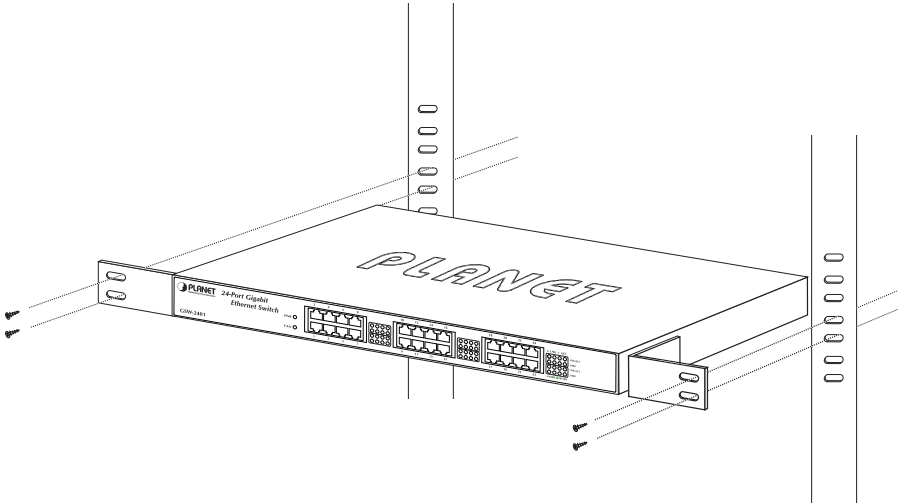


Figure 2-6 Mounting the Gigabit Ethernet Switch in a Rack

- Step 6: Proceeds with the steps 4 and steps 5 of session 2.2.1 Desktop Installation to connect the network cabling and supply power to your Gigabit Ethernet Switch.

3. Switch Operation

3.1 Address Table

The Gigabit Ethernet 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 Gigabit Ethernet Switch.

3.2 Learning

When one packet comes in from any port. The Gigabit Ethernet 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 Gigabit Ethernet Switch, it will also check the destination address besides the source address learning. The Gigabit Ethernet Switch 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 Gigabit Ethernet Switch 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 Gigabit Ethernet Switch 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 Gigabit 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 Gigabit Ethernet Switch, 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 Gigabit Ethernet 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 Gigabit Ethernet 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.

4. Troubleshooting

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

The per port LED is not lit



Solution

Check the cable connection of the Gigabit Ethernet Switch.

Performance is bad



Solution

Check the speed duplex mode of the partner device. The Gigabit Ethernet Switch is run at Auto-negotiation mode and if the partner is set to half duplex, then the performance will be poor.

Per port LED is lit, but the traffic is irregular



Solution

Check that the attached device is not set to dedicate full duplex. Some devices use a physical or software switch to change duplex modes. Auto-negotiation may not recognize this type of full-duplex setting.

Why the Gigabit Ethernet Switch doesn't connect to the network



Solution

Check per port LED on the Gigabit Ethernet Switch. Try another port on the Gigabit Ethernet 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.

APPENDIX A NETWORKING CONNECTION

A.1 Switch's RJ-45 Pin Assignments

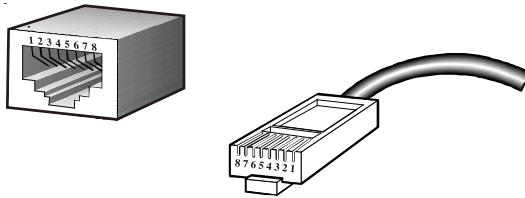
1000Mbps, 1000Base T

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-

10/100Mbps, 10/100Base-TX

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	

A.2 RJ-45 cable Pin Assignments



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:



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.