10/100/1000Mbps

Gigabit Ethernet Switch

GSW-2401/GSW-1601

User's Manual

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Appendix A

This chapter contains cable information of the Gigabit Ethernet Switch.

1.3 Product Features

- Complies with IEEE802.3, 10Base-T, IEEE802.3u 100Base-TX, IEEE802.3ab 1000Base-T
- 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
- IEEE802.3x flow control for full duplex operation and Backpressure for half duplex operation
- Integrated address look-up engine, support 8K absolute MAC addresses
- Provide 272/400KB buffer memory
- 9K Jumbo packet support
- Automatic address learning and address aging
- Supports Auto MDI/MDI-X function
- Support CSMA/CD protocol
- 100~240VAC, 3.0A, 50~60Hz universal Power input
- FCC, CE class A compliant

1.4 Product Specifications

Model	GSW-2401	GSW-1601
Hardware Specification		
Network Ports	24 10/100/1000Base-T RJ-45 MDI/MDI-X ports	16 10/100/1000Base-T RJ-45 MDI/MDI-X ports
Dimensions (W x H x D)	440 x 44 x 120 mm	
Weight (KG)	1.75 KG	1.6 KG
Power Requirement	100~240 VAC, 3.0A, 50-60 Hz	
Switch Specification		
Switch Architecture	Store-and-forward	
Address Table	8K entries, auto learning/ageing	
Shared Data Buffer	400KB	272KB
Flow Control	IEEE 802.3x full duplex operating and flow control	
Packet Control	Runt & CRC filtering, Broadcast storm control	
Switch Fabric	48Gbps	16Gbps
Switch Throughput	35.7Mbps	23.8Mbps
Standard Conformance		
Network Standards	IEEE 802.3 (Ethernet), IEEE 802.3u (Fast Ethernet) IEEE 802.3ab and IEEE802.3x (flow control)	
Operation Temperature	0~50°C 10% to 90% (Non-condensing)	
Humidity	-40~70°C	
Regulation Compliance	FCC, CE	

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 GSW-2401/GSW-1601 is 10/100/1000Mbps Gigabit Ethernet switch with 24/16 ports respectively, and non-blocking wire-speed performance. With a 48/32Gbps internal switching fabric, the GSW-2401/GSW-1601 can handle extremely large amounts of data in a secure topology linking to a backbone or high capacity servers. The GSW-2401/GSW-1601 has 8K MAC Address table and provides 400KB/272KB buffer memory. The GSW-2401/ GSW-1601offers wire-speed packets transfer performance without risk of packet loss. The high data throughput of GSW-2401/GSW-1601 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 is 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 switch supported routers and servers to directly connect to this switch for fast, reliable data transfer.

2.1.1 Product Overview

The PLANET GSW-2401 and GSW-1601 are Gigabit Ethernet switches with 24/16 RJ-45 10/100/1000 Mbps ports for high-speed network connectivity. The switches can also automatically identify and determine the correct transmission speed and half/full duplex mode of the attached devices with its 24/16 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.

This product 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 switches 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 GSW-2401/GSW-1601

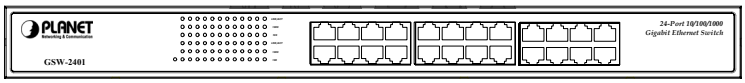


Figure 2-1 GSW-2401 front panel

Figure 2-2 GSW-1601 front panel

2.1.3 LED Indicators

LED	Color	Function
PWR	Green	Lights to indicate that the Switch is powered on.

LNK/ACT	Green	Lights to indicate the link through that port is successfully established. Blinks to indicate that the switch is actively sending or receiving data over that port.
1000	Green	Lights to indicate that the port is operating at 1000Mbps.
100	Green	Lights to indicate that the port is operating at 100Mbps.

2.1.4 Switch Rear Panel

Figure 2-3 & 2-4 shows a rear panel of GSW-2401/GSW-1601.

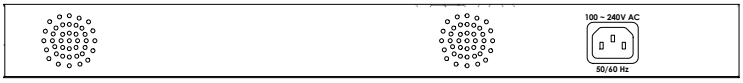
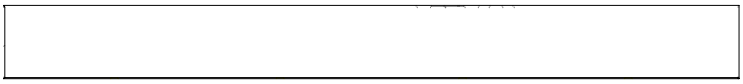


Figure 2-3 GSW-2401 front panel



Note: This switch does not need software configuration.

2.2.1 Desktop Installation

To install the switch on desktop, simply follow the next steps:

Step1: Attach the rubber feet to the recessed areas on the bottom of the switch.

Step2: Place the switch on desktop 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 1.4 Product Specification.

Step4: Connect your switch to network devices.

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

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 GSW-2401/GSW-1601 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 the Switch.

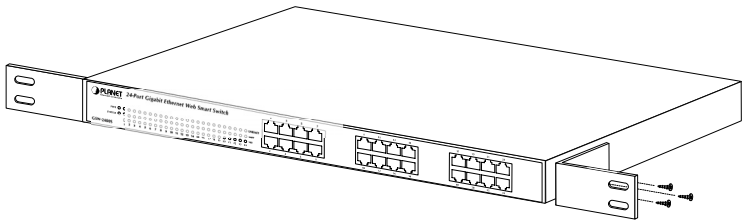


Figure 2-3 Attaching the brackets to the GSW-2401/GSW-1601

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 securely attach the brackets to the rack, as shown in Figure 2-4.

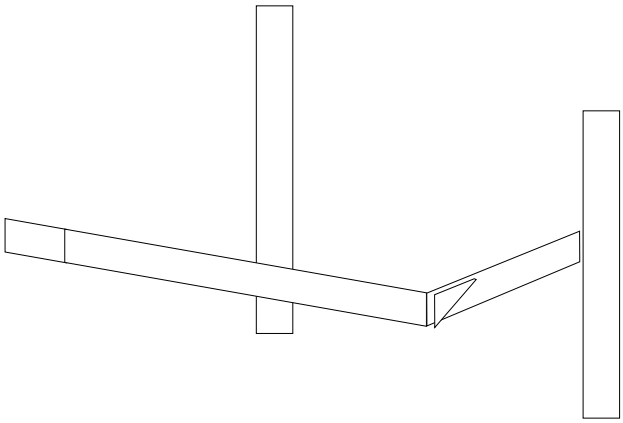


Figure 2-4 Mounting the Switch in a Rack

Step6: Procee **2.2.1**

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 increase 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 the 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.

Appendix A Switch's RJ-45 Pin Assignments

A.1 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

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

2010-A50140-000