

**10/100/1000Mbps
Gigabit / Fast Ethernet Switch**

GSD-1020



User's Manual

Trademarks

Copyright © PLANET Technology Corp. 2002.

Contents subject to revision without prior notice.

PLANET is a registered trademark of PLANET Technology Corp. All other trademarks belong to their respective owners.

Disclaimer

PLANET Technology does not warrant that the hardware will work properly in all environments and applications, and makes no warranty and representation, either implied or expressed, with respect to the quality, performance, merchantability, or fitness for a particular purpose.

PLANET has made every effort to ensure that this User's Manual is accurate; PLANET disclaims liability for any inaccuracies or omissions that may have occurred.

Information in this User's Manual is subject to change without notice and does not represent a commitment on the part of PLANET. PLANET assumes no responsibility for any inaccuracies that may be contained in this User's Manual. PLANET makes no commitment to update or keep current the information in this User's Manual, and reserves the right to make improvements to this User's Manual and/or to the products described in this User's Manual, at any time without notice.

If you find information in this manual that is incorrect, misleading, or incomplete, we would appreciate your comments and suggestions.

FCC Warning

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 / FAST ETHERNET SWITCH USER'S MANUAL

FOR MODEL: GSD-1020

REVISION: 1.0

PART NO.: 2010-000010-001

TABLE OF CONTENTS

1. INTRODUCTION	1
1.1 CHECKLIST.....	1
1.2 ABOUT THE SWITCH.....	1
1.3 FEATURES	1
2. HARDWARE DESCRIPTION	2
2.1 FRONT PANEL	2
2.2 REAR PANEL.....	3
3. INSTALLATION.....	4
3.1 BEFORE START UP	4
3.2 CONNECTING END NODE, HUB OR SWITCH.....	4
3.3 CONNECTING TO NETWORK BACKBONE OR SERVER.....	5
4. SWITCH OPERATION.....	6
5. TROUBLESHOOTING.....	7
APPENDIX A NETWORKING CONNECTION	8
A.1 SWITCH'S RJ-45 PIN ASSIGNMENTS	8
A.2 10/100MBPS / 10/100BASE-TX	8
A.3 RJ-45 CABLE PIN ASSIGNMENT	8
APPENDIX B TECHNICAL SPECIFICATIONS	9

1. INTRODUCTION

1.1 Checklist

Check the contents of your package for following parts:

- GSD-1020
- User's manual
- Power cord

If any of these pieces 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 About the Switch

The Ethernet Switch is equipped with unshielded twisted-pair (UTP) cable ports providing dedicated 10 or 100Mbps bandwidth. GSD-1020 supports MDI-X/ MDI convertible on each 10/100 port and 2 Gigabit Switch port that can be used for uplinking to another switch. The dual speed ports use standard twisted-pair cabling and are ideal for segmenting networks into small, connected sub-networks. Each 100M port can support up to 200Mbps of throughput in full-duplex mode. Each 1000M port can support up to 2Gbps in Full-duplex mode.

In addition, the Switch is also support 2 Ethernet Gigabit ports to uplink to a server or network backbone. These Gigabit Switches are designed for Plug and Play installation, allows the network administrator to simply connect the network and power cables and the Switching/bridging functions begin automatically.

The front panel of GSD-1020 provide LEDs for easy recognition of the switch operation status and for troubleshooting. These LED indicators display the power status for the system and Link/Act, 100, full-duplex for each 10/100M port, Act, 1000/100, full-duplex for each Gigabit port.

1.3 Features

- ◆ Complies with the IEEE802.3 Ethernet, IEEE802.3u Fast Ethernet and IEEE802.3ab Gigabit Ethernet standard
- ◆ Features Store-and-Forward mode with wire-speed filtering and forwarding rates
- ◆ Full/ Half-Duplex capability on each 10/100Base-TX port, Full Duplex only on each 1000Base-T port
- ◆ Automatic source address learning and aging
- ◆ Support 8K MAC addresses
- ◆ Support total 1Mbit packet buffers with dynamic allocation
- ◆ IEEE802.3x compliant full-duplex flow control, half-duplex flow control
- ◆ Broadcast storm control, runt and CRC Filtering eliminates erroneous packets to optimize the network bandwidth
- ◆ Support to handle up to 1522 bytes packet
- ◆ Internal power supply
- ◆ LED indicators for simple diagnostics and management
- ◆ Auto MDI/ MDI-X on each port

2. HARDWARE DESCRIPTION

This section describes the hardware features of the Giga Switch. For easier management and control of the switch, familiarize yourself with its display indicators, and ports. Front panel illustrations in this chapter display the unit LED indicators. Before connecting any network device to the Switch, read this chapter carefully.

2.1 Front Panel

The unit front panel provides a simple interface monitoring the switching. It includes a power indicator for each port.

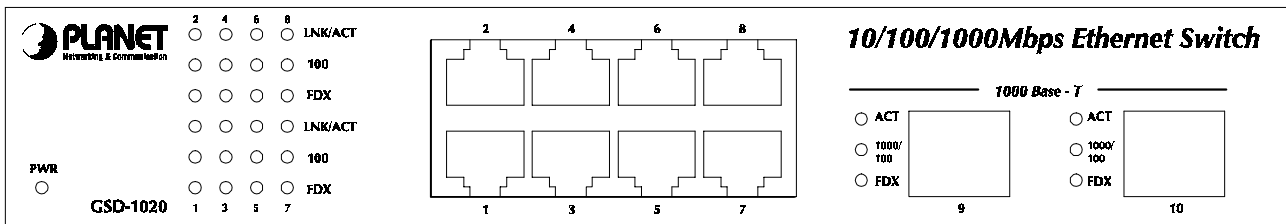


Figure 1: GSD-1020 Switch front panel

LED indicators:

System

LED	Color	Function
PWR	Green	Lit on: indicate the power is on. Lit off: indicate the power is off.

100Base-TX

LED	Color	Function
LNK / ACT	Green	Lit: indicate the link through that port is successfully established. Blink: indicate that the switch is actively sending or receiving data over that port.
100	Green	Each RJ45 station port on the Switch is assigned one LED for monitoring port "Good Link" and data traffic. The LED is normally OFF. After the power on operation, LED will light green color steadily to show "Good Link" when port is been connected with 100Mbps. LED will be off when port is run at 10Mbps.
FDX	Orange	Lit: indicate that the connection made through the corresponding port is running in Full Duplex mode. Blink: indicate that the connection is experiencing collisions

1000Base-T

LED	Color	Function
ACT	Green	Lit: indicate that the switch is actively sending or receiving data over that port.
1000/100	Green	Lit: indicate that connection made through the corresponding port is running at 1000Mbps.
	Orange	Lit: indicate that connection made through the corresponding port is running at 100Mbps.
FDX	Green	Lit: indicate that the connection made through the corresponding port is running in Full Duplex mode.
		Blink: indicate that the connection is experiencing collisions

2.2 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: GSD-1020 Switch 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 switch from being damaged by unregulated surge or current to the Switch or the power adapter.

3. INSTALLATION

3.1 Before start up

Before your installation, please refer to the followings for your cabling:

100Base-TX

All 100Base-TX ports come with auto-negotiation capability. They automatically support 100Base-TX and 10Base-T networks. Users only need to plug a working network device into one of the 100Base-TX ports, then turn on the Switch. The port will automatically runs in 10Mbps, 20Mbps, 100Mbps or 200Mbps after the negotiation with the connected device.

1000Base-T

The Switch are with two Gigabit port. This two ports support 10Mbps, 100Mbps and 1000Mbps speed and also are full-duplex supported.

Cabling

Each 10/100/1000Base-T ports use RJ-45 sockets -- similar to phone jacks -- for connection of unshielded twisted-pair cable (UTP). The IEEE802.3ab Gigabit Ethernet standard requires 4-pair Category 5/5e UTP cable. IEEE 802.3u Fast Ethernet standard requires Category 5 UTP for 100Mbps 100Base-TX. 10Base-T networks can use Cat.3, 4, or 5 UTP (see table below). Maximum distance is 100meters (328 feet).

Port Type	Cable Type	Connector
10Base-T	Cat 3, 4, 5, 2-pair	RJ-45
100Base-TX	Cat.5 UTP, 2-pair	RJ-45
1000Base-T	Cat. 5/5e UTP, 4-pair	RJ-45

Any Ethernet devices like hubs/ PCs can connect to the Switch by using straight-through wires. The eight 10/100Mbps port and two 1000Base-T are auto-MDI/ MDI-X can be used on straight-through or crossover cable.

3.2 Connecting end node, hub or switch

1. Place the Switch on a smooth surface or fasten the mounting brackets purchased separately with the provided screws in a standard 10"/19" rack.
2. Connect the power cord to the power inlet socket of Switch and the other end into the local power source outlet.
3. Connect other switch or PC to one port of the GSD-1020 using Category 3/4/5 UTP/STP cabling.
4. Connect another switch or PC to the other port of Switch by following the same process as described in Step3.

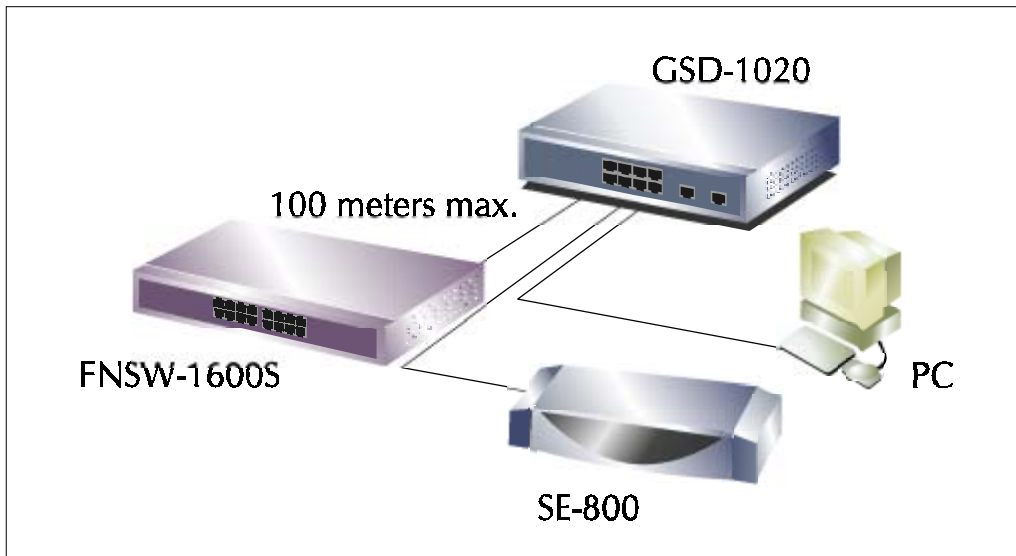


Figure 3. End node, Hub or Switch connection

Notice:

Cable distance for Switch

The cable distance between Ethernet Switch and hub/PC should not exceed 100 meter for UTP/STP cable.

Make sure the wiring is correct

It can be used Category 3/4/5 cable in 10 Mbps operation. To reliably operate your network at 100Mbps and 1000Mbps, you must use an Unshielded Twisted-Pair (UTP) Category 5 cable, or better Data Grade cabling. While a Category 3 or 4 cable may initially seem to work, it will soon cause data loss.

3.3 Connecting to Network Backbone or Server

Connect to the Gigabit Ethernet ports with Category 5 copper cable for uplinking to a network backbone or network server. These ports operate at 1000Mbps in full-duplex mode. A valid connection is indicated when the Link LED is light.

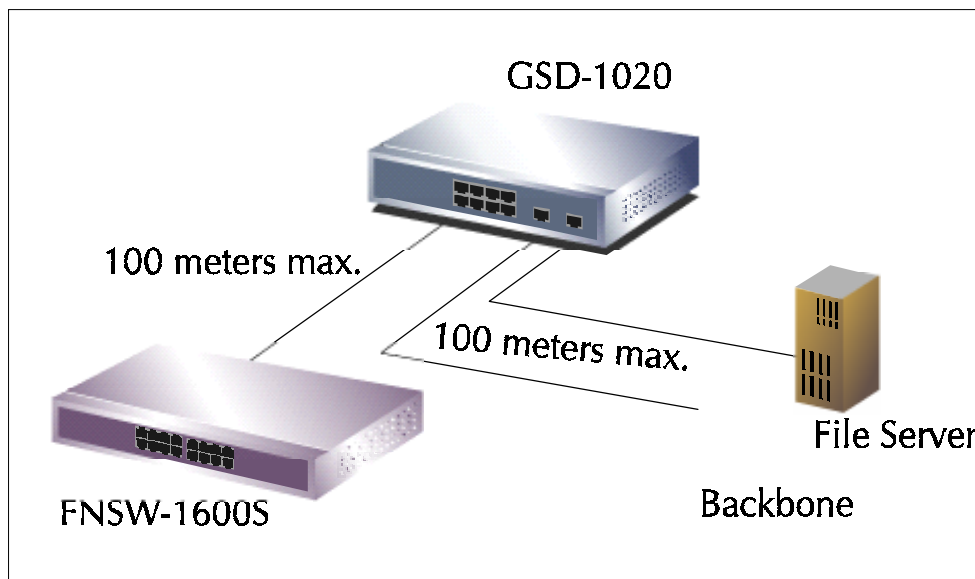


Figure 4: Network Backbone or Server connection

4. SWITCH OPERATION

Address Table

The Giga 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.

Learning

When one packet comes in from any port, the Giga 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.

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

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. A 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 and reduces the overall load on the network.

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

Auto-Negotiation

The STP ports on the GSD-1020 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 detecting 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 only connected in Full-duplex mode.

5. 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 remove duplex mode of the Giga Switch

Some stations can not 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 Ethernet Switch is set to full duplex and the partner is set to half duplex, then the performance will be poor.

APPENDIX A NETWORKING CONNECTION

A.1 Switch's RJ-45 Pin Assignments

1000Mbps / 1000BaseT

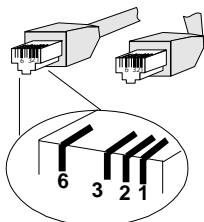
Contact	MDI	MDI-X
1	BI_DA+	BI_DB+
2	BI_DA-	BI_DB-
3	BI_DB+	BI_DA+
4	BI_DC+	BI_DD+
5	BI_DC-	BI_DD-
6	BI_DB-	BI_DA-
7	BI_DD+	BI_DC+
8	BI_DD-	BI_DC-

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

A.3 RJ-45 cable pin assignment



APPENDIX B TECHNICAL SPECIFICATIONS

GSD-1020 10/100/1000Mbps Gigabit Fast Ethernet Switch	
Hardware Specification	
Ports	Eight 10/ 100Base-TX , two 1000Base-T RJ-45 Auto-MDI/MDI-X ports
Switch Fabric	5.6Gbps
Switch Processing Scheme	Store-and-forward
Throughput (packet per second)	4.16Mpps
Address Table	8K entries
Queue Buffer	128Kbytes
Flow Control	Back pressure for half duplex, IEEE 802.3x PAUSE Frame for full duplex
Broadcast Storm Control	Runt and CRC Filtering eliminates erroneous packets to optimize the network bandwidth
Dimensions	217x 135x 43 mm (D x W x H)
Weight	1kg
Power Requirement	100~240 VAC, 50-60 Hz
Power Consumption / Dissipation	10 Watts maximum / 34 BTU/hr maximum
Temperature	Operating: 0~50°C, Storage -10~70°C
Humidity	Operating: 10% 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(1000Base-T)