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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 Fast Ethernet Switch User's Manual
FOR MODEL: FNSW-3200
Part No.: EM-FNSW32V1

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1. UNPACKING INFORMATION

Thank you for purchasing PLANET Ethernet Switches. Before continuing, please check the contents of the product package. This product package should contain the following items:

- One Ethernet Switch
- One Power Cord
- Two Rack-Mounting Brackets with attachment screws
- This User's manual

Please inform your local dealer/supplier immediately if any item is found to be defective, damaged or missing. Retain the original packaging (carton), including the packing materials, and use them to re-pack the product in the unlikely event there is a need to return it to us for repairing.

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2. PRODUCT INTRODUCTION

FNSW-3200 Ethernet Switch is multi-speed, versatile network devices combining both standard and "Big-Pipe" ports under the same hood.

2.1 Key Features

- w Compliant with IEEE802.3 and 802.3u standards for 100Base-TX
- w 32-port Fast Ethernet Switch, pure 10/100Base-TX
- w Wire-speed "Store-and-Forward" filtering/forwarding eliminates bad data packets with minimal delay
- w 100Base-TX ports automatically sense and set optimal line speed from 10/20, 100/200Mbps, All 100Base-TX port support Auto-Negotiation function
- w Shared buffer memory and up to 4K Fast Ethernet Switch-entry MAC source address table make for fast handling of data packets
- w Auto-MDI/MDI-X detection supports
- w Flow control to eliminate packets loss
- w Internal, full-range power supply suitable for worldwide use

2.2 Front Panel

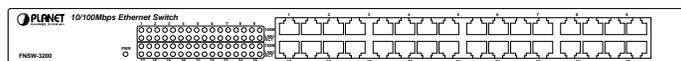


Figure 1: Front View of the FNSW-3200

2.2.1 Ports Speed

n 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.

2.2.2 Cabling

100Base-TX ports use RJ-45 sockets -- similar to phone jacks -- for connection of unshielded twisted-pair cable (UTP). The 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 A)

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

Table A: Supported port list

2.2.3 Auto-MDI/MDI-X

Each numbered port of FNSW-3200 is MDI/MDI-X port. Which automatically detects straight-through/ crossover cable types. You can direct use straight cable for the connection to your workstation or other end nodes. Either straight or cross-over cable can be used to connect switch, hub or end nodes without any hassle.

2.2.4 Status LEDs

One POWER LED to show power On/Off is on the front panel and each port has two status LED indicators, as shown below.

LABEL	STATUS/ COLOR	MEANING	DESCRIPTION
UPPER ROW	Steady orange	100M	Lit to indicate that a valid <i>physical</i> UTP/STP connection exists on that port runs in 100Mbps
	OFF	10M	Remains off and Link ON to indicate the port runs in 10Mbps
LOWER ROW	Steady Green	Link	Lit to indicate that a valid <i>physical</i> UTP/STP connection is detected
	Blink Green	Activity	Blink to indicate the port is receiving data packets

Table B: The Switch's Port-LED Functions

2.3 The Rear Panel



Figure 2: Rear View for FNSW-3200

2.3.1 Power Connector

The Power Connector is designed to be use with the power cord included in the product package. Attach the female end of the cord to the power connector and the male end of the cord to a grounded power outlet. The accepted power range is from 100VAC to 240VAC, 50/60Hz.

Note:

The Switch is a power-required device, it means, the Switch will not work until it is powered. If your networked PCs will need to transmit data all the time, please consider use an UPS (Uninterrupted Power Supply) for your Switch. It will prevent you from network data loss.

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

The Switch do NOT require software configuration. Users can immediately use any of the features of this product simply by attaching the cables and turning on the power.

To get the best use of these Switch models, many things need to be considered first. See Section 4. *OPTIMIZING CONFIGURATION* for details.

3.1 Rack-Mount Installation

Most users prefer to attach the power cord to the hub before installation in a network rack. Do not plug the other end of the cord into a power outlet until after the hub is installed.

For mounting the Switch in a network rack, first attach the rack-mount brackets to the side of the hub with screws. (Both brackets and screws are included in the product package.) Slide the hub into the rack and align the holes in the bracket with the corresponding holes in the network rack. Attach the bracket to the rack with the enclosed screws.

3.2 Desktop Installation

To locate the Switch on a desktop, first attach the four rubber feet to the bottom of the hub, one in each corner. Place the hub on a clean, flat desk or tabletop close to a power outlet. Make sure there is no hindrance behind the fan of the hub

Plug in all network connections, and then turn the switch on via plug in the power cord.

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4. OPTIMIZING CONFIGURATION

4.1 Prior to Installation

Before installing the Switch models and connecting network devices, it is important to plan the new network layout. Consider:

- w **Dedicated Bandwidth:** File servers and other high-traffic hardware can improve if they have their own direct connection with dedicated 10 or 100Mbps bandwidth.
- w **Full-Duplex:** Determine which devices would benefit from a Full Duplex connection and check that they support it.
- w **Fast Ethernet:** 100Base-TX and 100Base-FX have different rules for cable and distance. Make sure these are followed.
- w **Auto-Negotiation:** Devices with different speeds may be easily swapped when the other end of the cable is fixed to a port with auto-negotiation.

4.2 Half- and Full-Duplex

The Switch supports both Half- and Full-Duplex modes for 10Base-T and 100Base-TX. Half-Duplex mode is the traditional data transfer mode: one station sends data while other devices wait for the first to finish.

Full-Duplex is the simultaneous transmission and receiving of data. It is only possible between two devices with a dedicated link (e.g., switch-to-switch, switch-to-PC). Both of the devices must be capable of, and set to, Full-Duplex.

100Base-TX ports use auto-negotiation to detect and set the line's operating mode.

4.3 Fast Ethernet

100Base-TX and 100Base-FX are called "Fast Ethernet." This is because they use the Ethernet CSMA/CD access rules and data packet structure, but data travels ten times faster (100Mbps) than traditional 10Mbps Ethernet.

Below is a list of the cable types and connectors that supported by Switch for 10Base-T, 100Base-TX.

PORT TYPE	CABLES TYPE	CONNECTOR
100BASE-TX	Cat. 5 UTP only	RJ-45
10BASE-T	Cat.3, 4, 5 UTP	RJ-45

Table C: Cables & Connectors Supported by the Switch

In many cases, 10Base-T LANs can quickly and easily upgrade to 100Base-TX networks.

PORT TYPE	CABLES DISTANCE
10/100BASE-TX	100m

Table D: Cable Type & Cabling distance accepted

4.4 Auto-Negotiation

The 100Base-TX 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 mode and speed at the second device is capable of. The 100Base-TX devices can connect with the 100Base-TX port in either Half- or Full-Duplex mode.

If attached device is:	100Base-TX port will set to:
100Mbps, no auto-negotiation	100Mbps (100Base-TX, Half-Duplex)
100Mbps, with auto-negotiation	200Mbps (100Base-TX, Full-Duplex)
10Mbps, no auto-negotiation	10Mbps (10Base-T, Half-Duplex)
10Mbps, with auto-negotiation	20Mbps (10Base-T, Full-Duplex)

Table E: Speed & Duplex mode detected by the switch

4.5 MAC Address Table

This 6-byte ID is called the MAC (Media Access Control) Address. Every Ethernet data packet includes both source and destination addresses.

These Switch models can automatically learn and store up to 4K MAC addresses. The MAC address table is volatile: it disappears when the switch is powered off or reset.

Note: *When the network needs reconfiguration, we recommend turning off the power first. After all nodes have been moved, power on the switch to rebuild the internal MAC address table.*

4.6 Sample Application

The optimal application for the Switch, no matter with the extension module or not, is as a "big pipe" backbone interconnecting file servers with bandwidth-hungry workgroups, departments, and offices.

In the figure, the FNSW-3200 links to another hub's Uplink (MDI-II) port, some ports connect to 100Mbps Workstations, and attached to file servers at 200Mbps.

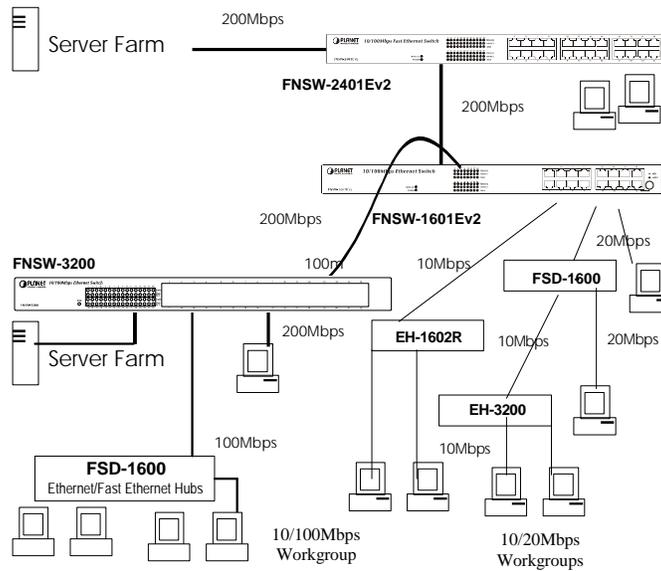


Figure 3: Sample Application

5. TROUBLESHOOTING

This chapter contains information to help you solve problems. If 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 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.

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6. PRODUCT SPECIFICATIONS

PRODUCT	FNSW-3200
	32
PORTS	10/100Base-TX RJ-45 (MDI / MDI-X)
MAC ADDRESSES	4K-entry
BANDWIDTH	100Base-TX, 200/100/20/10Mbps, Auto-Negotiation
FILTER/ FORWARD RATE	148,800 packets/second per port @ 100Mbps, max.
LEDs	1 for Power On/Off 2 per port for 100Mbps, Link/Act.
MEDIA SUPPORT	100Base-TX Cat. 5 UTP, RJ-45 10Base-T Cat. 3, 4, 5 UTP RJ-45
POWER SUPPLY	Auto-switching. Input voltage: 100~240 VAC, 50 ~ 60Hz
POWER CONSUMPTION	15 watt / 51BTU max.
ENVIRONMENT	Operating Temp: 0 ~ 50°C (32 ~ 122°F) Storage Temp: -30 ~ 70°C (-22 ~ 158°F) Humidity 0 ~ 90% non-condensing
DIMENSIONS	440 x 120 x 44 mm (L x W x H.)
STANDARD COMPLIANCE	
NETWORK	IEEE802.3 (10Base-T), IEEE802.3u (100Base-TX) IEEE802.3x (Flow-Control)
EMISSION	FCC Class A, CE
SAFETY	UL, TUV/GS (EN60950)

Table F: Product Specifications

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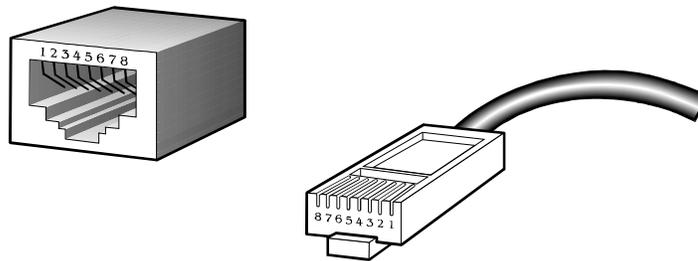
7. RJ-45 PIN ASSIGNMENT

When connecting your FNSW-3200 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:



Figure 4: 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.

EM-FNSW32v1

