

8-port 10/100Mbps Fast Ethernet Switch

User' s Guide

FCC Warning

This equipment has been tested and found to comply with the regulations for a Class B 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 this user's guide, 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 B product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

VCCI Mark Warning

注意

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ABOUT THIS GUIDE

Congratulations on your purchase of the 8-port 10/100M Fast Ethernet Switch. This device integrates 100Mbps Fast Ethernet and 10Mbps Ethernet network capabilities in a highly flexible desktop package.

Purpose

This manual discusses how to install the 8-port 10/100M Fast Ethernet Switch.

Terms/Usage

In this guide, the term “**Switch**” (first letter upper case) refers to the 8-port 10/100M auto-negotiation Fast Ethernet Switch, and “**switch**” (first letter lower case) refers to other Ethernet switches.

Overview of this User’s Guide

Introduction. Describes the Switch and its features.

Unpacking and Setup. Helps you get started with the basic installation of the Switch.

Identifying External Components. Describes the front panel, rear panel and LED indicators of the Switch.

Connecting the Switch. Tells how you can connect the Switch to your Ethernet network.

Technical Specifications. Lists the technical (general, physical and environmental, and performance) specifications of the Switch.

RJ-45 Pin Specification. Describes the RJ-45 receptacle/connector .

INTRODUCTION

This chapter describes the features of the Switch and some background information about Ethernet/Fast Ethernet switching technology.

Fast Ethernet Technology

The growing importance of LANs and the increasing complexity of desktop computing applications are fueling the need for high performance networks. A number of high-speed LAN technologies have been proposed to provide greater bandwidth and improve client/server response times. Among them, 100BASE-T (Fast Ethernet) provides a non-disruptive, smooth evolution from the current 10BASE-T technology. The non-disruptive and smooth evolution nature, and the dominating potential market base, virtually guarantee cost effective and high performance Fast Ethernet solutions in the years to come.

100Mbps Fast Ethernet is a new standard specified by the IEEE 802.3 LAN committee. It is an extension of the 10Mbps Ethernet standard with the ability to transmit and receive data at 100Mbps, while maintaining the CSMA/CD Ethernet protocol. Since the 100Mbps Fast Ethernet is compatible with all other 10Mbps Ethernet environments, it provides a straightforward upgrade and takes advantage of the existing investment in hardware, software, and personnel training.

Switching Technology

Another approach to pushing beyond the limits of Ethernet technology is the development of switching technology. A switch bridge Ethernet packets at the MAC address level of the Ethernet protocol transmitting among connected Ethernet or Fast Ethernet LAN segments.

Switching is a cost-effective way of increasing the total network capacity available to users on a local area network. A switch increases capacity and decreases network loading by dividing a local area network into different *segments*, which don't compete with each other for network transmission capacity.

The switch acts as a high-speed selective bridge between the individual segments. The switch, without interfering with any other segments, automatically forwards traffic that needs to go from one segment to another. By doing this the total network capacity is multiplied, while still maintaining the same network cabling and adapter cards.

For Fast Ethernet networks, a switch is an effective way of eliminating problems of chaining hubs beyond the "two-repeater limit." A switch can be used to split parts of the network into different collision domains, making it possible to expand your Fast Ethernet network beyond the 205-meter network diameter limit for 100BASE-TX networks. Switches supporting both traditional 10Mbps Ethernet and 100Mbps Fast Ethernet are also ideal for bridging between the existing 10Mbps networks and the new 100Mbps networks.

Switching LAN technology is a marked improvement over the previous generation of network bridges, which were characterized by higher latencies. Routers have also been used to segment local area networks, but the cost of a router, the setup and maintenance required make routers relatively impractical. Today switches are an ideal solution to most kinds of local area network congestion problems.

Features

The Switch was designed for easy installation and high performance in an environment where traffic on the network and the number of user increase continuously.

The Switch with its small, compact size was specifically designed for

small to middle workgroups. This Switch can be installed where space is limited; moreover, they provide immediate access to a rapidly growing network through a wide range of user-reliable functions.

The Switch is ideal for deployment with multiple high-speed servers for shared bandwidth 10Mbps or 100Mbps workgroups. With the highest bandwidth 200Mbps (100Mbps full-duplex mode), any port can provide workstations with a congestion-free data pipe for simultaneous access to the server.

The Switch is expandable by cascading two or more switches together. As all ports support 200Mbps, the Switch can be cascaded from any port and to any number of switches.

The Switch is a perfect choice for site planning to upgrade to Fast Ethernet in the future. Ethernet workgroups can connect to the Switch now, and change adapters and hubs anytime later without needing to change the Switches or reconfigure the network.

The Switch combine dynamic memory allocation with store-and-forward switching to ensure that the buffer is effectively allocated for each port, while controlling the data flow between the transmit and receive nodes to guarantee against all possible packet loss.

The Switch is a unmanaged 10/100Mbps Fast Ethernet Switch that offers solutions in accelerating small Ethernet workgroup bandwidth. Other key features are:

- ◆ Store and forward switching scheme capability. As the result of complete frame checking and error frame filtering, this scheme prevents error packages from transmitting among segments.
- ◆ Auto-MDI function supports automatic MDI/MDIX crossover detection function gives true 'plug and play' capability without the need of confusing crossover cables or crossover ports.
- ◆ Auto-negotiation for any port. This allows for auto-sensing of speed (10/100Mbps) thereby providing you with automatic and

flexible solutions in your network connections.

- ◆ Flow control for any port. This minimizes dropped packets by sending out collision signals when the port's receiving buffer is full. Note that flow control is only available in half duplex mode.
- ◆ Data filtering rate eliminates all error packets, runts, etc., per port at wire-speed for 100Mbps speed.
- ◆ Data filtering rate eliminates all error packets, runts, etc., per port at wire-speed for 10Mbps speed.

UNPACKING AND SETUP

This chapter provides unpacking and setup information for the Switches.

Unpacking

Open the box of the Switch and carefully unpack it. The box should contain the following items:

- ✓ *One 8-port 10/100M Fast Ethernet Switch*
- ✓ *One external power adapter*
- ✓ *This User's Guide*

If any item is found missing or damaged, please contact your local reseller for replacement.

Setup

The setup of the Switch can be performed using the following steps:

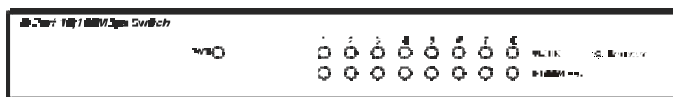
- ◆ The surface must support at least 1.5 Kg for the Switch.
 - ◆ The power outlet should be within 1.82 meters (6 feet) of the Switch.
 - ◆ Visually inspect the DC power jack and make sure that it is fully secured to the power adapter.
 - ◆ Make sure that there is proper heat dissipation from and adequate ventilation around the Switch. Do not place heavy objects on the Switch.
-

IDENTIFYING EXTERNAL COMPONENTS

This section identifies all the major external components of the switch. Both the front and rear panels are shown followed by a description of each panel feature. The indicator panel is described in detail in the next chapter.

Front Panel

The figure below shows the front panels of the switch.



LED Indicator Panel

Refer to the LED Indicator section for detailed information about each of the switch's LED indicators.

Rear Panel



DC Power Jack: Power is supplied through an external DC power adapter. Check the technical specification section for information about the DC power input voltage.

Since the switch does not include a power switch, plugging its power adapter into a power outlet will immediately power it on.

Auto MDI-X Jacks:

These jacks supports automatic MDI-II/MDI-X crossover detection function gives true ‘plug and play’ capability without the need of confusing crossover cables or crossover ports.

With the Auto-MDI function, you just need to plug-in the network cable to the hub directly and no need to care if the end node is NIC (Network Interface Card) or switches and hubs.

LED Indicators

Power Indicator (PWR)

This indicator lights green when the switch is receiving power, otherwise, it is off.

Link / Activity (green)

This indicator light green when the port is connected to a Fast Ethernet or Ethernet station, if the indicator blinking green will be transmission or received data .

100Mbps

This LED indicator light green when the port is connected to a 100Mbps Fast Ethernet station. Otherwise, the LED is off when the port is connected to 10Mbps Ethernet station.

CONNECTING THE SWITCH

This chapter describes how to connect the Switch to your Fast Ethernet network.

PC to Switch

A PC can be connected to the Switch via a two-pair Category 3, 4, 5 UTP/STP cables. The PC (equipped with a RJ-45 10/100Mbps phone jack) should be connected to any port of the Switch.

The LED indicators for PC connection dependent on the LAN card capabilities. If LED indicators are not light after making a proper connection, check the PC LAN card, the cable, the Switch conditions and connections.

The following are LED indicator possibilities for a PC to Switch connection:

1. The “LINK” LED indicator light green when the connecting is successful and the “ Activity “ LED indicator blinking when it transmit or receive data.
2. The “100Mbps ” LED indicator depends upon LAN card speed is 100Mbps or 10Mbps.

Hub to Switch

A hub (10BASE-T or 100BASE-TX) can be connected to the Switch via a two-pair Category 3, 4, 5 UTP/STP cable. The connection is accomplished from the hub to any of the Switch RJ-45 ports.

A. 10BASE-T Hub

For a 10BASE-T hub, the Switch LED indicators should light up as the following:

“LINK” indicator is ON.

“100Mbps” indicator is off.

B. 100BASE-TX Hub

For a 100BASE-TX hub, the Switch LED indicators should light up as the following:

“LINK” indicator is ON.

“100Mbps” indicator is ON.

Switch to switch (other devices)

The Switch can be connected to another switch or other devices (routers, bridges, etc.) via a two-pair Category 3, 4, 5 UTP/STP cable.

“LINK” indicator is ON.

“100Mbps” indicator is ON.

Port Speed & Duplex Mode

After plugging the selected cable to a specific port, the system uses auto-negotiation to determine the transmission mode for any new twisted-pair connection:

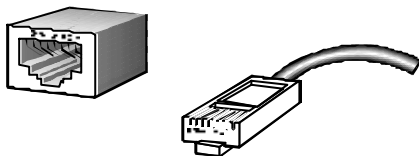
If the attached device does not support auto-negotiation or has auto-negotiation disabled, an auto-sensing process is initiated to select the speed and set the duplex mode to **half-duplex**.

RJ-45 PIN SPECIFICATION

The following diagram and tables show the standard RJ-45 receptacle/connector and their pin assignments .

RJ-45 Connector pin assignment	
Contact	Media Direct Interface Signal
1	TX + (transmit)
2	TX - (transmit)
3	Rx + (receive)
4	Not used
5	Not used
6	Rx - (receive)
7	Not used
8	Not used

The standard cable, RJ-45 pin assignment



The standard RJ-45 receptacle/connector

TECHNICAL SPECIFICATIONS

General	
Standards	IEEE 802.3 10BASE-T Ethernet IEEE 802.3u 100BASE-TX Fast Ethernet
Protocol	CSMA/CD
Data Transfer Rate	Ethernet: 10Mbps (half duplex), 20Mbps (full-duplex) Fast Ethernet: 100Mbps(half duplex), 200Mbps (full- duplex)
Topology	Star
Network Cables	10BASE-T: 2-pair UTP Cat. 3,4,5 (100 m), EIA/TIA-568 100-ohm STP (100 m) 100BASE-TX: 2-pair UTP Cat. 5 (100 m), EIA/TIA-568 100-ohm STP (100 m)
Number of Ports	8 x 10/100Mbps auto-negotiation, auto MDI-X port
Physical and Environmental	
DC inputs	DC 7.5V 1A
Power Consumption	2W (Max.)
Temperature	Operating: 0° ~ 50° C, Storage: -10° ~ 70° C
Humidity	Operating: 10% ~ 90%, Storage: 5% ~ 90%
Dimensions	171 x 98 x 29 mm (W x H x D)
EMI:	FCC Class B, CE Mark B, VCCI-II

Performance

Transmission Method:	Store-and-forward
Packet Filtering/Forwarding Rate:	10Mbps Ethernet: 14,880/pps 100Mbps Fast Ethernet: 148,800/pps
MAC Address Learning:	Automatic update