TE100-S32*plus*
32-Port 10/100Mbps
Ethernet Switch

User's Guide

FCC Warning

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

注意
この装置は、情報処理装置等電波障害自主規制協議会(VCCI)の基準
に基づく第一種情報技術装置です。この装置を家庭環境で使用すると電波妨
害を引き起こすことがあります。この場合には使用者が適切な対策を講ずる
よう要求されることがあります。

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ABOUT THIS GUIDE

Congratulations on your purchase of the 32-port 10/100Mbps Fast Ethernet Switch. This device integrates 100Mbps Fast Ethernet and 10Mbps Ethernet network capabilities in a highly flexible package.

Purpose

This guide discusses how to install your 32-port 10/100Mbps Fast Ethernet Switch.

Terms/Usage

In this guide, the term "**Switch**" (first letter upper case) refers to your 32-port 10/100Mbps 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 Installation. 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.

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 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. Some of the 100Mbps Fast Ethernet products (10/100Mbps dual-speed) are compatible with 10Mbps Ethernet environments; they provide 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 bridges 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 were 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 19" rack-mount size is specifically designed for middle to large workgroups. The Switch provides 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 Switch 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 an unmanaged 10/100 Fast Ethernet Switch that offers solutions in accelerating small Ethernet workgroup bandwidth. Other key features are:

- ✓ **Auto-MDIX feature, automatically detects and corrects for crossover cables and allows direct switch-to-switch connection using straight-through CAT5 RJ45 cable.**
- ✓ **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-negotiation for any port. This allows auto-sensing of speed (10/100Mbps) and duplex-mode (half or full-duplex), thereby providing you with automatic and flexible solutions in your network connections.**
- ✓ **IEEE 802.3x flow control for full-duplex.**
- ✓ **Backpressure flow control for half-duplex.**
- ✓ **Data forwarding rate per port is at wire-speed for both 10Mbps and 100Mbps speed.**
- ✓ **Data filtering feature for each port, eliminates all error packets, runts, etc. at wire-speed for both 10Mbps and 100Mbps speed.**
- ✓ **4K active MAC address entry table with self-learning and table ageing.**
- ✓ **1024KBytes RAM buffer per device.**
- ✓ **Optional 100Base-FX multimode fiber module.**
- ✓ **EIA-19" rack-mountable.**

UNPACKING AND INSTALLATION

This chapter provides unpacking and setup information for the Switch.

Unpacking

Open the shipping cartons of the Switch and carefully unpacks its contents. The carton should contain the following items:

- ✓ **One 32-port 10/100M Fast Ethernet Switch**
- ✓ **One AC power cord, suitable for your area's electrical power connections**
- ✓ **Four rubber feet for cushioning**
- ✓ **Screws and two mounting brackets (for mounting on EIA-19" equipment rack)**
- ✓ **This User's Guide**

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

Installation

The site where you install the hub stack may greatly affect its performance. When installing, consider the following pointers:

Install the Switch in a fairly cool and dry place. See *Specifications* for the acceptable temperature and humidity operating ranges.
Install the Switch in a site free from strong electromagnetic fields (such as generators and motors), vibration, dust, and direct exposure to sunlight.
Leave at least 10cm of space around of the Switch for ventilation.

Install the Switch on a sturdy, level surface that can support its weight, or in an EIA-19" standard equipment rack. For information on rack installation, see the next section, *Rack Mounting.*

When installing the Switch on a level surface, attach the rubber feet to the bottom of device (one at each corner). The rubber feet cushion the Switch and protect the housing from scratching.

100Base-FX Module Installation

The installation procedure for each module is the same. Additional information about each module is provided below.

To install any of the modules: (SC or ST type connectors)

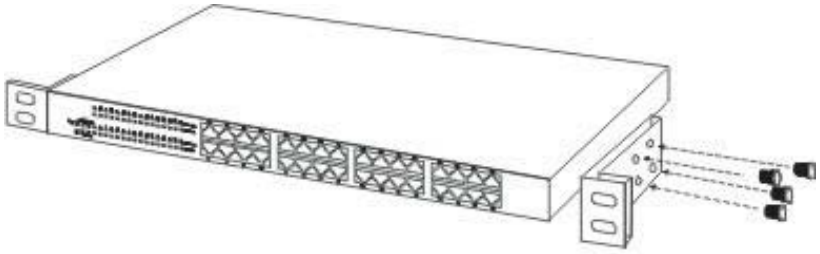
1. Power off the switch.
2. Locate the module bay on the switch's rear panel.
3. Using a screwdriver, undo the two screws and remove the dust cover on the module slot.
4. Holding the module with the component-side up and the connector-side away from you, gently slide the module along the guides on each side of the bay, and seat it in the internal connector slot.
5. Using a screwdriver and the two screws from step 3 to secure the module.
6. We recommend that you retain the dust cover in case you need to remove the module for extended period in the future.

Note: Port 9 and the 100BASE-FX port is the same port.

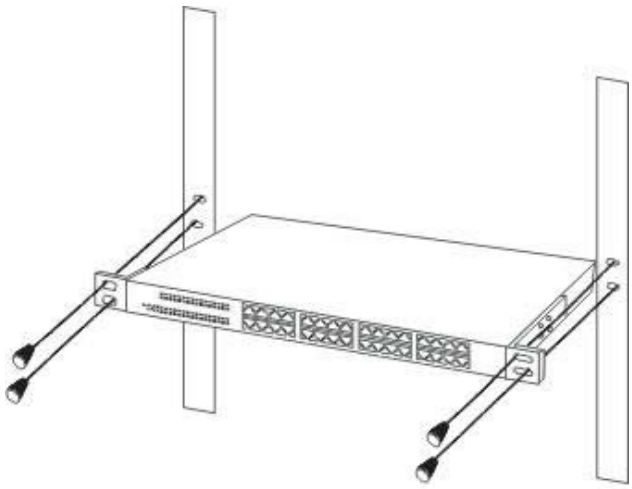
Do not use both Port 9 and the 100BASE-FX module at the same time.

Rack Mounting

The switch can be mounted on the EIA standard-size, 19-inch rack, which can be placed in a wiring closet with other equipments. Attach the mounting brackets at the switch's side panels (one on each side), and secure them with the provided screws.



Then, use screws provided with the equipment rack to mount each switch in the rack.



Connecting Network Cables

Each port on the Switch supports 10Mbps Ethernet and 100Mbps Fast Ethernet and it runs both in half and full duplex mode.

All ports are Auto-MDI type ports. The Switch can auto-transform each port to MDI-II or MDI-X type, so you can just make connections using a standard or crossover cable.

Power on

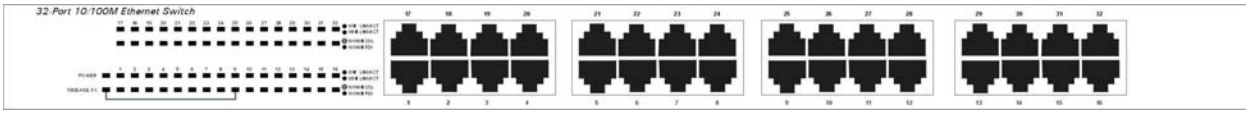
The 32-port 10/100Mbps Ethernet Switch can be used with AC power sources 100 - 240 VAC, 50 - 60 Hz. The Switch's power supply will adjust to the local power source automatically and may be turned on without having any or all LAN segment cables connected.

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's feature. The indicator panel is described in detail in the next chapter.

Front Panel

The figure below shows the front panels of the switch.



32-port 10/100Mbps Fast Ethernet Switch

LED Indicator Panel

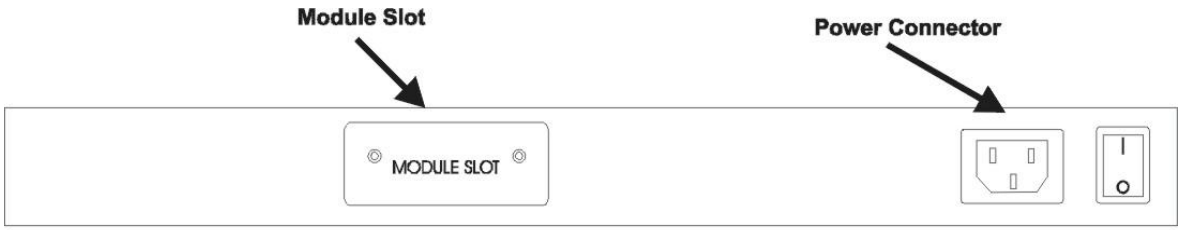
Refer to the next chapter for detailed information about each of the switch's LED indicators.

Twisted-Pair Ports

These ports supports automatic crossover detection function gives true 'plug and play' capability without the confusing crossover cables or crossover ports.

With the Auto-MDIX function, you just need to plug the network cable to the port and don't worry about if the end node is NIC (Network Interface Card) or switch or hub.

Rear Panel



Module Slots:

For installing optional module for 100BASE-FX connection.

AC Power Connector:

For the power cord.

LED Indicators

Power Indicator (Power)

This indicator lights green when the Switch is receiving power. It is off for no power.

Full-Duplex/Collision (FDX/COL)

This LED indicator lights green when a respective port is in full duplex (FDX) mode. The LED blinks green when collisions occur on the respective port.

Link/Activity (100M LINK/ACT *(green)*, 10M LINK/ACT *(amber)*)

This indicator lights green when the port is connected to a 100Mbps Fast Ethernet connection. The indicator blinks green when transmitting or receiving data on the 100Mbps network.

The indicator lights amber when the port is connected to a 10Mbps Ethernet station. The indicator blinks amber when transmitting or receiving data on the 10Mbps network.

100BASE-FX Module Indicator *(green)*

The LED lights green indicating a good link at the installed fiber module.

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. You can connect the PC (equipped with a RJ-45 10/100Mbps phone jack) to any of the 32ports (1 - 32)

When connecting PC to the Switch, the Switch's Port LED indicator will light according to the network adapter's connection speed. If the port LED indicator does not light after making a proper connection, check the PC network card, the cable, and the Switch's functionality.

Switch to Switch/Hub/(other devices)

The Switch can be connected to another switch, hub, or other Ethernet devices (i.e. router, bridge…etc.) via a two-pair Category 3, 4, 5 UTP/STP cable.

1. The "LINK/ACT" LED indicator lights solid green for 100Mbps connection, or LED lights amber for 10Mbps connection.

1. The "FDX/COL" LED indicator lights solid green if the connection supports full-duplex mode. This LED remains off for half-duplex mode operation.

Port Speed & Duplex Mode

After connecting the network cable from an Ethernet device's RJ45 port to a port on the Switch, the Switch uses auto-negotiation to determine the transmission mode for this 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**.

TECHNICAL SPECIFICATIONS

General	
Standards	IEEE 802.3 10Base-T Ethernet IEEE 802.3u 100 Base-TX Fast Ethernet ANSI/IEEE 802.3 auto-negotiation IEEE 802.3x flow control
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	10BASET: 2-pair UTP Cat. 3,4,5; EIA/TIA- 568 100-ohm STP, 100 meters max. 100BASE-TX: 2-pair UTP Cat. 5; EIA/TIA-568 100-ohm STP, 100 meters max. 100BASE-FX: 62.5/125 micron multimode fiber optic, half-duplex: 412 meters, full-duplex: 2 Km.
Number of Ports	32 x 10/100Mbps Auto-negotiation Auto-MDIX ports
Expansion Module Port	One module port for single-port 100BASE-FX connection (shared with port 9)

Physical and Environmental	
AC inputs	100 to 240 VAC, 50 or 60 Hz internal universal power supply
Power Consumption	40 watts. (max.)
Temperature	Operating: 0° ~ 50° C, Storage: -10° ~ 70° C
Humidity	Operating: 10% ~ 90%, Storage: 5% ~ 90%
Dimensions	440 x200 x 44 mm (W x H x D)
Weight	3kg
EMI:	FCC Class A, CE Mark Class A, VCCI Class A
Performance	
Transmits Method:	Store-and-forward
RAM Buffer:	1024KBytes per device
Filtering Address Table:	4K entries per device
Packet Filtering/Forwarding Rate:	10Mbps Ethernet: 14,880/pps 100Mbps Fast Ethernet: 148,800/pps
MAC Address Learning:	Automatic update