

TE100-S5P  
TE100-S8P  
5/8-port 10/100Mbps  
Auto-MDI  
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**

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***

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Congratulations on your purchase of the 5/8-port 10/100M Fast Ethernet Switch. This device integrates 100Mbps Fast Ethernet and 10Mbps Ethernet network capabilities in a highly flexible desktop package.

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### **Purpose**

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This manual discusses how to install the 5/8-port 10/100M Fast Ethernet Switch.

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### **Terms/Usage**

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In this guide, the term “**Switch**” (first letter upper case) refers to the 5/8-port 10/100M auto-negotiation Fast Ethernet Switch, and “**switch**” (first letter lower case) refers to other Ethernet switches.

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### **Overview of this User’s Guide**

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**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:** Explains how to connect the Switch to your Ethernet network.

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

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

## ***INTRODUCTION***

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

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### **Fast Ethernet Technology**

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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 take advantage of the existing investment in hardware, software, and personnel training.

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## Switching Technology

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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

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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.

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## Features

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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 mid size 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 an unmanaged 10/100 Fast Ethernet Switch that offers solutions in increasing small Ethernet/Fast 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***

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This chapter provides unpacking and setup information for the Switch.

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### **Unpacking**

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

One 5 or 8-port 10/100M Fast Ethernet Switch

One External AC Power Adapter

This User's Guide

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

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### **Setup**

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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 securely connected 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.
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## ***IDENTIFYING EXTERNAL COMPONENTS***

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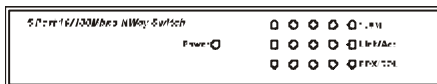
This section identifies all the major external components of the switch. Both the front and rear panels are shown followed by a description of each panel feature. The indicator panel is described in detail in the next chapter.

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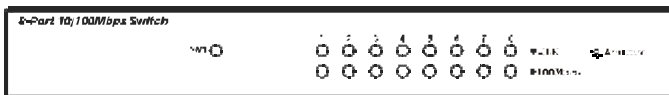
### **Front Panel**

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The figure below shows the front panels of the switch.



### **5-port Switch LED Indicator Panel**



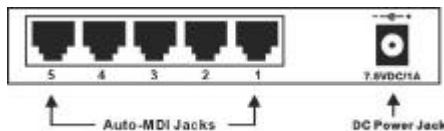
### **8-port switch LED Indicator Panel**

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

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## Rear Panel

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### 5-port Switch Rear Panel



### 8-port Switch Rear Panel

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

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

#### Auto MDI-X Jacks:

These ports support automatic MDI-II/MDI-X crossover detection function, gives the Switch true ‘plug and play’ capability.

With the Auto-MDI function, you just connect the network cable to the port and there is no need to worry about if the end node is NIC (Network Interface Card) or switch or hub.

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## LED Indicators

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When you power on the Switch, all LEDs will be ON for about 1 second and then go OFF, only the Power LED will stay lit.

For 5-port switch

Power

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

100M

This indicator lights green when the port is connected to an active 100Mbps Fast Ethernet device. This LED is off when the connection is 10Mbps or there is no connection to the port.

Link/Act

This indicator lights green when the port is connected to an active Ethernet/Fast Ethernet device. The indicator blinks green when the port is transmitting or receiving data on the network.

FDX/COL

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

***Note: It is normal to see some collisions in the network. If a Port's Collision LED is on constantly, check the status of the device the port is connected to.***

For 8-port switch

***Power Indicator (PWR)***

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

***LINK / ACT (Link/Activity) (green)***

This indicator lights green when the port is connected to a Fast Ethernet or Ethernet device. The indicator blinks green when there is activity on the port.

***100Mbps***

This indicator lights green when the port is connected to an active 100Mbps Fast Ethernet device. This LED is off when the connection is 10Mbps or there is no connection to the port.

## *CONNECTING THE SWITCH*

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

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### PC to Switch

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You can connect a PC to the Switch via a two-pair Category 3, 4, 5 UTP/STP cable. You can connect the PC (equipped with a RJ-45 10/100Mbps jack) to any of the ports. 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.

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### Hub to Switch

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A hub (10BASE-T or 100BASE-TX) can be connected to the Switch via a two-pair Category 3, 4, 5 UTP/STP cable (use Category 5 for 100Mbps connection). The connection is accomplished from the any RJ-45 port on the hub to any RJ-45 port on the Switch. After connecting the hub to the Switch, the Switch's Port LED indicator will light according to the hub's connection speed. If the port LED indicator does not light after making a proper connection, check the hub, the cable, and the Switch's functionality. Each port on the Switch has auto-MDI function; you can make the connection using crossover or straight through cable with uplink port or regular port from the hub.

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## Switch to switch (or other Ethernet devices)

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You can connect a switch or other Ethernet devices (10BASE-T or 100BASE-TX) to this Switch via a two-pair Category 3, 4, 5 UTP/STP cable (use Category 5 for 100Mbps connection). The connection is accomplished from the any RJ-45 port on the device to any RJ-45 port on the Switch. After connecting the hub to the Switch, the Switch's Port LED indicator will light according to the hub's connection speed. If the port LED indicator does not light after making a proper connection, check the device, the cable, and the Switch's functionality. Each port on the Switch has auto-MDI function; you can make the connection using crossover or straight through cable with uplink port or regular port from the device.

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## Port Speed & Duplex Mode

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After a connection is made 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**.

*Note: Only the 5-port model has Full-Duplex LED indicators.*



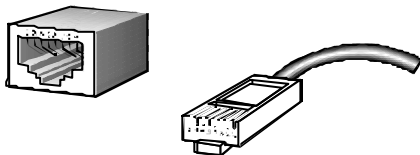
## ***RJ-45 PIN SPECIFICATION***

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

<b>RJ-45 Connector pin assignment</b>	
<b>Contact</b>	<b>Media Direct Interface Signal</b>
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***

<b>General</b>	
Standards	IEEE 802.3 10BASE-T Ethernet IEEE 802.3u 100BASE-TX Fast Ethernet ANSI/IEEE 802.3 NWay Auto-negotiation IEEE 802.3x Full-Duplex 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	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	5 or 8 x 10/100Mbps auto-negotiation, auto-MDI ports
<b>Physical and Environmental</b>	
DC inputs	DC 7.5V, 1A
Power Consumption	TE100-S5P: 7.5W (Max.) TE100-S8P: 2W (Max.)
Temperature	Operating: 0? ~ 50? C, Storage: -10? ~ 70? C
Humidity	Operating: 10% ~ 90%, Storage: 5% ~ 90%

Dimensions	TE100-S5P: 116 x 70 x 25 mm (W x H x D) Te100-S8P: 171 x 98 x 29 mm (W x H x D)
EMI:	FCC Class B, CE Mark B, VCCI-B

## Performance

Transmission Method:	Store-and-forward
Packet Filtering/Forwarding Rate:	10Mbps Ethernet: 14,880pps (packet per second) 100Mbps Fast Ethernet: 148,800pps
MAC Address Learning:	Automatic update
RAM Buffer	TE100-S5P: 128 KB TE100-S8P: 256 KB
Filtering Address Table	TE100-S5P: 4K entries per device TE100-S8P: 8K entries per device