

TEG-S224TX  
26-Port 10/100/1000Mbps  
Gigabit & Fast  
Ethernet Switch

*with*

*2 × 1000BASE-T plus*

*24 × 10/100BASE-T ports*

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 or her 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.

## **VCCI Warning**

This is a product of VCCI Class A Compliance.

### **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。

## **UL Warning**

a) **Elevated Operating Ambient Temperature-** If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature ( $T_{mra}$ ).

b) **Reduced Air Flow-** Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.

c) **Mechanical Loading-** mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.

d) **Circuit Overloading-** Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of circuits might have on over current protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

e) **Reliable Earthing-** Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g., use of power strips).

P/N : 1907E7224TA5000

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## ***ABOUT THIS GUIDE***

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Congratulations on your purchase of the 26-Port 10/100/1000Mbps Gigabit Ethernet Switch with 2 x 1000Mbps and 24 10/100Mbps ports. This device integrates 1000Mbps Gigabit Ethernet, 100Mbps Fast Ethernet and 10Mbps Ethernet network capabilities in a highly flexible package.

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### **Purpose**

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This user's guide tells you how to install your 26-Port 10/100/1000Mbps Gigabit Ethernet Switch and how to connect it to your Ethernet network.

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### **Terms/Usage**

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For simplicity, this documentation uses the terms “Switch” (first letter upper case) to refer to this 26-Port 10/100/1000Mbps Gigabit Ethernet Switch, and “switch” (first letter lower case) to refer to Ethernet switches in general.

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## ***INTRODUCTION***

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This chapter describes the features of the Switch. This section also provides some background information about Gigabit Ethernet and 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.

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. 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.

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## Gigabit Ethernet Technology

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Gigabit Ethernet is an extension of IEEE 802.3 Ethernet utilizing the same packet structure, format, and support for CSMA/CD protocol, full duplex flow control, and management objects, but with a tenfold increase in theoretical throughput over 100-Mbps Fast Ethernet and a hundredfold increase over 10-Mbps Ethernet. Since it is compatible with all 10-Mbps and 100-Mbps Ethernet environments, Gigabit Ethernet provides a straightforward upgrade without wasting a company's existing investment in hardware, software, and trained personnel.

The increased speed and extra bandwidth offered by Gigabit Ethernet are essential to coping with the network bottlenecks that frequently develop as computers and their busses get faster and more users using applications that generate more traffic. Upgrading key components, such as your backbone and servers to Gigabit Ethernet can greatly improve network response times as well as significantly speed up the traffic between your subnets.

Gigabit Ethernet supports video conferencing, complex imaging, and similar data-intensive applications. Likewise, since data transfers occur 10 times faster than Fast Ethernet, servers outfitted with Gigabit Ethernet NIC's are able to perform 10 times the number of operations in the same amount of time.

The phenomenal bandwidth delivered by Gigabit Ethernet was the most cost-effective method to take advantage of today's rapidly improving switching and routing internetworking technologies. And with expected advances in silicon technology

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and digital signal processing that enabled Gigabit Ethernet to eventually operate over unshielded twisted-pair (UTP) cabling, outfitting your network with a powerful 1000-Mbps-capable backbone/server connection creates a flexible foundation for the next generation of network technology products.

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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.

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.

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## Features

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- ?? **24×10/100BASE-TX Fast Ethernet ports plus 2×1000BASE-T Gigabit Ethernet ports**
- ?? **All ports support Auto-MDIX, so there is no need to worry about what type of cables to use**
- ?? **Full/half duplex transfer mode for 10/100Mbps Fast Ethernet ports**
- ?? **Full duplex transfer mode for Gigabit Ethernet ports**
- ?? **Wire speed reception and transmission**
- ?? **Store-and-Forward switching scheme capability to support rate adaptation and ensure data integrity**
- ?? **Up to 8K unicast addresses entities per device**
- ?? **Supports 512KB RAM for data buffering**
- ?? **Extensive front-panel diagnostic LEDs**
- ?? **IEEE 802.3x flow control for full-duplex mode ports**
- ?? **Back pressure flow control for half-duplex mode ports**

?? **Standard 19" Rack-mount size**

## ***UNPACKING AND INSTALLATION***

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This chapter provides unpacking and installation information for the Switch. To avoid causing any damage to the Switch, we recommend that you read this chapter carefully before starting installation.

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### **Unpacking**

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Open the shipping carton of the Switch and carefully unpack the items inside. The carton should contain the following items:

- ?? **One 26-Port 10/100/1000Mbps Gigabit & Ethernet Switch**
- ?? **One AC power cord, suitable for your area's electrical power connections**
- ?? **Four rubber feet to be used for shock cushioning**
- ?? **Screws and two mounting brackets**
- ?? **User's Guide**

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

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## Installation

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The site where you place the Switch may greatly affect its performance. When installing, take the following into your consideration:

Install the Switch in a fairly cool and dry place. See *Technical Specifications* for the acceptable temperature and humidity operating ranges.

Install the Switch in a site free from strong electromagnetic field generators (such as motors), vibration, dust, and direct exposure to sunlight.

Leave at least 10cm of space around the Switch for ventilation.

Install the Switch on a sturdy, level surface that can support its weight, or in an EIA standard-size 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 each device. The rubber feet cushion the hub and protect the hub case from scratching.

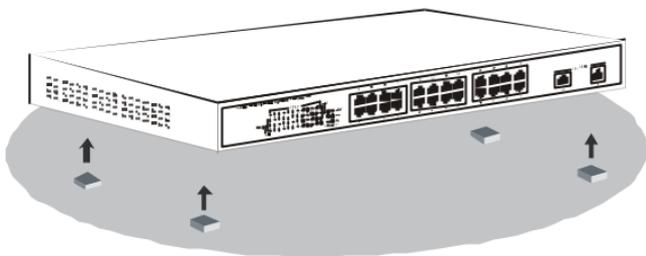


Figure 1. Attach the adhesive rubber pads to the bottom of the Switch

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## Rack Mounting

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

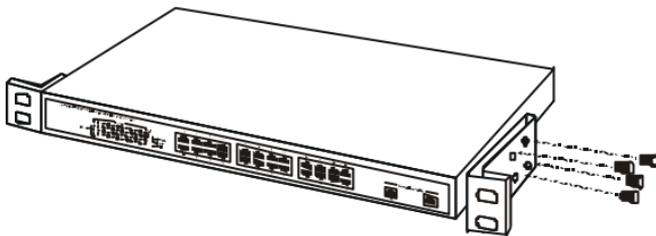


Figure 2. Attaching the mounting brackets to the Switch

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Then, use screws provided with the equipment rack to mount the Switch to the rack.

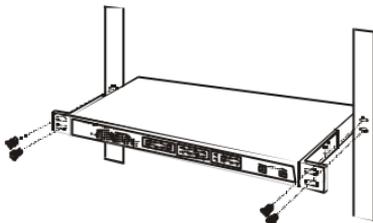


Figure 3. Installing the Switch on an equipment rack

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## Connecting Network Cable

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The Switch supports 10/100/1000Mbps Gigabit Ethernet. It runs full/half duplex transfer mode for 10/100Mbps and full duplex transfer mode for 1000Mbps.

These ports are Auto-MDIX type port. They can auto transform to MDI-II or MDI-X type, so you can make a connection using a standard or a crossover cable.

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## AC Power

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The Switch can be used with AC power supply 100~240V AC, 50~60 Hz. The Switch does not come with a Power ON/OFF switch, so the Switch will automatically power on when it is connected to an electrical outlet. The Switch's power supply will adjust to the local power source automatically and may be turned on without having any LAN segment cables connected.

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## ***IDENTIFYING EXTERNAL COMPONENTS***

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This chapter identifies all the major external components of the Switch. Both the front and rear panels are shown below, with a description of each panel features.

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### **Front Panel**

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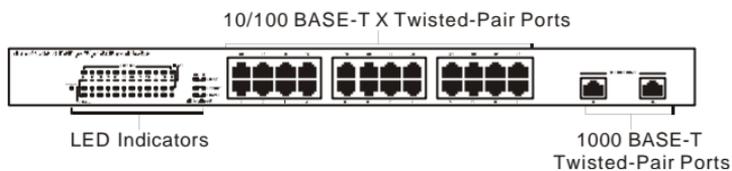


Figure 4. The front panel of the Switch

### **LED Indicators**

Refer to the next chapter *Understanding LED Indicators* for detailed information on the meaning of each LED indicator.

### **10/100BASE-TX Twisted-Pair Ports (Port1~24)**

These ports supports network speeds of either 10Mbps or 100Mbps, and can operate in half- and full- duplex transfer modes. These ports also support automatic MDI-II/MDI-X crossover detection, providing true “plug and play” capability.

### **1000BASE-T Twisted Pair Ports (Port 25~26)**

The Switch is equipped with 2 Gigabit twisted pair ports, which support Auto-negotiation and Auto-MDIX crossover detection functions. These two ports operate in full-duplex mode.

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## Rear Panel

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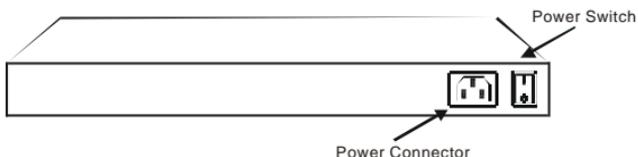


Figure 5. The rear panel of the Switch

### **AC Power Connector**

This is a three-pronged connector that supports the power cord. Plug in the female connector of the provided power cord into this connector, and the male into a power outlet. Supported input voltages range from 100~240V AC at 50~60Hz.

### **Power Switch**

Use the power switch beside this power connector to turn on or turn off the power to the Switch.

## UNDERSTANDING LED INDICATORS

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The front panel LEDs provides instant status feedback, and help monitor and troubleshoot.

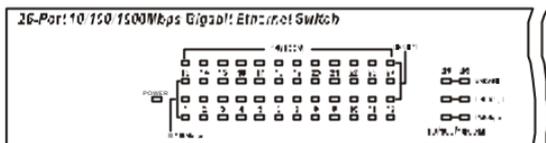


Figure 6. LED indicators of the Switch

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### Power LED

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#### POWER

<b>On</b>	<b>:</b>	<b>When the Power LED lights on, the Switch is receiving power.</b>
<b>Off</b>	<b>:</b>	<b>The LED is off when the Switch is not receiving power.</b>

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### Ports 1~24 Status LEDs

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#### LINK/ACT

<b>On</b>	<b>:</b>	<b>When the LED lights on, the respective port is connected to an Ethernet network.</b>
<b>Blinking</b>	<b>:</b>	<b>When the LED is blinking, the port is transmitting or receiving data on the 10/100Mbps Ethernet network.</b>
<b>Off</b>	<b>:</b>	<b>No link.</b>

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### 100Mbps

<b>On</b>	<b>:</b>	<b>When the LED lights on, the respective port is connected to a 100Mbps Ethernet network.</b>
<b>Off</b>	<b>:</b>	<b>When the LED is off, the respective port is connected to a 10Mbps Ethernet network.</b>

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### Port 25 & Port 26 Status LEDs

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#### LINK/ACT

<b>On</b>	<b>:</b>	<b>When the LED lights on, the respective port is connected to a 10/100/1000Mbps Ethernet network.</b>
<b>Blinking</b>	<b>:</b>	<b>When the LED is blinking, the respective port is transferring or receiving data on a 10/100/1000Mbps Ethernet network.</b>
<b>Off</b>	<b>:</b>	<b>No link.</b>

### 1000Mbps

<b>On</b>	<b>:</b>	<b>When the LED lights on, the respective port is connected to a Gigabit Ethernet network.</b>
<b>Off</b>	<b>:</b>	<b>When the LED is off, the respective port is connected to a 10/100Mbps Ethernet network.</b>

### 100Mbps

<b>On</b>	<b>:</b>	<b>When the LED lights on, the respective port is connected to a 100Mbps Fast Ethernet network.</b>
<b>Off</b>	<b>:</b>	<b>When the LED lights off, the respective port is connected to a 10Mbps or Gigabit Ethernet network.</b>

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## *TECHNICAL SPECIFICATIONS*

<b>General</b>	
<b>Standards</b>	IEEE 802.3 10BASE-T Ethernet IEEE 802.3u 100 BASE-TX Fast Ethernet IEEE 802.3ab 1000BASE-T Gigabit Ethernet
<b>Protocol</b>	CSMA/CD
<b>Data Transfer Rate</b>	Ethernet: 10Mbps (Half-duplex) 20Mbps (Full-duplex) Fast Ethernet: 100Mbps (Half-duplex) 200Mbps (Full-duplex) Gigabit Ethernet: 2000Mbps (Full-duplex)
<b>Topology</b>	Star Ethernet: 2-pair UTP/STP Cat. 3,4,5 ; Up to 100m
<b>Network Cables</b>	Fast Ethernet: 2-pair UTP/STP Cat. 5; Up to 100m Gigabit Ethernet: 4-pair UTP/STP Cat. 5; Up to 100m
<b>Number of Ports</b>	24 × 10/100BASE-TX Auto-MDIX UTP/STP ports 2 × 1000BASE-T Auto-MDIX UTP/STP ports

### Physical and Environmental

<b>AC inputs:</b>	100 to 240V AC, 50/60 Hz internal universal power supply
<b>Power Consumption:</b>	20 watts. (max.)
<b>Temperature:</b>	Operating: 0?~40?C, (32°~104°F), Storage: -10?~70?C, (14°~158°F)
<b>Humidity:</b>	Operating: 10%~90%, Storage: 5%~90%
<b>Dimensions:</b>	440 × 200 × 44 mm (17.3" x 7.9" x 1.7") (W × H × D)
<b>Emissions:</b>	CE Mark Class A, FCC Class A, VCCI Class A
<b>Safety:</b>	cUL(1950), CB(IEC60950)

## Performance

<b>Transmission Method:</b>	Store and Forward
<b>RAM Buffer:</b>	512KB per device
<b>Filtering Address Table:</b>	8K unicast addresses entities per device
<b>Packet Filtering</b>	10Mbps Ethernet: 14,880 pps
<b>Forwarding Rate</b>	100Mbps Fast Ethernet: 148,800 pps 1000Mbps Gigabit Ethernet: 1,488,000 pps
<b>MAC Address Learning</b>	Automatic Update
<b>Emissions:</b>	CE Mark Class A, FCC Class A, VCCI Class A
<b>Safety:</b>	cUL(1950), CB(IEC60950)