

# **9-Port 10/100/1000Mbps Gigabit Ethernet Switch**

*1×1000BASE-T*

*plus*

*8×10/100BASE-TX*

## **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 Warning**

This is a product of VCCI Class B 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。



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## ***ABOUT THIS GUIDE***

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This user's guide tells you how to install your 9-Port 10/100/1000Mbps Gigabit Ethernet Switch, how to connect it to your Gigabit Ethernet network.

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### **Terms**

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For simplicity, this documentation uses the terms “Switch” (first letter upper case) to refer to the 9-Port 10/100/1000Mbps Gigabit Ethernet Switch, and “switch” (first letter lower case) to refer to all Ethernet switches, including the 9-Port 10/100/1000Mbps Gigabit Ethernet Switch.

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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.

***Technical Specifications.*** Lists all the technical specifications of the Switch.



## ***INTRODUCTION***

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This section describes the features of the 9-Port 10/100/1000Mbps Gigabit Ethernet Switch, as well as providing some background information about Gigabit Ethernet and switching technology.

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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 is essential to coping with the network bottlenecks that frequently develop as computers and their busses get faster and more users use 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.

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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 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.

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## **Switching Technology**

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Another key development pushing the limits of Ethernet technology is in the field 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 making it possible for a local area network to be divided into different segments which don't compete with each other for network transmission capacity, giving a decreased load on each.

The switch acts as a high-speed selective bridge between the individual segments. Traffic that needs to go from one segment to another is automatically forwarded by the switch, without interfering with any other segments. This allows the total network capacity to be 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 and the setup and maintenance required make routers relatively impractical. Today's switches are an ideal solution to most kinds of local area network congestion problems.

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## **Features**

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The 9-Port 10/100/1000Mbps Gigabit Ethernet Switch was designed for easy installation and high performance in an environment where traffic on the network and the number of users increase continuously.

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- ◆ **1 1000BASE-T Gigabit Ethernet port**
- ◆ **8 100BASE-TX Fast Ethernet ports**
- ◆ **Supports Auto-Negotiation for 10/100/1000Mbps and duplex mode**
- ◆ **Supports Auto-MDIX for each port**
- ◆ **Support Full/Half duplex transfer mode for 10 and 100Mbps**
- ◆ **Support Full duplex transfer mode for 1000Mbps**
- ◆ **Full wire speed reception and transmission**
- ◆ **Store-and-Forward switching method**
- ◆ **Supports 4K absolute MAC addresses**
- ◆ **Supports 256K Bytes RAM for data buffering**
- ◆ **Extensive front-panel diagnostic LEDs**
- ◆ **IEEE 802.3x flow control for full-duplex**
- ◆ **Back pressure flow control for half-duplex**

## ***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 shipping carton of the Switch and carefully unpack its contents. The carton should contain the following items:

**One 9-Port 10/100/1000Mbps Gigabit Ethernet Switch**

**Four rubber feet with adhesive backing**

**One external 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:

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

**Install the Switch in a site free from strong electromagnetic source, vibration, dust, and direct sunlight.**

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**Leave at least 10cm of space at the left and right hand side of the Switch for ventilation.**

**Visually inspect the DC power jack and make sure that it is fully secured to the power adapter.**

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## ***IDENTIFYING EXTERNAL COMPONENTS***

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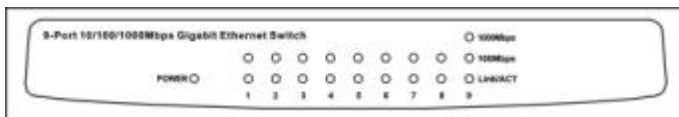
This chapter describes the front panel, rear panel and LED indicators of the Switch

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### **Front Panel**

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The figure below shows the front panels of the switch.



Front panel view of the Switch

### **LED Indicators**

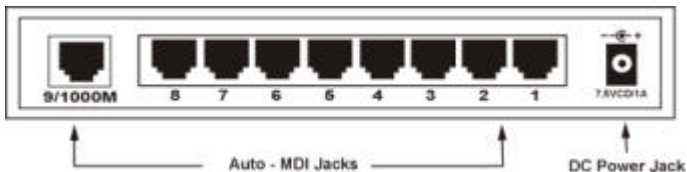
Comprehensive LED indicators display the conditions of the Switch and status of the network. A description of these LED indicators follows (see LED Indicators)

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### **Rear Panel**

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The front panel of the Switch consists of 8 10/100Mbps Fast Ethernet ports, 1 10/100/1000Mbps Gigabit Ethernet port, and DC power connector.



## Rear panel view of the Switch

### **DC Power Jack:**

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

### **100BASE-TX Twisted-Pair Ports (Port 1~8):**

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

### **1000BASE-T Twisted Pair Ports (Port 9) :**

The Switch is equipped with one Gigabit port, supported auto negotiable 10/100/1000Mbps and auto MDI/MDIX crossover detection function. This one port can operate in half- and full-duplex modes.

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## **LED Indicators**

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The LED indicators of the Switch include Power, Link/Act, 1000Mbps and 100Mbps. The following shows the LED indicators for the Switch along with an explanation of each indicator.

### **POWER LED**

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On	:	When the Power LED lights on, the Switch is receiving power.
Off	:	When the Power LED turns off or the power cord has improper connection.

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## Ports 1~8 Status LEDs

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### 100Mbps

On	:	When the LED lights on, the respective port is connected to a 100Mbps Ethernet network.
Off	:	The respective port is connected to a 10Mbps Ethernet network.

### LINK/ACT

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

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## Port 9 Status LEDs

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### 1000Mbps

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

### 100Mbps

On	:	When the LED lights on, the respective port is connected
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	to a 100Mbps Fast Ethernet network.
Off	: The respective port is connected to a 10Mbps or Gigabit Ethernet network, otherwise.

### **LINK/ACT**

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

## ***TECHNICAL SPECIFICATIONS***

<b>General</b>																
<b>Standards:</b>	IEEE 802.3ab 1000BASE-T IEEE 802.3u 100BASE-TX IEEE 802.3 10BASE-T IEEE 802.3x Flow Control															
<b>Protocol:</b>	CSMA/CD															
<b>Data Transfer Rate:</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 15%;">Ethernet:</td> <td style="width: 35%;">10Mbps</td> <td style="width: 50%;">(Half-duplex)</td> </tr> <tr> <td></td> <td>20Mbps</td> <td>(Full-duplex)</td> </tr> <tr> <td>Fast Ethernet:</td> <td>100Mbps</td> <td>(Half-duplex)</td> </tr> <tr> <td></td> <td>200Mbps</td> <td>(Full-duplex)</td> </tr> <tr> <td>Gigabit Ethernet:</td> <td>2000Mbps</td> <td>(Full-duplex)</td> </tr> </table>	Ethernet:	10Mbps	(Half-duplex)		20Mbps	(Full-duplex)	Fast Ethernet:	100Mbps	(Half-duplex)		200Mbps	(Full-duplex)	Gigabit Ethernet:	2000Mbps	(Full-duplex)
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<b>Topology:</b>	Star															
<b>Network Cables:</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 15%;">Ethernet:</td> <td style="width: 65%;">2-pair UTP Cat. 3,4,5, Unshield Twisted Pair (UTP )Cable</td> <td style="width: 20%;"></td> </tr> <tr> <td>Fast Ethernet:</td> <td>2-pair UTP Cat. 5, Twisted Pair (UTP )Cable</td> <td>Unshield</td> </tr> <tr> <td>Gigabit Ethernet:</td> <td>4-pair UTP Cat. 5, Twisted Pair (UTP )Cable</td> <td>Unshield</td> </tr> </table>	Ethernet:	2-pair UTP Cat. 3,4,5, Unshield Twisted Pair (UTP )Cable		Fast Ethernet:	2-pair UTP Cat. 5, Twisted Pair (UTP )Cable	Unshield	Gigabit Ethernet:	4-pair UTP Cat. 5, Twisted Pair (UTP )Cable	Unshield						
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<b>Number of Ports:</b>	8 ×100BASE-TX Auto-MDIX UTP ports 1 × 1000BASE-T Auto-MDIX UTP port															

Physical and Environmental	
DC inputs:	7.5V 1A
Power Consumption:	5.7 watts maximum
Operating Temperature:	0 °C ~ 40°C
Storage Temperature:	-10°C ~ 70°C
Humidity:	5% ~ 95% RH, non-condensing
Dimensions:	171 x 100 x 33 mm (W x H x D)
Certification:	FCC Class B, CE Marking Class B, VCCI Class B
Performance	
Transmission Method:	Store-and-forward
RAM Buffer:	256K Bytes per device
Filtering Address Table:	4K MAC address per device
Packet Filtering/Forwarding Rate:	Full wire speed
MAC Address Learning:	Self-learning, auto-aging