

**KS-124**

24-Port 10/100M  
NWay 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。

P/N:6012-3224001

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## About This Guide

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Congratulations on your purchase of the 24-port 10/100M NWay Fast Ethernet Switch. This device integrates 100Mbps Fast Ethernet and 10Mbps Ethernet network capabilities in a highly flexible package.

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## Purpose

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This guide discusses how to install your 24-port 10/100M NWay 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 your 24-port 10/100M NWay 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 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**

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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 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 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.

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## Features

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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 rack 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 MDI/MDIX feature automatically detects and corrects for crossover cables and allows direct switch-to-switch connection.**
- ✓ **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.**
- ✓ **NWay 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.**
- ✓ **IEEE 802.3x flow control for full-duplex**
- ✓ **Back pressure flow control for half-duplex**
- ✓ **Data forwarding rate per port is at wire-speed for both 10Mbps and 100Mbps speed.**
- ✓ **Data filtering rate eliminates all error packets, runts, etc., per port at wire-speed for both 10Mbps and 100Mbps speed.**
- ✓ **4K active MAC address entry table with self-learning and table ageing.**
- ✓ **768KBytes RAM buffer per device**

## Unpacking and Installation

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

- ✓ **One the 24-port 10/100M NWay Fast 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**
- ✓ **This 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 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 field generators (such as motors), vibration, dust, and direct exposure to sunlight.

Leave at least 10cm of space at the front and rear of the hub 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.



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## 100Base-FX Module Installation

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

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

1. Turn power off the switch
2. Locate the module slot in 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 component-side up and connector-side in, gently slide the module along the guides and seat it in the internal connector.
5. Using a screwdriver, replace the two screws and tighten until snug.

We recommend that you retain the dust cover in case you need to remove the module for an extended period sometime in the future.

The port 9 and the 100BASE-FX port is really the same port.

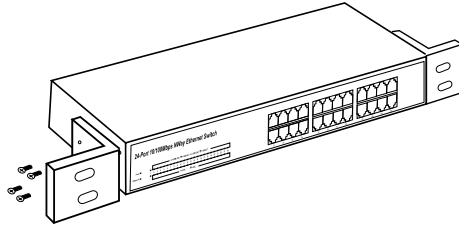
***Do not use both Port 9 and the 100BASE-FX port at the same time.***

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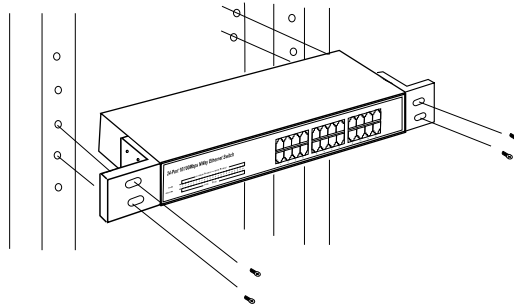
## Rack Mounting

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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 equipment. Attach the mounting brackets at the switch's front panel (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.



## Identifying External Components

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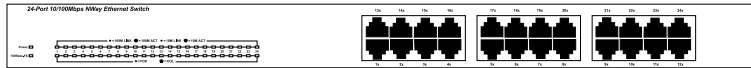
This section identifies all the major external components of the switch. Both the front and rear panel is shown, followed by a description of each panel feature. The indicator panel is described in detail in the next chapter.

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### Front Panel

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The figure below shows the front panels of the switch.



#### 24-port 10/100M NWay 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 MDI/MDIX 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.

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### Rear Panel

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#### Module Slots:

Used to install module options for 100BASE-FX connection.

#### AC Power Connector:

For the power cord.

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## LED Indicators

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### **Power Indicator (PWR)**

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

### **Full-Duplex/Collision (Full-Duplex/Collision)**

This LED indicator light green when a respective port is in full duplex (FDX) mode. Otherwise, it is blinking when collisions are occurring on the respective port.

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

This indicator light green when the port is connected to a 100Mbps Fast Ethernet station, if the indicator blinking green will be transmit or received data on the 100Mbps network. Otherwise, if the indicator light amber when the port is connected to a 10Mbps Ethernet station, if the indicator blinking amber will be transmit or received data on the 10Mbps network.

### **100BASE-FX Module Indicator (*green*)**

The FX Link/Rx, indicate a good link to a module installed.

## 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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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 of the 24 ports (1 - 24)

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/ACT" LED indicator light green for hookup to 100Mbps speed or light amber for hookup to 10Mbps speed.
2. The "FDX/COL LED" indicator depends upon LAN card capabilities for full duplex or half duplex.

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### Hub/Switch to Switch (other devices)

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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.

1. The "LINK/ACT" LED indicator light green for hookup to 100Mbps speed or light amber for hookup to 10Mbps speed.
2. The "FDX/COL" LED indicator depends upon LAN card capabilities for full-duplex or half-duplex

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### Port Speed & Duplex Mode

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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**.

## Technical Specifications

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<b>General</b>	
Standards	IEEE 802.3 10Base-T Ethernet IEEE 802.3u 100 Base-TX Fast Ethernet ANSI/IEEE 802.3 NWay 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	10BASE-T: 2-pair UTP Cat. 3,4,5; EIA/TIA- 568 100-ohm STP 100BASE-TX: 2-pair UTP Cat. 5; EIA/TIA-568 100-ohm STP 100BASE-FX: 62.5/125 micron multimode fiber optic
Number of Ports	24 x 10/100Mbps NWay Auto MDI/MDIX ports
Expansion Slot	One expansion slot for 100BASE-FX

<b>Physical and Environmental</b>	
AC inputs	100 to 240 VAC, 50 or 60 Hz internal universal power supply
Power Consumption	40 watts. (max.)
Temperature	Operating: 0° ~ 40° C, Storage: -10° ~ 70° C
Humidity	Operating: 10% ~ 90%, Storage: 5% ~ 90%
Dimensions	440 x 140 x 44 mm (W x H x D)
EMI:	FCC Class A, CE Mark Class A, VCCI Class A
<b>Performance</b>	
Transmits Method:	Store-and-forward
RAM Buffer:	768KBytes 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