Installation Guide

KTI 10/100 Fast Ethernet Switch

KS2028

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10/100 Fast Ethernet Switch
Installation Guide

DOC.971006-KS2028-NK
P/N: 750-0087-002

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TRADEMARKS

Ethernet is a registered trademark of Xerox Corp.

WARNING:

This equipment has been tested and found to comply with the limits 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 the instruction manual may cause harmful interference in which case the user will be required to correct the interference at his own expense.

NOTICE:

(1) The changes or modifications not expressively approved by the party responsible for compliance could void the user's authority to operate the equipment.
(2) Shielded interface cables and AC power cord, if any, must be used in order to comply with the emission limits.

CISPR A COMPLIANCE:

This device complies with EMC directive of the European Community and meets or exceeds the following technical standard.
EN 55022 - Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment. This device complies with CISPR Class A.
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.

CE NOTICE

Marking by the symbol **CE** indicates compliance of this equipment to the EMC directive of the European Community. Such marking is indicative that this equipment meets or exceeds the following technical standards:
•EN 55022: Limits and Methods of Measurement of Radio Interference characteristics of Information Technology Equipment.
•EN 50082/1:Generic Immunity Standard -Part 1: Domestic Commercial and Light Industry.
•EN 60555-2: Disturbances in supply systems caused by household appliances and similar electrical equipment - Part 2: Harmonics.

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1. Introduction

Driven by recent advances in desktop computing technology, today's network applications have grown speed, power and the ability to process information. To meet the demands of these more powerful applications, the switch has been developed to alleviate congestion and improve performance on your Ethernet network. The switch comes with multiple ports, with each capable of transmitting or receiving information simultaneously at full wire speed to control and allocate the network bandwidth.

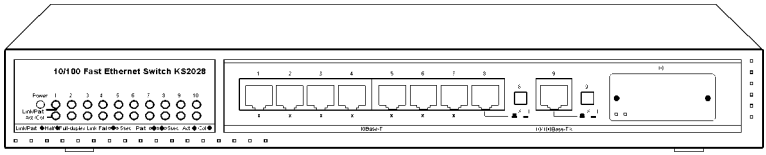

Figure 1-1 Switch Unit

The key features of this switch unit are:

- Combining one fixed 10/100Mbps-based fast Ethernet switched port, the switch provides a non-disruptive and smooth migration path from Ethernet to a Fast Ethernet network.
- With one expansion slot, the switch allows you to connect an additional 10/100Mbps auto sensing port or an optional 100Base-FX fiber optic port module to connect to a Fast Ethernet fiber optic backbone.
- Combining multiple speeds and multiple media support in the same unit, the switch can meet your diversified application requirements.

1.1 Features

Designed for resolving congestion problems caused by bandwidth-hungry devices and bandwidth-intensive applications as well as a high number of users, the switch not only adheres to the IEEE 802.3 10BASE-T and 100BASE-T standard, but also features:

- Various TP ports for flexible connection to servers and hubs.
  - eight 10BASE-T ports
  - one 10/100BASE-TX port
  - one expansion port slot for optional high-speed 10/100BASE-TX module or 100BASE-FX module
- The 10/100BASE-TX port and module support:
  - auto speed sensing for 100Mbps or 10Mbps connection
  - auto configuration with NWay devices
- Self learning for network configuration
- Store and forward switching to ensure only good packets are forwarded
- Full-duplex or half-duplex operation support for all switched ports
- Support manual settings for the connection with non-NWay devices
- Forwarding and filtering at full wire speed
- User-friendly designs
  - comprehensive LED indicators provide quick, easy to read port and hub information
  - rack mount kit provided
  - crossover switches for port #8 and #9 allow connection to different types of devices with a straight cable instead of a modified crossover cable
  - expansion port slot for adding another 100BASE-TX segment or a 100BASE-FX fiber segment to a Fast Ethernet fiber backbone.

1.2 Specifications

Network ports	10BASE-T ports	8
	10/100BASE-TX port	1
	Expansion port slot	1
Filtering rate	10BASE-T ports	14,880 pps
	10/100BASE-TX port	148,800 pps
	Expansion port slot	148,800 pps
Forwarding rate	10BASE-T ports	14,880 pps
	10/100BASE-TX port	148,800 pps
	Expansion port slot	148,800 pps
Filtering address	Multicast address	unlimited
	Broadcast address	unlimited
	Unicast address	8192 per port max.
RAM buffers	2MB shared	
Environment	Temperature	5°C to 40°C
	Relative humidity	15% to 95% non-condensing
Dimension	340mm x 220mm x 44mm (13.4 x 8.7 x 1.7 inch)	
Power	100-240 VAC, 50/60Hz, 35W	

2. Installing the Switch

The switch is designed to operate in workgroup environments without a complicated configuration procedure. It also features an auto-select 100-240V, 50/60Hz power supply unit, which works in most countries around the world.

Before connecting the supplied power cord into the switch, check to see that the cord voltage and current rating conform to the standards of the country of operation.

2.1 Packing List

The switch has the following components shipped with it:

- One switch unit
- One AC power cord
- 4 rubber feet for desktop mounting
- 19-inch ack mount kit
- Installation guide

2.2 Mounting the Switch

The switch can be placed on a desktop as a stand-alone unit. When installing the switch on a desktop you need to attach the rubber feet at each corner of the unit. The rubber feet are included in the product package. Allow enough ventilation space between the switch and the objects around it.

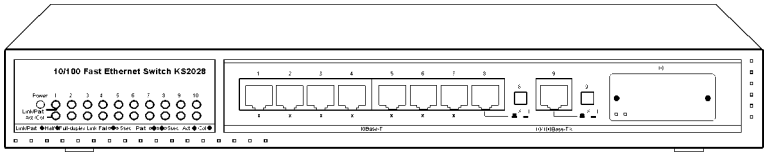

Figure 2-1 Desktop Mounting

Rack Mounting

For mounting the switch into a 19-inch rack, a pair of mount brackets is included in the pack.

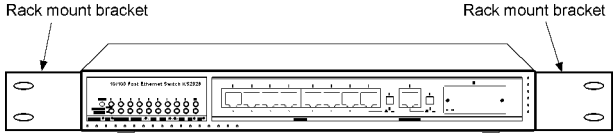

Figure 2-2 Install Rack Mount Brackets

Install the switch into a 19-inch rack as illustrated in the following figure:

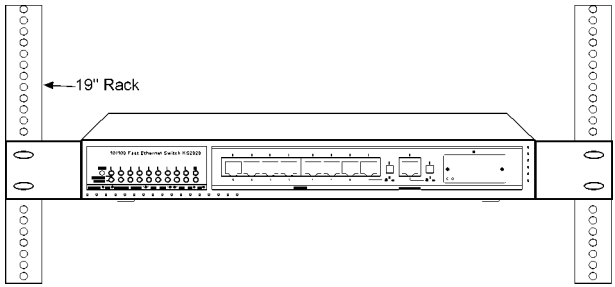

Figure 2-3 Install the Switch into the 19-inch Rack

2.3 Front Panel and Rear Panel

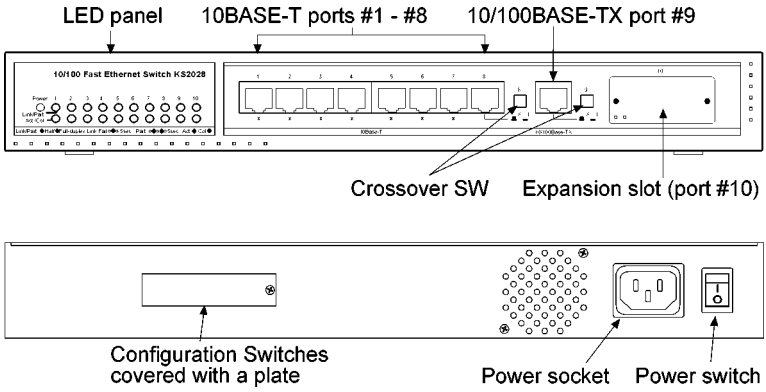

Figure 2-4 Components on the Front and Rear Panel

- **Eight 10BASE-T switched ports (Port #1 to Port #8)**

  Each port consists of an RJ-45 connector and is used for connection to a 10BASE-T hub or node.

- **One 10/100BASE-TX switched port (Port #9)**

  The port consists of an RJ-45 connector and is used for connection to a 10BASE-T or 100BASE-TX device (hub or node).

- **Crossover switches for Port #8 and Port #9**

  Each crossover switch is provided for configuring the pin assignments of the associated RJ-45 connector.

- **One expansion port slot (Port #10)**

  The port slot can accommodate one optional port module. Two types of port modules can be selected. One is a 10/100BASE-TX port module and the other is a 100BASE-FX port module. Refer to section 2.4 for how to install the module into the slot.

- **Diagnostic LED indicators**

  The indicators provide the operating status of the hub and the network ports. The status includes power, partition, duplex, activity, and collision.

- **Configuration switches**

  Two configuration switch groups are located on the rear of the switch unit. The switches are used for configuring the operation settings for all ports. The settings include mode, speed, and duplex.

2.4 Installing an Optional Port Module

Two types of port modules can be selected for the expansion port slot:

10/100BASE-TX port module

This module comes with one RJ-45 connector and one crossover switch on the front. It can support either one 10BASE-T connection or one 100BASE-TX connection. For dual-speed support, the module features the capability of speed auto-sensing.

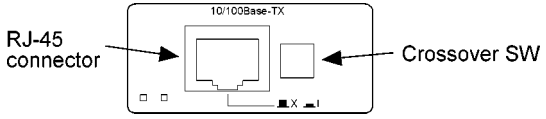

Figure 2-5 10/100BASE-TX Port Module

100BASE-FX port module

This 100Mbps-based module complies with 100BASE-FX standard and comes with two ST connectors. It can support one fiber cable segment to a Fast Ethernet network.

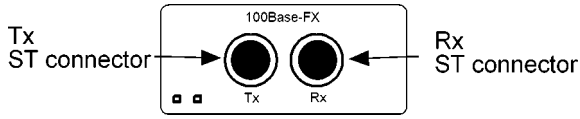

Figure 2-6 100BASE-FX Port Module

Before installing any optional modules, first turn the power to the switch off. To install a module into the expansion port slot, follow these steps:

1. Turn off the power switch.
2. Remove the cover of the slot.

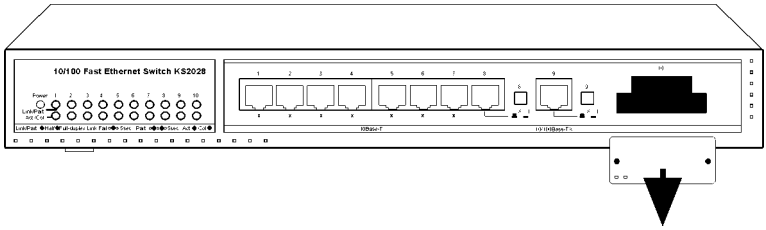

Figure 2-7 Remove the Slot Cover

3. Align the connector and insert the module until it is fully seated. Secure it to front panel.

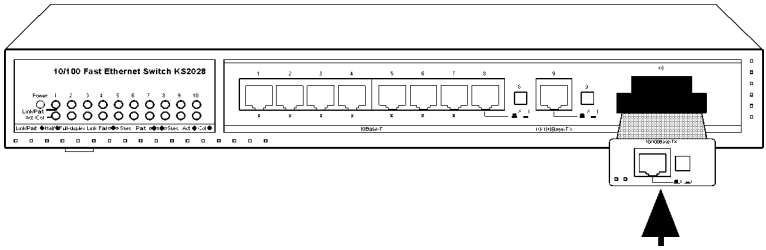

Figure 2-8 Insert Module into the Slot

2.5 Setting the Configuration Switches

Open the configuration switch cover on the rear of the unit. There are two switch groups as illustrated below:

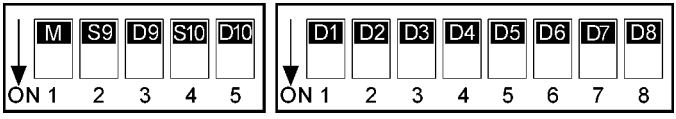

Figure 2-9 Configuration Switches

The following table specifies the definition of each switch:

The M switch only functions for Port #9 and Port #10. Since Port #1 to Port #8 are fixed 10BASE-T ports, the speed of these ports is fixed at 10Mbps. No speed selection is available. D1-D8 switches are used for selecting the duplex mode for each 10BASE-T port respectively.

Port #9 and Port #10 can be configured as NWay auto-negotition ports if the M switch is set to OFF position. This setting applies to both ports at the same time. The auto-negotiation mode enables the port to negotiate a common operation mode with the device connected at the remote end of the link cable. The common operation mode is negotiated in the sequence as follows:

When a operation mode is accepted by the remote device, the mode is used for the data transfer between the port and the connected device. Full-duplex operation enables two devices to transfer data bi-directionally at the same time.

For connecting to a **hub**, refer to the following table for the switch setting:

Port	**Connecting to**	**Setting**
Port #1 - #8	10BASE-T hub	Half duplex (D=Off)
Port #9, Port #10	10BASE-T hub	Auto-negotiation mode
Port #9, Port #10	100BASE-TX hub	Auto-negotiation mode

For connecting to other device such as another **switch** or **computer**, refer to the following table:

Port	**Connecting to**	**Setting**
Port #1 - #8	Half-duplex device	Half duplex (D=Off)
Port #1 - #8	Full-duplex device	Full duplex (D=On)
Port #9, Port #10	Non-NWay device	Manual mode
Port #9, Port #10	NWay device	Auto-negotiation mode

Factory Default Settings
All switches are set to OFF position when the switch unit is shipped out from factory. That means Port #1 to Port #8 are at half-duplex mode and Port #9 and Port #10 are at auto-negotiation mode.

Important Note:
As long as any change on the settings of the switch groups is made, you must turn the power to the switch unit off and turn it on again to make the change take effect.

3. Making Network Connections

3.1 Network Switched Ports

There are ten ports on the switch for connection to ten LAN segments. Each segment is an independent shared network in one collision-domain.

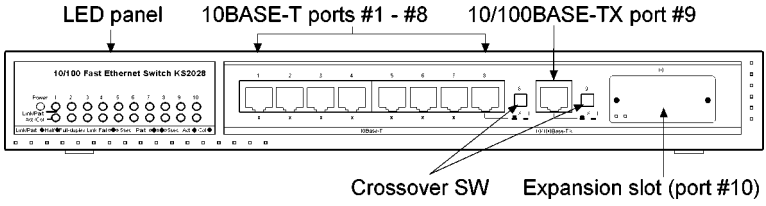

Figure 3-1 Network Ports

Port #1 to Port #8 are 10Mbps-based 10BASE-T switched ports and dedicated for connecting to eight separate 10Mbps Ethernet segments through individual 10BASE-T connections.

Port #9 is a 10/100Mbps-based dual-speed switched port. It can support connection to either one 10Mbps Ethernet segment or one 100Mbps 100BASE-TX fast Ethernet segment. It features the capability of auto-sensing the speed of the connected segment.

Port #10 is a configurable expansion port slot. The slot can be configured with one optional port module. Once installed, the slot becomes a network switched port and can be used for connecting to an additional network segment. Two optional modules are:

- 10/100BASE-TX port module - dual speed 10/100BASE-TX
- 100BASE-FX port module - 100BASE-FX fiber optic

3.2 10BASE-T Switched Ports

The individual RJ-45 connectors of Port #1 to Port #7 are defined as X type connectors and have fixed pin assignments as follows:

The following table lists the devices to which Port #1 to #7 can connect :

Device connected	Cable used
Computer 10BASE-T port	Cat. 3, 5 straight UTP
10BASE-T hub port (I type)	Cat. 3, 5 straight UTP
10BASE-T switched port (I type)	Cat. 3, 5 straight UTP

Port #8 has a configurable RJ-45 connector and its pin assignments are determined according to the setting of the crossover switch next to the RJ-45 connector as follows:

Crossover SW	PORT
	X type
	I type

The following table lists the devices to which Port #8 can connect :

Device connected	Crossover SW	Cable used
Computer 10BASE-T port	X setting	Cat. 3, 5 straight UTP
10BASE-T hub port (I type)	X setting	Cat. 3, 5 straight UTP
10BASE-T hub port (X type)	I setting	Cat. 3, 5 straight UTP
10BASE-T switched port (I type)	X setting	Cat. 3, 5 straight UTP
10BASE-T switched port (X type)	I setting	Cat. 3, 5 straight UTP

Straight UTP Cable

The cable is 2-pair Category 3 or 5 UTP and maximum length is 100 meters. The pin assignments are shown as follows:

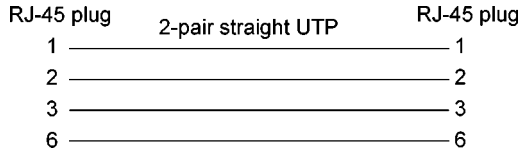

Figure 3-2 2-pair Straight UTP Cable

3.3 10/100BASE-TX Switched Ports

This section applies to the 10/100BASE-TX Port #9 and expansion slot Port #10 pre-configured with a 10/100BASE-TX port module. Use the crossover switch to set the type of RJ-45 connector as follows:

The following table lists the devices to which the ports can connect:

Device connected	Crossover SW	Cable used
Computer 10BASE-T port	X setting	Cat. 3, 5 straight UTP
10BASE-T hub port (I type)	X setting	Cat. 3, 5 straight UTP
10BASE-T hub port (X type)	I setting	Cat. 3, 5 straight UTP
10BASE-T switched port (I type)	X setting	Cat. 3, 5 straight UTP
10BASE-T switched port (X type)	I setting	Cat. 3, 5 straight UTP
100BASE-TX hub port (I type)	X setting	Cat. 5 straight UTP
100BASE-TX hub port (X type)	I setting	Cat. 5 straight UTP
100BASE-TX switched port (I type)	X setting	Cat. 5 straight UTP
100BASE-TX switched port (X type)	I setting	Cat. 5 straight UTP

Cable Type and Maximum Length

Connection	UTP Cable Category	Maximum length
10BASE-T (10Mbps)	Cat. 3, 5	100 meters
100BASE-TX (100Mbps)	Cat. 5	100 meters

3.4 100BASE-FX Module

The 100BASE-FX port module supports a connection to a Fast Ethernet network segment through a fiber optic connection. The module comes with two ST connectors. One labeled **Tx** is used for transmission. The other one labeled **Rx** is used for reception.

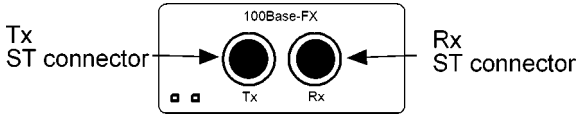

Figure 3-3 100BASE-FX Port Module

When connecting to a 100BASE-FX device using fiber cable, make sure the **Tx** connector of the module is connected to the **Rx** connector of the device and **Rx** connector is connected to the **Tx** connector of the device.

The required fiber optic cable for the connection is 1300nm 62.5/125 mm fiber cable. The maximum distance between the module and the connected device depends on the device connected and the duplex mode used for the connection as follows:

Device connected	Duplex mode	Maximum length
Computer 100BASE-FX port	Half-duplex	400 meters
Computer 100BASE-FX port	Full-duplex	2K meters
100BASE-FX hub port	Half-duplex	185 meters
100BASE-FX switched port	Half-duplex	400 meters
100BASE-FX switched port	Full-duplex	2K meters

Note:
The 100BASE-FX module does not support auto-negotiation function. When the port is set at auto-negotiation mode, it will operate in half-duplex mode automatically.

4. LED Indicators

4.1 LED Panel

The switch provides comprehensive LED indicators for diagnosing and monitoring the operation of the unit as illustrated below:

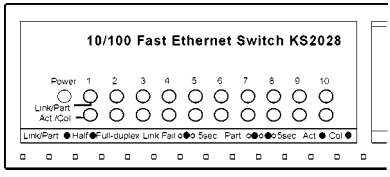

Figure 4-1 LED Indicators

4.2 Interpretation

One **Power** LED indicates the status of the power supplied to the switch.

Each port has two LEDs to indicate the port status including cable link, partition state, activity, collision, and duplex mode. Every port has identical interpretations for the LED display.

The LED can display two different colors. Different colors present different meanings as the table shown below:

Partition : the port is in partitioned state.
Activity : there are packets transmitted or received on the port.
Collision : there are collisions occurred on the port.