Installation Guide

10/100 Fast Ethernet Switch

KS-150

P/N:750-0134-001
DOC.991002-KS150-K

KTI Networks Inc. reserves the right to revise this documentation and to make changes in content from time to time without obligation on the part of KTI Networks Inc. to provide notification of such revision or change.

For more information, contact:

United States

KTI Networks Inc.
P.O. BOX 631008
Houston, Texas 77263-1008

Phone: 713-2663891
Fax: 713-2663893
E-mail: kti@ktinet.com
WWW: http://www.ktinet.com/

International

Fax: 886-2-26983873
E-mail: kti@ktinet.com.tw
WWW: http://www.ktinet.com.tw/

The information contained in this document is subject to change without prior notice.

TRADEMARKS

Ethernet is a registered trademark of Xerox Corp.

This device complies with Class A Part 15 the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received including the interference that may cause.

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.

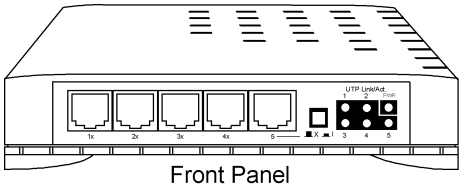
CE NOTICE

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.

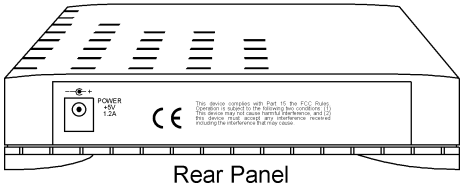
Table of Contents

1. Introduction

Driven by recent advances in desktop computing technology, today's network applications have increased in speed, power and the ability to process information. To meet the demands of these more powerful applications, this affordable switch device provides significant increase in performance for your Ethernet or Fast Ethernet network. This 5-port switch comes with multiple ports, each capable of transmitting or receiving information simultaneously at full wire speed to control and allocate the network bandwidth.



Front Panel



Rear Panel

The key features of this switch unit are:

- **Optimized Bandwidth** : Combining five 10/100Mbps-based Fast Ethernet switched ports, the switch delivers a high network bandwidth for your Fast Ethernet network
- **Easy Migration** : With 10BASE-T support on each port, the switch provides a non-disruptive and smooth migration path from Ethernet to a Fast Ethernet network.
- **Easy Installation** : With the functions of auto-speed-sensing and auto-negotiation on each port, the switch supports plug-and-play installation which eliminates configuration problems.

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 IEEE 802.3u 100BASE-TX standards, but also features:

- Five 10/100BASE-TX auto-negotiation switched ports for flexible connections to desktop PCs, servers and Ethernet hubs.
- The 10/100BASE-TX switched ports support:
  - auto speed sensing for 100Mbps or 10Mbps connection
  - auto configuration with auto-negotiation devices
  - full-duplex or half-duplex operation
- Self learning for active MAC addresses
- Store and forward switching to ensure only good packets are forwarded
- Forwarding and filtering at full wire speed
- Supports IEEE 802.3x flow control for full-duplex operation
- Supports back-pressure flow control for half-duplex operation
- Comprehensive LED indicators provide quick, easy to read port and switch information

1.2 Specifications

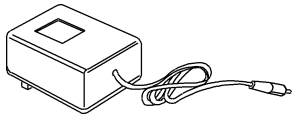
Port 1 - 4	10BASE-T/100BASE-TX connectivity One MDI-X RJ-45 jack
Port 5	10BASE-T/100BASE-TX connectivity One RJ-45 jack with MDI-X or MDI selection
Cables	10BASE-T Cat. 3, 4, 5 UTP cable (100 meters max.) 100BASE-TX Cat. 5 UTP cable (100 meters max.)
LED indicators	Power status Link/Activity/Duplex/Collision status per port
Filtering rate	14,880 pps for Ethernet (10BASE-T) 148,800 pps for Fast Ethernet (100BASE-TX)
Forwarding rate	14,880 pps for Ethernet (10BASE-T) 148,800 pps for Fast Ethernet (100BASE-TX)
Filtering address	Multicast/Broadcast/Unicast address 8K MAC addresses per unit
RAM buffers	256KB
Environment	Temperature 0°C to 40°C Relative humidity 10% to 90% non-condensing
Dimension	151 mm x 100 mm x 29 mm (WxDxH)
Power	+5V 1.2A minimum

2. Installing the Switch

2.1 Unpacking

Check to see that you have everything before you start the installation.

- Installation guide
- The switch unit
- One AC power adapter for the unit

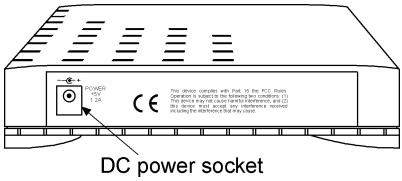


2.2 Checking AC Power

Before you begin the installation, check the AC voltage of your area. The AC power adapter which is used to supply the DC power for the unit should have the AC voltage matching the commercial power voltage in your area. The specifications of the AC power adapter are:

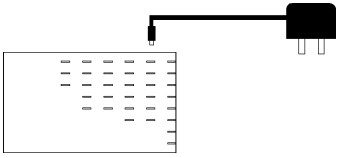
- AC input power: AC power voltage of your area
- DC output power: +5V VDC 1.2A min.
- DC plug type: 

The power socket for the AC power adapter is located on the rear of the switch as shown below:

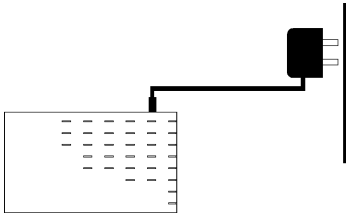


2.3 Installing the Switch

1. Install the switch with the AC power adapter provided.



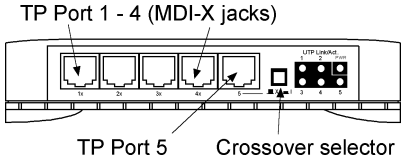
2. Connect the power adapter cable to the switch before connecting the adapter to the AC outlet.



3. Making Network Connections

3.1 Network Switched Ports

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



- **Five 10/100BASE-TX switched ports**

  Each port consists of one RJ-45 connector and is used for connection to either a 10BASE-T or 100BASE-TX device. The RJ-45 connectors of the Port 1 to Port 4 are fixed MDI-X jacks which are designed with internal crossover function. It allows a connection to an end station using straight-through UTP cable.

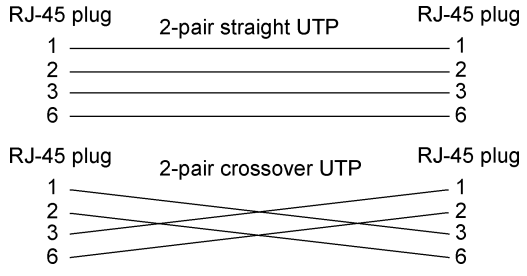
- **Crossover selector for Port 5**

  One crossover selector is provided for Port 5. It provides a flexible selection for the jack type of Port 5 RJ-45 connector. It is useful when using Port 5 as an uplink port and using straight-through UTP cable for the connection to any device.

RJ-45	Pin Definition	Port 1-4	Port 5
MDI-X	1 Rx+ 2 Rx- 3 Tx+ 6 Tx- 4,5,7,8 NC	✓	X
MDI	1 Tx+ 2 Tx- 3 Rx+ 6 Rx- 4,5,7,8 NC	N/A	I

3.2 UTP Cable

When making a connection to another device using straight-through UTP cable, make sure MDI-X to MDI connection rule is followed. The following figure illustrates the pin assignments of a straight-through UTP and a crossover UTP cable:



It is suggested to use straight-through UTP cables for all UTP connections. The maximum length and UTP cable categories used for the connections to a 10BASE-T device and 100BASE-TX device are:

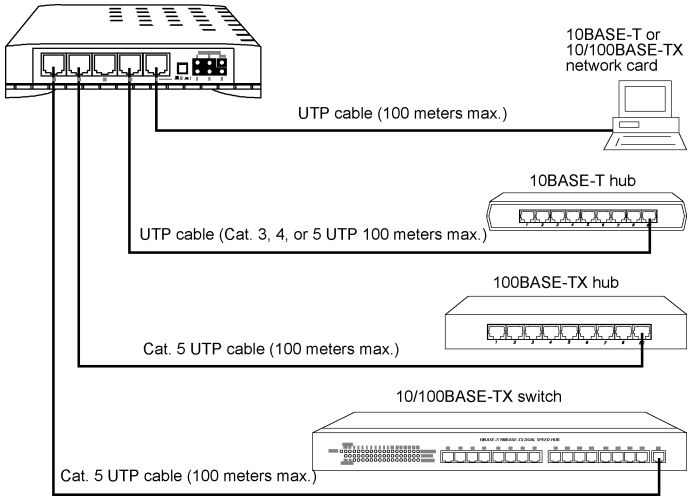
CONNECTED DEVICE	UTP CABLE USED & MAXIMUM LENGTH
10BASE-T device	Cat. 3, 4, 5 UTP (100 meters)
100BASE-TX device	Cat. 5 UTP (100 meters)

3.3 UTP Connections

The switch can support connections to the following devices:

- 10BASE-T network cards
- 10/100BASE-TX network cards
- 10BASE-T hub ports
- 100BASE-TX hub ports
- 10/100BASE-TX dual speed hub ports
- 10/100BASE-TX switch ports

The following figure illustrates some connection examples and also specifies the maximum distance of each connections:



3.4 Operating Mode

All switched ports are designed as auto-negotiation capable switched ports. Each port can determine the speed and duplex type used automatically through an auto-negotiation process with the remote connected auto-negotiation device. The auto-negotiation process is performed when the connection is made.

When connecting to a non-auto-negotiation device, each port also features the capability to auto-sense the connection speed.

The following table lists the operation mode used for the switched port when it connects to different devices. The operating mode includes the connection speed and duplex type.

Device Connected	**Operation Mode Used**
10BASE-T hub	10Mbps, half-duplex
100BASE-TX hub	100Mbps, half-duplex
Auto-negotiation device	Auto-negotiation *2
Non-auto*1 half-duplex device	auto-speed-sensing *3, half-duplex
Non-auto full-duplex device	Not supported

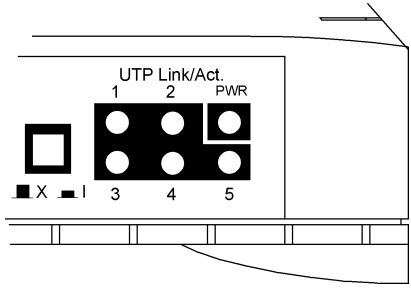
*1 Non-auto : non-auto-negotiation
*2 determined through auto-negotiation process
*3 speed is determined by auto-sensing function

Most of 10BASE-T hubs and 100BASE-TX hubs are non-auto-negotiation devices and operate on half-duplex mode.

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:



4.2 Interpretation

POWER LED : indicates the status of the power supplied to the switch.

Link/Act LED : Each port has one LEDs to indicate the port status including cable link, 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 indications as the table shown below:

PORT MODE	COLOR	STATE	INDICATION
-	-	Off	No active cable link
Half-duplex	G	On	An active link is established.
Half-duplex	G	Blink	Tx or Rx activities
Half-duplex	G/O	Blink	Tx/Rx activities and Collision
Full-duplex	O	On	An active link is established.
Full-duplex	O	Blink	Tx or Rx activities

* G : Green , O : Orange , G/O : Green/Orange flickering ,
Tx : Transmission , Rx : Receiving