KTI NETWORKS

Installation Guide

10/100 Bridging Converter

KS-220F series

Model:

KS-220F/T

KS-220F/C

KS-220F/S

KS-220F/S-A

KS-220F/S-3

KS-220F/S-5

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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.

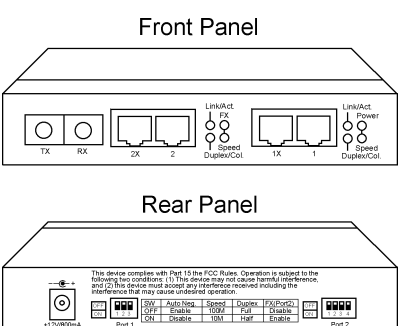
Table of Contents

1. Introduction

The 10/100 bridging converter provides two 10/100Mbps-based Fast Ethernet switch ports. Port 1 features one 10/100M UTP connection and Port 2 features either one 10/100M UTP connection or one 100M fiber connection. It provides a cost-effective solution for bridging between 10 and 100Mbps networks, extending distance for 100Mbps networks, and media conversion for UTP cable and fiber cable. Three models are available for multimode ST fiber, multimode SC fiber, and single mode SC fiber connections respectively.

Both switched ports feature NWay auto-negotiation capability by which they can negotiate the speed and duplex mode with the connected device.

The following figure illustrates the front and rear view of the switch:



Features

- Complies with IEEE 802.3u 100BASE-TX 100BASE-FX and IEEE 802.3 10BASE-T specifications
- 2 switched ports:
  Port 1 - 10/100M TP port
  Port 2 - configurable 10/100M TP port or 100M Fiber port
- The TP ports support:
  - auto speed sensing for 100Mbps or 10Mbps connection
  - auto-negotiation with NWay devices
- Each TP port provides one MDI-X jack and one MDI jack for flexible connection to different devices using straight-through UTP cable.
- Each port has an individual manual setting for speed and duplex type configuration for connecting to non-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 both ports
- Forwarding and filtering at full wire speed
- Comprehensive LED indicators
- Attachable to metal surface via flexible rubber magnet

Specifications

Standard:	10BASE-T, 100BASE-TX, and 100BASE-FX
Connectors:	Port 1 - 2 RJ-45 jacks Port 2 - 2 RJ-45 jacks and 1 fiber connector
Cables:	10BASE-T - Cat. 3, 4, or 5 UTP cable 100BASE-TX - Cat 5 UTP cable 100BASE-FX - 62.5/125μm MM fiber 100BASE-FX - 9/125μm SM fiber
LED indicators:	Link/Activity LED per port, Duplex/Collision LED per port, Speed LED per port, Power LED FX LED for Port 2
Filtering address:	1K MAC addresses shared by two ports
Filtering rate:	14,880 pps for 10M Ethernet 148,800 pps for 100M Fast Ethernet
Forwarding rate:	14,880 pps for 10M Ethernet 148,800 pps for 100M Fast Ethernet
Power:	+12VDC 800mA min.
Dimension:	144mm x 100mm x 26mm (WxDxH)
Temperature:	0^{o} to 40^{o}C when operating
Humidity:	10% to 90% non-condensing when operating

2. Installation

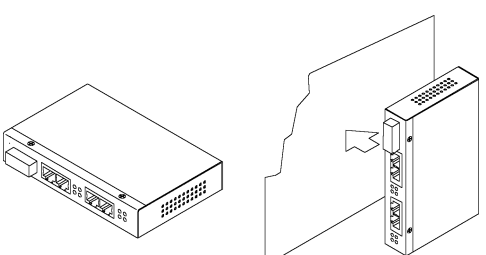
Unpacking

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

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

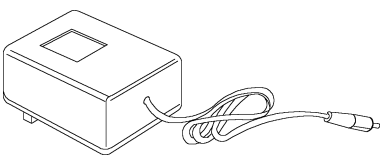
Installation

The switch can be placed on a desktop as a stand-alone unit. It also can be mounted on a magnetic-sensitive metal surface with its rubber magnet stand located on the bottom of the unit.

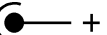


Checking AC Power

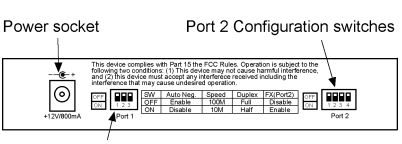
One AC power adapter is contained in the product package. Before you begin the installation, check the AC voltage of your area. The AC power adapter which is used to supply the DC power for the unit should have the AC voltage matching the commercial power voltage in your area.



The specifications of the AC power adapter are:

- AC input power: AC power voltage of your area
- DC output power: +12 VDC 800mA min.
- DC plug type: 

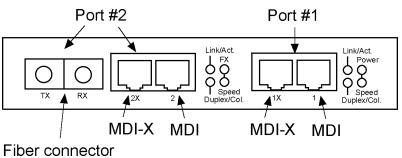
The power socket for the AC power adapter is located on the rear of the unit as shown below:



3. Making Network Connections

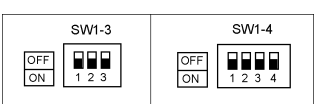
Two Switched Ports

Two switched ports are located on the front panel.



Configuration Switches

On rear panel, Port 1 and Port 2 have individual configuration switches as shown below:



Port 1, Port 2	SW1	Off	Auto-negotiation is enabled.
		On	Auto-negotiation is disabled.
Port 1, Port 2	SW2	Off	100Mbps is used. (When SW1 = On)
		On	10Mbps is used. (When SW1 = On)
Port 1, Port 2	SW3	Off	Full-duplex is used. (When SW1 = On)
		On	Half-duplex is used. (When SW1 = On)
Port 2 only	SW4	Off	Fiber connector is disabled.
		On	Fiber connector is enabled.

Factory Defaults

SW1	Off	Auto-negotiation is enabled.
SW2	Off	100Mbps
SW3	Off	Full-duplex
SW4	On	Fiber connector is enabled.

Important Note:
If any change are made to the configuration switch settings, the power to the unit must be turned off and turned on again before the changes can take effect.

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 includes connection speed and duplex type. When an operation mode is accepted by the remote device, the mode is used for the data transfer between the port and the connected device.

TP Ports

In order to provide flexible connection to a remote device using a popular straight-through UTP cable, each port features two types of RJ-45 jacks.

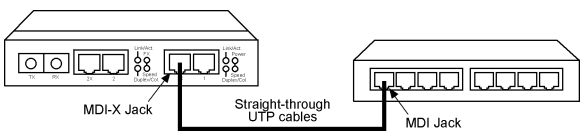
Jack	Function
1X	MDI-X jack for Port #1
1	MDI jack for Port #1
2X	MDI-X jack for Port #2
2	MDI jack for Port #2

The pin assignments of the jacks are defined as follows:

Pin	MDI-X Jacks	MDI Jacks
1	RX data +	TX data +
2	RX data -	TX data -
3	TX data +	RX data +
6	TX data -	RX data -
4,5,7,8	NC	NC

UTP Connections

The following figure shows a UTP connection from TP port to another device via a straight-through UTP cable. When TP port of Port 2 is used, make sure Port 2 SW4 is set to OFF position.



Depending on the configuration switch setting, the operating modes used for connecting to different devices are shown as follows:

Connected Device	SW1 setting	Port Operation Mode
10M Ethernet hub	AUTO	10BASE-T, half-duplex
100M Fast Ethernet hub	AUTO	100BASE-TX, half-duplex
10/100M dual speed hub	AUTO	100BASE-TX, half-duplex
10/100M NWay switch	AUTO	100BASE-TX, full-duplex
10/100M NWay NIC card	AUTO	100BASE-TX, full-duplex
10M Ethernet device	Non-auto	10BASE-T, half-duplex

* Note that all hub devices are half-duplex devices.

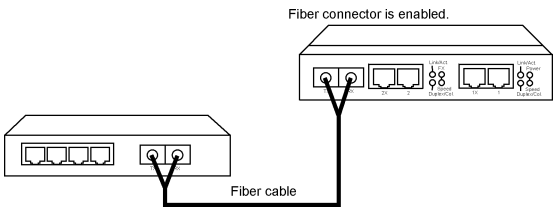
Compliant UTP Cables

Connection	UTP Cable Type	Maximum Length
10BASE-T	Cat. 3, 4, or 5	100 meters
100BASE-TX	Cat. 5	100 meters

When using a straight-through cable for the connection, make sure the MDI-X to MDI connection rule is followed.

Fiber Port and Fiber Connection

When connecting to a 100BASE-FX device using fiber cable, make sure Port 2 SW4 is set to ON position and TX-to-RX connection rule is followed.



Since the fiber connector does not support auto-negotiation function, it is recommended to set SW1 to ON position for the fiber connection. If SW1 is set to OFF, it operates on half-duplex mode.

Fiber Cables

The required fiber cable for the connection are:

Model	**/T model**	**/C model**	**/S series**
Fiber mode	Multimode	Multimode	Single mode
Wavelength	1300µm	1300µm	1300µm
Connectors	ST	SC	SC

Multimode fiber: 50/125, 62.5/125, 85/125, 100/140µm
Single mode fiber: 9/125µm

The maximum distance connecting to a 100BASE-FX device depends on the device connected and the duplex mode used for the connection as follows:

MULTIMODE FIBER CABLE

Connected device	Duplex type	Maximum length
100Base-FX NIC card	Half-duplex	400 meters
100Base-FX NIC card	Full-duplex	2K meters
100Base-FX hub port *1	Half-duplex	185 meters
100Base-FX hub port *2	Half-duplex	110 meters
100Base-FX switched port	Half-duplex	400 meters
100Base-FX switched port	Full-duplex	2K meters

*1 : One Class II hub network
*2 : Two Class II hub network

SINGLE MODE FIBER CABLE

Connecting to	Duplex type	Maximum length
100Base-FX NIC card	Full-duplex	15Km (S, S-A model)
100Base-FX switched port	Full-duplex	15Km (S, S-A model)
100Base-FX NIC card	Full-duplex	30Km (S-3 model)
100Base-FX switched port	Full-duplex	30Km (S-3 model)
100Base-FX NIC card	Full-duplex	50Km (S-5 model)
100Base-FX switched port	Full-duplex	50Km (S-5 model)

Applications

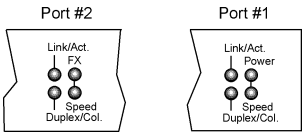
The following table lists some applications using the device:

Applications	Port 1 connection	Port 2 connection
Bridging device	10M network	100M network
Distance extender*	100M hub	100M hub
Media conversion	UTP cable	Fiber cable

* The maximum diameter for a 100M network is 205 meters with two Class II hubs. With the bridging converter, the network diameter can be extended up to 410 meters.

4. Interpreting LED Indicators

The following figure shows the locations of the LED indicators:



Power

State	Indication	Interpretation
On	Normal	The power of the unit is on.
Off	Problem	No power is being supplied to the unit.

Link/Act. (Link/Activity)

State	Indication	Interpretation
On	Normal	An active link is established.
Off	Normal	No active link
Blink	Normal	There are data transfer activities

Duplex/Col (Full-duplex/Collision)

State	Indication	Interpretation
On	Normal	Full-duplex mode is used.
Off	Normal	Half-duplex mode is used.
Blink	Normal	Collisions occur (half-duplex is used).

Speed

State	Indication	Interpretation
On	Normal	100M speed is selected. (Power ON default)
Off	Normal	10M speed is selected.

FX

State	Indication	Interpretation
On	Normal	Fiber port is used on Port 2.
Off	Normal	UTP port is used on Port 2.