

## Introduction

The FRM220-1000T(S) is a slide-in fiber media converter available in a number of different models that also act as line cards for placement in the FRM220 platform Media converter chassis. The FRM220-CH01 are stand-alone cases of FRM220 slide-in card with built-in power supply features. The FRM220-1000T(S) is a media converter for 1000Base-T to 1000Base-X SFP. The data transmission over optical fiber media converter depending on your specific network needs. All media converter are available with either multi-mode or single-mode optical transceivers and with connector SC or LC. In single mode, WDM (Wave Division Multiplexing with SC or LC) or "Bidi" are also available in 20, 40, 60km reach, which provide the ability to transmit and receive data using only a single optical fiber. When the FRM220-1000T(S) card is placed in the FRM220 rack with SNMP management, the card status, type, fiber link status and UTP link status can all be displayed. For the UTP side, auto-negotiation is default. These units will automatically tailor themselves to convert both half-duplex or full-duplex signals. The Fiber media converters give you the freedom to extend your Ethernet network cabling distance by allowing connectivity up to 120 kilometers. LED indicators display the status of the converters.

## Features

- 1000Base-T to 1000Base-SX/LX
- Network management via terminal or SNMP in FRM220 chassis
- 1000Base Full / Half
- Auto MDI/MDIX
- Forward 9K bytes (Max.) packets
- Support Link Fault Pass Through (LFP) function
- Auto Laser Shutdown (ALS)
- Fiber port Auto/Force mode

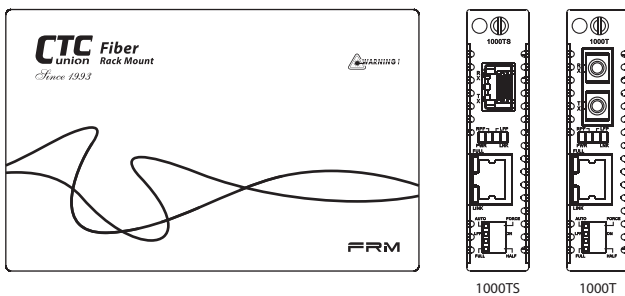
# User Guide

- Gigabit Ethernet over Fiber Media Converter
- FRM220-1000T(S)

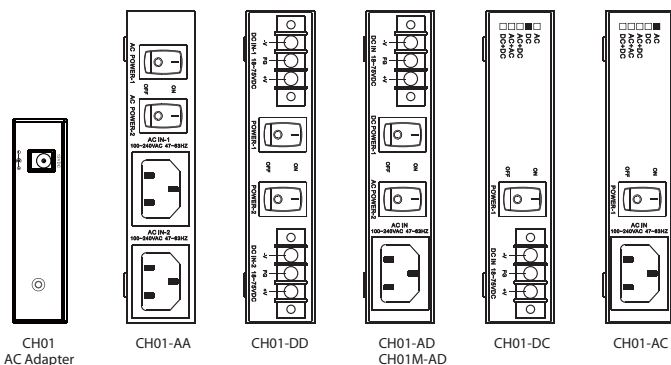


## Panel

- Figure #1. Upper Panel of FRM220-1000T(S)



- Figure #2 Stand-alone Power types of FRM220-1000T(S)



## Specifications

### Standards

IEEE802.3ab 1000Base-T, IEEE802.3z 1000Base-SX/LX, Gigabit Standards

### 1000BASE-T RJ-45 Connectors

1000T(S) : One RJ45 connector is provided for UTP cable connection  
All RJ45 ports utilizing auto MDI/MDIX, which allow all UTP connections for both straight and crossover UTP cable.

RJ-45 Pin	568-A type	568-B type
5	Pair1-Tip	Pair1-Tip
4	Pair1-Ring	Pair1-Ring
3	Pair2-Tip	Pair3-Tip
6	Pair2-Ring	Pair3-Ring
1	Pair3-Tip	Pair2-Tip
2	Pair3-Ring	Pair2-Ring
7	Pair4-Tip	Pair4-Tip
8	Pair4-Ring	Pair4-Ring

### 1000Base-X Fiber Optic Connectors

1000TS : One SFP slot LC connector is provided for optic cable connection.  
1000T : One SC connector is provided for optic cable connection

### Environment

Operating -- -10°C ~ 60°C, Storage -- -20°C ~ 70°C, Humidity -- 10 ~ 95%, (non-condensing)

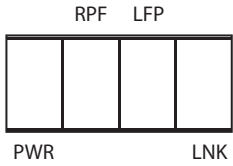
### Power

Adapter: 12V DC 1A, Built-in AC Power 100~240 V, Built-in DC Power 18~75VDC

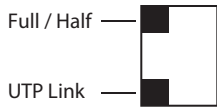
### Dimension and Weight: (W x D x H) mm

- 1000T(S)-DC12 : 88 × 160 × 24
- 1000T(S)-DC48 : 135 × 201 × 35
- 1000T(S)-AC : 135 × 201 × 35
- 1000T(S)-AD/AA/DD : 135 × 201 × 35

## LED Indicators

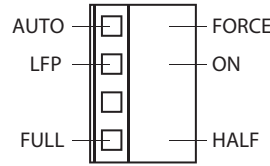


LED	Function	State	Status
PWR	Power indicator	On	Converter has power
		Off	Converter has no power
Link	Fiber link	On	Link on
		Off	No link or the link is faulty
		Blinking	Receiving data on the fiber
RPF	Remote Power Fail	On	Remote Power Fail
		Off	Remote Power is normal
LFP	LFP mode	On	Link Fault Pass Through enable
		Off	Link Fault Pass Through disable



LED	Function	State	Status
Duplex	Full/Half mode	Green	Full Duplex
		Off	Half Duplex
Link	Ethernet link	On	The UTP link is ok
		Off	No link or the link is faulty
		Blinking	Receiving data on Ethernet

## 1000T(S) DIP Switch:



Dip Switch		Function
Pin 1	Off	UTP Full duplex
	On	UTP Half duplex
Pin 2	Off	Reserved
	On	Reserved
Pin 3	Off	LFP function Off
	On	LFP function On
Pin 4	Off	Fiber Auto mode
	On	Fiber Force mode

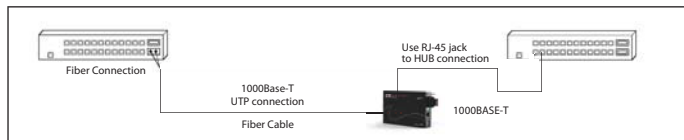
## Installation

Connect the fiber interface cable to the FRM220-1000T(S). Using a straight through or cross UTP cable, connect the Ethernet connection to the appropriate RJ-45 jack. Set the "Duplex" switch (full and half) according to the specifications of your equipments. Follow the connection examples below.

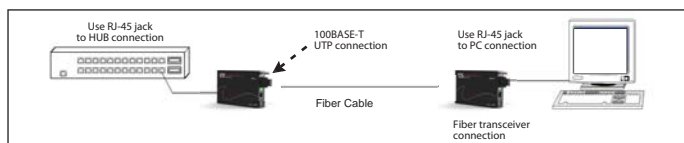
Install the fiber converter with the DC power adapter provided (+12VDC) and connect the adapter to an AC outlet.

### Connections

The following example illustrates the connection scheme when connecting from a 1000BASE-T port of one HUB to a 1000BASE-SX/LX port of another HUB through the fiber converter.



The following example illustrates the connection scheme when connecting from a 1000BASE-T port of one HUB to a 1000BASE-T Network Interface Card (NIC) in a computer through the fiber converter.



## Link-Fault-Pass through (LFP) Application Note

This media converter incorporates a Fiber Pass Through feature which allows indirect sensing of a Fiber Link Loss via the 10/100/1000 Base-TX UTP connection. Whenever the media converter detects a Link Loss condition on the Receive fiber (Fiber LNK OFF), it disables its UTP transmitter so that a Link Loss condition will be sensed on the receive UTP port. (See the following figure) The link loss can then be sensed and reported by a Network Management agent at the remote UTP port's host equipment.

This feature has no effect on the media converter's UTP LNK LED, which continues to function normally, independent of the state of the Fiber LNK LED and the UTP transmitter. This feature is enabled by default on all the FIB1-1000 family media converters.

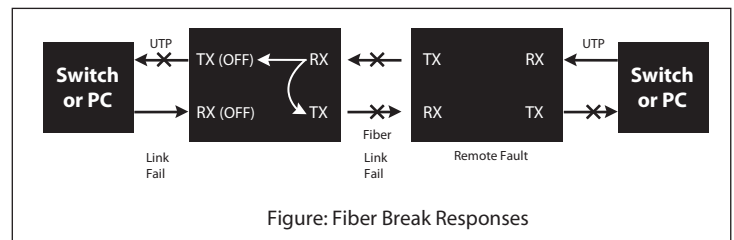


Figure: Fiber Break Responses