

## Introduction

The FRM220-1000E Families are slide-in fiber media converters 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 for FRM220 slide-in cards with built-in power supply features. The FRM220-1000EDS is a media converter with 2-port 10/100/1000Base-T to 2-port 1000Base-X SFP. The FRM220-1000ES-1 is a media converter with 1-port 10/100/1000Base-T to 1-port 1000Base-X SFP. The FRM220-1000E-1 is a media converter with 1-port 10/100/1000Base-T to 1-port 1000Base-X. The data transmission over optical fiber media converter depends on your specific network needs

All media converters 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 FRM220-1000E 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.

## User Guide

### Gigabit Ethernet over Fiber Media Converter FRM220-1000EDS, FRM220-1000E(S)-1



## Panel

Figure #1. Upper Panel of FRM220-1000E

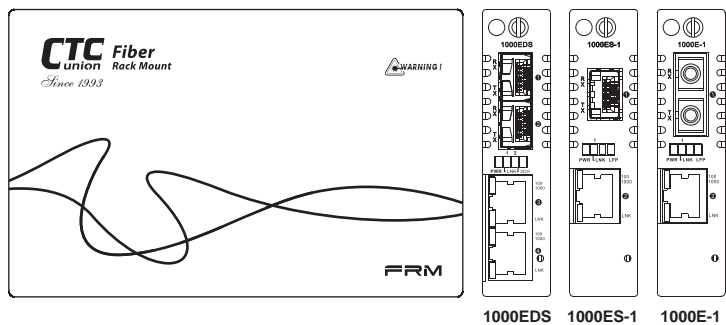
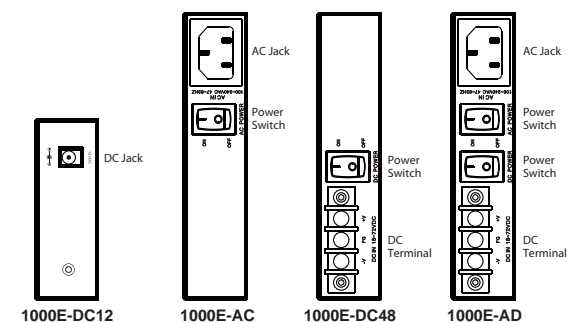


Figure #2 Stand-alone rear panel of FRM220-1000E



## Specifications

### Standards

IEEE802.3 10Base-T, IEEE802.3u 100Base-TX, IEEE802.3ab 1000Base-T, IEEE802.3z 1000Base-SX/LX, Gigabit Standards

### 10/100/1000Base-T RJ-45 Connectors

- 1000EDS : Two RJ45 connectors are provided for UTP cable connection.
- 1000ES-1 : One RJ45 connector is provided for UTP cable connection
- 1000E-1 : 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

- 1000EDS : Two SFP slot LC connectors are provided for optic cable connection.
- 1000ES-1 : One SFP slot LC connector is provided for optic cable connection
- 1000E-1 : One SC connector is provided for optic cable connection

### Environment

Operating -- 0°C – 50°C, Storage -- 0°C – 70°C, Humidity -- 10 – 90% (non-condensing)

### Power

Adapter: 12V DC 1A, Built-in AC Power 100~240 V, Built-in DC Power 18~72VDC

### Dimensions: (W x D x H) mm

1000E-DC12 : 88 × 160 × 24      1000E-AC : 135 × 201 × 35  
1000E-DC48 : 135 × 201 × 35      1000E-AD : 135 × 201 × 35

## LED Indicators

### 1000EDS



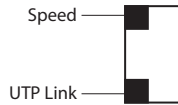
PWR Link 1 Link 2 2CH

### 1000E(S)-1



PWR Link 1 LFP

LED	Function	State	Status
PWR	Power indicator	On	Converter has power
		Off	Converter has no power
Link1	Fiber link 1	On	Link on
		Off	No link or the link is faulty
		Blinking	Receiving data on the fiber
Link2	Fiber link 2	On	Link on
		Off	No link or the link is faulty
		Blinking	Receiving data on the fiber
2CH	Operation mode	On	2-channel converter mode
		Off	4-port switch mode
		LFP	LFP mode
		Off	Link Fault Pass Through disable



## UTP Port LED Indicators

LED	Function	State	Status
Speed	mode display	Yellow	1000Base-TX
		Green	100Base-TX
		Off	10Base-T
		On	The UTP link is ok
Link	Ethernet link	Off	No link or the link is faulty
		Blink	Receiving data on Ethernet

## 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.

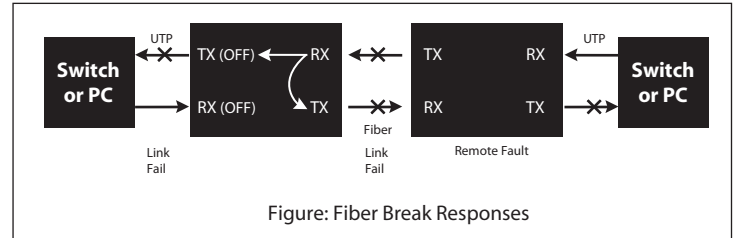
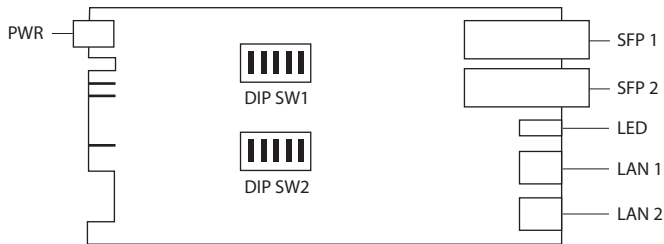


Figure: Fiber Break Responses

## 1000EDS DIP Switch :

### DIP SW1 for LAN1 and DIP SW2 for LAN2 Setting



Pin 1	Pin 2	Pin 3	Pin 4	Function
Off	Off	Off	-	UTP/N - Way
On	Off	Off	-	UTP 1000Mbps/Full
Off	On	Off	-	UTP 100Mbps/Full
Off	On	On	-	UTP 100Mbps/Half
On	On	Off	-	UTP 10Mbps/Full
On	On	On	-	UTP 10Mbps/Half
-	-	-	On	LFP On (used in converter mode)
-	-	-	Off	LFP Off (used in converter mode)

### DIP SW1 Pin 5 Operation mode:

Dip SW1 Pin 5 off: 4-port switch mode (default)

Dip SW1 Pin 5 on: 2-channel converter mode

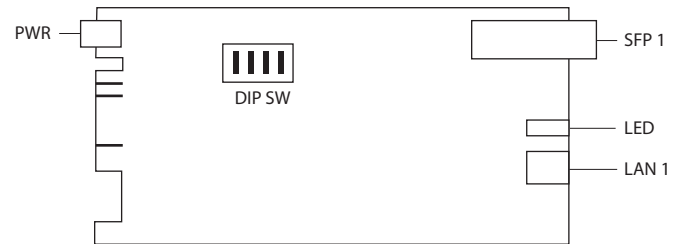
Channel one converter: SFP1 to LAN1

Channel two converter: SFP2 to LAN2

### DIP SW2 Pin 5 (Reserved)

## 1000E(S)-1 DIP Switch :

### DIP SW1 for LAN1 Setting



Pin 1	Pin 2	Pin 3	Pin 4	Function
Off	Off	Off	-	UTP/N - Way
On	Off	Off	-	UTP 1000Mbps/Full
Off	On	Off	-	UTP 100Mbps/Full
Off	On	On	-	UTP 100Mbps/Half
On	On	Off	-	UTP 10Mbps/Full
On	On	On	-	UTP 10Mbps/Half
-	-	-	On	LFP On
-	-	-	Off	LFP Off

### Note :

- If all types of slide-in card were installed in FRM220 chassis, The SNMP command will takeover the Dip switch setting.