

## Introduction

The FRM220-10/100iS-2 is a dual channel (two in one) 10/100Base Ethernet to 100Base-FX fiber slide-in card converter designed for central applications. With advanced features like bandwidth control, this media converter is targeted for first mile equipment in metro LAN, campus, enterprise and FTTx applications. By offering in-band management, this converter can be completely controlled and monitored from a centrally located managed rack controlling all converter settings including band-width control, duplex, and speed configuration. This media converter is completely transparent to Layer 2 and Layer 3 protocols including IEEE 802.1q, VLAN tag, Q in Q, STP, IPX, IP, etc.

## Features

- 2 independent 10/100BASE-TX to 100BASE-FX Converters
- Compatible with FRM220 10/100i
- 2 independent channels OAM in-band management media converter
- Auto-Cross over for MDI/MDIX at TP port
- Supports far end fault function
- Auto-Negotiation or forced mode at TP port
- Supports link fault pass through (LFP) function
- Supports flow control
- Bandwidth control (32K or 512Kbps x N)
- Supports Loop Back Test
- Forward 2046 bytes (max.) packets in switch mode
- Forward 9K jumbo packets in converter mode
- Supports remote CPE power fail detection (dying gasp)
- Supports Auto Laser Shutdown (ALS) function
- Supports On-line remote F/W upgrade

# User Guide

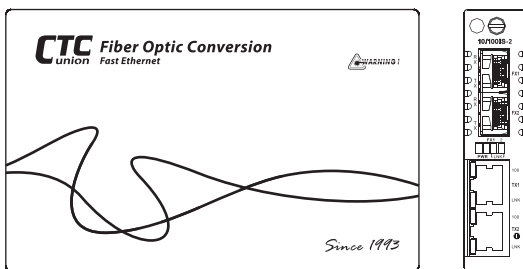
## In-band Managed Fiber Media Converter

- Dual channels 10/100Base-TX / 100Base-FX
- FRM220-10/100iS-2

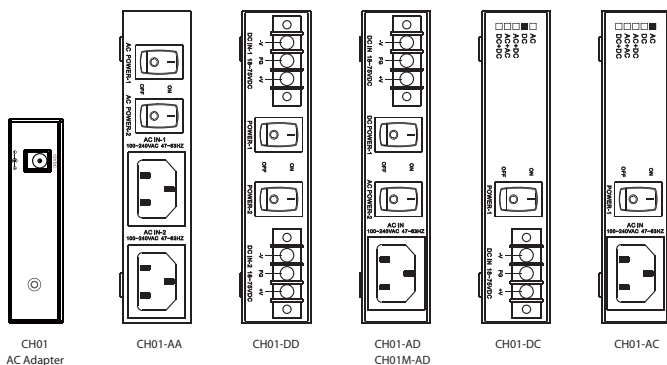


## Panel

- Figure #1. Front Panel of FRM220-10/100iS-2



- Figure #2. Rear Panel of Stand-alone FRM220-10/100iS-2 FRM220-10/100iS-AC/DC48/AD/AA/DD



## Specifications

### Standards

IEEE802.3 10BASE-T, IEEE802.3u 100BASE-TX, 100BASE-FX  
Supports Full Duplex Ethernet mode  
Supports Ethernet Packet up to 2046Bytes. In switch mode or jumbo Packets (>9K) in converter mode.

### 10/100BASE-TX RJ-45 Connectors

Two RJ-45 connectors are provided for LAN port TX1, TX2  
Auto MDI-X allows all UTP connections to be made using only a common straight-through UTP cable.

RJ-45 Pin	MDI-X type	MDI type
1	Rx+	Tx+
2	Rx-	Tx-
3	Tx+	Rx+
6	Tx-	Rx-

### 100BASE-TX UTP Cable

Cable type: 100Base-Tx; Category 5 or better  
Maximum cable distance: 100 meters (328 feet)

### Fiber Optic Connectors

FRM220-10/100iS-2 : two SFP slots LC connectors are provided for FX1, FX2

### Environment

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

### Power

Adapter: 12VDC 1A, Built-in AC Power 100~240V, Built-in DC Power 18~72VDC  
Consumption : < 5W

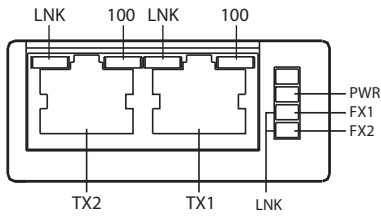
### Dimension and Weight: (W x D x H) mm

- 10/100iS-2-CH01 : 88 × 168 × 23 mm
- 10/100iS-2-CH01/AC : 135 × 212 × 32 mm
- 10/100iS-2-CH01/DC : 135 × 222 × 32 mm
- 10/100iS-2-CH01/AD : 135 × 222 × 32 mm
- 10/100iS-2-CH01/AA : 135 × 212 × 32 mm
- 10/100iS-2-CH01/DD : 135 × 222 × 32 mm
- 10/100iS-2-CH01M/AC : 135 × 212 × 32 mm
- 10/100iS-2-CH01M/DC : 135 × 222 × 32 mm
- 10/100iS-2-CH01M/AD : 135 × 222 × 32 mm
- 10/100iS-2-CH01M/AA : 135 × 212 × 32 mm
- 10/100iS-2-CH01M/DD : 135 × 222 × 32 mm

### Certification

FCC Part 15 Class A, CE Mark

## LED Indicators



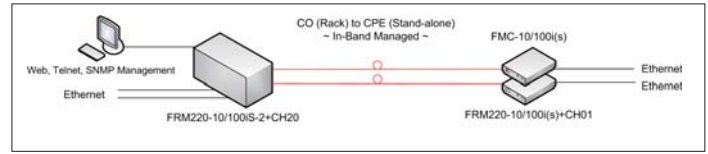
PWR	On :	Power On
FX1 LNK	On :	Link ok
	Off :	Link fail
	Flash :	Link ok and receive activity
FX2 LNK	On :	Link ok
	Off :	Link fail
	Flash :	Link ok and receive activity
100 (TX1, TX2)	On :	100 Base
	Off :	10 Base
LNK (TX1, TX2)	On :	Link ok
	Off :	Link fail
	Flash :	Link ok and receive activity

## Installation

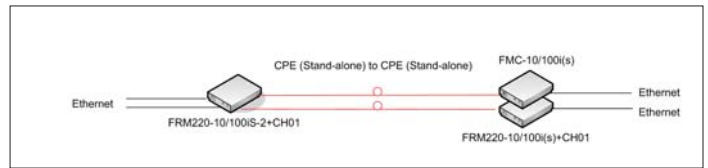
Connect the Ethernet cable to the FRM220-10/100iS-2 Series. The Converter will sense whether to operate in full or half mode and will be indicated on the LED. Follow the connection examples below. Install The fiber converter with the DC power adapter provided (+12VDC, 1A) And connect the adapter to an AC outlet.

## Connections

The following example illustrates the connection scheme when 2-channel FRM220-10/100iS-2 slide-in card converter in FRM220 chassis connect to two of one channel FRM220-10/100i(S) stand-alone converters through the fiber

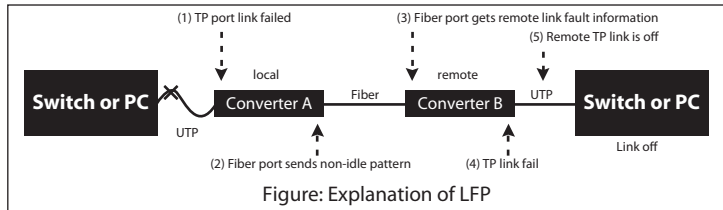


The following example illustrates the connection scheme when 2-channel FRM220-10/100iS-2 stand-alone converter connect to two of one channel FRM220-10/100i(S) stand-alone converters through the fiber



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

When 'link fault pass through' function is enabled, link status on TX port will inform the FX port of the same device and vice versa. From the link fault pass through explanation in the figure below, if link fail occurs on TX port (1), the local FX port sends non-idle pattern to notify the remote FX port (2). The remote FX port then forces its TX port to link failed after receiving the non-idle pattern (4). This mechanism will alert the link fault status of local TX port to the remote converter's TX port, and the link status of the remote TX port will become down. Link status LED will also be off for both. Link Fault Pass through is enabled by setting DIP switch 4 (ON).



## Notice

### Auto Laser Shutdown (ALS) function

Fiber loss will cause the fiber output off, for the eyesight safety.

### Fiber Hardware Reset (FHR)

Fiber loss will cause a hardware reset on the device.

While a remote fiber linked CPE device lost control by any software process, we can turn off the fiber optic output on the local device by the SNMP manager or just make a fiber disconnect. This will let the remote CPE device make a hardware reset (or call a Cool Start) by itself. Let this device rework again as normal.

## NOTE :

### 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 expressly 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 PUB.22 Class 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 55022:1994/A1:1995/A2:1997 Class A and EN61000-3-2:1995, EN61000-3-3:1995 and EN50082-1:1997