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User Guide

4 Port (1+3) Fast Ethernet Switch FRM220-FSW103 (Fiber Switch Card)



Table of Contents

Introduction	-----	1
Features	-----	1
Specifications	-----	2
Panel	-----	3
LED Indicators / Installation	-----	4
Console Management	-----	5
Operation	-----	6
Digital Optical Monitoring	-----	7
Auto Laser Shutdown	-----	7
Upgrading	-----	8
About SFP Modules	-----	9

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Introduction

This QIG applies to CTC Union's **FRM220A-FSW103**. This guide will help the newcomer, engineer or administrator quickly configure the device.

FRM220A-FSW103 is a three port copper to single port fiber Fast Ethernet solution designed to make conversion between 10/100Base-TX and 100Base-FX with SFP. With SNMP and Web-based management in **FRM220-NMC**, the network administrator can monitor, configure and control the activity of each card from a centrally located managed rack controlling all converter settings including 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

- 3 Port 10/100BASE-TX and 1 Port 100BASE-FX Converter.
- Auto-Cross over for MDI/MDIX at UTP port.
- Auto-Negotiation or Manual mode for UTP port.
- Supports flow control (802.3X).
- Forward 1552 bytes (max MTU).
- Supports LED indicators : Power / FX-Link, TX1-Link/TX1-Speed, TX2-Link/TX2-Speed, TX3-Link/TX3-Speed.
- Supports **FRM220** or **FRM220A** (for Ethernet Aggregation) managed chassis systems.
- Supports the local management (Monitor or Configure status) by the SNMP manager when placed in managed system.
- Supports DOM function for SFP fiber transceiver.
- Supports Auto Laser Shutdown (ALS) function.
- Provides product information for management.
- Supports On-Line F/W upgrade (local) by the SNMP manager when placed in managed system.

Management Features

When placed in a stand-alone chassis with console port, these devices support a text based serial terminal with an easy to use menu system for configuration. When placed in a managed chassis, the card is configured and monitored through the chassis **NMC** (network management controller) via console, Telnet, Web HTTP or SNMP.

Specifications

Standard

IEEE802.3 10BASE-T, IEEE802.3u 100BASE-TX, 100BASE-FX
 Supports Full Duplex Ethernet mode
 Supports Ethernet Packet up to 1552KBytes in size.

10/100BASE-TX RJ-45 Connectors

FRM220A-FSW103 : Three RJ45 connectors and one SFP cage are provided

Auto MDI-X allows all UTP connections to be made using only a common straight-through UTP cable.

Optical Specifications

100Base-FX Connector

FRM220A-FSW103 : One SFP with LC connector can be provided for optic cable connection.

Power

Adapter: 12VDC, Built-in AC Power 100-240V, Built-in DC Power 18-72V Consumption <4W

Environment

Operating -- 0°C ~ 80°C, Storage -- -10°C ~ 80°C, Humidity -- 10 ~ 95% (non-condensing)

Weight

FRM220-FSW103-DC12: 400g

FRM220-FSW103-AC: 750g

FRM220-FSW103-DC48: 750g

FRM220-FSW103-AA/DD: 800g

Dimensions (W x D x H) mm

FRM220-FSW103-DC12: 88 x 160 x 24

FRM220-FSW103-AC: 135 x 201 x 35

FRM220-FSW103-DC48: 135 x 201 x 35

FRM220-FSW103-AD: 135 x 201 x 35

FRM220-FSW103-AA/DD : 135 x 201 x 35

Certifications

CE (EM/LVD), FCC Class A, RoHS compliant

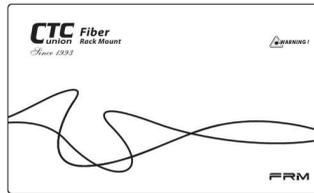
WARNING: Fiber optic equipment may emit laser or infrared light that can injure your eyes. Never look into an optical fiber or connector port. Always assume that fiber optic cables are connected to a laser light source.

- 2 -

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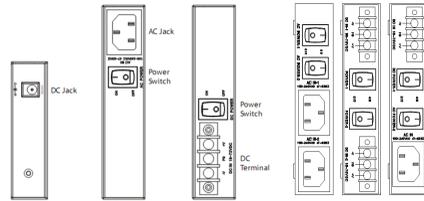
Panel

Figure 1. Upper Panel of FRM220A-FSW103



FRM220-FSW103

Figure 2. Stand-alone Rear Panel of FRM220A-FSW103



FSW103-DC12

FSW103-AC

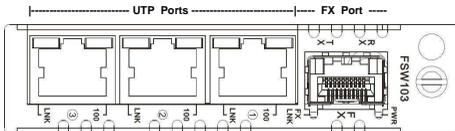
FSW103-DC48

FSW103-AA/DD/AD

- 3 -

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LED Indicators

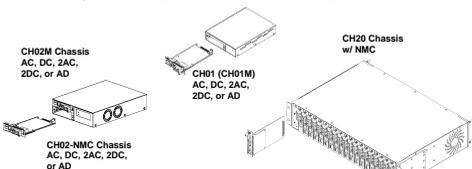


LED	Color	State	Status
PWR	(Green)	On	Power on
		Off	Power off or device disabled
		Flash	During firmware upgrade
FX	(Green)	On	Fiber port link
		Off	Fiber port no link
		Flash	UTP port at 100M
100	(Green)	On	UTP port at 100M
		Off	UTP port at 10M
		Flash	UTP port link and active
LNK	(Green)	On	UTP port link
		Off	UTP port no link
		Flash	UTP port link and active

Installation

Slide-in Card mounting of FRM220A-FSW103

Note: This converter card can be placed in CH01, CH01M 1-slot w/console, CH02M 2-slot w/console, CH02-NMC 2-slot with NMC or the full CH20 chassis.



Follow all ESD precautions when handling the card and SFP modules.

- 4 -

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Console Management

When placed in the 1-slot CH01M or 2-slot CH02M chassis, this card can be locally managed by connecting a simple serial terminal such as a notebook computer that has an RS232 port or via a commonly available USB to RS232 adapter. In Windows XP, HyperTerminal™ is an application available for emulating a serial terminal. You can also search for TeraTerm or PuTTY which are free alternatives, especially if the operating system is Vista or Win7.

Settings

Baud Rate: 38,400

Data bits: 8

Parity bits: none

Stop bits: 1

Handshaking: none

Emulation: VT-100

Connect the serial cable to the CH01/2M's DB9. Run the terminal emulation program. With power on, press [ESC], [space] or [Enter] to display the 'Main Menu' screen. The following is an example.

```

*****
*** CTC UNION TECHNOLOGIES CO.,LTD ***
*** FRM220A-FSW103 Manager Ver:1.0 ***
*****
Version:[1.00 -1.000-0.000-0.000] [ CH01M ]

<1> LAN 1 Service [ On ] Link [ Up ]
<2> Negotiation [ Auto ]
<3> Speed [ 100 ] Status[ 100 ]
<4> Duplex [ Full ] Status[ Full ]

<5> LAN 2 Service [ On ] Link [ Down ]
<6> Negotiation [ Auto ]
<7> Speed [ 100 ] Status[ 10 ]
<8> Duplex [ Full ] Status[ Half ]

<9> LAN 3 Service [ On ] Link [ Down ]
<A> Negotiation [ Auto ]
<B> Speed [ 100 ] Status[ 10 ]
<C> Duplex [ Full ] Status[ Half ]

<D> Device Status and Configuration
<E> Fiber Status and Configuration
<F> Setting Password
    
```

- 5 -

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Operation

Select any of the menu items by keying in the menu item number or letter. Use the [ESC] to return to a previous menu. Any setting is immediately applied to the transponder's circuitry. After all of the parameter settings have been selected, go to the <D> **Device Status and Configuration** menu from the main menu and press <Z> **Store Configuration** to write the configuration in non-volatile RAM (NVR).

Explanation of Settings

<1,5,9>. **LAN Service:** This brings up the sub-menu to enable/disable the device's port. When disabled, no traffic can go through.

<2,6,A>. **Negotiation:** The default setting provides auto-negotiation per IEEE802.3u. Using this selection will bring up the sub-menu to switch to manual mode setting.

<3,7,B>. **Speed:** This will bring up the sub-menu to set the speed to either 10M or 100M. This setting will not be applied unless the negotiation is set to Manual.

<4,8,C>. **Duplex:** This will bring up the sub-menu to set the duplex to either Full or Half. This setting will not be applied unless the negotiation is set to Manual.

<D>. **Device Status and Configuration:** This will bring up the sub-menu that includes disabling the entire device (all ports), saving the configuration to NVR, restoring the factory default configuration, and resetting the switch.

<E>. **Fiber Status and Configuration:** This will bring up the sub-menu specifically for the fiber interface. This includes enabling or disabling Auto Laser Shutdown (ALS) and displaying the SFP information.

<P>. **Password:** Use this menu item to set the device login password to protect it from unauthorized access.

Example of the Device Status and Configuration sub-menu:

```
*****
*** CTC UNION TECHNOLOGIES CO.,LTD ***
*** FRM220A-FSW103 Manager Ver:1.0 ***
*****
Version:[1.00 -1.000-0.000-0.000] [ CH01M ]

<< Device Status and Configuration >>
<1> Device Service [ Enable ]
<2> Store Configuration
<3> Default Configuration
<4> Reset Device Configuration

<ESC> Go to previous menu. Please select an item.
```

- 6 -

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Digital Optical Monitoring

Modern optical SFP transceivers support digital diagnostics monitoring (DDM) functions according to the industry-standard SFF-8472. This feature is also known as digital optical monitoring (DOM) and gives the end user the ability to monitor real-time parameters of the SFP, such as optical output power, optical input power, temperature, etc.

Example of reading Digital Diagnostics in SFP from Fiber sub-menu:

```
<< Fiber Side Status and Configuration >>
<1> Auto Laser Shutdown [ Disable ]
Fiber Link [ Up ]
FX Small Form Pluggable :[ Yes ]
Digital Diagnostic Function :[ Yes ]

Vendor Name [ CTC Union ]
Vendor Part Number [ SFS-5030-L31(I) ]
Fiber Type [ Single ]
Tx Wave Length [ 1310nm ]
Rx Wave Length [ 1310nm ]
Link Length [ 0030km ]
Tx Power [ -08 dBm ]
Rx Power [ -26 dBm ]
Rx Sensitivity [ -34 dBm ]
Temperature [ 43 C ]
<ESC> Go to previous menu.
```

Parameters are read from any MSA compliant SFP module. Extended information is only available in modules which support Digital Optical Monitor (DOM) function.

Auto Laser Shutdown

Automatic Laser Shutdown (ALS) is a technique used to automatically shut down the output power of the transmitter in case of fiber break according to ITU-T G.664. This is a safety feature that prevents dangerous levels of laser light from leaking out of a broken fiber, provided ALS is provisioned on both ends of the fiber pair. The sequence of events is as follows. If a fiber is cut, the receiver will detect a Loss Of Signal (LOS). The ALS agent will turn off the transmitter. The receiver at the far end will then detect an LOS and its ALS agent will turn off the transmitter. In this way the entire fiber will go dark.

Upgrading

FRM220A-FSW103 card may be firmware upgraded when it is placed in the **FRM220** with **NMC** management card. The user may use a local console connection to **NMC**, a remote Telnet (IP) connection, or a Web based (HTTP) connection with any available browser. **NMC** communicates to all cards through a serial TTL control bus. The upgrade code is transferred to **NMC** by way of TFTP server.

Quick Procedure

Place the line card's upgrade code on the TFTP server. Make sure you know the case sensitive file name. Connect to **FRM220-NMC** by local console or by remote Telnet connection. From the main menu choose:

<L> **SNMP System Configuration Setup**

Then:

<U> **Upgrade Line Card Menu**

```
*****
*** CTC UNION TECHNOLOGIES CO., LTD ***
*** FRM220 NMC VER. 2.01 ***
*****
<< Upgrade Line Card Menu >>
Target IP : 59.125.162.252
Target Gateway : 59.125.162.241
TFTP Server IP : 59.125.162.243

Please select a card type:
<1> : FRM220-10/100I and FMC-10/100I <3> : FRM220-SERIAL
<2> : FRM220-PX0/FXS <4> : FRM220-15SMS
<5> : FRM220-DATAPORT <6> : FRM220-E1/T1
<7> : FRM220-1000EDS/1000ES-2F <8> : FRM220-1000ES-1/1000E-1/2F
<9> : FRM220-10/100IS-2 <A> : FRM220-100UTS/100UT
<B> : FRM220-3R-2.7G-SS/3S <C> : FRM220-SL1/ET100T
<D> : FRM220-SL1/ET100S <E> : FRM220-Boe1
<F> : FRM220-3R-10G/SS/SX/XX <G> : FRM220-3R-10G/SS/SX/XX CDR
<H> : FRM220-MUX/DEMUX <I> : FRM220-E1/DATA
<J> : FRM220-FOM04 <K> : FRM220-FOM04 FPGA
<M> : FTIC <N> : 2K-4G/2S/3S
<O> : FRM220-10G-SXX <P> : FRM220-FSW103
<ESC>: Previous Menu
The card type = FRM220-3R-10G-SX
```

Select the line card type (FSW103) and local unit. Enter filename. The upgrade should complete in only a couple of minutes. DO NOT disconnect or pullout/insert any other cards during the upgrade process.

- 8 -

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About SFP Modules

The **FRM220A-FSW103** accepts any SFP module that complies with the MSA standard and supports either fixed 155M or multi-rate speed. Follow all ESD precautions when handling the card and pluggable modules. Fiber optic components and cables are very sensitive to dirt, dust and mishandling, especially in high-speed networks. Dirty or mistreated fiber may cause errors and an unwanted degradation of signal quality. Remove the dust caps on SFP only when ready to plug in optical cables.

When selecting SFP optical modules, make sure the modules are able to support the required data rates. **FRM220A-FSW103** requires an SFP that supports 125M data rate.

Installation

CTC Union supplied SFP modules are of the Bale Clasp type. The bale clasp pluggable module has a bale clasp that secures the module into the SFP cage.

- Inserting a Bale Clasp SFP Module into the cage
Step 1 Close the bale clasp upward before inserting the pluggable module.
Step 2 Line up the SFP module with the port, and slide it into the cage.
- Removing a Bale Clasp SFP Module
Step 1 Open the bale clasp on the SFP module. Press the clasp downward with your index finger.
Step 2 Grasp the SFP module between your thumb and index finger and carefully remove it from the SFP cage.



Bale Clasp type SFP with bale open

This completes the QIG for **FRM220A-FSW103**.

- 9 -

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