

## RS-422 4-wire

For RS-422 4 wire operation, TD+(A), TD-(B), RD+(A) and RD-(B) are connected.



Set Off, Off, Off, Off, Off, Off

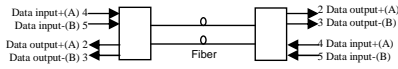


Figure 3. Physical and logical connections for RS-422 4 wire.

Signal Connections	
Pin	Connection
1	NC
2	RS-422 Out+(A)
3	RS-422 Out-(B)
4	RS-422 In+(A)
5	RS-422 In-(B)
6	Signal Ground

## RS-485 4-wire (full Duplex)

For RS-485 4 wire operation, Tx+, Tx-, Rx+ and Rx- are connected.



Set Off, Off, On, On, Off\*, Off\*\*

\*On enables Rx(-) pull down \*\*On enables Rx(+) pull down

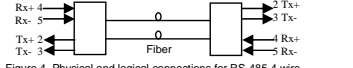


Figure 4. Physical and logical connections for RS-485 4 wire.

Signal Connections	
Pin	Connection
1	NC
2	RS-485 Out+
3	RS-485 Out-
4	RS-485 In+
5	RS-485 In-
6	NC

## RS-485 2-wire (half Duplex)

For RS-485 2 wire operation, RS-485+ and RS-485- are connected.



Set On, Off, Off, On, Off, Off

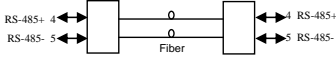


Figure 5. Physical and logical connections for RS-485 2 wire.

Signal Connections	
Pin	Connection
1	NC
2	NC
3	NC
4	RS-485 +
5	RS-485 -
6	NC

## RS-485 Termination

Termination is used to match impedance of a node to the impedance of the transmission line being used. When impedances are mismatched, the transmitted signal is not completely absorbed by the load and a portion is reflected back into the transmission line. This reflection may cause errors in the data.

Termination resistors should be placed only at the extreme ends of the data line, and no more than two terminations should be placed in any system.

4



Serial Port Fiber Media Converter  
FRM220-Serial / FRM220-Serial/SFP

## Quick Start Guide

6/2010  
Ver. 1.2

## Getting help

Technical support is available by phone from GMT 01:00-10:00

English : +886-2-2659-1021 Extension 251

Chinese : +886-2-2659-1021 Extension 551

Email support : techsupport@ctcu.com

Other resources : http://support.ctcu.com

Sales information : sales@ctcu.com

## Table of Contents

INTRODUCTION.....	2
SPECIFICATIONS.....	2
INSTALLATION.....	2
LED INDICATORS.....	2
DIP SWITCH.....	3
CONFIGURATION SETTINGS.....	3
RS-232 3-WIRE.....	3
RS-232 5-WIRE.....	3
RS-422 4-WIRE.....	4
RS-485 4-WIRE (FULL DUPLEX).....	4
RS-485 2-WIRE (HALF DUPLEX).....	4
RS-485 TERMINATION.....	4

©Copyright 2008-2010 CTC Union Technologies Co., Ltd.

All rights reserved.

The contents of this document are subject to change at any time and without any prior notice.

## Introduction

The FRM220-SERIAL will extend RS-485/422/232 transmissions up to 2KM over multi-mode fiber or up to 120KM over single mode fiber. The unit is user-configurable for RS-232, 3 & 5 wire, RS-485, 2 & 4 wire or RS-422 4 wire. The FRM220-Serial secures data transmissions at speeds up to 256K for RS-232, or up to 1024Kbps for RS-485/422.

## Specifications

### Optical

Wavelength: 1310 or 1550nm  
Optical Mode: Single Mode(S/M), or Multi-mode(M/M)  
Operating Distance: 2Km multimode or up to 120Km over single mode fiber  
Fiber Type: 50/125um, 60/125um for M/M ; 9/125um for S/M  
Power Margin: 11dB (2Km, M/M), 12dB ~ 35dB (15 ~ 120Km, S/M)  
Data Rate: 36.864Mbps  
Line Coding: Scrambled NRZ  
Bit Error Rate: Less than 10<sup>-11</sup>

### Connectors Specifications

Optical: ST/SC types, SC (WDM) type, or LC for SFP type  
Data: 6-Pin detachable screw terminal block

### DATA SIGNAL Specifications

Data Formats: RS-485 2-Wire  
RS-485/RS-422 4-Wire  
RS-232 3-Wire  
RS-232 5-Wire  
Baud Rates: RS-485/RS-422 up to 1024kbps  
RS-232 up to 256kbps

## Installation

**Caution:** Wear a grounding strap or maintain a physical contact with equipment ground when setting the DIP switch. Failure to do so may result in failure of the media converter due to electrostatic discharge (ESD).

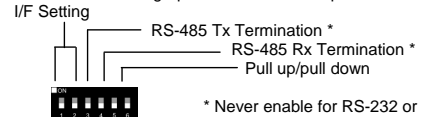
## LED Indicators

The LED indicators are located on the face of the converter and have the following meanings:

PWR (power): ON, the converter has power; OFF, the converter has no power or when installed in FRM220 chassis, the line card is disabled.  
FLK (fiber link): ON, the fiber link is up; OFF, there is no fiber link; Blinking, remote fiber sync loss (FEF)  
DI (data in): ON, receiving zero (space); OFF, receiving one (mark); blinking, receiving random data  
DO (data out): ON, sending zero (space); OFF, sending one (mark); blinking, sending random data  
Test : ON, a loop back test is active; OFF, normal status

## DIP Switch

The 4 pole DIP switch is located on the serial converter's PCBA and is accessible from the front of the converter. Refer to the graphic for a brief description of each switch.



\* Never enable for RS-232 or RS-422

## Configuration Settings

### RS-232 3-wire

For RS-232 3 wire operation, only TD, RD and SG are connected.

Signal Connections	
Pin	Connection
1	NC
2	NC
3	RS-232 Data Out
4	NC
5	RS-232 Data In
6	Signal Ground

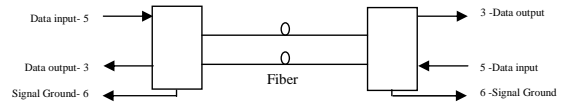


Figure 1. Physical and logical connections for RS-232 3 wire.

### RS-232 5-wire

For RS-232 5 wire operation, TD, RD and SG are connected, plus 1 handshaking pair.

Signal Connections	
Pin	Connection
1	NC
2	RS-232 RTS/CTS In
3	RS-232 Data Out
4	RS-232 RTS/CTS Out
5	RS-232 Data In
6	Signal Ground

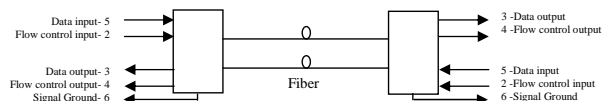


Figure 2. Physical and logical connections for RS-232 5 wire.