

## QUICK INSTALLATION GUIDE

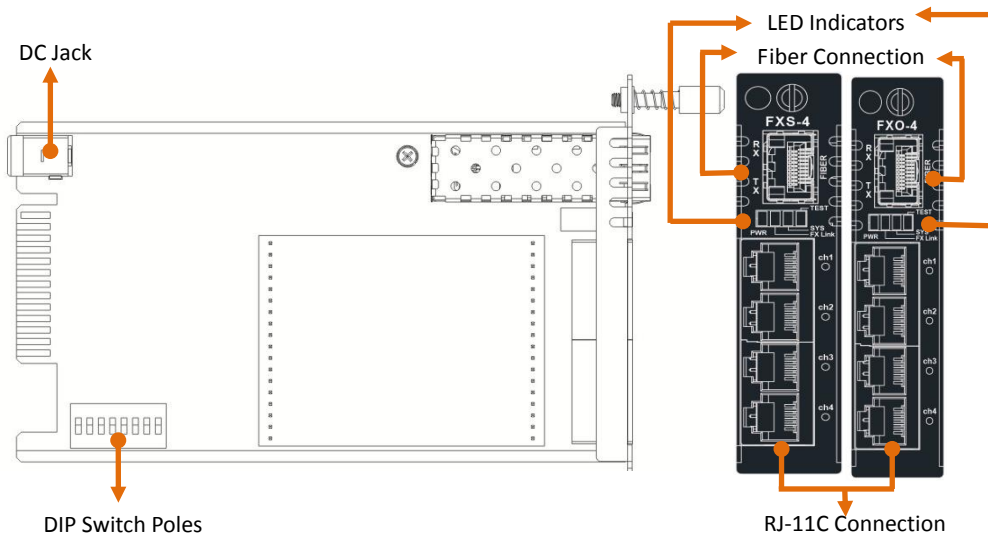
### FRM220-FXO-4/FXS-4 4 x FXO/FXS POTS Over Fiber Optic Slide-in-Module Media Converter

#### Description

CTC Union's FRM220-FXO-4/FXS-4 POTS over fiber media converter connects central-office voice grade signal to distant POTS (Plain Old Telephone Service) equipment using standard telephone signaling. It can extend, over fiber, the distance between two voice path communication devices by up to 120km using single mode fiber.

The FRM220-FXO-4/FXS-4 provides audio transmission, caller ID, ringing at the distant end and automatic ring down. Two units are required to implement an end to end system. The RJ-11 connector provides the electrical interface between the media converter and the telephone device or PSTN.

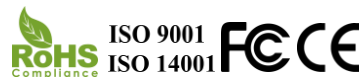
The FRM220-FXO-4/FXS-4 is designed to be installed in FRM220-CH20 (20 slots Chassis) for CO side or installed in FRM220-CH01 (1 slot Chassis) for CPE stand-alone.



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#### General Specifications

##### Environment

- Operating Temperature: 0°C~50°C
- Storage Temperature: -10°C~70°C
- Humidity: 5%~90% non condensing

##### Power

- DC+12V / 800mA input
- Power Consumption: < 8W (FRM220-FXS-4), < 5W (FRM220-FXO-4)

##### Dimension & Weight

- 88 mm (W) x 154 mm(D) x 24 mm (H)
- Weight: 120 g

#### Technical Specifications

##### Copper Connector

- FXO/FXS mode available
  - ◆ FRM-220-FXS-4: 4 x FXS ports
  - ◆ FRM-220-FXO-4: 4 x FXO ports
- Phone Connector: 4 X RJ-11C

##### Fiber Optic

- Connector: SFP-LC
- Fiber Type: MM 62.5/125um, 50/125um  
SM 9/125um
- Optical Data Rate: 155.648Mbps

##### FXS Mode

- Impedance: 600 ohm
- Coding: A-Law
- Dial: DTMF and Pulse Dial
- Battery Source: 48VDC ± 4V
- Ringing Waveform: Sine wave
- Ringing Supply: 60Vrms± 10%
- Ring Frequency: 20/25/30/35/40/45/50/55 Hz selectable
- Ring Cadence: FXS to FXS — On / 1 second, Off / 3 second  
FXO to FXS — Ring cadence selectable & user-defined option available
- REN (Ring Equivalence Number): 4.0B

##### FXO Mode

- Impedance: 600 ohm
- Coding: A-Law
- Loop Current: 10~100mA
- Ring Frequency: 20~55 Hz selectable

#### Installation

Connect the RJ-11 cable to the FRM220-FXO-4/FXS-4. The converter supports either FXO or FXS mode and the fiber link will be indicated on the LED. Follow the connection examples below. Install the fiber converter with the DC power adapter provided (+12VDC, 800mA) and connect the adapter to an AC outlet.

#### Connection

The following example illustrates the connection scheme when connecting PBX or PSTN to telephones through the fiber converter (POTS extension).

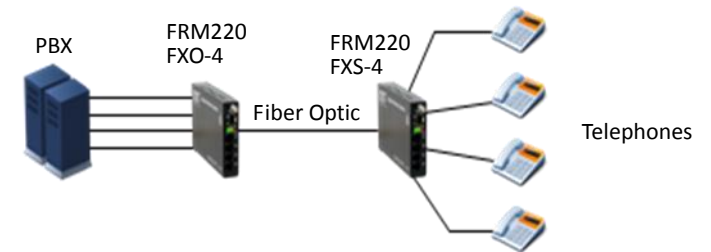


Figure 1: Voice Transmission over Fiber Optic

The following example illustrates the Automatic Ring-Down connection scheme (Hot Line) when connecting telephones to telephones through the fiber converter.

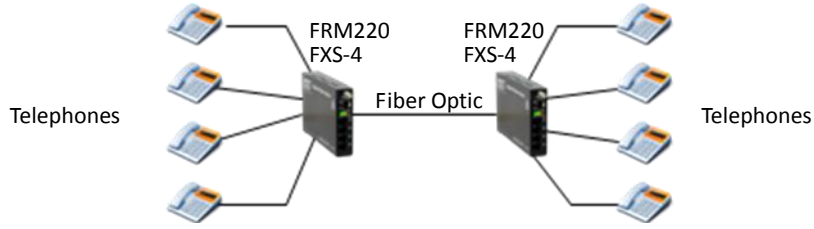


Figure 2: Automatic Ring Down Hotline

**DIP Switch Setting**

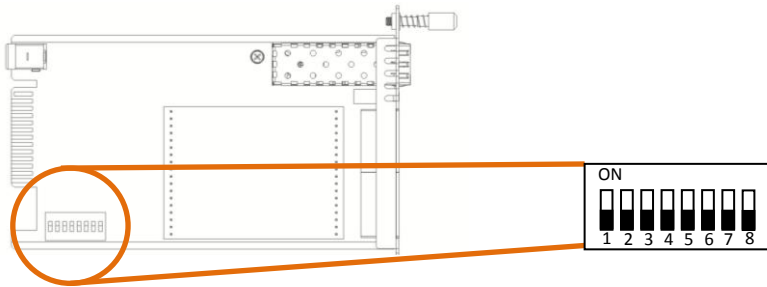


Figure 3: FRM220-FXS-4/FXO-4 DIP Switch

By default, all DIP Switch poles are set to OFF position. See tables below for DIP Switch settings.

FRM220-FXS-4 DIP SW					MODE SETTING	
1	2	3	4, 5, 6, 7	8		
OFF	OFF	OFF	Reserved for future uses.		Ring frequency: 20 Hz	
OFF	OFF	ON			Ring frequency: 25 Hz	
OFF	ON	OFF			Ring frequency: 30 Hz	
OFF	ON	ON			Ring frequency: 35 Hz	
ON	OFF	OFF			Ring frequency: 40 Hz	
ON	OFF	ON			Ring frequency: 45 Hz	
ON	ON	OFF			Ring frequency: 50 Hz	
ON	ON	ON			Ring frequency: 55 Hz	
					OFF	Setting parameters by DIP SW.
					ON	Setting parameters from storage.

Table 1: FRM220-FXS-4 DIP Switch Settings

FRM220-FXO-4 DIP SW						MODE SETTING
1	2	3	4	5, 6, 7	8	
ON	ON	ON	ON	Reserved for future uses.		Area setting: Area 1 (See NOTE below.)
ON	ON	ON	OFF			Area setting: Area 2 (See NOTE below.)
ON	ON	OFF	ON			Area setting: Area 3 (See NOTE below.)
ON	ON	OFF	OFF			Area setting: Area 4 (Australia)
ON	OFF	ON	ON			Area setting: Area 5 (Brazil)
ON	OFF	ON	OFF			Area setting: Area 6 (Bulgaria)
ON	OFF	OFF	ON			Area setting: Area 7 (China)
ON	OFF	OFF	OFF			Area setting: Area 8 (Japan)
OFF	ON	ON	ON			Area setting: Area 9 (New Zealand)
OFF	ON	ON	OFF			Area setting: Area 10 (South Africa)
OFF	ON	OFF	ON			Area setting: Area 11 (South Korea)
OFF	ON	OFF	OFF			Area setting: Area 12 (See NOTE below.)
					OFF	Setting parameters by DIP SW.
					ON	Setting parameters from storage.

Table 2: FRM220-FXO-4 DIP Switch Settings

**NOTE:** Counties covered in Area 1, 2, 3, 12 are described below:

**Area 1:** Austria, Bahrain, Belgium, Croatia, Cyprus, Czech Republic, Denmark, Egypt, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Latvia, Lebanon, Luxembourg, Malta, Morocco, Netherlands, Nigeria, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland (ETSI regulatory standard)

**Area 2:** Argentina, Canada, Chile, Colombia, Ecuador, El Salvador, Guam, Hong Kong, India, Indonesia, Kazakhstan, Kuwait, Macao, Mexico, Peru, Russia, Saudi Arabia, Singapore, Taiwan, UAE, USA, Yemen

**Area 3:** Jordan, Malaysia, Oman, Pakistan, Philippines, Thailand

**Area 12:** Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom (TBR 21 regulatory standard)

**LED Indicators**

LED	STATE	STATUS
PWR	Green	Converter has power.
	Off	Converter has no power.
FX Link	Green	The fiber link is ok.
	Off	No link or link is faulty.
SYS	Flash	The local device receives remote fiber link loss (FEF, Far End Fault) signals.
	Green	System is normal.
	Off	System fails.
Test	Flash	In upgrade mode.
	Off	Always off (no test function)
CH1, CH2, CH3, CH4	Green	Activity (Off hook)
	Off	Idle (On hook)
	Flash	Ringling

Table 3: LED Indicators