



# FRM220-E1/T1

## E1/T1 Fiber Modem

The FRM220-E1/T1 is a fiber media transport for G.703 E1/T1 transmissions. The BNC model provides unbalanced 75 Ohm coaxial E1 connections while the RJ-45 model provides switchable balanced 120 Ohm E1 or 100 Ohm T1 connections over twisted pair wiring. When the FRM220-E1/T1 card is placed in the FRM220 rack with in-band management, the card status, type, version, fiber link status, E1 or T1 link status and alarms for both local card and remote unit can all be displayed. When set for E1 mode, the FRM220-E1/T1 also supports fractional (structured) E1 when connected to a remote FRM220-Data, synchronous data communications converter. In an E1 transmission network where end connection requires synchronous data communication such as V.35 or RS-530 (X.21, RS-449), these units eliminate the need for an extra CSU/DSU. When placed in a single slot chassis and used standalone without management, the card may be configured by DIP switches.

### Features

- n-band network Managed via Terminal, web or SNMP in FRM220 chassis
- T1/E1 RJ-45 (USOC RJ-48C) or E1 Coax (BNC) to Fiber converter
- Supports AMI or B8ZS/HDB3 line codes
- T1 supports unframed to FRM220-Data
- E1 supports unframed or fractional (N x 64k) to FRM220-Data
- User selectable E1 or T1 setting
- Electrical and optical Loop back tests
- Standalone RS232 console management via CH01M

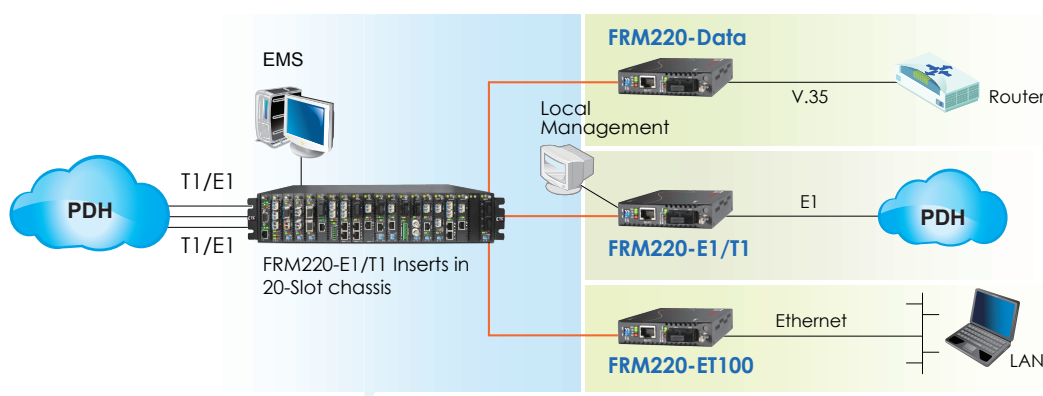
### Specifications

|                             |                                                    |                                     |
|-----------------------------|----------------------------------------------------|-------------------------------------|
| <b>Optical Interface</b>    | Connector                                          | 1x9 (SC, ST, FC)                    |
|                             | Data rate                                          | 36.864Mbps                          |
|                             | Line coding                                        | Scrambled NRZ                       |
|                             | Bit Error Rate                                     | Less than 10 <sup>-10</sup>         |
|                             | Distance                                           | MM 2km, SM 15/30/50km               |
|                             | Wavelength                                         | WDM 20/40km                         |
| <b>Electrical Interface</b> | Connector                                          | RJ45 E1-120Ω, T1-100 Ω, BNC E1-75 Ω |
|                             | Data rate                                          | E1: 2.048Mbps, T1:1.544Mbps         |
|                             | Line Code                                          | E1 HDB3/AMI, T1: B8ZS/AMI           |
|                             | Cable type                                         | Cat.3 or higher Twisted-Pair cable  |
| <b>Standards</b>            | E1 ITU-T G.703, G.704, G.706, G.732, G.823         |                                     |
|                             | T1 ITU-T G.703, G.704, AT&T, TR-62411, ANSI T1.403 |                                     |

|                          |                                                                                                 |
|--------------------------|-------------------------------------------------------------------------------------------------|
| <b>Indications</b>       | Power, FX-Link, E1/T1 SIG, Test, SYN, RD, TD, AIS<br>(E1/T1R) Power, FX-Link, E1 SIG, Test(E1B) |
| <b>Power Input</b>       | 12VDC                                                                                           |
| <b>Power Consumption</b> | < 5W                                                                                            |
| <b>Dimensions</b>        | 155 x 88 x 23mm (D x W x H)                                                                     |
| <b>Weight</b>            | 120g                                                                                            |
| <b>Temperature</b>       | 0 ~ 50°C (Operating), -10 ~ 70°C (Storage)                                                      |
| <b>Humidity</b>          | 10 ~ 90% non-condensing                                                                         |
| <b>Certification</b>     | CE, FCC, RoHS compliant                                                                         |
| <b>MTBF</b>              | 65,000 hrs                                                                                      |

### Application

#### In-band Managed PDH Fiber Modem



### Ordering Information

| Model Name        | Description                                       |
|-------------------|---------------------------------------------------|
| FRM220-E1/T1R     | E1/T1 RJ-45 fiber modem                           |
| FRM220-E1B        | E1 BNC fiber modem                                |
| FRM220-E1/T1R-SFP | E1/T1 RJ-45 fiber modem (SFP module not included) |
| FRM220-E1B-SFP    | E1 BNC fiber modem (SFP module not included)      |

| Connector Type | Connectivity Distance |
|----------------|-----------------------|
|----------------|-----------------------|

SC, ST, FC 002: 2km 015: 15km 030: 30km 050: 50km  
(Not Applicable for SFP Type) 20A: WDM 20km A type 20B: WDM 20km B type 40A: WDM 40km A type 40B: WDM 40km B type

Note: This card may be set by DIP switch and placed in CH01 chassis, or set by serial console if placed in CH01M chassis.

When connected as a remote to a managed central chassis, this card supports in-band management and only needs a CH01 chassis.

Connector Type Connectivity Distance  
FRM220 - □□ / □□□ - □□□□□  
Example: FRM220 - E1/T1R - SC002