



# 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

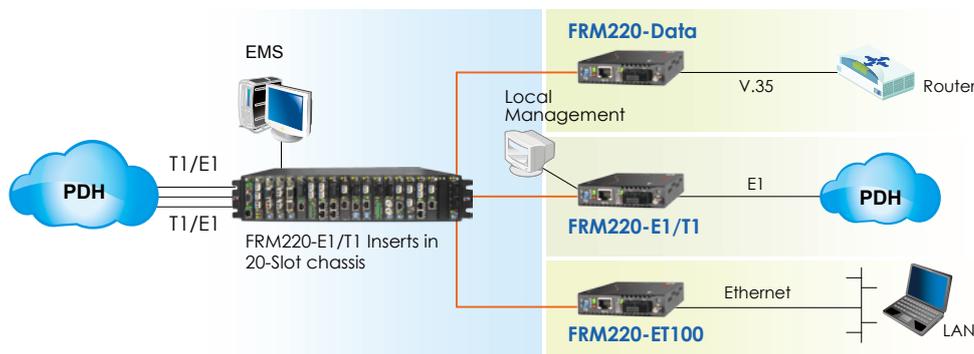
- n-band network Managed via Terminal, web or SNMP in FRM220 chassis
- T1/E1 RJ-45 (USOC RJ-48C) or E1 Coax (BNC) to Fiber converter
- Supports AMI or B8ZS/HDB3 line codes
- T1 supports unframed to FRM220-Data
- E1 supports unframed or fractional (N x 64k) to FRM220-Data
- User selectable E1 or T1 setting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

### Specifications

<b>Optical Interface</b>	Connector	1x9 (SC, ST, FC)	<b>Indications</b>	Power, FX-Link, E1/T1 SIG, Test, SYN, RD, TD, AIS (E1/T1R)				
	Data rate	36.864Mbps		<b>Power Input</b>	12VDC			
	Line coding	Scrambled NRZ			<b>Power Consumption</b>	< 6W		
	Bit Error Rate	Less than 10 <sup>-10</sup>				<b>Dimensions</b>	155 x 88 x 23mm (D x W x H)	
	Distance	MM 2km, SM 15/30/50km					<b>Weight</b>	120g
		WDM 20/40km						<b>Temperature</b>
Wavelength	1310nm, 1550nm	<b>Humidity</b>	10 ~ 90% non-condensing					
<b>Electrical Interface</b>	Connector		RJ45 E1-120Ω, T1-100 Ω, BNC E1-75 Ω	<b>Certification</b>				
	Data rate		E1: 2.048Mbps, T1:1.544Mbps		<b>MTBF</b>			
	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						

### 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

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

**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.