



# FRM220-FTEC

## E1/T1 Cross Rate Converter

The FRM220-FTEC is a T1 (US Standard) /E1 (European Standard) converter and timeslot cross connect which enables conversion between one T1 signal and one E1 signal. T1 and E1 signals with framing employ u-Law and A-Law compander encoding principles respectively and encode those analog (voice) signals into 64kbps digital data. The T1 interface supports D4(SF) or ESF frame formats with B8ZS or AMI line code. The E1 interface supports CCS (PCM31) or CAS (PCM30) framing without CRC-4 and framing with CRC-4. The line coding is HDB3.

Tests and diagnostics can easily be performed from the local console interface or via Web based management of the FRM220. Diagnostics include T1 local/remote and E1 local/remote loop back. When placed in a single slot chassis and used standalone without management, the card may be configured by DIP switches.

### Features

- Converts between T1 and E1 data and signaling
- Enable equipment to operate at T1 and E1 rates
- Supports G.802 Annex B (T1 over E1)
- Configures A-law/ $\mu$ -law and signaling conversion
- Transparent conversion at 64kbps timeslot level
- Controlled slip for buffer over or under flow
- 24 time slots of T1 Nx64 can be inserted into E1 Nx64, 30/CAS or 31/CCS timeslots

### Specifications

E1 Interface	Framing	CAS/PCM30 or CCS/PCM31 selectable
	Bit rate	2.048Mbps
	Line Code	HDB3
	Line Impedance	75 ohm (BNC) / 120 ohm (RJ-45)
	Line Impedance	Voice channel sample rule A-Law
	CRC check	CRC-4 enable/disable
	Pulse amplitude	Nominal 3.37V $\pm$ 10% for 75ohm Nominal 3.00V $\pm$ 10% for 120ohm
	Zero amplitude	$\pm$ 0.1V
	Connector	RJ-45
T1 Interface	Framing	D4, ESF selectable
	Bit rate	1.544Mbps
	Line Code	B8ZS / AMI
	Equalization	0 ~ 655 feet settable Voice channel sample rule $\mu$ -Law
	CRC check	CRC-6 when ESF
	Line Impedance	100 ohms
	Transmit Pulse level	3.0V $\pm$ 10%,
	Receive signal level	0 ~ -10dB
	Connector	RJ-45

<b>LEDs</b>	PWR, Sys, Test, T1/E1
<b>Standard</b>	ITU-T G.703, G.704, G.706, G.823, G.824, ANSI T1.403
<b>Power</b>	12VDC
<b>Power Consumption</b>	< 6W
<b>Dimensions</b>	159.5 x 20.8 x 88mm (DxWxH)
<b>Weight</b>	130g
<b>Temperature</b>	0 ~ 50°C (Operating), -10 ~ 70°C (Storage)
<b>Humidity</b>	10 ~ 90% non-condensing
<b>Certification</b>	CE, FCC
<b>MTBF</b>	57,000 hrs

### Application



### Ordering Information

Model Name	Description
FRM220-FTEC	E1/T1 cross rate converter card