



The FRM220-E1/ET100 is a slide-in card E1 inverse multiplexer capable of bundling 1x E1 lines for cost-effective connection of 10/100BaseTX or 100Base-FX LANs over multiple E1 transports. The FRM220-E1/ET100 inverse multiplexer transmits up to a 1.984Mbps Ethernet bridge channel (GFP-F encapsulated) over E1 links. The FRM220-E1/ET100 bridges the gap between E1 and E3, allowing bridges to operate at faster rates. It also provides high speed access to SDH/SONET backbones where the only access services available are E1 lines. The FRM220-E1/ET100 supports an E1 attenuation of up to 43 dB on twisted pair or coax cable. This provides an approximate operating range up to 2km (using 22AWG). The FRM220-E1/ET100 fully meets E1 specifications including ITU-T G.703 and G.823. The FRM220-E1/ET100 features diagnostic capabilities for performing remote loopback. The operator at either end of the line may test both the FRM220-E1/ET100 and the line in the digital loopback mode. The Ethernet copper interface supports auto-negotiation and auto MDI/MDIX, allowing plug-and-play Ethernet connection without any additional configuration.

### Features

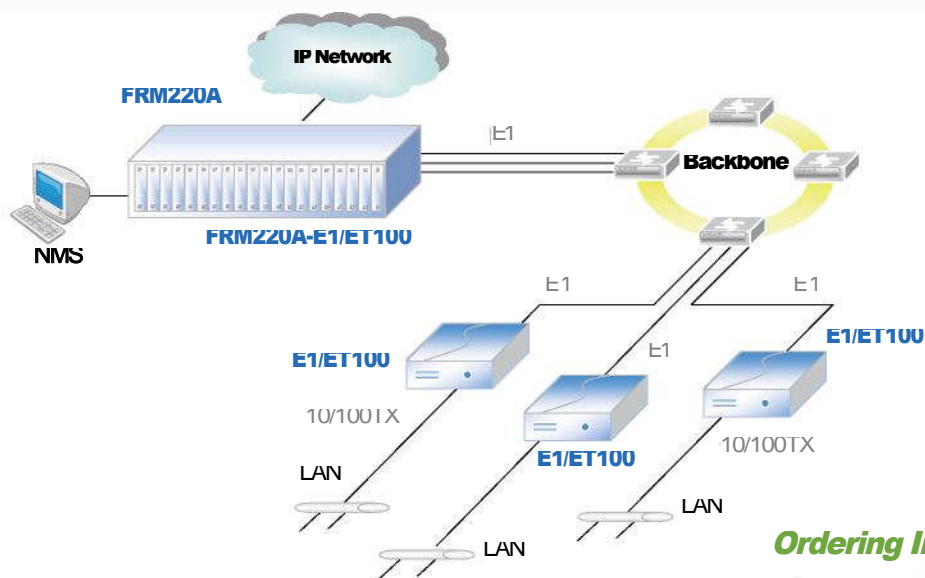
- Connects one Fast Ethernet over E1 links (1.984Mbps)
- Built-in GFP bridge operates at WAN rate
- Auto-Negotiation
- Maximum 220ms delay variance between E1 link
- Unbalanced E1/BNC or balanced E1/RJ45
- Fully compatible with FRM220A-CH20 chassis
- SNMP management with FRM220A-CH20 chassis
- LED Alarm indication

### Managed E1 Inverse Multiplexer

Delivering point-to-point Fast Ethernet service across E1 circuits

## E1 Inverse Multiplexer FRM220A-E1/ET100T

Interface	Framing	CCS+CRC
	Standard	ITU-T G.703/G.704/G.706 & G.732, G.823
	Bit rate	2.048Mbps± 50ppm
	Line code	HDB3
	Clock setting	Internal OSC or recovery clock -43dB
	Receive level	75 ohm (BNC) / 120 ohm (RJ45)
	Line impedance	Complies with ITU-T G.823
	Jitter Performance	Complies with ITU-T G.703
	Pulse Mask	Nominal 2.37V ± 10%
	Pulse amplitude	220ms
	Delay Variance	
	Connector	RJ45, BNC
	Diagnostics	Digital remote loopback
Standard	IEEE 802.3, 802.3u	
Data rate	10/100Base-TX, Half/Full duplex	
Indications	Connector	RJ45 10/100Base-TX
	Power, ALM, E1 signal loss, E1 Alarm, AIS, LOF, RAI, LOMF, LAN link /ACT, 10/100M, SD(100Base-FX)	
Power Input	AC adapter : 100~240VAC to 12VDC	
Power Consumption	AC 100 ~ 240V, DC -18 ~ 75V < 12W	
Dimensions	DC12	: 160 x 88 x 24mm (D x W x H)
	AC/DC48/AD	: 201 x 135 x 35mm (D x W x H)
Weight	DC 12 : 280g, AC/DC48/AD : 580g	
Temperature	0 ~ 50°C (Operating), -10 ~ 70°C (Storage)	
Humidity	10 ~ 90% RH (non-condensing)	
Certifications	CE, FCC, RoHS	
MTBF	6,500 hrs (25°C)	



FRM220-E1/ET100 can be inserted in any FRM220 chassis.  
For local management, must use either CH01M or CH02M

### Ordering Information

FRM220A-□□□□□ Optional card

E1/ET100T

Example: FRM220-E1/ET100T





The FRM220-8E1/ET100 is a slide-in card E1 inverse multiplexer capable of bundling up to 8 E1 lines for cost-effective connection of 10/100BaseTX or 100Base-FX LANs over multiple E1 transports. The FRM220-8E1/ET100 inverse multiplexer transmits up to a 15.87Mbps Ethernet bridge channel (GFP-F encapsulated) over 8 E1 links. The FRM220-8E1/ET100 bridges the gap between E1 and E3, allowing bridges to operate at faster rates. It also provides high speed access to SDH/SONET backbones where the only access services available are E1 lines. The FRM220-8E1/ET100 supports an E1 attenuation of up to 43 dB on twisted pair or coax cable. This provides an approximate operating range up to 2km (using 22AWG). The FRM220-8E1/ET100 fully meets E1 specifications including ITU-T G.703 and G.823. The FRM220-8E1/ET100 features diagnostic capabilities for performing remote loopback. The operator at either end of the line may test both the FRM220-8E1/ET100 and the line in the digital loopback mode. The Ethernet copper interface supports auto-negotiation and auto MDI/MDIX, allowing plug-and-play Ethernet connection without any additional configuration.

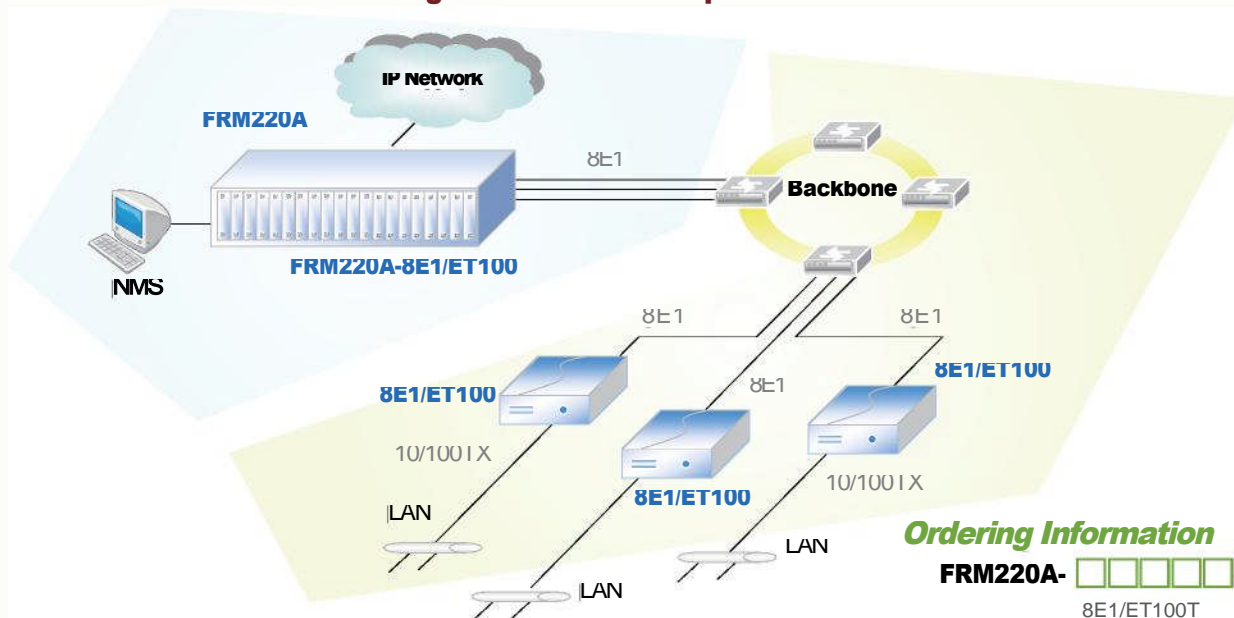
### Features

- Connects one Fast Ethernet over 8E1 links (1.984Mbps to 15.87Mbps)
- Built-in HDLC bridge operates at WAN rate
- Auto-Negotiation
- Maximum 220ms delay variance between E1 link
- Unbalanced E1/BNC or balanced E1/RJ45
- Fully compatible with FRM220A-CH20 chassis
- SNMP management with FRM220A-CH20 chassis
- LED Alarm indication

## 8E1 Inverse Multiplexer FRM220A-8E1/ET100

<b>Interface</b>	Framing	CCS+CRC
	Standard	ITU-T G.703/G.704/G.706 & G.732, G.823
	Bit rate	2.048Mbps± 50ppm (up to 8E1)
	Line code	HDB3
	Clock setting	Internal OSC or recovery clock
	Receive level	-43dB
	Line impedance	75 ohm (BNC) / 120 ohm (RJ45)
	Jitter Performance	Complies with ITU-T G.823
	Pulse Mask	Complies with ITU-T G.703
	Pulse amplitude	Nominal 2.37V ± 10%
	Delay Variance	220ms
<b>Indications</b>	Connector	BNC / RJ45
	Diagnostics	Digital remote loopback
	Standard	IEEE 802.3, 802.3u
	Data rate	10/100Base-TX, Half/Full duplex
	Connector	RJ45 10/100Base-TX
		SFP-LC 100Base-FX
	Power Input	Power, ALM, E1 signal loss, E1 Alarm (AIS, LOF, RAI, LOMF), LAN link /ACT, 10/100M, SD (100Base-FX)
	Power Consumption	AC adapter : 100~240VAC to 12VDC AC 100 ~ 240V, DC -18 ~ 75V
	Dimensions	< 12W
	Weight	DC12 : 160 x 88 x 24mm (D x W x H) AC/DC48/AD : 201 x 135 x 35mm (D x W x H)
	Temperature	DC 12 : 280g, AC/DC48/AD : 580g
Humidity	0 ~ 50°C (Operating), -10 ~ 70°C (Storage)	
Certifications	10 ~ 90% RH (non-condensing)	
MTBF	CE, FCC, RoHS 65,000 hrs (25°C)	

### Managed 8E1 Inverse Multiplexer



### Ordering Information

FRM220A-       Optional card

8E1/ET100T  
8E1/ET100S

Example: FRM220A-8E1/ET100T

## 16E1 Inverse Multiplexer

# FRM220A-16E1/ET100

The FRM220-16E1/ET100 is a slide-in card E1 inverse multiplexer capable of bundling up to 16 E1 lines for cost-effective connection of 10/100BaseTX or 100Base-FX LANs over multiple E1 transports. The FRM220-16E1/ET100 inverse multiplexer transmits up to a 31.74Mbps Ethernet bridge channel (GFP-F encapsulated) over 16 E1 links. The FRM220-16E1/ET100 bridges the gap between E1 and E3, allowing bridges to operate at faster rates. It also provides high speed access to SDH/SONET backbones where the only access services available are E1 lines. The FRM220-16E1/ET100 supports an E1 attenuation of up to 43 dB on twisted pair or coax cable. This provides an approximate operating range up to 2km (using 22AWG). The FRM220-16E1/ET100 fully meets E1 specifications including ITU-T G.703 and G.823. The FRM220-16E1/ET100 features diagnostic capabilities for performing remote loopback. The operator at either end of the line may test both the FRM220-16E1/ET100 and the line in the digital loopback mode. The Ethernet copper interface supports auto-negotiation and auto MDI/MDIX, allowing plug-and-play Ethernet connection without any additional configuration.configuration.

### Features

- Connects one Fast Ethernet over 16E1 links (1.984Mbps to 31.74Mbps)
- Built-in HDLC bridge operates at WAN rate
- Auto-Negotiation
- Maximum 220ms delay variance between E1 link
- Unbalanced E1/BNC or balanced E1/RJ45
- Fully compatible with FRM220A-CH20 chassis
- SNMP management with FRM220A-CH20 chassis
- LED Alarm indication



Framing	CCS+CRC
Standard	ITU-T G.703/G.704/G.706 & G.732, G.823
Bit rate	2.048Mbps± 50ppm (up to 16E1) HDB3
Line code	
Clock setting	Internal OSC or recovery clock
Receive level	-43dB
Line impedance	75 ohm (BNC) / 120 ohm (RJ45)
Jitter Performance	Complies with ITU-T G.823
Pulse Mask	Complies with ITU-T G.703
Pulse amplitude	Nominal 2.37V ± 10%
Delay Variance	220ms
Connector	RJ45, BNC
Diagnostics	Digital remote loopback
Standard	IEEE 802.3, 802.3u
Data rate	10/100Base-TX, Half/Full duplex 100Base-FX
Connector	RJ45 10/100Base-TX SFP-LC 100Base-FX

### Indications

Power, ALM, E1 signal loss, E1 Alarm, AIS, LOF, RAI, LOMF), LAN link /ACT, 10/100M, SD(100Base-FX)

### Power Input

AC adapter : 100~240VAC to 12VDC

### Power Consumption

AC 100 ~ 240V, DC -18 ~ 75V

### Dimensions

< 12W

DC12 : 160 x 88 x 24 (D x W x H)mm

AC/DC48/AD : 201 x 135 x 35 (D x W x H)mm

DC 12 : 280g , AC/DC48/AD : 580g

### Weight

### Temperature

### Humidity

0 ~ 50°C (Operating), -10 ~ 70°C (Storage)

### Certifications

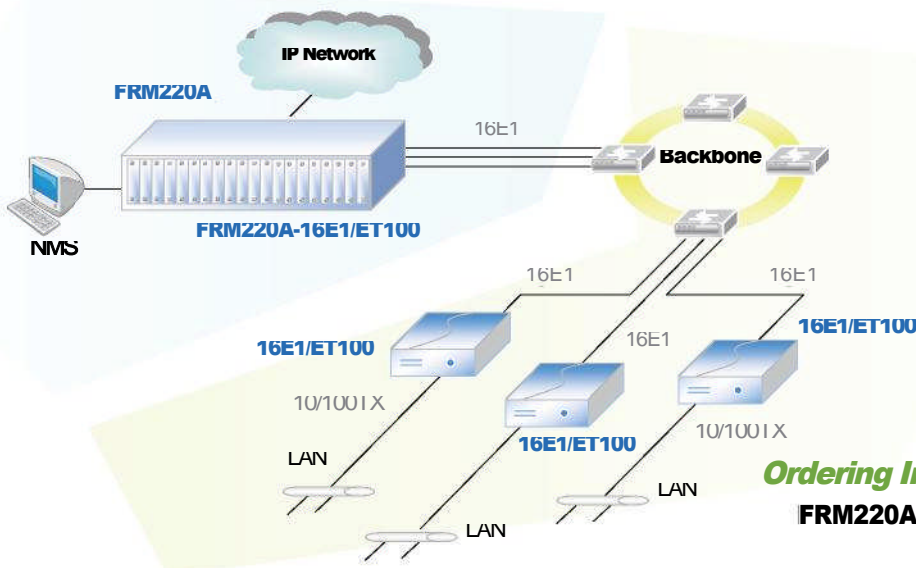
10 ~ 90% RH (non-condensing)

### MTBF

CE, FCC, RoHS

65,000 hrs (25°C)

### Managed 16E1 Inverse Multiplexer



### Ordering Information

FRM220A-      Optional card

16E1/ET100T

16E1/ET100S

Example: FRM220A-16E1/ET100T