Inverse Multiplexer Platform
FRM220A

The FRM220A is a 2U high 19" Rack, 20 slot modular media converter rack, designed with one Gigabit Ethernet switch uplink, for efficient scalability and easy deployment in access networks. It provides an economic solution in high density fiber converter installations in enterprises or central offices. All critical components, Power, fans, management module and interface cards are hot swappable, allowing online field replacement. The hot-swappable power modules can be chosen from AC100-240V, DC18-36. or DC 36-72V. The chassis also has a pair of alarm relays and is able to stack up to 10 chassis as one management unit.

Features

- 2U 19" 20-slot Chassis with AC/DC power redundancy
- Chassis cascade up to 10 with one IP management
- Chassis backplane consists of passive components
- Chassis supports uplink Gigabit Ethernet switch 4-port 10/100/1000T plus 4-port 1000SX/LX SFP trunk card
- All modules and cards support hot-swap function
- Two alarm relays
- E1 Inverse Multiplexers are supported by Gigabit
- Ethernet switch trunk card

Specifications

Connectors

Console RS232(DB9)

LAN 10/100 Base TX RJ45

Physical Specifications

Dimensions: 303mm x 438mm x 88mm (W x D x H)

Weight: 5.2kg w/o P/S

Power Characteristics

AC : 100 ~ 240VAC

DC24 : 18 ~ 36VDC, DC48: 36 ~ 75VDC

Environmental Specifications

Operating 0°C ~ 60°C

Storage -10°C ~ 70°C

Relative humidity 5% ~ 90% non-condensing

Predicted MTBF : 65,000 hrs

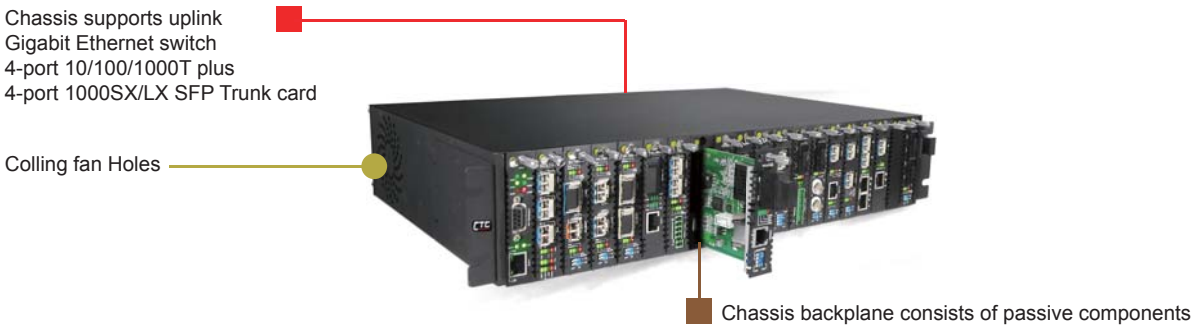
Certification

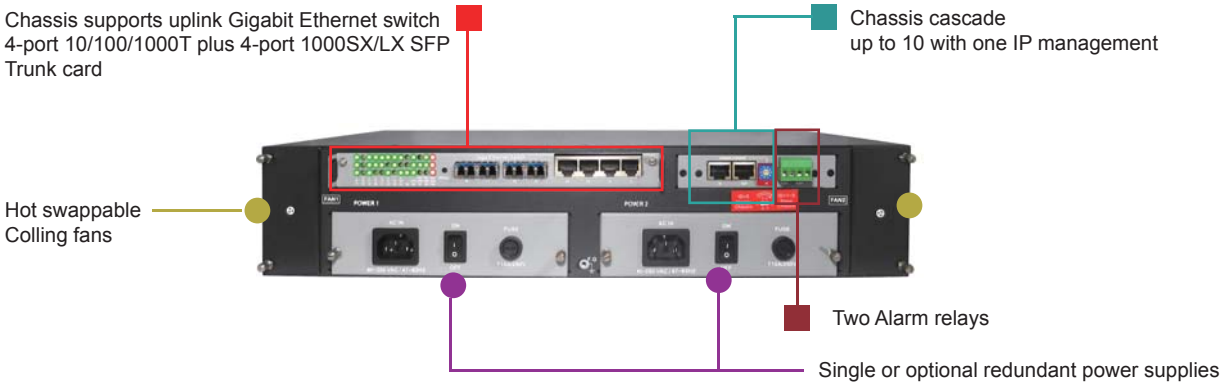
FCC class A, VCCI class A, CE, RoHS

2U High 19" 20-slot Inverse Multiplexer Platform overview

Technology support

- Gigabit Ethernet Aggregate Switch
- E1 Inverse Multiplexer
- Ethernet to E1 Access Unit
- Gigabit Ethernet OAM/IP Switch
- Metro Ethernet Swtich





Slide-in card overview

Gigabit Ethernet Aggregate Switch	E1 Inverse Multiplexer	E1 Access Unit
4-port 10/100/1000T plus 4-port 1000SX/LX SFP Trunk card  FRM220A-GSW/SNMP	 5 E1, 8 E1, 16E1 Inverse Multiplexer FRM220A-iMUX5 FRM220A-iMUX8 FRM220A-iMUX16	 Ethernet to E1 Converter FRM220A-Eoe1
Ethernet Demarcation (MEF-EDD)	**Gigabit/ Fast Ethernet over Fiber**	
 Metro Ethernet Switch FRM220A-ESW202	 GbE OAM/IP Switch FRM220A-1000EAS/X	

Power Redundancy

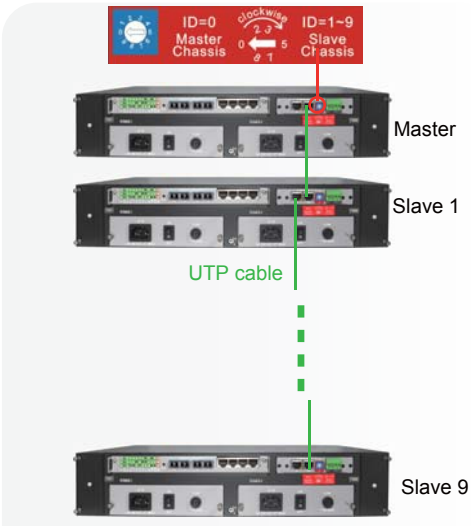
All the FRM220A chassis power supplies are hot swappable and modular, installing two into a chassis provides redundancy should a single power supply fail. A fully loaded chassis can run continuously with only one power module fitted into the chassis.

Cooling Fan

To further increase system reliability, the FRM220A chassis is fitted with two hot swappable fan modules. Both fan modules can be easily removed from the rear of the chassis, without interruption to the operation of the line cards. A fully loaded chassis can run continuously with only one fan module fitted into the chassis.

Chassis cascade

The FRM220A features cascadeable management which allows managing a stack (up to 10 chassis) from a single IP address. Chassis are interconnected with standard UTP cables that carry control signals. Each chassis has its own ID, starting with the master chassis ID0 and cascading up to ID9.



10 chassis cascade with one IP management

Gigabit Ethernet switch with Network Management

The FRM220A incorporates a 24+4 Gigabit Ethernet Switch. Twenty ports supply each slot of the 2U 20-slot chassis with an electrical gigabit Ethernet uplink with the remaining four electrical gigabit ports accessible via the rear of the chassis. The additional four ports are provided by SFP sockets.

All eight gigabit ports (4+4) are usable without restrictions for uplink aggregate to the Ethernet Metropolitan Area Network (E-MAN). The FRM220A-GSW/SNMP card transmits Ethernet between the subscriber equipment (bridge/modem or network interface card) and the E-MAN. The card provides a user-networking interface with Ethernet packets. This card is capable of providing high band-width for assembling Ethernet traffic. The FRM220A-GSW/SNMP card is not only the system aggragate/trunk module, but also the system's control module, providing OAM / IP Management functions.

Protocol Supported

The FRM220A chassis has been designed as a Multi-serivce platform. This allows network administrators to deploy the chassis in a wide range of network. Technologies supported by the chassis included Fast/Gigabit Ethernet, E1/T1, V35/X21/RS530, Serial RS485/422, Voice FXO/FXS, Repeater, Fiber Multiplexer and E1 Inverse Multiplexer (Supported by Gigabit Ethernet trunk card).

Ordering Information

FRM220A Chassis	FRM220A Slide-in card	***Smart View*** Element Management System***(EMS)***
FRM220A-CH20 : 2U 19" 20 slot chassis FRM220A-AC : 100 ~ 240 AC power card FRM220A-DC24 : 18 ~ 36 DC power card FRM220A-DC48 : 36 ~ 72 DC power card	FRM220A-GSW/SNMP :GbE Aggregate Switch FRM220A-Eoe1 :E1/ET100 Inverse Mux FRM220A-iMUX5 :5E1/ET100 Inverse Mux FRM220A-iMUX8 :8E1/ET100 Inverse Mux FRM220A-iMUX16 :16E1/ET100 Inverse Mux FRM220A-ESW202 : Metro Ethernet Switch FRM220A-1000EAS/X :GbE OAM/IP Switch	SV-PLF-05(5, 25, 50): Platform Server (5, 25, 50 admissions) SV-AGT-50(50,100,200,500): Device Agent (50, 100, 200, 500 Devices) SV-Fiber: FRM220A Managed Module

Gigabit Ethernet Aggregate Switch

FRM220A-GSW/SNMP

The FRM220A incorporates a 24+4 Gigabit Ethernet Switch. Twenty ports supply each slot of the 2U 20-slot chassis with an electrical gigabit Ethernet uplink with the remaining four electrical gigabit ports accessible via the rear of the chassis. The additional four ports are provided by SFP sockets. All eight gigabit ports (4+4) are usable without restrictions for uplink aggregate to the Ethernet Metropolitan Area Network (E-MAN). The FRM220A-GSW/SNMP card transmits Ethernet between the subscriber equipment (bridge/modem or network interface card) and the E-MAN. The card provides a user-networking interface with Ethernet packets. This card is capable of providing high bandwidth for assembling Ethernet traffic. The FRM220A-GSW/SNMP card is not only the system aggregate/trunk module, but also the system's control module, providing OAM Management functions.

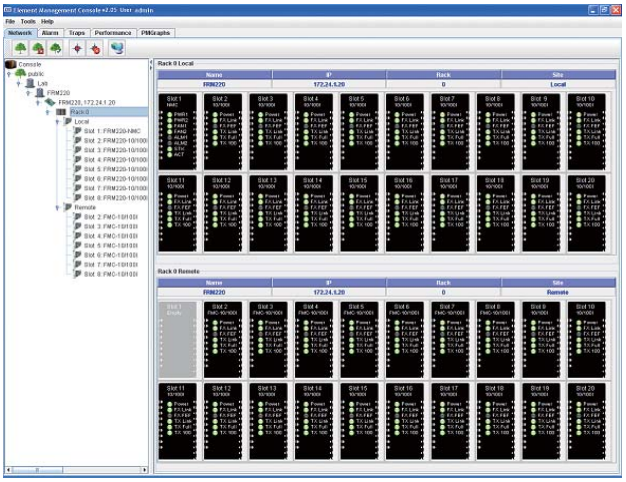
Features

- Provides chassis aggregation via 4 electrical (RJ-45) 10/100/1000T ports plus 4 optical (SFP) 1000X/2500Base-X Gigabit Ethernet ports
- Optical Ethernet ports Support stacking up to 10 chassis in Ring or Chain topology
- Each chassis slot has one gigabit Ethernet uplink
- Provides Web, Telnet, SNMP for out-band management
- Supports IEEE802.1d Ethernet bridge function between trunk Ethernet ports
- Supports Rapid Spanning Tree Protocol (RSTP) for the trunk interfaces per IEEE 802.1w
- Support automatic source MAC learning and block duplicate ones
- Supports IEEE 802.1q Port-base VLAN and Tag-base VLAN
- Supports static VLAN management
- Supports Link Aggregation in IEEE 802.3ad that allows GbE links to be aggregated together as logical link.
- Support Simple Network Time Protocol (SNTP)
- Supports VLAN level QoS function and 4 priority queues for QoS
- Supports TFTP on-line f/w upgrade

Trunk Interface	• 4x 10/100/1000Base-T plus 4x 1000Base-X/ 2500Base-X GbE Switch trunk card. • Auto-adaptive between full-duplex and half-duplex • Operation modes for 10, 100 , 1000 Mbps operation speed on RJ45 trunk port basis. • The system only supports full-duplex mode for 1000 Mbps. • Supports both RJ45 and optical SFP (Mini-GBIC) connectors
Capacity	Supports up to 20 service cards
Management Interface	• In-band management: provide all system OAM functions: software updates, and management system interaction through Ethernet trunk port. • Out-band management: supports Web, Telnet and SNMP management
Indications	PWR, FAN, Alarm, STK
Dimensions	142x200x26mm (DxWxH)
Weight	500g
Temperature	0 ~ 60°C (Operating), -10 ~ 70°C (Storage)
Humidity	5 ~90% non-condensing
Certification	CE, FCC, LVD, RoHS
MTBF	65,000 hrs (25°C)

Web GUI Manager

Element Manager System



Ordering Information

FRM220A-GSW/SNMP: Gigabit Ethernet Aggregate Switch with OAM Management

5E1 Inverse Multiplexer

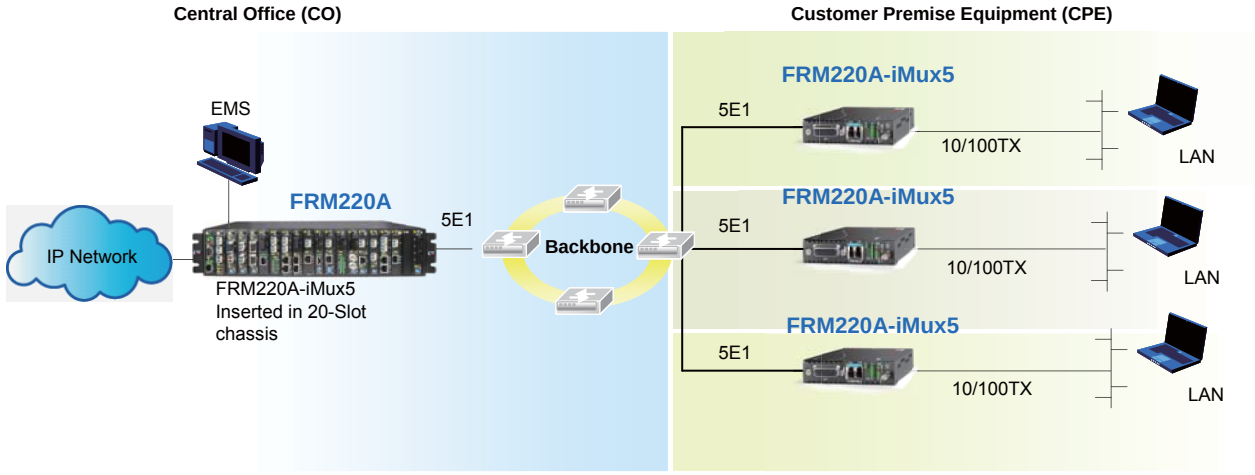
FRM220A-iMux5

The FRM220A-iMux5 is an E1 inverse multiplexer capable of bundling up to 5 E1 lines for cost-effective connection of 10/100BaseTX or 100Base-FX LANs over multiple E1 transports. The FRM220A-iMux5 inverse multiplexer transmits up to a 9.92Mbps Ethernet bridge channel (GFP-F encapsulated) over 5 E1 links. The FRM220A-iMux5 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 FRM220A-iMux5 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 FRM220A-iMux5 fully meets E1 specifications including ITU-T G.703 and G.823. The FRM220A-iMux5 features diagnostic capabilities for performing remote loopback. The operator at either end of the line may test both the FRM220A-iMux5 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 5E1 links (1.984Mbps to 9.92Mbps)
- 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 ERM04 chassis
- SNMP management with ERM04 chassis
- LED Alarm indication

Interface	
Framing	CCS+CRC
Standard	ITU-T G.703/G.704/G.706 & G.732, G.823
Bit rate	2.048Mbps± 50ppm (up to 5E1)
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
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 AC 100 ~ 240V, DC -18 ~ 75V
Power Consumption	< 12W
Dimensions	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
Weight	DC 12 : 280g ， AC/DC48/AD ：580g
Temperature	0 ~ 60°C (Operating), -10 ~ 70°C (Storage)
Humidity	10 ~ 90% RH (non-condensing)
Certifications	CE, FCC, RoHS
MTBF	7,500 hrs (25°C)



Ordering Information

FRM220A-iMux5 ❶ □ - ❷ □ / ❸ □□□□

❶ T : 10/100TX
S : 100FX

❷ R : 120 ohm(RJ-45)
B : 75 ohm(BNC)

❸ AC
DC48
AD

Smart View Element Management System***(EMS)***
Example: SV-PLF-05(5/ 25/ 50), SV-AGT-50(50/ 100/ 200/ 500), SV-Fiber
(Platform server: 5/ 25/ 50 Client user admission+
50/ 100/ 200/ 500 Device Agents + FRM220 Managed Module)

8E1 Inverse Multiplexer

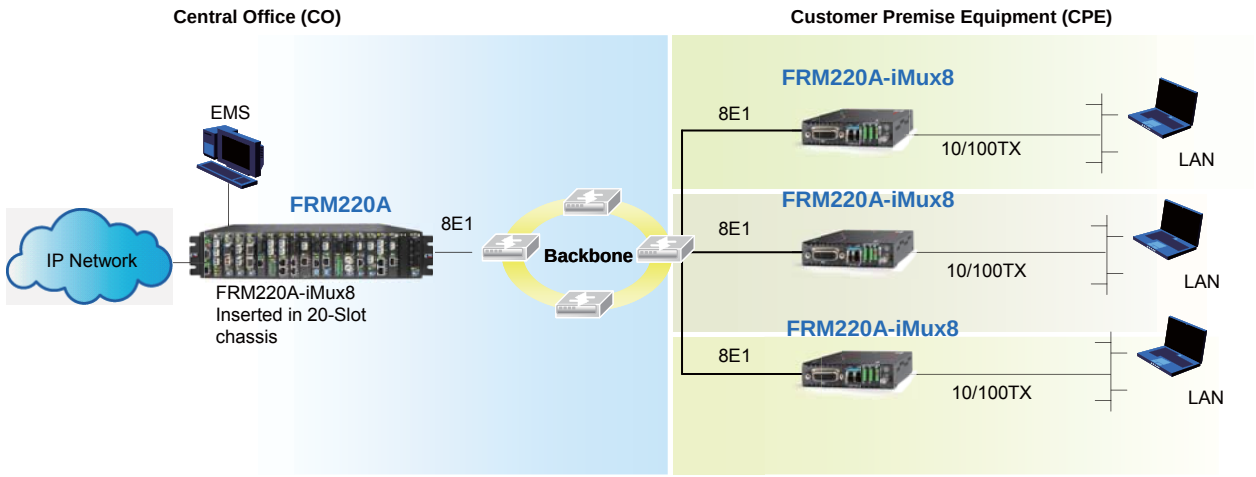
FRM220A-iMux8

The FRM220A-iMux8 is an 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 FRM220A-iMux8 inverse multiplexer transmits up to a 15.87Mbps Ethernet bridge channel (GFP-F encapsulated) over 8 E1 links. The FRM220A-iMux8 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 FRM220A-iMux8 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 FRM220A-iMux8 fully meets E1 specifications including ITU-T G.703 and G.823. The FRM220A-iMux8 features diagnostic capabilities for performing remote loopback. The operator at either end of the line may test both the FRM220A-iMux8 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 ERM04 chassis
- SNMP management with ERM04 chassis
- LED Alarm indication

Interface	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
	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
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 AC 100 ~ 240V, DC -18 ~ 75V
Power Consumption		< 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 ~ 60°C (Operating), -10 ~ 70°C (Storage)
Humidity		10 ~ 90% RH (non-condensing)
Certifications		CE, FCC, RoHS
MTBF		65,000 hrs (25°C)



Ordering Information

FRM220A-iMux8 ❶ □ - ❷ □ / ❸ □□□□

❶ T : 10/100TX
S : 100FX

❷ R : 120 ohm(RJ-45)
B : 75 ohm(BNC)

❸ AC
DC48
AD

Smart View Element Management System***(EMS)***

Example: SV-PLF-05(5/ 25/ 50), SV-AGT-50(50/ 100/ 200/ 500), SV-Fiber
(Platform server: 5/ 25/ 50 Client user admission+
50/ 100/ 200/ 500 Device Agents + FRM220 Managed Module)

16E1 Inverse Multiplexer

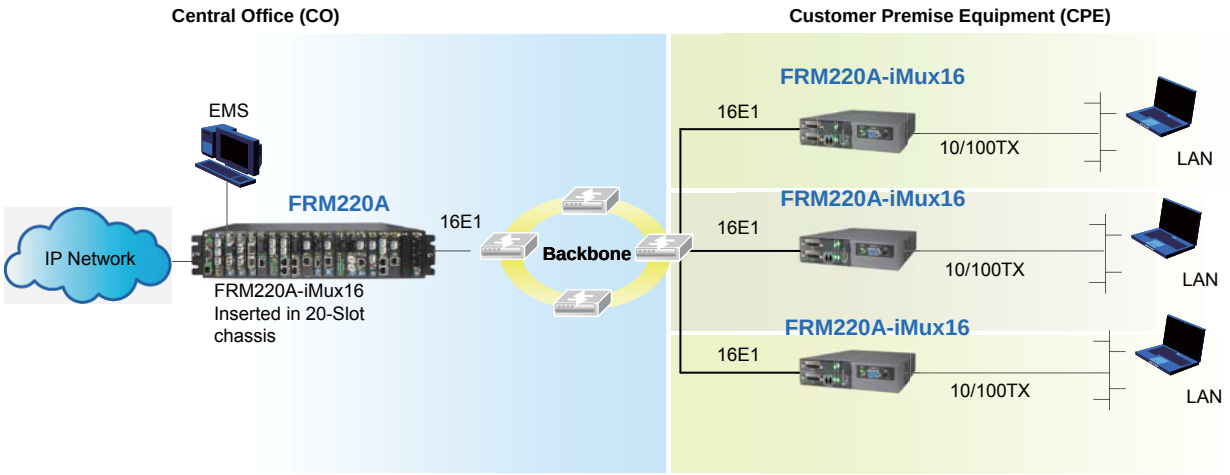
FRM220A-iMux16

The FRM220A-iMux16 is an 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 FRM220A-iMux16 inverse multiplexer transmits up to a 31.74Mbps Ethernet bridge channel (GFP-F encapsulated) over 16 E1 links. The FRM220A-iMux16 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 FRM220A-iMux16 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 FRM220A-iMux16 fully meets E1 specifications including ITU-T G.703 and G.823. The FRM220A-iMux16 features diagnostic capabilities for performing remote loopback. The operator at either end of the line may test both the FRM220A-iMux16 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 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 ERM04 chassis
- SNMP management with ERM04 chassis
- LED Alarm indication

Interface	Framing	CCS+CRC
	Standard	ITU-T G.703/G.704/G.706 & G.732, G.823
	Bit rate	2.048Mbps± 50ppm (up to 16E1)
	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
	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 AC 100 ~ 240V, DC -18 ~ 75V
Power Consumption		< 12W
Dimensions		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
Weight		DC 12 : 280g ， AC/DC48/AD : 580g
Temperature		0 ~ 60°C (Operating), -10 ~ 70°C (Storage)
Humidity		10 ~ 90% RH (non-condensing)
Certifications		CE, FCC, RoHS
MTBF		65,000 hrs (25°C)



Ordering Information

FRM220A-iMux16 ❶ □ - ❷ □ / ❸ □□□□

❶ T : 10/100TX
S : 100FX

❷ R : 120 ohm(RJ-45)
B : 75 ohm(BNC)

❸ AC
DC48
AD

Smart View Element Management System***(EMS)***

Example: SV-PLF-05(5/ 25/ 50), SV-AGT-50(50/ 100/ 200/ 500), SV-Fiber
(Platform server: 5/ 25/ 50 Client user admission+
50/ 100/ 200/ 500 Device Agents + FRM220 Managed Module)

E1 Inverse Multiplexer

FRM220A-Eoe1

The FRM220A-Eoe1 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 FRM220A-Eoe1 inverse multiplexer transmits up to a 1.984Mbps Ethernet bridge channel (GFP-F encapsulated) over E1 links. The FRM220A-Eoe1 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 FRM220A-Eoe1 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 FRM220A-Eoe1 fully meets E1 specifications including ITU-T G.703 and G.823. The FRM220A-Eoe1 features diagnostic capabilities for performing remote loopback. The operator at either end of the line may test both the FRM220A-Eoe1 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.

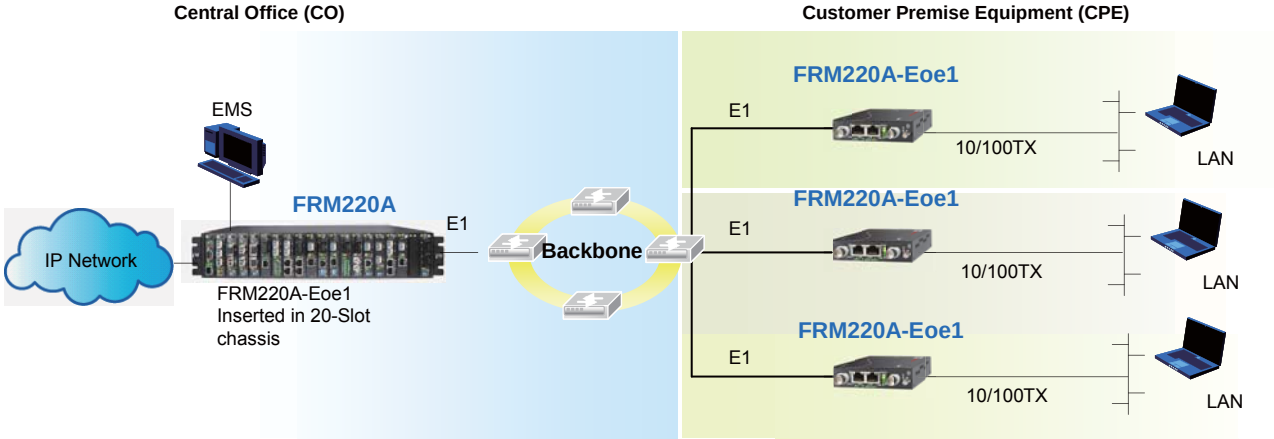
Features

- 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 chassis
- SNMP management with FRM220A chassis
- LED Alarm indication

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
	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
	Connector RJ45 10/100Base-TX
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 AC 100 ~ 240V, DC -18 ~ 75V
Power Consumption	< 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 ~ 60°C (Operating), -10 ~ 70°C (Storage)
Humidity	10 ~ 90% RH (non-condensing)
Certifications	CE, FCC, RoHS
MTBF	65,000 hrs (25°C)

Managed E1 Inverse Multiplexer

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



Ordering Information

FRM220A-Eoe1: Ethernet to E1 Access Unit

Smart View Element Management System***(EMS)***

Example: SV-PLF-05(5/ 25/ 50), SV-AGT-50(50/ 100/ 200/ 500), SV-Fiber (Platform server: 5/ 25/ 50 Client user admission+ 50/ 100/ 200/ 500 Device Agents + FRM220 Managed Module)

Gigabit Ethernet OAM/IP In-band Converter/Switch

FRM220-1000EAS/X

The FRM220-1000EAS/X is an IEEE802.3ah OAM compliant dual copper to dual fiber Gigabit Ethernet solution designed to make conversion between 10/100/1000Base-TX and 1000Base-SX/LX with SFP connector. With SNMP and Web-based management in the FRM220, the network administrator can monitor, configure and control the activity of each 802.3ah series card and remotely connected OAM compliant converter. By offering 802.3ah OAM Compliant in-band management, this converter can be completely controlled and monitored from a centrally located managed rack controlling all converter settings including band-width control, duplex, and speed configuration. This media converter is completely transparent to Layer 2 and Layer 3 protocols including IEEE 802.1q, VLAN tag, Q in Q, STP, IPX, IP, etc.

Features

- Supports local / remote 802.3ah OAM / IP In-band management
- Stand-alone IP Based, Web GUI, Telnet, SNMP management
- 2-port 10/100/1000Base-T to 2-port 1000Base-SX/LX SFP
- Auto-Negotiation or forced mode
- Auto MDI/MDIX
- Forward 9K bytes Jumbo packets (max.) packets
- Supports Q in Q double tagged frame transparent
- Supports IEEE 802.1q Tag and Port based VLAN
- Supports Flow control (Pause)
- Supports OAM remote loopback to assist in diagnosing network problems
- Supports bandwidth control (70K ~ 250Mbps)
- Supports remote CPE power fail detect (dying gasp)
- Supports Far End Fault
- Supports Link Fault Pass through (LFP)
- Supports Loop Back Test
- Supports RMON counter
- D/D function for supported SFP fiber transceiver
- Auto Laser Shutdown (ALS)
- Fiber Hardware Reset (FHR)
- Online local / remote f/w upgrade
- Fiber Redundant
- VLAN
- Spanning Tree
- Port Trunking
- Default port and 802.1p tag priority QoS
- Fixed or weighted priority QoS

Optical Interface	Connector SFP LC Data rate 1000Mbps Duplex mode Full duplex Fiber MM 50/125µm, 62.5/125µm. SM 9/125µm Distance MM 550m, 2km, SM 15/30/50/80/120km WDM 20/40/60km Wavelength MM 1310nm, SM 1310,1550nm WDM 1310Tx/1550Rx (type A) 1550Tx/1310Rx (type B)
Electrical Interface	Connector RJ45 Data rate 10Mbps, 100Mbps, 1000Mbps Duplex mode Half / Full duplex Cable 10Base-T Cat.3, 4, 5, UTP 100Base-TX Cat.5, 5e or higher 1000Base-T Cat.5, 5e or higher
Standard	IEEE 802.3, IEEE 802.3u, IEEE802.1q
Indications	LED (Power, FX-Link, Test, TX-Link, TX-SPD)
Power Input	Card : 12VDC Standalone : AC, DC options
Power Consumption	< 8W
Dimension	155 x 88 x 23mm (D x W x H)
Weight	120g
Temperature	0 ~ 60°C (Operating), -10 ~ 70°C (Storage)
Humidity	10 ~ 90% non-condensing
Certification	CE, FCC, LVD, RoHS
MTBF	65,000 hrs (25°C)

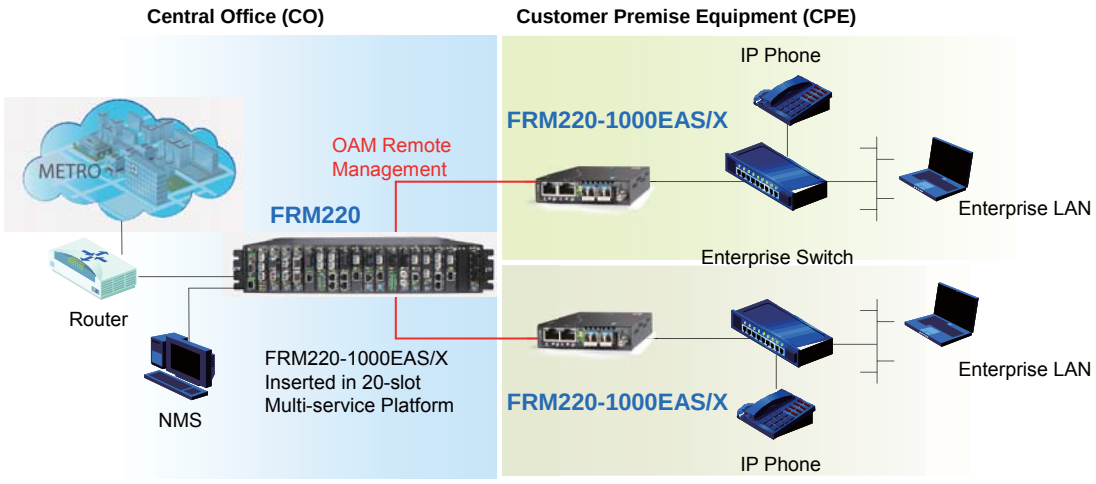
Ordering Information

FRM220-1000EAS/X: 2-port 10/100/1000Base-T to 2-port 1000Base-X SFP OAM/IP media converter

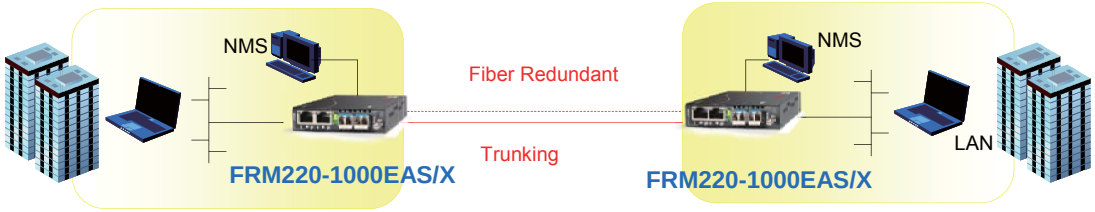
Smart View Element Management System***(EMS)***

Example: SV-PLF-05(5/ 25/ 50), SV-AGT-50(50/ 100/ 200/ 500), SV-Fiber
(Platform server: 5/ 25/ 50 Client user admission+
50/ 100/ 200/ 500 Device Agents + FRM220 Managed Module)

FRM220-1000EAS/X Application



Fiber Redundant / Trunking Application



Fiber Ring Application