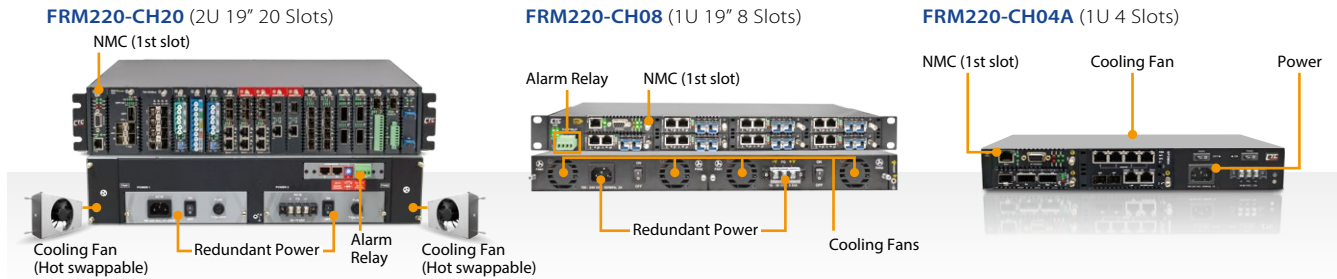


The FRM220 series is a multi-service chassis platform, which provides a reliable solution of high density media converter modules for applications such as telecom operator, enterprise, long haul transmission and factory automation. All of critical components of FRM220-CH20 and FRM220-CH08 chassis such as power modules, fans, management module and interface cards are hot swappable, allowing online field replacement. FRM220-CH04A is a fixed type AC, DC power built-in chassis. The available power options are built-in AC, DC power or built-in AC+DC, AC+AC, DC+DC redundant power. FRM220 series is offered in three chassis densities, a 2U 20-slot (FRM220-CH20), a 1U 8-slot (FRM220-CH08), and a 1U 4-slot (FRM220-CH04A)



Main Features

Module Cards for Deployment Scenarios

The FRM220-CH20, FRM220-CH08 and FRM220-CH04A have been designed as a Multi-service platform. This allows network administrators to deploy the chassis in a wide range of networks.

Technologies supported by the chassis include Fast/Gigabit Ethernet, E1/T1, V35/X21/RS-530, Serial RS-485/RS-422, Voice FXO/FXS, Repeater, Fiber Multiplexer, E1 Inverse Multiplexer, CWDM Mux/DeMUX EDFA Booster and 10G/16G/40G 3R Transponder.

Network Management

The FRM220-CH20, FRM220-CH08 and FRM220-CH04A require a NMC (Network Management Controller) card which must be installed into the first slot of chassis. The NMC card allows a network administrator the ability to configure and monitor the status of the blades. Management can be achieved locally over RS232, or over the network by Telnet, Web or SNMP. If the blades support Ethernet in the First Mile (IEEE 802.3ah), then the management module can also monitor the status of a remote CPE.

Standalone Chassis

Standalone Chassis

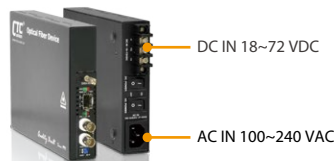
1-Slot Chassis

CH01 (Adapter Type)



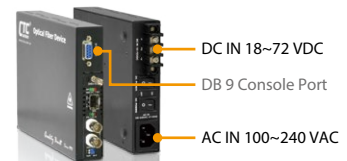
▪ DIM: 139 (D) x 23.2(W) x 88(H)mm

CH01 (Power Built-in)



▪ DIM: 180(D) x 30(W) x 135(H)mm

CH01M (Power Built-in)



▪ DIM: 185(D) x 30(W) x 135(H)mm

2-Slot Chassis

CH02M (Power Built-in)



▪ DIM: 219.4(D) x 44.5(W) x 167.4(H)mm

CH02/NMC (Power Built-in)



▪ DIM: 219.4(D) x 44.5(W) x 167.4(H)mm

CH02/SMT (Power Built-in)



▪ DIM: 220(D) x 44.7(W) x 205(H)mm

SmartView™ WEB EMS

- Web-based User Interface
- Remote Access and Centralized Device Management
- Real-time visual representations & processing of alarms
- Long term event storage (up to 1 year)

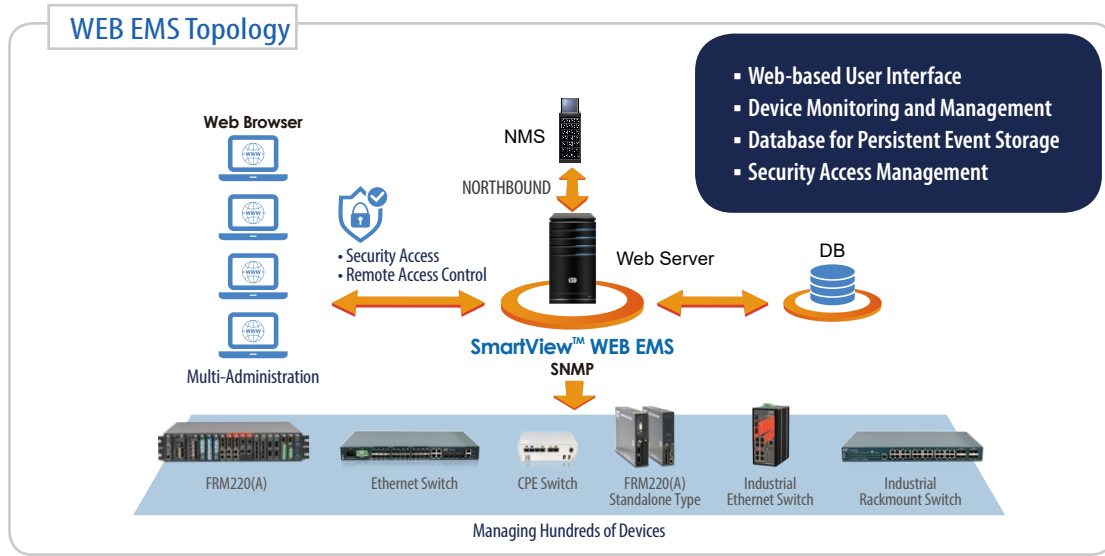
Functions

▪ Main Functions (FCAPS):

- Fault Management,
- Configuration Management,
- Accounting Management,
- Performance Management,
- Security Management



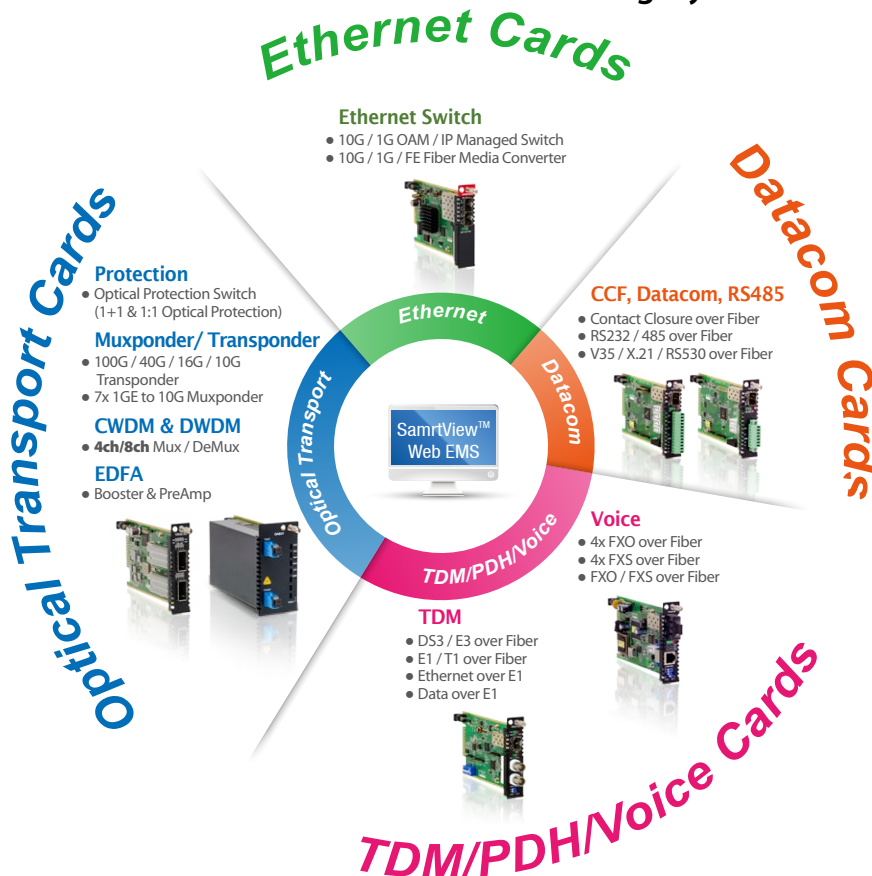
- Remote access control for efficient configuration
- Network element performance monitoring
- Alarm event and notification
- Auto discovery and device viewer
- Allow 20 concurrent operating users



iAccess Platform Solutions

iAccess™ Multi-Service Platform offers a full range of solutions for service providers and enterprises, including **Optical Transport Solutions** (transponders, muxponders, CWDM, DWDM), **TDM/PDH/Voice Solutions** (fiber converters and multiplexers), **Ethernet Services** (switches and converters) and **Data Communication Solutions** (Sync/Async serial over fiber). The iAccess is a fully modular product series that integrates a wide range of modules for any interface or protocol hosted in a selection of Chassis sizes for simple and flexible operations.

iAccess Platform Solution Category



► FRM220 Module Cards

Ethernet Switch

- NEW** ▪ FRM220-X2000EAS 2x 10G Base-R SFP+ and 1x 100/1000Base-X SFP OAM/IP Managed 10G switch
- NEW** ▪ FRM220A-2000EAS/4F 4x 100/1000Base-X SFP OAM/IP GbE Managed Switch
- NEW** ▪ FRM220A-2000EAS/2 2x 10/100/1000Base-T + 2x 100/1000Base-X SFP OAM/IP Managed GbE Switch
- NEW** ▪ FRM220A-2000EAS/1 10/100/1000Base-T + 100/1000Base-X SFP OAM/IP Managed GbE Switch
- NEW** ▪ FRM220-2000MS 100/1000Base-T to 100/1000Base-X SFP Web Smart In-Band Managed GbE Switch

Media Converter

- FRM220-10/100i In-Band Managed FE Media Converter, 100Base-TX to 100Base-FX
- FRM220-10/100iS-2 In-Band Managed FE Media Converter, Dual Channel 10/100Base-TX to 100Base-X SFP E1/T1 Cross Rate Converter
- FRM220-FTEC

Transponder

- FRM220-100GE-2Q 100GE QSFP28 to QSFP28 3R Transponder
- FRM220-40G-2Q 40G QSFP+ to QSFP+ 3R Transponder
- FRM220-40G-1Q4S 40G QSFP+ to 4x 10G SFP+ Transponder
- FRM220-16G-3R 16G 3R Multi-rate Transponder with Optical Line Protection
- FRM220-10G-3R 10G 3R Multi-rate Transponder with Optical Line Protection
- FRM220-4G-3R 4G 3R Multi-rate Transponder with Optical Line Protection
- FRM220-4G-3S 4G 2R Multi-rate Transponder with Optical Line Protection
- FRM220-1000DS FE/GE fiber Repeater
- FRM220-TM-10Gmux 7x GE to 10Gbps Muxponder

EDFA

- FRM220-OAB21A Single Channel EDFA Booster 21dB
- FRM220-OAB21 Single Channel EDFA Booster 21dB with AGC
- FRM220-OAB15 Single Channel EDFA Booster 15dB
- FRM220-OAP17 Single Channel EDFA Preamp 17dB
- FRM220-OAP10 Single Channel EDFA Preamp 10dB

Optical Protection Switch

- FRM220-OPSS1 1:1 Single-mode Fiber Optical Protection Switch
- FRM220-OPSS1M 1:1 Multi-mode Optical Protection Switch
- FRM220-OPSS2 1+1 Single-mode Fiber Optical Protection Switch

WDM Optical Multiplexer

- FRM220-DWMD40/80/160 4ch/8ch/16ch DWDM Mux/DeMUX
- FRM220-CWMD40/80/160 4ch/8ch/16ch CWDM Mux/DeMUX
- FRM220-OADM Optical Add-Drop Multiplexer

CCF, Datacom, RS485

- FRM220-CCF40 4ch Contact Closure Fiber Converter, In-Band Managed
- FRM220-CCF20 2ch Contact Closure Fiber Converter, In-Band Managed
- FRM220-DATA RS232/530/V35 over Fiber, In-Band Managed
- FRM220-Serial RS232/485 over Fiber, In-Band Managed

TDM/PDH

- FRM220-DS3/E3 DS3/E3 over Fiber, In-Band Managed
- FRM220-E1/T1 E1/T1 over Fiber, In-Band Managed
- FRM220-E1/DATA E1 to DATA
- FRM220A-iMux16 Ethernet over Bonded 16 E1 NTU, In-Band Managed
- FRM220A-iMux8 Ethernet over Bonded 8 E1 NTU, In-Band Managed
- FRM220A-iMux4 Ethernet over Bonded 4 E1 NTU, In-Band Managed
- FRM220-GFOM08 8ch E1/T1+ GbE Fiber Multiplexer with In-Band Management
- FRM220-GFOM04 4ch E1/T1+ GbE Fiber Multiplexer with In-Band Management
- FRM220-FOM04 4ch E1/T1+ FE Fiber Multiplexer with In-Band Management
- FRM220-FOM01 1ch E1/T1+ FE Fiber Multiplexer with In-Band Management

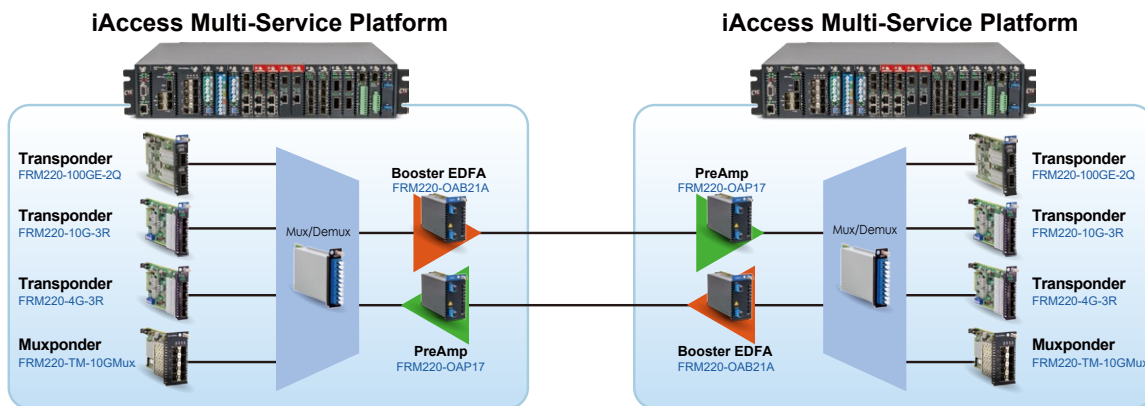
Voice

- FRM220-FXO/FXS FXO/FXS over Fiber In-Band Managed Converter
- FRM220-FXO-4 4ch FXO over Fiber In-Band Managed Converter
- FRM220-FXS-4 4ch FXS over Fiber In-Band Managed Converter

Application

Optical Transport Solution

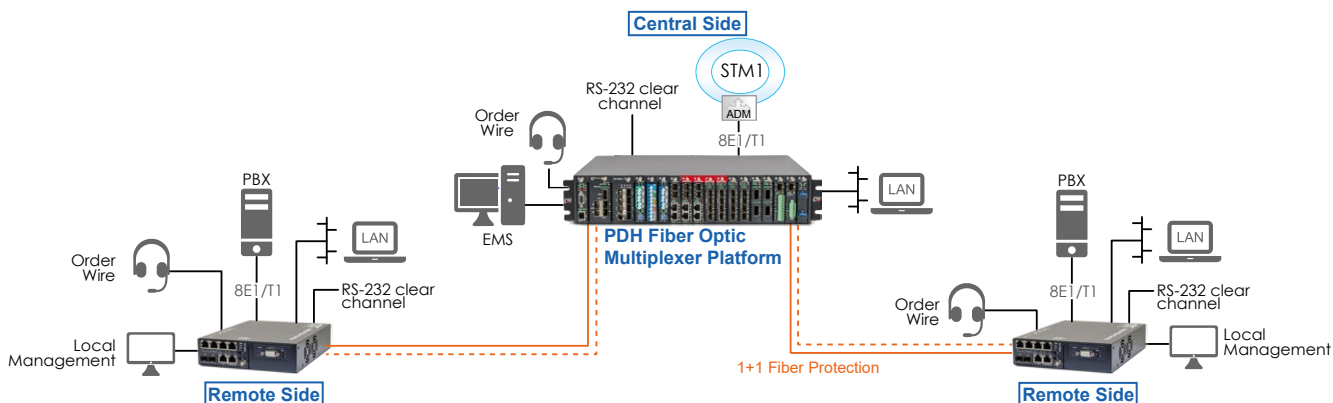
Optical transport is important in providing data over long distances. CTC Union's Optical Transport Solutions include the optical transport building blocks of Mux/Demux, transponders, muxponders, EDFA and optical protection switching.



CWDM /DWDM P to P Application

TDM/PDH/Voice solution

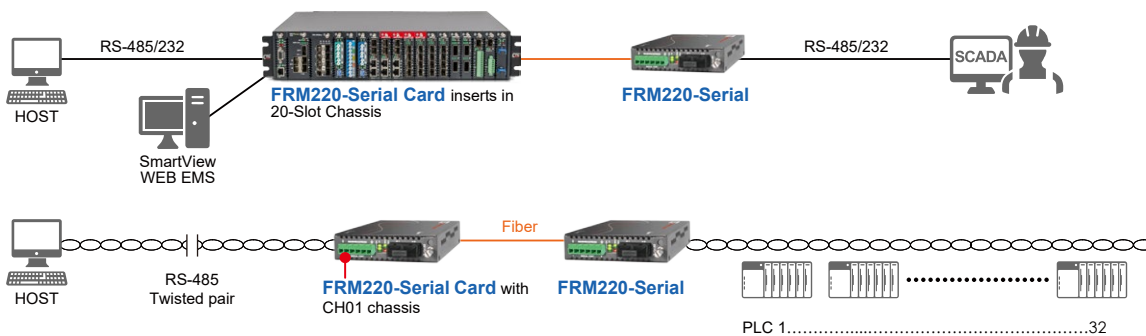
TDM and PDH are becoming legacy protocols, however, much of the world's voice communications still rely on devices that transport these protocols. CTC Union's solutions include DSU/CSU access units, Time Division Multiplexers, PDH over fiber and POTS over fiber devices.



PDH Fiber Optical Multiplexer P2P Application

Data Communication Solution

Data communications are important for device control and satellite communications. CTC Union's devices provide low latency data communications over fiber optical transport.



Data Communications Application