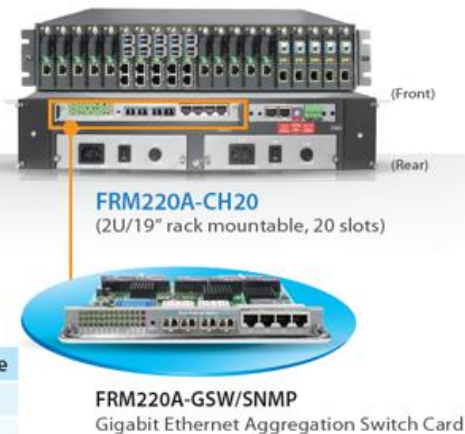


Multi-Service Platform

In-Band Managed Multi-Service Platform



Ethernet Aggregation Platform



Comparison Table

Chassis Type	Slot	Power Type	NMC	Ethernet Aggregation Card	Chassis Cascade
FRM220-CH20	20	AC, DC, AD, AA, DD	✓		✓
FRM220A-CH20	20	AC, DC, AD, AA, DD		✓	
FRM220-CH08	8	AC, DC, AD, AA, DD	✓		

Note: AC: AC Power DC: DC Power AD: AC+DC Power AA: AC+AC Power DD: DC+DC Power

Features & Benefits

IEEE 802.3ah OAM/IP in-band management

FRM220 chassis solution supports in-band management to enable network administrators to easily monitor and configure both local and remote modules without truck roll to save the OPEX for operators

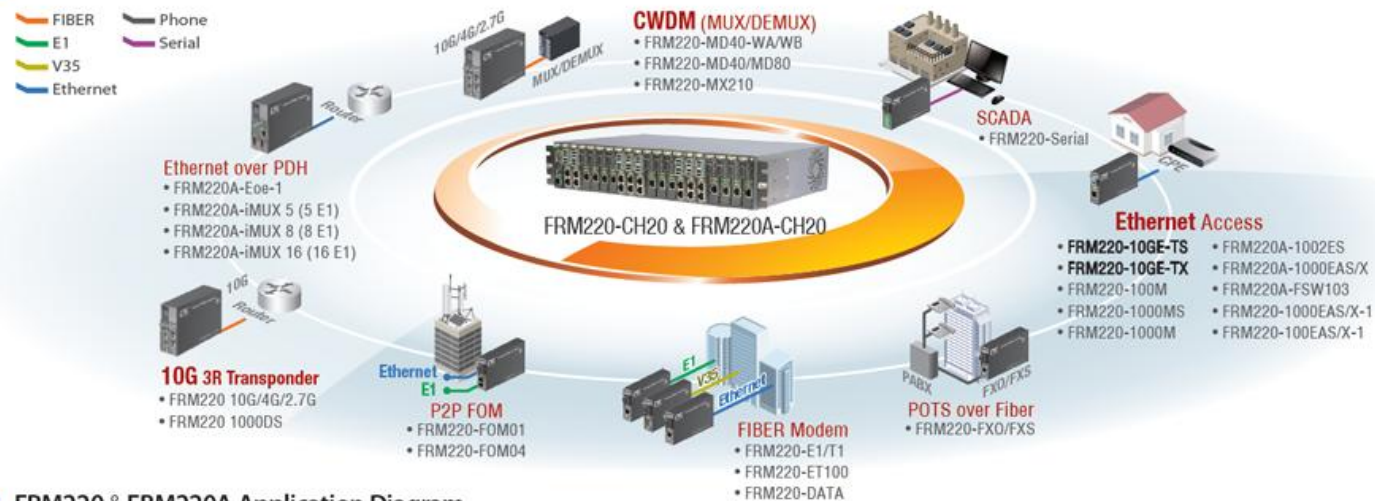
All modules and interface card are hot swappable

In case any component module or interface card requires swapping, the maintenance engineer can perform in-service replacement without network connection interruption required

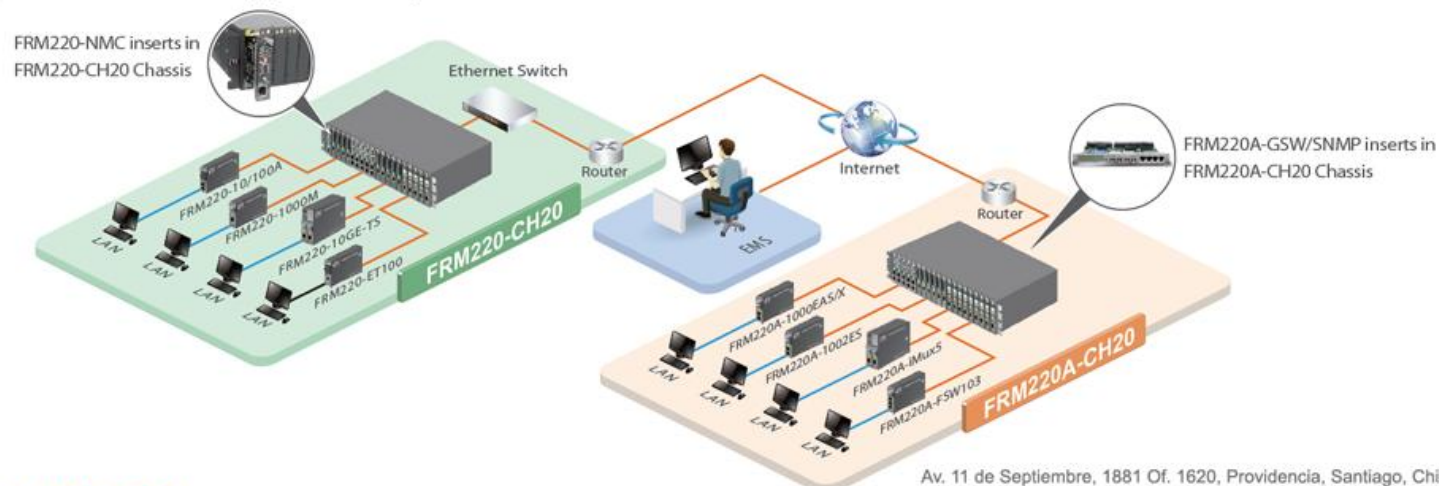
Cascaded connection for single IP management

FRM220-CH20 supports cascaded connection up to 10 sets maximum for single IP managed purpose to enable centralized management capability as well as flexible scalability

Module Cards for Deployment Scenarios



FRM220 & FRM220A Application Diagram



Metro Ethernet

The MEF has defined Carrier Ethernet as a ubiquitous, standardized, carrier-class service and network with five attributes that distinguish it from familiar LAN-based Ethernet. These attributes are standardized services, scalability, reliability, management and quality of service. Leveraging those attributes, Carrier Ethernet Services offer the following characteristics and benefits which enable implementation of robust and future proof WAN connectivity solutions.

CTC Union starts to unveil the Metro Ethernet product line and formally enters into the booming Metro Ethernet Market. The solution scope covers Ethernet demarcation device, that is MEF defined UNI (User Network Interface) solution from subscriber end (UNI-C) to operator end (UNI-N). The products comply to the MEF defined standards to guarantee the interoperability with other MEF certified equipment providers world wide.



MSW-4424A

Gigabit L2+ OAM Managed Fiber Access Switch

24x100/1000Mbps SFP slots +
4-Port 10Gbps SFP+ slots



MSW-202

Ethernet Demarcation Device OAM Managed Switch

2-Port 100/1000Base-T RJ45 +
2-Port 100/1000Mbps SFP slots

Key Features

- Compliant to MEF9/14 standards-E-Line, E-LAN service
- Various QoS capability (IEEE 802.1p/port/MAC/Diffserv)
- IEEE 802.1ad Q-in-Q for ISP application
- STP / RSTP / MSTP
- Supports IEEE 1588 PTP and Synchronous Ethernet
- ITU-T G.8032 Ethernet ring protection
- Supports IPv6
- Web/CLI/SNMP Management
- Supports IEEE802.3ah/IEEE 802.1ag/ITU-T Y.1731 Ethernet OAM

Metro Ethernet Business Application



Benefits

Scalability as service demand drives

Scalable for the future bandwidth needs, geographic, applications, company expansions

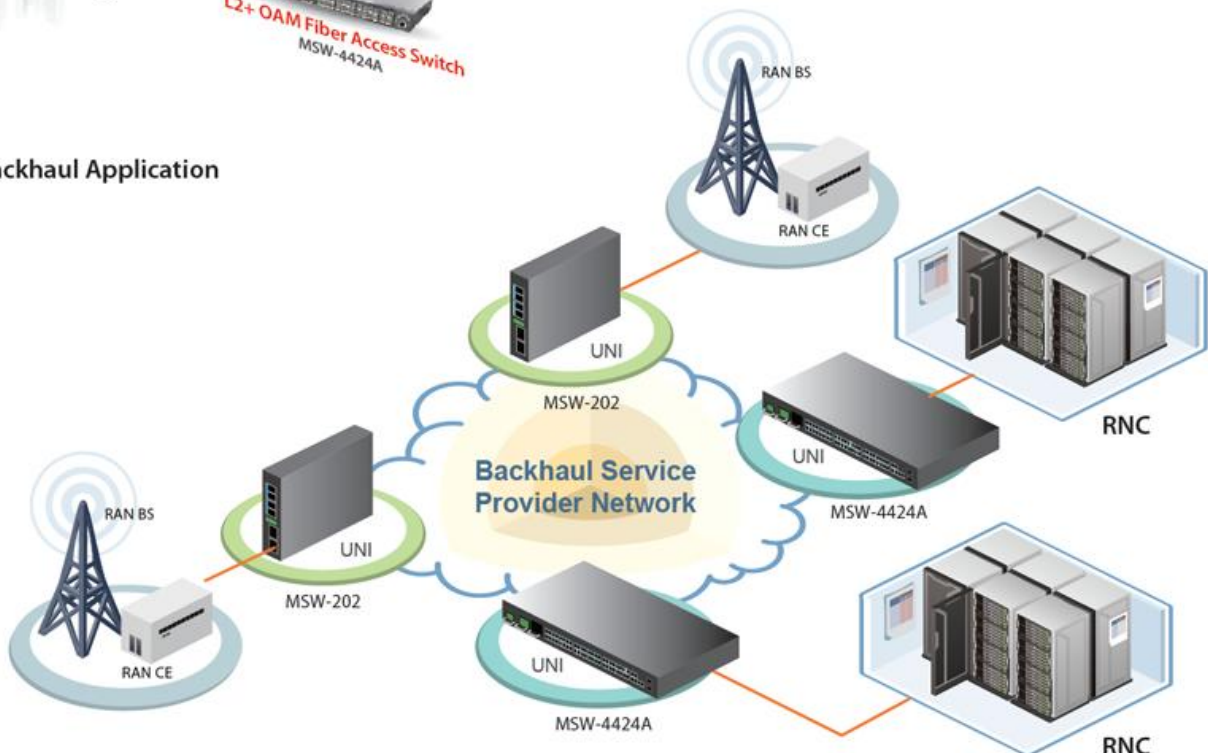
Fully Ethernet OAM enabled

Enabling Ethernet OAM features (IEEE 802.3ah/802.1ag/ITU-T Y.1731) to rapidly detect and recover network fault and save the OPEX for operators as well as increase customer satisfaction

MEF standards compliant solution

MEF 9/14/21 compliant product to guarantee the compatibility with other MEF certified equipment and reduce the risk and cost for Metro Ethernet network deployment of operators

Mobile Backhaul Application



FTTH Active Ethernet

Access Site Solutions



MSW-4424A

Features & Benefits

Gigabit L2+ OAM Managed Fiber Access Switch

- Front access and hot swappable design
- Fully dual rate architecture of fiber link port
- Fully Ethernet OAM enabled
- Supports IEEE 1588 PTP and Synchronous Ethernet



FRM220-CH20 FRM220-CH08
In-Band Managed Multi-Service Platform



FRM220A-CH20
Ethernet Aggregation Platform

CPE Site Solutions

OAM Managed



FTH4-100M & FTH4-1000MS

Web Smart OAM FE/GbE Managed Media Converter

- Supports 9k bytes Jumbo Frame
- Built-in fiber cable tray
- Ingress/Egress Bandwidth control
- IEEE802.1Q tagged VLAN/Q-in-Q
- Dying gasp



FMC-100M FMC-1000MS

Web Smart OAM / IP Managed FE/GbE Media Converter

- Supports 9k bytes Jumbo Frame
- Ingress/Egress Bandwidth Control
- IEEE802.1Q tagged VLAN/Q-in-Q
- Dying gasp

SNMP Managed



FTH4-1004MS

Web Smart OAM GbE Managed Switch

- 4-ports 100/1000Base-T + 1-Port 100/1000Base-X SFP slot
- Supports 9k bytes Jumbo Frame
- Built-in fiber cable tray
- Ingress/Egress Bandwidth control
- IEEE802.1Q tagged VLAN/Q-in-Q

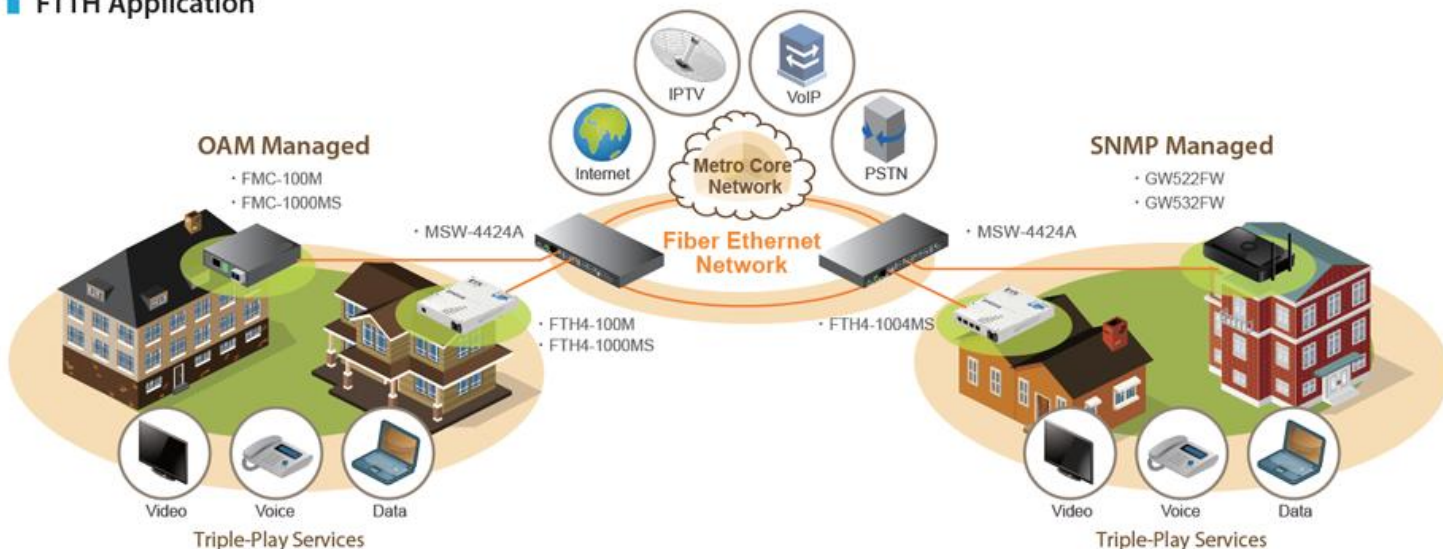


GW522FW & GW532FW

Fast/GbE Ethernet Fiber IAD Gateway with WiFi

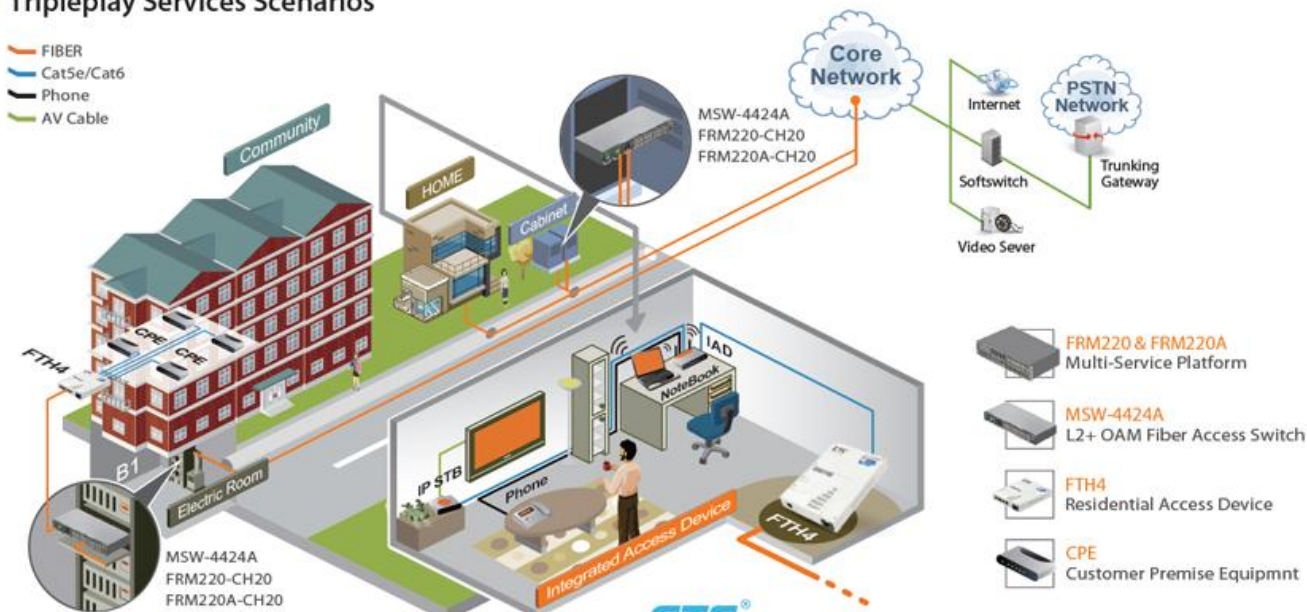
- Built-in IEEE 802.11n WLAN
- RFC3261 SIP
- Multi-WAN
- TR-069/104 (option)

FTTH Application



Tripleplay Services Scenarios

- FIBER
- Cat5e/Cat6
- Phone
- AV Cable

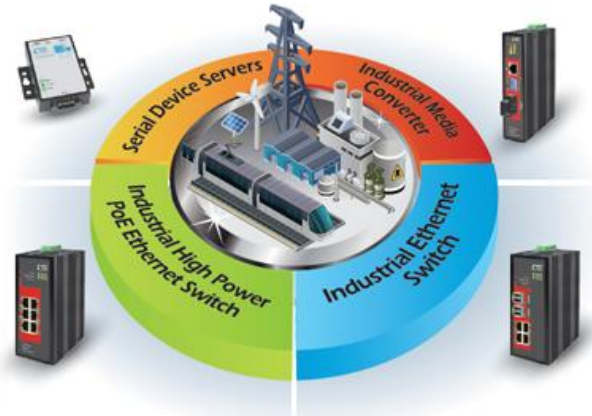


- FRM220 & FRM220A Multi-Service Platform
- MSW-4424A L2+ OAM Fiber Access Switch
- FTH4 Residential Access Device
- CPE Customer Premise Equipmnt

Industrial Networks

CTC Union offers a variety of industrial networking solutions including Fast and Gigabit Ethernet switches, copper to fiber media converters, serial I/O interface to fiber as well as optional support for Power over Ethernet. With CTC Union's hardened design core technology, robust mechanical and mounting design, redundant power and link, as well as extensive wide temperature designs, CTC Union's transmission solutions enable customers to build up the needs and wants of an intelligently automated factory.

- Wide Temperature -40°C ~ 75°C Models Available
- Industrial Grade EMS Certified
- Hazardous Location Applications
- Fan less and high MTBF
- 5-Year Warranty



Hardened Fast Ethernet Switches

- Wide selections, from 5 to 11 ports
- Unmanaged to managed, copper to Fiber 20KM/30KM/60KM
- L2 full managed with ring redundant model supported
- Provides broadcast storm protection

Hardened Gigabit Ethernet Switches

- High bandwidth Gigabit data Communications
- 5-port to 11-port, copper to fiber several model selection
- Industrial Grade EMS Certified
- Redundant dual power input 24/48 VDC(25~57VDC)

Managed Ring Redundant Ethernet Switches

- Fast Ring redundancy standard G.803.2, MSTP, RSTP supported
- Up to 11 ports Fast/Gigabit Ethernet Connections
- Layer 2 full management
- UL508, UL Class I Div.2

Media Converters

Serial Media Converter

- RS-232/422/485 to 1 or 2 Fiber Converter
- 2.5KV isolation for serial signal
- Rotary switch for setting the pull high/low resistor
- Fiber interface support daisy-chain or ring connection

Ethernet Media Converter

- Two Operating Mode: Store-and-Forward & Cut Through
- Link Fault Pass Through (LFP) supported, PoE/PD model available
- Fast Ethernet/Gigabit Ethernet to Fiber connections

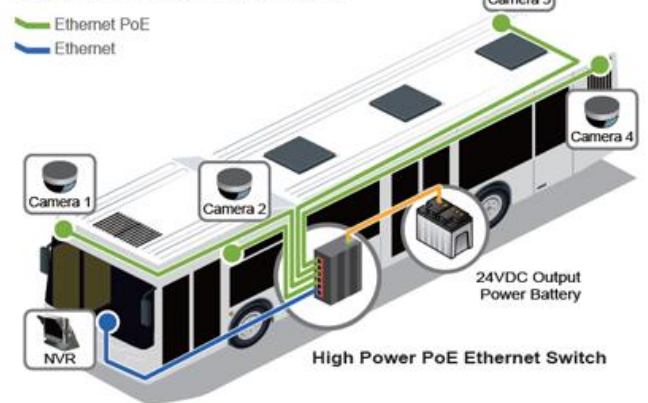
Serial Device Servers

- Supports RS-232/422/485 serial interface
- 1-Port RJ-45 Ethernet 10/100Base-TX
- Easy to use with Windows utility
- TCP Server, TCP Client, UDP, Virtual COM, Paired Mode
- Supports HTTP, ICMP, ARP, IP, UDP, TCP

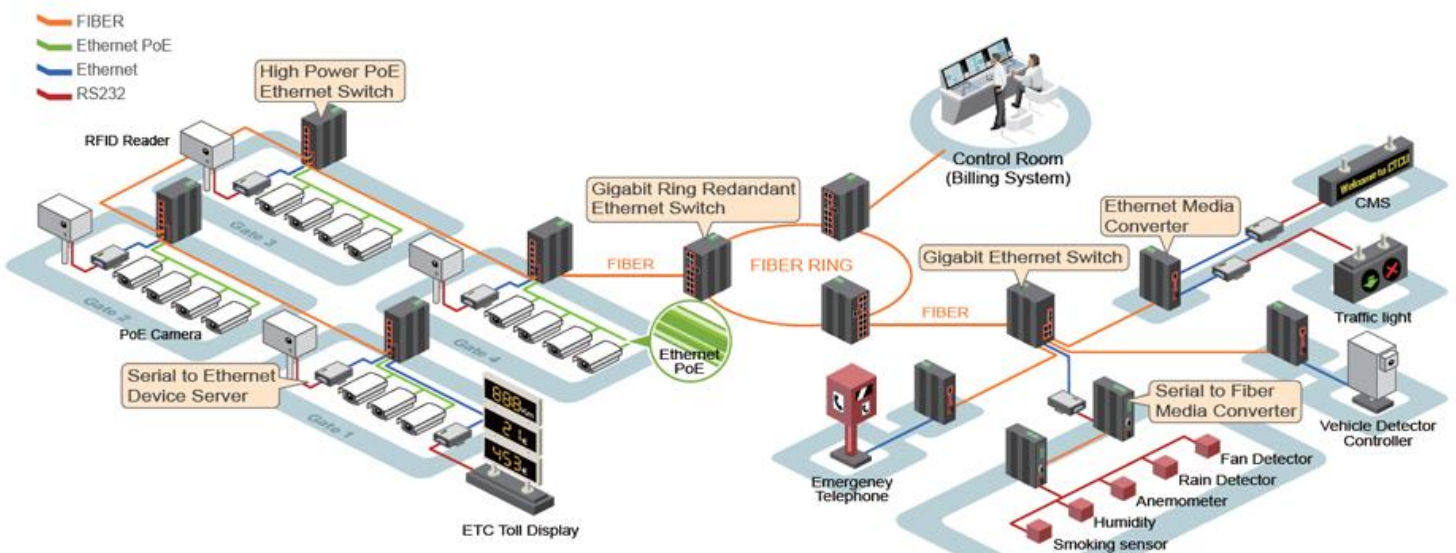
High Power PoE Ethernet Switches

- Plug-and-Play or full managed selections
- Fast Eth./Gigabit Ethernet Supported
- Up to 4-port High Power PoE/PSE 30 watts
- Layer 2 full management
- 24 VDC/48 VDC Boost

Bus Surveillance Application



ITS and ETC Billing Application



CWDM

CWDM provide high performance multiplexing or de-multiplexing for various of applications. CTC Union CWDM product family covers the following wavelength windows commonly used in optical fiber systems: From 1471nm to 1611nm for CWDM optical communications. The optical multiplexers are used to combine signal from the traffic card (single channel transponders or GbE Multiplexer) on to a single pair of fiber. The WDM components have much wider operating bandwidth, lower insertion loss, higher power handling, high isolation, etc.

NEW



FRM220-MX210



2-port Gigabit Ethernet Multiplexer

- Local configuration via DB9 craft port in stand-alone (CH01M)
- Transports two Gigabit Ethernet over one wavelength doubling the CWDM system transmission capacity
- Network Management via web, Telnet, SNMP in central FRM220 chassis
- Facility loopback on both Line / client sides
- Forward 9K bytes Jumbo Packets
- Detect transceiver error Alarm



FRM220-MD40 WA/WB



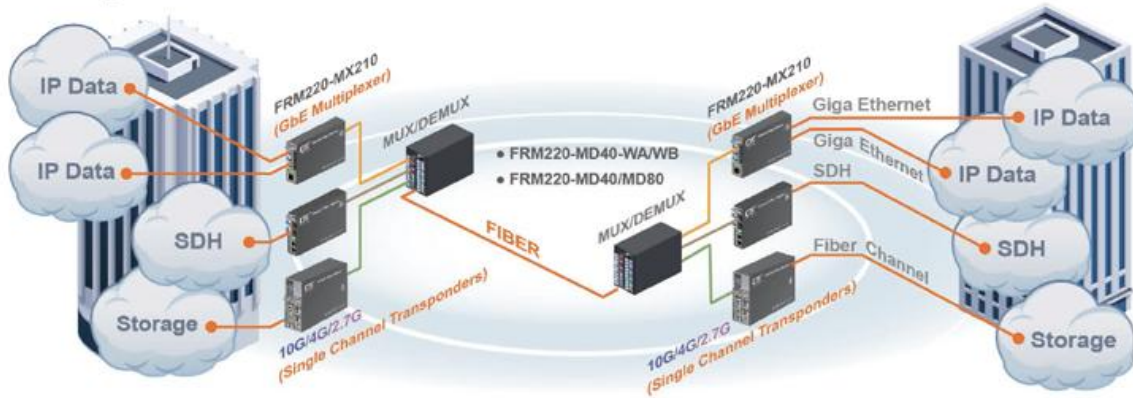
FRM220-MD40/MD80

4ch Single CWDM Fiber MUX/DeMUX

4ch/8ch CWDM Single Fiber MUX/DeMUX

- Utilizes industry standard ITU CWDM wavelength
- Full native mode performance
- Passive model requires no power
- Optical connectors
- Protocol transparent, no limitation

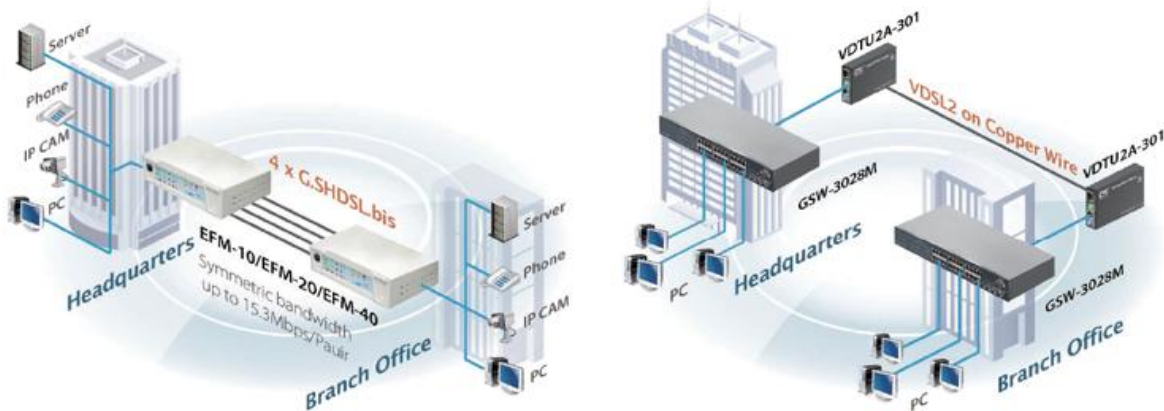
Application Diagram



EFM LAN Extender

To connect a private LAN between buildings or multiple locations is a challenge for the network administrator. The LAN extender forwards the traffic between LANs which is transparent to higher network protocols layer over the reached distance which exceeds the limitation of standard Ethernet specification. The CTC Union offers the LAN extender options over the copper wires based on TDM over SHDSL and VDSL2 technologies.

Application Diagram



EFM-10/EFM-20/EFM-40



SHDTU03bf-ET10R(S)



VDTU2A-301

TDM over SHDSL Based Technology

- Supports TC-PAM 32 for 5.7Mbps over single pair copper
- EFM bonding up to 61Mbps (4-pairs, TC-PAM 128)
- EFM OAM complying IEEE 802.3ah
- Flexible configuration as CO or CPE device

ATM over SHDSL Based Technology

- Supports TC-PAN 32 for 5.7Mbps over single pair copper
- Data rate 2-wire up to 5.7Mbps and 4-wire up to 11.4Mbps
- Easy-to-use web-based GUI for quick setup

VDSL2 Based Technology

- Data rate 100/75Mbps@300m ; 10/10Mbps@1km
- IEEE 802.1Q VLAN tag transparent
- Selectable CPE and CO mode via DIP switch