Telecom Transmission

PRODUCT GUIDE

- Multi-Service Platform
- Ethernet Aggregation Platform
- 4G LTE Router
- Carrier Ethernet
- SyncE Switch
- E1 Access & Mux
- PoE Surge Protector

ISO 9001
ISO 14001
RoHS Compliance

RoHS
UL c-UL

e-Catalog
SmartView™

CTC Union’s Management System is a comprehensive management solution that monitors device performance, enables remote configuration and provisioning, and provides fault notification status.

Device Management Software

- Main Functions (FCAPS): Fault, Configuration, Accounting, Performance and Security Management
- Manage up to 2000 device IP’s
- Remote access control for efficient configuration
- Traffic/Performance monitoring and management
- Alarm Trap and event log management
- Auto Discovery and Device Viewer
- Allow up to 25 administrators to login

4G LTE Router/Gateway

- **4G LTE Router**
  - ICR-4103
  - Supports Multi-band 4G FDD/TDD LTE, WCDMA, GSM 900/1800MHz, LTE Cat4
  - Built-in dual SIM card slots for network redundancy
  - Supports 2 Di, 1 Do interface
  - Supports 1 RS-232, 1 RS-485 (2-wire) Serial COM port
  - Integrated dual detachable antennas
  - Supports IPv6/IPv4, PPPoE, Static Routing and RIP1/2, QoS, VLAN, NAT
  - CE, RED, NCC, EN 60950-1

- **4G LTE, WiFi Gateway**
  - ICR-403
  - Provides dual 4G LTE Cellular SIMs for fail-over redundancy
  - High performance IEEE802.11b/g/n/ac (5GHz & 2.4GHz) connectivity
  - GNSS fleet tracking & Communication (GPS)
  - VO port, Serial port ideal for IoT application
  - High Security on Various VPN protocols, built-in Firewall and Authentication
  - Ruggedized design with vibration, shock, wide operating temp.
  - Certified by EN 60950-1, CE, FCC

- **4G LTE Router & Gateway**
  - ICR-W401
  - Provides dual 4G LTE Cellular SIMs for fail-over redundancy
  - Supports Multi-band 4G FDD/TDD LTE, WCDMA, GSM 900/1800MHz, LTE Cat4
  - Built-in dual SIM card slots for network redundancy
  - Supports 2 Di, 1 Do interface
  - Supports 1 RS-232, 1 RS-485 (2-wire) Serial COM port
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Application

- Bus Location Tracking
- Ticketing Information
- Passenger Information
- Bus Stop Surveillance

Remote Control Center
- Fire Wall
- GPS
- Cell Carrier 4G LTE/ISP
10G Ethernet Aggregation Platform - FRM220A

**FRM220A-CH20** (2U 19" 20 Slots)

- Provides chassis aggregation via 4x 10/100Gigabit Base-X SFP/SFP+ uplink slots
- Fiber optical ports supports Ring topology
- Provides Web (https) SNMPv1, v2c, v3, IPv6 management
- Supports tagged and QinQ VLAN
- Supports AC/DC power module hot swappable and power redundancy
- Two alarm relays contact for critical events warning
- Interface cards are hot swappable

**Ethernet Switch**

FRM220A-1000EAS/X
2x 10/100/1000Base-T + 2x 1000Base-X OAM/IP Managed Switch

**Ethernet Demarcation Device (EDD)**

FRM220-MSW202
2x 10/100/1000Base-T + 2x 100/1000Base-X L2+ Gigabit Carrier Ethernet Switch (EDD)

**Enabling VLAN & QoS Prioritized Multiple Play Services**

- FRM220A-CH20 w/FRM220A-1000EAS/X Slide-in
- FRM220A-1000EAS/X

![Diagram of network with FRM220A-CH20, GbE, Internet, SmartView EMS, Video Server, SIP Server, and Bank](image-url)
iAccess™ Platform offers a full range of solutions for service providers and enterprise users, including high density 40G/16G connectivity, DWDM, CWDM, distance extension, Ethernet Switch/NID, Fiber Modem, Fiber Multiplexer and Media Converter. It is a fully modular product that integrates a wide range of optical transport modules for any interface or protocol hosted in a selection of chassis sizes for simple and flexible operations.

### Transponder
- 40G QSFP+ to 4x 10G SFP+ TP – FRM220-40G-1Q4S
- 40G QSFP+ to 40G QSFP TP – FRM220-40G-2Q
- 16G 3R Multi-rate TP – FRM220-16G-3R
- 10G 3R Multi-rate TP – FRM220-10G-3R
- 4G-3R Multi-rate TP – FRM220-4G-3R

### Muxponder
- 7x GE to 10G MP – FRM220-MP7G1X

### WDM
- 4ch/8ch CWDM MUX/DEMUX – FRM220-CWDM40/80
- Single channel EDFA Booster – FRM220-DB15
- Optical line Protection switch – FRM220-OPS51/52

### TDM
- E1/T1 over fiber – FRM220-E1/T1
- E1 to Ethernet – FRM220-E1/E1
- 4/8/16 Inverse Mux – FRM220-imux4/8/16

### Voice
- 4ch FXO over fiber – FRM20-FXO-4
- 4ch FXS over fiber – FRM220-FXS-4
- FXO/FXS over fiber – FRM220-FXO/FXS

### Datacom / RS485, CCF
- RS232/530, V35 over fiber – FRM220-Data
- RS485 over fiber – FRM220-Serial
- 2ch/4ch Contact closure over fiber – FRM220-CCF20/40

### RS3/E3 over fiber
- FRM220-30/S30

### E1/T1 over fiber
- FRM220-E1/T1

### 4/8/16 Inverse Mux
- FRM220-imux4/8/16

### FRM220 series
- 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.

#### Features
- 20/8-slot chassis with 1 slot for management card
- Network management card with Telnet and SNMP
- 20-slot chassis may cascade up to 10 chassis (FRM220-CH20)
- Supports AC/DC power module hot swappable and power redundancy
- Two alarm relays contact for critical events warning

#### Network Management Controller
- FRM220-NMC
- NMC card provides central management for FRM220-CH20, FRM220-CH08, FRM220-CH04A, CH02/SMT and CH02/NMC
  - Use interfaces for serial console, Telnet & Web
  - Configure, monitor and provide fault management for all installed line cards
  - Provides upgrade feature for most line card types
  - SNMP agent for complete management by enterprise software
  - Running System log with time stamping for SNTP (time server)
  - Parameter management for quick configuration, configuration copy/backup/restore
  - Card alias and inventory by type and serial number
- Linux Kernel based for high stability and reliability
FRM20 Series Standalone Chassis

1-slot
FRM20-CH01-AC (DC or AD)
- DC IN 18~72 VDC
- AC IN 100~240 VAC

FRM20-CH01M
- DC IN 18~72 VDC
- AC IN 100~240 VAC
- DB 9 Console Port (Local Management)

FRM20-CH01 (Adapter Type)
- Power Jack 12 VDC

2-slot
FRM20-CH02M & CH02M-2
- Cooling Fan (CH02M): 30 Watt
- Fanless (CH02M-2): 12 Watt

FRM20-CH02/NMC
- DC IN 18~72 VDC
- AC IN 100~240 VAC
- DB 9 Console Port (Local Management)

FRM20-CH02/SMT
- Power & Cooling Fan Failure Alarm Detection

FRM20-CH02
- Power Jack 12 VDC

4-slot
FRM20-CH04A
- NMC Card (Remote Management)
- Cooling Fan

Application
- CWDM Telecom Access Network

Related Products

Transponder
FRM20-16G-3R / FRM20-10G-3R
- Re-Amplification, Re-Shaping, Re-Timing
- 1+1 protection
- Select modules support SFP, SFP+ and XFP pluggable transceivers

Data Rates:
- 10G / 1G/10G Ethernet, STM-64, OC-192, FC 1/2/4/8/10G

CWDM MUX / DEMUX
FRM20-CWDM
- LC connectors
- 4 and 8 channel (wavelengths) MUX/DEMUX module
- Protocol and Rate Transparent
- ITU-T G.694.2 wavelengths between 1271nm ~ 1611nm
- Optional Pass Band and Monitor Port

FRM20-16G-3R / FRM20-10G-3R
- Re-Amplification, Re-Shaping, Re-Timing
- 1+1 protection
- Select modules support SFP, SFP+ and XFP pluggable transceivers

Data Rates:
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CWDM Telecom Access Network

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40G/16G/10G 3R Transponder Connectivity

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FMC Chassis
- 2U, 19", 17-Slot FMC chassis
- The Chassis with single or dual built-in AC or DC power
- Hot swappable

FMC Converter
- FMC Gigabit Ethernet Converter – FMC-1001S
- FMC Fast Ethernet Converter – FMC-10/100
- FMC Web Smart Converter – FMC-1000MS
- FMC PoE+ (PSE) Converter – FMC-1000S-PH

Fiber Media Converter Concentrator
PHB-200M / PHB-200
- 1U" 19" 20ch Fiber Media Converter Concentrator
- 20-port 100/1000Base-T to 20-port 100/1000Base-X SFP
- Supports Web, Telnet, SNMP Management (PHB-200M)
- Available in AC, DC, AC+DC power built-in
L2+ Ethernet Switch

SyncE Switch

L2+ Managed Carrier Ethernet Switch with SyncE
MSW-4424CS
- 20 x 100/1000Mbps SFP+ slots + 4 x GE combo ports + 4 x ports 10G/10Gbps SFP+ slots
- CE 2.0 standard compliant (E-Line, E-LAN, E-Tree Service)
- SyncE / IEEE 1588 v2
- IEEE 802.1d/IEEE 802.1aq / ITU-T Y.1731 Ethernet OAM
- IETF G.8032 Ethernet ring protection
- IPv6 support

Carrier Ethernet Switch

Carrier Ethernet Switch
MSW-4428X
- 24 x GE/E/SFP + 4 x GE RJ45 + 4 x 1/10Gbps SFP
- CE 2.0 standard compliant (E-Line, E-LAN, E-Tree, E-Access Service)
- IEEE 802.3ah / IEEE 802.1ag/ITU-T Y.1731 Ethernet OAM
- RFC2544 & ITU-T Y.1564 tester functionality

Carrier Ethernet Managed Switch
MSW-4424C
- 20 x GE/E/SFP + 4 x GE Combo + 4 x 10GE SFP+
- Power and Fan module built-in
- ITU-T G.8032 Ethernet ring protection
- CE 2.0 standard compliant (E-Line, E-Access Service)
- IEEE 802.3ah / IEEE 802.1ag / ITU-T Y.1731 Ethernet OAM

Carrier Ethernet Switch
MSW-4424A
- 24 x GE/E/SFP + 4 x 10GE SFP+
- Hot Swappable Power and E/FAN module
- ITU-T G.8032 Ethernet ring protection
- CE 2.0 standard compliant (E-Line, E-Access Service)
- IEEE 802.3ah / IEEE 802.1ag / ITU-T Y.1731 Ethernet OAM

NID/EDD

L2+ Carrier Ethernet Switch with SyncE
MSW-4204S
- 10M/100M/1G/1G/4GBICx2 = 10M/100M/1G/2.5G/4GBICx2 + 10G/10G SFP x 2
- CE2.0 standards compliant (E-Line, E-LAN, E-Tree, E-Access services)
- Supports 10K Byte jumbo frame
- ITU-T G.8032 Ethernet ring protection
- IPv4 Ethernet OAM Support
- RFC2544 & ITU-T Y.1564 tester functionality

L2+ Carrier Ethernet Switch (NID/EDD)
MSW-404 / MSW-202
- 2 or 4 x GE RJ45 + 2 or 4 x 100/1000Base-X SFP
- CE 2.0 Compliant (E-Line, E-LAN, E-Tree Service) (MSW-404)
- Compliant with IEEE 802.1ab, IEEE 802.1aq and ITU-T Y.1731
- RFC 2544 & ITU-T Y.1564 tester functionality (MSW-404)
- Supports IEEE 802.1Q/802.1Q active VLAN
- Various CoS capability (MAC/Port/802.1P/CoS) band
- IEEE 1588v2 PTP
- Fully Ethernet OAM Enabled
- IPv6 support
L2+ Managed PoE Switch

- 8x IEEE802.3af/at PoE+ (GSW-3224MP)
- 12x IEEE802.3af/at PoE+ (GSW-3424MP)
- Rugged metal, IP30 protection & fanless design (GSW-3208MPE/3214MPE)
- IEEE 802.1Q tagged VLAN, QinQ (VLAN stacking), L2/L3 QoS
- IEEE 802.1Q T-S TP / 802.1w RSTP / 802.1s MSTP
- DHCP option 82 / DHCP snooping
- GMP snooping v1/v2/v3, MLD snooping v1, MVR
- Broadcast / Multicast / Unicast storm control
- Operating Temperature -10 °C ~ 60°C
- IPv6 management
- PoE PD failure auto checking, and auto reset when PD fail
- PoE port on/off weekly scheduling
- Per port PoE function enable/disable
- PoE port power priority
- Per PoE port power limit

PoE Fiber Converter

PoE+ (PSE) Fiber Converter
FMC-1000S-PH
- 10/100 Base-T to 100/1000 Base-X SFP with PoE+ (PSE)
- Supports IEEE802.3at PoE, output 30Watts Power Budget
- Conversion between 10/100/1000Base-T and 1000Base-X Fiber cable interface
- Supports Switch or Converter mode
- Supports LFPT (Link Fault Pass Through)
- Supports Jumbo frame 9K bytes packet
- Wall-Mountable kit (optional)

CPE Switch

L2+ Managed Ethernet PoE+/PSE Switch
GSW-2020P
- 4x GbE, RJ45 + 1x GbE, RJ45 with PoE+ PSE L2+ Managed Ethernet Switch with Cable Tray (optional)
- Built-in one PoE+/PSE port for feeding PoE equipment
- Regulated PoE output voltage (52VDC) to stabilize PoE device, and guarantee delivery
- PoE power distance to 100 meter
- Cable diagnostics, measuring cable OK or broken point distance

Application

L2+ Managed Ethernet Switch
GSW-2020P

- 8-port 10/100/1000Base-T RJ45 + 2 uplink 100/1000Base-X SFP (GSW-2008MS)
- 5-Port 10/100/1000Base-T RJ45 + 1 uplink 100/1000Base-X SFP (GSW-1005MS)
- Supports IEEE 802.1p priority queue
- Supports IGMP snooping v1/v2/v3
- Supports dying gasp
- Fiber Cable Tray (optional)
10G Muxponder

**MP-8G1X**
- Aggregate up to 8x 1GbE over 10 Gbps trunk port
- Remotely activated Local or Remote Loopback
- Support Optical line protection function
- SNMP, Web, Console and Telnet Management
- In Band Management
- Flexible connectivity options
- SFP+ Digital Diagnostics monitoring
- Dual line ports enabling Optical line protected configuration

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**Application**

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**TDM over IP**

**IPM-E1/4E1/8E1/16E1**
- 1, 4, 8, or 16x E1 over Ethernet
- Supports Web Management
- Supports IETF RFC4553 Structure-Agnostic TDM over Packet (SAToP), Metro Ethernet Forum MEF8
- Use Raw Encapsulation method for PDH payload over Ethernet packet
- Supports Circuit Emulation Service over Ethernet networks
- Comply with IETF draft standard for CESoPSN and SAToP. Metro Ethernet Forum MEF8 IA
- Supports both Point-to-Point and Point-to-Multipoint operation
- PDH LOS detection triggered PN/L field or payload AIS generation at Egress direction (TDM->PSN)
- Configurable IEEE 802.3 DA/SA assignment

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**Fiber Multiplexer**

**FMUX1001 & FMUX101**
- 16 E1/T1 Multiplexer with 100/1000Mbps or 10/100Mbps Ethernet, RS-232 data (async) interface, or FXO/FXS Interface
- Port based VLAN, tag based VLAN & bandwidth control
- Supports 1+1 fiber (SFP) line protection. Less than 50ms
- Supports order wire (2 wire or 4 wire)
- Management via Web, Telnet, console, SNMP and SmartView EMS
- Redundant hot swappable power supplies and fiber uplink
STM1/E1 Managed Multiplexer

iSAP2000 / iSAP5100
- Interfaces supported: E1, V35, FXO/FXS, E&M, RS232, Ethernet and G.703 co-directional
- Supports console, Telnet, SNMP and GUI management
- Modular 4U high, 19-inch unit with 18 slots for I/O modules (iSAP5100)
- Modular 2U high, 19-inch unit with 6 slots for I/O modules (iSAP2000)
- 63x E1 over STM-1 fiber
- Two optical STM-1 links (iSAP5100)
- 144x E1 DXC cross connect capability (iSAP5100)
- Supports E1 time slot broadcast function

G.SHDSL.bis Series

G.SHDSL.bis ATM 2/4/8-wire EFM Router
- Supports T3-PAM 32 for 5.7 Mbps over single pair copper
- EFM Bonding up to 61 Mbps (4 pairs, T3-PAM 128)
- Supports EFM OAM complying IEEE 802.3ah
- Flexible configuration as CPE or CO

Related Products
SHDTU04bF-ET10RS (2W)
SHDTU04bAF-ET10RS(4W)
SHDTU04bCF-ET10RS(8W)

G.SHDSL.bis EFM VPN Router
- Extend Ethernet Services to sites with existing copper infrastructure
- EFM Bonding up to 61 Mbps (4 pairs, TC-PAM 64/128)
- Supports both EFM mode and ATM mode
- IPSec VPN for safeguarded connections
- Support EFM OAM complying with IEEE 802.3ah

Related Products
VPN10 (2W) / VPN20 (4W) / VPN40(8W)

LAN Extender

EFM LAN Extender
- Supports T3-PAM 32 for 5.7 Mbps over single pair copper
- EFM Bonding up to 61 Mbps (4 pairs, TC-PAM 128)
- Supports EFM OAM complying IEEE 802.3ah
- Flexible configuration as CPE or CO

Related Products
EFM-10 / EFM-20 / EFM-40

VDSL2 LAN Extender
- Cost effective bridge function to connect two Ethernet LAN
- Supports flow control on Fast Ethernet port via PAUSE frame or Back Pressure
- EET 802.1Q VLAN tag transparent
- Easy installation via simple plug-and-play
- Selectable VDSL2 profile mode (17a or 30a): Support up to VDSL2 30a profile to ensure high data rate

Related Products
VDTU2-B110

Surge Protector

PoE

Key Features
- 10G/10Gbps data rate
- 63V PoE clamping voltage on DATA and PoE pins(1, 2, 3, 4, 5, 6, 7, 8)
- 1.5KA surge discharge current
- Compatible with 48V power over Ethernet systems
- CAT5 and CAT5e compatible. All 8 pins protected.
- Integral mounting feet and separate ground wire
- Shielded RJ45 jacks and metal enclosure for EMI noise suppression

Sp-GPOE-24
- 24-Port Gigabit Ethernet PoE

Sp-GPOE-01
- 1-Port Gigabit Ethernet PoE

Sp-GE-24
- 24-Port Gigabit Ethernet

Sp-GE-01
- 1-Port Gigabit Ethernet

Key Features
- Ethernet 10/100/1000Base-T Data line protection
- Exceeds CAT 5 & 6 Transmission Values
- Fast energy absorption when over-voltage occurs
- Low series resistance and minimal capacitance values to preserve the data information