



# FRM220-10G-FEC

## 10G 3R FEC Multi-rate Transponder

The FRM220-10G-FEC is a conversion module suitable for high-speed 10G signals with Forward-Error-Correction (FEC). The module supports four flexible SFP+ ports suitable for wavelength conversion and the transferring application for 10GbE and STM-64. The main field of FRM220-10G-FEC application is cost-optimized CWDM and DWDM networks. As an intelligent transponder module, the FRM220-10G-FEC converts a transparent data channel to a corresponding CWDM/DWDM wavelength. By means of the implemented 3R functionality (re-amplification, re-shaping, re-timing) for signal processing, the module is also suited for the use as a repeater. The data rates between 9.95Gbps and 11.32Gbps can be provided. Two types of housings are available for installation in a 19" FRM220 chassis. 20 slots are provided by using the FRM220-CH20 chassis 2U while the FRM220-CH08 1U supports up to 8 modules. Both housings can be monitored and configured through SNMP, Web GUI or Telnet using a NMC management module.

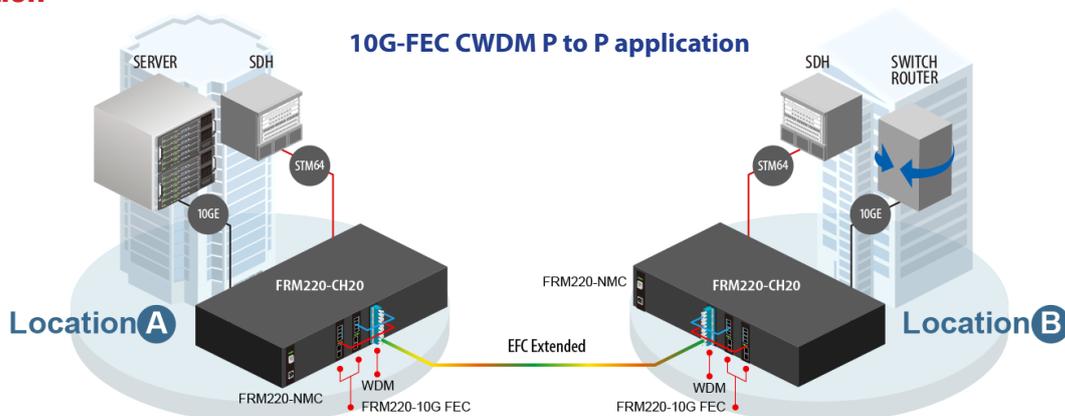
### Features

- Protocol transparent (9.95 – 11.32Gbps)
- 10Gbps signal repeating for 10GbE and STM-64
- 10Gbps conversion: Multimode, Single mode, CWDM, DWDM
- Future-proof and flexible SFP+ technology
- 3R functionality (Re-amplification, Re-shaping and Re-clocking)
- Low power consumption
- SNMP management through NMC management module
- SFP+ transceivers for flexible configuration including DWDM
- SFP+ Digital Diagnostics
- Wide range of applications
  - Dual OTN transponder or OTN repeater
  - Lambda conversion with FEC exchange
- Multiple clients data rate support
  - 10G Ethernet LAN/WAN PHY
  - 10G OC-192/STM-64 SONET/SDH
- Non OTN/FEC
  - 10G Ethernet LAN-PHY to LAN-PHY
  - 10G Ethernet LAN-PHY to WAN-PHY
- Per interface Forward Error Correction (FEC) encoding selection:
  - ITU-T G.709 Standard RS(255,239) (GFEC) – 6.2 dB
  - ITU-T G.975.1 Section I.7 Ultra-strong FEC with scaled - overhead (UFEC 7%) – 8.1 dB
  - ITU-T G.975.1 Section I.4 Ultra-strong FEC with scaled - overhead (UFEC 10%) – 8.3 dB
  - Zero FEC (wrapper done, FEC is zero)
  - No FEC (wrapper done, FEC is disabled)
- Comprehensive G.709 line and service performance monitoring
  - 10G Ethernet, 10G SONET/SDH
- Connection testing tools
  - Loopback
  - Notification or fault propagation

### Specifications

<b>General</b>	1-slot module for integration in a FRM220 platform Operating temperature: 0°C – 40°C Dimensions (D x W x H): 155 x 88 x 23mm	
<b>Interfaces</b>	4x SFP+ ports (1 x line, 1 x client) Protocol : STM-64, 10G Ethernet Data rate: 9.92Gbps – 11.32Gbps depending on SFP+ type and application used	
<b>SFP+ Types</b>	Optical (LC)	10Gigabit Ethernet (with or without FEC) STM-64 (with or without FEC) Multi-rate for 10Gigabit, STM-64
<b>SFP+ Types</b>	Optical (LC)	Wavelengths: 850nm, 1310nm, 1550nm, DWDM or tunable optics
<b>Management</b>	SNMP, Telnet and Web management using a NMC management module SFP+ management information provided by integrated DMI functions: input/output power, wavelength, bit rate, status, supported protocols, temperature	
<b>Housing Types</b>	FRM220-CH08 1U 8-slot chassis FRM220-CH20 2U 20-slot chassis FRM220-CH02M, FRM220-CH02/NMC, 2-slot chassis	

### Application



-Related Products: FRM220-40G-1Q45/16G-3R/10G-SXX/10G-SS/2.7G-3S (40G, 16G, 10G and 2.7G 3R Transponder)

### Ordering Information

Model Name	Description
FRM220-10G-FEC	10G 3R FEC Multi-rate Transponder (optional SFP+)

### Note:

This card MUST be placed in CH02M chassis with fan.  
For SNMP management, place this card in CH02/NMC or CH04A Chassis.