EKINOPS PM 200FRS02

Single Slot FlexRate Pluggable Transponder/Muxponder

KEY FEATURES & BENEFITS

- Small form factor —1 slot module supporting 100G and 200G line rates
- Software selectable line side modulation —DP-QPSK or 16QAM
- Integrated FlexRate line interface provides 1.2T of throughput capacity in 2RU
- Built-in Self-Test (BIST) feature eliminates service turn-up failures
- Integrated Variable Optical Attenuator *(VOA)* allows remote selectivity of the output power level *(single fiber version)*
- QSFP28 client ports supporting 100GbE and OTU4
- Compatible with multiple channel spacings —both on-grid and off-grid
- Support for up to 80 200G channels
- Highly power efficient at 0.3 W per Gbps

APPLICATIONS

- Multireach transport —Metro Regional, Long Haul & Ultra-long Haul
- Data Center Interconnection
- 100G service aggregation
- Alien wavelength capacity upgrade
- Single fiber deployments

OVERVIEW

With the PM 200FRS02, EKINOPS delivers a highly power and space efficient flexible rate transponder/muxponder in a single slot form factor.

Using advanced Digital Signal Processor *(DSP)* technology, the EKINOPS PM 200FRS02 supports both the 16QAM and DP-QPSK modulation formats with the software flexibility to select either for a 100G or 200G line rate, depending on your requirements for capacity and distance.

In DP-QPSK format, the EKINOPS PM 200FRS02 can transport 100G up to 10000 km but can be used for shorter metro-regional spans as well. In 16QAM format, it can transport 200G up to 1000 km. With this flexibility, network operators can use the same line card for multiple applications no matter what the span requirements are helping them simplify sparing, streamline logistics and speed ordering and replacement, all of which result in lower operational costs. It also allows the operator to easily double capacity on any link simply by upgrading the existing module. This process can be easily accomplished from a remote Network Operations Center *(NOC)* using a simple firmware download. There is no need to roll a truck or dispatch a technician to replace hardware or move patch cords.

The PM 200FRS02 includes a Built-In Self-Test (BIST) feature that validates that the service channel is ready to receive traffic without faults. BIST simplifies service commissioning by looking at client port transparency to 100GbE or OTU4 traffic in both directions on all client ports which helps eliminate service turn-up failures. Along with the line counters, you can have a complete view on the health and stability of the link during deployment eliminating the need to use an external test set and reducing the cost of the deployment and commissioning process.

The EKINOPS PM 200FRS02 provides dual QSFP28 client interfaces that allow you to mix and match 100GbE and OTU4 on the same 200G wavelength. Occupying only a single slot, the module is ultra-compact delivering up to 1.2T in only 2RU with power efficiency as low as 0.3W per Gigabit.
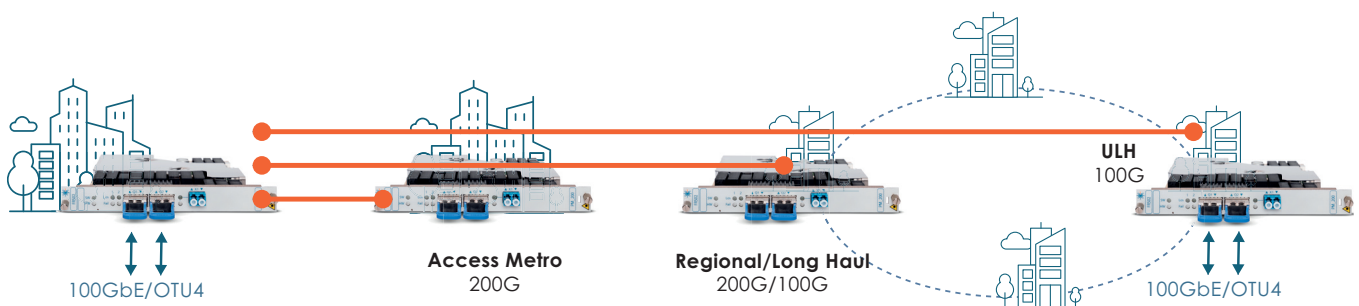

Figure: EKINOPS PM 200FRS02 for Metro, Regional and LH/ULH applications

The PM 200FRS02 is also available in a single fiber variant supporting transmit and receive of different channels on the same module over a single strand of fiber. Combining this with ease of operation, unmatched price points and superior performance, EKINOPS makes your choice easy when it comes to coherent transport solutions.

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MANAGEMENT

The EKINOPS PM 200FRS02 module can be managed through SNMP or via the EKINOPS standard element level management interfaces, which include a Command Line Interface *(CLI)* and an EKINOPS Graphical User Interface *(GUI)*. The CLI is accessible via Secure Socket Shell *(SSH)* and Telnet remotely or via a local serial port on the Management board.

Complete performance monitoring and management is provided, including laser shut off and local and remote loopback, which is useful for maintenance and fault isolation.

Digital Diagnostics Management *(DDM)* is supported for QSFP28 interfaces. This includes link status, transmit *(TX)* and receive *(RX)* signal power monitoring, and operational temperature, as well as manufacturer and transceiver model. A 10 Mbps in-band Data Communications Channel *(DCC)* is embedded in the line side for remote management.

The EKINOPS PM 200FRS02 module is also supported by Celestis**NMS**, the Ekinops advanced Network Management System.

SPECIFICATIONS

• CLIENT INTERFACE

Protocols	100GbE; OTU4	Optical interface: QSFP28	Number of Ports: 2

• LINE INTERFACE

Specifications	PM 200FRS02 100G	PM 200FRS02 200G
Protocol	DP-QPSK	16QAM
Max distance	10 000 km	1000 km
OSNR	12 dB	21 dB

Specifications	PM 200FRS02-SF 100G	PM 200FRS02-SF 200G
Protocol	DP-QPSK	16QAM
Max distance	10 000 km	1000 km
OSNR	12 dB	21 dB

• MANAGEMENT

MIB	SNMP V2c private MIB	Remote management: 10 Mb Ethernet DCC

• PHYSICAL SPECIFICATIONS

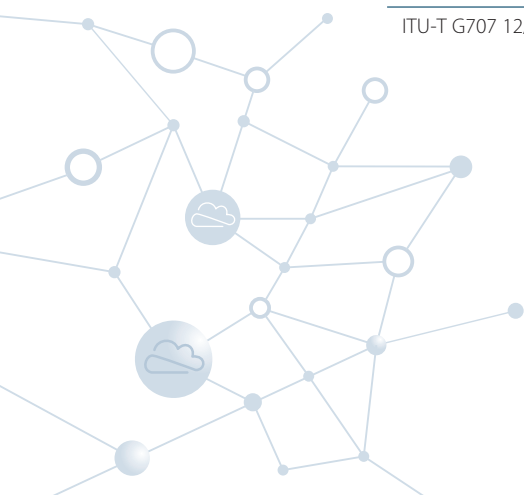| Module size	1 slot	Chassis compatibility: C200HC *(6x100G modules per chassis)*
Operating temperature	0°C to +50°C /+32°F to +122°F	Storage temperature: -20°C to +85°C /-4°F to +185°F

• INDICATORS

Status	HW ready, SW ready	Alarm: port down *(client and line)*

• PERFORMANCE

Optical spacing	50GHz and 100GHz - Other off grid spacing possible
Power	60W *(includes client optics)*

• REFERENCE STANDARDS

ITU-T G707 12/2003 edition; ITU-T G709; IEEE 802.3-2002; IEEE 803.3ae-2002; IEEE 802.3ba

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ORDERING INFORMATION

	PRODUCT CODE	DESCRIPTION
PLUGGABLE MODULE (PM)	PM_200FRS02	Single slot FlexRate transponder/muxponder *(Metro Regional 200G or Ultra Long Haul 100G)*, 2 multiprotocol client ports *(100GbE or OTU4)*, 1 line port with DCC, QSFP28 clients and tunable 100G ULH/200G MR line interface *(QSFP28 not included, tunable line interface included)*.
	PM_200FRS02-SF	Single slot FlexRate transponder/muxponder *(Metro Regional 200G or Ultra Long Haul 100G)*, 2 multiprotocol client ports, 1 line port with VOA & DCC, compatible with single fiber configuration. QSFP28 clients and tunable 100G ULH/200G MR line interface *(QSFP28 not included, tunable line Interface included)*.
EKINOPS CHASSIS	C600HC	High Capacity modular chassis 7RU
	C200HC	High Capacity modular chassis 2RU
	PM_MNGT4	Management card
	400EEM	Ekinops Craft Interface Software

CONTACT

www.ekinops.com

Ekinops EMEA
sales.eu@ekinops.com

Ekinops APAC
sales.asia@ekinops.com

Ekinops Americas
sales.us@ekinops.com