



EKINOPS PM 400FRS04-SF

Pluggable FlexRate™ Muxponder

DATA SHEET 12 | 2024

KEY FEATURES & BENEFITS

- Selectable line rate evolution from 100Gbps to 400Gbps on existing hardware
- Optimal performance for any capacity or reach requirement
- One module for all applications
- Easy capacity addition using pluggable QSFP28 client optics
- Simple inventory management and reduced sparing requirements
- Single fiber operation

APPLICATIONS

- Long Haul & ULH Transport
- Metro/Regional Transport
- Data Center Interconnection
- Submarine Transport
- Alien wavelength
- Single fiber networks

OVERVIEW

In today's networking environment, service providers and other network operators require the ability to deliver a variety of applications and services. With a highly differentiated customer base that is demanding a broad set of services with guaranteed performance, they need a high capacity network that is capable of delivering any service to any point in the network. This means having flexibility at the transport layer that is equivalent to the services layer. Ekinops PM 400FRS04-SF delivers an unprecedented level of configurability and manageability that allows service providers to tune their optical transport network to match their service level needs. Capable of operating in multiple different modes, it supports any type of transport application from metro access to ultra-long haul including data center interconnectivity and even submarine transport.

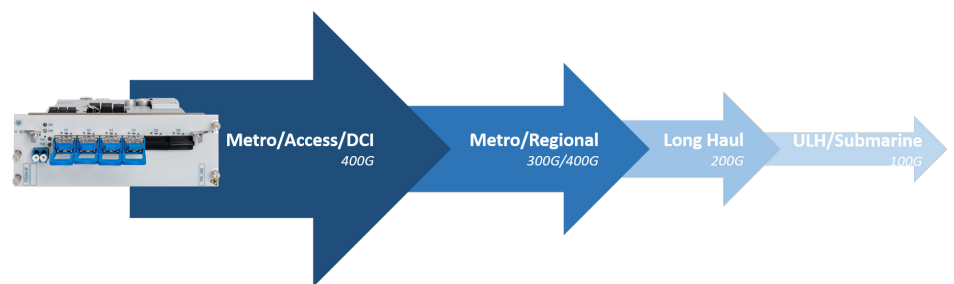


Figure 1: PM 400FRS04 - SF multi-rate, multi-reach capability

The PM 400FRS04-SF has multiple adjustable parameters including modulation scheme, Forward Error Correction (FEC) overhead and baud rate as well as tunable wavelengths that allow service providers to optimize the reach and capacity of their transport network.

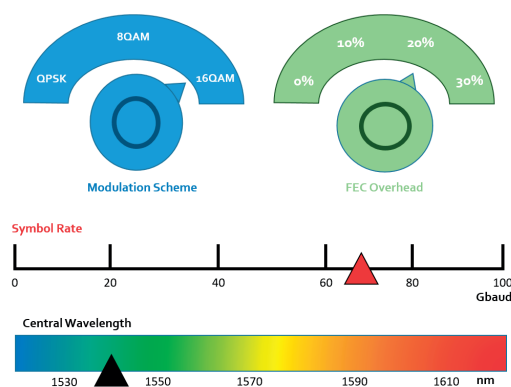


Figure 2: PM 400FRS04 - SF adjustable parameters



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The PM 400FRS04-SF is capable of single fiber operation supporting transmit and receive of different channels on the same module over a single strand of fiber at full line rate to deliver high capacity connectivity even in networks normally restricted by fiber availability.

Even with its advanced functionality, PM 400FRS04-SF fits seamlessly into existing Ekinops networks and can even be deployed as an alien wavelength over third party line systems. It is fully compatible with existing Ekinops360 chassis and runs using the same software.

MANAGEMENT

The EKINOPS PM 400FRS04-SF 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 are provided, including laser shutoff and local and remote loopback, which is useful for maintenance and fault isolation. Digital Diagnostics Management (DDM) is supported for QSFP28 interfaces.

Complete performance monitoring and management are provided by [Celestis NMS](#), the Ekinops advanced Network Management System.

SPECIFICATIONS

• CLIENT INTERFACES

Protocols	100GbE; OTU4
Optical interface	QSFP28
Number of ports	4

• LINE INTERFACES

Current Specifications

	100G	200G	200G	300G	400G
Modulation	DP-QPSK	DP-QPSK	16QAM	8QAM	16QAM
Baud rate	33Gbaud	67Gbaud	41Gbaud	67Gbaud	66Gbaud
Channel spacing	50GHz	75GHz	50GHz	75GHz	75GHz

• MANAGEMENT

MIB	SNMP V2c Private MIB
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• PHYSICAL SPECIFICATIONS

Module size	3 slots
Chassis compability	C200HC C600HC
Operating temperature	0°C to +50°C / +32°F to +122°F
Storage temperature	-20°C to +85°C / -4°F to +185°F
Typical power consumption	135W <i>(varies according to modulation and baud rate used; includes client optics)</i>
Max. power consumption	165W <i>(varies according to modulation and baud rate used; includes client optics)</i>

• INDICATORS

Status	HW ready, SW ready
Alarm	Port down <i>(Client & Line)</i>

• REFERENCE STANDARDS

ITU-T G707 12/2003 edition; ITU-T G709; IEEE 802.3-2002; IEEE 803.3ae-2002; IEEE 802.3ba; ISO/IEC 18033-3



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ORDERING INFORMATION

PLUGGABLE MODULE (PM)

PRODUCT CODE	DESCRIPTION
PM_400FRS04-SF	100G ULH, 200G LH, 200G MR, 300G MR and 400G MA FlexRate muxponder; 4 client ports (100GbE or OTU4); 1 line port compatible with single fiber configuration with DCC and VOA; QSFP28 clients and tunable 100G/200G/300G/400G line interface (QSFP28 not included, tunable line interface included)

EKINOPS CHASSIS

C600HC	High capacity modular chassis 7RU
C200HC	High capacity modular chassis 2RU
PM_MNGT4-2	Management card
400EEM	Ekinops Craft interface software

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