



# EKINOPS PM 400FRS04-SF

## Pluggable 400G FlexRate™ Muxponder

DATA SHEET 03 | 2019

### KEY FEATURES & BENEFITS

- Up to 600Gbps on a single optical carrier
- Selectable modulation and baud rate—100Gbps, 200Gbps or 400Gbps line rate available today with future evolution to include 300Gbps, 500Gbps and 600 Gbps.
- One module for all applications
- Easy capacity addition using pluggable QSFP28 client optics
- Simple inventory management and reduced sparing requirements
- NETCONG/YANG configurable
- 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.

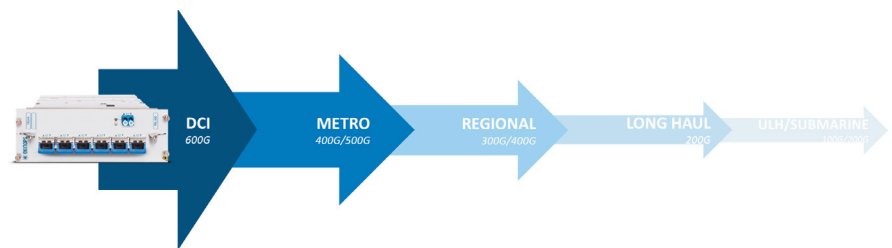


Figure 1: PM 400FRS04-SF multi-rate, multi-reach capability

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.

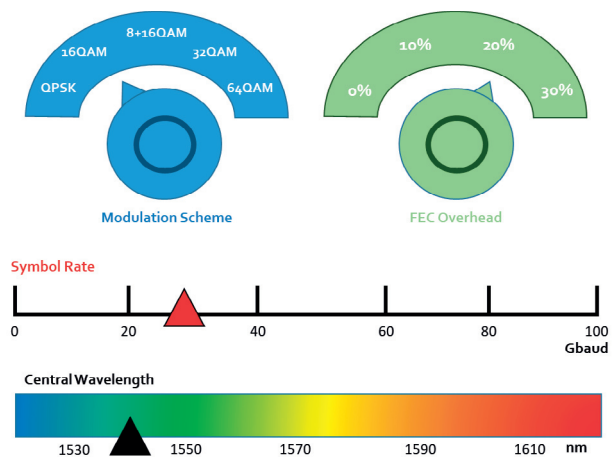


Figure 2: PM 400FRS04-SF adjustable parameters

## EKINOPS PM 400FRS04-SF

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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 EKINOPS 360 chassis and runs using the same software. SDN-ready, the PM 400FRS04-SF can also be managed using any controller based on NETCONF/YANG data models in addition to Ekinops' management tools (see below).

### 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 **CelestisNMS**, the Ekinops advanced Network Management System, or through any SDN controller via NETCONF interface

### SPECIFICATIONS

#### • CLIENT INTERFACES

Protocols	100GbE; OTU4
Optical interface	QSFP28
Number of ports	6

#### • LINE INTERFACES

##### Current Specifications

	100G	200G	400G
Modulation	DP-QPSK	DP-QPSK	16QAM
Max distance	10 000Km	4500Km	1000Km
OSNR	11 dB	14 dB	22.5 dB

##### Future Specifications

	200G	300G	500G	600G
Modulation	16QAM	8+16QAM	32QAM	64QAM
Max distance	1500Km	1000Km	300Km	120Km
OSNR	19 dB	21 dB	26 dB	28 dB

#### • MANAGEMENT

MIB	SNMP V2c private MIB
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## EKINOPS PM 400FRS04-SF

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#### SPECIFICATIONS

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##### • PHYSICAL SPECIFICATIONS

Module size	3 slots
Chassis compatibility	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
Power	150W (varies according to modulation and baud rate used; includes client optics)

##### • INDICATORS

Status	HW ready, SW ready
Alarm	Port down ( <i>client and Line</i> )

##### • REFERENCE STANDARD

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

#### ORDERING INFORMATION

##### PLUGGABLE MODULE (PM)

PRODUCT CODE	DESCRIPTION
PM_400FRS04-SF	100G ULH, 200G LH and 400GMR 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/400G line interface (QSFP28 not included, tunable line interface included)

#### CONTACT



[www.ekinops.net](http://www.ekinops.net)

Ekinops EMEA  
[sales.eu@ekinops.net](mailto:sales.eu@ekinops.net)

Ekinops APAC  
[sales.asia@ekinops.net](mailto:sales.asia@ekinops.net)

Ekinops Americas  
[sales.us@ekinops.net](mailto:sales.us@ekinops.net)