

# SFEXM

## CW 1.5 $\mu\text{m}$ Single-Frequency High Power Fiber Laser Module



Standard Wavelengths:  
**1550, 1556, 1560 nm**

Custom Wavelengths:  
**Any within the range 1532 – 1578 nm**

Wavelength Tuning Range: **0.5 nm**

Output Power:  
**Up to 1 W (10-100% adjustable)**

The Optromix SFEXM is a single-frequency high output power Erbium fiber laser with an ultra-narrow linewidth. SFEXM is made in a OEM module form factor and intended for use as a part of different systems. SFEXM requires an external power supply of +5 VDC and can be controlled using a computer via the software provided with the module. SFEXM provides a wide-range precise thermal wavelength tuning and a fast piezo tuning using an external PZT driver. This module consists of a seed laser and a power fiber amplifier allowing achieving up to 1 W output power with a 10-100% adjustment range.

### Key Features

- Ultra Narrow Linewidth
- Thermal Wavelength Tuning
- Fast Piezo Wavelength Tuning
- High Beam Quality
- High Power Stability
- Low RIN level

### Applications

- Atomic Trapping and Cooling
- Quantum Optics and Computing
- Free Space Communication
- Optical Sensing
- Nonlinear Pump Source
- Coherent Communication
- High Precision Spectroscopy

# FEATURES

## THERMAL WAVELENGTH TUNING

SFEXM allows for the thermal wavelength tuning to be carried out using a temperature adjustment of the seed laser temperature. The allowable wavelength tuning range is > 0.5 nm. Wavelength stabilization occurs approximately 0.1 seconds after setting a new value.

## FAST WAVELENGTH TUNING AND MODULATION

SFEXM is equipped with a piezo-actuator for the fast wavelength tuning using an external PZT driver. The allowable voltage is 0 – 100 V. Typical values of the tuning factor are ~60–80 MHz/V (DC voltage). The allowable signal modulation is up to 10 kHz.

### Options

- Up to 1 nm Wavelength Tuning

### Range

- Up to 5 m length optical output cable

## OUTPUT POWER ADJUSTMENT. APC/ACC MODES OF OPERATION. OUTPUT POWER STABILITY.

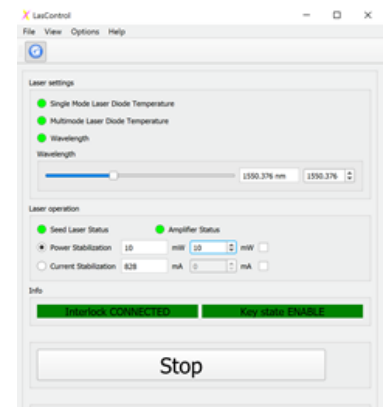
This laser model allows for output power adjusting in the range of 10 – 100 % of the nominal output power. The laser can operate in Automatic Power Control (APC) as well as in Automatic Current Control (ACC) modes. SFEXM provides excellent long term power stability.

## OPTICAL OUTPUT TYPE

A standard model is equipped with a PM output fiber cable terminated by an FC/APC connector. A Narrow Key of the FC/APC connector is aligned to the output polarization.

## COMPUTER CONTROL

The standard SFEXM model allows controlling the laser using a computer via an Ethernet port. The original Otromix software is provided along with the laser.



# SPECIFICATION

## OPTICAL

Parameter	SFEXM
Operating Mode	CW, Single-frequency, TEM <sub>00</sub>
Standard Wavelength	1550.12 nm, 1556.30 nm, 1560.48 nm
Custom Wavelength	1532 – 1578 nm
Thermal Wavelength Tuning Range <sup>1</sup>	0.5 nm
Linewidth (FWHM)	< 5 kHz
Nominal Output Power	1000 mW
Power Stability <sup>2</sup>	< 1% (typical <0.5%)
Beam quality (M <sup>2</sup> )	< 1.05 (typical <1.02)
Piezo Tuning Range <sup>3</sup>	> 60 MHz/V @ 0Hz
Wavelength Modulation <sup>3</sup>	Up to 10 kHz
Polarization	Linear (PER > 23dB)
RIN level (peak:app 0.7 MHz)	< -105dB/Hz@peak, < -140dB/Hz@10MHz
Output Optical Isolator	Yes
Optical Output <sup>4</sup>	Fiber cable terminated by an FC/APC connector

### Notes

1. Optionally up to 1 nm
2. Over 8 Hours with base temperature constant within 0.2 °C after 30 minute warm-up
3. External PZT Driver 0-100V, Modulation up to 10 kHz
4. Optional Output: The output type can be replaced by the customers' request

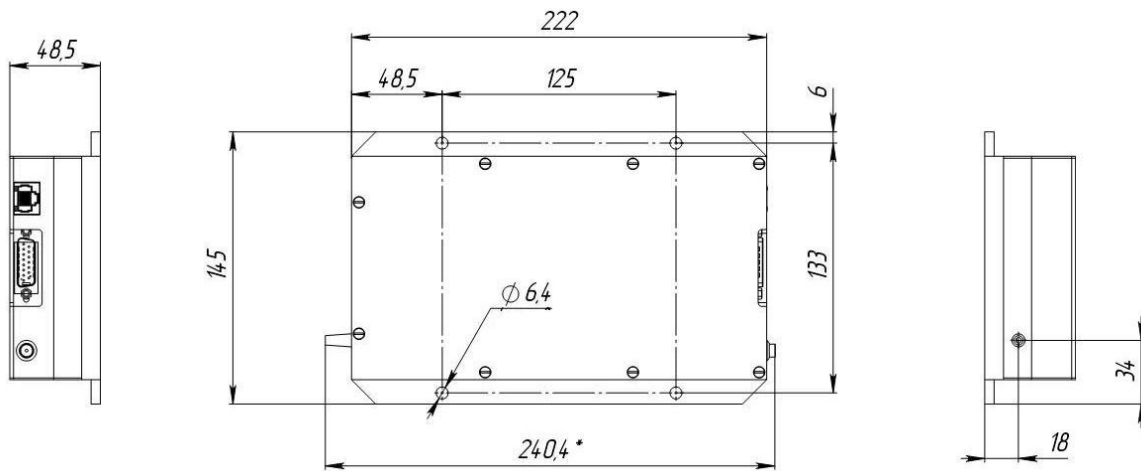
## ELECTRICAL/MECHANICAL/ENVIRONMENTAL

Parameter	SFEXM
Power Supply Requirements	+5 VDC
Power Consumption (10W output)	< 75 W
Cooling	Heat Sink, Mounting Surface
Control Connector <sup>1</sup>	Ethernet
Dimensions (WxHxL)	145 mm x 48.5 mm x 222 mm
Standard Output Cable Length <sup>2</sup>	1.2 m
Weight	< 2 kg
Operation temperature	15 – 35 °C
Storage temperature	- 40 – +70 °C
Operation Humidity	10 – 85 %
MTBF	> 10.000 Hrs

### Notes

1. Optional Connectors: RS232
2. Optional length: Up to 5 m.

## DIMENSIONS



Product code:  
SFEXM-15xx-1000-cc

xx - Wavelength(nm)  
yyyy- Output power(mW)  
cc- Optical output:  
FA-FC/APC, FO-fiber without termination, CL-Collimator

Standard Warranty - 12 months from the date of delivery.

Information in this document is a subject to change without notice.

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