

# Continuous-Wave Solid-State Lasers

FCD Series



Continuous-wave, solid-state FCD (frequency-converted diode) series lasers feature all-in-fiber architecture. A package contains both the optical elements of the laser and the control electronics, allowing full control and diagnostics of the laser system through an analog interface and RS232 interface. Powered by an external 5 V DC power supply, the laser is cost-efficient, reliable, and compact, with excellent electrical and thermal efficiency. It has a low heat load, so the laser operates without a heat sink.

Based on proprietary technology, the FCD series enables consistent high-volume laser manufacturing with a “package, splice, and test” design. The components are put in hermetic packaging—the fibers are spliced together—and the laser is tested.

FCD series lasers are available in two versions: free space and a fiber-delivered version with the same characteristics and reliability as the free-space laser.

#### **Key Features**

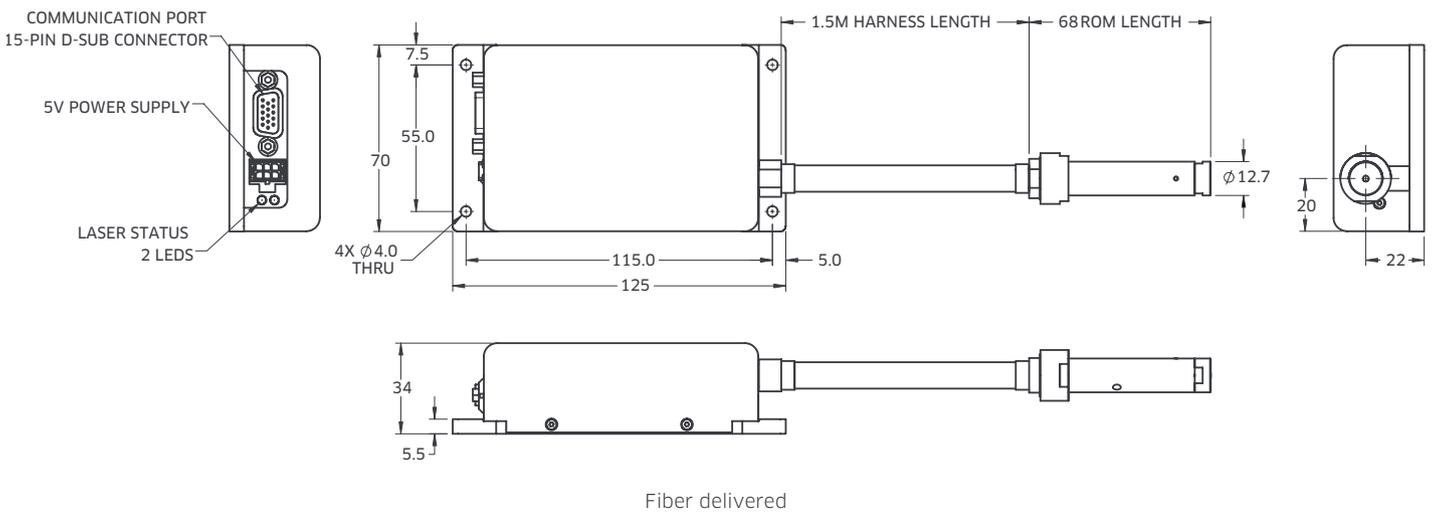
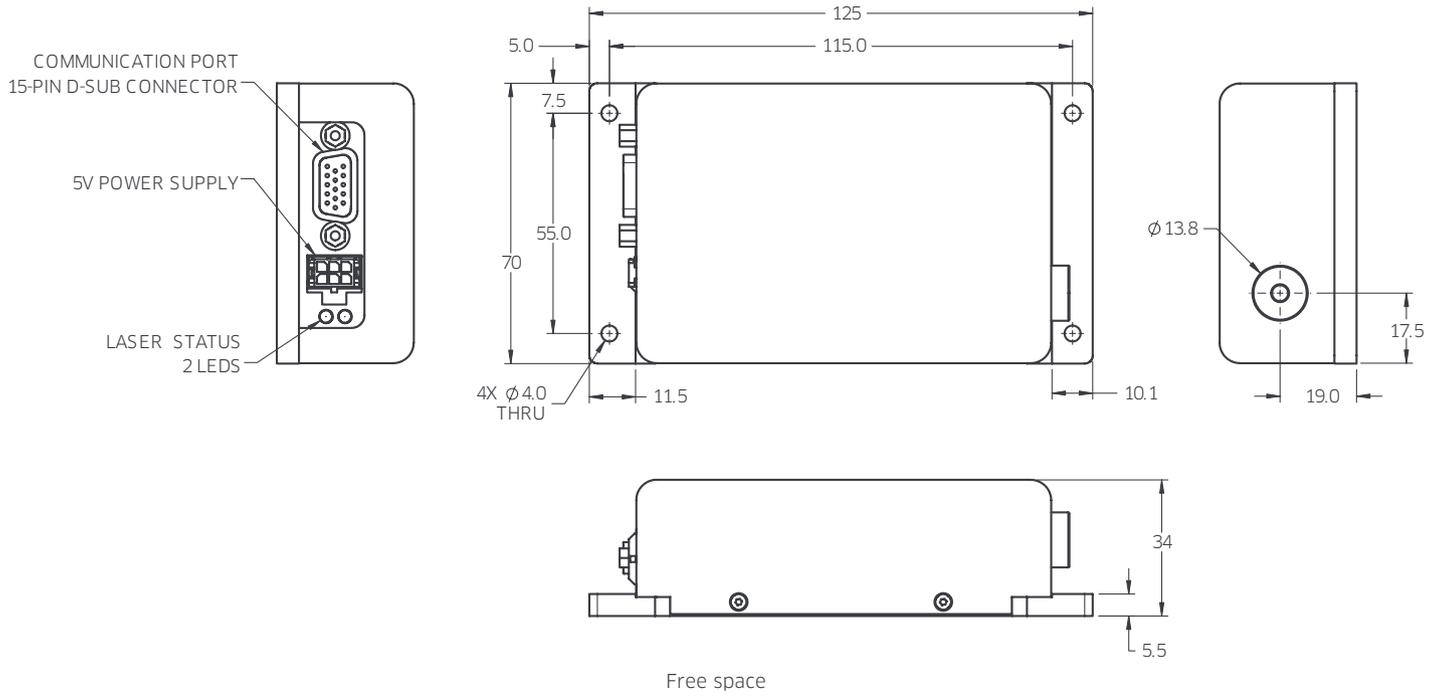
- Free-space and fiber-delivered versions with unique end-of-fiber power monitoring
- Compact—optics and electronics integrated in one housing
- Highly-reliable telecom-based technology
- Low heat load—no heat sink required

#### **Applications**

- Biotechnology
- Semiconductor instrumentation
- Metrology

**Dimensions Diagram**

(Specifications in mm unless otherwise noted.)



### Specifications

Parameter	FCD488-010/020/025 (Free Space)	FCD488FC-010/020 (Fiber Delivered)
<b>Optical</b>		
Wavelength	488±2 nm	
Output power	10/20/25 mW	10/20 mW
Power stability (drift over 2 hours, 25 ± 3°C) after warm-up	<2.0%	
Mode quality M <sup>2</sup>	<1.2	
Beam diameter (1/e <sup>2</sup> point)	0.7 mm ±10%	
Beam divergence (full angle)	<1.0 mrad	
Polarization ratio (E-vector is vertical)	>100:1	
Noise (rms, 20 Hz to 2 MHz)	<0.5%	
Ellipticity	<10%	
Pointing stability after warm-up	<10 µrad/°C	
Static alignment	Beam position	±0.25 mm    ±0.50 mm
	Beam angle	±2.5 mrad    ±50 mrad
<b>Environmental</b>		
Base plate temperature	Operating	10 to 45°C
	Non-operating	0 to 60°C
Shock (11 ms duration)	Operating	1 g
	Non-operating	25 g
Vibration (sinusoidal, 5 to 500 Hz)	Operating	0.3 g
	Non-operating	2g
Warm-up time	<10 minutes	
Electrical requirements	Operating	5.0 ±0.4 V DC
	Nonoperating	4 A

### Ordering Information

For more information on this or other products and their availability, please contact your local Lumentum account manager or Lumentum directly at customer.service@lumentum.com.

Description	Product Code
FCD continuous-wave 10 mW 488 nm free-space solid-state laser	FCD488-010
FCD continuous-wave 20 mW 488 nm free-space solid-state laser	FCD488-020
FCD continuous-wave 25 mW 488 nm free-space solid-state laser	FCD488-025
FCD continuous-wave 10 mW 488 nm fiber-delivered solid-state laser	FCD488FC-010
FCD continuous-wave 20 mW 488 nm fiber-delivered solid-state laser	FCD488FC-020

### Compliance with Regulatory Requirements

FCD series lasers are OEM versions of Lumentum solid-state lasers and are only intended for integration into other equipment. These lasers do not comply with CDRH. The customer is responsible for CDRH certification of systems incorporating FCD lasers.

The units have been designed and tested to comply with the following standards:

- Electromagnetic emission and immunity tested to standard EN 61326-1
- Safety compliance tested to standards IEC/EN 61010-1 and IEC/EN 60825-1

## Warranty

FCD series lasers are warranted to be free of defects in materials and workmanship for twelve months from the date of shipment or 5,000 hours, whichever occurs first.



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