



# CUBE

## Diode Laser System

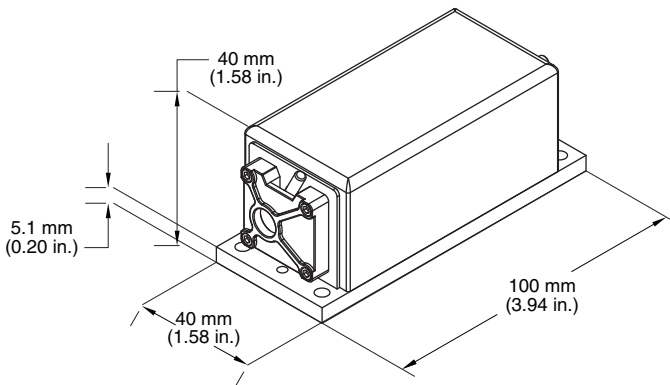


### Features

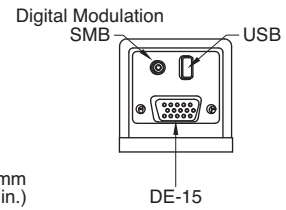
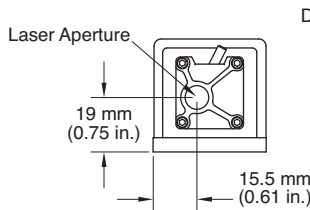
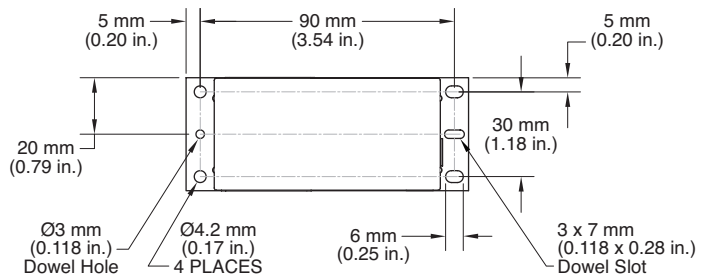
- Compact and modular OEM design
- Complete CDRH safety features for scientific and laboratory use
- TEC temperature-stabilized and conductively cooled through baseplate
- Analog and digital modulation
- USB and RS-232

### Mechanical Specifications

#### Laser Head



#### Top View



Superior Reliability & Performance

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### System Specifications

CUBE	375-16C	405-50E
Part Number	1112774	1069408
Wavelength <sup>1</sup> (nm)	375	
Output Power <sup>2</sup> (mW)	16	50
Beam Diameter at 1/e <sup>2</sup> (mm)(typical)	1.1	2.6 x 1.1
Beam Divergence (mrad)(typical)	0.5	0.2 x 0.5
M <sup>2</sup> (ModeMaster beam quality) <sup>3</sup>	<1.5	
Beam Asymmetry <sup>3</sup>	<1:1.2	1:2.4
Laser Drive Modes	Digital, Analog & PC Control	Digital, Analog & PC Control
Digital Modulation		
Maximum Bandwidth (MHz)	150	150
Rise Time (10% to 90%) (nsec)	<2	<2
Fall Time (10% to 90%) (nsec)	<2	<2
Modulation Depth (extinction ratio)	>1,000,000:1 at 0 Hz, >250:1 at 150 MHz	>1,000,000:1 at 0 Hz, >250:1 at 150 MHz
Analog Modulation		
Maximum Bandwidth (kHz)	70	>250:1 at 150 MHz
Rise or Fall Time (10% to 90%) (µsec)	<5	<1
Modulation Depth (extinction ratio)	>10,000:1	>10,000:1
Laser Enable Control Input		
Maximum Bandwidth (kHz)	130	130
Rise or Fall Time (10% to 90%) (µsec)	<1	<1
Modulation Depth (extinction ratio)	∞, complete On/Off	∞, complete On/Off
RMS Noise		
20 Hz to 10 MHz	<0.2%	<0.2%
10 MHz to 500 MHz	<1.0%	<1.0%
Long-Term Power Stability (8 hours)	<±2%	<±2%
Warm-Up Time (minutes)	<5	<5
Spatial Mode (far field)	TEM <sub>00</sub> , M <sup>2</sup> <1.5	TEM <sub>00</sub> , M <sup>2</sup> <1.5
Pointing Stability (µrad/°C)	<6	<6
Polarization Ratio <sup>4</sup>	Min. 100:1, Vert. ±5°	Min. 100:1, Vert. ±5°
Static Alignment Tolerances <sup>5</sup>		
Beam Position (mm)	<1	<1
Beam Angle (mrad)	<5	<5
CDRH Laser Classification	Class IIIb	Class IIIb
ESD Protection <sup>6</sup>	Level 4	Level 4

<sup>1</sup> Laser-to-laser tolerance. All lasers ±5 nm except CUBE 635 with 633 to 642 nm range, CUBE 640-40 with 635 to 642 nm range, CUBE 640-100 with 640 to 644 nm range, CUBE 660 with 652 to 665 nm range, and CUBE 785 ±10 nm.

<sup>2</sup> Output power is variable via RS-232, USB or analog interface from 1% to 100%. Specifications are valid for 100% power. Recommended power range is 70% to 100% power.

<sup>3</sup> M<sup>2</sup> and Beam Asymmetry measured with ModeMaster with 84/16 clip levels.

<sup>4</sup> Polarization measurement is max./min. power with polarizer at 32 in. from laser with LM-2 power head at 37 in. from laser.

<sup>5</sup> Static alignment tolerances are relative to the right bottom edge (in beam direction).

<sup>6</sup> Electro-Static Discharge Standard IEC 1000-4-2, 1995.

# CUBE™ Diode Laser System

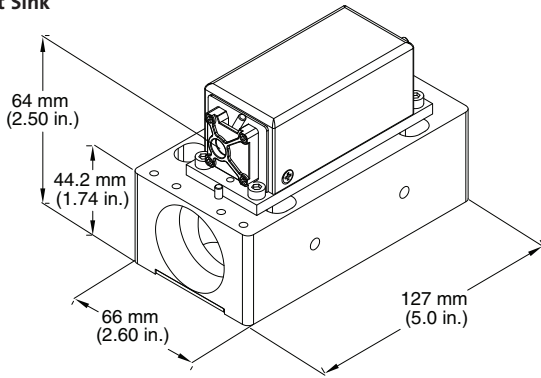
405-50C	405-100C	445-40C	635-30E	635-25C
1069413	1142279	1069418	1069410	1069415
405		445	635	635
50	100	40	30	25
1.1	1.4	1.1	1 x 3.8	0.7
0.5	0.4	0.6	0.8 x 0.3	1.3
<1.5		<1.5		
<1:1.2	<1:1.2	<1:1.2	1:3.8	<1:1.2
Digital, Analog & PC Control	Digital, Analog & PC Control	Digital, Analog & PC Control	Digital, Analog & PC Control	Digital, Analog & PC Control
150	150	125	150	150
<2	<2	<2	<2	<2
<2	<2	<3	<2	<2
>1,000,000:1 at 0 Hz, >250:1 at 150 MHz	>1,000,000:1 at 0 Hz, >250:1 at 150 MHz	>1,000,000:1 at 0 Hz, >250:1 at 125 MHz	>1,000,000:1 at 0 Hz, >250:1 at 150 MHz	>1,000,000:1 at 0 Hz, >250:1 at 150 MHz
>250:1 at 150 MHz	>250:1 at 150 MHz	350	350	350
<1	<1	<1	<1	<1
>10,000:1	>10,000:1	>10,000:1	>10,000:1	>10,000:1
130	130	130	130	130
<1	<1	<1	<1	<1
∞, complete On/Off	∞, complete On/Off	∞, complete On/Off	∞, complete On/Off	∞, complete On/Off
<0.2%	<0.2%	<0.2%	<0.2%	<0.2%
<1.0%	<1.0%	<1.0%	<1.0%	<1.0%
<±2%	<±2%	<±2%	<±2%	<±2%
<5	<5	<5	<5	<5
TEM <sub>00</sub> , M <sup>2</sup> <1.5	TEM <sub>00</sub> , M <sup>2</sup> <1.5	TEM <sub>00</sub> , M <sup>2</sup> <1.5	TEM <sub>00</sub> , M <sup>2</sup> <1.5	TEM <sub>00</sub> , M <sup>2</sup> <1.5
<6	<6	<6	<6	<6
Min. 100:1, Vert. ±5°	Min. 100:1, Vert. ±5°	Min. 100:1, Vert. ±5°	Min. 100:1, Vert. ±5°	Min. 100:1, Vert. ±5°
<1	<1	<1	<1	<1
<5	<5	<5	<5	<5
Class IIIb	Class IIIb	Class IIIb	Class IIIb	Class IIIb
Level 4	Level 4	Level 4	Level 4	Level 4

# CUBE™ Diode Laser System

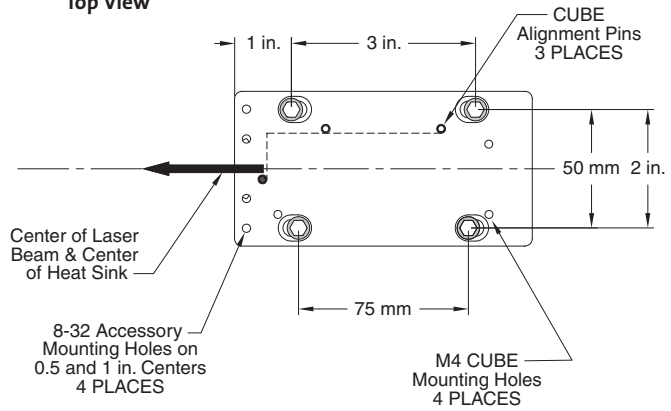
640-40C	Preliminary 640-100C	660-60C	660-100C	785-40C
1069417	1150205	1094060	1130061	1069416
640	640	660	660	785
40	100	60	100	40
1	1	1.4	1	1.2
1	1	0.6	1	1
	<1.5			<1.5
<1:1.2	<1:1.2	<1:1.2	<1:1.2	<1:1.2
Digital, Analog & PC Control	Digital, Analog & PC Control	Digital, Analog & PC Control	Digital, Analog & PC Control	Digital, Analog & PC Control
150	150	150	150	150
<2	<2	<2	<2	<2
<2	<2	<2	<2	<2
>1,000,000:1 at 0 Hz, >250:1 at 150 MHz	>1,000,000:1 at 0 Hz, >250:1 at 150 MHz	>1,000,000:1 at 0 Hz, >250:1 at 150 MHz	>1,000,000:1 at 0 Hz, >250:1 at 150 MHz	>1,000,000:1 at 0 Hz, >250:1 at 150 MHz
350	350	350	350	350
<1	<1	<1	<1	<1
>10,000:1	>10,000:1	>10,000:1	>10,000:1	>10,000:1
130	130	130	130	130
<1	<1	<1	<1	<1
∞, complete On/Off	∞, complete On/Off	∞, complete On/Off	∞, complete On/Off	∞, complete On/Off
<0.2%	<0.2%	<0.2%	<0.2%	<0.2%
<1.0%	<1.0%	<1.0%	<1.0%	<1.0%
<±2%	<±2%	<±2%	<±2%	<±2%
<5	<5	<5	<5	<5
TEM <sub>00</sub> , M <sup>2</sup> <1.5	TEM <sub>00</sub> , M <sup>2</sup> <1.5	TEM <sub>00</sub> , M <sup>2</sup> <1.5	TEM <sub>00</sub> , M <sup>2</sup> <1.5	TEM <sub>00</sub> , M <sup>2</sup> <1.5
<6	<6	<6	<6	<6
Min. 100:1, Vert. ±5°	Min. 100:1, Vert. ±5°	Min. 100:1, Vert. ±5°	Min. 100:1, Vert. ±5°	Min. 100:1, Vert. ±5°
<1	<1	<1	<1	<1
<5	<5	<5	<5	<5
Class IIIb	Class IIIb	Class IIIb	Class IIIb	Class IIIb
Level 4	Level 4	Level 4	Level 4	Level 4

# CUBE™ Diode Laser System

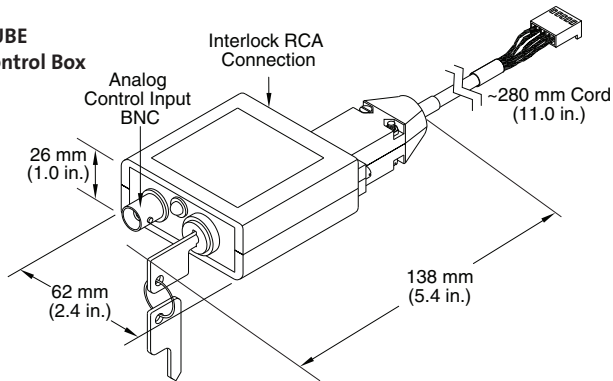
**CUBE  
Heat Sink**



**Heat Sink  
Top View**



**CUBE  
Control Box**



**CUBE  
Power Supply**



**CUBE Accessories**

1073840	CUBE Heat Sink Accessory	CUBE heat sink with fan, 127 x 66 x 44 mm
1079150	CUBE 2nd Emission Lamp	CDRH lamp for laser emission. Connects to CUBE I/O cable.
1072166	* CUBE Interface Cable	CUBE to control box, I/O, RS-232 and power
1072454	* CUBE Power Supply, 6 VDC, 2.5 amps	IEC320 input, 110V/220V, switch and LED
1108906	* CUBE USB Cable, 6 ft. (1.8m)	USB standard to mini for CUBE
1039966	* Control Box, CDRH, Keyswitch, Interlock	Control box for CUBE lasers. Included box, key, interlock RCA and cable.
1080090	Cable, Extension, DB-9 M/F, 6 ft. (1.8m)	Extension cable to extend control box or RS-232. M-F, DB-9.
1040408	* Plug, RCA	Interlock RCA plug for control box, non-shorted
1079890	* CUBE Manual and Software	CUBE user manual and software CD for Windows 2000** and Windows XP**
1108063	* Power Cord, USA, 6 ft. (1.8m)	Power cord, USA plug style to IEC320
1116779	CUBE Heat Sink Right Angle	CUBE right angle mount, 102 x 47 x 44 mm, same beam position with horizontal polarization

\* Included free with every CUBE system.

\*\* Windows 2000 and Windows XP are registered trademarks of Microsoft Corporation.

# CUBE™

## Diode Laser System

### Utility and Environmental Requirements

Laser Head Operating Voltage	+4.8 to 6.5 VDC
Laser Head Operating Current	<2.5 amps
Baseplate Temperature Range <sup>1</sup>	+10° to 50°C (50° to 122°F)
Maximum Heat Dissipation of Head (baseplate at 50°C)	13W
Storage Temperature	-20° to 60°C (-4° to 140°F)
Power Supply <sup>2</sup> (included)	100 to 240 VAC, 50 to 60 Hz
Operating Voltage <sup>3</sup>	<15W
Power Consumption	

	Dimensions (L x W x H)	Weight
Laser Head	100 x 40 x 40 mm (3.9 x 1.6 x 1.6 in.)	0.3 kg (0.7 lbs.)
Control Box	138 x 62 x 26 mm (5.4 x 2.4 x 1.1 in.)	0.12 kg (0.3 lbs.)
Power Supply	87 x 47 x 32 mm (3.4 x 1.9 x 1.3 in.)	0.22 kg (0.5 lbs.)
Head Cable	254 to 406 mm (10 to 18 in.)	0.08 kg (0.2 lbs.)
USB Cable	1.8m (6 ft.)	0.1 kg (0.2 lbs.)
Heat Sink (optional)	127 x 66 x 44 mm (5 x 2.6 x 1.74 in.)	0.4 kg (0.9 lbs.)

<sup>1</sup> Non-condensing with laser diode TEC at set point of 22°C.

<sup>2</sup> On-off power switch and LED included in cord to laser head.

<sup>3</sup> System includes USA-type power cord, IEC320 input connection.



Coherent follows a policy of continuous product improvement. Specifications are subject to change without notice.

Coherent's scientific and industrial lasers are certified to comply with the Federal Regulations (21 CFR Subchapter J) as administered by the Center for Devices and Radiological Health on all systems ordered for shipment after August 2, 1976.

Coherent offers a limited warranty for all CUBE lasers. For full details of this warranty coverage, please refer to the Service section at [www.Coherent.com](http://www.Coherent.com) or contact your local Sales or Service Representative.



[www.Coherent.com](http://www.Coherent.com)

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