

## FEATURES

-  **+5VDC UNIFIED POWER**
-  **PM SM MM FIBER COUPLING**
-  **DEM DEDICATED DESIGN**
-  **SELF-CONTAINED UNIT**



-  **TEC COOLED**
-  **AUTOMATIC POWER CONTROL**
-  **USB OR UART CONTROL**
-  **SMART ELECTRONICS**

## APPLICATIONS

## CONTROL SOFTWARE

### CW Lasers (regular spectrum)

- Fluorescence spectroscopy
- Scanning Microscopy
- Particle analysis
- Sorting
- Flow cytometry
- Excitation

### Pulsed Lasers

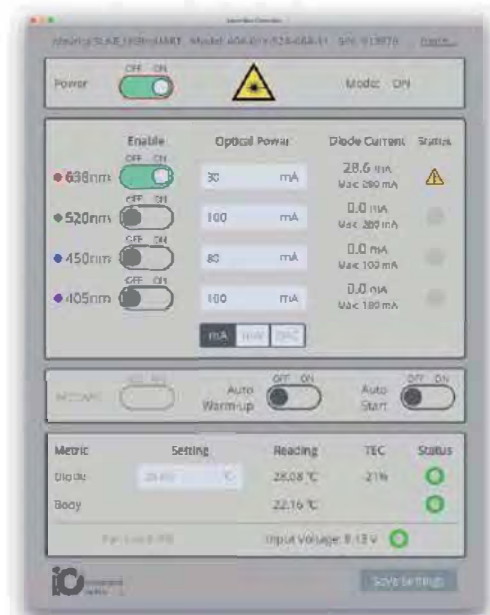
- Range Finding
- Laser Induced Breakdown Spectroscopy (LIBS)
- Laser Seeding
- Raman Spectroscopy
- Holography
- Supercontinuum Generation

### CW Lasers (narrow spectrum)

- Raman Spectroscopy
- Holography
- Inspection
- Metrology
- Interferometry
- Laser Seeding

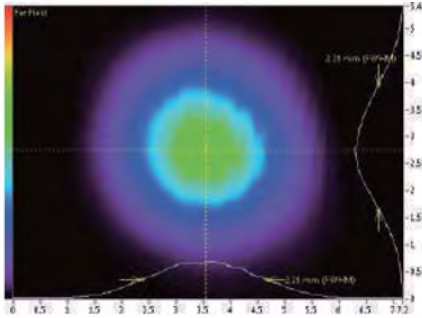
### Wavelength combiner

- Diagnostic
- Sorting
- Illumination

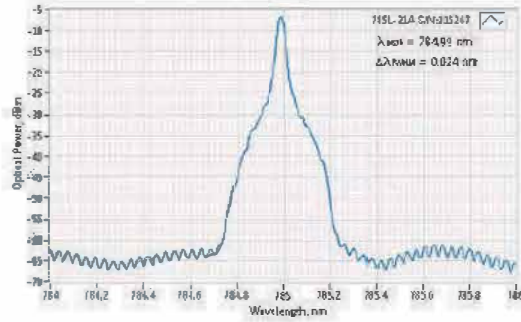


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## GENERAL INFORMATION

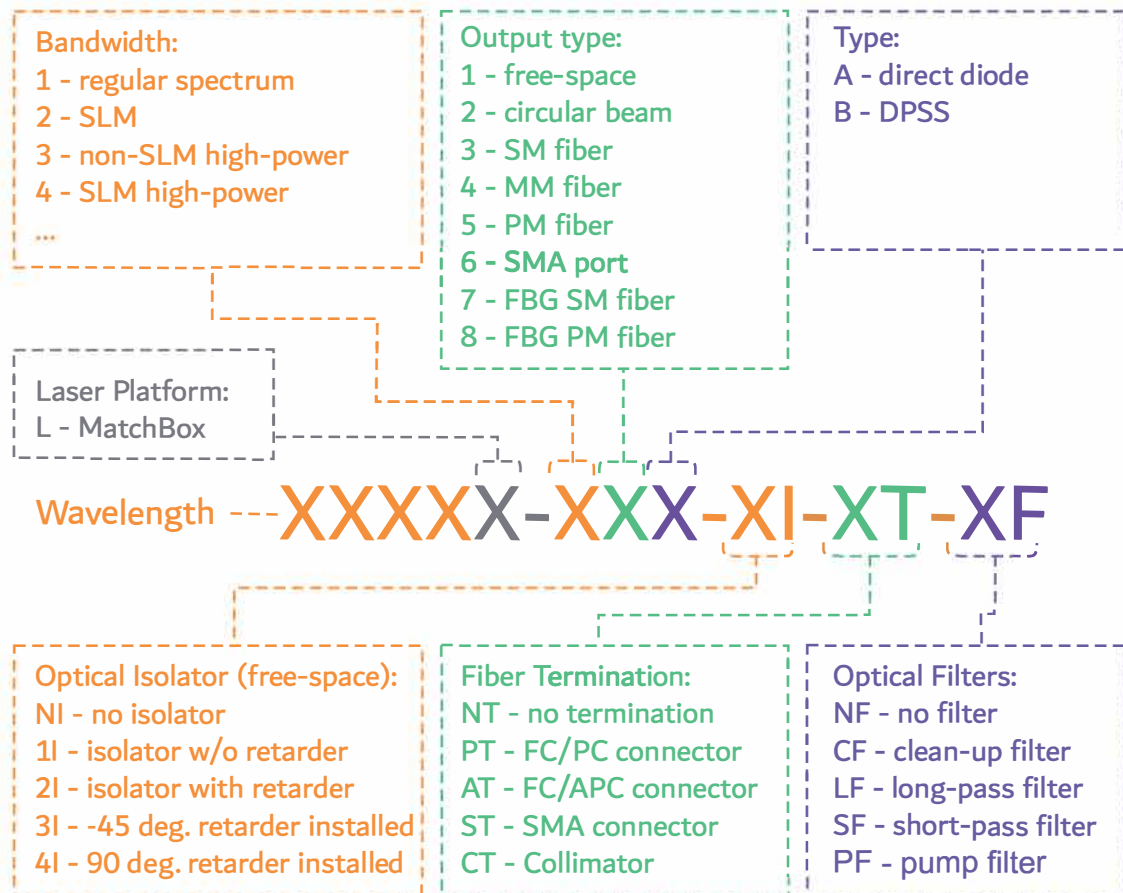


Beam profile of 1064L-11B  
(far field)



Spectrum of 785L-21A SLM laser  
(measurement is limited by spectrum analyzer)

## PART NUMBERS OF CW LASERS



## SPECIFICATIONS OF SLM CW LASERS

	Output power, mW	Power Stability, % RMS, 8 hrs*	Noise, % RMS, 20 Hz to 20 MHz*	Spectral line-width FWHM, pm*	Polarization contrast*	M <sup>2</sup> effective*	Transversal modes
0405L-21A	50	0.05	0.25	0.1	2000:1	1.3	TEM00
0405L-23A	20	0.2	0.25	0.1	N/A	1.05	TEM00
0405L-24A	40	0.2	0.25	0.1	N/A	N/A	Multi mode
0405L-25A	20	0.2	0.25	0.1	20 dB	1.05	TEM00
0405L-26A	40	0.2	0.25	0.2	N/A	N/A	Multi mode
0488L-21A	30	0.05	0.25	0.1	2000:1	1.3	TEM00
0488L-23A	10	0.2	0.25	0.1	N/A	1.05	TEM00
0488L-24A	15	0.2	0.25	0.1	N/A	N/A	Multi mode
0488L-25A	10	0.2	0.25	0.1	23 dB	1.05	TEM00
0488L-26A	15	0.2	0.25	0.2	N/A	N/A	Multi mode
0515L-21A	10	0.1	0.5	0.1	2000:1	1.3	TEM00
0515L-23A	5	0.1	0.5	0.1	N/A	1.05	TEM00
0515L-24A	8	0.1	0.5	0.1	N/A	N/A	Multi mode
0515L-25A	5	0.1	0.5	0.1	23 dB	1.05	TEM00
0515L-26A	8	0.1	0.5	0.2	N/A	N/A	Multi mode
0520L-21A	40	0.05	0.5	0.1	2000:1	1.3	TEM00
0520L-23A	25	0.05	0.5	0.1	N/A	1.05	TEM00
0520L-24A	35	0.05	0.5	0.1	N/A	N/A	Multi mode
0520L-25A	25	0.05	0.5	0.1	27 dB	1.05	TEM00
0520L-26A	35	0.2	0.5	0.2	N/A	N/A	Multimode
0532L-21A	50	0.4	0.5	0.1	1000:1	1.1	TEM00
0532L-23A	25	1	0.5	0.1	N/A	1.05	TEM00
0532L-24A	40	1	0.5	0.1	N/A	N/A	Multi mode
0532L-25A	25	1	0.5	0.1	23 dB	1.05	TEM00
0532L-26A	40	1	0.5	0.1	N/A	N/A	Multi mode
0532L-41B	100	0.05	0.5	0.1	1000:1	1.1	TEM00
0532L-43B	50	0.05	0.5	0.1	N/A	1.05	TEM00
0532L-44B	80	0.05	0.5	0.1	N/A	N/A	Multi mode
0532L-45B	50	0.05	0.5	0.1	23 dB	1.05	TEM00
0532L-46B	80	0.05	0.5	0.1	N/A	N/A	Multi mode
0532L-61B	200	0.4	0.5	0.1	1000:1	1.1	TEM00
0532L-63B	100	1	0.5	0.1	N/A	1.05	TEM00
0532L-64B	150	1	0.5	0.1	N/A	N/A	Multi mode
0532L-65A	100	1	0.5	0.1	23 dB	1.05	TEM00
0532L-66A	150	1	0.5	0.1	N/A	N/A	Multi mode
0633L-21A	70	0.03	0.25	0.1	2000:1	1.3	TEM00
0633L-23A	35	0.1	0.25	0.1	N/A	1.05	TEM00
0633L-24A	40	0.1	0.25	0.1	N/A	N/A	Multimode
0633L-25A	35	0.1	0.25	0.1	25 dB	1.05	TEM00
0633L-26A	40	0.1	0.25	0.2	N/A	N/A	Multi mode
0638L-21A	100	0.03	0.25	0.1	2000:1	1.3	TEM00
0638L-23A	60	0.1	0.25	0.1	N/A	1.05	TEM00
0638L-24A	80	0.1	0.25	0.1	N/A	N/A	Multi mode
0638L-25A	60	0.1	0.25	0.1	27 dB	1.05	TEM00
0638L-26A	80	0.1	0.25	0.2	N/A	N/A	Multi mode
0785L-21A	130	0.03	0.25	0.1	2000:1	1.3	TEM00
0785L-23A	80	0.05	0.25	0.1	N/A	1.05	TEM00
0785L-24A	100	0.05	0.25	0.1	N/A	N/A	Multi mode
0785L-25A	80	0.05	0.25	0.1	27 dB	1.05	TEM00
0785L-26A	100	0.05	0.25	0.2	N/A	N/A	Multimode
0785L-27A	80	0.2	0.25	5	N/A	1.05	TEM00
0785L-28A	80	0.2	0.25	5	20 dB	1.05	TEM00

	Output power, mW	Power Stability, % RMS, 8 hrs*	Noise, % RMS, 20 Hz to 20 MHz*	Spectral Line-width FWHM, pm*	Polarization contrast*	M <sup>2</sup> effective*	Transversal modes
0830L-21A	80	0.02	0.25	0.1	2000:1	1.3	TEM00
0830L-23A	50	0.05	0.25	0.1	N/A	1.05	TEM00
0830L-24A	70	0.05	0.25	0.1	N/A	N/A	Multimode
0830L-25A	50	0.05	0.25	0.1	23 dB	1.05	TEM00
0830L-26A	70	0.05	0.25	0.2	N/A	N/A	Multimode
1030L-21A	400	0.4	0.5	0.2	1000:1	1.1	TEM00
1030L-23A	200	1	0.5	0.2	N/A	1.05	TEM00
1030L-24A	280	1	0.5	0.2	N/A	N/A	Multimode
1030L-25A	200	1	0.5	0.2	23 dB	1.05	TEM00
1030L-26A	280	1	0.5	0.2	N/A	N/A	Multimode
1064L-21A	400	0.4	0.5	0.2	1000:1	1.1	TEM00
1064L-23A	200	1	0.5	0.2	N/A	1.05	TEM00
1064L-24A	280	1	0.5	0.2	N/A	N/A	Multimode
1064L-25A	200	1	0.5	0.2	23 dB	1.05	TEM00
1064L-26A	280	1	0.5	0.2	N/A	N/A	Multimode

#### HIGH POWER (CLASS 4) LASERS

	Output power, mW	Power Stability, % RMS, 8 hrs*	Noise, % RMS, 20 Hz to 20 MHz*	Spectral Line-width FWHM, nm*	Polarization contrast*	Fiber core diameter, μm	
0405L-31A	500	0.2	0.8	1	100	N/A	
0405L-34A	400	1	0.8	1	N/A	50	
0405L-36A	400	1	0.8	1	N/A	50	
0450L-31A	400	0.2	0.8	1.4	N/A	N/A	
0450L-34A	300	1	0.8	1.4	N/A	50	
0450L-36A	300	1	0.8	1.4	N/A	50	
0532L-31B	500	0.2	3	0.3	2000	N/A	
0532L-34B	400	1	3	0.3	N/A	50	
0532L-36B	400	1	3	0.3	N/A	50	
0638L-31A	600	0.2	0.4	1	N/A	N/A	
0638L-34A	500	1	0.4	1	N/A	50	
0638L-36A	500	1	0.4	1	N/A	50	
0785L-31A	1500	0.2	0.4	1	N/A	N/A	
0785L-34A	1000	1	0.4	1	N/A	50	
0785L-36A	1000	1	0.4	1	N/A	50	
0785L-41A	1000	0.2	0.25	0.03	1500	N/A	
0785L-44A	500	1	0.25	0.03	N/A	50	
0785L-46A	500	1	0.25	0.03	N/A	50	
0808L-34A	1600	1	0.25	1	N/A	50	
0808L-36A	1600	1	0.4	1	N/A	50	
0830L-34A	1000	1	0.25	1	N/A	50	
0830L-36A	1000	1	0.25	1	N/A	50	
0915L-34A	2000	1	0.25	1	N/A	50	
0915L-36A	2000	1	0.25	1	N/A	50	
0940L-34A	2000	1	0.25	1	N/A	50	
0940L-36A	2000	1	0.25	1	N/A	50	
0975L-34A	2000	1	0.25	1	N/A	50	
0975L-36A	2000	1	0.25	1.5	N/A	50	
1064L-34A	1000	1	0.25	1.5	N/A	50	
1064L-36A	1000	1	0.25	1.5	N/A	50	
1550L-34A	1000	1	0.25	2	N/A	50	
1550L-36A	1000	1	0.25	2	N/A	50	

\* Typical performance (full specification available at <https://integratedoptics.com/products/cw-lasers>)

Note: Product specifications are subject to change without prior notice to improve reliability, function or design or otherwise.

## REGULAR SPECTRUM CW LASERS

	Output power, mW	Power Stability, % RMS, 8 hrs*	Noise, % RMS, 20 Hz to 20 MHz*	Spectral line-width FWHM, nm*	Polarization contrast / extinction*	M <sup>2</sup> effective*	Transverse modes
0405L-11A	180	0.2	0.25	0.5	2000:1	1.2	TEM00
0405L-13A	100	0.2	0.25	0.5	N/A	1.05	TEM00
0405L-14A	150	0.2	0.25	0.5	N/A	N/A	Multimode
0405L-15A	100	0.2	0.25	0.5	27 dB	1.05	TEM00
0405L-16A	150	0.2	0.25	0.5	N/A	N/A	Multimode
0445L-11A	60	0.1	0.25	0.8	2000:1	1.2	TEM00
0445L-13A	35	0.1	0.25	0.8	N/A	1.05	TEM00
0445L-14A	50	0.1	0.25	0.8	N/A	N/A	Multimode
0445L-15A	35	0.1	0.25	0.8	23 dB	1.05	TEM00
0445L-16A	50	0.1	0.25	0.8	N/A	N/A	Multimode
0488L-11A	40	0.2	0.25	1	2000:1	1.2	TEM00
0488L-13A	20	0.2	0.25	1	N/A	1.05	TEM00
0488L-14A	30	0.2	0.25	1	N/A	N/A	Multimode
0488L-15A	20	0.2	0.25	1	27 dB	1.05	TEM00
0488L-16A	30	0.2	0.25	1	N/A	N/A	Multimode
0505L-11A	60	0.03	0.5	0.7	2000:1	1.2	TEM00
0505L-13A	30	0.1	0.5	0.7	N/A	1.05	TEM00
0505L-14A	50	0.1	0.5	0.7	N/A	N/A	Multimode
0505L-15A	30	0.1	0.5	0.7	23 dB	1.05	TEM00
0505L-16A	50	0.1	0.5	0.7	N/A	N/A	Multimode
0520L-11A	100	0.2	0.5	1	2000:1	1.2	TEM00
0520L-13A	50	0.2	0.5	1	N/A	1.05	TEM00
0520L-14A	90	0.2	0.5	1	N/A	N/A	Multimode
0520L-15A	50	0.2	0.5	1	23 dB	1.05	TEM00
0520L-16A	80	0.2	0.5	1	N/A	N/A	Multimode
0532L-11B	200	0.1	3	0.1	1000:1	1.3	TEM00
0532L-13B	100	2	3	0.3	N/A	1.05	TEM00
0532L-14B	160	1	3	0.1	N/A	N/A	Multimode
0532L-15B	100	2	3	0.3	23 dB	1.05	TEM00
0532L-16	150	1	3	0.3	N/A	N/A	Multimode
0638L-11A	170	0.03	0.25	0.7	2000:1	1.15	TEM00
0638L-13A	100	0.05	0.25	0.7	N/A	1.05	TEM00
0638L-14A	120	0.05	0.25	0.7	N/A	N/A	Multimode
0638L-15A	100	0.05	0.25	0.7	27 dB	1.05	TEM00
0638L-16A	120	0.05	0.25	0.7	N/A	N/A	Multimode
0660L-11A	110	0.1	0.25	0.7	2000:1	1.2	TEM00
0660L-13A	60	0.1	0.25	0.7	N/A	1.05	TEM00
0660L-14A	90	0.1	0.25	0.7	N/A	N/A	Multimode
0660L-15A	60	0.1	0.25	0.7	27 dB	1.05	TEM00
0660L-16A	80	0.1	0.25	0.7	N/A	N/A	Multimode
0785L-11A	170	0.05	0.25	0.2	2000:1	1.2	TEM00
0785L-13A	120	0.05	0.25	0.2	N/A	1.05	TEM00
0785L-14A	150	0.05	0.25	0.2	N/A	N/A	Multimode
0785L-15A	120	0.05	0.25	0.2	27 dB	1.05	TEM00
0785L-16A	150	0.05	0.25	0.2	N/A	N/A	Multimode
0830L-11A	130	0.1	0.25	0.5	2000:1	1.2	TEM00
0830L-13A	70	0.1	0.25	0.5	N/A	1.05	TEM00
0830L-14A	90	0.1	0.25	0.5	N/A	N/A	Multimode
0830L-15A	70	0.1	0.25	0.5	27 dB	1.05	TEM00
0830L-16A	90	0.1	0.25	0.5	N/A	N/A	Multimode
0850L-11A	130	0.03	0.25	0.1	1000:1	1.2	TEM00
0850L-13A	70	0.03	0.25	0.1	N/A	1.05	TEM00
0850L-14A	110	0.03	0.25	0.1	N/A	N/A	Multimode
0850L-15A	70	0.03	0.25	0.1	27 dB	1.05	TEM00
0850L-16A	110	0.03	0.25	0.1	N/A	N/A	Multimode



	Output power, mW	Power Stability, % RMS, 8 hrs*	Noise, % RMS, 20 Hz to 20 MHz*	Spectral line-width FWHM, nm*	Polarization contrast*	M <sup>2</sup> effective*	Transverse modes
0915L-11A	170	0.05	0.25	0.5	2000:1	1.2	TEM00
0915L-13A	80	0.05	0.25	0.5	N/A	1.05	TEM00
0915L-14A	140	0.05	0.25	0.5	N/A	N/A	Multi mode
0915L-15A	80	0.05	0.25	0.5	27 dB	1.05	TEM00
0915L-16A	140	0.05	0.25	0.5	N/A	N/A	Multi mode
0975L-11A	170	0.05	0.25	0.5	2000:1	1.2	TEM00
0975L-13A	100	0.05	0.25	0.5	N/A	1.05	TEM00
0975L-14A	140	0.05	0.25	0.5	N/A	N/A	Multi mode
0975L-15A	100	0.05	0.25	0.5	23 dB	1.05	TEM00
0975L-16A	140	0.05	0.25	0.5	N/A	N/A	Multi mode
1030L-11B	<500	0.1	1.5	0.7	1000:1	1.1	TEM00
1030L-13B	300	0.1	1.5	0.7	N/A	1.05	TEM00
1030L-14B	400	0.1	1.5	0.7	N/A	N/A	Multi mode
1030L-15B	300	0.1	1.5	0.7	27 dB	1.05	TEM00
1030L-16B	400	0.1	1.5	0.7	N/A	N/A	Multi mode
1064L-11B	<500	0.1	3	0.1	1000:1	1.1	TEM00
1064L-13B	300	0.1	3	0.1	N/A	1.05	TEM00
1064L-14B	400	0.1	3	0.1	N/A	N/A	Multi mode
1064L-15B	300	0.1	3	0.1	27dB	1.05	TEM00
1064L-16B	400	0.1	3	0.1	N/A	N/A	Multimode
1123L-11B	200	0.2	3	0.7	1000:1	1.1	TEM00
1123L-13B	100	0.5	3	0.7	N/A	1.05	TEM00
1123L-14B	160	0.5	3	0.7	N/A	N/A	Multi mode
1123L-15B	100	0.5	3	0.7	23 dB	1.05	TEM00
1123L-16B	160	0.5	3	0.7	N/A	N/A	Multi mode
1319L-11B	200	0.2	3	0.7	1000:1	1.1	TEM00
1319L-13B	100	0.5	3	0.7	N/A	1.05	TEM00
1319L-14B	160	0.5	3	0.7	N/A	N/A	Multi mode
1319L-15B	100	0.5	3	0.7	23 dB	1.05	TEM00
1319L-16B	160	0.5	3	0.7	N/A	N/A	Multi mode
1342L-11B	200	0.2	3	0.7	1000:1	1.1	TEM00
1342L-13B	100	0.5	3	0.7	N/A	1.05	TEM00
1342L-14B	160	0.5	3	0.7	N/A	N/A	Multi mode
1342L-15B	100	0.5	3	0.7	23 dB	1.05	TEM00
1342L-16B	160	0.5	3	0.7	N/A	N/A	Multi mode
1470L-11A	300	0.2	0.25	10	2000:1	1.2	TEM00
1470L-13A	200	0.5	0.25	10	N/A	1.05	TEM00
1470L-14A	250	0.5	0.25	10	N/A	N/A	Multimode
1470L-15A	200	0.5	0.25	10	25 dB	1.05	TEM00
1470L-16A	250	0.5	0.25	10	N/A	N/A	Multi mode
1550L-11A	300	0.2	0.25	10	2000:1	1.2	TEM00
1550L-13A	250	0.2	0.25	10	N/A	1.05	TEM00
1550L-14A	200	0.2	0.25	10	N/A	N/A	Multi mode
1550L-15A	250	0.2	0.25	10	25 dB	1.05	TEM00
1550L-16A	200	0.2	0.25	10	N/A	N/A	Multi mode

\* Typical performance (full specification available at <https://integratedoptics.com/products/cw-lasers>)

Custom: other wavelengths and configurations are available on request.

Note: Product specifications are subject to change without prior notice to improve reliability, function or design or otherwise.

## OTHER PARAMETERS OF CW LASERS

### BEAM PROPERTIES:

- Beam diameter at aperture ( $1/e^2$ ): <2 mm for diode and ~1 mm for DPSS
- Beam divergence (full angle): <1.5 mrad for diode and DPSS, except 500 mW versions of 532 nm and 785 nm
- Beam pointing stability: <5  $\mu\text{rad}/\text{C}^\circ$

### MODULATION:

- Fast TTL modulation (up to 10 Mhz in ACC mode) is available for non-SLM diode lasers
- Typical rise time of diode non-SLM lasers is 17ns
- Typical fall time of diode non-SLM lasers is 13 ns
- Modulation of DPSS lasers (up to few kHz) is implemented upon request
- For SLM diode and all DPSS lasers, the TTL pin is configured for fan speed control

### FIBER SPECS:

- Default connector for SLM laser is FC/APC.
- Default connector for regular spectrum lasers is FC/PC
- Standard length of a fiber is 1 m to 1.2 m
- Polarization rotation (PM fiber): less than 5 degree

### PHYSICAL PROPERTIES:

- Control interface type: UART serial bus, convertible to USB or RS232 using standard accessories
- External power supply requirement: +5VDC, 5A for DPSS, 1.5 A for diode up to 200 mW
- Dimensions (L-W-H): 50 x 30 x 18 mm (excluding pins and output window)
- Beam height from the base: 10.4 mm (+/- 0.3 mm)
- Heatsink requirement: diode <1  $^\circ\text{C}/\text{W}$ , DPSS <0.5  $^\circ\text{C}/\text{W}$
- Optimum heatsink temperature (non-condensing): +15...+30  $^\circ\text{C}$
- Max. heatsink temperature 40  $^\circ\text{C}$
- Internal temperature stabilization: TEC
- Overheat protection: Yes
- Storage temperature (non-condensing): -10 to +50  $^\circ\text{C}$
- Warranty: 14 months, or 10000 hours, whichever occurs first. Operational time calculation is based on an internal EPROM counter

### COMPATIBILITY:

- RoHS
- General Product Safety Directive (GPSD) 2001/95/EC
- Electromagnetic Compatibility (EMC) Directive 2004/108/EC
- IEC60825-1:2014 (compliant only using additional accessories)



#### Unified Physical Control Interface

Vcc and GND pins are for +5 VDC power supply;  
Tx and Rx pins are for UART communication;  
TTL pin is used for digital modulation;  
For DPSS and VBG diode lasers, the TTL pin is configured for FAN control of a compatible heatsink.

## MATCHBOX ACCESSORIES



### Break-out-box

An optional accessory which simplifies installation and use of MatchBox lasers. It provides DATA, POWER connections as well as interlock, TTL modulation and fan control pins.



### Heatsinks

We offer a range of heatsinks - from cost effective sinks with fan cooling to high-end TEC coolers.

### Shutters

several shutter options are provided with extra functionality of lens holder (for beam expanders), optical isolator holders, cage bench adapters.

### Power supplies

our break-out-boxes are now standartized for PD (Power Delivery standard), thus we are offering several models of PD power supplies.