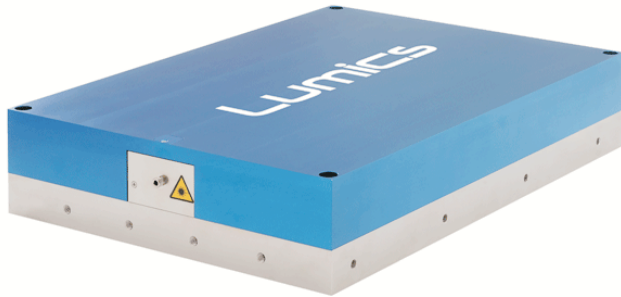




LuOcean M2

LU1470_980A Diode Laser
Up to 300 W c.w. Operating Power at 980 nm and 110 W at 1470 nm



Description:

The **LuOcean M2** device consists of multiple single emitter laser diodes in a rugged industrial package. Long lifetime is ensured due to laser diode facet passivation, extensive burn-in testing and screening of the individual single emitters. Its performance makes it a valuable tool for various applications.

Features & Functions:

- Wavelength 980 nm and 1470 nm
- Burn-in tested single emitters
- SMA connector
- Sealed housing
- Internal cooling
- Temperature sensor
- Power monitor

Options:

- Up to 2 fiber sensors
- Up to 2 temperature sensors
- Red pilot laser
- Replaceable protection window
- D80 connector (uncooled)
- 200 μ m or 400 μ m fiber

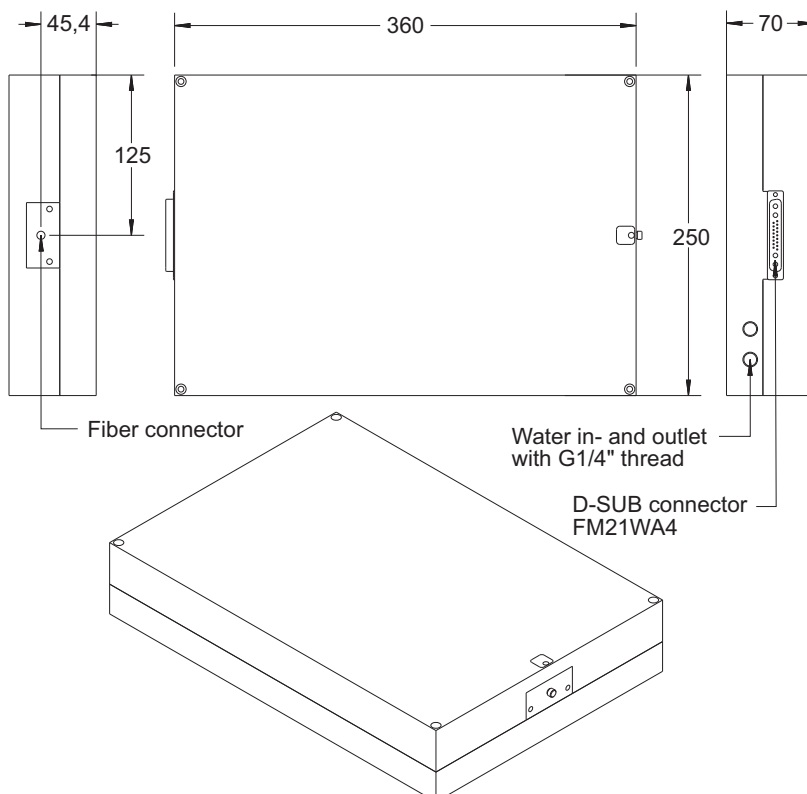
Benefits:

- No DI water required
- Low current

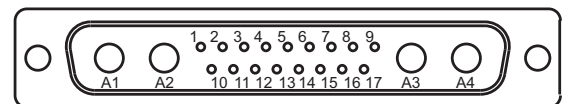
Applications:

- Medical treatment
- Illumination
- Material processing

Module Drawing (Dimensions in mm)



Connector



Pin Connections

1	$V_s=12$ V for Fiber sensor* / Monitor diode cathode (12 V)
2	GND for Fiber sensor*/LM35*/Monitor diode
3	Fiber sensor 1 signal*
4	Fiber sensor 2 signal*
5	NTC 1 or LM35 5 V or PT100/1000
6	NTC 1 signal or LM35 signal or PT100/1000
7	NTC 2 or LM35 5 V or PT100/1000 *
8	NTC 2 signal or LM35 signal or PT100/1000 *
9	Monitor diode 1 signal
10	Monitor diode 2 signal*
11	Pilot laser (3-5 V)*
12	Pilot laser (GND)*
13	Pilot laser power control (0-5 V)*
14	NTC 3 or LM35 5 V or PT100/1000 *
15	NTC 3 signal or LM35 signal or PT100/1000 *
16/17	N. C.
A1	Laser diode GND (-)
A2	Laser diode (+)
A3	Laser diode GND (-)
A4	Laser diode (+)
* = optional	

Your ideas are welcome.

Electrical and Optical Characteristics Typical laser specifications at 25° C*

Parameter	Conditions	Symbol	120 W @ 980 nm & 40 W @ 1470 nm in 200µm	300 W @ 980 nm & 110 W @ 1470 nm in 400 µm	Unit
Output power (1)	c.w.	P _{op} 980nm	120	300	W
Output power (1)	c.w.	P _{op} 1470nm	40	110	W
Operating current	c.w.	I _{op} 980nm	16.0	24.0	A
Operating current	c.w.	I _{op} 1470nm	12.0	20.5	A
Absolut max. forward current	c.w.	I _{max} 980nm	17.0	25.0	A
Absolut max. forward current	c.w.	I _{max} 1470nm	14.0	21.0	A
Peak wavelength at P _{op} 980nm			980 ± 10	980 ± 10	nm
Peak wavelength at P _{op} 1470nm			1470 ± 20	1470 ± 20	nm
Spectral width (FWHM) 980nm		Δλ	6	6	nm
Spectral width (FWHM) 1470nm		Δλ	10	10	nm
Threshold current		I _{th} 980nm	<1.5	<2.5	A
Threshold current		I _{th} 1470nm	<1.5	<2.0	A
Operating voltage		V _f 980nm	28	40	V
Operating voltage		V _f 1470nm	30	45	V
Conversion efficiency 980nm			35	35	%
Conversion efficiency 1470nm			13	13	%
Wavelength tuning vs. temperature 980nm		λ / T	0.3	0.3	nm/K
Wavelength tuning vs. operating current 980nm		λ / I	1	1	nm/A
Wavelength tuning vs. temperature 1470nm		λ / T	0.7	0.7	nm/K
Wavelength tuning vs. operating current 1470nm		λ / I	2	1	nm/A
Weight		m	ca. 8100	8.100	g
Output fiber (SMA905 or D80 connector on module)					
Core diameter of output fiber		d _{core}	200	400	µm
Fiber centricity			10	10	µm
Numerical aperture		NA	0.22	0.22	
Power monitor		PD	10-30	10-30	mV/W
Temperature sensor			LM35, NTC (10k) or PT100/1000 (please specify)		
Thermal resistance (bottom to temp. sensor)		R _{th}	0.013	0.013	K/W
Water temperature (recommended)		T	<18°	<15°	°C
Minimum water flux (industrial water, no DI-water)			1.5	4	l/min
Options					
Red pilot laser					
C.w. output power			1	1	mW
Peak wavelength			650 ±15	650 ±15	nm
Operating voltage			5	5	V
Fiber sensor					
Fiber sensor signal			12	12	V
Fiber sensor type PNP IFRM03P1503/Q (normally open) or with open collector output (please specify)					

Remarks:

* taken at internal temperature sensor

(1) Power is measured ex fiber according to given fiber specifications including precision and measures of fiber and ferrules for uncoated fiber facets

Rule of thumb: Power ex fiber decreases up to 4% every 10 °C temperature increase at internal temp. sensor, lifetime decreases by about factor of two every 10 °C

Calculation example of necessary water temperature for 100 W output power:

Thermal load = Output power * (1/conversion efficiency - 1), Water temperature = internal temperature - thermal load * Thermal resistance

Example: Output power: 100 W, Conversion efficiency: 0.2, Thermal resistance: 0.01 K/W, Internal temperature: 25 °C

Thermal load = 100 W * (1/0.2 - 1) = 400 W, Water temperature = 25 °C - 400 W * 0.01 K/W = 19 °C, (water flux must be adjusted accordingly)

Absolute Maximum Ratings / General Informations

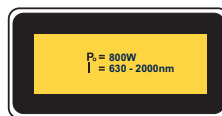
Parameter	Symbol	Min	Max	Unit
Storage temperature	T_{max}	0	+50	°C
Operating temp.* c.w.-operation **	$T_{op.c.w.}$	+15	+35	°C
Humidity / non condensing atmosphere			90	%
LD reverse voltage	$V_{R,max}$		10	V
Max fiber flange temperature			45	°C
Mounting screws / metric			M6	

Remarks:

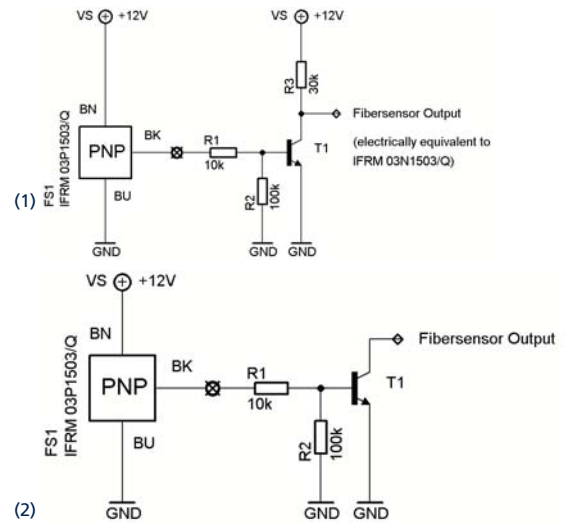
* taken at internal temperature sensor

** we recommend to operate the laser above dew point

User Safety



Option fiber sensor signal:



Important Note

Read and carefully follow operating manual instructions. Especially, whenever power supply is switched on or off, always disconnect from laser module. See manual for details. Uncontrolled on / off switching may cause spikes and result in fatal device damage.