Lumics

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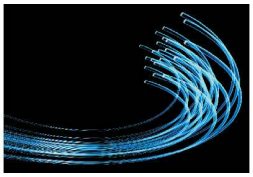
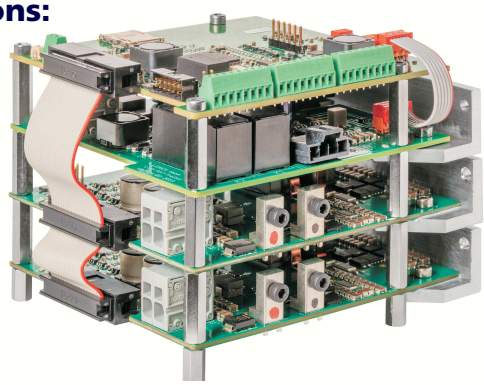



LuOcean Driver Kit Rev. 5 - Laser Driver Part

Features & Functions & Options:

- Full digital control
- Current range 0.3A to 28 A
- Pilot on/off & intensity control
- Pulse width down to 200µs
- Duty cycle range 1% to 99%
- Laser off after error/interlock
- External analog synchronisation
- Shut down in case of overheating
- Fan & heat sink for laser/chiller driver
- Wall plug efficiency 96%



Description:

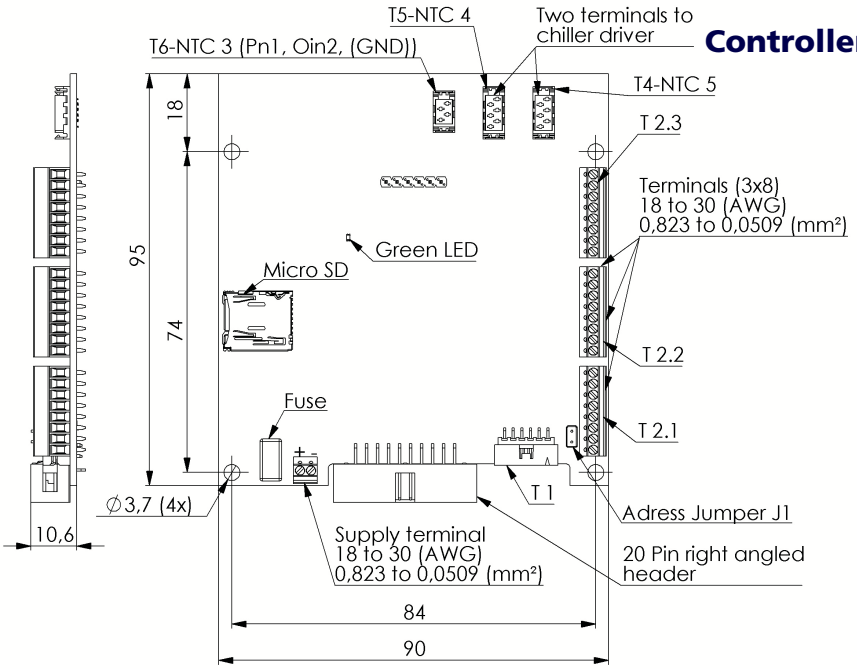
The LuOcean™ driver kit is designed for OEM manufacturers requiring a digital interface to the LuOcean™ diode laser series. It provides laser driver and temperature control with a laser driver, chiller driver and a cooling unit. The standard RS232 programming interface and build-in protective features provide the opportunity to simplify development and manufacturing.

Benefits:

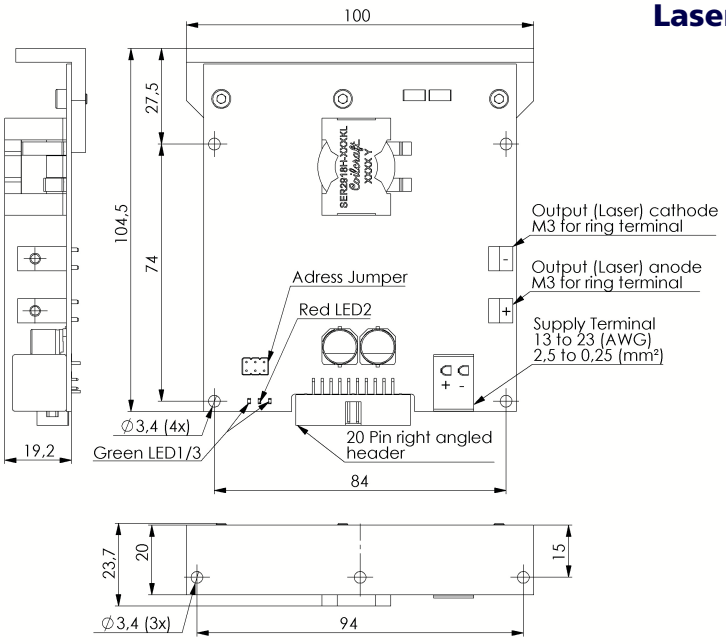
- Laser short circuit protection
- External interlock signal
- Digital access to all laser module sensors
- Full laser diode protection
- Synchronizing up to 6 LD and 2 TEC drivers
- Variable configuration

Drawing (Dimension)

Controller



Laser Driver



Controller Terminal T1 Description

Pin	Term.	Sensor/Control Function Terminal
1	T1	Vs = 12 V for Fiber sensor / Monitor diode cathode
2	T1	Fiber sensor 1 signal - In
3	T1	GND
4	T1	Fiber sensor 2 signal - In
5	T1	Monitor diode signal 1 - In
6	T1	Pilot laser (3/5) V (50 mA) 8 V / 100 mA - Out
7	T1	Monitor diode signal 2 - In
8	T1	GND (Pilot) or humidity sensor or digital bus
9	T1	GND (NTC)
10	T1	Pilot intensity control (0-5)V, pilot off =5V
11	T1	NTC1 - In
12	T1	NTC2 - In or digital bus

Controller Terminal T2 Description

Pin	Term.	Sensor/Control Function Terminal
1	T2.1	RS232-TX signal - OUT
2	T2.1	RS232-RX signal - In
3	T2.1	GND RS232 (serial interface common, floating)
4	T2.1	Interlock signal - In
5	T2.1	Interlock supply - Out (12V or 24 V)
6	T2.1	no connection
7	T2.1	GND
8	T2.1	Interlock on - LED Out (3.3V)
1	T2.2	Laser driver 1 on - LED out (3.3V)
2	T2.2	Laser driver 2 on - LED out (3.3V)
3	T2.2	Laser driver 3 on - LED out (3.3V)
4	T2.2	Laser driver 4 on - LED out (3.3V)
5	T2.2	Laser driver 5 on - LED out (3.3V)
6	T2.2	Laser driver 6 on - LED out (3.3V)
7	T2.2	Laser diode monitor 1 (V) module dependent
8	T2.2	Laser diode monitor 2 (V) module dependent
1	T2.3	GND
2	T2.3	Pulse Sync In
3	T2.3	GND
4	T2.3	Pulse Sync Out
5	T2.3	GND
6	T2.3	no connection
7	T2.3	Fan (GND) laser driver
8	T2.3	Fan (+) laser driver

We manufacture diode lasers.

General Characteristics (ambient condition)

Parameter / Conditions	Symbol	Min	Typ	Max	Unit	LuOcean Diode Laser Application
Diode Laser Driver Output Voltage Range						
Input voltage on DC supply terminal	Vin		48		V	Mini series, M4 series
Output voltage on laser terminal	Vout	3.5		40	V	
Input voltage on DC supply terminal	Vin		36		V	Mini series, M4 series
Output voltage on laser terminal	Vout	3		30	V	
Input voltage on DC supply terminal	Vin		24		V	Mini series, M4 series
Output voltage on laser terminal	Vout	2		20		
Input voltage on DC supply terminal	Vin		12		V	Mini series, M4 series
Output voltage on laser terminal (1)	Vout	1		10	V	
General Characteristic Diode Laser Driver						
Output current on laser terminal in pulsed and cw mode	Iout	0.3		28	A	
Efficiency	h		96		%	
Output Current Ripple (10 - 600) KHz at >=1A	Irms		0.1		A	
Output Current Ripple (10 - 600) KHz below 1A	Irms		0.2		A	
Rise and Fall Time full current range (4)	trise		0.03	0.15	ms	
Current Overshoot (2) at >=1A and output voltage >=10% input voltage	Ierr			10	%	
Current Overshoot (2) at >=1A and output voltage (>7% and <10%) input voltage	Ierr		10	20	%	
Current Overshoot (2) below 1A	Ierr		20		%	
Current Accuracy (dc to 5 kHz) (3) at >=1A	Iacc_1			+-2	%	
Current Accuracy (dc to 5 kHz) (3) below 1A	Iacc_2		+-5		%	
Pulse width single current driver	Pw	200			µs	
Minimum pulse phase delay between two syncronized pulses	Pw	100			µs	
Pulse duty cycle	Pdc	1		99	%	
Controller						
Supply Voltage / Current without fan		12 / <0.8		48 / <0.2	V/A	
Single shot and pulse train with up to 1000 pulses			yes			
Current read back, sample rate			2		ms	
Voltage read back, sample rate			2		ms	
Maximum phase shift per number of synchronized pulses			20		µs	
Maximum phase jitter between synchronized pulses			20		µs	
RS232 Baud rate			9600 or 115200			
RS232 Data Format			8 Data Bit / no parity / 1 Stop Bit			
Fan voltage setting for optional heat sink with fan	Vfan		14 or 26		V	
Fan current for optional heat sink with fan	Ifan			0.7	A	
Interlock Signal	Vinterlock	11	12	13	V	
Laser shut down delay after external interlock signal	td_delay			200	µs	

Note
(1) Lower driving voltage than 1.3V results in current over shoot of >20%.
It is recomemdned to add Si schotty diodes in series with the laser diode to increase to driving voltage
(2) Current overshoot is about max. 400µs and typical 200µs long and increases with lower driving voltage, lower duty cycle and lower puls width
(3) Accuracy depends on current
(4) Rise and Fall time increase with driving current

General Parameters

Parameter	Symbol	Min	Typ	Max	Unit
Storage temperature (1)	T_S	-10		55	°C
Ambient operation temperature (1)	T_{op}	0		45	°C
Humidity / non-condensing atmosphere				80	%
Compliance (4)	ROHS / UL94V-0 / EMC certificate with demo housing example according to EN 55011 under evaluation				
Controller					
Cooling	convection cooling only				
Signal & control interface terminal 1 to laser module 12 pin double row flat cable socket					
Signal & control Interface terminal 2 to external devices 3x8 way screw terminal block					
Fuse in a box , type Littlefuse 0154002Dr					
Laser Driver					
Cooling optional (heat sink and type (convection or forced air cooling) depends on thermal load, total thermal resistance of build-in heat sink 10K/W					
To diode laser one 2 way M3 srew terminal block, type Würth electronic 7461101					
To power supply one 2 way push in clamp terminal block for up to 2.5 sq.mm or 10 AWG , type Wago 2624-1102					
Fuse 30A SMD , type Schurter 3403.0289.23					
Further Options					
Interface cable to LuOcean diode lasers					
Chiller packages for LuOcean diode lasers on request					
Heat sink with fan for laser driver depending on electrical power supplied					

Notes:
(1) Operating temperature and rel. humidity must be chosen in a way that the dewpoint of humid air is below the temperature of the board to avoid condensing of water.
(2) Fan voltage: one operation mode only at 12V when DC supply is 12V and two modes (14V/24V) for >=24V supply
(3) External interlock must be a low current (<1mA) sourcing (mechanical) switch (e.g. door lock). Interlock 12(24)V for 12(>=24)V DC supply
(4) EMC certificate under evaluation.

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