

evolase

Evolase Oy

Laser Engineering Company

evolase.com



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About Evolase

Evolase was founded in 2021 by a team of engineers with long term experience in fiber optics, high speed electronics, optics and industrial laser systems as spin-off from Aalto University (Espoo, Finland).



Thanks to an extensive know-how in key laser technologies developed by our engineering and scientific team, Evolase offers customized design of the laser sources. which fit best to the customers most demanding applications and not available as standard product from established vendors. The laser design which fulfils most stringent customer requirements is delivered at the time and cost comparable to the off-shelf products.

Available list of technologies includes

- mode lock fiber oscillators
- high power fiber amplifiers based on customized active ultra large mode area fibers
- ps and ns pulsed laser diode-based seed sources
- high speed and laser control electronics
- SHG, THG, FHG technology for green, UV and deep UV generation
- solid state amplifiers both pulsed and continuously pumped for low and high repetition rate high energy hybrid lasers
- embedded software for precise control of laser parameters

The range of products offered for customers includes

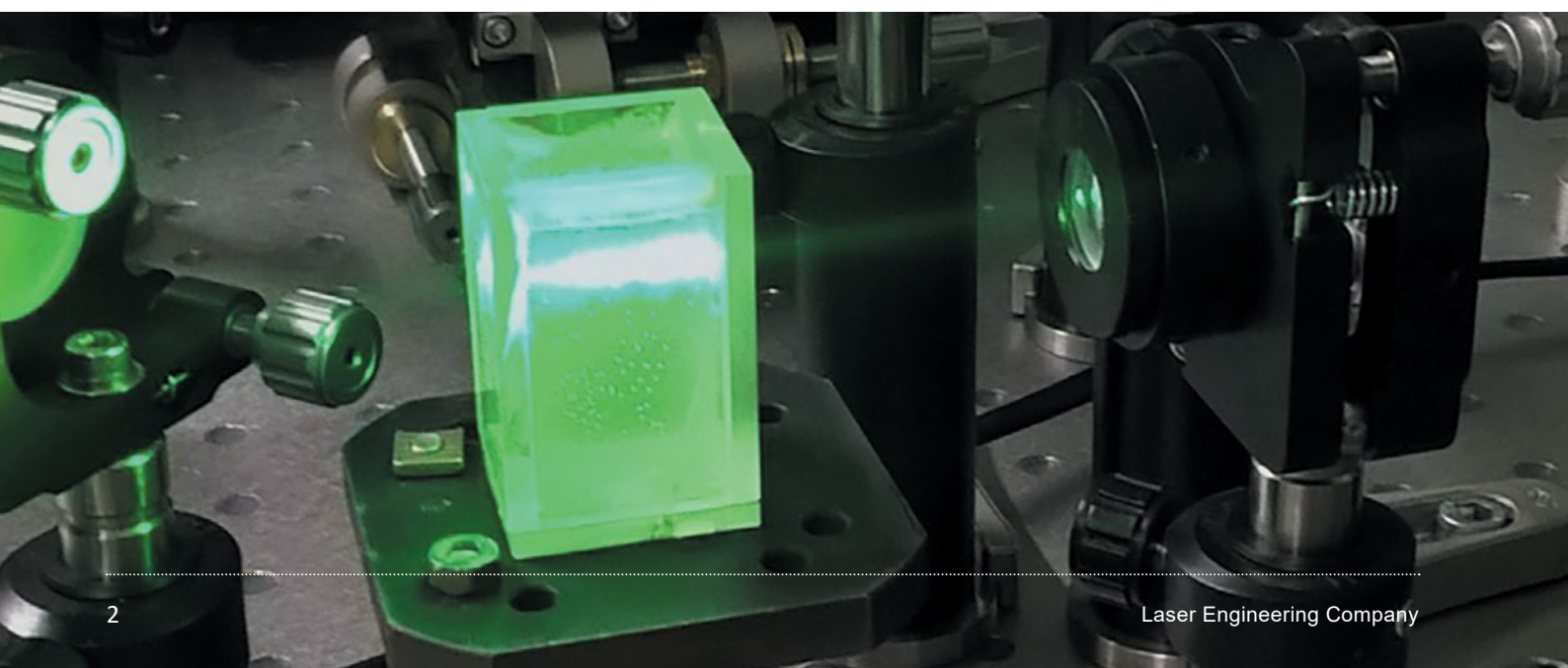
- CW and short pulse laser drivers,
- diode based ultrashort pulse laser modules,
- ultra-compact high power and high energy ultrashort pulse ns/ps/fs fiber lasers in IR/Green/UV spectral range
- single frequency lasers
- ultra-compact hybrid fiber-solid state lasers with pulse energy at the level of few tens of mJ

The unique feature of our laser is ultracompact dimensions and highest possible energy efficiency provided as a response to global demand for green production technology to reduce carbon footprint and drop production cost.

Along with customised and customer specific laser sources Evolase offers several off-shelf products from the above listed product categories. *Please get familiar with our catalogue.*

Evolase products find applications in the following industries:

- high precision material processing
- sensing and measurement systems
- medical systems
- science and research



UKKO LASERS

PICOSECOND FIBER LASERS



Key Features

- Up to 70 W at 1064 nm
- Up to 30 W at 532 nm
- Up to 12 W at 355 nm
- 50 kHz–20 MHz repetition rate
- Up to 60 μ J pulse energy
- Pulse duration 50 ps
- Excellent beam quality $M^2 < 1.3$
- Monolithic, sealed and rugged design
- Air- and water cooled versions
- Low life-time ownership cost

Applications

- Inner volume marking of transparent materials
- Marking and structuring
- Micromachining of brittle materials
- Biological Imaging
- Pumping of femtosecond OPO/OPA
- Microscopy
- Laser cleaning
- Raman spectroscopy
- Glass modification

Ordering information

UKKO-PS-1064/532/355-50-5/10/12/30/70-10/12/20/30/60

UKKO – "pulse range" – "wavelength" – "pulse duration" –
"maximum output power" – "maximum pulse energy"

Example: **UKKO-PS-1064-50-10-20**

wavelength: 1064 nm

pulse duration: 50 ps

maximum output power: 10 W

maximum pulse energy: 20 μ J

Air cooling

UKKO-PS-1064-50-10-20

UKKO-PS-1064-50-10-60

UKKO-PS-532-50-5-10

UKKO-PS-532-50-5-25

Water cooling

UKKO-PS-1064-50-70-60

UKKO-PS-532-50-30-25

UKKO-PS-355-50-12-10

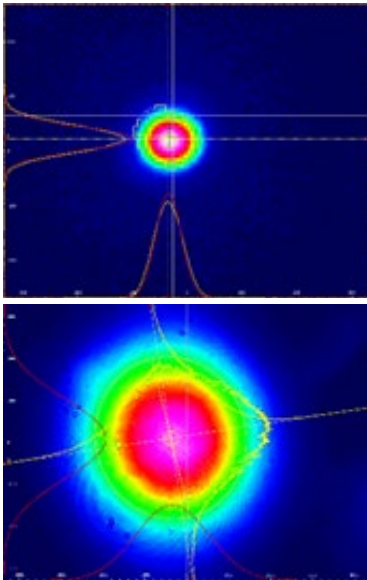


Specifications

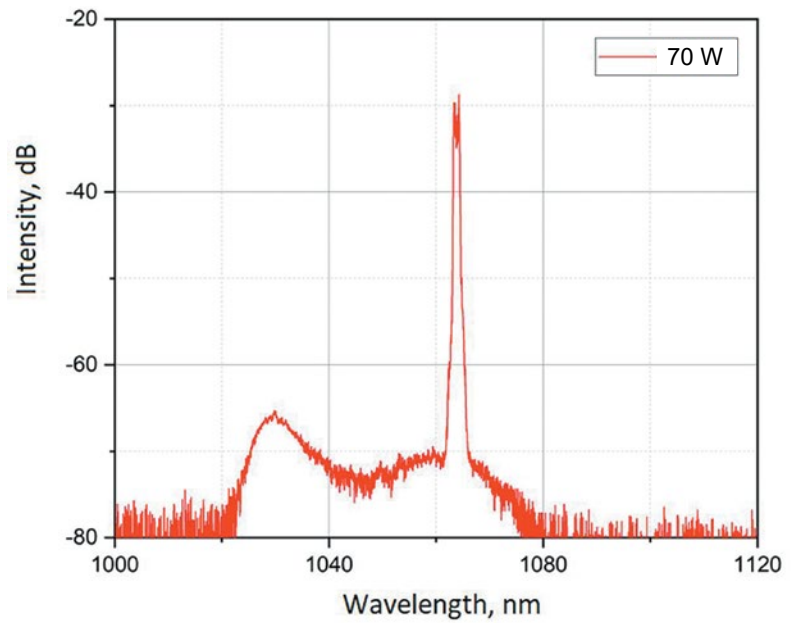
Model (UKKO-PS-...)	1064-50-10-20	1064-50-10-60	1064-50-70-60	532-50-5-10	532-50-5-25	532-50-30-25	355-50-12-10
MAIN SPECIFICATIONS							
Central wavelength	1064±1 nm						
Linewidth (FWHM)	<0.1 nm						
Laser pulse repetition rate (PRR) range	50 kHz–20 MHz						
Maximal average output power (1064 nm)	>10W	>10W	>70W	-	-	-	-
Maximal average output power (532 nm)	-	-	-	> 5W	> 5W	> 30W	-
Maximal average output power (355 nm)	-	-	-	-	-	-	> 12W
Pulse energy at lowest PRR (1064 nm)	20µJ	60µJ	60µJ	-	-	-	-
Pulse energy at lowest PRR (532 nm)	-	-	-	10µJ	25µJ	25µJ	-
Pulse energy at lowest PRR (355 nm)	-	-	-	-	-	-	10µJ
Power long term stability over 8 h after warm-up (Std.dev.)	<1.0 %						
Pulse duration (FWHM) at 1064 nm	50±5 ps						
M ² parameter	<1.3						
Polarization (PER)	>15dB						
Beam circularity, far field	>0.85						
Beam divergence, full angle	<3mRad						
Astigmatism	<0.1						
Beam pointing stability (pk-to-pk)	<70µRad						
Beam diameter (1/e ²) at 50cm distance from laser aperture	1±0.2 mm						
Control interfaces	RS232, LAN, USB, external TTL triggering, TTL signal output synchronized with optical pulse						
OPERATING REQUIREMENTS							
Mains requirements*	24 VDC	24 VDC	24 VDC; 36 VDC	24 VDC	24 VDC	24 VDC; 36 VDC	24 VDC; 36 VDC
Maximal power consumption	100W	110W	400W	170W	180W	400W	400W
Chiller power consumption	Not required	Not required	300W	Not required	Not required	300W	300W
Operating ambient temperature	18–27 °C						
Relative humidity	10–80 % (non-condensing)						
Air contamination level	ISO 9 (room air) or better						
PHYSICAL CHARACTERISTICS							
Cooling	Air	Air	Water	Air	Air	Water	Water
Laser size (W×H×L)	345×330×121 mm						
CLASSIFICATION							
Classification according EN60825-1	CLASS 4 laser product						

*Can be powered by 220V 50 Hz when using the optional "UKKO Power Supply"

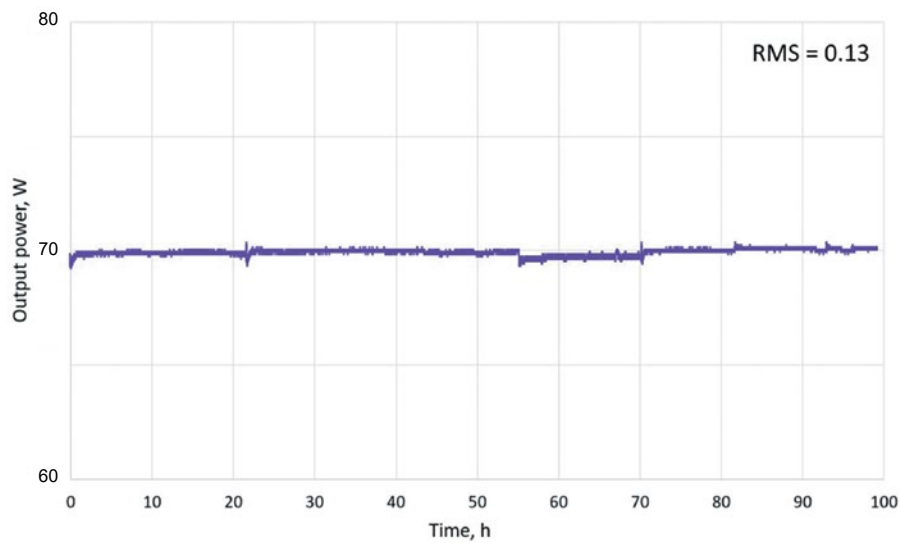
Performance



Typical beam profile at 1064 nm at maximum average power

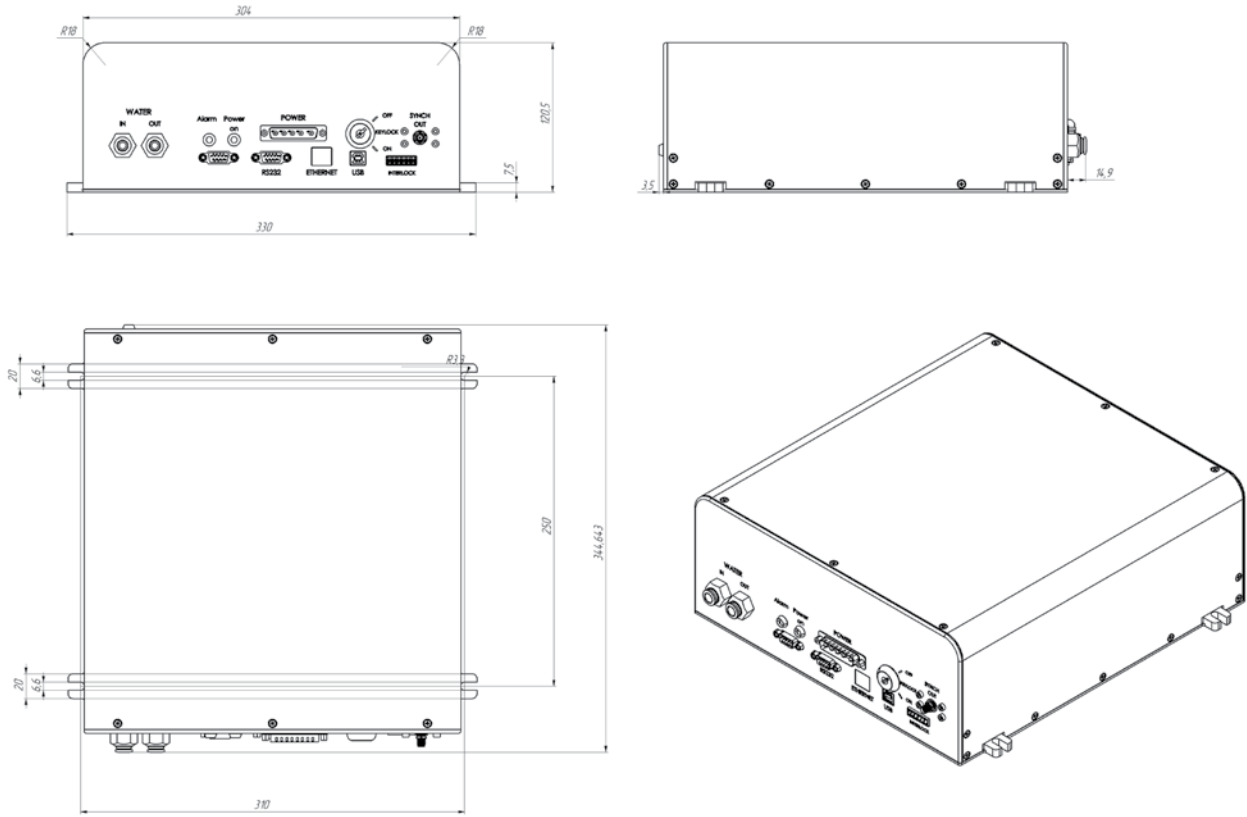


Spectrum at maximum average power at 1064 nm

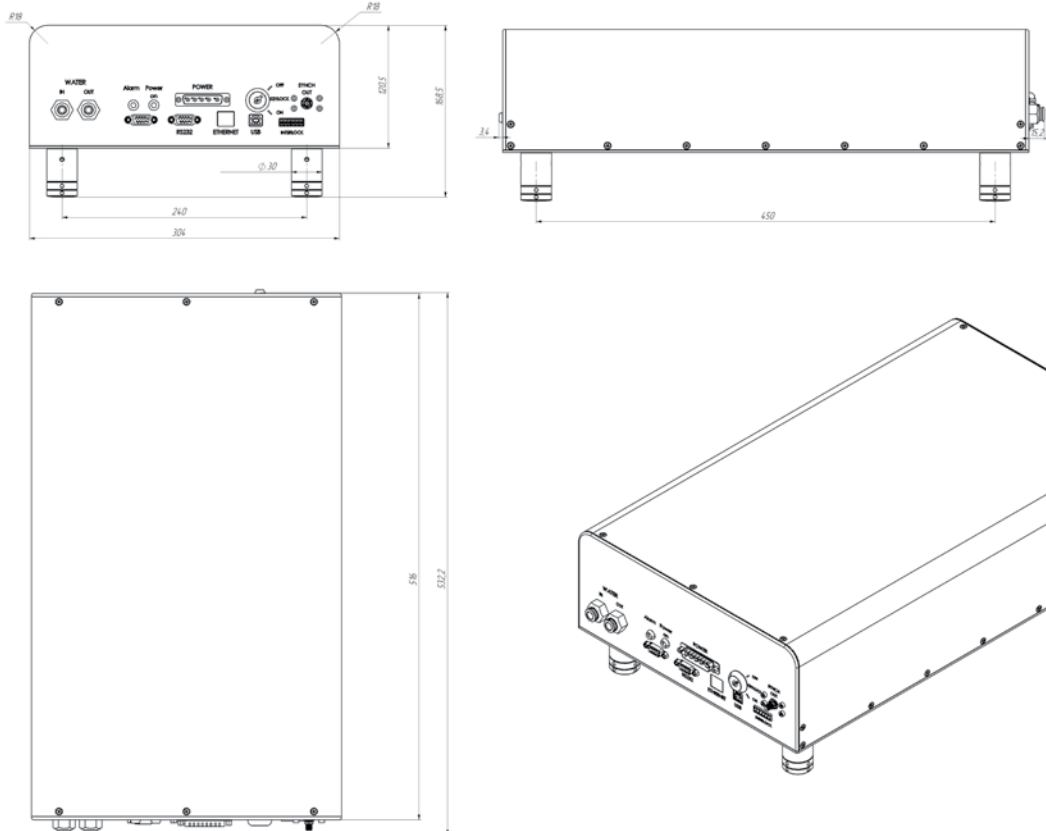


Average output power versus time at a wavelength of 1064 nm (RMS=0.13)

Drawings



UKKO-PS-1064 and UKKO-PS-532 series laser



UKKO-PS-355 series laser dimensions

UKKO NS-532/1064

NANOSECOND FIBER LASERS



UKKO-NS-532-30-80

- Up to 80 uJ peak power
- Up to 10 W average power
- Free space output

UKKO-NS-1064-100-250

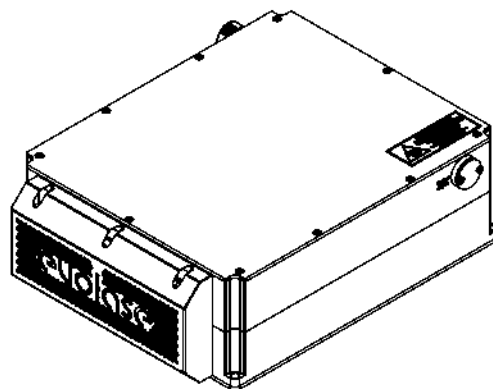
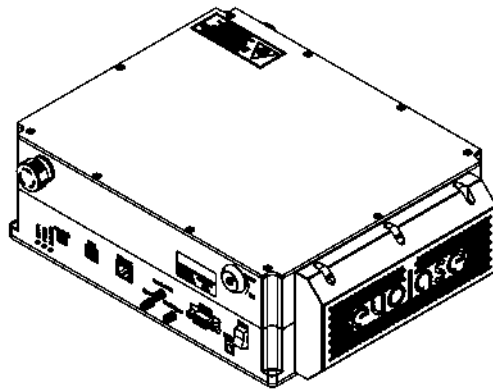
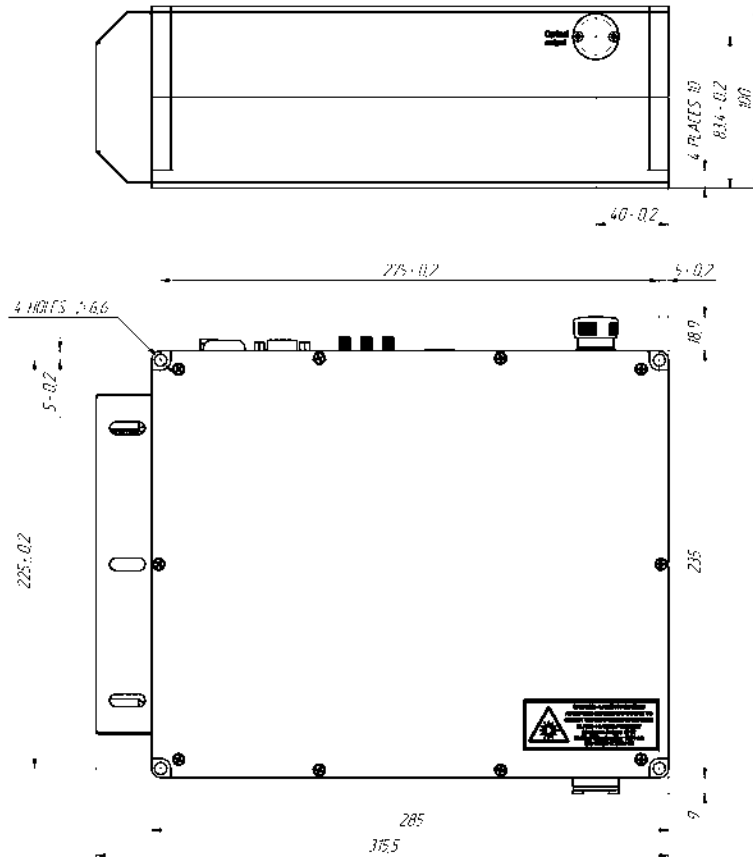
- Up to 250 uJ peak power
- Up to 40 W average power
- Fiber and free space output

Specifications

Model (UKKO-NS-...)	532-30	532-80	1064-100	1064-250
Central wavelength	532 ± 1 nm		1064 ± 1 nm	
Laser pulse repetition rate range	10–10 000 kHz			
Max. average output power	Up to 10 W		Up to 40 W	
Max. pulse energy	30 µJ	80 µJ	100 µJ	250 µJ
Power long term stability over 8 h after warm-up (Std.dev.)	< 1.0 %			
Pulse duration (FWHM) at 1064 nm	0.7–5 ns	0.7–100 ns	0.7–5 ns	0.7–100 ns
M ² parameter	< 1.3			
Linewidth (FWHM), nm	< 200 pm			
Polarization (PER)	> 20 dB	> 20 dB	> 20 dB	> 15 dB
Beam circularity, far field	> 0.85			
Beam divergence, full angle	< 3 mRad			
Astigmatism	< 0.1			
Beam diameter (1/e ²) at 50 cm distance from laser aperture	1±0.2 mm			
Output	Free space	Free space	1) bare fiber 2) collimator	Free space
Control interfaces	RS232, LAN, USB, external TTL triggering, TTL signal output synchronized with optical pulse			
Mains requirements	24 VDC			

* two options for cooling: conduction cooling and aircooling (heatsink module with fans)

Drawings



SPGM

SHORT PULSE FIBER AMPLIFIERS



Features

- High-power gain module based on tapered double clad fiber
- Single mode output, $M^2 < 1.3$
- Can operate with seed power as low as 10 mW
- Gain as high as 40 dB
- Out-of-fiber peak power as high as 1.5 MW
- Large mode area, low level of nonlinear effects
- Ideal for amplification of narrow line width signals
- Slim and rigid metal housing
- Ready to splice to pump and seed source
- Easy thermal management
- Thermistors for temperature monitoring

Applications

- To be used for direct amplification of short optical pulses
- Higher order harmonic generation
- Marking and structuring
- Micromachining of brittle materials
- Biological Imaging
- Pumping of femtosecond OPO/OPA
- Microscopy

Description

EVOLASE SHORT PULSE MODULE is an amplifying module containing all the needed optical components packaged inside an aluminum housing. The unit is ready-to-splice to pump diodes and seed source. The pump coupling unit inside the housing is directly water cooled, and the baseplate of the unit can be easily mounted onto an external heat sink for high power applications.

This module is ideal for customers who want to have fully assembled, ready-to-splice gain unit, but prefer to use their own pump diodes or integrate the module inside a larger system.

The module is fully tested and shipped with a complete test report.

Ordering information

SPGM-PM-C2-“wavelength”-“signal fiber”-
“pump fiber”-“built in base cooling”

Signal fiber: 10/125

Pump fiber: 105/125 NA 0.22 or 200/220 NA 0.22
or 220/240 NA 0.22

Built in base cooling to support high power operation more than 50 W output and eliminates the need to attach the module base to an external heat sink:
0 – no built-in base cooling, 1 – built-in base cooling.

Specifications

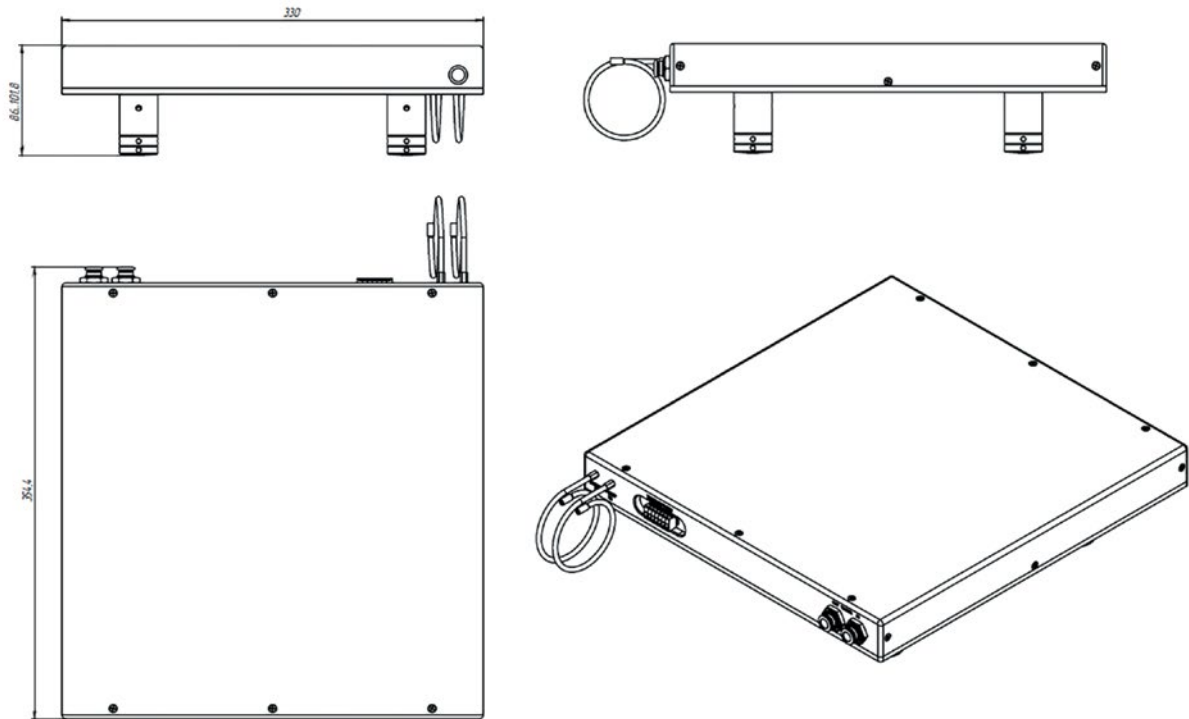
Parameter	Min.	Typ.	Max.	Units
INPUT				
Wavelength	1030	1040	1065	nm
Input signal power	5	30	-	mW
Pump power ¹⁾			180	W
Pump wavelength		976		nm
Pulse energy			60	µJ
OUTPUT				
Max output power ²⁾		100		W
Mode field diameter ³⁾	30	35	40	µm
Polarization extinction ratio (PER)	13	15		
M ²	1.05	1.2	1.3	
FIBERS				
Input signal fiber	PM 10/125			
Pump fiber	200/220 NA 0.22 150 W, 105/125 NA 0.22 100 W, others upon request			
MECHANICAL				
Dimensions	355 × 330 × 38 mm			
Water flow	5		10	l/min

¹⁾ Maximum allowed pump power depends on operation wavelength and seed signal parameters

²⁾ Maximum output power depends on operation wavelength and seed signal parameters

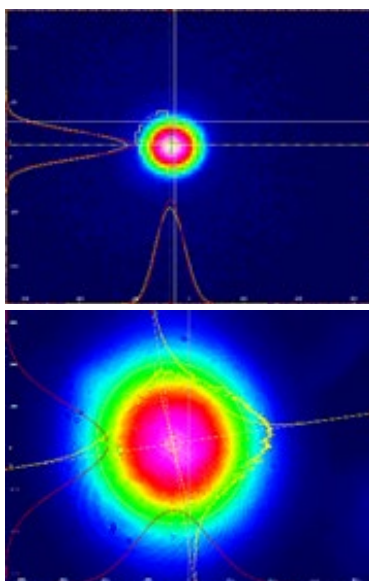
³⁾ Maximum mode field diameter depends on operation wavelength

Drawings

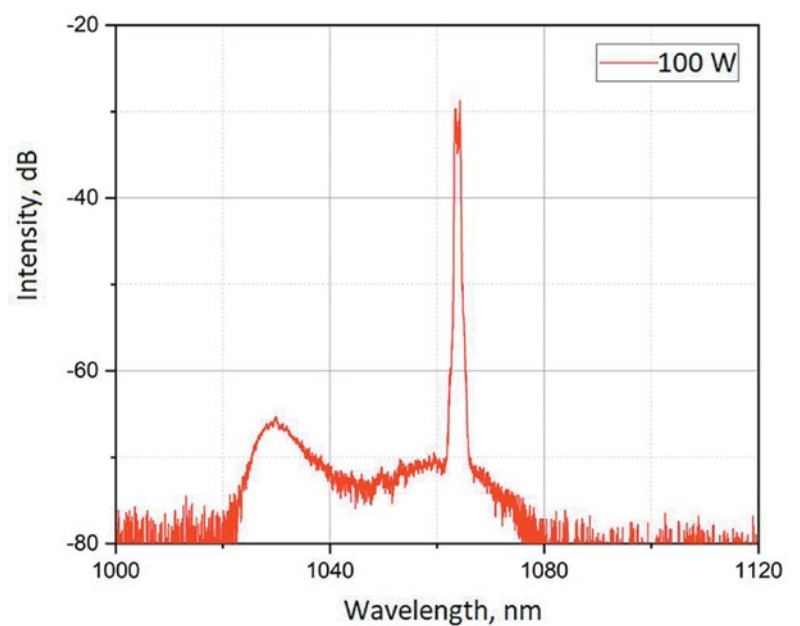


Short Pulse Gain Module laser dimensions

Performance



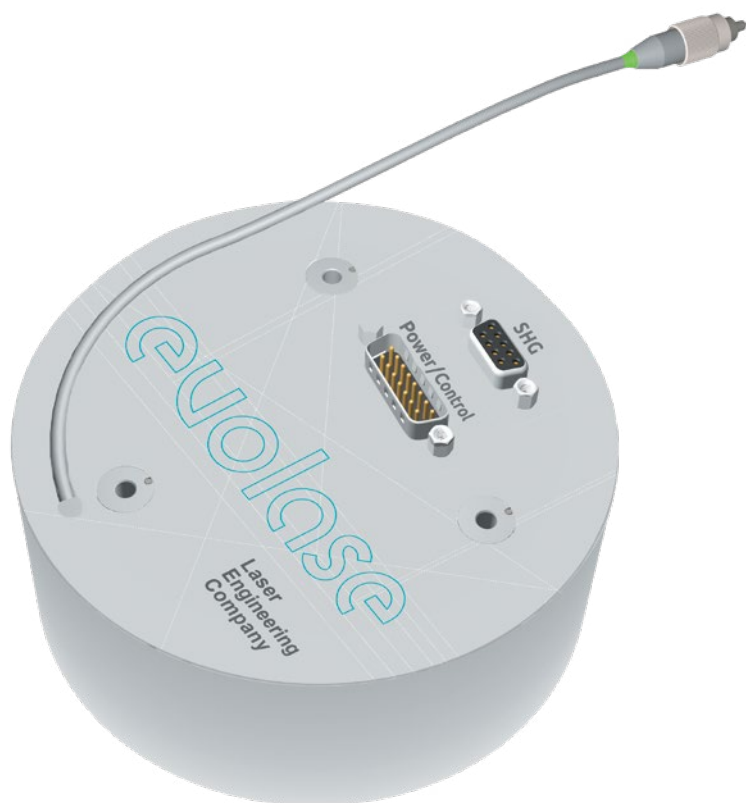
Typical 1064 nm beam profile



Typical spectrum at 100 W at 1064 nm

EVO-UC-NS

NANOSECOND FIBER LASER



EVO-UC-NS-1064

with central wavelength of 1064 nm
for environmental Lidar applications

EVO-UC-NS-532

with central wavelength of 532 nm
for underwater or cross water
Lidar applications

Specifications

Main specifications

Wavelength	1064 nm	532 nm
Output power	3 W	0.6 W
Repetition rate	10 kHz–1 MHz	
Max pulse energy	> 25 μ J	> 8 μ J
Pulse duration	0.7–4 ns	
Optical output	10/125 fiber with FC/APC connector	Free space, collimated beam

Operating requirements

Operating voltage	24 VDC
Control interface	RS232, Connectors D-SUB Combination 7W2

Physical characteristics

Dimensions	cylinder (D) 127 mm; height (H) 50 mm
SHG dimensions	130×80×80 mm

Key features

Narrow Pulse Width, High Spatial Resolution

The EVO-UC-NS series pulsed fiber lasers deliver pulses with duration tunable from the true subnanosecond range (0.7–0.9 ns) up to 5 ns to meet the high spatial resolution requirements of LIDAR systems.

High Average Power, High Pulse Energy, Flexible Repetition Rate

The EVO-UC-NS series pulsed fiber lasers can produce an output average power of >3 W at 1064 nm. The pulse energy of the 532 nm module is >2 μJ at 300 kHz repetition rate, with the repetition rate being adjustable from 10 kHz to 1000 kHz.

Robust, Compact and Lightweight

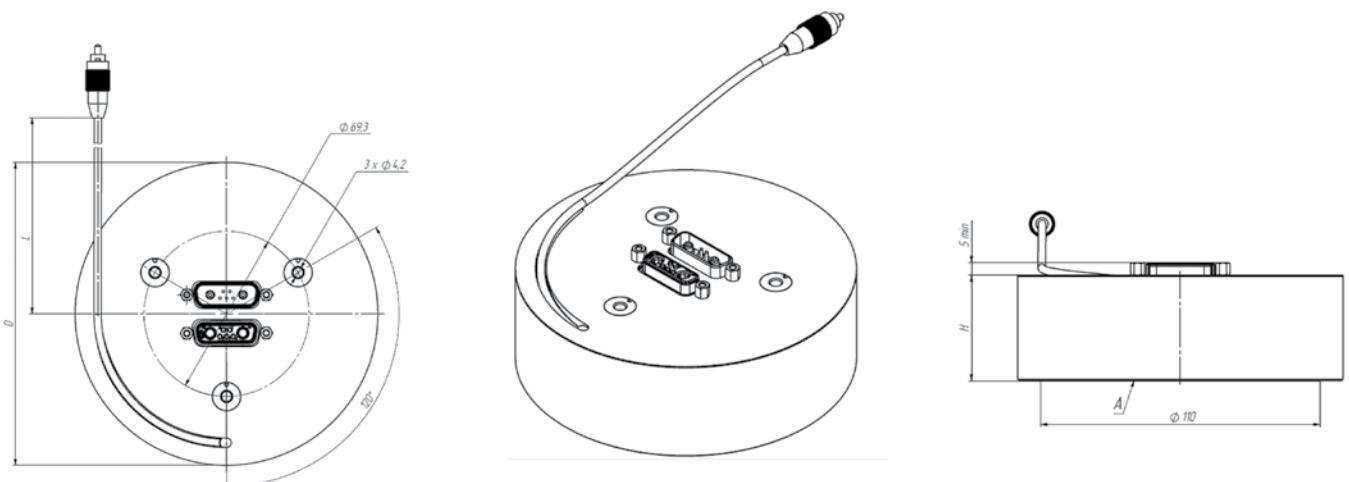
The 1064 nm EVO-UC-NS is provided with a cylindrical housing with an external compact fiber coupled second harmonic generation module, which could be detachable.

The laser is extremely compact, durable and reliable with minimal power consumption, ensuring a prolonged lifespan with minimal operational expense, and ease of integration into Lidar systems.

Exceptional performance stability

EVO-UC-NS series pulsed fiber lasers boasts exceptional performance stability and is tested to sustain vibration and mechanical shocks as well as thermal cycling to comply with IEC 68-2-27 and IEC 68-2-6 standards.

Drawings



LDM-PS/NS-XXX-GHz-Burst

Multichannel ultrashort pulse laser source **with GHz repetition rate and flexible pulse pattern capability**



Features

- Adjustable pulse duration: from 30ps to 100ns (depending on the LD used)
- Mutually non-coherent pulses
- Close to transform limit spectrum width
- User defined wavelength for each output from 365nm to 1550nm (defined by available LDs)
- Pulse repetition rate up to 1GHz
- Arbitrary pulse profile for pulses longer than 1ns
- Up to two independent optical outputs, different wavelengths are possible
- User selectable pulse burst modes
- External triggering by LVDS trigger signal
- LVDS synchronization output
- USB and UART control interfaces

Applications

- Laser source for quantum communications
- Biomedicine
- Spectroscopy of biological objects
- Burst and high rep rate seed source for fiber amplifiers for material processing

Example of pulses and pulse patterns



35 ps pulse at wavelength of 1310 nm



Pairs of noncoherent picosecond pulses with 1 ns spacing

EPFL-PS/NS-1550

1550 nm PICOSECOND / NANOSECOND LASER



Features

- Up to 3W at 1550 nm
- Laser pulse repetition rate: 100 kHz—2 MHz
- Excellent beam quality $M^2 < 1.2$
- Monolithic, sealed and rugged design
- Low life-time ownership cost

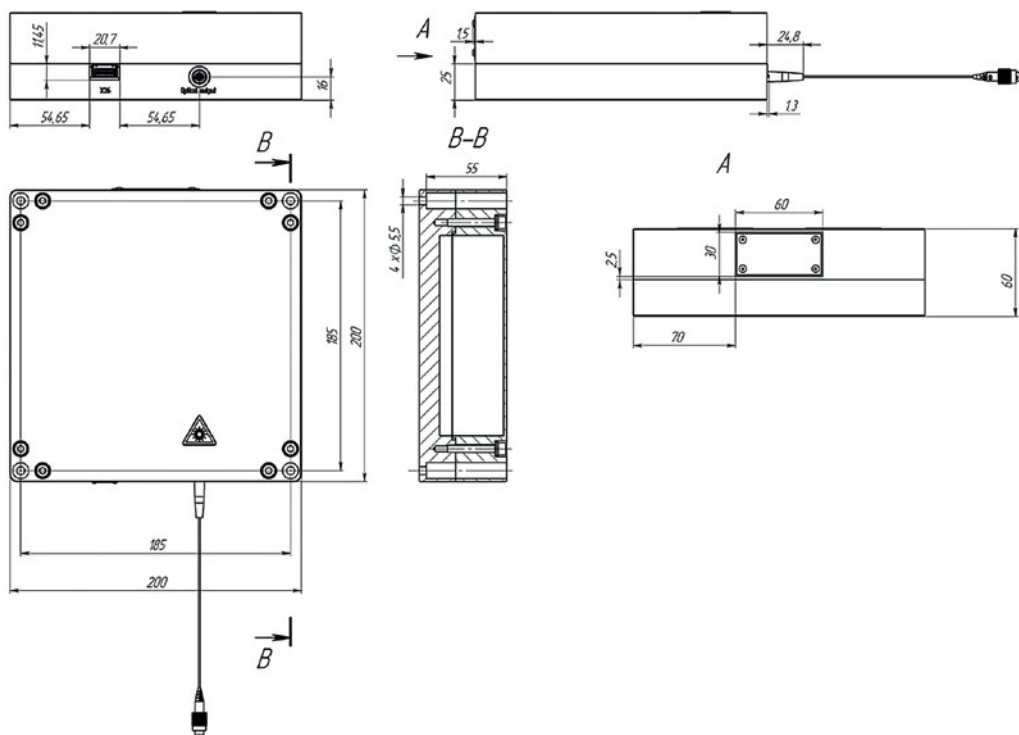
Applications

- LiDAR
- 3D Scanning
- Range Finding
- Metrology and Pollution Detection
- Other Scientific Research

Specifications

Model	EPFL-PS-1550	EPFL-NS-1550
Main specifications		
Central wavelength	1550±1 nm	
Pulse duration (FWHM)	35 ps	1–10 ns
Laser pulse repetition rate range	100 kHz—2 MHz	
Max. average output power	1 W	3 W
Max. pulse energy	1 uJ, peak power 25 kW	250 uJ, 25 kW
Power long term stability over 8 h after warm-up (Std.dev.)	< 1%	
M ² parameter	< 1.2	
Polarization (PER)	Linear/random	
Output	SMF 28, 10/125 fiber	
Trigger mode	External TTL Trigger	
Operating requirements		
Operating voltage	5.5–12 VDC	
Operating ambient temperature	From -10 to +40 °C	
Relative humidity	10–80 % (non-condensing)	
Air contamination level	ISO 9 (room air) or better	
Physical characteristics		
Laser size (W × H × L)	230×230×90 mm	

Drawings



EPFL-1550-1 laser dimensions

EVO-SF

SINGLE-FREQUENCY NARROWBAND ERBIUM LASER



Description

Erbium single-frequency narrowband fiber laser with low noise level. Stability of laser parameters is achieved by active temperature stabilization in a wide range. The laser has small dimensions and can be built into a standard 19" rack or have an OEM design.

Due to the user-friendly front panel interface and flexible Ethernet (TCP/IP) interface, the laser can easily be used for research purposes in laboratories and measurement facilities.

Specifications

Center wavelength	1550 nm
Wavelength range	1530–1580 nm
Wavelength thermal tuning range	0.35 nm
Wavelength piezo tuning range	0,75 nm
Min. power	40 mW
Max. power	7 W
Beam quality M^2	1.15
Spectral linewidth	<5 kHz
RIN peak	appr. 30 MHz
RIN level	< -40 dBc/Hz @ peak < -50 dBc/Hz @ 10 MHz
Max. phase noise	< -35 dBc[rad/√Hz] @100 Hz < -30 dBc[rad/√Hz] @1 kHz < -38 dBc[rad/√Hz] @10 kHz
S/N	48 dB
Output isolation	43 dB
Polarization	Linear
Power stability (short-term)	0.125 %
Power stability (long-term)	0.5 %/h
Frequency drift (long-term)	0.0001 %/h

Applications

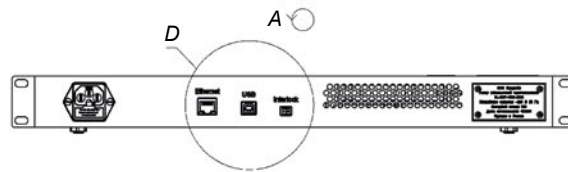
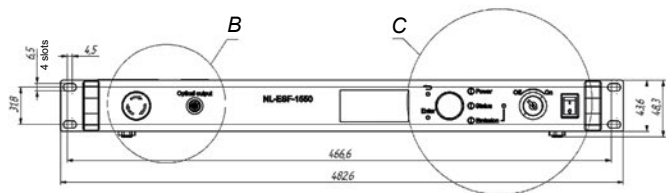
- Interferometric measurements
- Measurements of surface velocity in fast-moving, shock-wave processes
- Vibrometry
- Laser spectroscopy
- Optical communications

Ordering information

Part number: EVO-SF-aaaa-bbbb-ccc

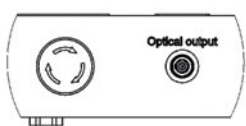
Part-number	Wavelength, nm	Power, mW	Configuration
EVO-SF	aaaa	bbbb	ccc
	1530	40	OEM
	1550	200	No marking – at 19" rack body
	1580	2000	
	Other from the range	10000	

Mechanical drawings

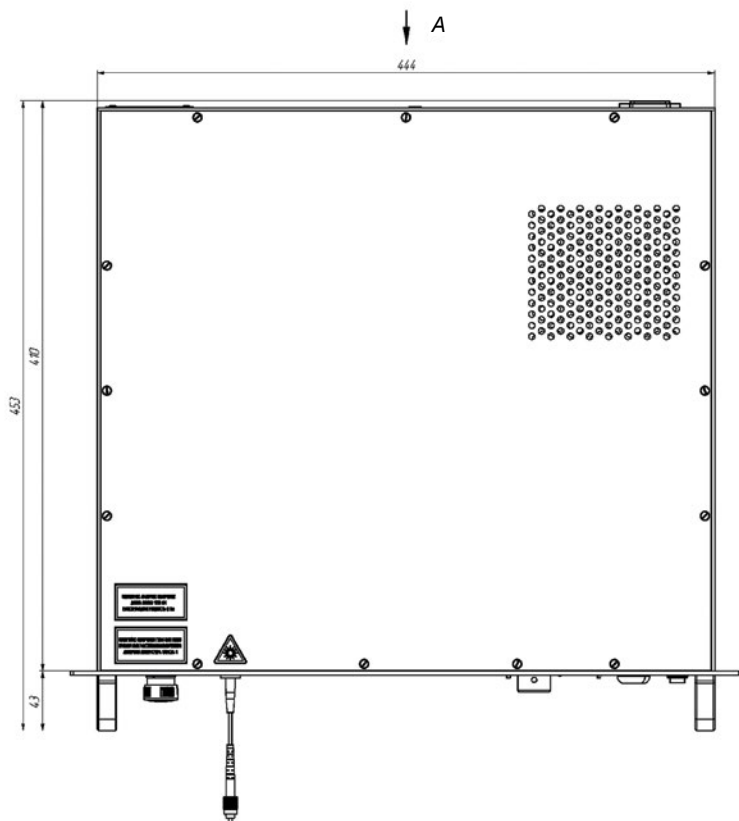
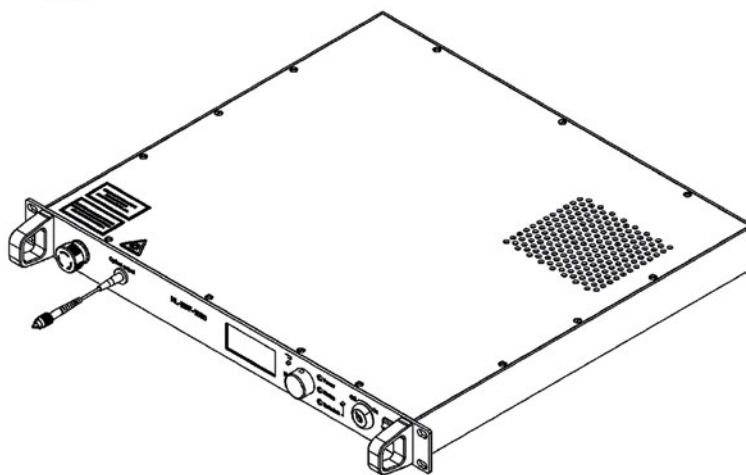
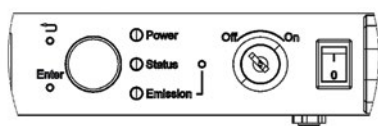


B (zoomed in)

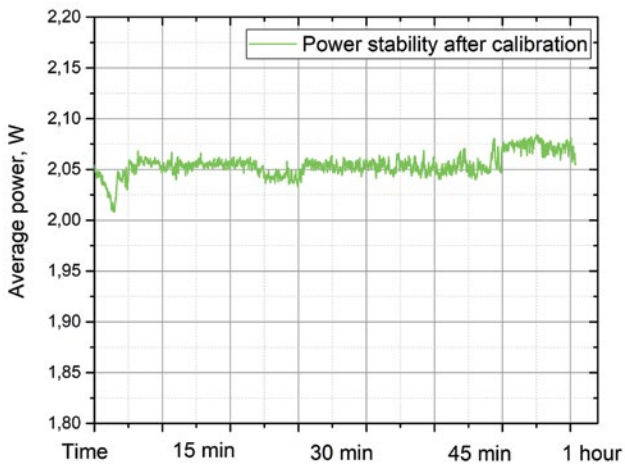
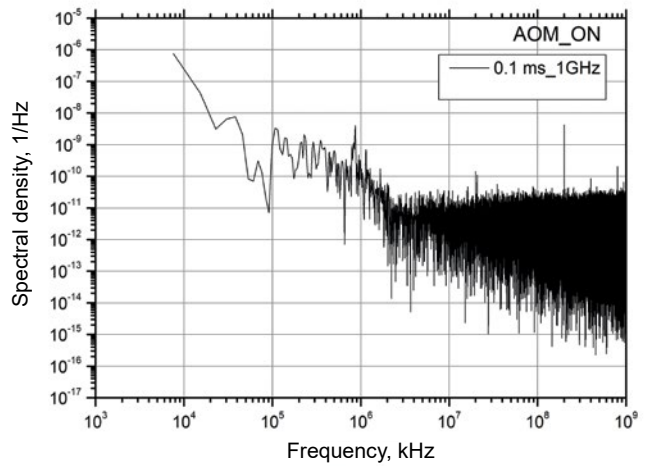
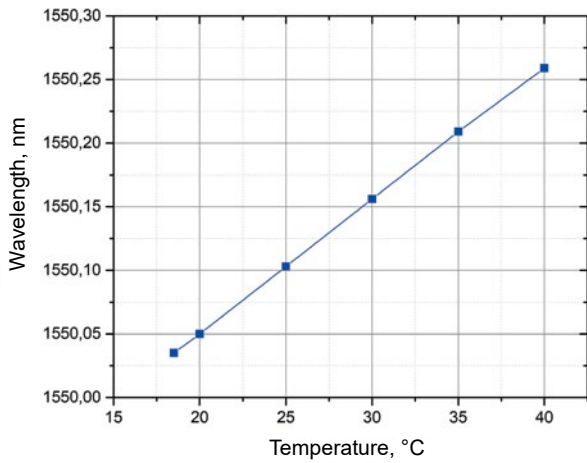
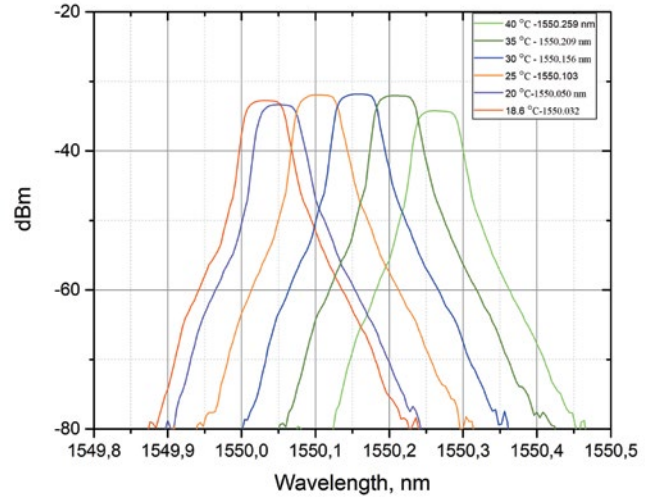
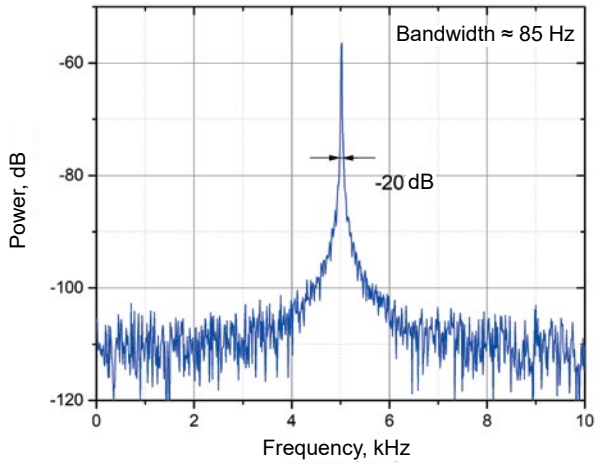
C (zoomed in)



D (zoomed in)



Typical performance characteristics



LDM-PS-NS

LASER DIODE MODULE



Key Features

- Laser pulses as short as 30 ps and widely tunable in nanosecond range
- Peak power of more than 2 W for specific wavelengths
- Standard range of wavelengths covering most popular spectral range
- Collimated free space output with detachable fiber pigtail or fixed fiber output
- Adjustable pulse duration for ns modules 1–100 ns
- External TTL trigger capability
- Repetition rate up to 30 MHz from on-board generator and up to 60 MHz from an external source of TTL signal
- Wavelength TEC tuning
- Compact size cost effective design: 105 mm × 70 mm × 25 mm
- Computer control via mini USB interface



Parameter	Picosecond	Nanosecond
Wavelength*	405–1550 nm	
Spectrum width*	<10 nm	
Pulse repetition rate	Up to 30 MHz	Up to 10 MHz
Laser triggering	TTL	
Optical pulse width*	< 150 ps	Tunable 1–100 ns
Minimal peak power	50–2000 Mw	100–2000 M
Output type	FS/Fiber	

* Depending on laser diode

Specifications

Spectroscopy

- Fluorescent Lifetime measurements
- Time-Resolved Spectroscopy

Laser Physics

- Seeding of Fiber Lasers and MOPA Systems
- Single Photon Generation

Laser Imaging and 3D Laser Scanning

Time of Flight Experiments

Optical Time Domain Reflectometry (OTDR)

Microscopy

- Time-Resolved Photoluminescence
- Confocal Laser Scanning Microscopy
- Fluorescence/Phosphorescence Lifetime imaging Microscopy

Picosecond Laser Diode Modules

Part number	Wavelength ¹ , nm	Spectrum width, nm	Pulse duration, ps	Min peak power ² , mW	Pulse repetition rate ³ , MHz	Output type ⁴
Fabry-Perot LD						
LDM-PS-405	405±5	<1	<100	300	30	FS/Fiber
LDM-PS-450	450±10	<2		180		
LDM-PS-520	520±10			100		
LDM-PS-635	635±5			200		
LDM-PS-660	660±5			350		
LDM-PS-780	785±5		<1	<120		400
LDM-PS-940	940±5	<1	<150	600		
LDM-PS-976	976±1	<100	2000			
LDM-PS-1064	1064±10	<5	<150	600		FS/Fiber
LDM-PS-1550	1550±20	<10	<150	600		FS/Fiber
Single frequency LD						
LDM-PS-1030S	1030±2	<0.1	<50	100	30	Fiber
LDM-PS-1064S	1064±2		<50	100		
LDM-PS-1064SH	1064±2		<150	500		
LDM-PS-1550S	1550±2		<30	50		

Note:

¹ Other wavelengths are available on request

² Minimal peak power guaranteed for reliable and safe diode operation. Higher peak power could be reached at a customer risk

³ Pulse repetition rate is for built-in pulse generator. Pulse repetition rate set by an external pulse generator via TTL sync input is up to 60 MHz

⁴ The optical performance is shown for Free Space (FS) output in case of both FS and fiber output options are available. The modules with free space output could be supplied with detachable fiber pigtail with corresponding optical performance reduction to about 25% out of the free space performance level

Nanosecond Laser Diode Modules

Part number	Wavelength ¹ , nm	Spectrum width, nm	Pulse duration, ns	Min peak power ² , mW	Pulse repetition rate ³ , MHz	Output type ⁴
Fabry-Perot LD						
LDM-NS-405	405±5	<1	1–100	300	10	FS/Fiber
LDM-NS-450	450±10	<2		180		
LDM-NS-520	520±10			100		
LDM-NS-635	635±5			200		
LDM-NS-660	660±5			350		
LDM-NS-780	785±5	<1		400		
LDM-NS-940	940±5			600		
LDM-NS-976	976±2			2000		
LDM-NS-1064	1064±10	<5		600		
LDM-NS-1550	1550±20	<10		600		FS/Fiber
Single frequency LD						
LDM-NS-1030S	1030±2	<0.1	1–100	100	10	Fiber
LDM-NS-1064S	1064±2			100		
LDM-NS-1064SH	1064±2			1500		
LDM-NS-1550S	1550±2			100		

Note:

¹ Other wavelengths are available on request

² Minimal peak power guaranteed for reliable and safe diode operation. Higher peak power could be reached at a customer risk

³ Pulse repetition rate is set by built-in pulse generator. For each pulse duration maximum repetition rate is limited by duty cycle of 2%

⁴ The optical performance is shown for Free Space (FS) output in case of both FS and fiber output options are available. The modules with free space output could be supplied with detachable fiber pigtail with corresponding optical performance reduction to about 25% out of the free space performance level

PLD-PS

SHORT PULSE LASER DIODE DRIVER



Key Features

- Special Design for 10/14 pin Butterfly Laser Diode
- Output current up to 2000 mA
- Compliance voltage up to 3 V
- Extra short 50 ps pulse width
- Repetition rate up to 30 MHz
- External trigger option
- USB, RS-232, CAN, UART interfaces
- LabView and Python libraries
- On-Board TEC Controller
- 5VDC Input Power
- Integrated heatsink
- Compact size 85 × 60 × 21 mm

Description

The PLD-PS is a compact short-pulse seed laser diode driver for powering 10/14-pin butterfly laser diode modules for applications, which require pulse widths about 50 ps. The pulse repetition frequency can be varied from 1 kHz to 30 MHz.

The driver circuitry requires a single 5 VDC power source. All other needed voltages are generated on the board by high-frequency switching power supplies. The driver supplies a bidirectional proportional-integral-derivative (PID) thermoelectric cooler controller (TEC) with current capability of 1.5 A and a voltage capability of 4 V.

The main parameters of PLD-PS (power, repetition frequency, temperature set point) are controlled by computer interface.

The PLD-PS has an external TTL-compatible input for repetition rate control from single shot up to 30 MHz.

The PLD-PS has an external output for synchronization with each current pulse.

Driver has landing pads for soldering a butterfly laser diode directly into driver board and large heat sink for stable heat dissipation.

Specifications

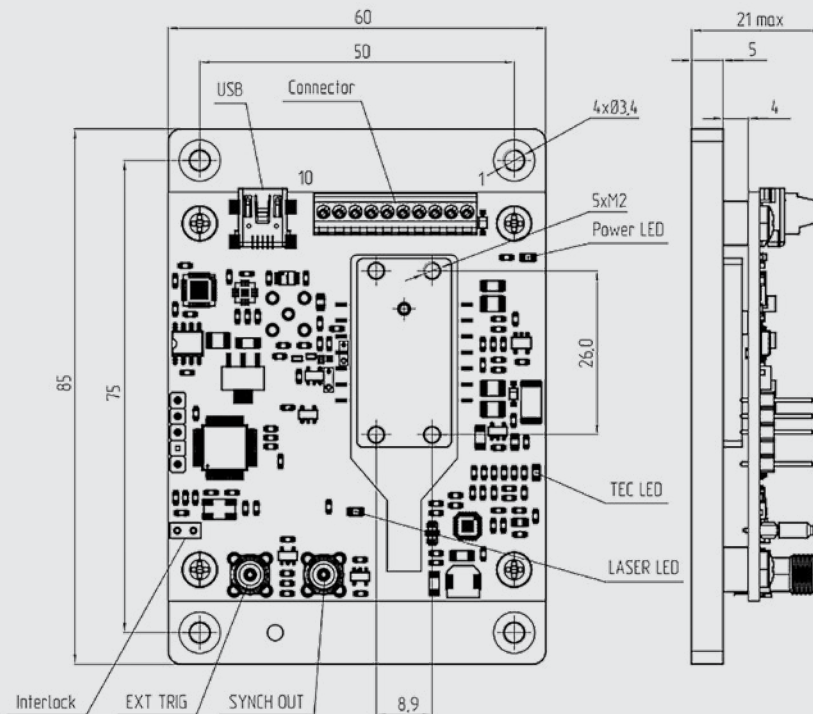
Parameter	Min.	Typ.	Max.	Units
INPUT				
Voltage	4.8	5.0	5.2	VDC
Current	-	-	0.6	A
External trigger (50 Ω impedance)	3.3	-	5	VDC
OUTPUT				
Current	-	-	2000	mA
Compliance Voltage	1	-	3	V
Pulse width*	40	50	150	ps
Repetition rate*	0.001	-	30	MHz
Rise time*	40	50	60	ps
Fall time*	40	50	100	ps
TEC current	-1.5	-	+1.5	A
TEC Voltage	1	-	4	V
TEC Temperature Set	15	25	45	°C
TEMPERATURE				
Operating	+10	-	+50	°C
Storage	-20	-	+70	°C
Humidity, Non-Condensing	-	-	95	%
CONNECTIONS				
Power and interface connector	Terminal block (1-282834-0 TE connectivity)			
USB	Mini-USB, Type B (1734035-1 TE connectivity)			
MECHANICAL				
Size	85 × 60 × 21 mm			
Weight, not more	160 g			

* Output performance depends upon laser diode characteristics.
Performance cannot be guaranteed for all laser types. See optical output waveforms.

Dimensions and Connections

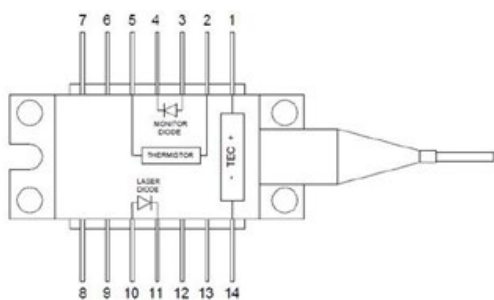
Connector pinout

PIN	Function	Description
1	GND	Device ground
2	+5VDC	Power input
3	CANH	CAN bus high
4	CANL	CAN bus low
5	RS232 TX	RS232 port transmit
6	RS232 RX	RS232 port reception
7	GND	Device ground
8	UART TX	UART TX
9	UART RX	UART RX
10	INT	Interlock



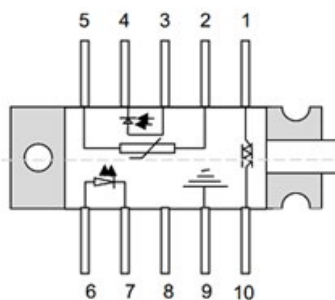
Compatible Laser Pinout

14-pin Butterfly package



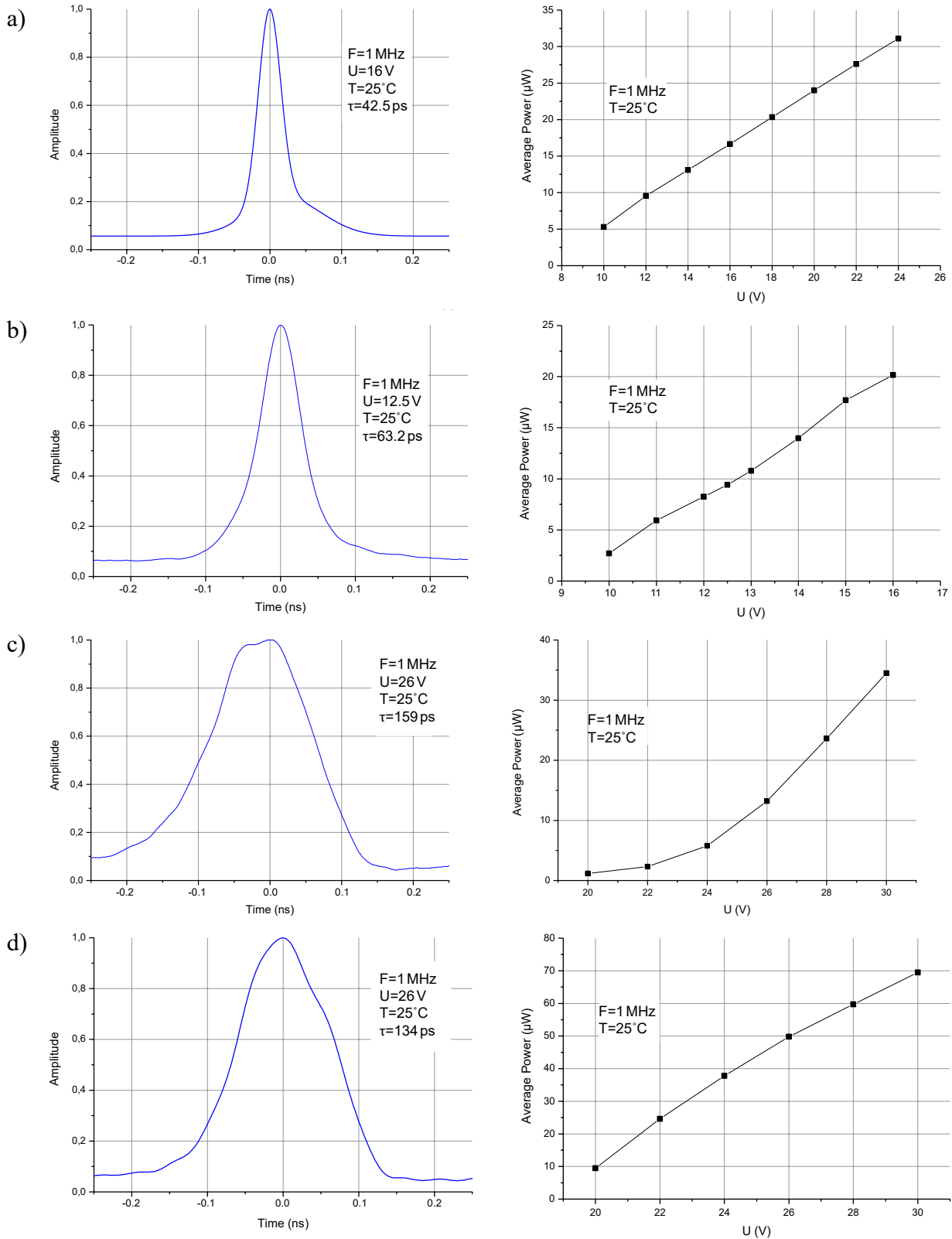
Nº	Description	Nº	Description
1	TEC Anode	8	n/c
2	Thermistor	9	n/c
3	Monitor PD Anode	10	LD Anode
4	Monitor PD Cathode	11	LD Cathode
5	Thermistor	12	n/c
6	n/c	13	n/c
7	n/c	14	TEC Cathode

10-pin Butterfly package



Nº	Description	Nº	Description
1	TEC (+)	6	Laser anode (+)
2	Thermistor	7	Laser cathode (-)
3	Monitor anode (-)	8	NC
4	Monitor cathode (+)	9	Package ground
5	Thermistor	10	TEC (-)

Typical Performance Characteristics



Typical pulse form and dependence of average power on operation voltage for different types of laser diode

a) DFB 1064 nm, b) FBG 1550 nm, c) FBG 1064 nm, d) FP 1030 nm

PLD-NS

SHORT PULSE LASER DIODE DRIVER



Key Features

- Special Design for 10/14 pin Butterfly Laser Diode
- Output current up to 2000 mA
- Compliance voltage up to 3V
- Adjustable pulse width 1–100 ns
- Repetition rate up to 10 MHz
- External trigger option
- USB, RS-232, CAN, UART interfaces
- LabView and Python libraries
- On-Board TEC Controller
- 5VDC Input Power
- Completed by heatsink
- Compact size 85 × 60 × 21 mm

Description

The PLD-NS is a compact short-pulse seed laser diode driver for powering 10/14-pin butterfly laser diode modules for applications, which require pulse widths from 1 ns to 100 ns. The pulse repetition frequency can be varied from 1 kHz to 10 MHz.

The driver circuitry requires a single 5 VDC power source. All other needed voltages are generated on the board by high-frequency switching power supplies. The driver supplies a bidirectional proportional-integral-derivative (PID) thermoelectric cooler controller (TEC) with current capability of 1.5 A and a voltage capability of 4 V.

The main parameters of PLD-NS (output current, pulse width, repetition frequency, temperature set) are controlled by computer interface.

The current pulse monitor output can be viewed with an oscilloscope by on-board SMA connector allowing the user

a real time view of the current. Voltage amplitude 1 V is equal to 2 A current.

The PLD-NS has an external TTL-compatible input for repetition rate control from single shot up to 10 MHz.

The PLD-NS has an external output for synchronization with each current pulse.

Driver has landing pads for soldering a butterfly laser diode directly into driver board and large heat sink for stable heat dissipation.

Specifications

Parameter	Min.	Typ.	Max.	Units
INPUT				
Voltage	4.8	5.0	5.2	VDC
Current	-	-	2	A
External trigger (50 Ω)	3.3	-	5	VDC
OUTPUT				
Current	-	-	2000	mA
Compliance Voltage	1	-	3	V
Pulse width**	1	-	100	ns
Pulse width step	-	0.2	-	ns
Repetition rate*	0.001	-	10	MHz
Rise time**	50	-	500	ps
Fall time**	200	-	1000	ps
TEC current	-1.5	-	1.5	A
TEC Voltage	1	-	4	V
TEC Temperature Set	15	25	50	°C
TEMPERATURE				
Operating	+10	-	+50	°C
Storage	-20	-	+70	°C
Humidity, Non-Condensing	-	-	95	%
CONNECTIONS				
Power and interface connector	Terminal block (1-282834-0 TE connectivity)			
USB	Mini-USB, Type B (1734035-1 TE connectivity)			
MECHANICAL				
Size	85 × 60 × 21 mm			
Weight, not more	160 g			

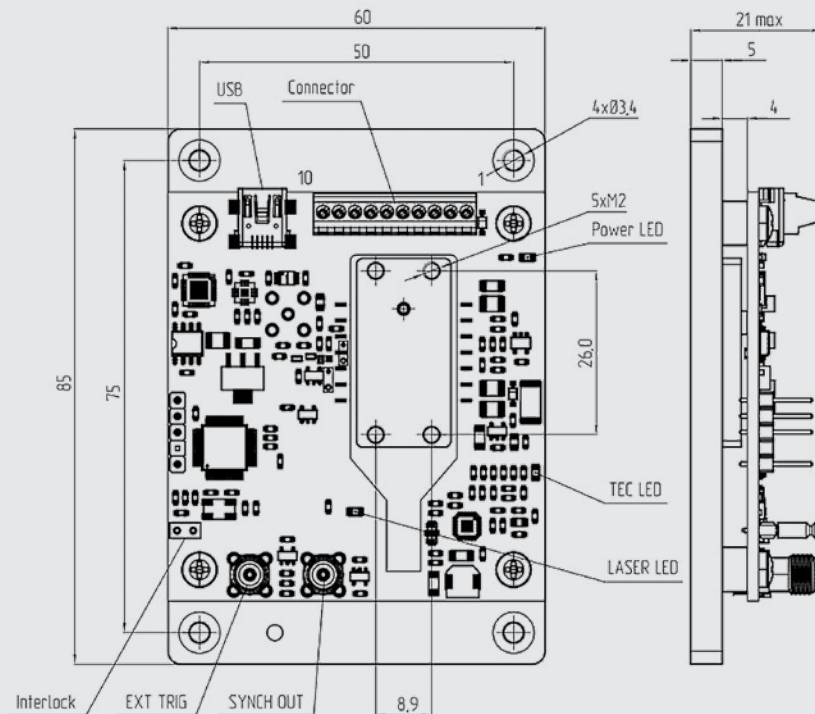
* Maximum duty cycle is limited to 2%

** Output performance depends upon laser diode characteristics. Performance cannot be guaranteed for all laser types. See optical output waveforms

Dimensions and Connections

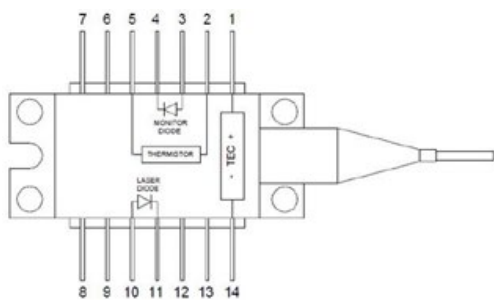
Connector pinout

PIN	Function	Description
1	GND	Device ground
2	+5VDC	Power input
3	CANH	CAN bus high
4	CANL	CAN bus low
5	RS232 TX	RS232 port transmit
6	RS232 RX	RS232 port reception
7	GND	Device ground
8	UART TX	UART TX
9	UART RX	UART RX
10	INT	Interlock



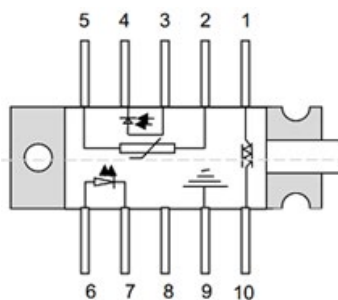
Compatible Laser Pinout

14-pin Butterfly package



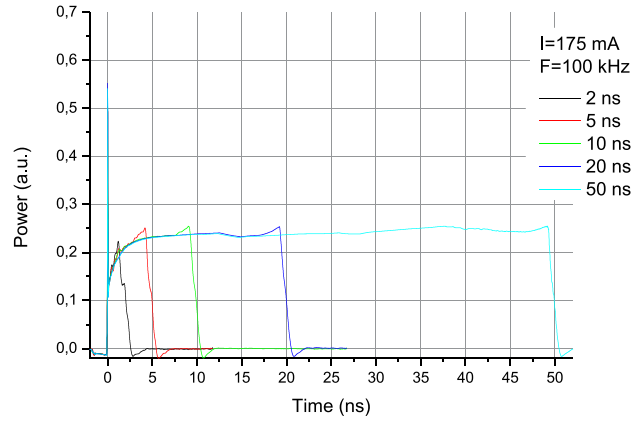
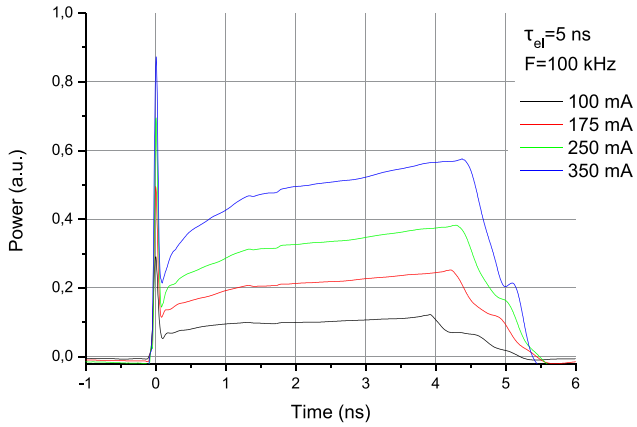
Nº	Description	Nº	Description
1	TEC Anode	8	n/c
2	Thermistor	9	n/c
3	Monitor PD Anode	10	LD Anode
4	Monitor PD Cathode	11	LD Cathode
5	Thermistor	12	n/c
6	n/c	13	n/c
7	n/c	14	TEC Cathode

10-pin Butterfly package

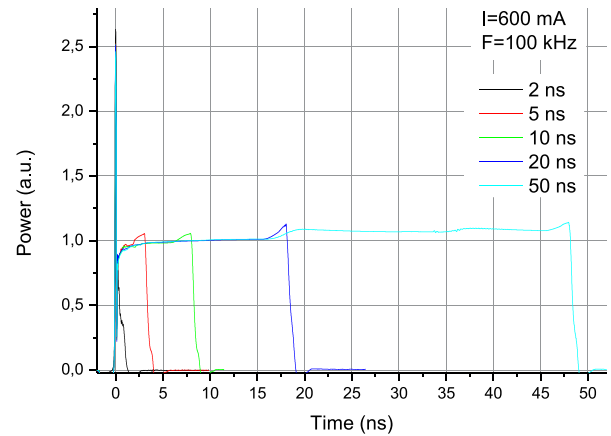
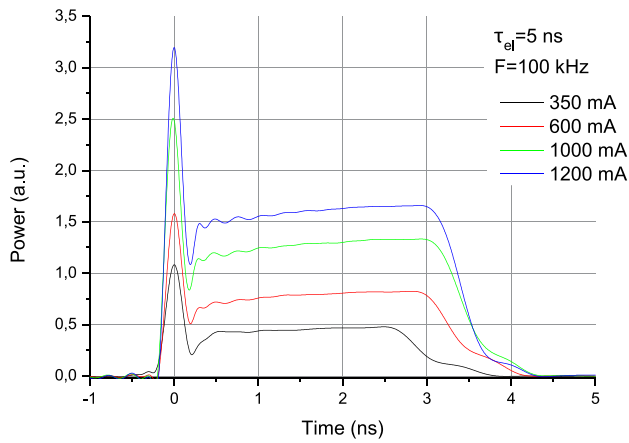


Nº	Description	Nº	Description
1	TEC (+)	6	Laser anode (+)
2	Thermistor	7	Laser cathode (-)
3	Monitor anode (-)	8	NC
4	Monitor cathode (+)	9	Package ground
5	Thermistor	10	TEC (-)

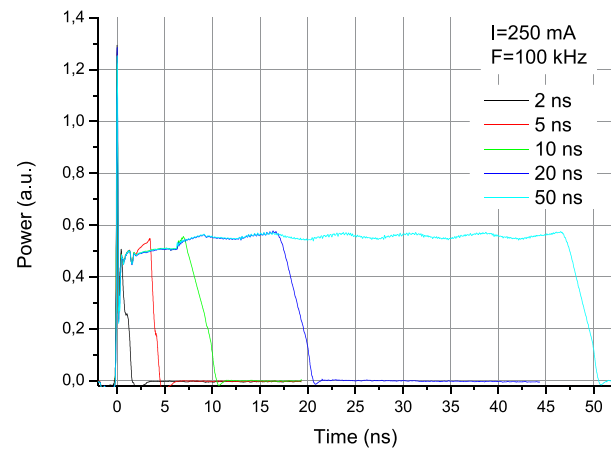
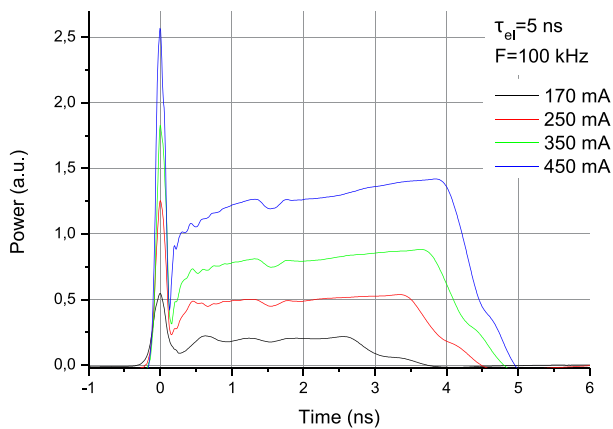
Typical Performance Characteristics



DFB 1064 at current 0.1-0.35 A, 2 ns, 3 ns, 5 ns, 10 ns, 20 ns, 50 ns



FBG 1064 at current 0.35-1.2 A, 2 ns, 5 ns, 10 ns, 20 ns, 50 ns



FP 1030 at current 0.17-0.45 A, 2 ns, 5 ns, 10 ns, 20 ns, 50 ns

PLD-PS-SYNC

SHORT PULSE LASER **DIODE** **DRIVER**



Key Features

- Special Design for 10/14 pin Butterfly Laser Diode
- Output current up to 2000 mA
- Compliance voltage up to 3 V
- Extra short 50 ps pulse width
- Repetition rate up to 30 MHz
- External trigger option
- External clock option
- Master/slave operation mode with the repetition rate jitter suppression
- USB, RS-232, CAN, UART interfaces
- On-Board TEC Controller
- 5Vdc Input Power
- Completed by Heatsink
- Compact Size 85 mm × 60 mm × 21 mm

Description

The PLD-PS-SYNC is a compact short-pulse seed laser diode driver for powering 10/14-pin butterfly laser diode modules for applications, which require pulse widths about 50 ps. The pulse repetition frequency can be varied from 1 kHz to 30 MHz.

The driver is specially designed to minimize jitter between external trigger signal and optical pulse by enabling external clock synchronization. The driver also supports operation in Master/Slave mode and synchronization of optical pulses between two lasers, one operates as Master and another one as Slave, with the optical pulse position jitter below 500 ps and tunable delay between the optical pulses from two lasers.

The driver circuitry requires a single 5 VDC power source. All other needed voltages are generated on the board by high-frequency switching power supplies. The driver supplies a bidirectional proportional-integral-derivative (PID) thermoelectric cooler controller (TEC) with current capability of 1.5 A and a voltage capability of 4 V.

The main parameters of PLD-PS-SYNC (power, repetition frequency, temperature set point, pulse delays in sync mode) are controlled by computer interface.

The PLD-PS-SYNC has an external TTL-compatible input for repetition rate control from single shot up to 30 MHz. The driver has an external output for synchronization with each current pulse. The PLD-PS-SYNC has an external input/output of the clock frequency for synchronous operation of two drivers with minimal period jitter between optical pulses.

Driver has landing pads for soldering a butterfly laser diode directly into driver board and large heat sink for stable heat dissipation.

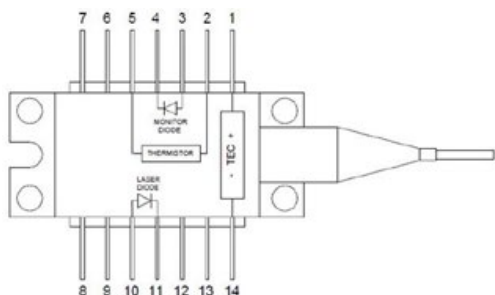
Specifications

Parameter	Min.	Typ.	Max.	Units
INPUT				
Voltage	4.8	5.0	5.2	VDC
Current	-	-	0.6	A
External trigger (50 Ω)	3.3	-	5	VDC
OUTPUT				
Current	-	-	2000	mA
Compliance Voltage	1	-	3	V
Pulse width *	40	50	150	ps
Repetition rate	0.001	-	30	MHz
Rise time *	40	50	60	ps
Fall time *	40	50	100	ps
TEC current	-1.5	-	1.5	A
TEC Voltage	1	-	4	V
TEC Temperature Set	15	25	50	°C
Repetition rate in sync mode	-	-	1	MHz
Pulse delay in sync mode	-50	-	+50	ns
TEMPERATURE				
Operating	+10	-	+50	°C
Storage	-20	-	+70	°C
Humidity, Non-Condensing	-	-	95	%
CONNECTIONS				
Power and interface connector	Terminal block (1-282834-0 TE connectivity)			
USB	Mini-USB, Type B (1734035-1 TE connectivity)			
External trig in/out	SMA (1-1478979-0 TE connectivity)			
Clock in/out	U.FL (U.FL-R-SMT-1(10) Hirose Electric)			
MECHANICAL				
Size	85 × 60 × 21 mm			
Weight, not more	160 g			

* Output performance depends upon laser diode characteristics. Performance cannot be guaranteed for all laser types. See optical output waveforms.

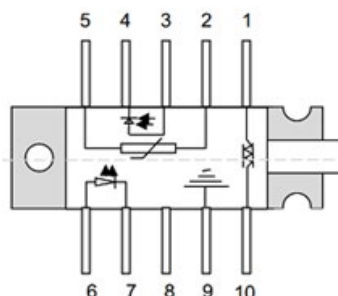
Compatible Laser Pinout

14-pin Butterfly package



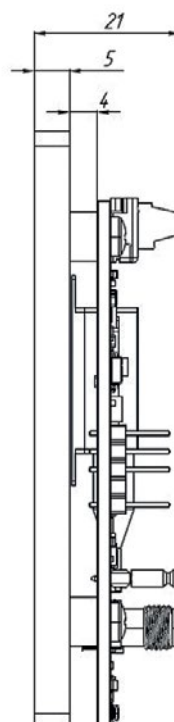
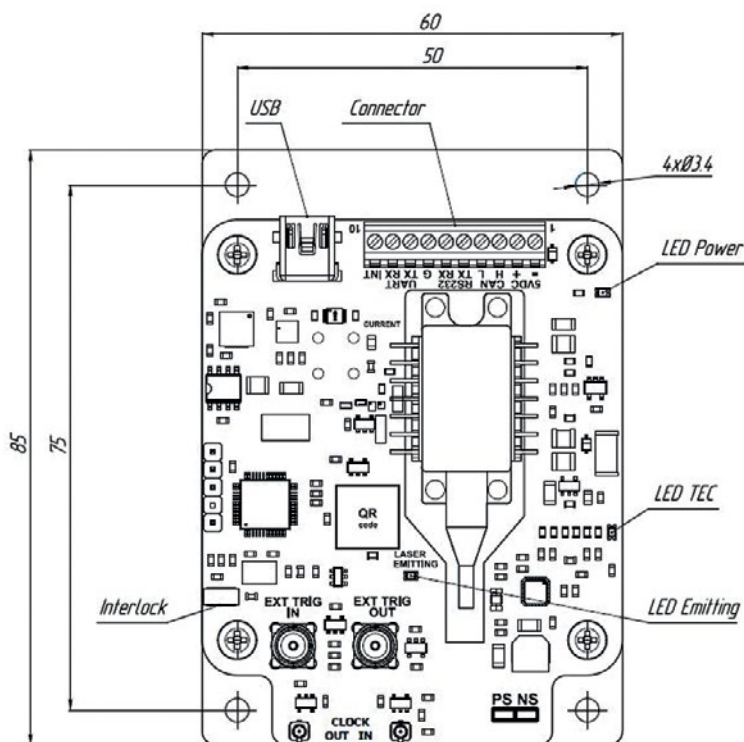
Nº	Description	Nº	Description
1	TEC Anode	8	n/c
2	Thermistor	9	n/c
3	Monitor PD Anode	10	LD Anode
4	Monitor PD Cathode	11	LD Cathode
5	Thermistor	12	n/c
6	n/c	13	n/c
7	n/c	14	TEC Cathode

10-pin Butterfly package



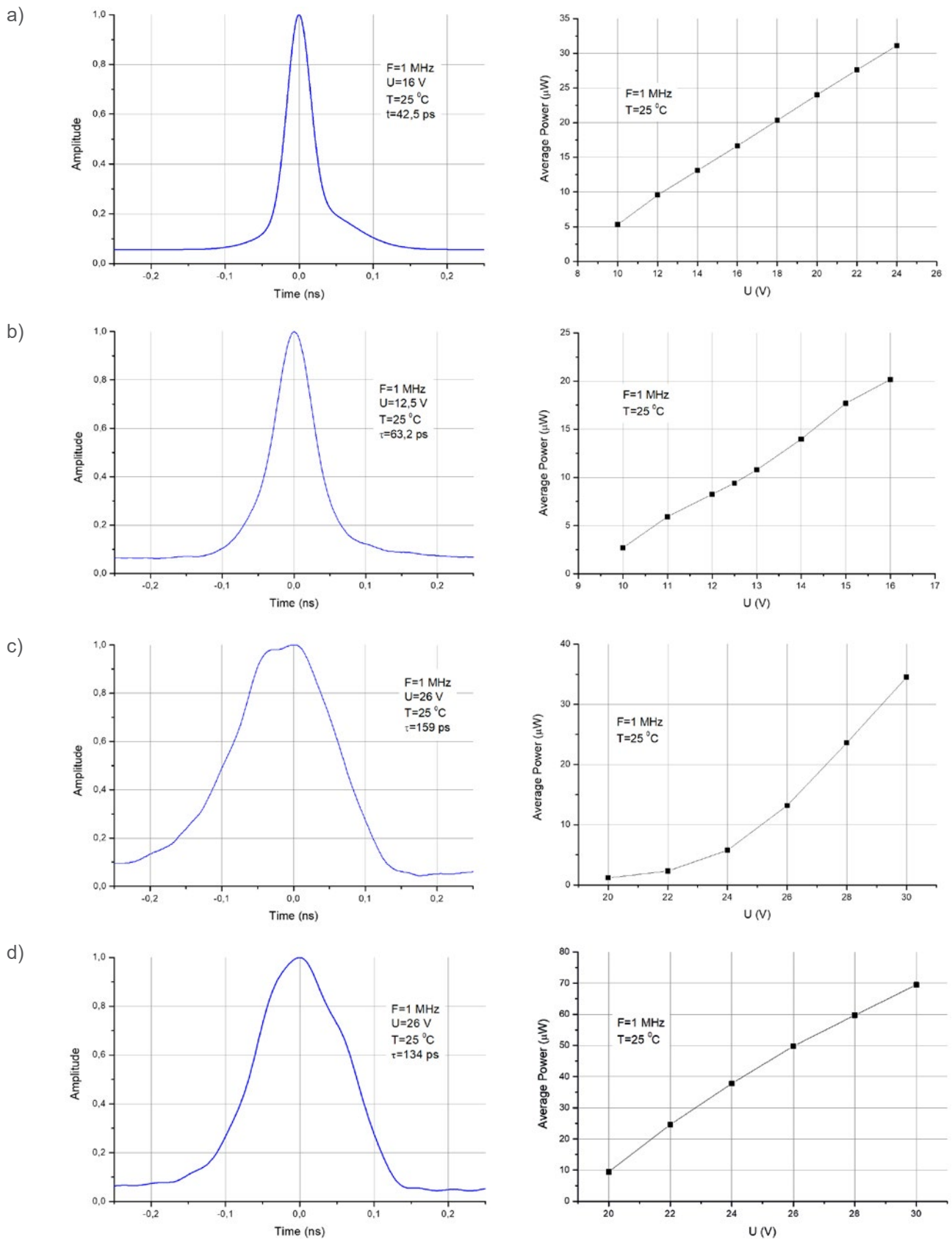
Nº	Description	Nº	Description
1	TEC (+)	6	Laser anode (+)
2	Thermistor	7	Laser cathode (-)
3	Monitor anode (-)	8	NC
4	Monitor cathode (+)	9	Package ground
5	Thermistor	10	TEC (-)

Dimensions and Connections



1	GND
2	+5VDC
3	CAN H
4	CAN L
5	RS232-TX
6	RS232-RX
7	GND
8	UART-TX
9	UART-RX
10	Interlock

Typical Performance Characteristics



Typical pulse form and dependence of average power on operation voltage for different types of laser diode.
 a) DFB 1064 nm, b) FBG 1550 nm, c) FBG 1064 nm, d) FP 1030 nm

PLD-NS-SYNC

SHORT PULSE LASER **DIODE** **DRIVER**



Key Features

- Special Design for 10/14 pin Butterfly Laser Diode
- Output current up to 2000 mA
- Compliance voltage up to 3 V
- Adjustable pulse width 1–100 ns
- Repetition rate up to 10 MHz
- External trigger option
- External clock option
- Master/slave operation mode with the repetition rate jitter suppression
- USB, RS-232, CAN, UART interfaces
- On-Board TEC Controller
- 5Vdc Input Power
- Completed by Heatsink
- Compact Size 85 mm × 60 mm × 21 mm

Description

The PLD-NS-SYNC is a compact short-pulse seed laser diode driver for powering 10/14-pin butterfly laser diode modules for applications, which require pulse widths from 1 ns to 100 ns. The pulse repetition frequency can be varied from 1 kHz to 10 MHz.

The driver is specially designed to minimize jitter between external trigger signal and optical pulse by enabling external clock synchronization. The driver also supports operation in Master/Slave mode and synchronization of optical pulses between two lasers, one operates as Master and another one as Slave, with the optical pulse position jitter below 500 ps and tunable delay between the optical pulses from two lasers.

The driver circuitry requires a single 5 VDC power source. All other needed voltages are generated on board by high-frequency switching power supplies. The driver supplies a bidirectional proportional-integral-derivative (PID) thermoelectric cooler controller (TEC) with current capability of 1.5 A and a voltage capability of 4 V.

The main parameters of PLD-NS-SYNC (output current, pulse width, repetition frequency, temperature set, pulse delays in sync mode) are controlled by computer interface.

The PLD-NS-SYNC has an external TTL-compatible input for repetition rate control from single shot up to 1 MHz. The driver has an external output for synchronization with each current pulse. The PLD-NS-SYNC has an external input/output of the clock frequency for synchronous operation of two drivers with minimal period jitter between optical pulses.

The current pulse monitor output can be viewed with an oscilloscope by on-board SMA connector allowing the user a real time view of the current. Voltage amplitude 1 V is equal to 2 A current.

Driver has landing pads for soldering a butterfly laser diode directly into driver board and large heat sink for stable heat dissipation.

Specifications

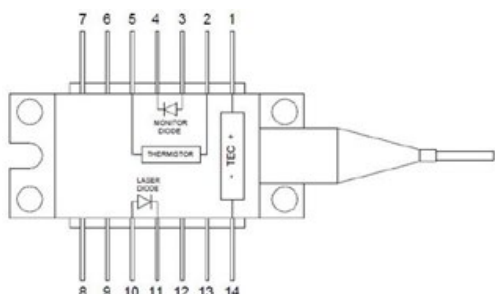
Parameter	Min.	Typ.	Max.	Units
INPUT				
Voltage	4.8	5.0	5.2	VDC
Current	-	-	2	A
External trigger (50 Ω)	3.3	-	5	VDC
OUTPUT				
Current	-	-	2000	mA
Compliance Voltage	1	-	3	V
Pulse width *	1	-	100	ns
Pulse width step	-	0.2	-	ns
Repetition rate *	0.001	-	10	MHz
Rise time **	50	-	500	ps
Fall time **	200	-	1000	ps
TEC current	-1.5	-	1.5	A
TEC Voltage	1	-	4	V
TEC Temperature Set	15	25	50	°C
Repetition rate in sync mode	-	-	1	MHz
Optical pulse delay in sync mode	-50	-	+50	ns
TEMPERATURE				
Operating	+10	-	+50	°C
Storage	-20	-	+70	°C
Humidity, Non-Condensing	-	-	95	%
CONNECTIONS				
Power and interface connector	Terminal block (1-282834-0 TE connectivity)			
USB	Mini-USB, Type B (1734035-1 TE connectivity)			
External trig in/out	SMA (1-1478979-0 TE connectivity)			
Clock in/out	U.FL (U.FL-R-SMT-1(10) Hirose Electric)			
MECHANICAL				
Size	85 × 60 × 21 mm			
Weight, not more	160 g			

* Maximum duty cycle is limited to 2 %

** Output performance depends upon laser diode characteristics. Performance cannot be guaranteed for all laser types. See optical output waveforms.

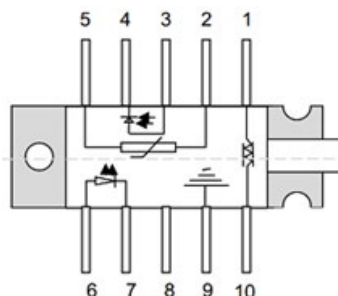
Compatible Laser Pinout

14-pin Butterfly package



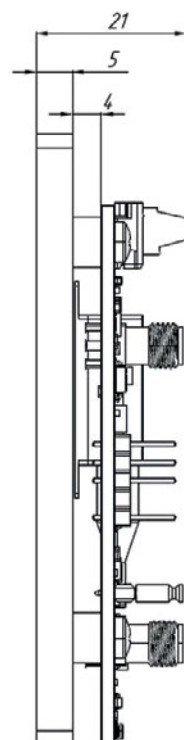
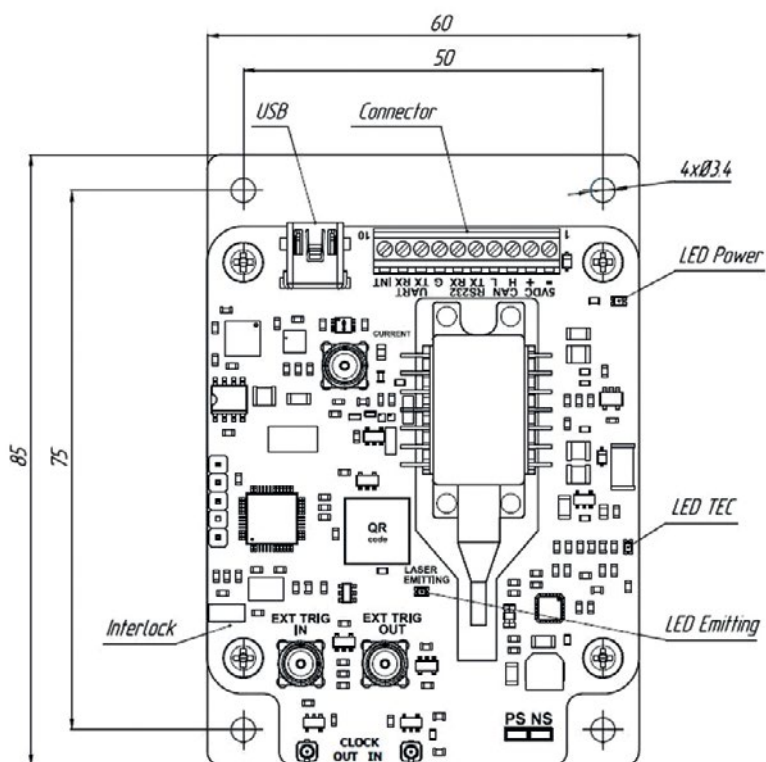
Nº	Description	Nº	Description
1	TEC Anode	8	n/c
2	Thermistor	9	n/c
3	Monitor PD Anode	10	LD Anode
4	Monitor PD Cathode	11	LD Cathode
5	Thermistor	12	n/c
6	n/c	13	n/c
7	n/c	14	TEC Cathode

10-pin Butterfly package



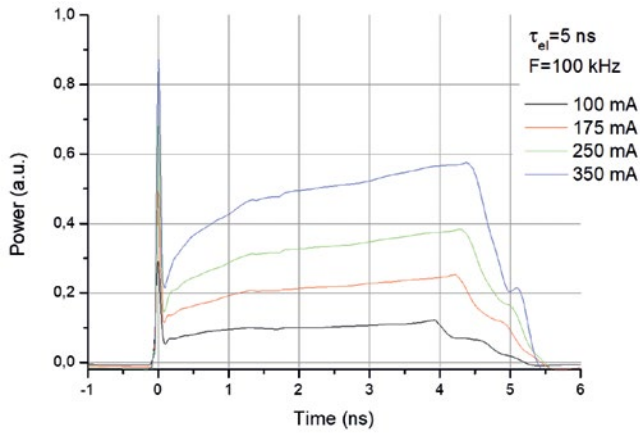
Nº	Description	Nº	Description
1	TEC (+)	6	Laser anode (+)
2	Thermistor	7	Laser cathode (-)
3	Monitor anode (-)	8	NC
4	Monitor cathode (+)	9	Package ground
5	Thermistor	10	TEC (-)

Dimensions and Connections

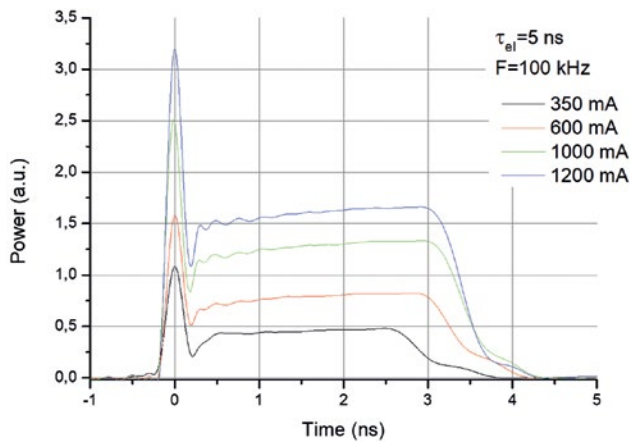
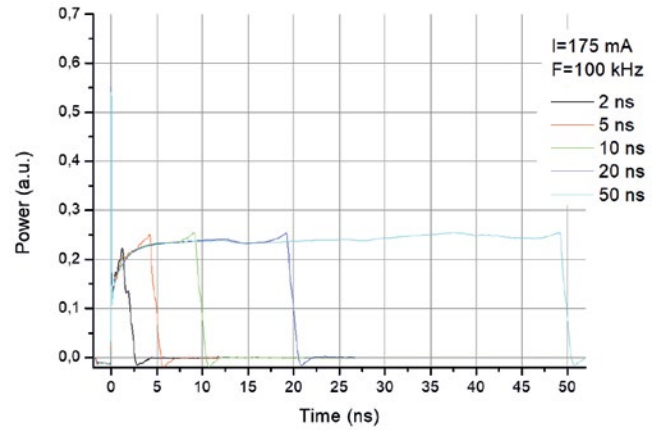


1	GND
2	+5VDC
3	CAN H
4	CAN L
5	RS232-TX
6	RS232-RX
7	GND
8	UART-TX
9	UART-RX
10	Interlock

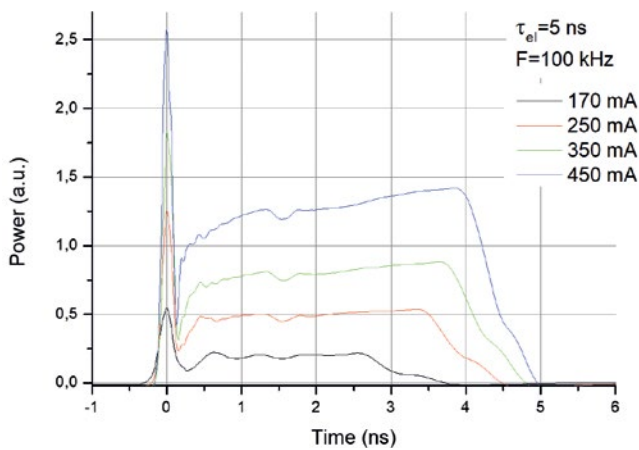
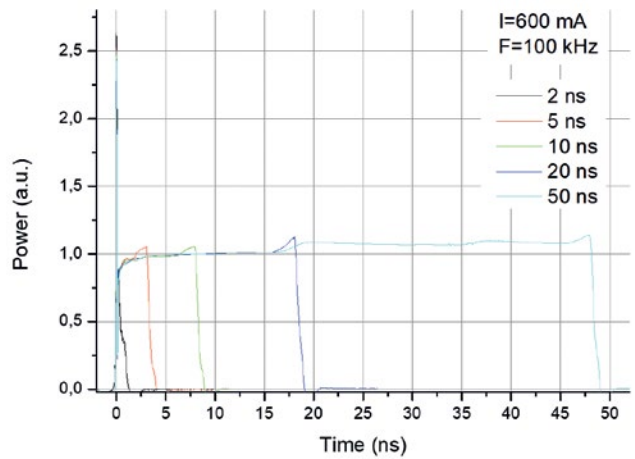
Typical Performance Characteristics



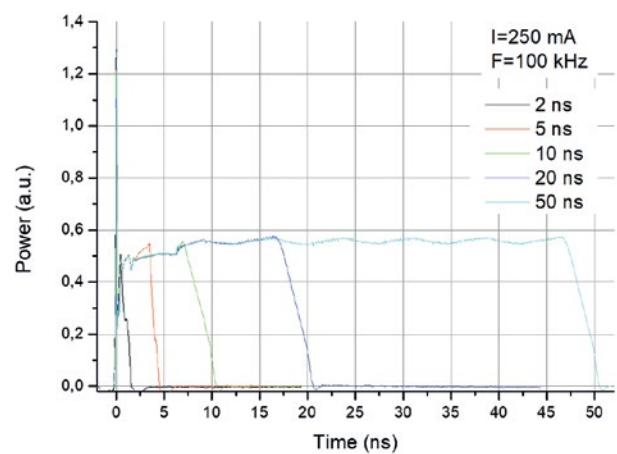
DFB 1064 at current 0.1–0.35 A, 2 ns, 3 ns, 5 ns, 10 ns, 20 ns, 50 ns



FBG 1064 at current 0.35–1.2 A, 2 ns, 5 ns, 10 ns, 20 ns, 50 ns

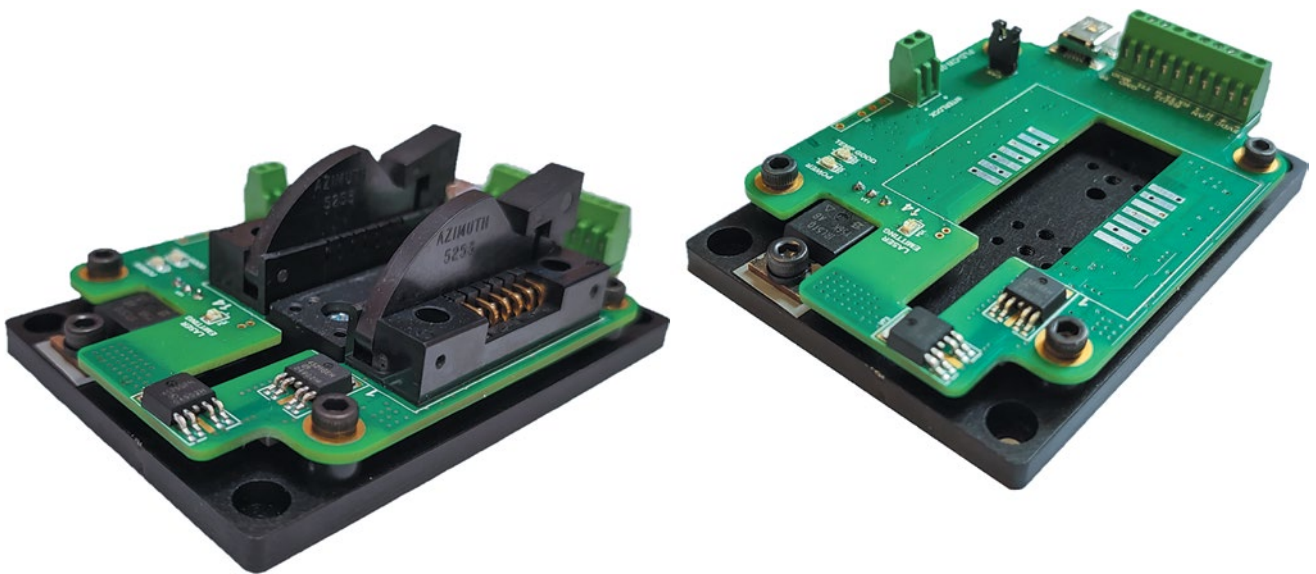


FP 1030 at current 0.17–0.45 A, 2 ns, 5 ns, 10 ns, 20 ns, 50 ns



PLD-CW-2000 PLD-CW-2000-ZIF

CONSTANT CURRENT LASER DIODE DRIVER



Key Features

- Unified design for 10/14 pin Butterfly Type I Laser Diode
- Constant Current Mode
- Output Current up to 2000 mA
- Compliance voltage up to 3 V
- Low current ripple
- High current stability
- Computer Interface USB, RS-232, CAN
- On-Board TEC Controller
- 5VDC Input Power
- Completed by Heatsink
- Compact Size 85 mm × 60 mm × 21 mm

Description

The PLD-CW-2000/PLD-CW-2000-ZIF is a constant current laser diode driver for powering 10/14-pin butterfly laser diode modules for applications, which require precision low ripple constant current regulation.

The driver circuitry operates from a single 5VDC power source. The driver supplies a bidirectional proportional-integral-derivative (PID) thermoelectric cooler controller (TEC) with current capability of 4 A and voltage capability of 4 V.

The main parameters of PLD-CW-2000/PLD-CW-2000-ZIF (output current, temperature set, monitor photodiode signal) are controlled by computer interface.

The GUI can control multiple drivers connected by CAN/USB hub.

The driver supports full amplitude modulation of drive current by an external analog 0...5V and TTL signals.

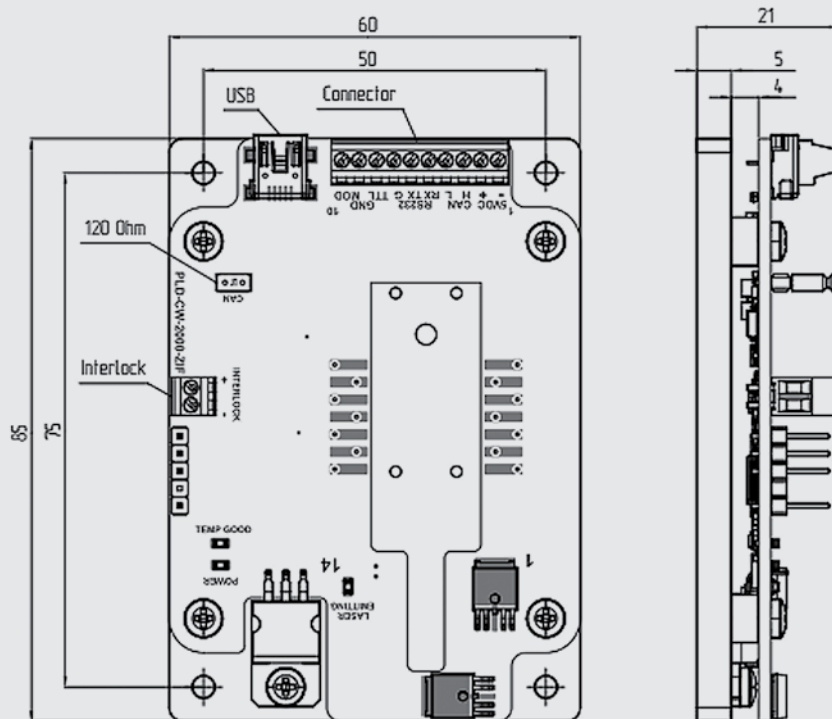
Driver has landing pads for soldering a butterfly laser diode directly into driver board and large heat sink for stable heat dissipation.

Specifications

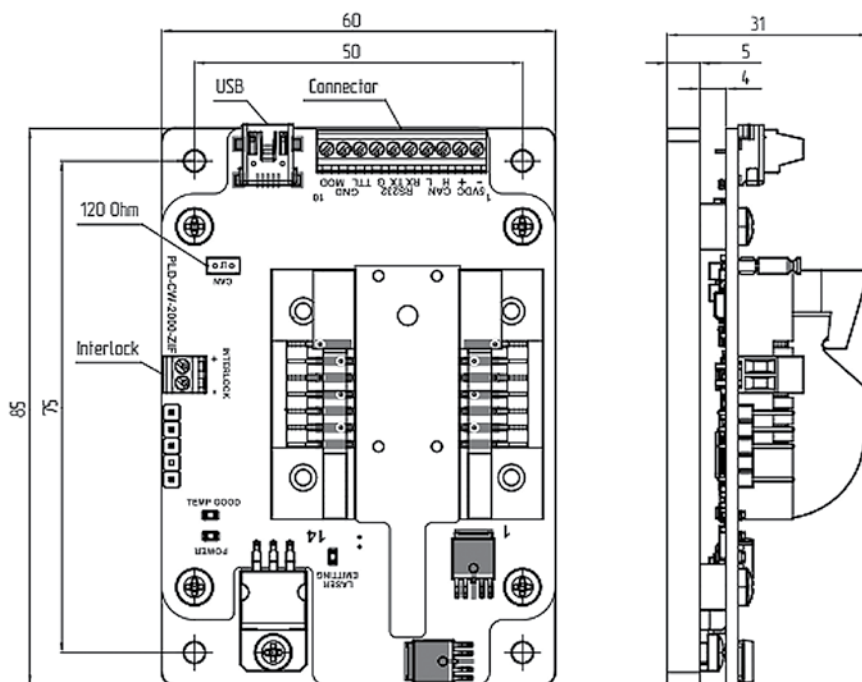
Parameter	Min.	Typ.	Max.	Units
INPUT				
Voltage	4.8	5.0	5.2	VDC
Current	-	-	3	A
OUTPUT				
Current	-	-	2000	mA
Current Regulation Step	-	0.1	-	mA
Current Ripple	-	-	0.1	%
Current Stability	-	-	0.2	%
Current Set Accuracy	-	-	1	%
Compliance Voltage	1	-	3	V
TEC current setting range	-4	-	+4	A
TEC Voltage	1	-	4	V
TEC Temperature Set	5	25	50	°C
TEC Temperature Step	-	0.1	-	°C
TEC Temperature Accuracy	-	-	0.1	%
TEMPERATURE				
Operating	+10	-	+50	°C
Storage	-20	-	+70	°C
Humidity, Non-Condensing	-	-	95	%
CONNECTIONS				
Power and interface connector	Terminal block (1-282834-0 TE connectivity)			
USB	Mini-USB, Type B (1734035-1 TE connectivity)			
Interlock	Terminal block (282834-2 TE connectivity)			
MECHANICAL				
Size	85 × 60 × 21 mm			
Weight, not more	160g			

Dimensions and Connections

PLD-CW-2000



PLD-CW-2000-ZIF



PLD-CW-2000(H)-ZIF

PRECISION CONSTANT CURRENT **LASER** **DIODE DRIVER**



Key Features

- Unified design for 10/14 pin Butterfly Laser Diode
- High Precision Constant Current Mode
- Output Current up to 2000 mA
- High Current Stability: 0.01 mA
- Control interfaces USB, RS-232, CAN
- LabView compatible
- Analog and Digital full current amplitude modulation
- Python libraries
- Optical power stabilization mode
- On-Board TEC Controller
- Regulated Maximum TEC Current
- High precision temperature stability: 0.01 deg
- 5 VDC Input Power
- Completed by Heatsink
- Compact Size 100 mm × 85 mm × 31 mm

Description

The PLD-CW-2000(H)-ZIF is a constant current laser diode driver for powering 10/14-pin butterfly laser diode modules for applications, which require high precision low ripple constant current regulation.

The driver circuitry operates from a single 5VDC power source. The driver supplies a bidirectional proportional-integral-derivative (PID) thermoelectric cooler controller (TEC) with current capability of 4 A and voltage capability of 4 V. Maximum TEC current is regulated by user.

The main parameters of PLD-CW-2000(H)-ZIF (output current, temperature set, maximum TEC current, monitor photodiode

signal) are controlled by computer interface. The GUI can control multiple drivers connected by CAN/USB hub.

The driver supports full amplitude modulation of drive current by an external analog 0...5 V and TTL signals.

Driver has special push-in connector for easy connecting butterfly laser diode directly into driver board and large heat sink for stable heat dissipation.

Specifications

Parameter	Min.	Typ.	Max.	Units
INPUT				
Voltage	4.8	5.0	5.2	VDC
Current	-	-	3	A
OUTPUT				
Current	-	-	2000	mA
Current Regulation Step	-	0.01	-	mA
Current Ripple amplitude	-	-	0.1	%
Current Stability	-	-	0.1	%
Current Set Accuracy	-	-	1	%
Compliance Voltage	1	-	3	V
TEC current setting range	-4	-	+4	A
TEC Voltage	1	-	4	V
TEC Temperature Set	5	25	50	°C
TEC Temperature Step	-	0.01	-	°C
TEC Temperature Accuracy	-	-	0.1	%
MODULATION				
Trigger input voltage	3.3	-	5	V
Trigger input impedance	-	500	-	Ω
Trigger pulse frequency	-	-	3	kHz
Trigger pulse width	150	-	-	μs
Current rise time	100	-	140	μs
Current fall time	80	-	160	μs
Analog input voltage	0	-	5	V
Analog input impedance	-	400	-	Ω
Current setpoint	-	400	-	mA/V
Analog input frequency	-	-	3	kHz

Parameter	Min.	Typ.	Max.	Units
TEMPERATURE				
Operating	+10	-	+50	°C
Storage	-20	-	+70	°C
Humidity, Non-Condensing	-	-	95	%
CONNECTIONS				
Power	2 mm / 5.5 mm Jack (PJ-05AH Cui Devices)			
USB	Mini-USB, Type B (1734035-1 TE connectivity)			
Interface connector	Terminal block (1-282834-0 TE connectivity)			
MECHANICAL				
Size	100 × 85 × 31 mm			
Weight, not more	200g			

Interface connector pinout

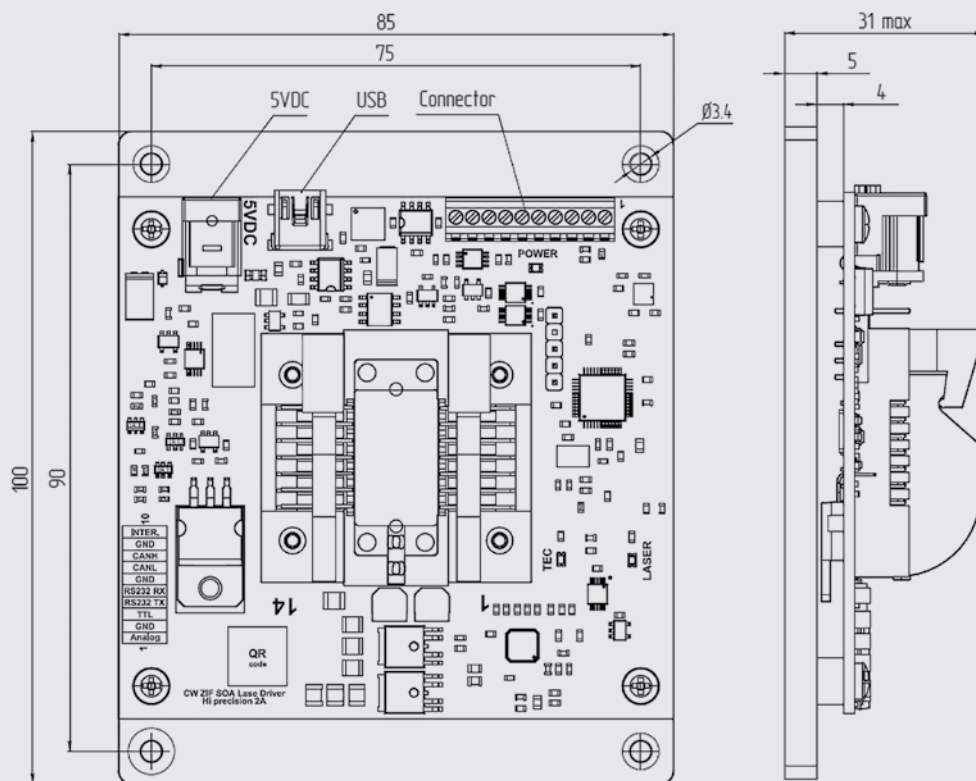
PIN	Function	Description
1	ANALOG	<p>Analog modulation input.</p> <p>Connect to the external analog voltage or external sinusoidal signal generator for control output current. 0÷5V analog input correspond to 0÷2 A output current. Current setpoint is 400 mA/V. Input impedance is 400 Ω.</p> <p>Choose “ANALOG” mode by PC software and press “ON/OFF” button to activate output current and control it by analog input. Maximum frequency of external sinusoidal signal is 3 kHz, that supports 2 A modulation amplitude. The modulation amplitude gets smaller at higher frequency.</p>
2	GND	Device ground
3	TTL	<p>Trigger input</p> <p>Connect to the external TTL signal generator for triggering output current. The amplitude of external trigger must be 3.3V to 5V range. Input impedance is 500 Ω.</p> <p>Choose “External” mode by PC software and press “ON/OFF” button to activate triggering output current by external input. Current amplitude sets by PC software. Maximum frequency of external triggering signal is 3 kHz.</p>
4	RS232 TX	RS232 port transmit
5	RS232 RX	RS232 port reception
6	GND	Device ground
7	CANL	CAN bus low
8	CANH	CAN bus high
9	GND	Device ground

INTERLOCK

Connect to the external interlock circuit. Open: device is locked. Closed: device is operational. Internally pulled up to 3.3V by 1 kΩ resistor. Use open collector or dry contact.

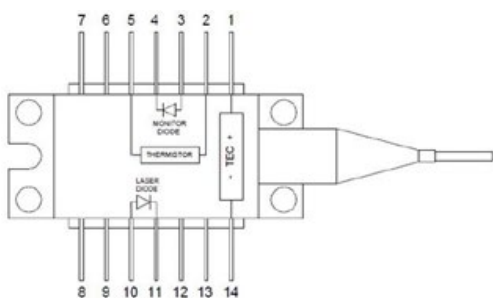
Note: The laser emission can only be started when the interlock circuit is closed

Dimensions and Connections



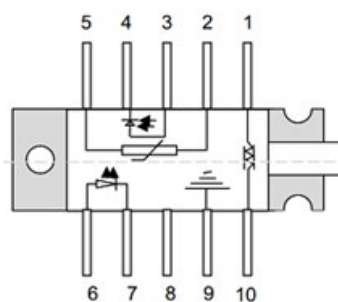
Compatible Laser Pinout

14-pin Butterfly package



Nº	Description	Nº	Description
1	TEC Anode	8	n/c
2	Thermistor	9	n/c
3	Monitor PD Anode	10	LD Anode
4	Monitor PD Cathode	11	LD Cathode
5	Thermistor	12	n/c
6	n/c	13	n/c
7	n/c	14	TEC Cathode

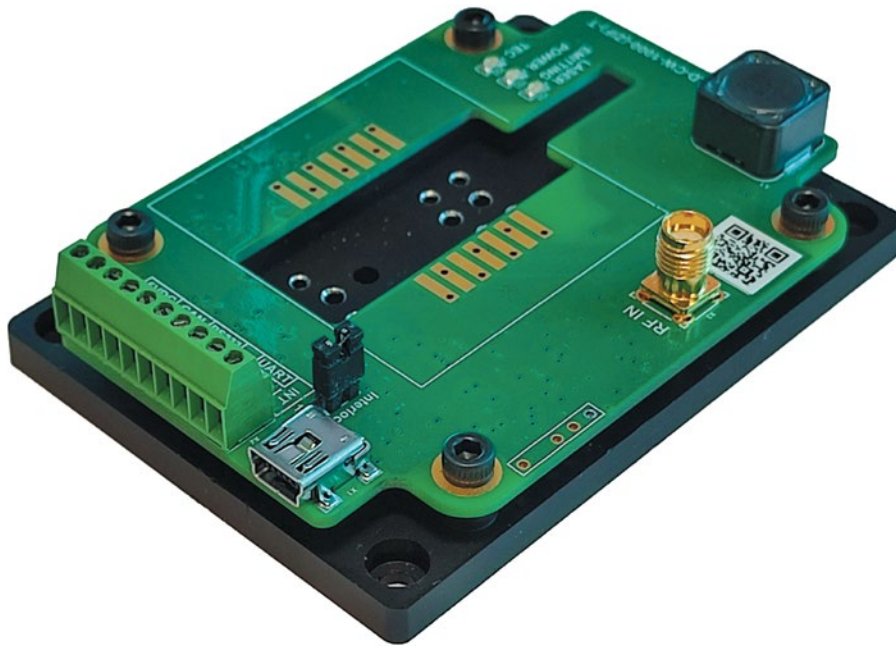
10-pin Butterfly package



Nº	Description	Nº	Description
1	TEC (+)	6	Laser anode (+)
2	Thermistor	7	Laser cathode (-)
3	Monitor anode (-)	8	NC
4	Monitor cathode (+)	9	Package ground
5	Thermistor	10	TEC (-)

PLD-CW-1000-TII

CONSTANT CURRENT LASER DIODE DRIVER



Key Features

- Unified design for 10/14 pin Butterfly Type II Laser Diode
- Constant Current mode
- Output Current up to 1000 mA
- Compliance voltage up to 3V
- Low current ripple
- High current stability
- USB, RS-232, CAN, UART interfaces
- LabView compatible
- Python libraries
- Analog RF Modulation
- Optical power stabilization mode
- On-Board TEC Controller
- 5VDC Input Power
- Completed by Heatsink
- Compact Size 85 mm × 60 mm × 21 mm

Description

The PLD-CW-1000-TII is a constant current laser diode driver for powering 14-pin butterfly laser diode modules for applications, which require operation in low-signal RF modulation mode. The driver provides precision low ripple constant current regulation.

The driver circuitry operates from a single 5Vdc power source. The driver supplies a bidirectional proportional-integral-derivative (PID) thermoelectric cooler controller (TEC) with current capability of 1.5 A and voltage capability of 4 V.

The main parameters of PLD-CW-1000-TII (output current, temperature set, monitor photodiode signal) are controlled by computer interface. The GUI can control multiple drivers connected by CAN/USB hub.

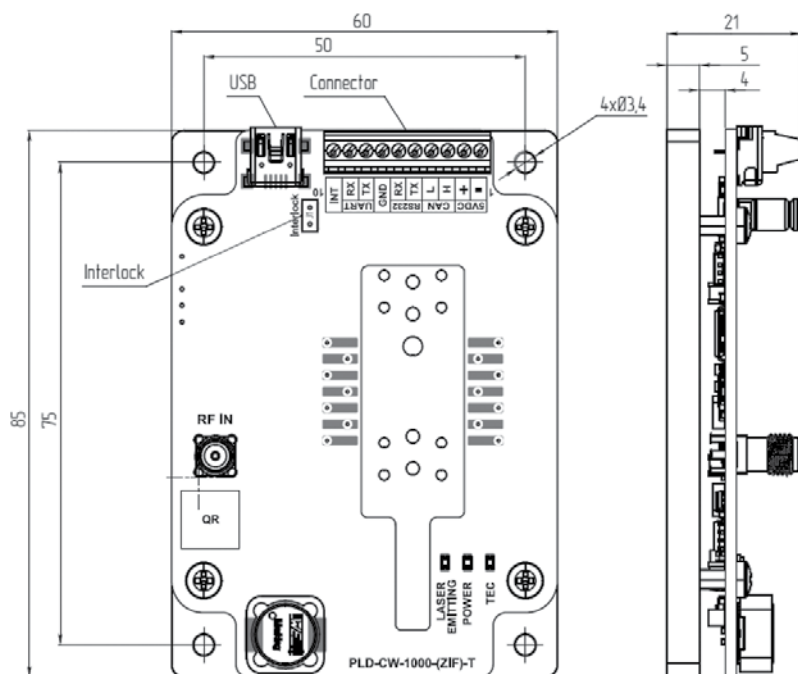
The PLD-CW-1000-TII has landing pads for soldering a butterfly laser diode directly into driver board and large heat sink for stable heat dissipation.

Specifications

Parameter	Min.	Typ.	Max.	Units
INPUT				
Voltage	4.8	5.0	5.2	V
Current	-	-	2	A
RF modulation*	0.005	-	500	MHz
OUTPUT				
Current	-	-	1000	mA
Current Regulation Step	-	0.1	-	mA
Current Ripple	-	-	1	%
Current Stability	-	-	0.2	%
Current Set Accuracy	-	-	1	%
Compliance Voltage	1	-	3	V
TEC current setting range	-1.5	-	+1.5	A
TEC Voltage	1	-	4	V
TEC Temperature Set	5	25	50	°C
TEC Temperature Step	-	0.1	-	°C
TEC Temperature Accuracy	-	-	0.1	%
TEMPERATURE				
Operating	+10	-	+50	°C
Storage	-20	-	+70	°C
Humidity, Non-Condensing	-	-	95	%
CONNECTIONS				
Power and interface connector	Terminal block (1-282834-0 TE connectivity)			
USB	Mini-USB, Type B (1734035-1 TE connectivity)			
Interlock	Terminal block (282834-2 TE connectivity)			
MECHANICAL				
Size	85 × 60 × 21 mm			
Weight, not more	160 g			

* Performance depends upon laser diode characteristics

Dimensions and Connections



PIN	Name	Description
1	-	Device ground
2	+	5VDC Power input
3	H	CAN CAN bus high
4	L	
5	TX	RS232 RS232 port transmit
6	RX	
7	GND	Device ground
8	TX	UART UART port transmit
9	RX	
10	INT	INTERLOCK

INTERLOCK

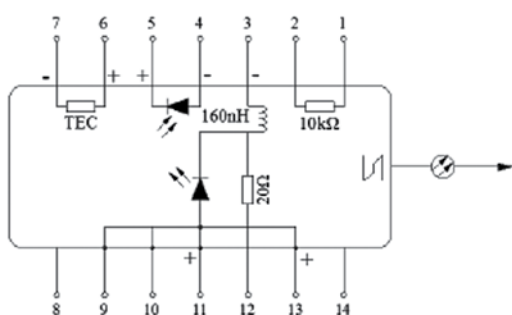
Connect to the external interlock circuit. Open: device is locked. Closed: device is operational.

Internally pulled up to 3.3V by 1kΩ resistor. Use open collector or dry contact.

Note: The laser emission can only be started when the interlock circuit is closed

Compatible Laser Pinout

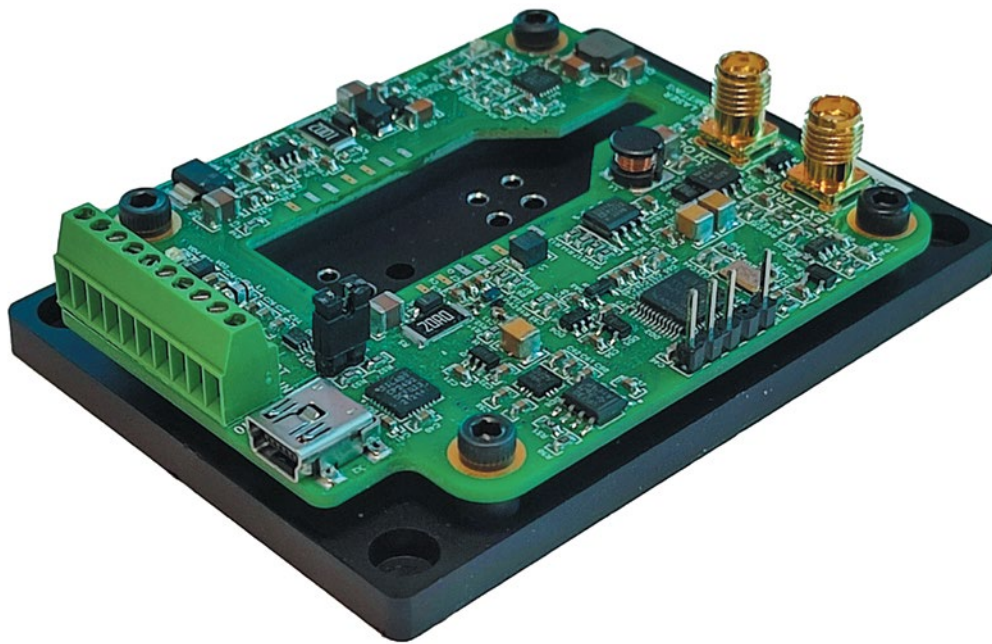
14-pin Butterfly package Type 2 (Telecom)



No	Description	No	Description
1	Thermistor	8	NC
2	Thermistor	9	Case Ground
3	Laser dc Bias (Cathode) (-)	10	Case Ground
4	Monitor PD Anode (-)	11	Laser Anode (+), Case Ground
5	Monitor PD Cathode (+)	12	Laser RF Cathode (-)
6	Thermoelectric Cooler (+)	13	Laser Anode (+), Case Ground
7	Thermoelectric Cooler (-)	14	NC

PLD-NS-GSS

GAIN SWITCH SUPPRESSED SHORT PULSE LASER DIODE DRIVER



Key Features

- Special Design for 10/14 pin Butterfly Laser Diode
- Output Current up to 2000 mA
- Compliance voltage up to 3V
- Adjustable pulse width 2–100 ns
- Repetition rate up to 1 MHz
- External trigger option
- Gain switch suppress option
- USB, CAN interfaces
- On-Board TEC Controller
- 5VDC Input Power
- Completed by Heatsink
- Compact Size 85 mm × 60 mm × 21 mm

Description

The PLD-NS-GSS is a compact short-pulse seed laser diode driver for powering 10/14-pin butterfly laser diode modules for applications, which require nanosecond pulse with long rise time. The pulse repetition frequency can be varied from 1 Hz to 1 MHz.

The driver circuitry requires a single 5VDC power source. All other needed voltages are generated on the board by high-frequency switching power supplies. The driver supplies a bidirectional proportional-integral-derivative (PID) thermoelectric cooler controller (TEC) with current capability of 1.5A and a voltage capability of 4V.

The main parameters of PLD-NS-GSS (pulse current, bias current, pulse width, repetition frequency, temperature set) are controlled by computer interface.

The PLD-NS-GSS is specifically designed to suppress gain switching by controlling the bias current. The PLD-NS-GSS has an external TTL-compatible input for repetition rate control from single shot up to 1 MHz.

The PLD-NS-GSS has an external output for synchronization with each current pulse. Driver has landing pads for soldering a butterfly laser diode directly into driver board and large heat sink for stable heat dissipation.

Specifications

Parameter	Min.	Typ.	Max.	Units
INPUT				
Voltage	4.8	5.0	5.2	V
Current	-	-	2	A
External trigger (50 Ω)	3.3	-	5	V
OUTPUT				
Pulse Current	-	-	1000	mA
Compliance Voltage	1	-	3	V
Bias Current	-	-	150	mA
Pulse width *	2	-	100	ns
Pulse width step	-	0.2	-	ns
Repetition rate *	0.001	-	1000	kHz
Rise time **	0.3	-	0.5	ns
Fall time **	0.2	-	1	ns
TEC current	-1.5	-	1.5	A
TEC Voltage	1	-	4	V
TEC Temperature Set	15	25	50	°C
TEMPERATURE				
Operating	+10	-	+50	°C
Storage	-20	-	+70	°C
Humidity, Non-Condensing	-	-	95	%
CONNECTIONS				
Power and interface connector	Terminal block (1-282834-0 TE connectivity)			
USB	Mini-USB, Type B (1734035-1 TE connectivity)			
MECHANICAL				
Size	85 × 60 × 21 mm			
Weight, not more	160g			

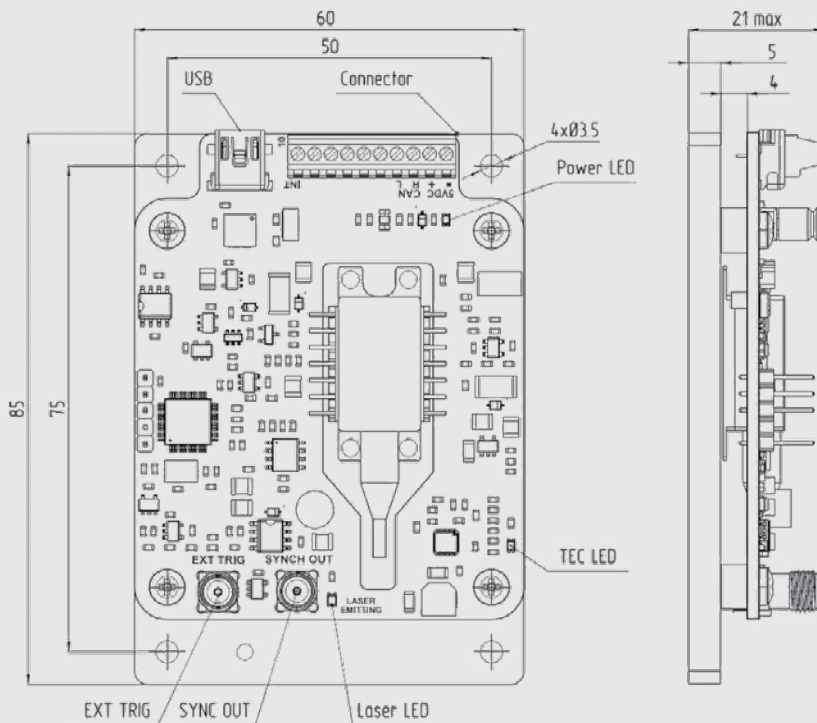
* Maximum duty cycle is limited to 2%

** Output performance depends upon laser diode characteristics

Dimensions and Connections

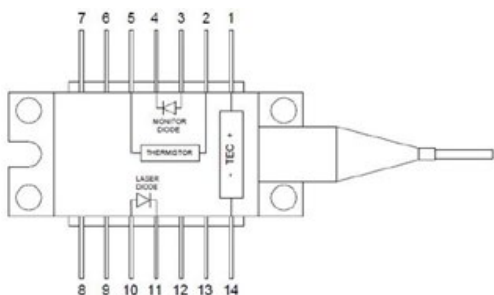
Connector pinout

PIN	Function	Description
1	-5VDC	Device ground
2	+5VDC	Power input
3	CANH	CAN bus high
4	CANL	CAN bus low
5	NC	-
6	NC	-
7	NC	-
8	NC	-
9	GND	Device ground
10	INT	Interlock



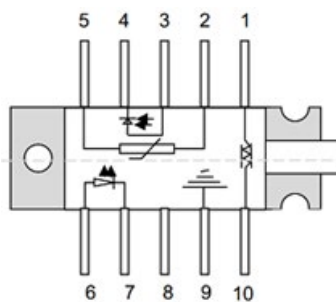
Compatible Laser Pinout

14-pin Butterfly package



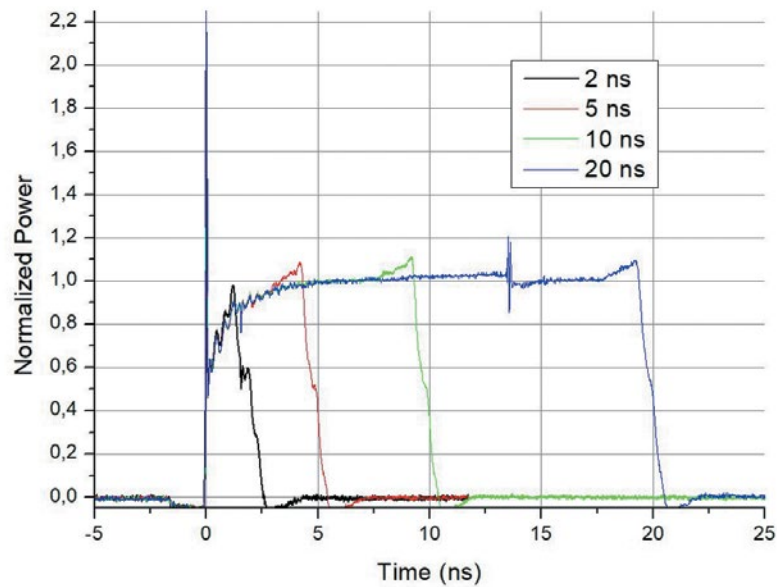
Nº	Description	Nº	Description
1	TEC Anode	8	n/c
2	Thermistor	9	n/c
3	Monitor PD Anode	10	LD Anode
4	Monitor PD Cathode	11	LD Cathode
5	Thermistor	12	n/c
6	n/c	13	n/c
7	n/c	14	TEC Cathode

10-pin Butterfly package

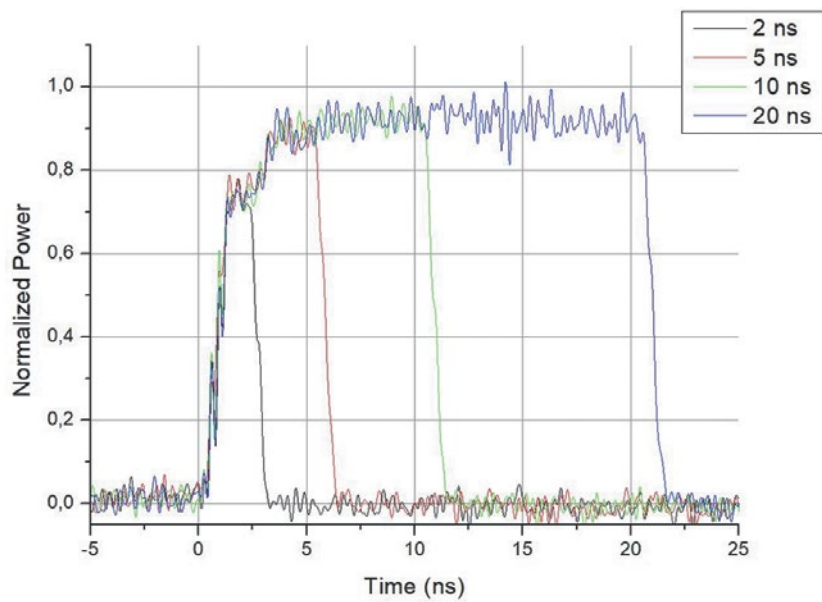


Nº	Description	Nº	Description
1	TEC (+)	6	Laser anode (+)
2	Thermistor	7	Laser cathode (-)
3	Monitor anode (-)	8	NC
4	Monitor cathode (+)	9	Package ground
5	Thermistor	10	TEC (-)

Typical Performance Characteristics



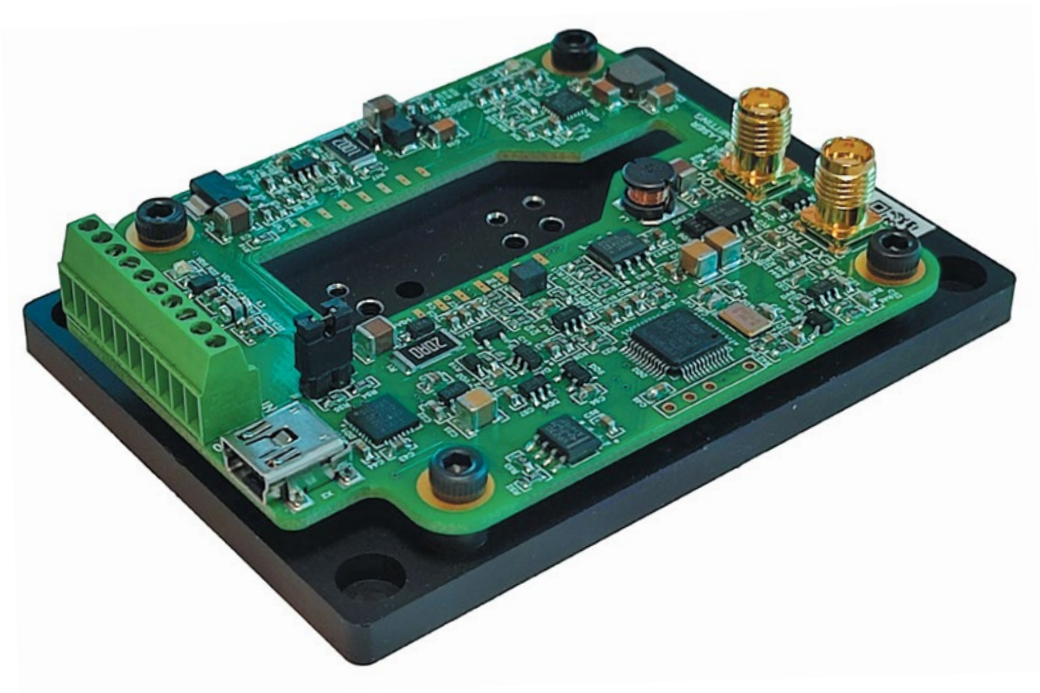
No Gain Switch Suppress



Gain Switch Suppress

PLD-NS-GSS-Tr

PRE-SHAPING SHORT PULSE LASER DIODE DRIVER



Key Features

- Special Design for 10/14 pin Butterfly Laser Diode
- Output Current up to 2000 mA
- Compliance voltage up to 3 V
- Adjustable pulse width 10–500 ns
- Repetition rate up to 1 MHz
- External trigger option
- Gain switch suppress option
- Pulse pre-shaping option
- USB, CAN interfaces
- On-Board TEC Controller
- 5VDC Input Power
- Completed by Heatsink
- Compact Size 85 mm × 60 mm × 21 mm

Description

The PLD-NS-GSS-Tr is a compact short-pulse seed laser diode driver for powering 10/14-pin butterfly laser diode modules for applications, which require nanosecond pulse with long rise time. The pulse repetition frequency can be varied from 1 Hz to 1 MHz.

The driver circuitry requires a single 5VDC power source. All other needed voltages are generated on the board by high-frequency switching power supplies. The driver supplies a bidirectional proportional-integral-derivative (PID) thermo-electric cooler controller (TEC) with current capability of 1.5A and a voltage capability of 4V.

The main parameters of PLD-NS-GSS-Tr (pulse current, bias current, rise time, pulse width, repetition frequency, temperature set) are controlled by computer interface.

The PLD-NS-GSS-Tr provides control of the bias current and the pulse rise front slope, which allows both suppressing the gain switch and pre-shaping pulses for further amplification.

The PLD-NS-GSS-Tr has an external TTL-compatible input for repetition rate control from single shot up to 100 kHz.

The PLD-NS-GSS-Tr has an external output for synchronization with each current pulse. Driver has landing pads for soldering a butterfly laser diode directly into driver board and large heat sink for stable heat dissipation.

Specifications

Parameter	Min.	Typ.	Max.	Units
INPUT				
Voltage	4.8	5.0	5.2	V
Current	-	-	2	A
External trigger (50 Ω)	3.3	-	5	V
OUTPUT				
Pulse Current	-	-	1000	mA
Compliance Voltage	1	-	3	V
Bias Current	-	-	150	mA
Pulse width *	10	-	500	ns
Pulse width step	-	0.2	-	ns
Repetition rate *	0.001	-	1000	kHz
Rise time **	8	-	100	ns
Fall time **	2	-	5	ns
TEC current	-1.5	-	1.5	A
TEC Voltage	1	-	4	V
TEC Temperature Set	15	25	50	°C
TEMPERATURE				
Operating	+10	-	+50	°C
Storage	-20	-	+70	°C
Humidity, Non-Condensing	-	-	95	%
CONNECTIONS				
Power and interface connector	Terminal block (1-282834-0 TE connectivity)			
USB	Mini-USB, Type B (1734035-1 TE connectivity)			
MECHANICAL				
Size	85 × 60 × 21 mm			
Weight, not more	160g			

* Maximum duty cycle is limited to 2%

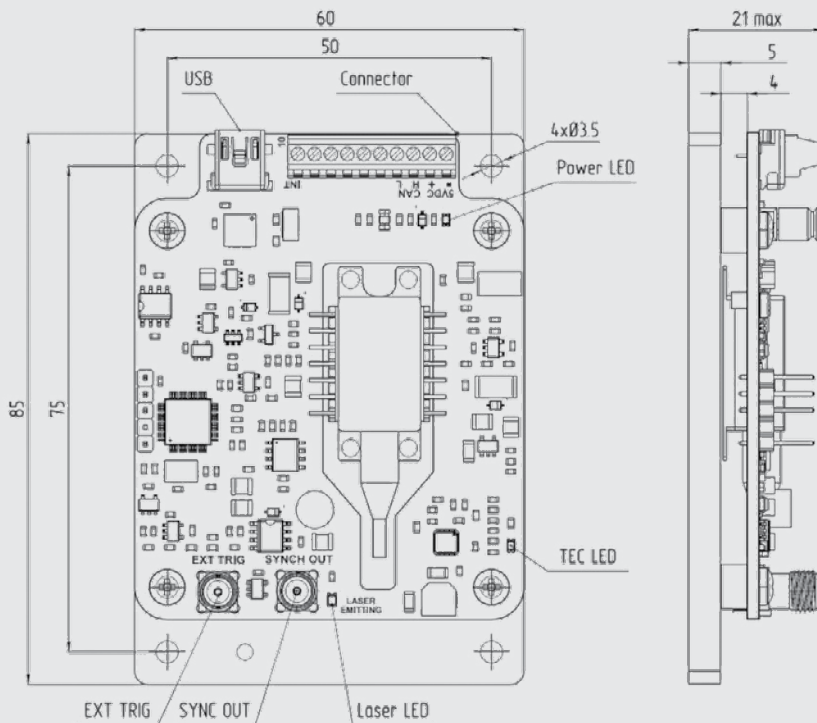
** Controlled by user

*** Output performance depends upon laser diode characteristics

Dimensions and Connections

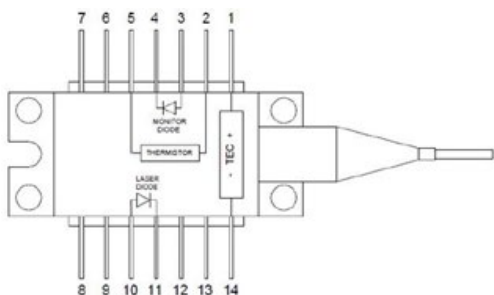
Connector pinout

PIN	Function	Description
1	-5VDC	Device ground
2	+5VDC	Power input
3	CANH	CAN bus high
4	CANL	CAN bus low
5	NC	-
6	NC	-
7	NC	-
8	NC	-
9	GND	Device ground
10	INT	Interlock



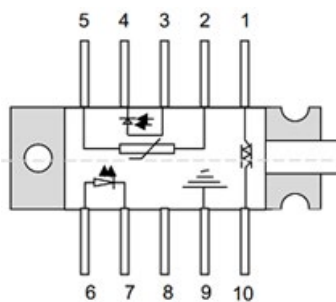
Compatible Laser Pinout

14-pin Butterfly package



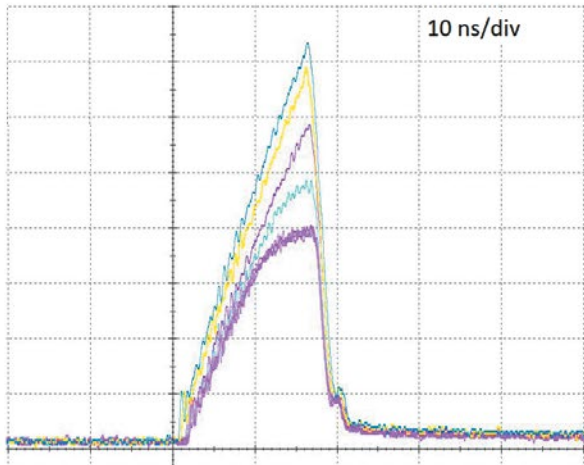
Nº	Description	Nº	Description
1	TEC Anode	8	n/c
2	Thermistor	9	n/c
3	Monitor PD Anode	10	LD Anode
4	Monitor PD Cathode	11	LD Cathode
5	Thermistor	12	n/c
6	n/c	13	n/c
7	n/c	14	TEC Cathode

10-pin Butterfly package

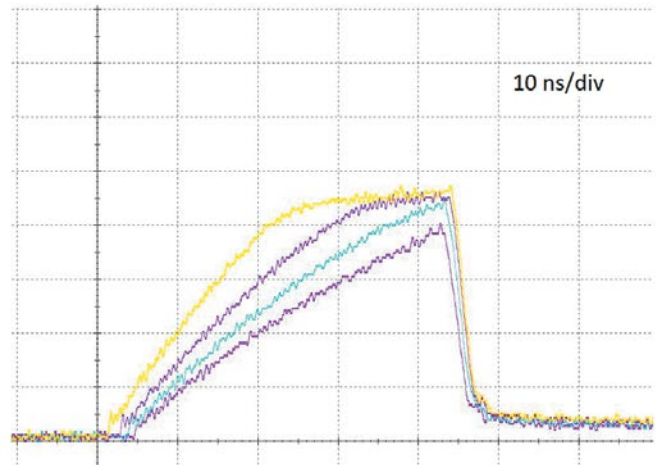


Nº	Description	Nº	Description
1	TEC (+)	6	Laser anode (+)
2	Thermistor	7	Laser cathode (-)
3	Monitor anode (-)	8	NC
4	Monitor cathode (+)	9	Package ground
5	Thermistor	10	TEC (-)

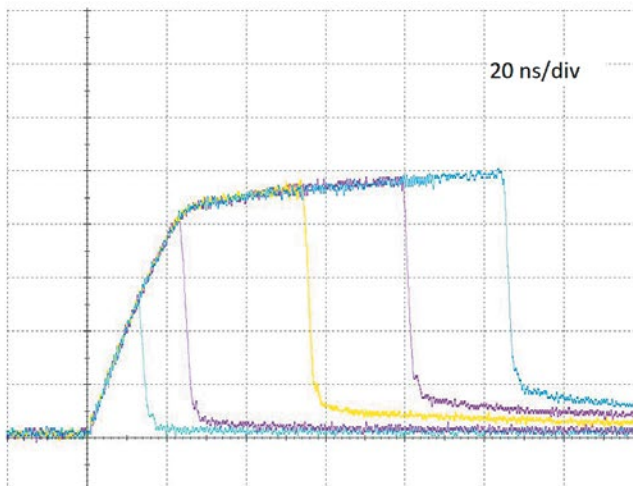
Typical Performance Characteristics



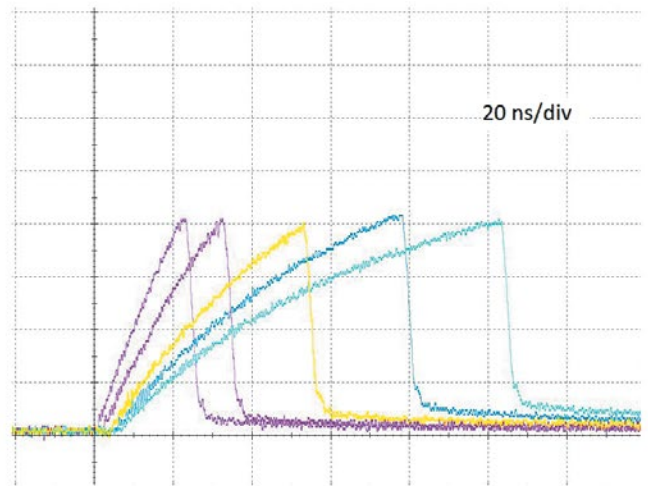
20 ns pulses different pre-shaping



50 ns pulses different pre-shaping



20 ns pulses different pre-shaping



50 ns pulses different pre-shaping

HPLD-1000

HIGH POWER CONSTANT CURRENT LASER DIODE DRIVER



Key Features

- Wide input voltage range up to 48 VDC
- Output current up to 25 A
- Compliance voltage up to 40 V
- Efficiency up to 97 %
- Low current ripple
- Triggering up to 3 kHz
- Analog modulation up to 30 kHz
- Overcurrent protection
- Reverse current protection
- Crowbar circuit protection
- External interlock function
- CAN interface
- Integrated heatsink
- Compact Size 70 mm × 56 mm × 34 mm

Description

The HPLD-1000 is a compact non-isolated DC/DC switch mode power supply with constant current output. Driver produces high stability, low ripple current for powering laser diode modules. The output current value can be varied from 0 to 25 A. Driver can be controlled by CAN interface or external modulation signals.

Driver has three modes for use in various applications.

- **Mode 1 – CW** – is continuous current mode with parameters set by PC control software.
- **Mode 2 – Trigger** – allows to set current value by PC control software and to trigger output current by external TTL signal.
- **Mode 3 – Analog** – allows to modulate current by external modulation signal and to turn driver ON / OFF by external TTL trigger.

Protection features include an overcurrent protection, reverse current protection, crowbar clamp protection and over-temperature shutdown.

Powering

The driver requires a DC power supply. PSU's output characteristics must cover the driver output power and laser diode voltage. The power supply output voltage must be at least 15% higher than the laser diode voltage drop. We recommend to use a low voltage power supply (for example 12 VDC) for powering low power laser diode with voltage drop 2÷10V.

Cooling

The HPLD-1000 PCB is completed by heatsink for easy thermal management. The driver produces up to 42W of power losses. Thus the driver heatsink has to be mounted on a thermal conductive surface to ensure proper operation and prevent an over-temperature shutdown. If the conduction cooling is not enough cooling can be improved by adding a fan.

Software

We offer own PC control software to control the driver.

Operating modes

Driver has three operating modes, that allows use it as independent driver for powering single laser or use it in system of powering lasers with external control.

No	Mode	Description
1	CW	Driver is controlled by PC control software. Constant current value is set from control software. "ON/OFF" button starts / stops driver with soft start function, that allows rise and fall current within 10 mS for safe laser turning ON / turning OFF. See details on figure 1.
2	Trigger	Current value is sets by PC control software. External trigger starts and stops driver with 50 μ s rise / fall time. The frequency of external trigger can be from single pulse to 3 kHz. The mode is characterized by bias current 40 mA between pulses. See trigger to current pulse delay details on figures 2.
3	Analog	Current is modulated by external analog (eg. sinusoidal) signal. Current wave form replicates external sinusoidal signal up to 10 kHz with full amplitude. Current modulation amplitude is reduced up to 30% for frequencies from 10 kHz to 30 kHz. It is not recommended to apply signal with rise / fall time less than 10 μ s. Accuracy of current amplitude setting is not more 20%. Use current sensing monitor for reading actual amplitude, frequency and form of laser current. Driver ON/OFF is done by PC control software.

Keep the connection between driver and laser diode as short as possible, not more than 200 mm, especially for modes 2, 3.

Specifications

Parameter	Min.	Typ.	Max.	Units
INPUT				
Voltage	12	-	48	VDC
Current	-	-	22	A
OUTPUT				
Power	-	-	1000	W
Compliance voltage ¹	2	-	40	V
Current range	0.0	-	25.0	A
Current ripple amplitude	-	40	60	mA
Current ripple frequency	-	425	-	kHz
Current set accuracy	-	-	1.5	%
Overcurrent value ²	5	26	30	A
Soft start rise time ³	-	-	11	ms
Soft stop fall time ³	-	-	16	ms
Rise / Fall time ⁴	-	50	70	µs
Current sensing monitor	-	50	-	mV/A
MODULATION				
Trigger input voltage	3.3	-	5	V
Trigger input impedance	-	500	-	Ω
Trigger pulse frequency	-	-	3	kHz
Trigger pulse width	150	-	-	µs
Trigger to current delay	-	-	20	µs
Analog input voltage	0	-	10	V
Analog input impedance	-	4	-	kΩ
Current setpoint	-	2.5	-	mA/V
Analog input frequency ⁵	-	-	30	kHz
POWER DISSIPATION				
Efficiency ⁶	-	-	97	%
Maximum power losses	-	-	42	W
TEMPERATURE				
Operating	+10	-	+40	°C
Storage	-20	-	+70	°C
Humidity, Non-Condensing	-	-	95	%
CONNECTIONS				
Power	2-pin Terminal Block (393900102 Molex)			
CAN interface / Interlock / Trigger / Modulation	8-pin Ribbon Cable Connectors (7-188275-8 TE Connectivity)			
Current monitor	SMA (5-1814832-2 Molex)			
MECHANICAL				
Size	70 × 56 × 34 mm			
Weight, not more	200 g			

1. Output voltage cannot be more than $0.85 \cdot V_{in}$

2. Default value is 26 A. Can be programmed from 5 A to 30 A. Overcurrent will cause immediately stop driver with crowbar protection

3. For mode 1

4. For modes 2, 3. Depends on wires length from driver to laser

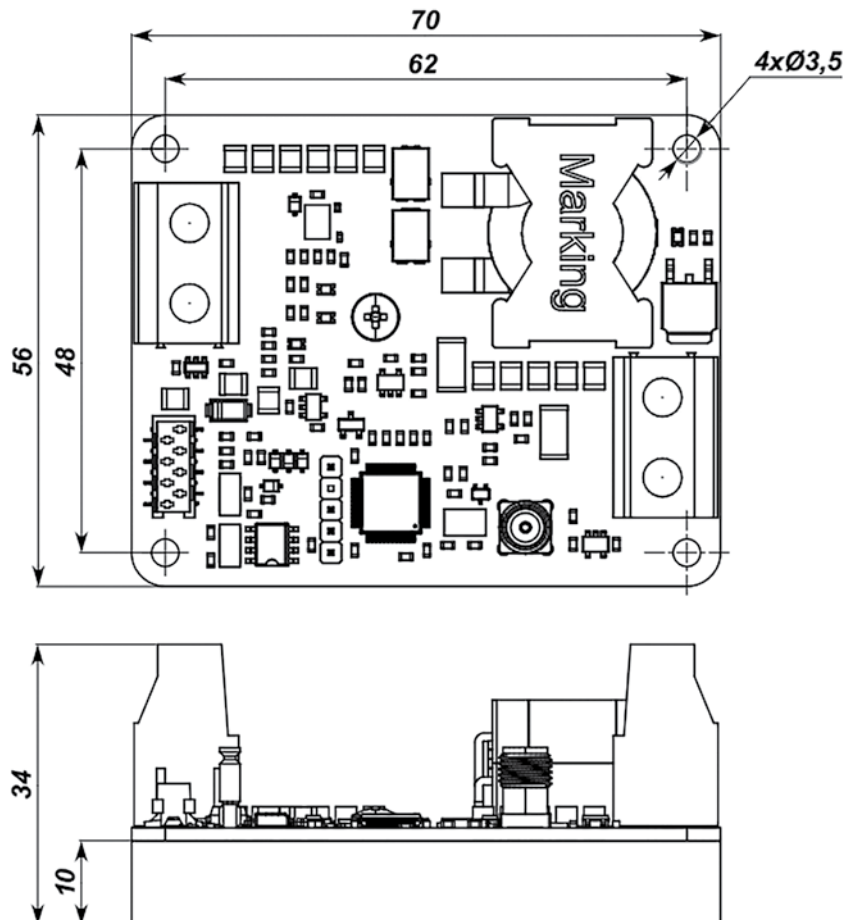
5. See details on Figure 5

6. Depends on input voltage, output voltage, output current. See details on Figure 6

Terminal description

PIN		Function	
Vin +		Connect to the positive and negative terminals of power supply. Note polarity. Use wires sizes AWG#13 or 2.5 mm ² with length not more 1 m.	
Vin -			
LD +		Connect to the laser diode anode (+) and cathode (-). Note polarity. Use wires sizes AWG#13 or 2.5 mm ² with length not more 2 m for mode 1 and not more 200 mm for modes 2, 3.	
LD -			
Control Connector	1	CANH	Connect to the CAN interface. Note polarity. Use onboard jumper J1 to connect one driver to CAN device. Delete all onboard jumper J1 except the last driver, if you connect several drivers to CAN device.
	2	CANL	
	3	Interlock +	Connect to the external interlock circuit. Open: locked, Low: operational. Internally pulled up to 3.3V by 1 k Ω resistor. Use open collector or dry contact. Note polarity. Use onboard jumper J2 to imitate interlock function. Delete onboard jumper J2 to activate interlock function.
	4	Interlock -	
	5	Trigger +	Connect to the external pulse signal generator for modes 2, 3. Note polarity.
	6	Trigger -	
	7	Modulation +	Connect to external analog voltage or external sinusoidal signal generator for mode 3. Note polarity.
	8	Modulation -	
Current monitor		Connect to 50 Ω oscillography input for current monitoring. 50 mV correspond 1 A. Use SMA connector.	

Dimensions



LaserBench

PRECISION
CONSTANT
CURRENT
**LASER
CONTROL
BENCH**



Key Features

Built-in

- Unified design for 10/14 pin Butterfly Laser Diode
- High Precision Constant Current Mode
- Output Current up to 2000 mA
- High Current Stability: 0.01 mA
- Control interfaces USB, RS-232
- Optical power stabilization mode
- On-Board TEC Controller
- Regulated Maximum TEC Current
- Hi precision temperature stability: 0.01 deg
- 12VDC Input Power

Extension

Could be extended by any Evolase laser controller board via RS232 interface

Description

The LaserBench is a constant current laser diode driver for powering 10/14-pin butterfly laser diode modules for applications, which require high precision low ripple constant current regulation.

The driver circuitry operates from a single 12VDC power source. The driver supplies a bidirectional proportional-integral-derivative (PID) thermoelectric cooler controller (TEC) with current capability of 4A and voltage capability of 4V. Maximum TEC current is regulated by user.

The main parameters of LaserBench (output current, temperature set, maximum TEC current, monitor photodiode signal) are controlled by touch screen.

The LaserBench can control multiple Evolase laser controller board via RS232 interface.

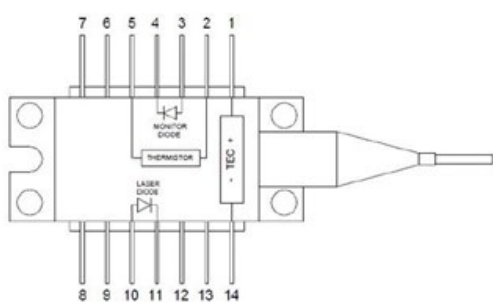


Specifications

Parameter	Min.	Typ.	Max.	Units
INPUT				
Voltage	11.8	12.0	12.2	VDC
Current	-	-	5	A
OUTPUT				
Current	-	-	2000	mA
Current regulation step	-	0.01	-	mA
Current ripple amplitude	-	-	0.1	%
Current stability	-	-	0.1	%
Current set accuracy	-	-	1	%
Compliance voltage	1	-	3	V
TEC current setting range	-4	-	+4	A
TEC voltage	1	-	4	V
TEC temperature set	5	25	50	°C
TEC temperature step	-	0.01	-	°C
TEC temperature accuracy	-	-	0.1	%
TEMPERATURE				
Operating	+10	-	+50	°C
Storage	-20	-	+70	°C
Humidity, Non-Condensing	-	-	95	%
CONNECTIONS				
Power	2 mm / 5.5 mm Jack (PJ-05AH Cui Devices)			
USB	Mini-USB, Type B (1734035-1 TE connectivity)			
Interface connector	DB9 (5-338313-2 TE connectivity)			
MECHANICAL				
Size	100 × 85 × 31 mm			
Weight, not more	200 g			

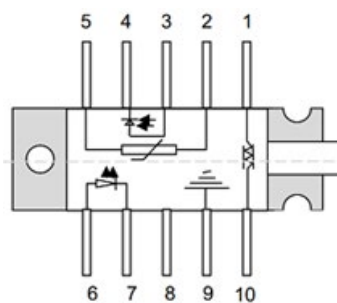
Compatible Laser Pinout

14-pin Butterfly package



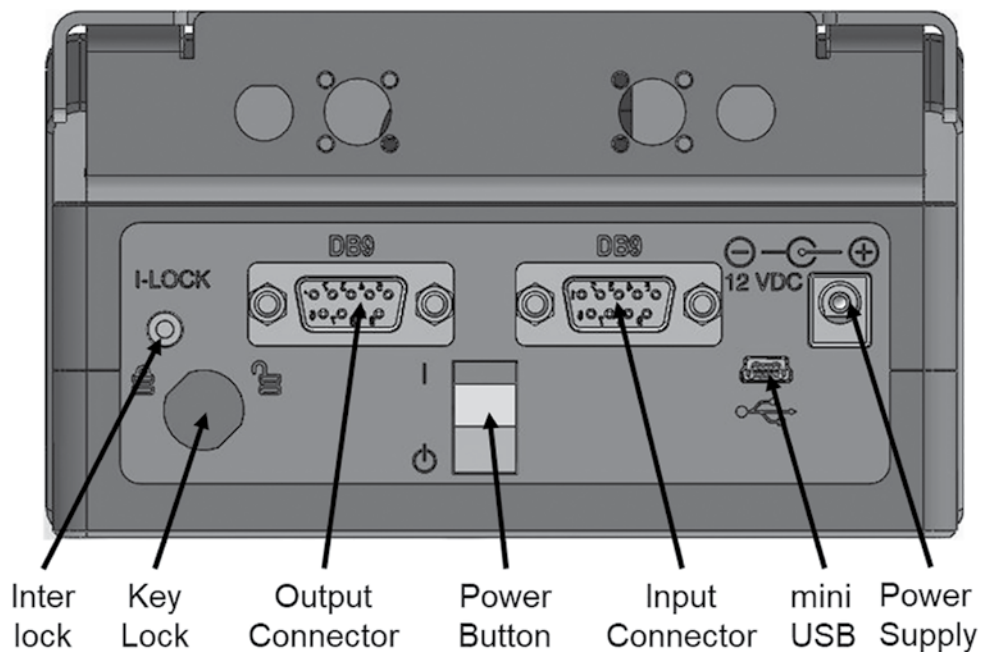
Nº	Description	Nº	Description
1	TEC Anode	8	n/c
2	Thermistor	9	n/c
3	Monitor PD Anode	10	LD Anode
4	Monitor PD Cathode	11	LD Cathode
5	Thermistor	12	n/c
6	n/c	13	n/c
7	n/c	14	TEC Cathode

10-pin Butterfly package



Nº	Description	Nº	Description
1	TEC (+)	6	Laser anode (+)
2	Thermistor	7	Laser cathode (-)
3	Monitor anode (-)	8	NC
4	Monitor cathode (+)	9	Package ground
5	Thermistor	10	TEC (-)

Connections



Input connector pinout

PIN	Function	Description
1	NC	No connection
2	RS232-RX	RS232 port reception
3	RS232 TX	RS232 port transmit
4	NC	No connection
5	GND	Device ground
6	NC	No connection
7	NC	No connection
8	CANL	CAN bus low
9	CANH	CAN bus high

Output connector pinout

PIN	Function	Description
1	+5VDC	Power output
2	+5VDC	Power output
3	+5VDC	Power output
4	GND	Device ground
5	GND	Device ground
6	GND	Device ground
7	NC	No connection
8	CANL	CAN bus low
9	CANH	CAN bus high

LASER BENCH QP

LASER DIODE CONTROLLER



Description

The Laser Bench QP is a universal compact desktop laser diode controller for driving low-power laser diodes. It contains laser diode power supply and thermoelectric module controller.

The Laser Bench QP is plastic housed desktop device with LCD display and manual controls.

The Laser Diode powering channel delivers a constant current up to 2A at a voltage up to 9V for driving laser diode.

The Thermoelectric Module channel is completed a bidirectional proportional-integral-derivative (PID) thermoelectric cooler controller (TEC) with current capability of 4A and voltage capability of 5V.

Specifications

Parameter	Min.	Typ.	Max.	Units
POWER SUPPLY				
Line Voltage	90	-	285	VAC
Frequency	50	-	60	Hz
Power Consumption	-	-	30	W
LD OUTPUT				
Power *	-	-	10	W
Compliance voltage *	1	-	9	V
Current set range *	0	-	2000	mA
Current set step	-	0.1	-	mA
Current ripple amplitude	-	40	60	mA
Current ripple frequency	-	425	-	kHz
Current set accuracy	-	-	1	%
Soft start rise time	10	13	50	mS
Soft stop fall time	10	15	50	mS
TEC OUTPUT				
Power	-	-	20	W
Compliance voltage	-5	-	+5	V
Current range	-4	-	+4	A
Temperature set range	10	25	50	°C
Temperature step	-	0.1	-	°C
Temperature accuracy	-	-	0.1	°C
TEMPERATURE				
Operating	+10	-	+40	°C
Storage	-20	-	+60	°C
Humidity, Non-Condensing	-	-	95	%
CONNECTIONS				
Power	Power Entry Connector Receptacle, Male Pins IEC 320-C8, Non-Polarized			
Output	9 Position D-Sub Receptacle, Female Sockets Connector			
CAN interface Interlock	2 Position Terminal Block Header, Male Pins			
MECHANICAL				
Size	206 × 198 × 68 mm			
Weight, not more	620 g			

Note:

* maximum output power is limited by 10 W.

The maximum output current 2000 mA can be achieved at 5V output voltage.

Output current 1100 mA can be achieved at 9V output voltage.

Applications

The Laser Bench QP has external output connector type DB9 for connecting to the 14-pin DIL laser diode mount QM14DIL or 14-pin butterfly laser diode mount QM14BTF.



QM14DIL



QM14BTF

Package set

- Laser Diode Controller – 1 pcs
- Power cord – 1 pcs
- 9-pin d-sub cable assembly
- Interlock and CAN-interface connectors – 2 pcs
- Operating Manual – 1 pcs

Also the Laser Diode Controller can be connected to the corresponding laser diode drivers by CAN interface.

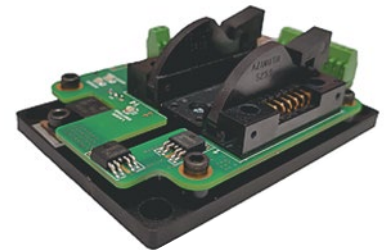
LASER LAB SOLUTION PACKAGE



Stand alone laser controller
LaserBench for all types of drivers



CW high precision LD
and SOA controller



CW laser controllers with
and without fast clamps



Picosecond laser controller



Nanosecond laser controller



High current laser controller



Nanosecond/picosecond
controller for SOA



USB/CAN hub

Key Features

- Available designs include 10/14 pin butterfly laser diodes, Type I, Type II, Type II telecom, SOA
- Output current up to 2000 mA for CW controllers
- Full current modulation for CW controllers
- Single 5 VDC input power
- Down to 40 ps pulse width for ps controller
- Adjustable pulse width 1-100 ns for ns controller
- External trigger option
- Flexible pulse bursts generation
- USB, RS-232, CAN, UART interfaces
- LabView and Python libraries
- All controllers can be controlled via single software interface or stand along LaserBench unit

Description

Evolase offers Laser Lab Solution package which includes laser diodes and SOA completed with a variety of highly flexible laser diode controllers for CW and ns/ps pulsed mode. The package allows to build complex experimental set ups and control them via single user-friendly software interface or via stand along benchtop LCD touch screen driver unit.

The set of laser diode controllers could be conveniently connected to a single lab computer or stand along benchtop LCD touch screen driver unit via USB/CAN hub.

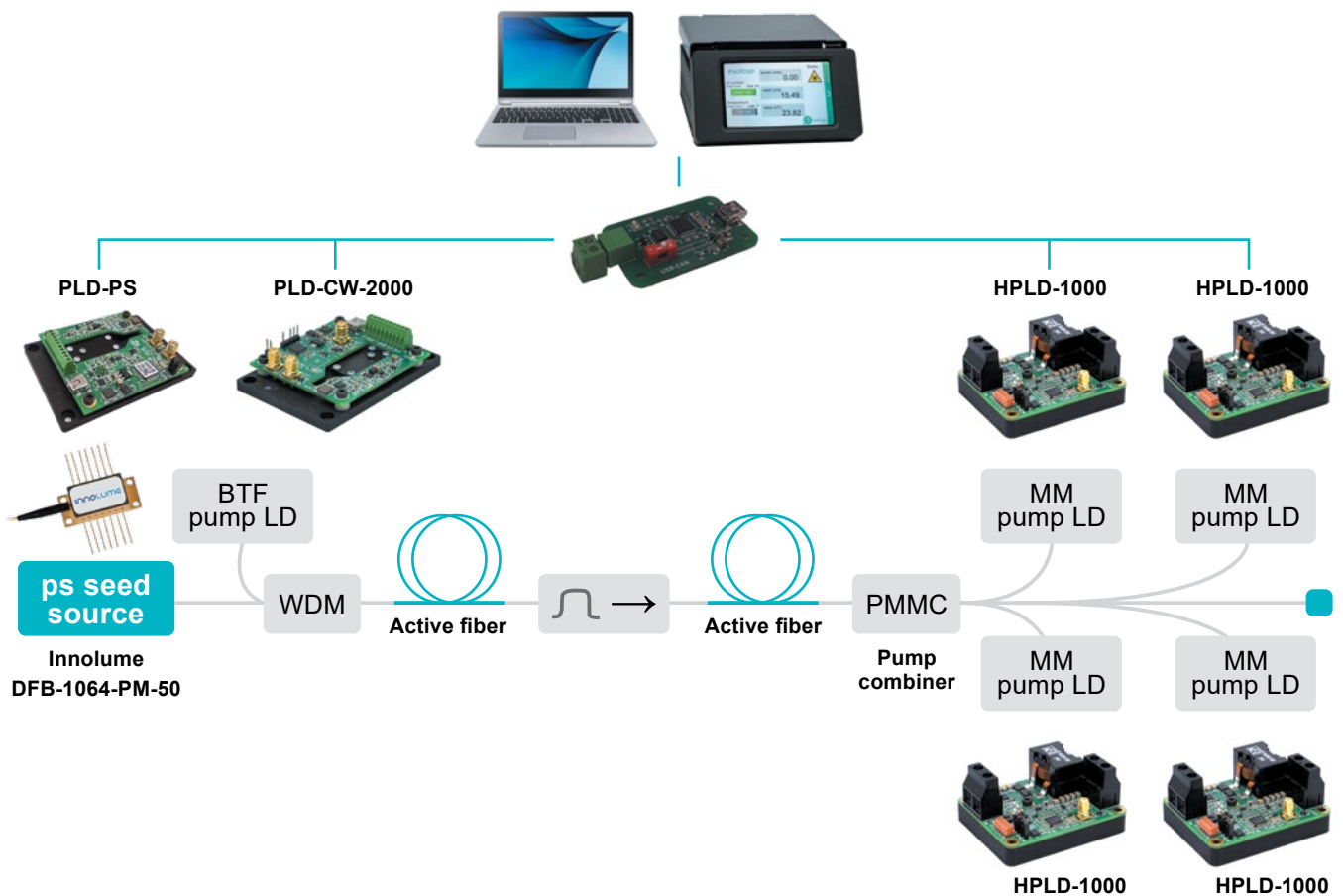
Then all drivers can be controlled via CAN protocol.

The package LDs+controllers can be used:

- to build experimental set ups for CW fiber lasers and short pulse fiber lasers including MOPA systems for picosecond and nanosecond pulses with SOA based pulse pickers
- multiwavelength laser set up
- set up for quantum communications
- set up for microwave photonics
- set up for laser telecommunication
- spectroscopic set up

Example of application

Picosecond MOPA fiber laser



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