

Picosecond Diode Lasers with Driver

PICOPOWER™-LD Series

Standard wavelengths:

375, 405, 450, 488, 510, 635, 670, 785, 850, 976,
1030, 1047, 1053, 1064, 1310, 1550 nm.

More than 60 other customer-specific wavelengths
in the range 375 nm - 2300 nm.



Laser pulses as short as
12 ps and more than 2 W peak power
for specific wavelengths.
Exchangeable laser heads.

Features

- Laser pulses as short as 12 ps for specific wavelengths
- More than 2 W peak power for specific wavelengths
- Proprietary high-frequency design for the shortest & highest peak power diode laser pulses available on the market
- Collimated free-space output or fiber-coupled
- Exchangeable laser heads with different wavelengths for greatest flexibility
- Single-, dual and multi-channel driver models
- Proprietary diode laser driver generating picosecond high-current pulses
- Built-in superior performance frequency generators for repetition rate adjustment from 1 Hz to 20, 50 or 100 MHz with a step of 1 Hz
- External TTL trigger capability and synchronized output TTL or NIM

Applications

- Microscopy
 - Confocal Laser Scanning Microscopy (CLSM)
 - Fluorescence / Phosphorescence Lifetime Imaging Microscopy (FLIM / PLIM)
 - Stimulated Emission Depletion Microscopy (STED)
 - Fluorescence Recovery After Photobleaching (FRAP)
 - Total Internal Reflection Fluorescence Microscopy (TIRFM)
 - Time-Resolved Photoluminescence (TRPL)
- Spectroscopy
 - Fluorescence (Lifetime) Correlation Spectroscopy (FCS / FLCS)
 - Fluorescence Lifetime Measurements and Time-Resolved Spectroscopy
 - Single Molecule Spectroscopy / Detection
 - Time-Correlated Single Photon Counting (TCSPC)
- Laser Physics
 - Single Photon Generation
 - Seeding of Fiber Lasers and MOPA Systems
- Other
 - Laser Imaging and 3-D Laser Scanning
 - Time-Response Characterization of Opto-Electronic Devices
 - Diffuse Optical Tomography and Imaging
 - Time of Flight (TOF) Experiments
 - Optical Time Domain Reflectometry (OTDR)



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Picosecond Diode Laser Heads: Typical Performance for STANDARD MODELS

Models with Free-Space Beam ¹⁾	Wavelength (nm) ²⁾	Spectral Width (nm) ³⁾	Pulse Width (ps) @ 50 MHz	Peak Power (mW)	Average Power (mW) @ 50 MHz ⁴⁾	Maximum Repetition Rate (MHz) ⁵⁾
FABRY-PÉROT LASER TYPE						
PICOPOWER-LD-375	375 ±5	< 1.5	30	1000	1.5	50
PICOPOWER-LD-405-L	405 ±5	< 3	25	> 1000	1.3	100
PICOPOWER-LD-405-H	405 ±5	< 3	25	> 2000	2.5	100
PICOPOWER-LD-450	450 ±10	< 4	50	750	1.9	100
PICOPOWER-LD-488	488 ±10	< 6	70	350	1.3	70
PICOPOWER-LD-510	510 ±10	< 5	75	300	1.1	50
PICOPOWER-LD-635	635 ±5	< 2	65	1300	4.3	80
PICOPOWER-LD-660	660 ±5	< 2	60	600	1.9	50
PICOPOWER-LD-670	670 ±10	< 5	40	400	0.8	100
PICOPOWER-LD-785	785 ±10	< 4	60	220	0.7	90
PICOPOWER-LD-810	810 ±5	< 8	50	400	1	100
PICOPOWER-LD-850	850 ±10	< 4	80	350	1.4	100
PICOPOWER-LD-900	900 ±10	< 7	45	100	0.3	100
PICOPOWER-LD-976	976 ±10	< 10	45	1100	2.5	50
PICOPOWER-LD-1053 ⁶⁾	1053 ±5	< 25	25	1200	1.5	70
PICOPOWER-LD-1550 ⁶⁾	1550 ±20	< 2	25	80	0.1	100
DFB LASER TYPE (Narrow Linewidth) ⁷⁾						
PICOPOWER-LD-532	532 ±2	< 0.2	40	20	0.04	50
PICOPOWER-LD-561	561 ±2	< 0.2	40	20	0.04	50
PICOPOWER-LD-594	594 ±2	< 0.2	40	20	0.04	50
PICOPOWER-LD-1030 ⁶⁾	1030 ±2	< 0.2	30	350	0.5	100
PICOPOWER-LD-1047 ⁶⁾	1047 ±2	< 0.1	40	100	0.2	50
PICOPOWER-LD-1053 ⁶⁾	1053 ±2	< 0.1	40	100	0.2	50
PICOPOWER-LD-1064 ⁶⁾	1064 ±2	< 0.2	30	350	0.5	100
PICOPOWER-LD-1310 ⁶⁾	1310 ±2	< 1.5	20	150	0.15	100
PICOPOWER-LD-1550 ⁶⁾	1550 ±2	< 0.3	12	130	0.08	100

Notes:

¹⁾ All wavelengths are available with fiber-coupling in single-mode SM or PM fibers with typical efficiency of 25% - 30% (exception: 375 nm is with multi-mode fiber).

²⁾ More than 60 customer-specific wavelengths in the range 375 nm - 2300 nm are available.

³⁾ Spectral width is larger for fiber-coupled diode lasers.

⁴⁾ Higher average powers are available for longer pulse durations.

⁵⁾ All diode lasers can be operated up to 100 MHz or even higher with lower peak powers and larger pulse widths on a special order.

⁶⁾ These diode lasers can be used for seeding of fiber and bulk amplifiers.

⁷⁾ Customer-specific wavelengths in the range 760 nm - 2300 nm are also available.

Beam profile is TEM₀₀, but slightly elliptical.

Laser class is typically 3B to 1M depending on the wavelength.

Picosecond Diode Laser Heads: Mechanical Specifications

Dimensions and Weight	Ø 25 × 155 mm, 140 g or 40 × 37 × 144 mm ³ , 250 g	<ul style="list-style-type: none"> Customer-specific housing is also available. Fiber-coupled diode lasers are integrated in the driver, but optionally they can have a stand-alone laser head.
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Picosecond Diode Laser Drivers: Typical Specifications

Parameters	Specifications			Comments
MECHANICAL				
Dimensions and Weight	255 × 118 × 270 mm, 2.6 kg			19" rack, OEM and customer-specific options are available
ELECTRICAL				
Models	PLDD-20M	PLDD-50M	PLDD-100M	
Frequency Range	1 Hz - 20 MHz	1 Hz - 50 MHz	1 Hz - 100 MHz	
Step	1 Hz	1 Hz	1 Hz	
Frequency Generator	Built-in superior performance frequency generator			Period jitter: < 10 ps
Pulse-to-Pulse Amplitude Instability ¹⁾	< 1% rms			
External TRIG IN	TTL into 50 Ω, rising edge			Duty cycle: 50%
Delay Laser Output to TRIG IN (TTL)	43 ns (typ.)			
Delay Laser Output to SYNC OUT (TTL)	34 ns (typ.)			
SYNC OUT (TTL)	+3.5 V into 50 Ω			
SYNC OUT (NIM), optional	-800 mV into 50 Ω			Pulse width is typically 5 ns
Delay Laser Output to SYNC OUT (NIM)	30 ns (typ.)			
Jitter ¹⁾ : Laser Pulse to External Trigger	< 4 ps			External trigger with rise time < 0.2 ns and amplitude 5 V ± 0.5 V
Jitter ¹⁾ : Laser Pulse to SYNC OUT (TTL)	< 4 ps			External trigger with rise time < 0.2 ns and amplitude 5 V ± 0.5 V or internal trigger
GENERAL				
Voltage / Current Requirements	100 V AC / 0.2 A, 230 V AC / 0.1 A			12 V DC supply input is optionally available
Power Consumption	20 W (typ.)			
Operating Temperature	15°C to 35°C (59°F to 95°F)			

Note: ¹⁾ These values are valid up to 30 MHz and for amplitudes not less than 50% of the maximum ones.

Picosecond Diode Laser Drivers: Options

Optional Features	Comments
• CW Mode	The optional CW mode (in addition to the pulsed mode operation) provides much higher output power which is very useful e.g. for alignment purposes ¹⁾
• Variable Amplitude	Provides easy control of the peak and average power ²⁾
• Additional Laser Heads	Allows use of a single diode laser driver to drive more than one laser head ³⁾
• Wavelength TEC Tuning	Wavelength TEC tuning is recommended for red or infrared diode lasers
• NIM Sync Output	Some signal processing devices may require NIM sync input -800 mV by default / optionally: variable 5 ns pulse width FWHM
• Multiple Independent Channels	Allows to drive two diode laser heads simultaneously. Two channels are available in the standard housing. More than two channels are possible with 19" rack housing.

Notes:

¹⁾ CW mode may reduce the peak or average power for frequencies > 50 MHz.

²⁾ Amplitudes lower than 50% from the maximum amplitude may have larger instability or larger pulse width.

³⁾ Some combinations of different diode laser heads may reduce the maximum operating frequency.

Customer-specific parameters are available upon request. Please contact us for further information.
Specifications are subject to change without prior notice.



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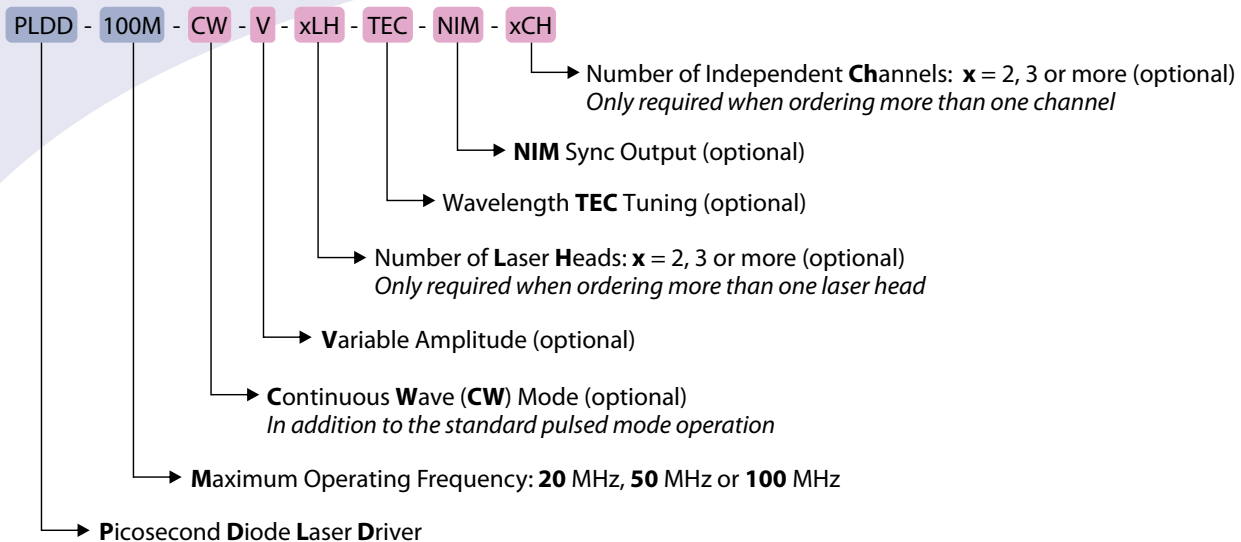
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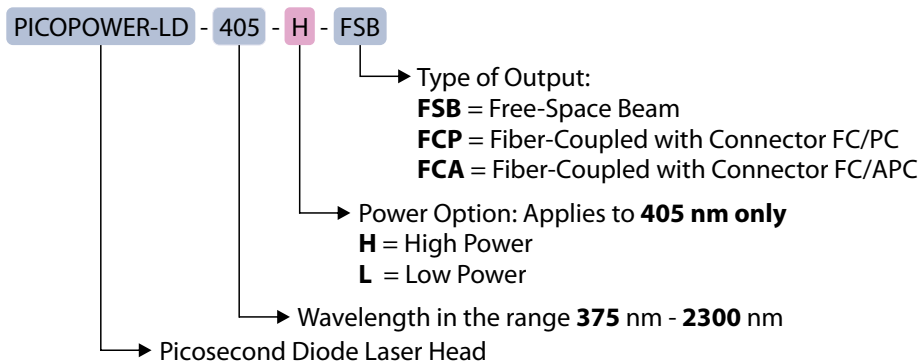
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Ordering Information for Picosecond Diode Laser Driver



Ordering Information for Picosecond Diode Laser Heads



Note: Pink color marks the optional parameters which are available to be ordered.

Ordering Example: Picosecond Diode Laser with Driver and Additional Laser Head

Picosecond Diode Laser Driver:
PLDD-50M-V-2LH-NIM

This driver has a max. frequency of **50 MHz** and includes the following options:

- Variable amplitude
- More than one laser head: **2 Laser Heads**
- **NIM** sync output

First Diode Laser Head:
PICOPOWER-LD-1064-FC/APC

Picosecond Diode Laser Head

- Wavelength: **1064 nm**
- Fiber-Coupled with **FC/APC** connector

Second Diode Laser Head:
PICOPOWER-LD-635-FSB

Picosecond Diode Laser Head

- Wavelength: **635 nm**
- Free-Space Beam



**WARNING – VISIBLE AND INVISIBLE
LASER RADIATION
AVOID EXPOSURE TO BEAM
CLASS 3B LASER PRODUCT
IEC / EN 60825-1**



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