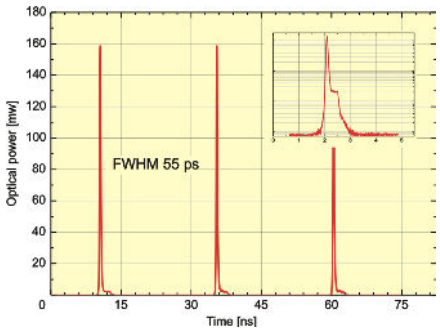
PDL 800-D

Picosecond Diode Laser Driver

- Well-known laser driver from PicoQuant
- Pulsed and CW operation
- Compact and robust
- Easily controlled via local interface
- Suited for LDH Series, LDH-FA Series, and PLS Series
- 5-year warranty

Applications

- Time-resolved measurements
- Material science & semiconductor diagnostics
- Metrology & calibration
- Ranging & LiDAR
- Lifescience, FLIM, FCS, FRET, STED, TRPL
- Diffusion measurements (DOT, DCS, TD-DCS)
- Quantum optics, single photon generation
- Seeding



The PDL 800-D is a stand-alone driver for the picosecond pulsed laser diode heads from 266 to 1560 nm (LDH-P/D/FA Series) as well as for the sub-nanosecond pulsed LEDs from 355 to 600 nm (PLS Series). The laser heads can emit light pulses as short as 40 ps FWHM at repetition rates from single shot up to 80 MHz with peak powers up to 100-200 Watts (depending on wavelength). The PDL 800-D features easy to use controls for repetition frequency and laser pulse energy. Continuous wave (CW) operation is possible with the laser heads of the LDH-D-C Series. Wavelengths can be changed quickly by simply plugging in a different laser head.

The internal oscillator has two selectable base frequencies, 80 MHz and 1 MHz. Each base frequency can be further reduced by division through 1, 2, 4, 8, 16 and 32. The highest repetition frequency that can be derived is therefore 80 MHz, the lowest repetition rate is 31.25 kHz.

Laser pulses can also be triggered by an external trigger input so that the PDL 800-D can be synchronized with other instruments over the full frequency range. A sync output allows to trigger other components such as TCSPC electronics. Gating inputs allow to disable the laser output on two time scales through an external TTL-signal.

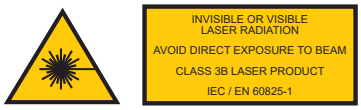
For multiple wavelengths experiments and/or automated systems requiring computer control, the multichannel Sepia PDL 828 and Taiko PDL M1 are recommended.

Picosecond pulsed diode laser modules are also available in OEM versions for system suppliers. These compact, cost-effective diode lasers with fixed parameters (repetition frequency, output power and wavelength) can easily be integrated into complex systems.

Specifications

Internal oscillator	
Type	crystal locked (up to 80 MHz max.)
Operation mode	pulsed or Continuous wave (CW)
Base frequencies	80 MHz, 1 MHz (selectable)
Repetition frequencies	user selectable: 1, 1/2, 1/4, 1/8, 1/16, 1/32 of base frequency: • 80, 40, 20, 10, 5 or 2.5 MHz • 1000, 500, 250, 125, 62.5 or 31.25 kHz
Jitter	typ. 3-5 ps
External trigger input	
Amplitude	- 5 to + 5 V (maximum limits)
Trigger level (adjustable)	-1 to + 1 V (negative slope)
Pulse width	> 5 ns
Frequency range	10 Hz to 80 MHz
Delay	trigger input to optical output[1]: typ. 35 ± 5 ns
Impedance	50 Ohms (dynamic), 50 Ohms (static)
Connector type	BNC (female)
Synchronization output	
Amplitude	< -800 mV into 50 Ohms (NIM)
Pulse width	6 ns
Delay	12 ns (from falling edge to laser output)
Impedance	50 Ohms
Connector type	SMA (female)
Gating inputs	
Slow gate	transition time < 100 ms (pulsed and CW)
Internal Impedance	> 500 Ohms
Connector Type	4-pin LEMO socket - 00.304 series, example of connector: FGG.00.304.CLA
Fast gate	transition time typ. 10 ns (pulsed only)
Internal Impedance	50 Ohms
Connector Type	1-pin LEMO socket - 00.250 series, example of connector: FFA.00.250.NTA
Remote interlock	
Voltage	< 7 VDC
Loop resistance	10 Ohms max.
Power supply	
Line voltage	220/240 or 110/120 VAC, 50/60 Hz
Power consumption	45 Watts max.
Dimensions	
Driver unit	237 × 310 × 97 mm (w × d × h)
Temperature range	10 - 40 °C

[1] The value of the delay between the trigger signal input and the optical pulse output can vary in the range of ± 5 ns depending on the PDL 800-D driver and on the laser diode head which is attached to it. For a given hardware combination, the delay is defined and constant, only the jitter applies.



These tables are updated on a regular basis based on data of recently manufactured laser heads. Other specifications such as shorter pulse widths or higher powers than listed might be possible depending on the performance of diodes on stock. Please contact us for more information. All measurements shown may be subject to a 10 % calibration error. Each laser head undergoes an extensive burn-in test to ensure long-term stability and is shipped with a comprehensive set of test data. This test data is kept in our database, which already holds records of more than 18 years.

Pulsed Light Sources

LDH-P/D/FA Series

Picosecond pulsed laser diode heads

Available wavelengths: 266-1560 nm, pulsed and CW operation, Peltier cooled, options: high power, narrow linewidth, short pulses, fiber coupling to single mode and multimode optical fibers

PLS Series

Sub-nanosecond pulsed LEDs

Available wavelengths: 355-600 nm, options: spectral bandpass filter

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