

PDL 800-D



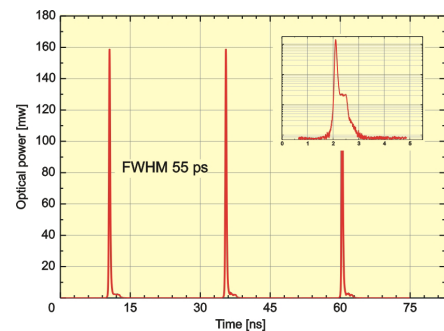
Picosecond Pulsed Diode Laser Driver

- Pulsed and CW operation
- Easily selectable repetition rates from 31.25 kHz to 80 MHz
- Externally triggerable from single shot up to 80 MHz / sync output
- Laser pulse energy adjustable via driver unit
- Laser heads from 266 to 1990 nm, LED heads from 245 to 600 nm
- External trigger / sync output



Applications

- Time-resolved fluorescence spectroscopy
- Single molecule spectroscopy
- Test and measurement of detectors and optical fibers
- Diffuse Optical Tomography (DOT) of biological tissue
- Confocal microscopy (FLIM-, FRET-, FCS-imaging)
- Stimulated Emission Depletion (STED) microscopy
- Quantum optics, single photon generation
- Materials research



The PDL 800-D is a stand-alone driver for the picosecond pulsed laser diode heads from 266 to 1990 nm (LDH-P/D/FA Series) as well as for the sub-nanosecond pulsed LEDs from 245 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 latest generation of laser heads, the LDH-D Series. Wavelengths can be changed quickly by simply plugging in a different laser or LED 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.

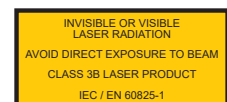
Laser pulses can also be triggered by an external trigger input so that the PDL 800-D can be synchronized with other instruments over the full frequency range. A sync output allows to trigger other components such as TCSPC electronics. Gating inputs allow to disable the laser output on two time scales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

For multiple wavelengths experiments and automated systems, the computer controlled multichannel PDL 828 "Sepia II" is 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 |
| 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 | 35 ± 5 ns (from trigger input to optical output), jitter < 20 ps |
| 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), jitter < 20 ps |
| 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 |



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: 266-1990 nm, pulsed and CW operation, peltier cooled, options: high power, narrow linewidth, short pulses, fiber coupling to singlemode and multimode optical fibers

PLS Series

Sub-nanosecond pulsed LEDs



Available wavelengths: 245-600 nm, options: spectral bandpass filter