

CPDL-M/S Series



Compact Diode Lasers for Integration

- Compact design for integration
- Wavelengths between 375 and 1990 nm
- Pulse widths < 100 ps
- Fixed intensity setting
- Internally triggered or externally triggered versions

Applications

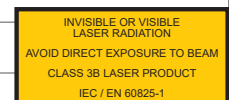
- Time-resolved measurement
- Fluorescence lifetime
- Diffusion measurements
- Testing & Semiconductor Diagnostic
- Metrology & ranging (LiDAR)
- Seeding



PicoQuant's CPDL-M and CPDL-S Series consists of a range of laser heads suited for integration. They are based on our well established picosecond pulsed diode laser technologies as found in our LDH Series. CPDL-M and CPDL-S heads do not require a laser driver from the PDL Series for operation. Some (easy) integration work on the customer's side is needed to provide electrical power. The laser heads do not require any adjustment and are delivered with fixed intensity settings (e.g.. pulse shape setting). They can be triggered either internally (CPDL-M) at selected a fixed set of user selectable repetition rates or externally (CPDL-S) at any repetition rate from single shot up to typically 40 MHz.

Specifications

Beam parameters	
Optics focus length	$f = 4.5 \text{ mm}$
Numerical aperture	0.55
Typical divergence (with optics)	theta parallel $< 0.6 \text{ mrad}$
	theta perpendicular $< 0.5 \text{ mrad}$
Polarisation	typ. linear, perpendicular to the longer axis of the elliptical beam
PER	typ. $> 1:10$ ($> 10 \text{ dB}$)
Side Mode Suppression Ratio (SMSR)	typ. < 0.01
Pulse Repetition rate	
CPDL-M (Master, internally triggered)	standard: 40, 20, 10, 5 MHz (On request: 80, 40, 20, 10 MHz)
CPDL-S (Slave, externally triggered)	standard: single shot up to 40 MHz (On request: up to 80 MHz)
Sync Out (CPDL-M only)	
Connector	SMA, coaxial
Source Impedance	50 Ohm
Amplitude	$< -0.8 \text{ V}$
Pulse width	Min. $> 5 \text{ ns}$ Max. $< 10 \text{ ns}$
Trigger Input (CPDL-S only)	
Connector	NIM-CAMAC
Internal Impedance	50 Ohms
Trigger Level	0.5 V
Pulse width	min. 5 ns
Repetition frequency	max. 40 MHz (on request up to 80 MHz)
Active slope	rising edge
Recommended Trigger Signal (CPDL-S only)	
Amplitude	+1V
Source impedance	50 Ohms
Pulse width	$> 6 \text{ ns}$
Slope	1 ns (10 to 90%)
Dimensions	
free beam	62 × 100 mm (diameter × length)
with fiber coupling	62 × 132 mm (diameter × length)
Spectral width	
Wavelengths $< 900 \text{ nm}$	approx. 2 to 8 nm
Wavelengths $> 900 \text{ nm}$	approx. 10 to 20 nm
Power stability (cooled)	
12 hours, Delta T (ambient) $< 3 \text{ K}$	1 % RMS, 3 % peak to peak
Environmental	
Operating Temperature	15° to 40°C
Power Supply	
Voltage	22 to 25 VDC
Current	$< 1 \text{ A}$



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.

Wavelengths

The table below is a non exhaustive list of possible wavelengths based on data from recently manufactured laser heads. Further wavelength and other other specifications such as shorter pulse widths or higher powers might be available upon request. Please contact us for more information.

Wavelength (± 10) [nm]	Type (LDH-)	Pulse ¹ (FWHM) [ps]	Standard average power ² [mW]	High average power ³ [mW]
375	CPDL-M/S-375	< 40	0.8	4.0
395	CPDL-M/S-395	< 70	1.0	5.0
405	CPDL-M/S-405	< 50	1.0	3.0
420	CPDL-M/S-420	< 70	0.5	5.0
440	CPDL-M/S-440	< 80	0.8	4.0
450	CPDL-M/S-450	< 70	0.7	5.0
470	CPDL-M/S-470	< 70	0.8	4.0
485	CPDL-M/S-485	< 90	0.7	5.0
500	CPDL-M/S-500	< 100	0.7	5.0
510	CPDL-M/S-510	< 110	0.6	4.0
640	CPDL-M/S-640	< 90	1.0	10.0
650	CPDL-M/S-650	< 90	0.4	3.0
660	CPDL-M/S-660	< 90	0.5	5.0
685	CPDL-M/S-685	< 70	0.5	4.0
705	CPDL-M/S-705	< 70	1.0	5.0
730	CPDL-M/S-730	< 70	1.0	3.0
760	CPDL-M/S-760	< 90	0.3	3.0
785	CPDL-M/S-785	< 70	0.5	5.0
830	CPDL-M/S-830	< 70	0.15	4.0
1060 (± 20)	CPDL-M/S-1060	< 90	0.7	10.0
1550 (± 30)	CPDL-M/S-1550	< 50	0.01	0.5

¹ Shortest pulse width at optimal intensity setting above laser threshold (standard factory setting). Pulses are deconvoluted with 30 ps detection IRF. Shorter pulse widths are available on demand.

² Average optical power at shortest pulse width (standard factory setting) and 40 MHz repetition rate.

³ On request: maximal average optical power for high intensity setting and broad pulses (special factory setting).