

# LDH Series

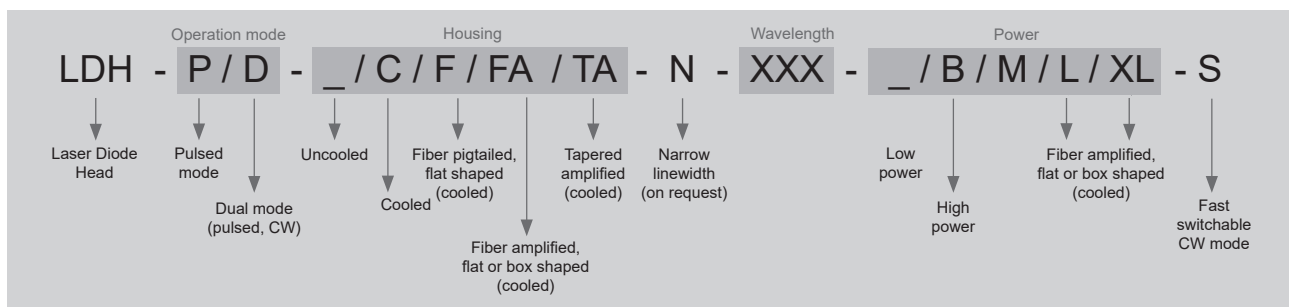
## Picosecond Laser Diode Heads for PDL 800-D / PDL 828

- **NEW** PIE-ALEX ready fast-switched laser heads – best controlled via Sepia PDL 828
- Wavelengths between 375 nm and 1990 nm
- Pulse widths as short as 20 ps (FWHM)
- Repetition rate from single shot to 80 MHz
- Adjustable (average) power up to 380 mW
- Peak power up to 1 W
- Pulsed, burst, and CW operation
- TE cooled, collimated beam, optional fiber coupling



### Applications

- Time-resolved measurements
- Lifetime spectroscopy and microscopy, FLIM, FCS, STED
- Semiconductor diagnostic and detector calibration
- LiDAR
- Seeding



C: Laser head with thermoelectric cooler, mandatory for some laser heads, optional for all other laser heads

S: **NEW** ns fast-switched capability for CW mode. PIE-ALEX ready – best controlled via Sepia PDL 828

M: Transversal multi-mode structure, reduced coupling efficiency into single mode fibers, not suited for microscopy applications

F: Laser head emits a divergent beam from FC/APC fiber output connector

The following tables list the pulse parameters and power values of the available wavelengths of the LDH Series. The two power adjustment levels specified here refer to the same laser head. These levels can be adjusted using the corresponding driver of the PDL Series (PDL 800-B, PDL 800-D, PDL 808 “Sepia“, PDL 828 “Sepia II“). The ‚low‘ adjustment is the best choice for shortest pulses and is usually reached close to the lasing threshold. The ‚high‘ adjustment is used to achieve highest pulse power at moderate pulse length and corresponds to the maximum intensity setting of the driver. Dual mode laser heads (LDH-D Series, pulsed and CW operation) can only be controlled by the PDL 800-D or PDL 828 „Sepia II“ laser driver. These laser heads have a spectral width of a few nm. Special selected laser heads with narrow spectral bandwidth can also be provided.

## Wavelengths

Wavelength (± 10) [nm]	Type (LDH-)	Pulse <sup>1</sup> (FWHM) [ps]	Max rep. rate [MHz]	High avg. power <sup>2</sup> [mW]	Low avg. power <sup>3</sup> [mW]	CW power [mW]
266 (± 3)	P-FA-266	Please see separate datasheet for LDH-P-FA Series.				
355 (± 3)	P-FA-355	Please see separate datasheet for LDH-P-FA Series.				
375 (± 5)	D-C-375	< 70	40	5.0	0.8	40
	D-C-375M	On request				
395	D-C-390	< 70	40	5.0	1.0	30
405	D-C-405	< 50	40	3.0	1.0	50
	D-C-405S	< 50	40	3.0	1.0	50
	P-C-405M	< 200	40	25.0	5.0	.....
420	D-C-420	< 70	40	5.0	0.5	30
440	D-C-440	< 70	40	4.0	1.0	50
	D-C-440S	< 80	40	4.0	0.8	50
	P-C-440M	On request				
450	D-C-450	< 70	40	5.0	0.7	10
	D-C-450M	< 110	40	20.0	1.0	200
	D-C-470	< 70	40	4.0	0.8	60
	D-C-470S	< 70	40	4.0	0.8	60
	D-C-470M	< 120	40	20.0	8.0	200
485	D-C-485 <sup>4</sup>	< 100	40	5.0	0.9	50
	D-C-485S <sup>4</sup>	< 90	40	5.0	0.7	50
488 (± 3)	D-C-488	< 140	40	4.0	0.7	40
500	D-C-500	< 100	40	5.0	0.7	40
510	D-C-510 <sup>4</sup>	On request				
	D-C-510S <sup>4</sup>	On request				
515 (± 3)	P-FA-515L	Please see separate datasheet for LDH-P-FA Series.				
515 (± 10)	D-C-515	< 170	40	4.0	1.3	40
520	P-C-520M	< 160	40	25.0	6.0	--
532 (± 3)	P/D-FA-530B/L/XL	Please see separate datasheet for LDH-P-FA Series.				
532 (± 3)	D-TA-530	< 80	80	0.7	0.3	10
	D-TA-530B	< 80	80	1.1	0.5	20
557 (± 3)	P-FA-560	Please see separate datasheet for LDH-P-FA Series.				
561 (± 3)	D-TA-560	< 80	80	0.5	0.3	5
	D-TA-560B	< 80	80	0.7	0.5	20
594 (± 3)	D-TA-595	< 100	80	0.3	0.2	5
	D-TA-595B	< 100	80	0.5	0.4	5
596 (± 3)	P-FA-595B	Please see separate datasheet for LDH-P-FA Series.				
635	D-C-635M	< 120	80	20.0	4.0	100
640	D-C-640	< 90	80	20.0	3.0	50
	D-C-640S	< 90	80	20.0	2.0	50
655	D-C-650	< 90	80	6.0	0.9	10
	D-C-660	< 90	80	10.0	1.0	30
	D-C-670B	< 90	80	4.0	0.7	15
670	D-C-670	< 70	80	2.0	0.7	3
685	D-C-690	< 70	80	8.0	1.0	20
	D-C-705	< 70	80	10.0	2.0	20
	D-C-730	< 70	80	6.0	2.0	15
760 (± 3)	P-C-N-760	On request				
766 (± 3)	P-FA-765XL	Please see separate datasheet for LDH-P-FA Series.				
775 (± 3)	P-FA-775XL	Please see separate datasheet for LDH-P-FA Series.				
780	D-C-780	< 70	80	10.0	1.0	40
805	D-C-810	< 110	80	10.0	1.0	50
	D-C-810M	< 90	80	30.0	3.0	100

Wavelength (± 10) [nm]	Type (LDH-)	Pulse <sup>1</sup> (FWHM) [ps]	Max rep. rate [MHz]	High avg. power <sup>2</sup> [mW]	Low avg. power <sup>3</sup> [mW]	CW power [mW]	
830	D-C-830	< 70	80	8.0	0.3	20	
	D-C-830M	< 90	80	30.0	10.0	100	
840	D-C-840	< 80	80	4.0	0.5	30	
852 (± 3)	P-C-N-850	On request					
	D-C-850	< 90	80	10.0	3.0	50	
905	D-C-905	< 90	80	8.0	1.5	50	
940	D-C-940	< 90	80	5.0	1.4	50	
975	D-C-980	< 80	80	6.0	1.8	50	
976	P-F-980	< 110	80	25.0	7.0		
	D-F-980	< 110	80	25.0	7.0	100	
980	P-C-980MB <sup>5</sup>	< 6000	80	380.0	--	--	
1062 (± 3)	D-C-N-1064	< 80	80	10.0	0.3	25	
1063 (± 3)	P-FA-1060/XL	Please see separate datasheet for LDH-P-FA Series.					
1080	D-C-1080	< 50	80	4.0	2.5	30	
1120	D-C-1120	< 90	80	5.0	2.5	20	
1310 (± 20)	P-C-1310	< 50	80	2.0	0.1	--	
	D-C-1310	< 50	80	2.0	0.1	5	
1532 to 1560 (± 3)	P-FA-1530/XL	Please see separate datasheet for LDH-P-FA Series.					
1550 (± 20)	D-C-1550	< 60	80	1.0	0.05	2.5	
1550 (± 10)	D-C-N-1550	< 50	80	2.0	0.1	10	
1550 (± 3)	D-F-N-1550	< 60	80	2.0	0.4	20	
1990 (± 40)	P-F-1990	< 120	80	0.3	0.1	--	

<sup>1</sup> Shortest pulse width at min intensity setting above laser threshold. Possible pulse broadening at high intensity settings. Pulses are deconvoluted with 30 ps detection IRF. Shorter pulse widths are available on demand.

<sup>2</sup> Average optical power at max repetition rate and max intensity setting.

<sup>3</sup> Average optical power at max repetition rate and min intensity setting above laser threshold.

<sup>4</sup> Different coupling efficiency into optical fibers for pulsed and CW operation due to astigmatism and possible wavelength shift. The coupling is optimized for pulsed operation as standard.

<sup>5</sup> The max sustained repetition rate without extra cooling is 40 MHz. 80 MHz is meant to be used in burst mode with duty cycle of max 50% for e.g. upconversion application. A sustained operation at 80 MHz is possible with external fan cooling. Without external cooling, possible overheating may occur after a few minutes, leading to safety shut-off.

## Specifications

Beam parameters	
Optics focus length	f' = 4.5 mm (typ. for LDH-P/D-C-xxx) f' = 9.0 mm (typ. for LDH-D-TA-xxx)
Numerical aperture	0.55
Typical divergence with optics	typ. Theta    0.11 mrad, typ. Theta ⊥ 0.32 mrad
Polarization	typ. linear, perpendicular to the longer axis of the elliptical beam <sup>1</sup>
PER	typ. > 1:10 (> 10 dB)
Sidemode suppression ratio (SMSR)	typ. < 0.01
Cooling (optional)	
Peltier cooling stability	better than 1 K for ambient temperature between 15 °C and 30°C
Spectral width <sup>2</sup>	
Wavelength < 900 nm	approx. 2-8 nm
Wavelength > 900 nm	approx. 10-20 nm
CW operation	< 1 nm
Power stability (cooled)	
12 hours, DT <sub>ambient</sub> < 3 K	1 % RMS, 3 % peak to peak
Dimensions	
Cooled (∅ × length)	62 × 100 mm, with fiber coupling: 62 × 132 mm
Flat type (l × w × h)	195 × 112 × 24 mm
Cooled D-TA-type (∅ × length)	68 × 148 mm
„F-type“ with FC/APC connector (l × w × h)	200 × 100 × 35 mm

<sup>1</sup> a few exceptions to this behavior might occur

<sup>2</sup> narrower bandwidth might be available on request

