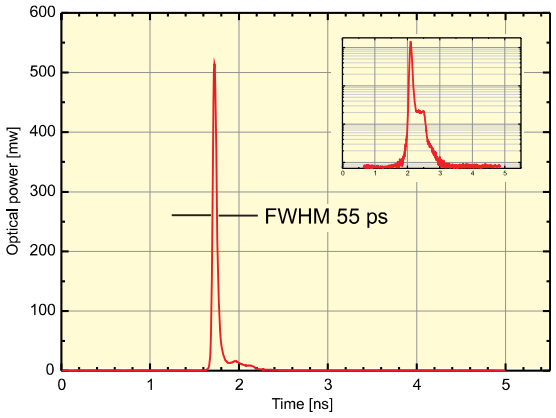
LDH Series

PicoQuant

Picosecond Laser Diode Heads for PDL 800-B/-D/808/828



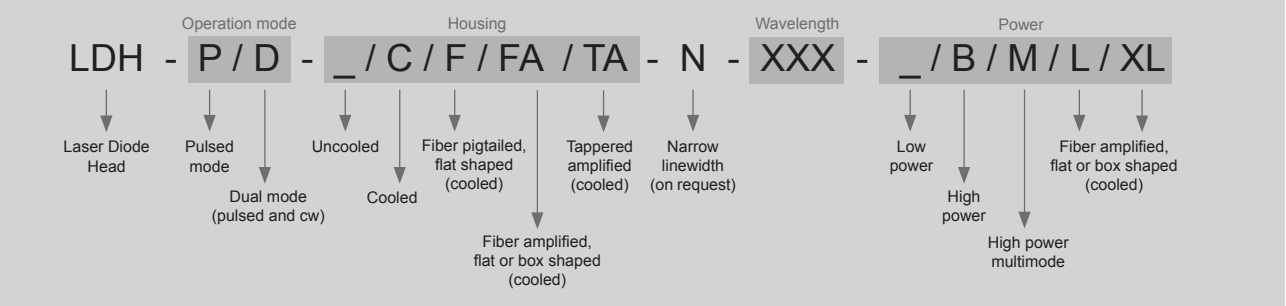
- Wavelengths from 375 to 1990 nm
- Peak power up to 1 W
- Pulse widths as short as 50 ps (FWHM)
- Repetition rates from single shot to 80 MHz
- Collimating optics, optional fiber, coupler and peltier cooling
- Optional dual mode: CW and pulsed operation

Applications

- Time-resolved fluorescence spectroscopy/microscopy
- Biochemical analytics
- Time-response characterization of opto-electronic devices
- Diffuse Optical Tomography (DOT)
- Seed for fiber lasers
- Single photon sources
- Quantum optics
- Optical Time Domain Reflectometry (OTDR)

These following tables lists the pulse paramters 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.

Naming scheme of the LDH Series laser heads



C: Laser head with thermoelectric cooler, mandatory for some laser heads, optional for all other laser heads
F: Laser head emits a divergent beam from FC/APC fiber output connector
M: Transversal multimode structure, reduced coupling efficiency into single mode fibers

			Power adjust = low (narrow pulse)			Power adjust = high (wide pulse)		
Wavelength	**Type**	**CW power**	**Pulse**	**Average power**		**Pulse**	**Average power**	
(± 10)	(LDH-)		(FWHM)	**40 MHz**	**80 MHz**	(FWHM)	**40 MHz**	**80 MHz**
[nm]		[mW]	[ps]	[mW]	[mW]	[ps]	[mW]	[mW]
266 (± 3)	P-FA-266	--	Please see separate data sheet for LDH-P-FA Series.					
375	P-C-375	--	< 70	0.5	--	< 300	1.0	--
	P-C-375B	--	< 70	0.5	--	< 300	3.0	--
	D-C-375	10	< 70	0.5	--	< 300	3.0	--
395	P-C-390	--	< 70	1.0	--	< 300	5.0	--
	D-C-390	30	< 70	1.0	--	< 300	5.0	--
405	P-C-405	--	< 70	0.4	0.8	< 300	2.0	4.0
	P-C-405B	--	< 70	1.0	--	< 500	3.0	--
	D-C-405	50	< 70	1.0	--	< 500	3.0	--
	P-C-405M	--	< 70	2.0	--	< 600	20.0	--
	D-C-405M	200	< 70	2.0	--	< 600	20.0	--
420	P-C-420	--	< 70	0.5	--	< 300	5.0	--
	D-C-420	30	< 70	0.5	--	< 300	5.0	--
440	P-C-440	--	< 90	0.4	--	< 300	2.0	--
	P-C-440B	--	< 90	0.8	--	< 500	4.0	--
	D-C-440	50	< 90	0.8	--	< 500	4.0	--
	P-C-440M	--	< 90	3.0	--	< 500	20.0	--
	D-C-440M	200	< 90	3.0	--	< 500	20.0	--
450	P-C-450	--	< 100	0.5	--	< 300	2.0	--
	P-C-450B	--	< 90	0.7	--	< 300	5.0	--
	D-C-450	10	< 90	0.7	--	< 300	5.0	--
470	P-C-470	--	< 90	0.4	--	< 500	2.0	--
	P-C-470B	--	< 90	0.8	--	< 500	4.0	--
	D-C-470	40	< 90	0.8	--	< 500	4.0	--
485	P-C-485	--	< 110	0.4	--	< 500	2.0	--
	P-C-485B	--	< 100	0.7	--	< 550	5.0	--
	D-C-485*	50	< 100	0.7	--	< 550	5.0	--
500	P-C-500	--	< 130	0.5	--	< 500	2.0	--
	D-C-500	5	< 130	0.5	--	< 500	2.0	--
510	P-C-510	--	< 130	0.3	--	< 600	2.0	--
	P-C-510B	--	< 110	0.6	--	< 600	4.0	--
	D-C-510*	40	< 110	0.6	--	< 600	4.0	--
532 (± 3)	P-FA-530B/L/XL	--	Please see separate data sheet for LDH-P-FA Series.					
561 (± 3)	D-TA-560	5	< 80	--	0.2**	--	--	--
594 (± 3)	D-TA-595	5	< 80	--	0.2**	--	--	--
635	P-635	--	< 90	0.3	0.6	< 400	2.5	4.0
	P-C-635M	--	< 100	2.0	4.0	< 500	10.0	20.0
	D-C-635M	100	< 100	2.0	4.0	< 500	10.0	20.0
640	P-C-640B	--	< 100	1.0	2.0	< 500	10.0	20.0
	D-C-640	50	< 100	1.0	2.0	< 500	10.0	20.0

			Power adjust = low (narrow pulse)			Power adjust = high (wide pulse)		
Wavelength	**Type**	**CW power**	**Pulse**	**Average power**		**Pulse**	**Average power**	
(± 10)	(LDH-)		(FWHM)	**40 MHz**	**80 MHz**	(FWHM)	**40 MHz**	**80 MHz**
[nm]		[mW]	[ps]	[mW]	[mW]	[ps]	[mW]	[mW]
655	P-650	--	< 70	0.4	0.9	< 400	3.0	6.0
	D-C-650	10	< 70	0.4	0.9	< 400	3.0	6.0
660	P-660	--	< 90	0.5	1.0	< 500	5.0	10.0
	D-C-660	30	< 90	0.5	1.0	< 500	5.0	10.0
665	P-670B	--	< 90	0.3	0.7	< 400	2.0	4.0
	D-C-670B	15	< 90	0.3	0.7	< 400	2.0	4.0
670	P-670	--	< 70	0.3	0.7	< 300	1.0	2.0
	D-C-670	3	< 70	0.3	0.7	< 300	1.0	2.0
690	P-690	--	< 70	0.5	1.0	< 400	4.0	8.0
	D-C-690	20	< 70	0.5	1.0	< 500	4.0	8.0
705	P-705	--	< 70	1.0	2.0	< 400	5.0	10.0
	D-C-705	20	< 70	1.0	2.0	< 400	5.0	10.0
730	P-730	--	< 100	0.7	1.5	< 400	2.0	4.0
	P-C-730	--	< 70	1.0	2.0	< 400	3.0	6.0
	D-C-730	15	< 70	1.0	2.0	< 400	3.0	6.0
760	P-760	--	< 100	0.4	0.9	< 600	3.0	6.0
	P-C-760	--	< 100	0.4	0.9	< 600	3.0	6.0
	D-C-760	10	< 100	0.4	0.9	< 600	3.0	6.0
766 (± 3)	P-FA-765	Please see separate data sheet for LDH-P-FA Series.						
785	P-780	--	< 70	0.5	1.0	< 500	5.0	10.0
	P-C-780	--	< 70	0.5	1.0	< 500	5.0	10.0
	D-C-780	40	< 70	0.5	1.0	< 500	5.0	10.0
806	P-810	--	< 90	0.4	0.9	< 500	5.0	10.0
	P-C-810	--	< 90	0.4	0.9	< 500	5.0	10.0
	D-C-810	30	< 90	0.4	0.9	< 500	5.0	10.0
830	P-830	--	< 70	0.2	0.4	< 300	4.0	8.0
	P-C-830	--	< 70	0.2	0.4	< 300	4.0	8.0
	D-C-830	20	< 70	0.2	0.4	< 300	4.0	8.0
835	P-840	--	< 90	1.0	2.0	< 750	6.0	12.0
	P-C-840	--	< 90	1.0	2.0	< 750	6.0	12.0
	D-C-840	30	< 90	1.0	2.0	< 750	6.0	12.0
850	P-850	--	< 70	0.5	1.0	< 500	4.5	9.0
	P-C-850	--	< 70	0.5	1.0	< 500	4.5	9.0
	D-C-850	40	< 70	0.5	1.0	< 500	4.5	9.0
905	P-905	--	< 90	0.5	1.0	< 300	4.0	8.0
	P-C-905	--	< 90	0.5	1.0	< 300	4.0	8.0
	D-C-905	50	< 90	0.5	1.0	< 300	4.0	8.0
930		On request.						
950		On request.						
965	P-965	--	< 90	1.2	2.5	< 400	10.0	20.0
	P-C-965	--	< 90	1.2	2.5	< 400	10.0	20.0
	D-C-965	30	< 90	1.2	2.5	< 400	10.0	20.0
975		On request.						
1025	P-F-1030	--	< 90	1.0	2.0	< 550	5.0	10.0
1060 (± 20)	P-1060	--	< 70	1.0	2.0	< 100	10.0	20.0
	P-C-1060	--	< 70	1.0	2.0	< 100	10.0	20.0
	D-C-1060	50	< 70	1.0	2.0	< 100	10.0	20.0
1063 (± 3)	P-FA-1060/L	Please see separate data sheet for LDH-P-FA Series.						
1080	P-C-1080	--	< 50	1.2	2.5	< 50	2.0	4.0
	D-C-1080	30	< 50	1.2	2.5	< 50	2.0	4.0
1120	P-C-1120	--	< 90	1.2	2.5	< 90	2.5	5.0
	D-C-1120	20	< 90	1.2	2.5	< 90	2.5	5.0
1310 (± 20)	P-1310	--	< 50	0.08	0.15	< 500	1.0	2.0
	P-C-1310	--	< 50	0.08	0.15	< 500	1.0	2.0
	D-C-1310	5	< 50	0.08	0.15	< 500	1.0	2.0
1532 (± 3)	P-FA-1530	Please see separate data sheet for LDH-P-FA Series.						
1550 (± 30)	P-1550	--	< 50	0.01	0.02	< 400	0.5	1.0
	P-C-1550	--	< 50	0.01	0.02	< 400	0.5	1.0
	D-C-1550	2.5	< 50	0.01	0.02	< 400	0.5	1.0
1990	P-F-1990	--	< 120	0.05	0.1	< 500	0.15	0.3

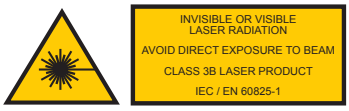
*different coupling efficiency into optical fibers for pulsed and CW operation due to astigmatism
** higher pulse energies possible at lower repetition rates

On request: narrow spectral bandwidth

The given specification are for information only, possible changes may occur.

				Power adjust = low (narrow pulse)			Power adjust = high (wide pulse)		
Wavelength	**Variation**	**Type**	**Spectral**	**Pulse**	**Average power**		**Pulse**	**Average power**	
		(LDH-)	(FWHM)	(FWHM)	**40 MHz**	**80 MHz**	(FWHM)	**40 MHz**	**80 MHz**
[nm]	[nm]		[nm]	[ps]	[mW]	[mW]	[ps]	[mW]	[mW]
772	± 3	P-C-N-780	< 1.0	< 120	1.2	2.5	< 350	3.5	7.0
784	± 3	P-C-N-780	< 0.3	< 100	0.9	1.6	< 500	4.0	8.0
852	± 3	P-C-N-845	< 0.3	< 100	0.7	1.5	< 350	4.5	9.0
976	± 3	P-C-N-976	< 0.5	--	--	--	< 90	5.0	10.0
1063	± 3	P-F-N-1064	< 0.5	< 100	0.4	0.9	< 700	5.0	10.0
1064	± 3	P-C-N-1064	< 1	< 130	0.6	1.3	< 600	5.0	10.0
1275	± 7	P-C-N-1310	< 0.5	< 40	0.01	0.03	< 250	0.6	1.3
1300	± 7	P-C-N-1310	< 0.5	< 40	0.01	0.03	< 250	0.6	1.3
1310	± 7	P-C-N-1310	< 0.5	< 40	0.01	0.03	< 250	0.6	1.3
1325	± 7	P-C-N-1310	< 0.5	< 40	0.01	0.03	< 250	0.6	1.3
1349	± 7	P-C-N-1310	< 0.5	< 40	0.01	0.03	< 250	0.6	1.3
1417	± 3	--	< 0.2	< 100	0.01	0.03	< 400	0.5	1.0
1470	± 3	P-C-N-1550	< 0.2	< 40	0.02	0.05	< 500	0.6	1.3
1490	± 3	P-C-N-1550	< 0.2	< 40	0.02	0.05	< 500	0.6	1.3
1510	± 3	P-C-N-1550	< 0.2	< 40	0.02	0.05	< 500	0.6	1.3
1530	± 3	P-C-N-1550	< 0.2	< 40	0.02	0.05	< 500	0.6	1.3
1550	± 3	P-C-N-1550	< 0.2	< 40	0.02	0.05	< 500	0.6	1.3
1570	± 3	P-C-N-1550	< 0.2	< 40	0.02	0.05	< 500	0.6	1.3
1590	± 3	P-C-N-1550	< 0.2	< 40	0.02	0.05	< 500	0.6	1.3
1610	± 3	P-C-N-1550	< 0.2	< 40	0.02	0.05	< 500	0.6	1.3
1530 to 1560, any wavelength		P-F-N-1550	< 0.5	< 100	0.2	0.4	< 900	2.5	5.0
Available upon request: 760, 763, 780, 795, 937, 1083 nm (± 3 nm)									

Please check our website for all available wavelengths and updated information. Other wavelengths as well as wavelength selection are available upon special request. All measurements shown may be subject to a 10 % callibration 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 15 years.



Specifications

Beam parameters

Optics focus length ..... f' = 4.5 mm
Numerical aperture 0.55
Typical divergence with optics ..... Theta ∥ 0.32 mrad, Theta ⊥ 0.11 mrad*
Polarization ..... typ. linear, perpendicular to the fast axis*
Polarization degree ..... > 90 %*
Sidemode suppression ratio (SMSR) ..... < 0.01*

Cooling (optional)

Peltier cooling stability ..... better than 1 K for ambient temperature between 15 °C and 30 °C

Spectral width [1)]

Wavelength < 900 nm ..... approx. 2-8 nm
Wavelength > 900 nm ..... approx. 10-20 nm
CW operation ..... < 1 nm

Power stability (cooled)

12 hours, $DT_{ambient}$ < 3 K ..... 1 % RMS, 3 % peak to peak

Dimensions

Cooled (ø × length) ..... 62 × 100 mm, with fiber coupling: 62 × 132 mm
Uncooled (ø × length) ..... 25 × 76 mm, with fiber coupling: 25 × 106 mm
Flat type (l × w × h) ..... 195 × 112 × 24 mm

1) for spectral width of laser heads with narrow bandwidth, please see table above ** typical values*

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