

# LDH-I Series

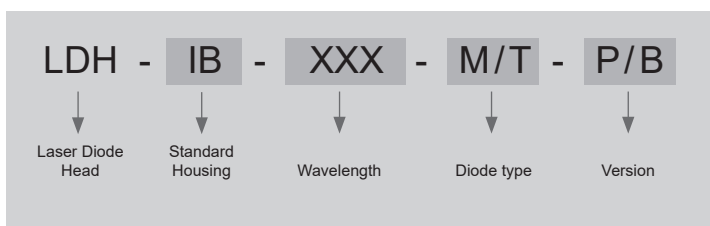
## Smart Laser Diode Heads for Taiko PDL M1

- **NEW** Wavelength 532, 561, and 594 nm
- **NEW** Design with improved efficiency
- **NEW** Dual calibration - max power and linear mode
- **NEW** High power multimode diodes in Vis and NIR
- Wavelengths between 375 and 1550 nm
- Pulse widths as short as 20 ps (FWHM)
- Repetition rate from single shot to 100 MHz
- Adjustable (average) power up to 200 mW
- Pulsed, bursts and CW operated
- Power calibrated, operating hours counter, TE cooled
- Collimated beam, optional fiber coupling



### Applications

- Time-resolved measurements
- Lifescience, FLIM, FCS, STED
- Material science & semiconductor diagnostics
- Metrology & calibration
- Ranging & LiDAR
- Seeding



I = Taiko compatible, "intelligent"

M = Multimode diode, reduced coupling efficiency into single mode fibers, not suited for microscopy applications

T = Tapered amplified

B = High power

P = Narrow pulse

LDH-I Series features a large range of smart laser heads compatible with the Taiko PDL M1 driver. Laser heads from this series provide wavelengths in the spectral range from 375 to 1550 nm and include power calibrations. When coupled with a Taiko PDL M1, their optical output power can be controlled in both pulsed and continuous modes. Additionally, a wavelength calibration is available in CW mode. Each laser head is identified by the Taiko PDL M1 driver and includes not only linearized calibration data but also an operating hours counter.

The following tables list the pulse parameters and power values of the available wavelengths of the LDH-I Series (available between 375 and 1550 nm). The two power adjustment levels specified here refer to the same laser head. These levels can be adjusted using the corresponding driver Taiko PDL M1. 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 and corresponds to the maximum intensity setting of the 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]
375	IB-375-P	< 40	70	4.0	1.0	10
375	IB-375-B	< 70	80	7.0	1.5	20
375	IB-375-M-P	< 90	50	8.0	3.0	100
375	IB-375-M	< 110	50	35.0	-	100
395	IB-390-B	< 70	100	20.0	3.0	50
405	IB-405-P	< 50	80	4.0	1.0	10
405	IB-405-B	< 50	100	20.0	3.0	50
405	IB-405-M-P	< 100	50	50.0	10.0	200
405	IB-405-M	< 160	50	85.0	-	200
420	IB-420-B	< 60	100	12.0	2.0	50
440	IB-440-B	< 80	100	25.0	1.0	50
440	IB-440-M-P	< 100	80	30.0	10.0	200
440	IB-440-M	< 160	50	85.0	-	200
450	IB-450-B	< 70	80	12.0	2.0	50
450	IB-450-M-P	< 110	50	40.0	5.0	200
450	IB-450-M	< 220	50	85.0	-	200
470	IB-470-B	< 70	100	15.0	1.0	70
470	IB-470-M-P	< 110	80	40.0	15.0	200
470	IB-470-M	< 220	50	100.0	-	200
485	IB-485-P <sup>4</sup>	< 90	60	3.0	1.5	40
485	IB-485-B <sup>4</sup>	< 100	100	10.0	1.0	50
485	IB-485-M-P	< 140	50	35.0	20.0	200
485	IB-485-M	< 220	50	100.0	-	200
500	IB-500-B	< 110	70	7.0	1.8	40
510	IB-510-B <sup>4</sup>	< 120	50	7.0	0.7	40
515	IB-520-B <sup>4</sup>	< 160	100	7.0	1.0	20
520	IB-520-M-P	< 130	50	13.0	6.0	200
520	IB-520-M	< 200	50	50.0	-	200
532 (± 3)	IB-530-T-P	< 80	100	-	0.5	20
532 (± 3)	IB-530-T-B	< 80	100	1.1	-	20
561 (± 3)	IB-560-T-P	< 80	100	-	0.5	20
561 (± 3)	IB-560-T-B	< 80	100	0.9	-	20
594 (± 3)	IB-595-T-P	< 100	100	-	0.2	5
594 (± 3)	IB-595-T-B	< 100	100	0.5	-	5
640	IB-640-B	< 90	100	30.0	3.0	50
640	IB-640-M-P	< 130	60	40.0	4.5	100
640	IB-640-M	< 160	70	50.0	-	100
655	IB-650-P	< 60	100	1.0	0.5	5
655	IB-650-B	< 70	100	10.0	2.5	10
670	IB-670-P	< 50	100	2.5	1.0	5
670	IB-670-B	< 70	100	7.0	0.8	10
685	IB-690-B	< 80	100	10.0	1.0	20
705	IB-705-B	< 70	100	20.0	3.0	25
730	IB-730-B	< 80	100	20.0	3.0	20
780	IB-780-B	< 70	100	30.0	1.0	40
780	IB-780-M-P	< 150	100	40.0	12.0	100
780	IB-780-M	< 220	80	110.0	-	100
805	IB-810-B	< 110	80	10.0	1.5	50
805	IB-810-M-P	< 70	100	50.0	5.0	200
805	IB-810-M	< 160	80	110.0	-	200
830	IB-830-B	< 70	100	10.0	0.3	20
830	IB-830-M-P	< 90	100	50.0	12.0	200

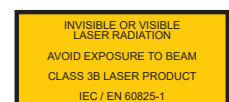
Wavelength (± 10) [nm]	Type (LDH-)	Pulse <sup>1</sup> (FWHM) [ps]	Max rep. rate [MHz]	High avg. power <sup>2</sup> [mW]	Low avg. power <sup>3</sup> [mW]	CW power [mW]
830	IB-830-M	< 160	80	110.0	-	200
840	IB-840-B	< 70	100	15.0	0.8	20
850	IB-850-B	< 90	80	10.0	3.0	50
905	IB-905-B	< 100	80	8.0	2.0	50
910	IB-910-M-P	< 100	80	30.0	10	200
910	IB-910-M	< 180	80	150.0	-	200
940	IB-940-B	< 90	100	6.0	2.0	50
975	IB-980-B	< 100	100	7.0	1.8	50
980	IB-980-M-P	< 80	100	35.0	4.0	200
980	IB-980-M	< 180	80	100.0	-	200
1062 (± 3)	IB-1060-B	< 130	100	10.0	1.2	40
1060 (± 20)	IB-1060-M-P	< 80	100	35.0	4.0	200
1060 (± 20)	IB-1060-M	< 250	80	100.0	-	200
1550 (± 3)	IB-1550-B	< 40	100	3.0	0.1	10

<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 optimal repetition rate and max intensity setting (in max power mode).

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

<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.



## Specifications

Beam parameters	
Optics focus length	$f' = 4.5 \text{ mm}$ (Typ. for most LDH-IB)
	$f' = 9.0 \text{ mm}$ (Typ. for LDH-IB-xxx-T)
Numerical aperture	0.55
Typical divergence (with optics)	theta parallel typ. 0.11 mrad theta perpendicular typ. 0.32 mrad
Polarisation	typ. linear, perpendicular to the longer axis of the elliptical beam <sup>1</sup>
PER	typ. $> 1:10$ ( $> 10 \text{ dB}$ )
Side mode suppression ratio (SMSR)	typ. $< 0.01$
Cooling	
Peltier cooling stability	better than 1 K for ambient temperature between 15°C and 30°C
Dimensions	
Cylinder	76 × 175 mm (diameter × length)
Cylinder with fiber coupling	76 × 207 mm (diameter × length)
Cuboid	175 × 77 × 83.7 mm (length × width × height)
Cuboid with fiber coupling	207 × 77 × 83.7 mm (length × width × height)
Spectral width <sup>2</sup>	
Wavelengths $< 900 \text{ nm}$	approx. 2 to 8 nm
Wavelengths $> 900 \text{ nm}$	approx. 10 to 20 nm
CW operation	$< 1 \text{ nm}$
Power stability (cooled)	
12 hours, Delta T (ambient) $< 3 \text{ K}$	1 % RMS, 3 % peak to peak

<sup>1</sup> A few exceptions may occur.

<sup>2</sup> Narrow bandwidth on request.



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