Taiko PDL M1

NEW

Picosecond diode laser driver with smart capabilities

- User-defined bursts patterns, pulsed and continuous wave mode
- Repetition rate from 1 Hz to 100 MHz
- Free intensity adjustment in calibrated value of optical power
- Fine wavelength adjustment
- Fully synchronized manual and computer control
- Very low jitter
- External trigger input
- 5-year warranty

Applications

- Time-resolved fluorescence spectroscopy/microscopy (FLIM, FRET, FCS)
- Stimulated Emission Depletion Microscopy (STED)
- Biochemical analytics
- Diffuse Optical Tomography (DOT)
- Quantum optics
- LIDAR, ranging
- 3D polymerization

The Taiko PDL M1 is a smart, universal laser driver that can operate and monitor any laser head from the LDH-I Series. The strengths of the Taiko are flexibility and ease-of-use, making it accessible even to novice laser users. Changing the emission wavelength is as simple as plugging in a different laser head and the Taiko will automatically recognize its operational parameters.

Take full control

The Taiko PDL M1 smart driver interfaces with laser heads from the LDH-I Series to read out and display various operational parameters. These include central and current
emission wavelength, laser head temperature, repetition rate, as well as an estimation of current output intensity. Every LDH-I head is calibrated during manufacturing with regards to its intensity / output power curve and temperature dependent wavelength shift. The Taiko PDL M1 is thus able to provide an indication of current output power and central wavelength during operation. Setting of the output power can be done either by relative percentage values of intensity or by absolute calibrated values of optical power (mW, W). Due to its extended high power capability, the Taiko can drive an even wider range of laser heads, including our latest generation of high power, multi mode diodes.

Flexible pulse patterns

The Taiko PDL M1 laser driver supports arbitrary internal repetition rates ranging from single shot to 100 MHz, as well as operation in continuous wave mode or external triggering. It can also generate user-defined burst sequences consisting of up to 17 million pulses with freely selectable burst periods. Using this burst mode is of great value for time-resolved

phosphorescence measurements or other applications where larger amounts of excitation energy have to be periodically deposited into a sample.

Intuitive user interfaces

Control the Taiko PDL M1 either via its intuitive “one button control” local interface or remotely by PicoQuants laser driver software (requires USB connection).

All laser parameters can be accessed and adjusted locally via a unique dial and push button combination that allows navigating an intuitive menu-based system on the Taiko’s color LCD display. Set power intensity, operation mode (pulsed, burst, continuous wave), and repetition rate with just a few twists.

The Taiko PDL M1 can also be operated remotely from any Windows™ based PC through a dedicated control software with a user-friendly graphical user interface. The Taiko PDL M1 is connected to the PC via a standard USB connection. Local and remote interfaces are fully synchronised and can be used simultaneously. Both interfaces provide a read out of relevant laser head information such as current temperature, repetition rate, operation mode and estimated wavelength shift and optical output power.

Laser safety

The Taiko PDL M1 laser driver incorporates all relevant laser safety features, including key switch and remote interlocks, and complies with international laser safety regulations for devices of up to laser class 4 / IV.

Specifications

Internal Oscillator	
Type	crystal locked
Operation mode	pulsed, burst or continuous wave (cw)
Repetition frequency range	1 Hz to 1 MHz in steps of 1, 2 or 5 times various powers of ten
Synchronization Output	
Amplitude	< -800 mV into 50 Ohms (NIM)
Pulse width	5 ns
Delay	sync output (falling edge) to laser output: typ. 10 ns, jitter < 20 ps
Input impedance (destination)	50 Ohms
Connector	SMA socket (female)
External Trigger Input	
Input voltage range	-5 to +5 V (TTL compatible)
Trigger level (adjustable)	-1 to +1 V
Required pulse width	> 5 ns
Delay	trigger input to optical output: typ. 16 ns, jitter < 40 ps trigger input to sync output: typ. 6 ns
Frequency range	single shot to 90 MHz
Input impedance	50 Ohms
Connector	BNC socket (female)
Gating Inputs	
Slow gate	transition time < 1 ms
Fast gate	transition time typically 10 ns, user selectable input impedance: 10 kOhms with pull-up or 50 Ohms with pull-down

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 depening on the performance of diodes on stock. Please contact us for more information. 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 18 years.

Remote Interlock	
Voltage	< 16 VDC
Loop resistance	1000 Ohms maximum
Remote Interlock connectors	Lemo 00.304 and banana socket
Computer	
PC Interface	USB 2.0
Operating system	Windows™ 8 / 8.1 / 10
Power Supply	
Line voltage	220 / 240 or 110 / 120 VAC, 50 / 60 Hz
Power consumption	140 W maximum
Dimensions	
Base unit	355 x 311 x 95 mm (w x l x h)
Operation Environment	
Temperature range	10 to 40°C
Rel. humidity	< 80 %

Wavelengths, preliminary

LDH-I Series: Examples of available laser heads
Many other wavelengths are available, please ask us for a quote.

Wavelength (± 10) [nm]	**Type** (LDH-)	**Max. avg. power (CW)** [mW]	**Pulse width** (FWHM) [ps]	**Max. avg. power (pulsed)** [mW]
375	IB-375	10	< 40	4.0
405	IB-405	50	< 50	3.0
440	IB-440	50	< 80	4.0
470	IB-470	60	< 70	5.0
485	IB-485	50	< 90	5.0
510	IB-510	40	< 110	4.0
640	IB-640	50	< 90	20.0

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