

PLS-I

High Power Nanosecond Pulsed LEDs

- Wavelengths from 255 to 600 nm
- Average power up to 300 μ W (pulsed&CW)
- Pulse widths 0.8 to 2 ns (FWHM)
- Repetition rate from single shot up to 40 MHz
- Pulsed, burst and CW mode
- Optional band pass filter available for improved spectral purity



Applications

- Time-resolved fluorescence spectroscopy
- Biochemical analysis
- Detection of molecules labeled with Perylene, Coumarin, Fluorescein and Rhodamine dyes
- Intrinsic protein fluorescence from tryptophan or tyrosine
- Testing of optoelectronic devices such as pin-diodes and PMTs

The LED heads from the PLS-I Series are compatible with the Taiko PDL M1 and allow for sub-to-few nanosecond pulsed operation, burst operation as well as in CW mode.

They combine short pulse widths, high repetition rates, and high optical power in a compact and maintenance free set-up.

Direct emission in the ultraviolet

LEDs from the PLS-I Series emit directly in the ultraviolet spectral range at wavelengths as short as 255 nm.

Different LEDs with central wavelengths between 255 nm and 400 nm allow to choose a peak wavelength according to the needs of the application. Their spectral and timing characteristics are also particularly well-suited for biomedical applications, e.g., for the detection of labeled substances as well as naturally fluorescent amino acids like tryptophan or tyrosine.

Pulsed average power up to 300 μ W

The LED heads from the PLS-I Series are designed to yield the maximum possible output power in pulsed and CW mode. In pulsed operation the maximum average optical power reaches typically 80 μ W. In CW operation the average power reaches typically a few 100's μ W and even up a few mW for wavelengths where the most powerful LEDs are available.

Taiko architecture gives the possibility to work either in linear mode (constant medium pulse energy up to maximum repetition rate) or free trigger mode (medium pulse energy up to maximum repetition rate) or in max power mode (max pulse energy up to 10 MHz repetition rate).

Pulse widths down to 1 ns

The pulsed LED heads of the PLS-I series emit nanosecond pulses with a full width at half maximum (FWHM) ranging from typ. 1 to 5 ns depending on the wavelength and on the power setting.

Suitable for time-resolved fluorescence spectroscopy

The PLS-I series are very useful excitation sources notably for short range interactions as in a time-resolved fluorescence lifetime spectrometer, where sufficient power is required for wavelengths typically around 300 nm.

In this range the PLS-I series offer a higher power alternative to the classic Sepia-compatible PLS series from PicoQuant with a factor 5 to 15 more in terms of optical power. On the other hand, the PLS-I series offers an affordable alternative to classic laser solution such as ultrafast laser with OPO or a VisUV from PicoQuant.

All functions of the PLS-I Series such as repetition rate and output power are controlled and adjusted by the Taiko PDL M1.

Wavelengths

Wavelength (± 10) [nm]	Type (PLS-I)	Pulse width ¹ (FWHM) [ns]	Max rep. rate [MHz]	Max. avg. power (pulsed), without filter ² [μW]	Max. CW power [μW]
255	B-255	1.3	20	30	50
265	B-265	1.3	20	30	50
275	B-270	1.2	20	40	50
285	B-280	1.3	20	40	100
295	B-295	1.3	20	40	100
310	B-310	1.0	20	40	100
325	B-320	1.2	10	12	100
345	B-340 ³	1.2	10	20	100
360	B-360 ³	1.3	10	20	200
375	B-370	1.3	40	300	300
400	B-400 ³	1.5	40	300	300
600	B-600 ³	1.5	40	40	300

¹ Typ. pulse width at highest power setting. The pulse width shortens at lower power settings.

² Available as an option. Band Pass Filter typ. 10% losses, Colored Glass Filter typ. 45% losses.

³ The emission is spectrally clean, no additional filter needed.



Specifications

Cooling	
Peltier cooling stability	better than 1 K for ambient temperature between 15°C and 30°C
Dimensions	
With fiber coupling	76 × 207 mm (diameter × length)
Power stability (cooled)	
12 hours, Delta T (ambient) < 3 K	3 % RMS, 5 % peak to peak ¹

¹ stability measurement is limited by the accuracy of the detector for LEDs



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