INDYLIT 10

Industrial Femtosecond Laser for Microprocessing

1030 nm, 450 fs, 10 W, 80 kHz – 1 MHz

WWW.LITILIT.COM

ROBUST DESIGN FOR FLEXIBLE APPLICATIONS

FEATURES

- Extremely robust and stable
- Adjustable repetition rate, pulse duration, power
- High pulse energy and clean pulse shape
- Passively air cooled
- Maintenance-free & turn-key

APPLICATIONS

- Material microprocessing
- Ophthalmology
- Semiconductor and electronics
- Display manufacturing
- Battery manufacturing
- Stainless steel black and color marking

INDYLIT 10

The **Indylit 10** is a high energy air-cooled industrial class femtosecond laser designed for a variety of ultrafast applications.

The laser head features an entirely state of the art passively-cooled design, ensuring high stability of the optical parameters such as pulse duration, beam pointing and power. Its mechanical construction can withstand almost everything you can throw at it, making the Indylit system a new standard in industrial femtosecond technology.

Build-in second harmonics (SH) module laser provides wavelength extension enabling even more different material processing applications.

SPECIFICATIONS

<table>
<tr><th>Model</th><th>Indylit 10</th><th>Indylit 10 SH</th></tr>
<tr><td>Central wavelength</td><td>1030 ± 2 nm</td><td>515 ± 1 nm</td></tr>
<tr><td>Average power [1]</td><td>> 10 W @ 1000 kHz</td><td>> 5W @ 200kHz</td></tr>
<tr><td>Max. pulse energy [1]</td><td>> 100 µJ @ 80 kHz
> 10 µJ @ 1 MHz</td><td>> 60 µJ @ 80 kHz
> 3 µJ @ 1 MHz</td></tr>
<tr><td>Pulse duration</td><td colspan="2">< 450 fs</td></tr>
<tr><td>Pulse duration tunability</td><td>450 fs – 2 ps</td><td>N/A</td></tr>
<tr><td>Pulse duration with external compression module [2]</td><td colspan="2">< 60 fs</td></tr>
<tr><td>Internal pulse repetition rate</td><td colspan="2">80 kHz – 1 MHz,
down to 20 kHz in burst mode</td></tr>
<tr><td>Pulse picker</td><td colspan="2">integrated</td></tr>
<tr><td>Triggering mode</td><td colspan="2">pulse picker control via TTL gate</td></tr>
<tr><td>Burst length</td><td colspan="2">1 ... 16 pulses</td></tr>
<tr><td>Max. energy in burst</td><td>> 400 µJ</td><td>> 200 µJ</td></tr>
<tr><td>Power attenuation [3]</td><td colspan="2">100 – 0.1 %</td></tr>
<tr><td>Beam quality</td><td colspan="2">$M^2 < 1.2$</td></tr>
</table>

Model	Indylit 10	Indylit 10 SH
Beam circularity [4]	> 0.87	> 0.85
Beam diameter (at $1/e^2$ level)	2 ± 0.2 mm	1.7 ± 0.2 mm
Beam divergence (full angle)	< 1 mrad	
Beam pointing (pk-to-pk) [5]	± 50 µrad	
Beam pointing vs temp. (pk-to-pk)	< 20 µrad/°C	
Pulse energy stability (RMS) [6]	< 1.0 %	< 2.0 %
Power stability (RMS) [7]	< 1.0 %	< 2.0 %
Warm-up time (cold start)	< 30 min	
Warm-up time (warm start)	< 90 s	
Laser control interface	CAN, USB	
Operating voltage	100 ... 240 V AC, 47 ... 63 Hz	
Average power consumption (after warm-up)	< 300 W	
Operating temperature	15 – 35 °C	
Humidity	non condensing	
Transportation/storage temperature	-20 – +70 °C	
Dimensions: Laser head (L × W × H) Control unit (L × W × H)	 522 × 233 × 179 mm 449 × 370 × 140 mm	
Umbilical length	3 ± 0.3 m	
Colling: Laser head Control unit	 air (passive) forced air (fans)	

[1] Please refer to the power and energy vs. pulse repetition rate curves for typical values.

[2] For more information about pulse compression module please contact LITILIT directly.

[3] Attenuation can be controlled by a few different methods: a) via PC user interface, b) by CAN register, c) by analog input (0 – 1 V, real time).

[4] Defined as the worst case ellipticity along the z-scan (± 5 × $L_{Rayleigh}$) of the beam.

[5] At constant environmental temperature (temperature stability within ± 1 °C) after 30 min. warmup time.

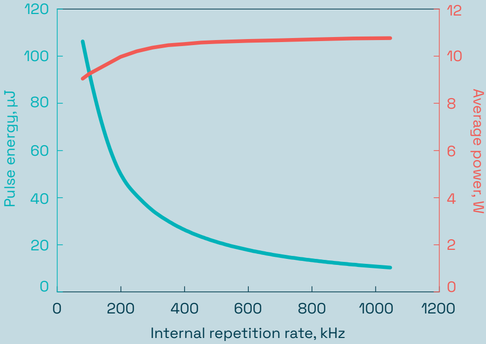
[6] Measured within 10 s time interval .

[7] Measured within a 24 h time interval with integration time of < 5 s. Environment temperature stability should be within ± 2 °C.

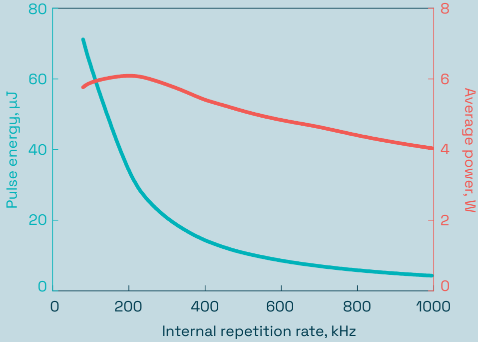
[8] Technology is protected by international patents: LT6261 (B); JP6276471 (B2); US10038297 (B2); EP3178137; DK3178137 (T3); CN106575849 (B); PL3178137 (T3); LT6639 (B); LT2020 563.

DANGER: VISIBLE AND/OR INVISIBLE LASER RADIATION AVOID EYE OR SKIN EXPOSURE TO DIRECT, REFLECTED OR SCATTERED RADIATION

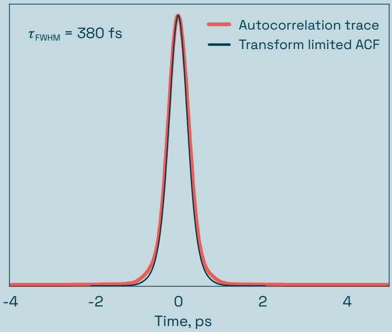
CLASS 4 LASER PRODUCT



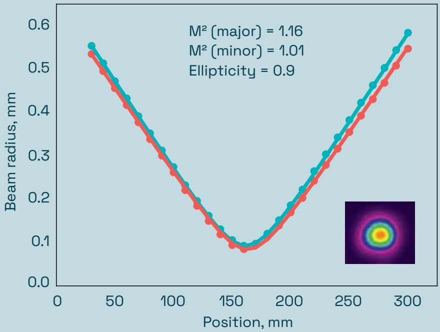
IR (1030 nm) energy and power dependence on internal repetition rate of the **Indylit 10** laser



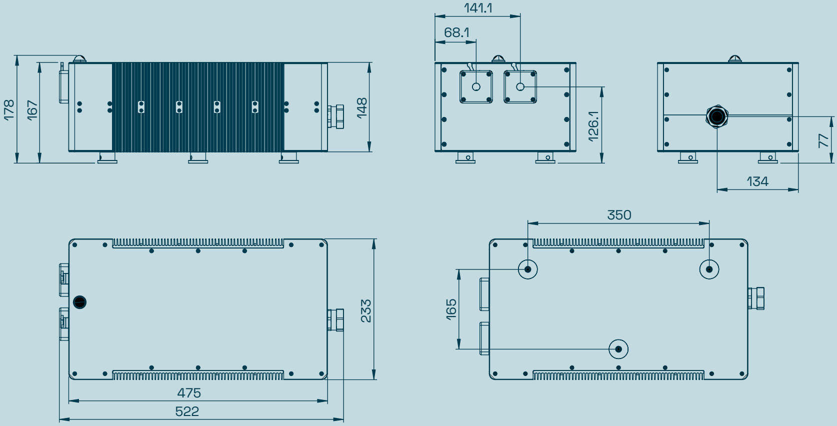
SH (515 nm) energy and power dependence on internal repetition rate of the **Indylit 10** laser



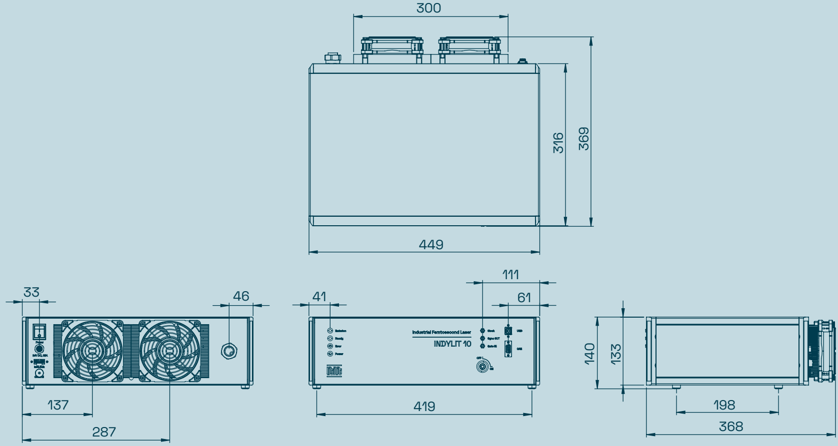
Pulse autocorrelation trace of **Indylit 10** laser at 100 µJ output energy



Beam diameter dependence on propagation distance (z-scan) of **Indylit 10** laser and M² fit



Drawing of **Indylit 10** laser head (in mm)



Drawing of **Indylit 10** laser power supply (in mm)

NOTES

Savanoriu ave 235, LT-02300 Vilnius, Lithuania
info@litilit.com | +370 675 39583 | litilit.com