

IB Photonics Ltd.

EDUKIT - Diode Pumped Solid State Laser Kit

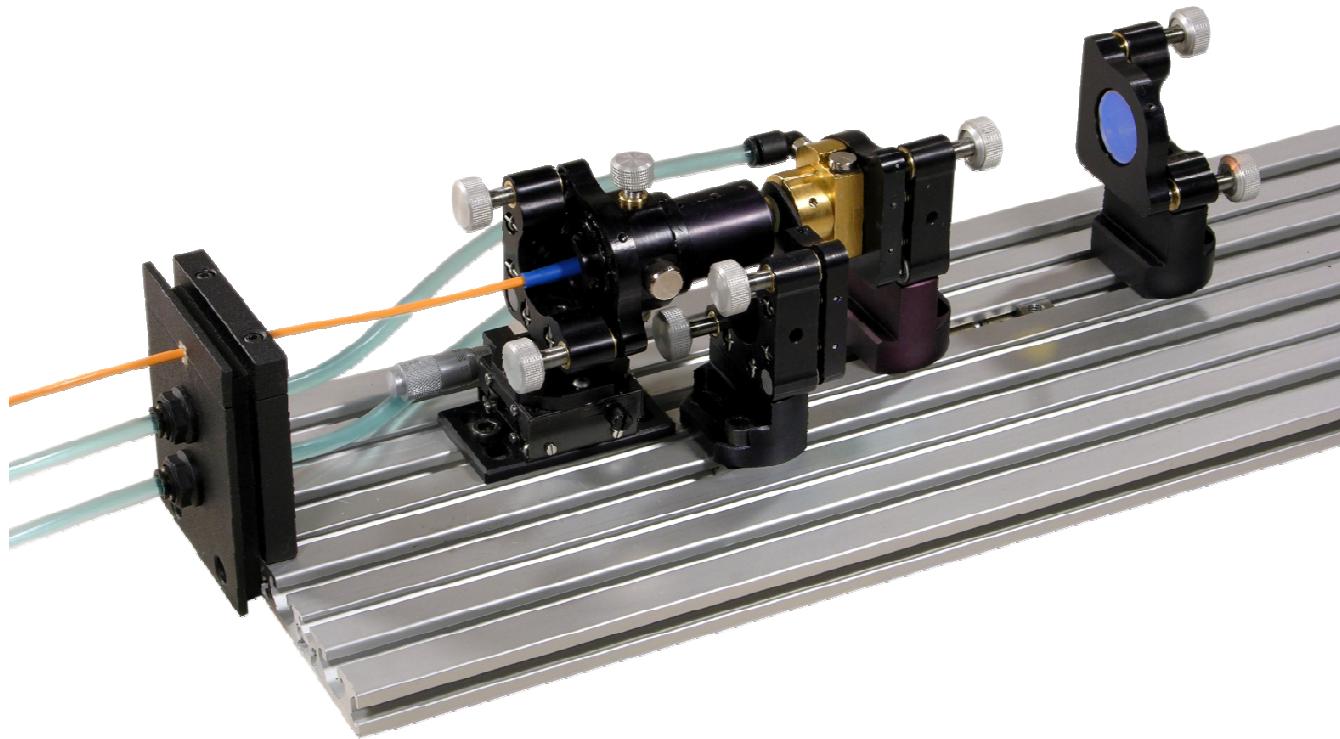


Photo above is the high power fiber coupled version of the kit

The diode pumped solid state laser kit and its modifications (see specification below) are multipurpose laser instruments for education, research and experimental analysis.

TEM₀₀ CW at 1064 nm

Frequency doubled CW at 532 nm

Operation modes

CW Q-switched at 1064 nm

CW Q-switched at 532 nm

EDUKIT components:

- Optical rail;
- Pump laser diode module:
 - Peltier cooler;
 - Additional pump optics for EDUCIT-LP2 (2 W);
 - Fiber coupled pump laser diode add-on for EDUCIT-LP2;
 - Laser diode driver;
 - TEC controller;
 - Fiber coupled pump laser diode for EDUCIT-HP4 (4 W) and EDUCIT-HP30 (30 W);
- Active medium:
 - Nd:YAG crystal mounted in a heat sink;
 - Optional Nd:YVO₄ crystal mounted in a heat sink;
 - Additional water cooling for HP4 and HP30 models;
- Set of laser mirrors with dielectric coating:
 - Rear mirror;
 - Flat / Curved Output Couplers
- Saturable absorber for passive Q-switching:
 - Cr₄₊:YAG crystal;
 - Mounted in a holder;
- Intracavity second harmonic generation crystal, mounted;
- Frequency doubling crystal for intracavity and external frequency doubling
 - KTP;
 - Mounted in a holder;
- Additional kinematic mirror holders - 3 pcs.
- Additional crystal holders - 3 pcs.
- Handbook:
 - Tutorials;
 - Experiments descriptions;

Alignment and measurement:

- Alignment laser module:
 - Wavelength @ 670 nm;
 - Mounted in a holder;
- Infrared visualiser for alignment and mode analysis
- Ultrafast PIN photo diode (rise time < 2ns) for relaxation oscillations observation and pulse duration measurements
- High-resolution CMOS camera for Mode structure and beam analysis:
- Laser power meter:
 - Wide surface photodiode;
 - Optional thermoelectric power meter;

EDIKIT can be used for the following experiments:

- Absorption of Optical Pumping and Emission
- Laser alignment:
 - Operation in CW regime;
 - Stability regions of laser resonator;
 - Optimum cavity configuration for TEM₀₀ regime of operation;
- Various transversal cavity modes:
 - TEM₀₀ generation;
 - Higher modes generation;
- Laser operation in passive Q-switching regime:
 - Passive Q-switching threshold;
 - Pulse formation;
 - Maximum output optimization;
- Laser operation:
 - Laser threshold;
 - Differential efficiency;
 - Maximum output power;
 - Shortest pulse conditions;
- Optimum output coupler determination
- Frequency doubling:
 - In Q-switched operation – external;
 - In Q-switched operation – intracavity;
 - In CW operation – intracavity;
- Fluorescence lifetime of the active medium
- Laser dynamics:
 - Relaxation oscillations;
 - Q-switching;
 - Dependence on the parameters of the active medium;
- Comparison between different active media (Nd:YAG and Nd:YVO₄)

Technical Specifications

Mode of Operation:	CW			Q-Switched and Pulsed mode		
Model:	-LP2	-HP4	-HP30	-LP2	-HP4	-HP30
	Optical Parameters					
Wavelengths:	1.064 μm fundamental / 532 nm second harmonic					
Max. Output Power**:	≥250 mW	≥500 mW	≥5 W	≥50mW	≥150mW	≥2W
Frequency-doubled output power at 532 nm **:	≥10 mW	≥15mW	≥200mW	≥15 mW	≥25 mW	≥350 mW
Repetition Rate: (Passive Q-Switching)	-	-	-	5-60 kHz, 1-10 kHz	5-60 kHz, 1-10 kHz	5-60 kHz, 1-10 kHz
Pulse Width:	-	-	-	10-100 ns	10-100 ns	10-100 ns
	Laser Diode					
Maximum Output Power:	2 W	4W	30 W	2 W	4W	30 W
Threshold Current:	1.2 A	1.5 A	6 A	1.2 A	1.5 A	6 A
Fiber Coupled:	No*	Yes	Yes	No*	Yes	Yes
Fiber Core Diameter:	N/A	105 μm	200 μm* / 400 μm	N/A	105 μm	200 μm* / 400 μm
Divergence X axis:	12°	0.22 NA	0.22 NA	12°	0.22 NA	0.22 NA
Divergence Y axis:	32°	0.22 NA	0.22 NA	32°	0.22 NA	0.22 NA
Cooling System:	TE Peltier Cooler			TE Peltier Cooler		
	Laser Diode Driver: Electrical Characteristics					
Operating Current:	3.4 A	5.5 A	40 A	3.4 A	5.5 A	40 A
Power Supply	110-220 VAC 50-60 Hz, 150 W max	110-220 VAC 50-60 Hz, 350W max	110-220 VAC 50-60 Hz, 550W max	110-220 VAC 50-60 Hz, 150W max.	110-220 VAC 50-60 Hz, 350W max.	110-220 VAC 50-60 Hz, 550W max.

* Optional.

** Typical value at best alignment.