

BDL-488-SMC

488 nm Picosecond / CW Diode Laser with Single-Mode Fibre Coupler

60% coupling efficiency into single-mode fibre

TEM₀₀ mode

Wavelength 488 nm

Pulsed and CW operation

Pulse width down to 40 ps

Repetition rate 20-50-80 MHz

Low skew trigger output

Extremely low RF noise

Cooled laser diode

Fast on / off / multiplexing capability

Simple + 9 V to +12V wall-mounted power supply

Compact design - no external controller unit

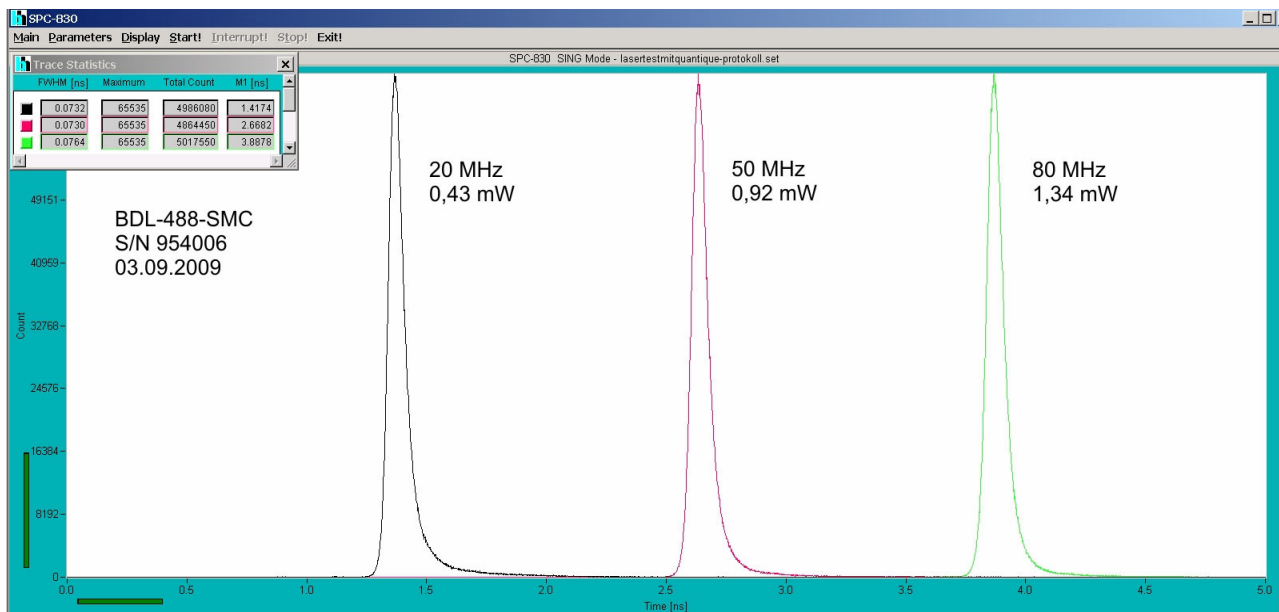
Compatible with all standard 1" footprint fibre couplers

Luminescence lifetime experiments

Laser scanning microscopy

Fluorescence correlation

Time-correlated single photon counting experiments



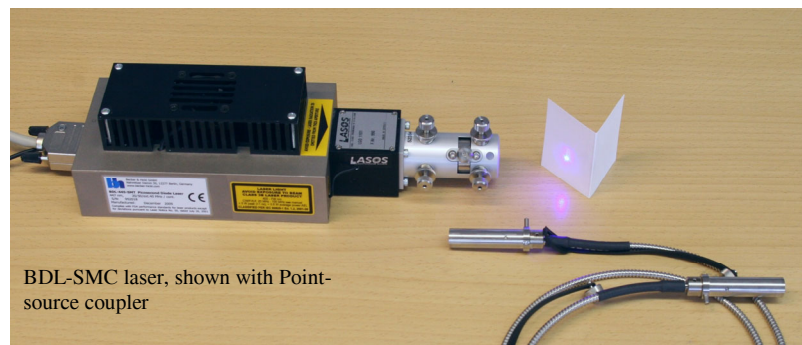
Designed and manufactured by



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BDL-SMC laser, shown with Point-source coupler

Sales Representatives



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BDL-488-SMC

Optical Data

Repetition Rate
 Wavelength (CW mode)
 Wavelength (pulsed mode)
 Pulse Width (FWHM, at 1 mW power, 50 MHz)
 Peak Power
 Average Power
 (Average CW equivalent power,
 user adjustable)
 Beam diameter before coupler
 Polarisation
 Coupling efficiency into single-mode fibre, typically
 Stability of Repetition Rate
 Pulse-to Pulse Jitter
 Reaction time to 'Laser on' signal (pulsed mode)
 Reaction time to 'Laser on' signal (CW mode)
 Power and pulse shape stabilisation after switch-on
 Fibre coupler

20-50-80 MHz, or CW operation
 484 nm to 488 nm, typ. 487 nm, see 'Optical spectra'
 475 nm to 480 nm, typ. 478 nm, see 'Optical spectra'
 40 to 90 ps
 40 to 500 mW¹⁾
 20 MHz: 0.07 mW to 0.4 mW²⁾
 50 MHz: 0.3 mW to 1.5 mW²⁾
 80 MHz: 0.3 mW to 2.3 mW²⁾
 CW mode: 0.5 mW to 10 mW²⁾
 0.7 mm, TEM₀₀ mode
 horizontal
 60%
 ± 100 ppm
 < 20 ps
 1 µs
 3 µs
 3 min⁵⁾

all 1" footprint couplers: Point Source, Schäfter&Kirchhoff, OZ Optics, Linus

Electrical Data

Trigger Output

Pulse Amplitude +100 to +300 mV (peak) into 50 Ω
 Pulse Width 1 ns
 Output Impedance 50 Ω
 Connector SMA
 Delay from Trigger to Optical Pulse < 500 ps
 Jitter between Trigger and Optical Pulse < 10 ps

Control Inputs

Frequency 20 MHz TTL / CMOS high³⁾
 Frequency 50 MHz TTL / CMOS high³⁾
 Frequency 80 MHz TTL / CMOS high³⁾
 CW operation TTL / CMOS high³⁾
 Laser ON / Off TTL / CMOS low³⁾
 External Power Control analog input, 0 to + 10V

Power Supply

Power Supply Voltage + 9 V to +12 V
 Power Supply Current 300 mA to 1 A⁴⁾
 Power Adapter AC-DC power adapter, with key switch and control box in cable

Maximum Values

Power Supply Voltage 0 V to +15 V
 Voltage at Digital Control Inputs -2 V to +7 V
 Voltage at Ext. Bias Input -12 V to + 12 V
 Ambient Temperature 0 °C to 40 °C⁵⁾

Mechanical Data

Dimensions 160 mm x 90 mm x 60 mm
 Mounting Thread two M6 holes

1) Typical values, sample tested. Depends on pulse width and selected power.

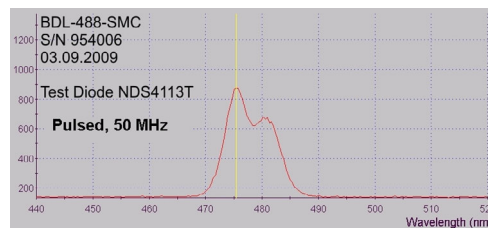
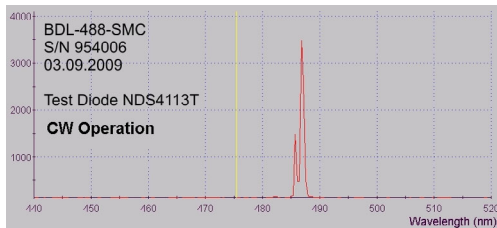
2) Recommended power adjust range. Lower power gives broader pulses, higher power gives ringing in pulse shape. Power levels above the given range can be selected, but may impair the lifetime of the laser diode.

3) All inputs have 10 kΩ pull-up resistors. Open input is equivalent to logic 'high'.

4) Dependent on ambient temperature. Cooling current changes due to temperature regulation of laser diode

5) Operation below 13 °C may result in extended warm-up time.

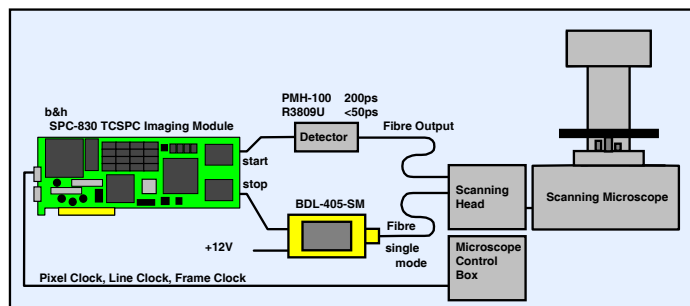
Optical Spectra



Caution: Class 3B laser product. Avoid direct eye exposure. Light emitted by the device may be harmful to the human eye. Please obey laser safety rules when operating the devices. Complies with US federal laser product performance standards.

Application: TCSPC lifetime imaging with laser scanning microscopes

The BDL-405-SM laser excites the sample with 50 MHz, 75 ps pulses. The microscope scans the sample in y-x direction, and the SPC-830 TCSPC imaging module records the photon distribution versus time and the coordinates of the scanning area. The setup detects single and double exponential lifetimes down to a few 10ps. Typical applications are ion concentration, ph, or oxygen saturation measurements by fluorescence quenching, FRET experiments and distinguishing of autofluorescence components. Please see www.becker-hickl.com for detailed information.



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