

PICOSECOND LIGHT SOURCES



Now available with single mode fiber output coupling

From Becker & Hickl GmbH



Boston Electronics Corporation

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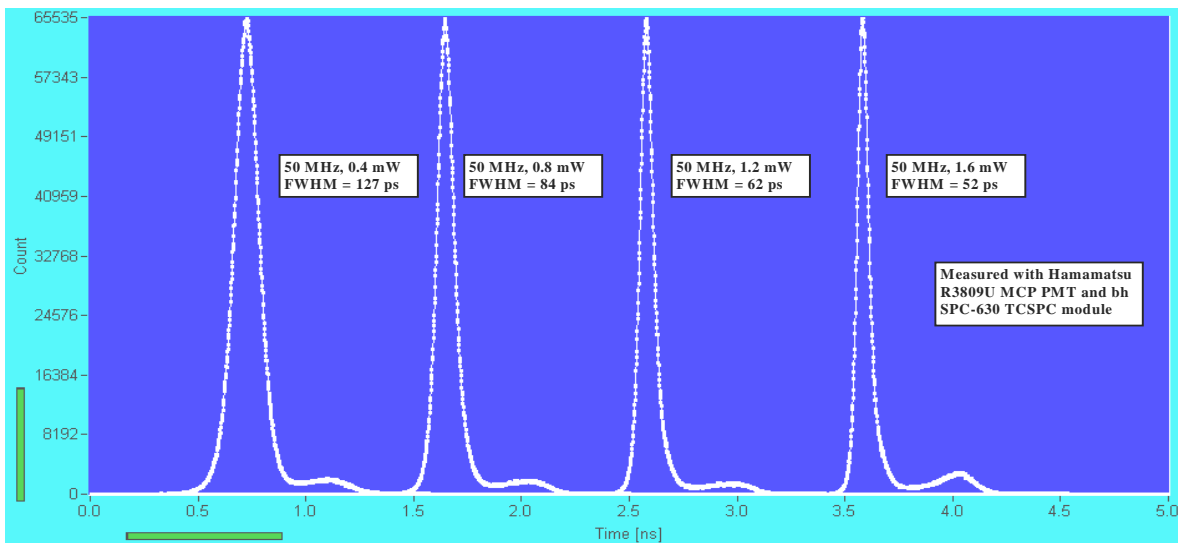
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BDL-405-SMC

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

60% coupling efficiency into single-mode fibre
TEM₀₀ mode
Wavelength 405 nm
Pulsed and CW operation
Pulse width down to 60 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-405-SMC

Optical

Repetition Rate	20-50-80 MHz, or CW operation
Wavelength	401 nm to 410 nm, typ. 405 nm
Pulse Width (FWHM, at 1 mW power, 50 MHz)	50 to 90 ps
Peak Power	80 to 500 mW ¹⁾
Average Power	20 MHz: 0.12 mW to 0.6 mW ²⁾
(Average CW equivalent power, user adjustable)	50 MHz: 0.3 mW to 1.6 mW ²⁾
	80 MHz: 0.4 mW to 2.4 mW ²⁾
	CW mode: 5 mW to 40 mW ²⁾
Beam diameter before coupler	0.7 mm, TEM ₀₀ mode
Polarisation	horizontal
Coupling efficiency into fibre, typically	60%
Stability of Repetition Rate	± 100 ppm
Pulse-to Pulse Jitter	< 20 ps
Reaction time to 'Laser on' signal (pulsed mode)	1 µs
Reaction time to 'Laser on' signal (CW mode)	3 µs
Power and pulse shape stabilisation after switch-on	3 min
Fibre coupler	all 1" footprint couplers: Point Source, Schäfter&Kirchhoff, OZ Optics, Linus

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 high ³⁾
Frequency 50 MHz	TTL / CMOS high ³⁾
Frequency 80 MHz	TTL / CMOS high ³⁾
CW operation	TTL / CMOS high ³⁾
Laser ON / Off	TTL / CMOS low ³⁾
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 A ⁴⁾
Power Adapter	AC-DC power adapter, with key switch and control box in cable

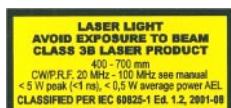
Mechanical Data

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

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 °C ⁵⁾

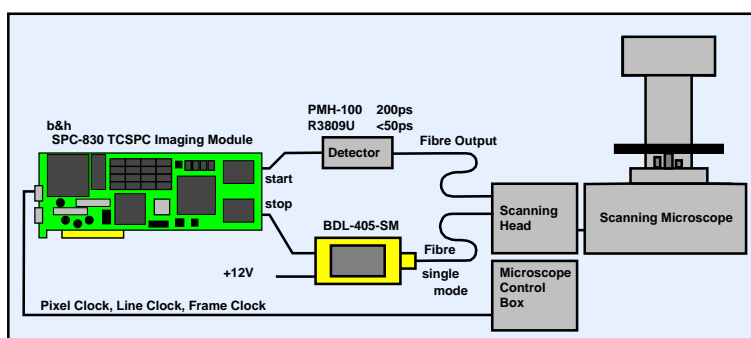
- 1) Typical values, sample tested. Depends on pulse width and selected power.
- 2) Recommended power adjust range. Lower power gives broader pulses, higher power gives ringing in pulse shape. Power levels above the given range can be selected, but may impair the lifetime of the laser diode.
- 3) All 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.



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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BDL-440-SMC

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

60% coupling efficiency into single-mode fibre

TEM₀₀ mode

Wavelength 440 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

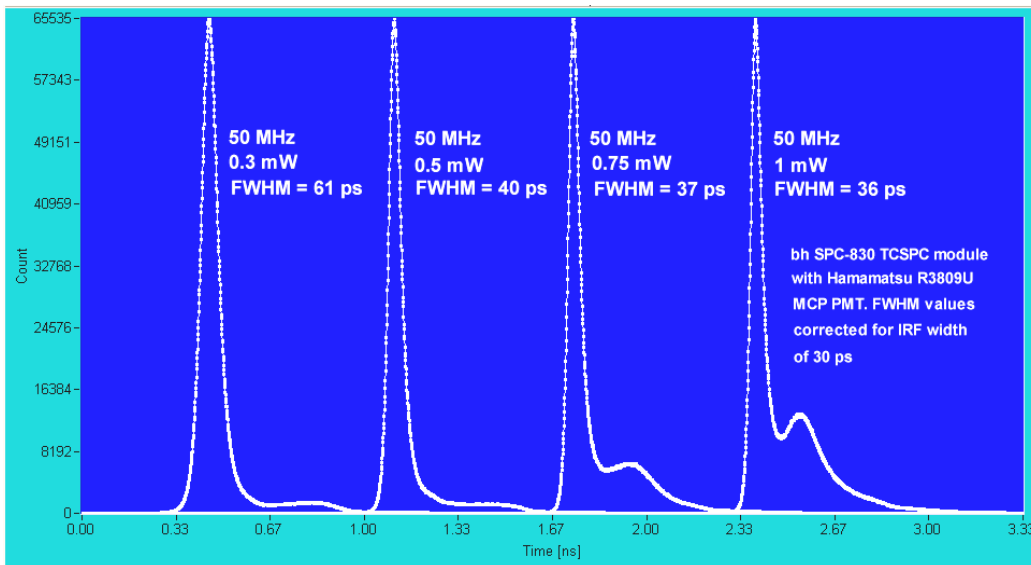
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BDL-440-SMC

Optical

Repetition Rate	20-50-80 MHz, or CW operation
Wavelength	436 nm to 448 nm, typ. 440 nm
Pulse Width (FWHM, at 1 mW power, 50 MHz)	40 to 90 ps
Peak Power	40 to 250 mW ¹⁾
Average Power	20 MHz: 0.07 mW to 0.2 mW ²⁾
(Average CW equivalent power, user adjustable)	50 MHz: 0.3 mW to 1 mW ²⁾
	80 MHz: 0.4 mW to 1.2 mW ²⁾
	CW mode: 1 mW to 20 mW ²⁾
Beam diameter before coupler	0.7 mm, TEM ₀₀ mode
Polarisation	horizontal
Coupling efficiency into single-mode fibre, typically	60%
Stability of Repetition Rate	± 100 ppm
Pulse-to Pulse Jitter	< 20 ps
Reaction time to 'Laser on' signal (pulsed mode)	1 µs
Reaction time to 'Laser on' signal (CW mode)	3 µs
Power and pulse shape stabilisation after switch-on	3 min ⁵⁾
Fibre coupler	all 1" footprint couplers: Point Source, Schäfer&Kirchhoff, OZ Optics, Linus

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 high ³⁾
Frequency 50 MHz	TTL / CMOS high ³⁾
Frequency 80 MHz	TTL / CMOS high ³⁾
CW operation	TTL / CMOS high ³⁾
Laser ON / Off	TTL / CMOS low ³⁾
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 A ⁴⁾
Power Adapter	AC-DC power adapter, with key switch and control box in cable

Mechanical Data

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

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 °C ⁵⁾

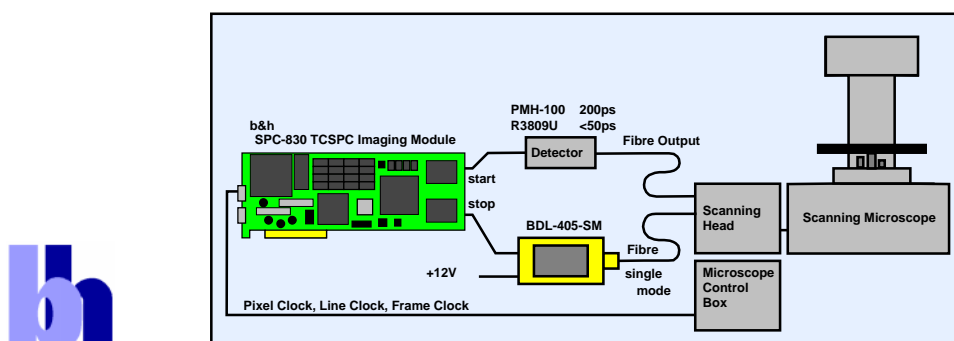
- 1) Typical values, sample tested. Depends on pulse width and selected power.
- 2) Recommended power adjust range. Lower power gives broader pulses, higher power gives ringing in pulse shape. Power levels above the given range can be selected, but may impair the lifetime of the laser diode.
- 3) All 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.



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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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BDL-473-SMC

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

60% coupling efficiency into single-mode fibre

TEM₀₀ mode

Wavelength 473 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

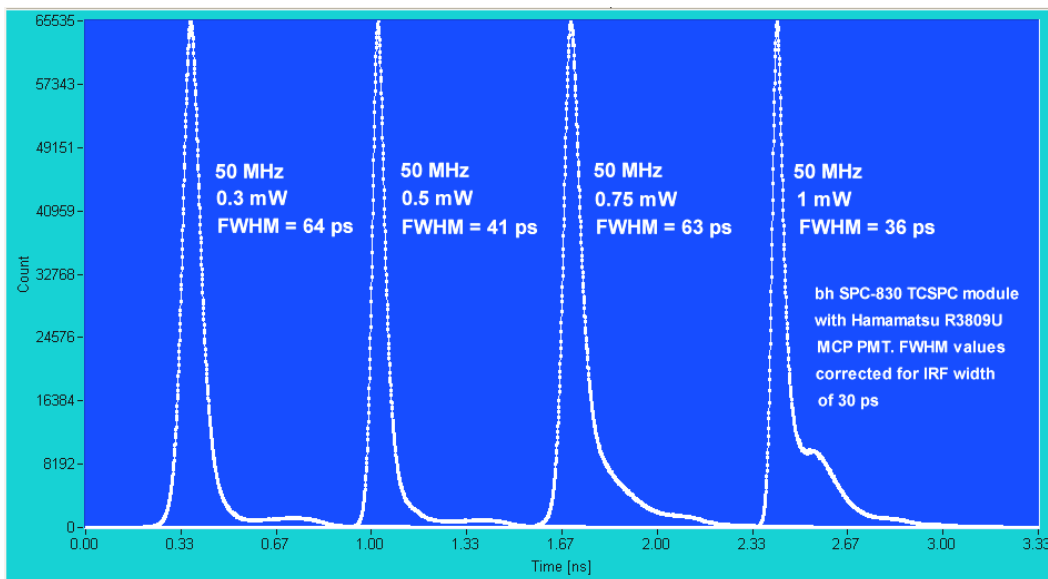
Compatible with all standard 1" footprint fibre couplers

Luminescence lifetime experiments

Laser scanning microscopy

Fluorescence correlation

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BDL-473-SMC

Optical

Repetition Rate	20-50-80 MHz, or CW operation
Wavelength	467 nm to 476 nm, typ. 473 nm
Pulse Width (FWHM, at 1 mW power, 50 MHz)	40 to 90 ps
Peak Power	40 to 250 mW ¹⁾
Average Power	20 MHz: 0.07 mW to 0.2 mW ²⁾
(Average CW equivalent power, user adjustable)	50 MHz: 0.3 mW to 1 mW ²⁾
	80 MHz: 0.4 mW to 1.2 mW ²⁾
	CW mode: 0.5 mW to 10 mW ²⁾
Beam diameter before coupler	0.7 mm, TEM ₀₀ mode
Polarisation	horizontal
Coupling efficiency into single-mode fibre, typically	60%
Stability of Repetition Rate	± 100 ppm
Pulse-to Pulse Jitter	< 20 ps
Reaction time to 'Laser on' signal (pulsed mode)	1 µs
Reaction time to 'Laser on' signal (CW mode)	3 µs
Power and pulse shape stabilisation after switch-on	3 min ⁵⁾
Fibre coupler	all 1" footprint couplers: Point Source, Schäfer&Kirchhoff, OZ Optics, Linus

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 high ³⁾
Frequency 50 MHz	TTL / CMOS high ³⁾
Frequency 80 MHz	TTL / CMOS high ³⁾
CW operation	TTL / CMOS high ³⁾
Laser ON / Off	TTL / CMOS low ³⁾
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 A ⁴⁾
Power Adapter	AC-DC power adapter, with key switch and control box in cable

Mechanical Data

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

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 °C ⁵⁾

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

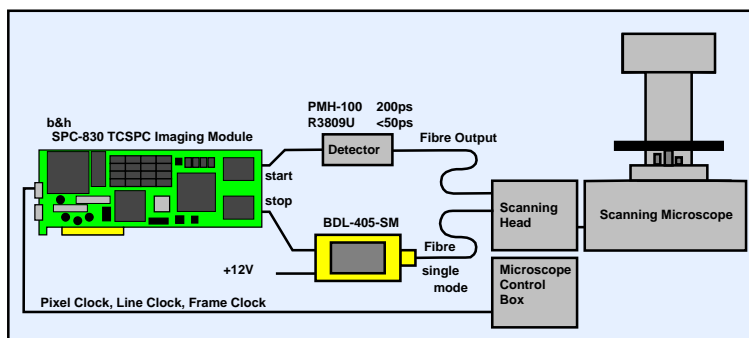
5) Operation below 13 °C may result in extended warm-up time.



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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BDL-375

Ultraviolet Picosecond Diode Laser

Pulse width down to 60 ps

Repetition rate 20-50-80 MHz

Wavelength 375 nm

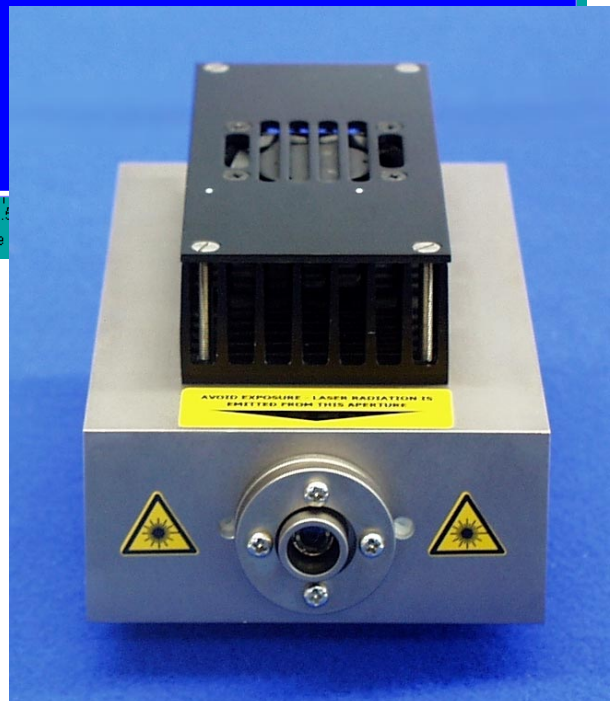
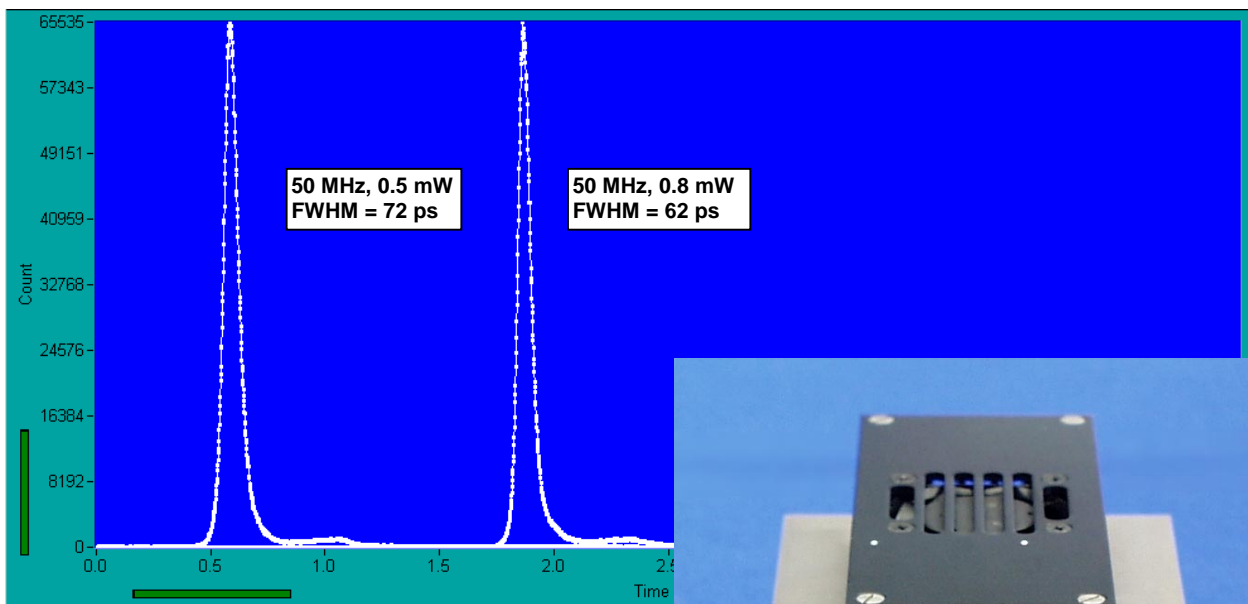
Low skew trigger output

Extremely low RF noise

Cooled laser diode

Simple + 9 V to +12V power supply

Compact design - no external controller unit



Luminescence lifetime experiments
Picosecond lifetime microscopy
Fluorescence correlation
Time-correlated single photon counting experiments



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BDL-375

Optical

Repetition Rate	20-50-80 MHz, selectable
Wavelength	370 nm to 380 nm, typ. 375 nm
Pulse Width (FWHM, Power 0.5 mW, 50 MHz)	60 to 90 ps
Peak Power	125 mW ¹⁾
Optical Power	20 MHz: 0.1 mW to 0.3 mW ²⁾
(Average or CW-equivalent power, adjustable)	50 MHz: 0.2 mW to 0.8 mW ²⁾
	80 MHz: 0.3 mW to 0.8 mW ²⁾
Stability of Repetition Rate	± 100 ppm
Pulse-to-Pulse Jitter	< 10 ps
Power and pulse shape stabilisation after 'Laser on' signal	1 µs
Power and pulse shape stabilisation after switch-on	3 min

Trigger Output

Pulse Amplitude	+100 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 high ³⁾
Frequency 50 MHz	TTL / CMOS high ³⁾
Frequency 80 MHz	TTL / CMOS high ³⁾
/Laser Off	TTL / CMOS low ³⁾
External Bias Input	analog input, -10 V to +10V

Power Supply

Power Supply Voltage	+ 9 V to +12 V
Power Supply Current	300 mA to 1 A ⁴⁾
Power Adapter	AC-DC power adapter, with key switch and control box in cable

Mechanical Data

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

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 30 °C ⁵⁾

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

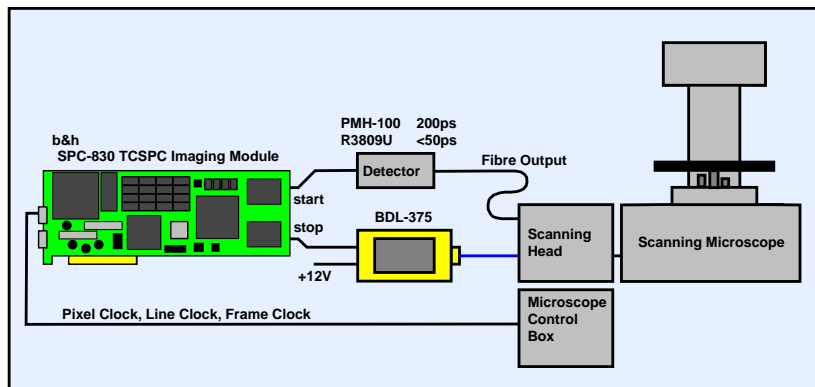
5) Operation below 13 °C may result in unstable power or extended warm-up time.



Caution: Class 3B laser product. Avoid exposure to beam. Light emitted by the device may be harmful to the human eye and skin. 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-375 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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BDL-405

405 nm Picosecond Diode Laser

Pulse width down to 60 ps

Repetition rate 20-50-80 MHz

Wavelength 405 nm

Low skew trigger output

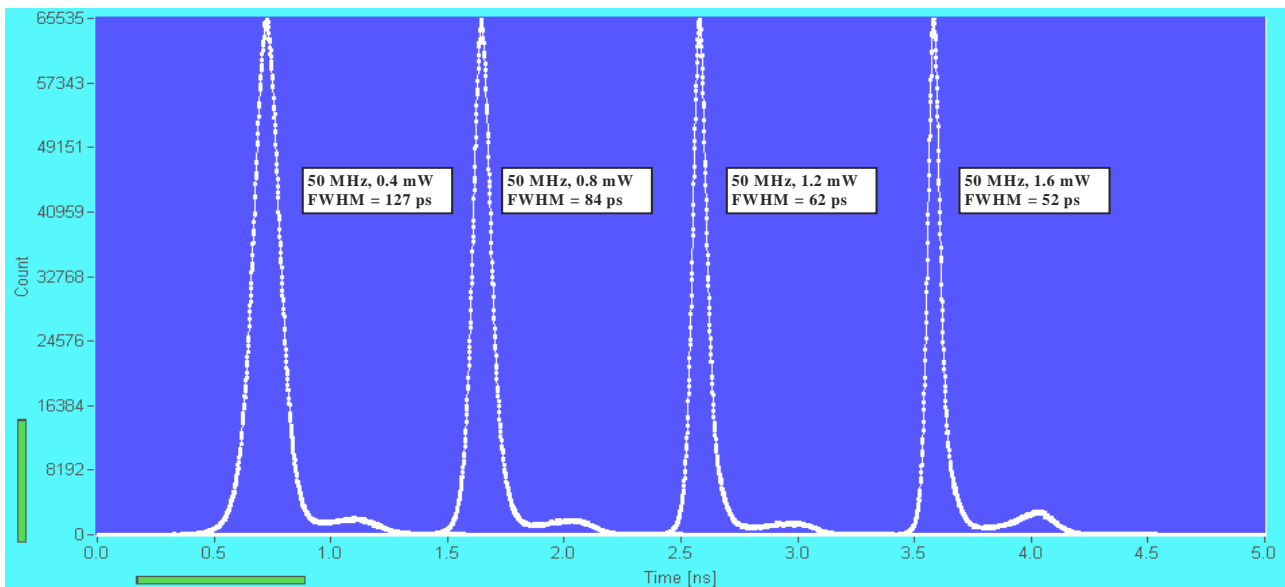
Extremely low RF noise

Cooled laser diode

Fast on / off / multiplexing capability

Simple + 9 V to +12V power supply

Compact design - no external controller unit



Luminescence lifetime experiments

Picosecond lifetime microscopy

Fluorescence correlation

Time-correlated single photon

counting experiments



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UK Representative:
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BDL-405

Optical

Repetition Rate	20-50-80 MHz, selectable
Wavelength	401 nm to 410 nm, typ. 405 nm
Pulse Width (FWHM, at 1 mW power, 50 MHz)	50 to 90 ps
Peak Power	80 to 500 mW ¹⁾
Optical Power	20 MHz: 0.12 mW to 0.6 mW ²⁾
(Average CW equivalent power, adjustable)	50 MHz: 0.3 mW to 1.6 mW ²⁾
	80 MHz: 0.4 mW to 2.4 mW ²⁾
Stability of Repetition Rate	± 100 ppm
Pulse-to Pulse Jitter	< 20 ps
Power and pulse shape stabilisation after 'Laser on' signal	1 µs
Power and pulse shape stabilisation after switch-on	3 min

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 high ³⁾
Frequency 50 MHz	TTL / CMOS high ³⁾
Frequency 80 MHz	TTL / CMOS high ³⁾
Laser ON / Off	TTL / CMOS low ³⁾
External Bias Input (Power Control)	analog input, -10 V to + 10V

Power Supply

Power Supply Voltage	+ 9 V to +12 V
Power Supply Current	300 mA to 1 A ⁴⁾
Power Adapter	AC-DC power adapter, with key switch and control box in cable

Mechanical Data

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

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 30 °C ⁵⁾

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

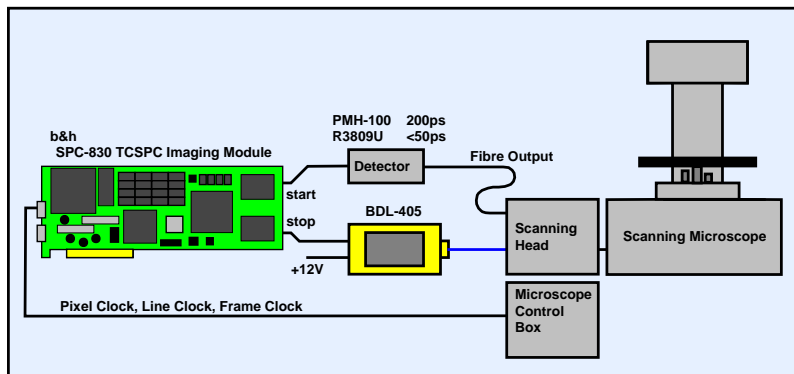
5) Operation below 13 °C may result in unstable power or extended warm-up time.



Caution: Class 3R 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 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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BDL-475

Blue Picosecond Diode Laser

Pulse width down to 60 ps

Repetition rate 20-50-80 MHz

Wavelength 473nm

Low skew trigger output

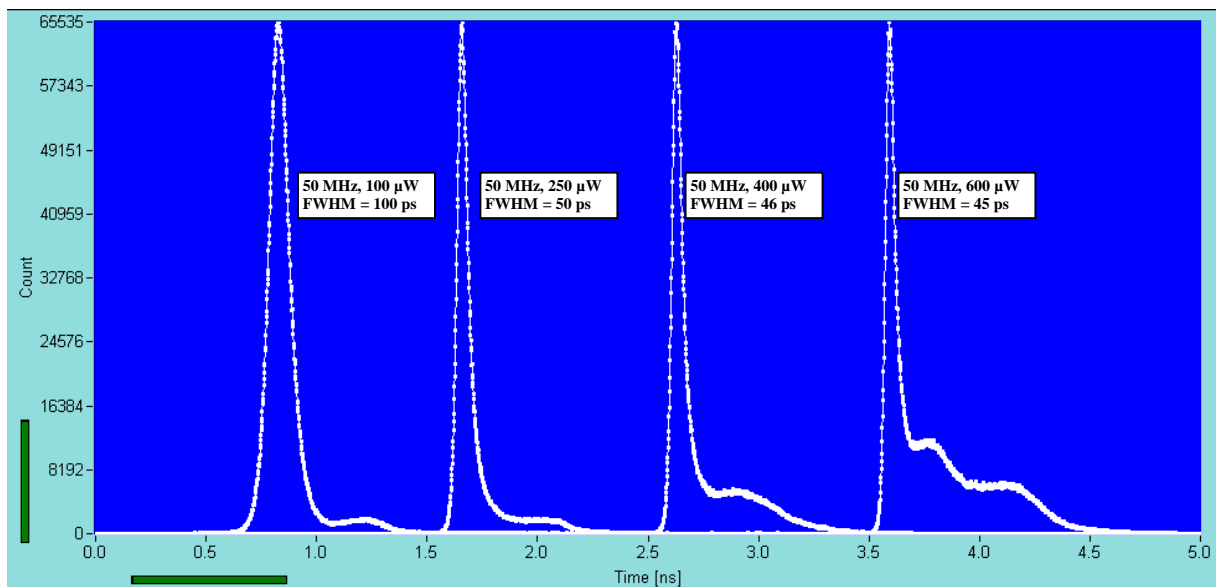
Extremely low RF noise

Cooled laser diode

Fast on / off / multiplexing capability

Simple + 9 V to +12V power supply

Compact design - no external controller unit

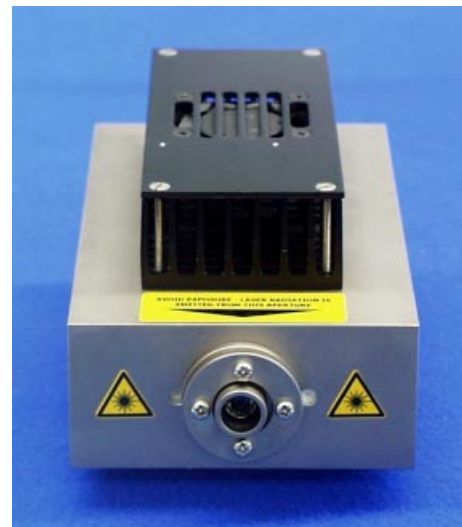


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BDL-475

Optical

Repetition Rate	20-50-80 MHz, selectable
Wavelength	468 nm to 482 nm, typ. 473 nm
Pulse Width (FWHM, Power 0.2 to 0.4 mW, 50 MHz)	45 to 60 ps
Peak Power	25 to 150 mW ¹⁾
Optical Power	20 MHz: 0.1 mW to 0.24 mW ²⁾
(Average CW equivalent power, adjustable)	50 MHz: 0.2 mW to 0.6 mW ²⁾
	80 MHz: 0.3 mW to 0.9 mW ²⁾
Stability of Repetition Rate	± 100 ppm
Pulse-to-Pulse Jitter	< 10 ps
Power and pulse shape stabilisation after 'Laser on' signal	1 µs
Power and pulse shape stabilisation after switch-on	3 min

Trigger Output

Pulse Amplitude	+100 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 high ³⁾
Frequency 50 MHz	TTL / CMOS high ³⁾
Frequency 80 MHz	TTL / CMOS high ³⁾
/Laser Off	TTL / CMOS low ³⁾
External Bias Input	analog input, -10 V to + 10V

Power Supply

Power Supply Voltage	+ 9 V to +12 V
Power Supply Current	300 mA to 1 A ⁴⁾

Mechanical Data

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

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 30 °C ⁵⁾

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

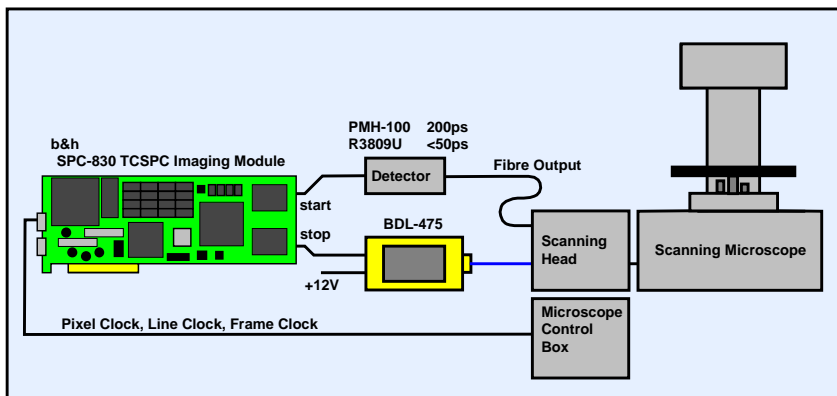
5) Operation below 13 °C may result in unstable power or extended warm-up time.



Caution: Class 3R 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-475 laser excites the sample with 50 MHz, 50 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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BHL-600

Red and NIR Picosecond Diode Laser Modules

Pulse width down to 50 ps

Average power up to 0.5 mW

Repetition rate 50 MHz

Wavelengths 635 nm to 1300 nm

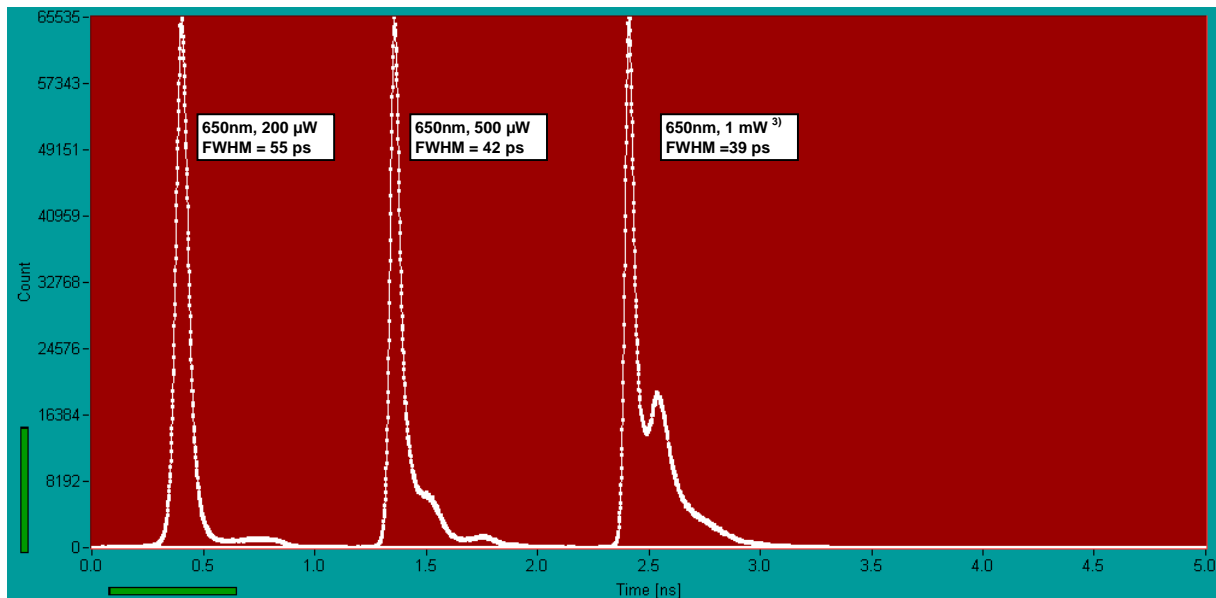
Low skew trigger output

Extremely low RF noise

Simple + 9 V to +12V power supply

Compact design - no external controller unit

Interfaces directly to all bh TCSPC modules



Photon migration experiments
Luminescence lifetime of NIR fluorophores
Fluorescence correlation
Testing of optical detectors
Time-correlated single photon counting experiments



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BHL-600

Optical

Repetition Rate	50 MHz
Wavelength	635, 650, 660, 670, 785, 808, 830, 980, 1300 nm ¹⁾
Average power (adjustable)	0.1 mW to 0.5 mW ²⁾
Maximum CW power	1 mW ³⁾
Average power for best pulse shape (typical value)	0.2 mW
Minimum pulse width (FWHM)	40 ps to 100 ps ⁴⁾
Pulse Width (FWHM, Power 0.5 mW)	<150 ps ⁴⁾
Peak Power	100 mW ^{4,5)}
Stability of Repetition Rate	± 100 ppm
Pulse-to Pulse Jitter	< 10 ps
Power regulation	within 2% ⁵⁾
Collimator focal length	8 mm

Trigger Output

Pulse Amplitude	-100 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

Power Supply

Power Supply Voltage	+9 V to 12 V
Power Supply Current	100 mA to 200 mA

Mechanical Data

Dimensions	110 mm x 66 mm x 38 mm
Mounting Thread	two M6 holes

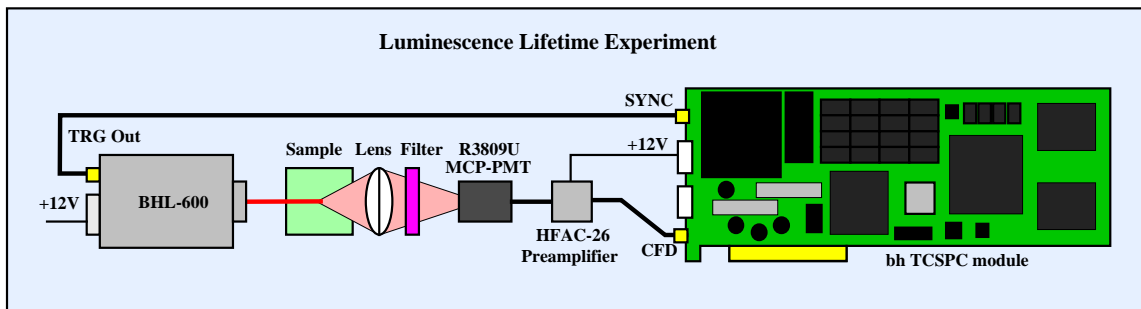
Maximum Values

Power Supply Voltage	0 V to +15 V
Ambient Temperature	0 °C to 30 °C
Maximum CW power	1 mW ³⁾

- 1) Other wavelengths are available, but pulse width may differ from values given
- 2) Recommended power adjust range. Please note that the pulse width changes with the power. Permanent operation above the given range may impair the lifetime of the laser diode.
- 3) Absolute maximum of CW power. It is not guaranteed that all versions actually reach this power.
- 4) Pulse width varies with wavelength version and power. Please contact bh for detailed information.
- 5) Typical value, sample tested only.
- 6) Power is regulated via internal monitor photodiode. Reflecting the beam back or shining other light into the laser diode may impair power stability or even shutdown the laser.



Caution: Class 3R 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.

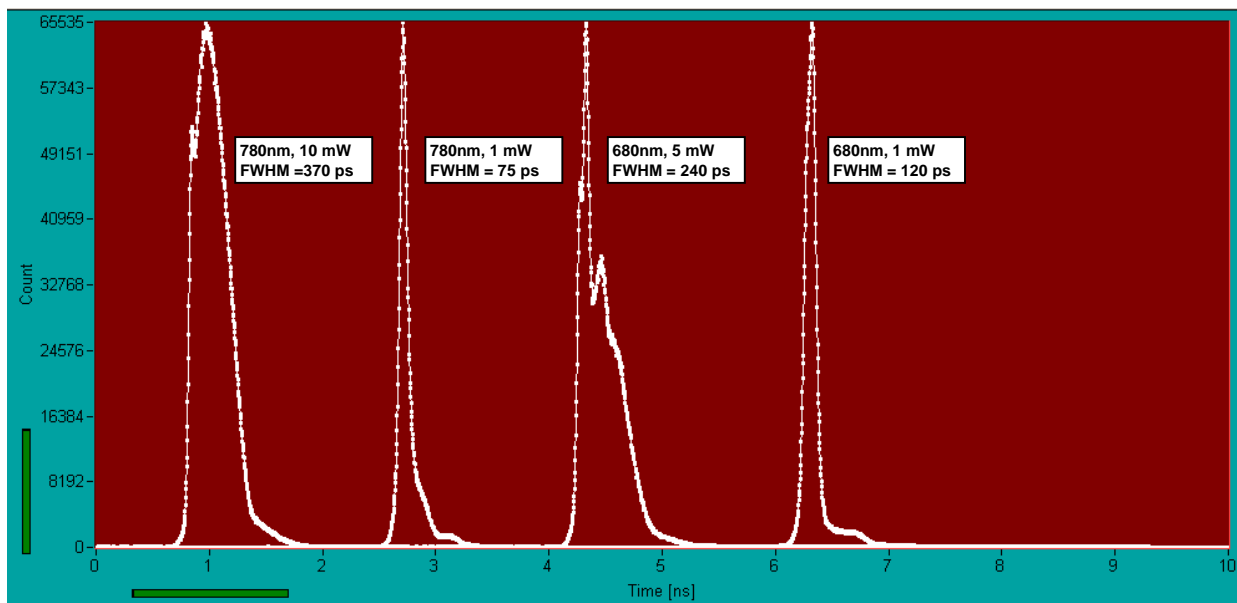


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BHLP-700

Red and NIR Picosecond Diode Laser Modules

Pulse width down to 100 ps
Average power up to 10 mW
Repetition rate 50 MHz
Wavelength 685 nm, 785 nm
Low skew trigger output
Extremely low RF noise
Cooled laser diode
Shutdown / startup within 2 μ s - fast multiplexing capability
Simple +12V power supply
Compact design - no external controller unit
Interfaces directly to all bh TCSPC modules



Diffuse Optical Tomography
Luminescence Lifetime of NIR Fluorophores
Fluorescence Correlation
Time-Correlated Single Photon Counting
Experiments



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BHLP-700

Optical

Repetition Rate	50 MHz
Wavelength	685 nm, 785 nm ¹⁾
Pulse Width (FWHM, Power 1 mW, typical value)	120 ps
Pulse Width (FWHM, Power 5 mW, typical value)	300 ps
Peak Power	300 mW ²⁾
Average CW power (adjustable)	0.2 mW to 10 mW ³⁾
Stability of Repetition Rate	± 100 ppm
Pulse-to Pulse Jitter	< 10 ps
Power and pulse shape stabilisation after 'Laser on' signal	2 µs
Power and pulse shape stabilisation after switch-on	2 min

Trigger Output

Pulse Amplitude	-100 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

/Laser Off (Shutdwn)	TTL / CMOS low ⁴⁾
Shutdwn delay	< 100 ns
Power and pulse shape stabilisation after end of '/Laser Off'	2 µs
External Power Control	analog input, 0 to +5 V

Power Supply

Power Supply Voltage	+12 V
Power Supply Current	200 mA to 1 A ⁵⁾

Mechanical Data

Dimensions	110 mm x 66 mm x 78 mm
Mounting Thread	two M6 holes

Maximum Values

Power Supply Voltage	0 V to +15 V
Voltage at /Laser Off input	-2 V to +7 V
Voltage at Ext. Bias Input	-2V to +7V
Ambient Temperature	0 °C to 30 °C ⁶⁾

1) Other wavelengths from 635nm to 1300nm are available. Power and pulse width parameters may differ for wavelengths other than specified above. Please contact bh.

2) Typical value, sample tested only.

3) Recommended power adjust range. Please note that the pulse width changes with the power. Power levels above the given range can be selected, but may impair the lifetime of the laser diode.

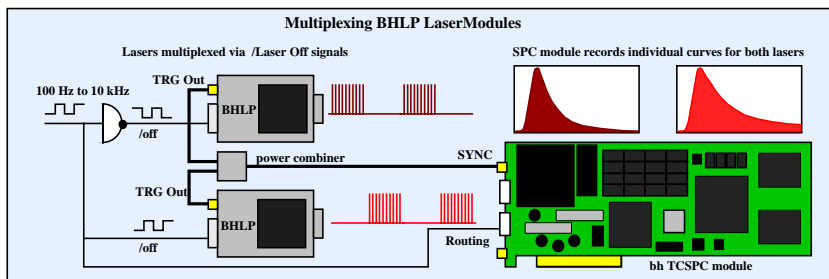
4) All inputs have 10 kΩ pull-up resistors. Open input is equivalent to logic 'high'.

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

6) Operation below 13 °C may result in unstable power or extended warm-up time.



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



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