



# BDU-SM

## BDU-SM Family USB-Controlled Picosecond Diode Lasers

Small-size, 40 mm x 80 mm x 120 mm

USB interface

Power supply from USB port

No external controller or power supply

Wavelengths from 375 nm to 785 nm

Pulse repetition rate 20, 50, 80 MHz, CW

Pulse width down to 40 ps

Excellent timing stability

Excellent power stability

No warm-up time

Free-beam or single-mode fibre output

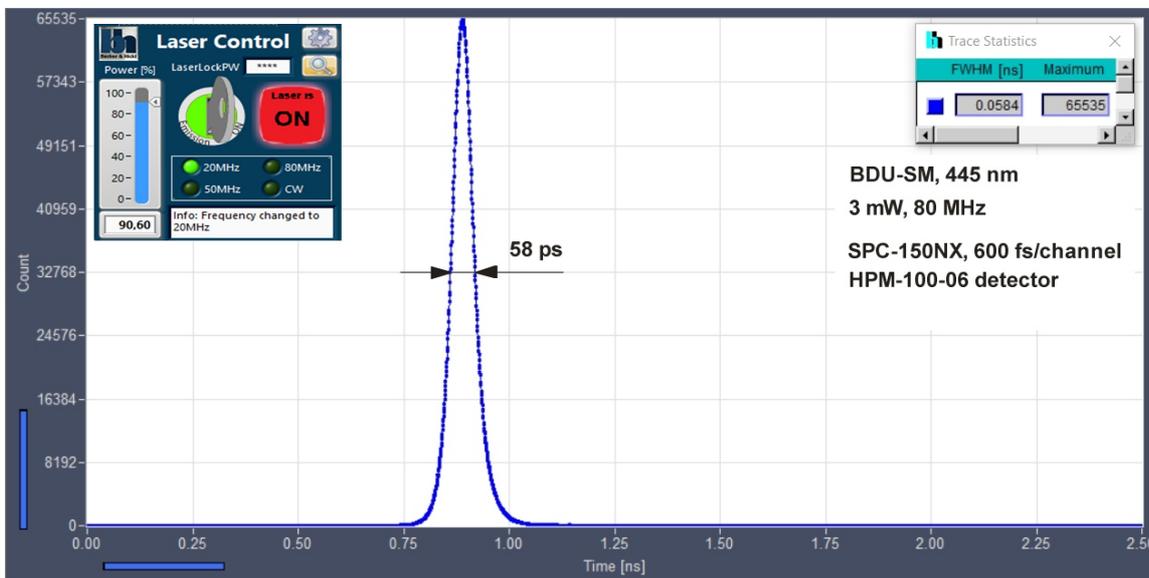
Free-beam power in pulsed mode up to 3 mW

Free-beam power in CW mode up to 10 mW

Internal power stabilisation loop

USB 2.0 compatible

Compatible with all bh TCSPC devices



Pulse shapes and power levels may change due to development in laser diode technology. Coupling efficiency into single-mode fibres is 40 to 60%.

Designed and manufactured by



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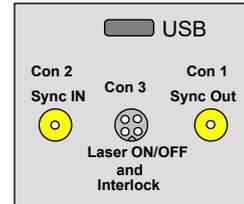
# BDU-SM

## Optical

Repetition Rate, selected via USB 20 MHz, 50 MHz, 80 MHz, for other repetition rates contact bh  
 Wavelengths 375 nm, 405 nm, 445 nm, 470 nm, 485 nm, 515 nm, 640 nm, 685 nm, 785 nm, for other contact bh  
 Pulse width (FWHM, at medium power) 30 to 90 ps  
 Pulse width (FWHM, at maximum power) 60 to 300 ps  
 Power control range (ps mode, 80 MHz, power in free beam) 0 to 1 mW ..... 0 to 5 mW, depends on wavelength version  
 Power control range (CW mode, power in free beam) 0 to 10 mW, limited by USB power supply limitations  
 Beam diameter, free beam 0.8 mm  
 Polarisation vertical  
 Coupling efficiency into single-mode fibre, typically 40% to 60 %

## SYNC / Trigger Output, to TCSPC Modules (Con1, see right)

Connector SMA  
 Pulse Amplitude -1.2 V (peak) into 50 Ω  
 Pulse Width 1 ns, see figure lower right  
 Output Impedance 50 Ω  
 Jitter between Trigger and Optical Pulse < 5 ps  
 Timing stability, trigger out to optical pulse < 2 ps over 10 minutes

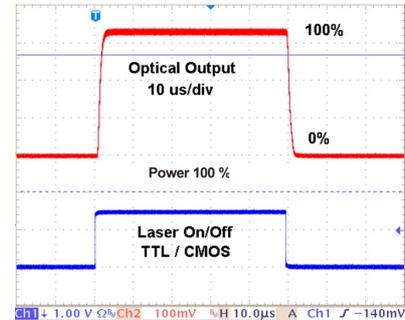


## Synchronisation Input (Con2, see right)

Connector SMA  
 Input pulse amplitude +3.3 to +5V into 50 Ω  
 Duty cycle 10 to 30 %. DC equivalent must be < 2.5V  
 Switching between external sync and internal oscillator By average input voltage  
 Input frequency range Vav < 2.5V: External. Vav > 2.5V: Internal  
 10 MHz to 80 MHz

## Laser ON/OFF Modulation Input (Con 3, see right)

Signal Levels TTL / CMOS  
 Response time of optical output to on/off signal < 4 us for power 10 to 100%, see figure right  
 Standard configuration, active H, normally ON TTL / CMOS H: Emission on, pull-up resistor  
 Special configuration, active H, normally OFF TTL / CMOS H: Emission on, pull-down resistor  
 Special configuration, active L, normally ON TTL / CMOS L: Emission on, pull-down resistor  
 Special configuration, active L, normally OFF TTL / CMOS L: Emission on, pull-up resistor  
 Special configurations on demand



## Safety Interlock Function (Con 3, see right)

Laser enabled: Con 3 INTLCK connected to GND  
 Laser disabled: Con 3 INTLCK open

## USB Interface

Version USB 2.0 standard  
 Connector USB C

## Power Supply

Power Supply Voltage +5V from USB port  
 Power Supply Current 200 mA to 800 mA

## Mechanical Data

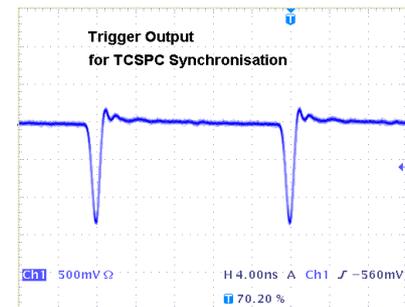
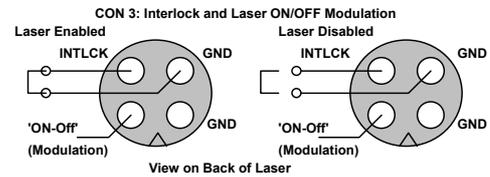
Dimensions, including heat sink 40 mm x 80 mm x 120 mm  
 Mounting holes four holes for M3 screws

## Maximum Ratings

Supply voltage 4.5 V to 5.5 V  
 Voltage at 'Laser On/Off' input -2 V to +7 V  
 Ambient Temperature 0 °C to 40 °C

## Related Products

BDS-SM picosecond and CW diode lasers, BDS-MM picosecond diode lasers



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

## International Sales Representatives



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