

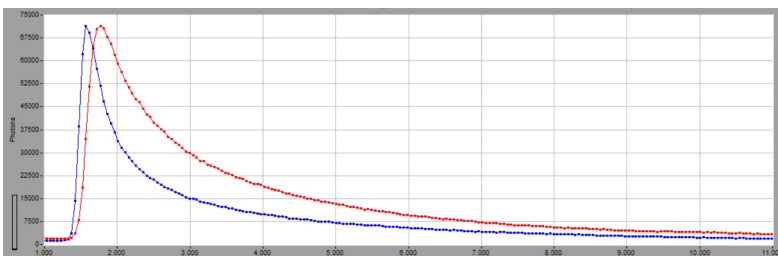
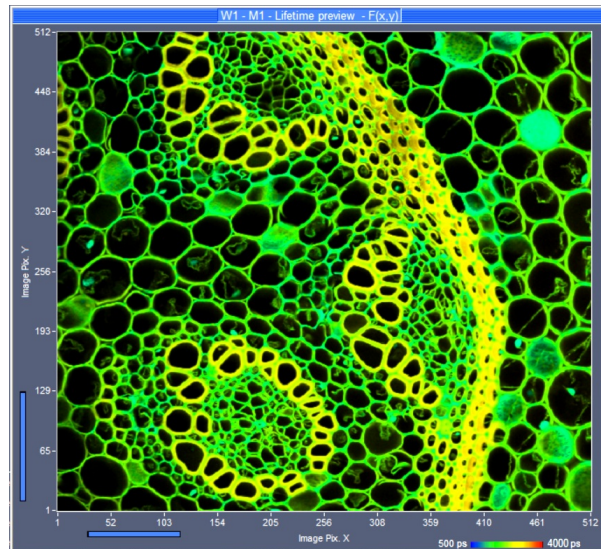
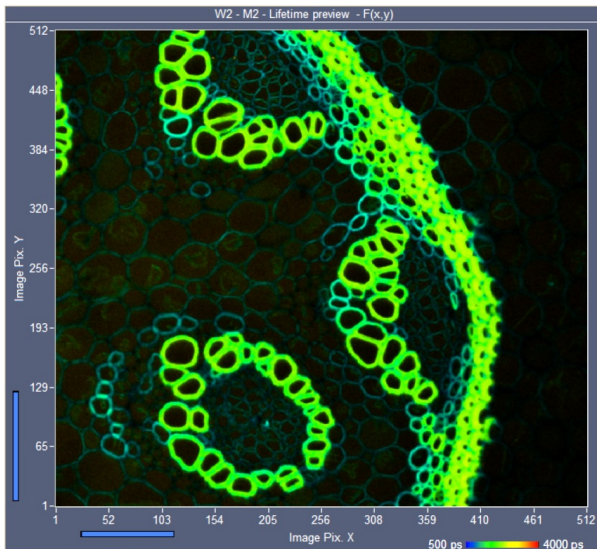


Four ps Diode Lasers - One Fibre Output

- Four lasers of different wavelength
- One single-mode fibre output
- Internal variable optical attenuators
- Wavelengths from 375 nm to 850 nm
- Pulsed mode and CW mode
- Pulse repetition rate 20, 50, 80 MHz
- Power in pulsed mode up to 3 mW
- Power in CW mode up to 20 mW
- Pulse width down to 38 ps
- Sync input, Sync output
- Excellent power stability
- Excellent timing stability
- Fast ON/OFF and multiplexing capability
- Compact Module, 450 mm × 300 mm × 80 mm
- Simple +12 V power supply
- Compatible with all bh TCSPC devices



- Fluorescence-lifetime spectroscopy
- Fluorescence-lifetime microscopy
- Near-infrared tissue spectroscopy



FLIM of Convallaria Sample
Multiplexed excitation, 405 nm and 488 nm



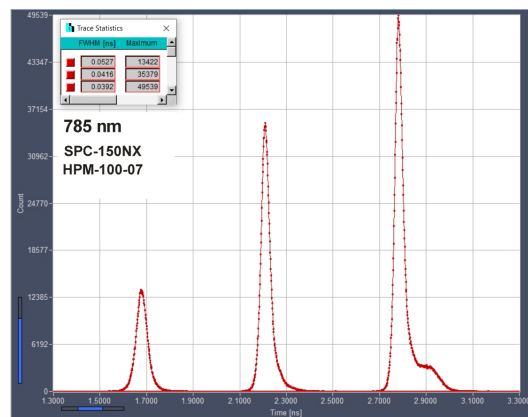
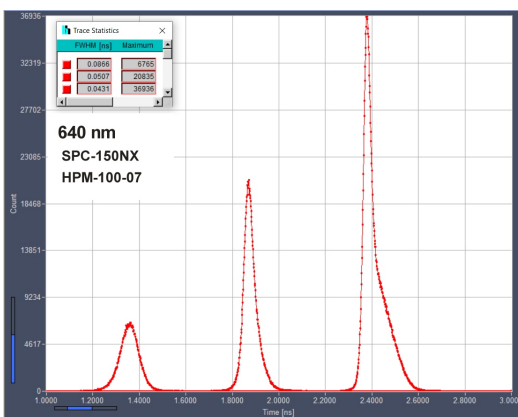
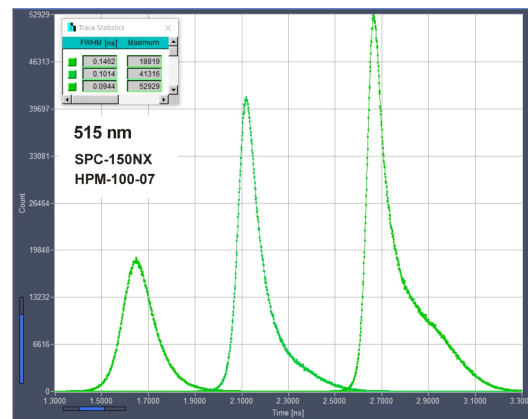
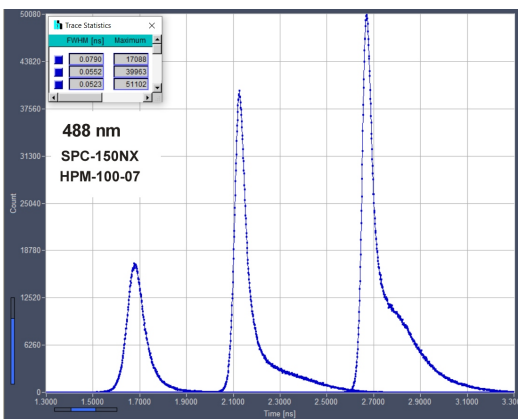
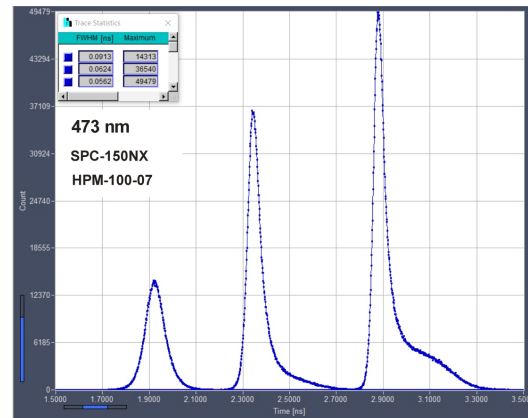
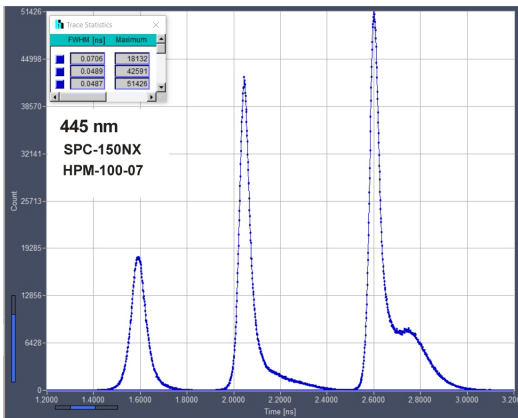
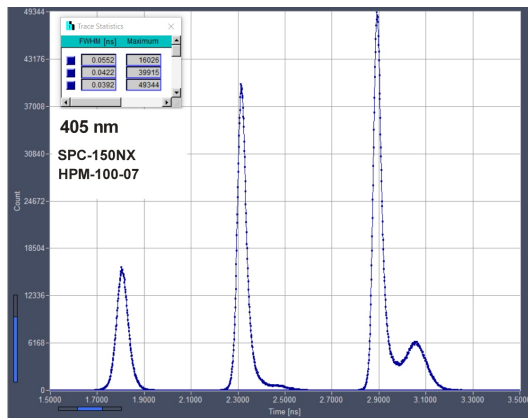
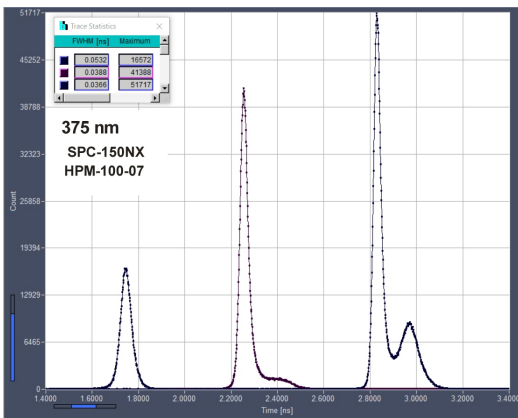
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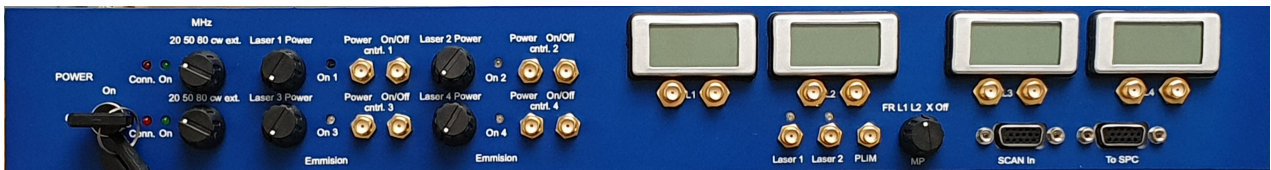
Pulse Shapes for Selected Wavelengths - Scale 200 ps / div





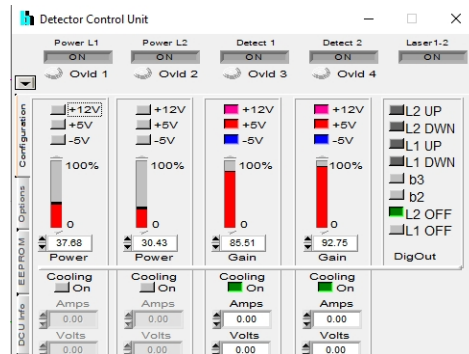
Manual Control of Lasers

Manual control elements of the LHB-104 are shown in the figure below. There are a key switch to turn on and off the power supply, switches for the laser repetition rate (common for Laser 1 and 2 and Laser 3 and 4), and potentiometers to adjust the laser power. The actual power (in per cent of the maximum) is shown by LCD displays. For use in laser scanning microscopy the LHB-104 can be equipped with a multiplexing module (MPM). The MPM module receives the scan clock pulses of the microscope and multiplexes two of the available lasers synchronously with the pixels, lines, or frames of the scan. The multiplexing mode is selected by a switch below the laser power indicators.

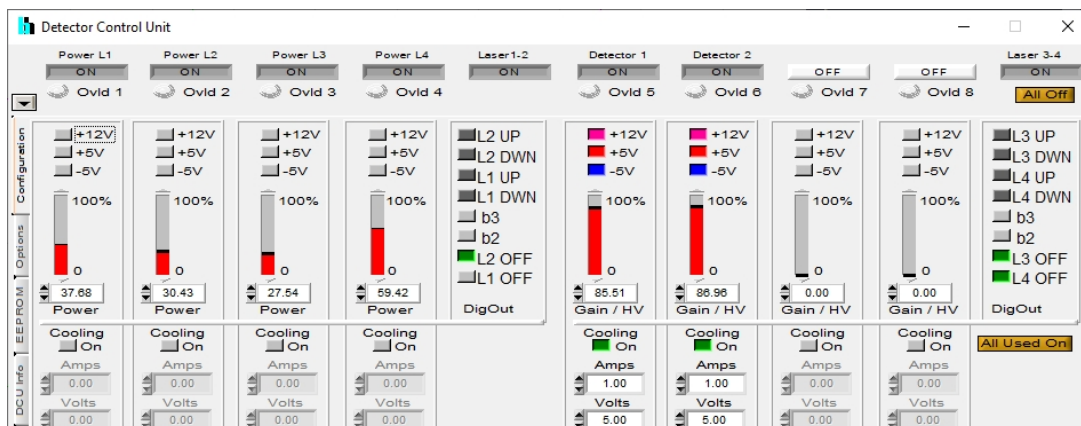


Software Control of Lasers

Software control of the LHB-104 is integrated the bh SPCM TCSPC data acquisition software. Connection of the computer to the LHB-104 is provided by USB via the DCU-104 or DCU-108 Detector/Laser Controller modules.



Software control of four lasers



Software control of four lasers and four detectors



Specifications

Optical

Number of laser lines	up to 4
Output fibre type	Single mode, LASOS precision connector, Point source connector, or FC connector
Wavelengths range	375 nm to 850 nm
Integrated bh laser series	BDS-SM, BDS-SMY
Repetition Rate	20, 50, 80 MHz and CW
Pulse width (FWHM, at 50% power)	30 to 100 ps
Power control range (electrical, ps mode)	0 to 1 mW 0 to 3 mW (depends on wavelength)
Power control range (electrical, CW mode)	0 to 5 mW 0 to 20 mW (depends on wavelength)
Power control range (optical)	1% to 100%, separate for individual lasers

Sync Output, to TCSPC Modules

Pulse Amplitude	-1.2 V (peak) into 50 Ω
Pulse Width	1 ns
Output Impedance	50 Ω
Connector	SMA
Jitter between Sync Out and Optical Pulse	< 10 ps

Synchronisation Input / Laser Trigger

Input amplitude	+3.3 to +5 V into 50 Ω
Duty cycle	max. 30 %. DC equivalent must be < 2.5 V
Input frequency	single shot to 80 MHz
Switch between internal clock and sync input	automatic, by average voltage at trigger input
Frequency range with active power stabilization	10 MHz to 80 MHz
Connector	SMA

Control Inputs

Laser Emission ON/OFF	TTL / CMOS, 'low' means 'OFF', internal pull-up, separate for the four lasers
Response of optical output to ON/OFF signal	< 4 us for power 10 to 100 %
External Power Control	analog inputs, 0 to +10 V, separate for the four lasers
Response time of optical output to power control	< 4 us for power 10 to 100 %
Frequency Control	20/50/80/CW, common for Laser 1 and 2 and for Laser 3 and 4

Multiplexed Operation

Multiplexing control	via internal MPM module or external DDG-120 pulse generator
Multiplexed-FLIM operation	via internal MPM module, Pixel, frame, line multiplexing, controlled by scan clocks
FLIM/PLIM operation	via internal MPM module or external DDG-120 pulse generator

Laser Safety Remote Interlock

Connector	LEMO 4 pin
Polarity of interlock signal	Connection to GND, Connection to +5V...+12V, CMOS L or CMOS H
Function	Interlock turns off the power supply to the lasers

Power Supply

Power Supply Voltage	+12V (+ 9 V to +15 V)
Power Supply Current at 12V	500 mA to 2 A ¹⁾

Mechanical Data

Dimensions	450 mm x 300 mm x 80 mm
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More Technical Details

please see **LHP-104 laser lub, user manual**
and

BDS-SM picosecond diode lasers, extended data sheet

1) Depends on case temperature due to laser diode cooling. Cooling current changes with case temperature.

Related Product Literature

BDS-SM picosecond diode lasers, extended data sheet, see www.becker-hickl.com
LHB-104 Laser Hub, user manual, see www.becker-hickl.com
FLIM systems for Zeiss LSM 980, addendum to User Handbook for FLIM systems for LSM 710/780/880

Laser Safety



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.

International Sales Representatives



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