HORIBA
Scientific

DeltaDiode

ELEMENTAL ANALYSIS

FLUORESCENCE

GRATINGS & OEM SPECTROMETERS

OPTICAL COMPONENTS

PARTICLE CHARACTERIZATION

RAMAN

SPECTROSCOPIC ELLIPSOMETRY

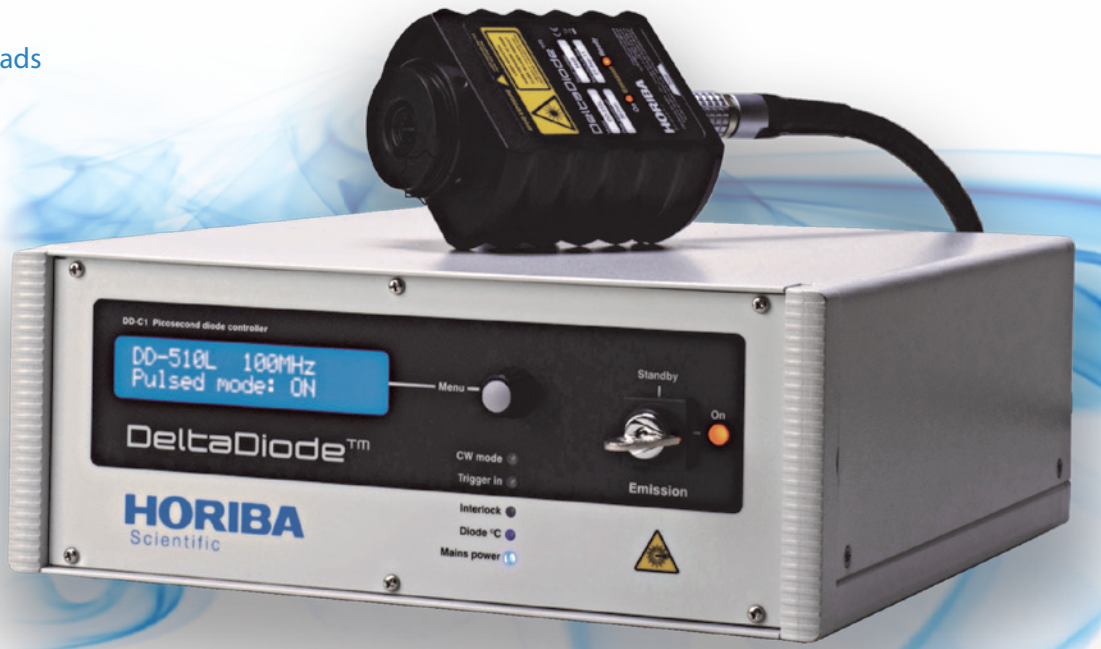
SPR IMAGING

JOBIN YVON Technology

DeltaDiodes are the latest lifetime innovation from HORIBA Scientific

Built around diode lasers and LEDs, their unrivalled speed and stability make them the ideal excitation sources for the most demanding TCSPC applications. Total software control and automatic adjustment of parameters make them extremely versatile and very easy to use.

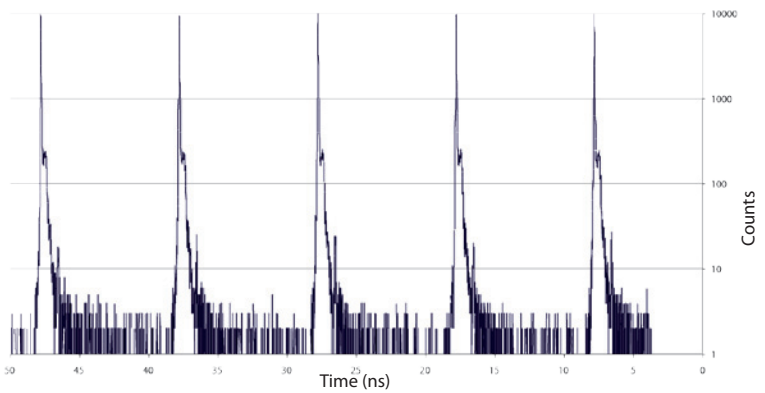
- Hot-swappable plug-n-play heads – No adjustment required
- USB interface for complete software control
- Self dimming LCD display for use in dark rooms
- Regulated diode temperature
- Ultra low jitter synchronization circuitry
- Flexible triggering and gating I/O
- Integrated optics with adjustable focus and beam pointing
- Quick release bayonet attachment – plane of polarization easily rotatable



Features

- The widest range of interchangeable heads
- Short optical pulses from <50ps optical FWHM
- Repetition rates up to 100MHz
- Wavelengths from 250nm to NIR
- No additional optimization of sources required in normal use
- Diode operating features fully accessible for advanced applications

Stable high repetition rate output



DD-405L 50ps pulses at 100MHz—note log y-axis

Applications and Examples

Fluorescence Lifetime
- FRET
- Short decay and acquisition time

Photosynthesis
- Intramolecular charge transfer

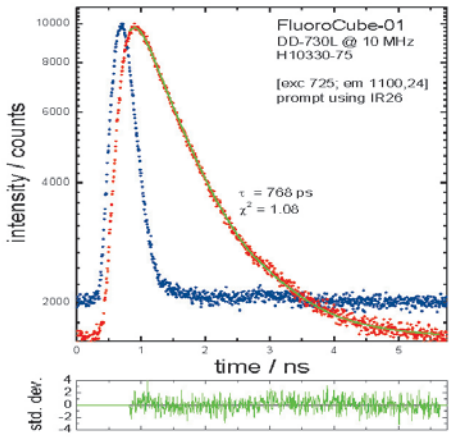
Photovoltaics
- Electron Injection

Biomolecules
- Protein interactions
- Photochemical drug release

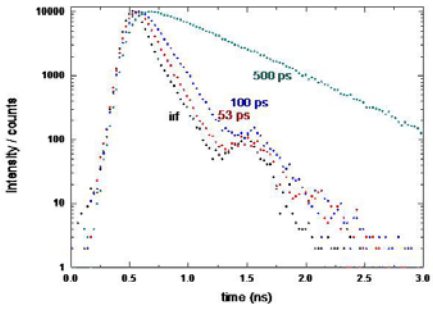
Quantum Dots

Photochemical Reactions

NIR Fluorescence



Picosecond lifetimes



and more...

- Characterization of photodetectors
- Quantum cryptography
- Bandwidth characterization of optical fibers
- Optical time domain reflectometry (OTDR)
- Diffuse optical tomography

Accessories

Shutters

Fiber launchers

Filters

Specifications

Laser diode heads

Model[5]	Peak Wavelength[1]	Pulse Width Typical[2]	Pulse Width Maximum[2]	Peak Power[3,4]	Average Power[3,4]	Maximum Repetition Rate	CW Mode	Other
DD-375L	375 ± 7 nm	45 ps	70 ps	300 mW	1.8 mW	100 MHz	Optional	
DD-395L	395 ± 8 nm	70 ps	90 ps	400 mW	3.0 mW	100 MHz	Optional	
DD-405L	405 ± 8 nm	45 ps	70 ps	300 mW	1.4 mW	100 MHz	Optional	
DD-415L	415 ± 8 nm	70 ps	90 ps	250 mW	1.7 mW	100 MHz	Optional	
DD-425L	425 ± 8 nm	70 ps	70 ps	230 mW	1.6 mW	100 MHz	Optional	Active stabilization of diode temperature in range 20–40°C.
DD-440L	440 ± 9 nm	60 ps	70 ps	400 mW	3.0 mW	100 MHz	Optional	
DD-450L	450 ± 10 nm	80 ps	120 ps	250 mW	3.0 mW	100 MHz	Optional	Aspheric collimation lens, adjustable for focus and beam trajectory.
DD-470L	472 ± 7 nm	65 ps	90 ps	160 mW	1.5 mW	100 MHz	Optional	
DD-485L	485 ± 7 nm	80 ps	95 ps	300 mW	3.0 mW	100 MHz	Optional	
DD-510L	508 ± 10 nm	110 ps	140 ps	100 mW	1.4 mW	100 MHz	No	Vertically polarized output.
DD-635L	635 ± 10 nm	60 ps	80 ps	300 mW	2.0 mW	100 MHz	Optional	
DD-650L	650 ± 15 nm	70 ps	90 ps	60 mW	0.4 mW	80 MHz	Optional	Mounting: 35 mm bayonet coupling permits quick interchange, free rotation of beam polarization, and ambient light exclusion; M4-threaded hole provided for optical table mounting.
DD-670L	670 ± 10 nm	75 ps	90 ps	30 mW	0.2 mW	100 MHz	Optional	
DD-730L	730 ± 10 nm	60 ps	70 ps	500 mW	3.0 mW	100 MHz	Optional	
DD-785L	785 ± 10 nm	60 ps	80 ps	250 mW	2 mW	100 MHz	No	
DD-830L	830 ± 10 nm	50 ps	70 ps	200 mW	0.6 mW	100 MHz	No	
DD-980L	980 ± 10 nm	100 ps	350 ps	10 mW	0.2 mW	50 MHz	No	
DD-1060L	1055 ± 10 nm	100 ps	345 ps	125 mW	4.3 mW	100 MHz	No	
DD-1310L	1310 ± 10 nm	100 ps	350 ps	10 mW	0.2 mW	100 MHz	No	
DD-xxxL	New laser heads are continually under development—contact HORIBA Scientific for other wavelengths							

1. Spectral FWHM in pulsed mode is typically <10 nm, in CW mode <2 nm.
2. Pulse width refers to optical pulse duration measured at 20 MHz repetition rate and default settings; in TCSPC the prompt FWHM is also a function of detector TTS.
3. Peak power and average power are measured at maximum repetition rate and are typical values when new peak power is calculated.
4. To calculate typical pulse energy, divide average power (in watts) by maximum repetition rate, e.g., for DeltaDiode-375L, pulse energy is 20 pJ.
5. To specify fiber-launcher, add –F suffix. To specify CW operation (where available), add –CW suffix.

LED heads

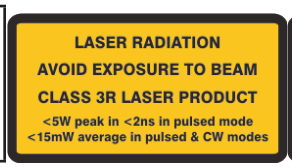
Model[5]	Peak Wavelength	Spectral FWHM[3]	Pulse Width Typical[1]	Pulse Width Maximum[1]	Average Power[3,4]	Maximum Repetition Rate	Other
DD-250	250 ± 10 nm	<15 nm	750 ps	1.0 ns	4 µW	20 MHz	
DD-260	260 ± 10 nm	<15 nm	750 ps	1.0 ns	5 µW	20 MHz	
DD-270	270 ± 10 nm	<15 nm	800 ps	1.2 ns	10 µW	20 MHz	
DD-280	280 ± 10 nm	<15 nm	950 ps	1.5 ns	10 µW	20 MHz	Active stabilization of diode temperature in range 20–40°C (for DD-250 to DD-360).
DD-290	290 ± 10 nm	<15 nm	800 ps	1.2 ns	10 µW	20 MHz	
DD-300	300 ± 10 nm	<15 nm	800 ps	1.2 ns	5 µW	20 MHz	Adjustable focusing lens. Unpolarized output.
DD-310	310 ± 10 nm	<15 nm	800 ps	1.2 ns	5 µW	20 MHz	
DD-320	320 ± 10 nm	<15 nm	800 ps	1.2 ns	5 µW	20 MHz	
DD-330	330 ± 10 nm	<20 nm	800 ps	1.5 ns	2 µW	20 MHz	Mounting: 35mm bayonet coupling permits quick interchange and ambient-light exclusion; M4 threaded hole provided for optical table mounting.
DD-340	340 ± 10 nm	<20 nm	750 ps	1.0 ns	2 µW	20 MHz	
DD-350	350 ± 10 nm	<20 nm	800 ps	1.0 ns	2 µW	20 MHz	
DD-360	360 ± 10 nm	<20 nm	800 ps	1.0 ns	2 µW	20 MHz	
DD-370	372 ± 10 nm	<15 nm*	800 ps	1.2 ns	2 µW	20 MHz	
DD-xxx	New LED heads are continually under development—contact HORIBA Scientific for other wavelengths						

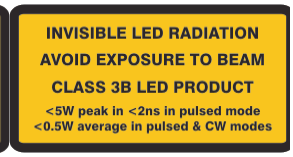
1. Pulse width refers to optical pulse duration measured at 20 MHz repetition rate and default settings; in TCSPC the prompt FWHM is also a function of detector TTS.
2. Average power is measured at maximum repetition rate and is typical value when new.
3. Spectral filtering may be required depending on application. Monochromators and filters are available as optional accessories. *Indicates filter included.
4. 50 MHz available to special order at certain wavelengths.

DD-C1 Controller

Function	Specifications
Repetition rates	10 kHz, 20 kHz, 50 kHz, 100 kHz, 250 kHz, 500 kHz, 1 MHz, 2 MHz, 4 MHz, 5 MHz, 8 MHz, 10 MHz, 16 MHz, 20 MHz, 25 MHz, 50 MHz, 80 MHz, 100 MHz, or trigger input (single-shot to 50 MHz). Subject to attached head.
Trigger input	Pulse amplitude +0.5V to +5V, trigger threshold software-programmable from +0.2 V to +2 V, 50 Ω, 20 ns minimum spacing.
Sync outputs	Simultaneous output of NIM-compatible (–0.8 V_{pp} 50 Ω) and TTL-compatible (+2 V_{pp} 50 Ω), automatic width-selection 5–15 ns nominal
Sync delay control	Adjustment of sync output pulse-timing in range –10 ns to +10 ns nominal in 1 ns steps, uncalibrated.
Fast gate input	Pulse amplitude +0.5 V to +5 V, trigger threshold software-programmable from +0.2 V to +2 V, 50 Ω. Selectable inhibit/enable modes. Operates in pulsed mode.
Slow gate input	Pulse amplitude +2 V to +5 V, 10 kΩ. Selectable inhibit/enable modes. Operates in pulsed and CW modes.
Interlock	2-pin connector (included). Contacts must be short-circuited to enable emission.
Connection to head	1.5 m cable (included)
User interface	LCD display (stand-alone operation) or software (PC control).
PC interface	USB 2.0 with integral hub for downstream connection to other USB peripherals (cable to host PC and software are supplied)
Power requirements	90 V to 260 V AC, 50/60 Hz, 100 VA
Operating temperature	+15°C to +30°C (ambient)
Weight & dimensions	3.1 kg, 234 × 255 × 92 mm

Class 3R/3B laser product
Class 3B LED product
Avoid exposure to beam
Conforms to international safety standards. USA: 21 CFR subchapter 1040.10. Elsewhere IEC 60825-1





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