PIXEA

High-quality Picosecond Pulsed Laser

- ✓ **Wavelengths selection: 375 nm to 1,990 nm**
- ✓ **Pulse widths as short as 20 ps,**
- ✓ **Very low jitter < 3 ps**
- ✓ **Repetition rate from single shot to 120 MHz**
- ✓ **Peak power from 20 mW up to 1W**
- ✓ **Very clean pulses with minimize pulse tails**
- ✓ **Graphical User Interface, and DLL for LabVIEW, C++, VB**
- ✓ **Computer controlled via USB 2 interface**
- ✓ **Maintenance free – no alignments**

The PIXEA is a high-quality stand-alone laser system for generating ultra-short optical pulses by using gain-switched laser diode technologies. The laser features high-quality picosecond laser "clean" pulses with no satellite pulses and minimize pulse tail. The PIXEA series offer a large variety of centered wavelengths between 375 nm and 2 um. The pulse duration down to 20 ps is optimized for each wavelength.

The repetition rates from single shot up to 120 MHz, the very low jitter down to few ps, and the easily trigger from external signals, make the PIXEA a flexible picosecond laser system suitable for large variety of applications. Moreover, it is very reliable maintenance free laser with no alignment required, ideal for the most demanding industrial and scientific applications looking for low-cost of ownership.

The PIXEA laser is based in one or two modules, the laser head and the dedicated Control Unit including the front-panel LCD display, and the fast USB interface. The easy-to-use Graphical User Interface and the DLL libraries for the most common programming software (LabVIEW, Visual Basic, C++) are provided. Different optical output options are available, including free space collimating optics and optical fiber coupled.

Applications

Time-Correlated Single Photon Counting (TCPSC)

Time-Resolved Fluorescence & Photoluminescence

Fluorescence Lifetime Imaging (FLIM)

Fluorescence Correlation Spectroscopy (FCS, FLCS)

Forster Resonance Energy Transfer (FRET)

Stimulated Emission Depletion Microscopy (STED)

Singlet Oxygen

Detectors and optical fibers time characterization

Quality control and inspection

Laser seeding

Options

Dual mode with pulsed and CW operation

Free-space or optical fiber output

All-in-one laser system

Picosecond Laser head specifications

Parameters	Typical Specifications
Centre Wavelength	375 nm – 1,990 nm
Tolerance Wavelength	+/-10 nm
Spectral width	< 10nm
Pulse duration	< 100ps (20 ps – 150 ps)
Pulse Rep. Rate	Single shot to 120 MHz (CW option)
Timing Jitter	< 3 ps
Peak power	> 300 mW (20 mW – 1W)
Av. power @ 100 MHz	0.5 - 2 mW
Beam quality	$M^2 < 1.1$, TEM_{00}
Polarization Ratio	>99%
Operation temperature	$15^0C – 35^0C$
Warm-up time	< 10 minutes
Free space output option	Collimated output 2mm
Fiber output option	FC/PC or FC/APC single mode fiber
Cooling Laser head	Air/Peltier cooling
Dimensions	147x95x31 mm^2
Weight	0.45 Kg

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Computer controlled or manually Control Unit Specifications

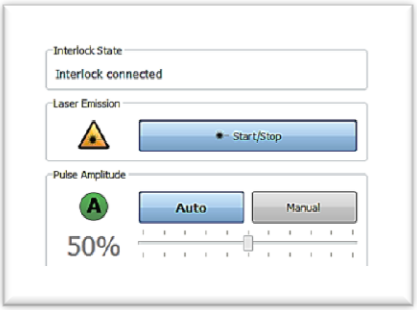
Features	Specifications
Internal trigger repetition rate	adjustable from 50Hz to 120 MHz
External trigger repetition rate	Adjustable from Single Shot to 120MHz
Jitter	<4ps between trigger and optical pulse
Trigger output	SMA or BNC TTL
Trigger Input	SMA or BNC TTL
Adjustable trigger input	SMA or BNC
Power supply	+12 VDC – Power supply provided
LCD Display	240 x 400 Color LCD touch screen
Security	Interlock
External PC connection	USB 2 Mini B
Dedicated software	GUI with DLL, LabVIEW, C++, Visual Basic
Dimensions	245x213x112 mm^2
Weight	< 3 kg

Option: the "all-in-one" laser system with fiber output

Connected with a DVI cable, the control unit manages the laser head. Optional 2-channels, 3-channels, and 4-channels control unit allows synchronously or asynchronously respectively 2-, 3-, 4-indepenndent picosecond laser heads. The Control unit is managed either by the user with the touch-screen LCD display or by a Personal Computer via the USB port. The laser power parameters can be set up in Auto or in Manual mode:

- Auto mode : the system set automatically the pulse power in function of the trigger frequency to keep the optimal pulse width (50ps),
- Manual mode: the user set manually the pulse power (with the risk of distorting the pulse).

Graphical User Interface software and DLL libraries



- ✓ Dedicated easy-to-use GUI software for PC is provided This software permits to control and set up all the laser parameters,
- ✓ Complete DLL libraries with examples for LabVIEW, C++, VB is provided,
- ✓ The system can be switch between pulse or CW mode via the LCD display or the GUI software,
- ✓ The parameters can be save and restore,
- ✓ The GUI is fully compatible with all AUREA's Single Photon Counting modules for easy-to-use TCSPC systems.

Laser output options

The PIXEA picosecond laser is available in free-space or optically fibered:

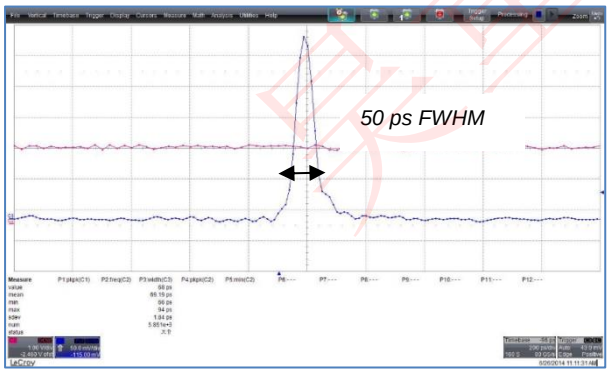
- For the free space operation, the system is composed of 2 modules: the laser head and the electronic driver connected by a DVI cable.
- For the optical fiber output options, the PM, SM and MM optical fiber with FC/PC or FC/APC connectors. Moreover, depending on the selected wavelength, the system can be delivered in only one module with an FC/PC or FC/APC connector in front panel.

Quality control

A complete test sheet is provided for each delivered PIXEA laser.

Example of available wavelength

PIXEA-xxxx	Wavelength (nm)	Pulse width (ps)	Peak power (mW)	Spectral width (nm)
PIXEA-405	405	< 45	> 300	< 5
PIXEA-440	440	< 60	> 150	< 5
PIXEA -470	470	< 60	> 150	< 5
PIXEA -510	510	< 80	> 150	< 10
PIXEA -635	635	< 45	> 200	< 7
PIXEA -665	665	< 45	> 200	< 7
PIXEA -690	690	< 50	> 200	< 7
PIXEA-720	720	< 50	> 200	< 7
PIXEA -770	770	< 50	> 100	< 7
PIXEA -830	830	< 45	> 100	< 10
PIXEA -850	850	< 50	> 100	< 10
PIXEA -880	880	< 50	> 100	< 10
PIXEA -905	905	< 50	> 100	< 10
PIXEA -940	940	< 50	> 100	< 10
PIXEA -980	980	< 50	> 100	< 10
PIXEA -1060	1060	< 60	> 100	< 15
PIXEA -1310	1310	< 35	> 50	< 15
PIXEA -1550	1550	< 35	> 50	< 15
Other wavelengths, pulse widths or power available on request				



Oscilloscope Data: Measure of pulse width @ 780 nm

Ordering Information

PIXEA_XXXX_YY_ZZ
XXXX: wavelength
YY: **FS** for Free Space or **FC** for Fiber Coupling
ZZ: CW for continuous option

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