PicoHarp 300

Stand Alone TCSPC Module with USB 2.0 Interface

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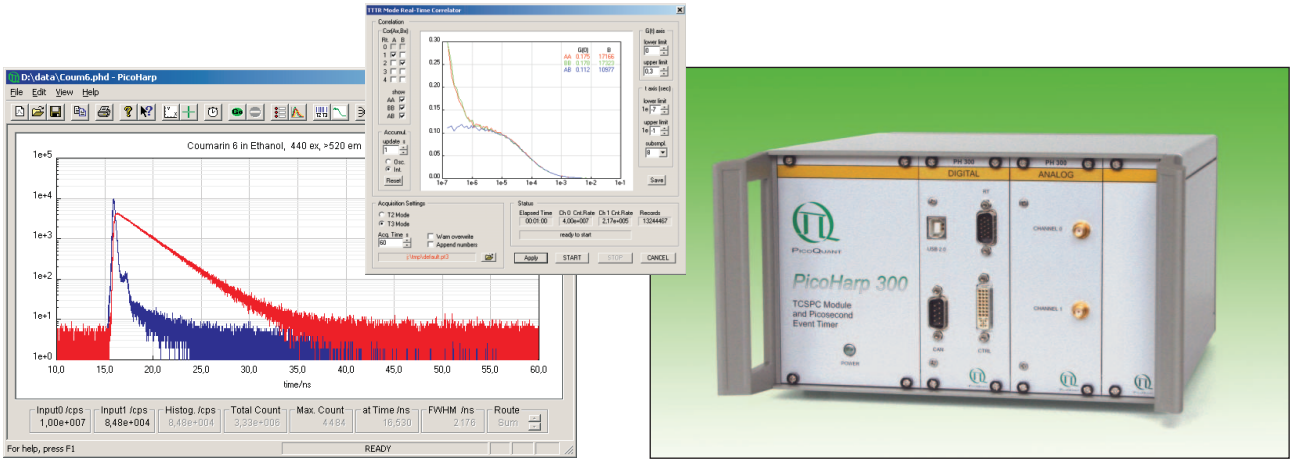
http://www.picoquant.com

- Two identical synchronized but independent input channels
- 65536 histogramm channels, minimum width 4 ps
- Count rate up to 10 million counts/sec
- Multi-stop capability for efficiency at slow repetition rates
- Histogrammer measurement range from 260 ns to 33 µs
- Multi-channel routing capability*
- Online Fluorescence Correlation Spectroscopy (FCS)*
- Time-Tagged Time-Resolved (TTTR) mode*
- External sync signals for imaging or other control*

* add-on option



Applications

- Time-resolved fluorescence and luminescence spectroscopy
- Fluorescence Lifetime Imaging (FLIM)
- Single Molecule Spectroscopy (SMS)
- Time response characterization of optoelectronic devices
- Time-of-flight (TOF) measurements
- Diffuse optical molecular imaging, Optical tomography
- Quantum cryptography

Stand Alone TCSPC Module with USB 2.0 Interface

The PicoHarp 300 is a high-end, easy-to-use, plug and play Time-Correlated Single Photon Counting (TCSPC) system. It is connected to a PC through a state of the art USB 2.0 high speed interface. A new design approach provides identical synchronized but independent input channels. They can be used as detector inputs for coincidence correlation experiments or as a pair of start and stop inputs for TCSPC. It allows a forward start-stop operation even at full repetition rate of mode locked lasers with stable repetition rate up to 84 MHz. Experiments with low repetition rate benefit from the PicoHarp's multi-stop capability. The design allows high measurement rates up to 10 million counts/sec and provides a highly stable, crystal calibrated time resolution of 4 ps. This time resolution is well matched to the SPADs of the PDM series or micro-channel plate photomultiplier tubes (MCP). Overall IRF widths down to 50 ps can be achieved even with pulsed diode lasers. Both input channels are equipped with constant fraction discriminators (CFD), sensitive on the falling edge.

A Time-Tagged mode for recording of individual photon events with their arrival time on both channels is available as an option, allowing the most sophisticated offline analysis of the photon dynamics. TTTR data can also be correlated in real-time for monitoring of FCS experiments at count rates up to 500.000 counts/sec. In the TTTR mode, the device can be synchronized with other hardware such as scanners. As accessories external routers for connection of up to four detectors are available. External hardware such as monochromators can be controlled via CAN-Bus.

The PicoHarp software for Windows™ provides functions such as the setting of measurement parameters, display of results, loading and saving of measurement parameters and measurement curves. Important measurement characteristics such as count rate, count maximum, position and peak width are displayed continuously. A comprehensive online help function shortens the users' learning curve. A driver library for custom programming e.g. with LabVIEW™ is also available as an option. Software upgrades for extended functionality will be available with further product development.

Options

Time-Tagged Time-Resolved (TTTR) mode
DLL for custom programming
4-channel router for PMTs / SPADs
Data analysis software “FluoFit”, “SymPhoTime”

Specifications

Measurement Channels	Constant Fraction Discriminator
Input voltage range	0 to -800 mV, optimum: -200 mV to -400 mV
Trigger point	Falling edge
Trigger pulse width	0.5 to 30 ns
Trigger pulse rise/fall time	2 ns max.
Time to Digital Converter	
Minimum channel width	4 ps
Electrical time resolution	<12 ps rms
Full scale range - Histogram mode	260 ns to 33 µs (depending on chosen resolution)
Full scale range - Time-Tagged mode	Infinite
Maximum count rate	10×10^6 counts/sec
Maximum sync rate	84 MHz
Sustained throughput Time-Tagged mode	typ. 5×10^6 events/sec
Dead time	<95 ns
Differential non-linearity	<5% peak, <1% rms
Histogrammer	
Count depth	16 bit
Maximum number of channels	65536
Collection time	1 ms to 100 hours
Operation	
PC interface	USB 2.0 high speed
PC requirements	1 GHz min. CPU clock, 512 MB memory
Operating system	Windows™ 2000/XP/Vista
Power consumption	25 W at 100 to 240 VAC

To learn more about Time-Correlated Single Photon Counting, please request our Tech Note on TCSPC. Additionally available is our Allround PCI board for Photon Counting TimeHarp 200 and our Multi-channel Scaler / Photon Counter PCI-board NanoHarp 250. Further available are Fluorescence Lifetime Spectrometer; Time-resolved Fluorescence Microscopes; Upgrade kit for Laser Scanning Microscopes; Picosecond / Nanosecond Pulsed, Modulated and Fast Swichted Diode Lasers. Please call for detailed information and data sheets. **Please check our website for latest changes of specs.**

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