News Release

For immediate release
October 14th, 2009

TCSPC System "HydraHarp 400" now with up to 8 channels

PicoQuant announces an extended version of the multichannel Picosecond Event Timer and Time-Correlated Single Photon Counting system "HydraHarp 400" that can now accommodate up to eight independent input channels. Each channel is based on a novel time digitizer with 1 picosecond resolution, a processing rate of 12.5 million counts per second, a very short dead time and an extremely low differential non-linearity. The „HydraHarp 400" is modular and can be fitted with 2, 4, 6 or 8 identical input channels and a common sync channel. The large number of input channels qualifies the instrument for advanced applications such as Diffuse Optical Tomography (DOT). All channels operate independently, but with a common crystal time base. Therefore, not only TCSPC histograms but also picosecond coincidence correlations across all channels can be obtained. The latter is of great interest in single molecule work and quantum information processing research. A time-tagged data collection mode provides a stream of individual timing events to the host computer that can be processed and analyzed with virtually unlimited flexibility, e.g. for photon burst detection, coincidence correlation or for combined measurement of fluorescence lifetime and Fluorescence Correlation Spectroscopy (FCS).

The high timing resolution qualifies the system for use with high resolution detectors such as a Micro Channel Plate PMT (MCP-PMT). Overall time resolutions of 30 ps can be achieved. Of course, the instrument can also be used with all other common single photon detectors. Fully software controlled Constant Fraction Discriminators (CFD) in all channels ensure precise and optimized timing. Accessories such as pre-amplifiers, attenuators and signal inverters allow the adaption to virtually all signal sources. Sync/excitation sources can be as fast as 150 MHz but even very slow sources can be used efficiently with 'multi-stop' acquisition. The on-board histogramming mode is 32 bits deep and provides up to 65536 time bins for each channel. This results in a count maximum of over 4 billion counts per time bin and a total time span of 65 ns. The base resolution of 1 ps can be binned in hardware, thereby providing longer histogram spans up to 65 µs. Time spans in time tagged mode are virtually unlimited. The timing of the individual channels can be shifted with respect to one another and with respect to the sync with picosecond resolution, simply through software control. This allows precise temporal alignment under the given experiment conditions without any need for physical adjustments of cable lengths or optical paths.

The HydraHarp 400 is connected through a USB interface, combining a high degree of portability across laboratories with "plug & play" ease of use.The system hardware is reconfigurable by software for the implementation of different measurement modes and field upgrades. The system software runs on all recent Windows platforms including the x64 versions. It permits control of the hardware as well as convenient data handling and visualization. A programming library for custom software development is also available.

Attachment
picture of HydraHarp 400

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About PicoQuant GmbH
PicoQuant GmbH is a research and development company, founded in 1996 and based in the Technology Park Berlin-Adlershof, Germany. The company is leading in the field of Single Photon Counting technology and its applications. The product line includes pulsed light sources, photon counting instrumentation, fluorescence lifetime spectrometer and time-resolved confocal microscopes. It employes around 40 people.