

PHR 800

Universal 4-Channel Detector Router for PicoHarp 300



- Allows simultaneous measurement of 4 detector signals
- Adjustable input polarity and trigger threshold
- Predefined settings for TTL or NIM signals provided by SPAD detectors
- Optional Constant Fraction Discriminators for PMTs, Hybrid-PMTs and MCP-PMTs
- Adjustable input delay for each channel with 4 ps resolution
- Supports histogramming and TTTR measurement modes
- 4 connectors for external synchronization (marker) signals in TTTR measurements
- Fully supported by PicoHarp 300 and SymPhoTime 64 software



Applications

- Simultaneous recording for polarization anisotropy measurements
- Multicolor Single Molecule Spectroscopy (SMS)
- Fluorescence Correlation Spectroscopy (FCS) of mixed fluorophores
- Burst Integrated Fluorescence Lifetime (BIFL)
- Multicolor Fluorescence Lifetime Imaging (FLIM)
- Diffuse Optical Tomography (DOT)

The four channel router PHR 800 is an accessory for the PicoHarp 300 Time-Correlated Single Photon Counting (TCSPC) system (from hardware revision 2.0). Using the PHR 800, users can connect up to 4 (even different) single photon detectors to perform simultaneous multichannel time-resolved measurements. These can provide another valuable dimension of information, e.g. color and/or polarization as well as improved collection efficiency. This permits sophisticated and fast multidimensional fluorescence detection methods in the life sciences or in general sensitive analytics.

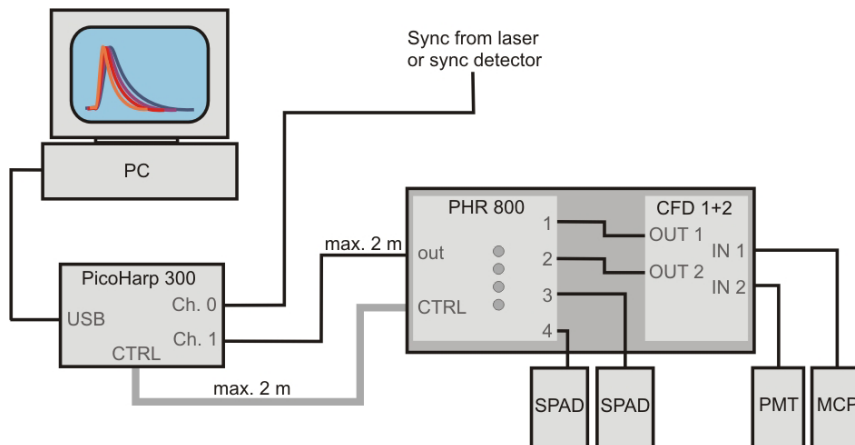
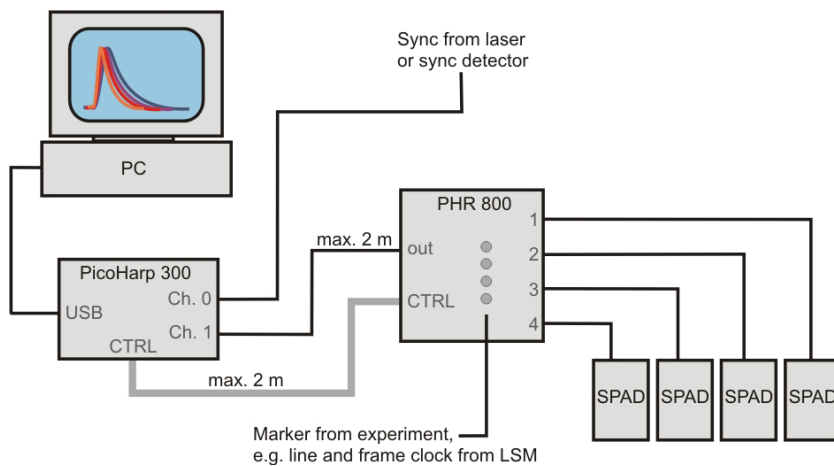
Histogramming and time-tagging support

The 4-channel router supports both histogramming and Time-Tagged Time-resolved (TTTR) mode. The latter allows the recording of each individual photon with its picosecond timing and the detector channel it came from. This permits ultimate flexibility in data analysis e.g. for burst detection or Fluorescence Correlation Spectroscopy (FCS) combined with fluorescence lifetime information. Using two or more detectors and TTTR mode it is possible to perform cross correlations in FCS. Each router channel includes an internal adjustable delay with ± 8 ns range at 4 ps resolution to tune for relative delays. Up to four external synchronization signals can also be connected to the frontpanel of the PHR 800. They appear as marker signals in TTTR data files and allow e.g. to synchronize the data acquisition with the movement of a scanner for Fluorescence Lifetime Imaging (FLIM).

Supports SPADs, PMTs, Hybrid-PMTs, MCP-PMTs,...

The settings of the PHR 800 can be adjusted through the software interface of the PicoHarp 300, the PicoHarp 300 programming library or the SymPhoTime 64 software. This allows selection of the input polarity and the trigger threshold, so that almost any detector signal can be used. Standards supported are TTL and NIM from commonly used SPAD detectors. Dependent on the chosen configuration, the PHR 800 can optionally contain Constant Fraction Discriminators (CFD), separate for all four inputs and also adjustable by the software. This supports detectors with fluctuating pulse heights such as Photomultiplier Tubes (PMT), Hybrid Photomultiplier and Multichannel Plate-Photomultiplier Tubes (MCP-PMT).

Set-up Examples



Specifications

Detector input	
Impedance	50 Ohms
Trigger level	-1.5 to +2.5 V
Voltage range	actual trigger level ± 3 V
Trigger edge	falling or rising
Pulse width	> 15 ns
Dead time	typ. 80 ns
Adjustable delay range for each channel	± 8 ns, resolution 4 ps
External input	
Count enable	TTL, 3 to 5 V, high active
Marker 0-3	TTL, 3 to 5 V, high or low active
Constant Fraction Discriminator (CFD)	
CFD level range	0 to -800 mV
CFD zero cross range	0 to 20 mV
Input Impedance	50 Ohms
Output signal peak	typ. 700 mV
Output signal pulse width	typ. 30 ns
Connectors	
PicoHarp 300 control port	DVI-I female
Input/output	SMA female
Count enable and marker inputs	Lemo ERN.00.250.CTL
Power consumption	110/240 VAC, 50/60 Hz, max. 25 W
Dimensions	310 × 235 × 140 mm