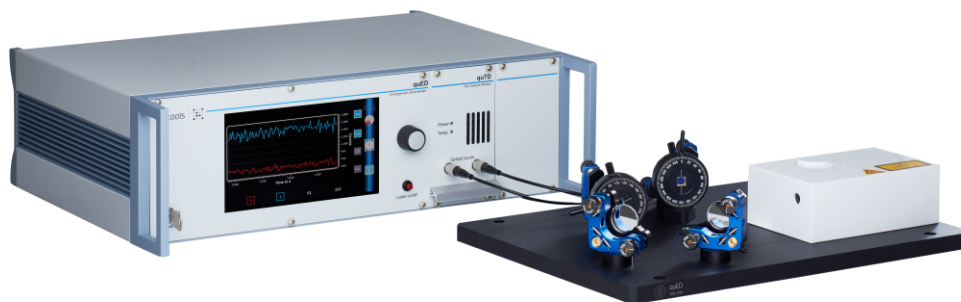




# quED

## The Entanglement Demonstrator



### Hardware

qutools' quED is a state-of-the-art physics experiment for the generation and analysis of polarization-entangled photon pairs. Its design combines recent achievements of quantum optics technology into a simple and user-friendly system for academic, research and applied purposes.

The setup is perfectly suited to practically demonstrate the physics of entanglement in student lab courses at colleges and universities. The high performance enables its integration into modern scientific experiments and commercial applications. A fully automated motorized version is also available.

### quED Specifications

	basic model	high rate option
Single-count rate	> 10 kHz	> 50 kHz
Coincident-count rate	> 1 kHz	> 5 kHz
Entanglement quality	> 88 %	> 88 %
Operating wavelength	810 nm	810 nm
Pump laser power	15 mW	> 50 mW
Phase-matching	type I	
SPDC type	degenerate; non-collinear	
Coincidence window length	approx. 40 ns	
Dimensions (in mm)	optical unit: < 450 x 600 x 100 electronic unit: 480 x 300 x 150	
Counting rate interface	graphical touch display	
Connections	USB, Ethernet	

### Add-Ons

#### Michelson Interferometer quED-MI

Demonstrate the wave nature of single photons through their interference or build a quantum eraser. Also available in a motorized version.

#### Hanbury Brown-Twiss quED-HBT

Explore the particle nature of single photons or generate quantum numbers.

#### Hong-Ou-Mandel Effect quED-HOM

Experience the purely quantum 2-photon interference effect by revealing the Hong-Ou-Mandel dip. Also available in a motorized version.

### Key features

- Generation / analysis of true polarization-entangled photon pairs
- Complete system to violate Bell's inequalities (CHSH)
- Hands-on study of quantum phenomena
- Easy-to-use
- Custom configuration
- Automated motorized version available
- Additional polarization-control and polarization-analysis optics available

### System includes

- Two silicon avalanche photodiodes
- Four channel counter with integrated coincidence logic
- Two polarizers in rotation optic mounts
- Control and read-out unit
- Alignment utilities including auxiliary low-power laser module
- Connection to a PC

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