



ID Qube Ultra Low Noise

NIR Single Photon Detector

Compact, cost effective, noise < 300 Hz

Synchronous and Asynchronous

Single-Photon Detection at Telecom Wavelengths



The ID Qube ULN (Ultra Low Noise) is a cost-effective and compact solution delivering precise and reliable single photon detection, with high detection efficiency, precise timing jitter and low detector noise.

As a free-running telecom SPAD, it is especially adapted for applications in which asynchronous photon detection is essential, such as photon correlation or time of flight measurements.

It features a dedicated gate input port connector to avoid saturation or undesired detections. The cooled InGaAs/InP avalanche photodiode and associated electronics have been designed to achieve especially low afterpulsing and the lowest dark-count rate for its class of single-photon detectors.

Get the best out of your photonic experiments and applications with the ID Qube NIR ULN!

Key Features

- ▶ **Compact, cost effective and dependable performance**
- ▶ **Free-running with gated mode up to 1 MHz**
- ▶ **Ultra-low noise** (<300 cps at 10%)
- ▶ **Low jitter** (<200 ps, typically <150 ps)
- ▶ **Fibre-coupled optical input**
- ▶ **Broadband detection** (900–1700 nm)
- ▶ **Intuitive GUI & Linux API**

Applications

- ▶ **QKD and quantum communication**
- ▶ **Quantum optics and computing**
- ▶ **Single-photon source characterisation**
- ▶ **Fluorescence lifetime imaging**
- ▶ **Failure analysis of integrated circuits**
- ▶ **VIS, NIR and MIR spectroscopy**

Ordering guide

ID Qube-NIR-XX-YY-ULN

- **XX:** FR (*Free running model*)
- **YY :** MMF (*Fibre coupled model, compatible with SMF and MMF FC/PC couplers*)

Specifications

ID Qube NIR ULN

Wavelength range	900 nm to 1700 nm			
Deadtime range	100 ns to 80 µs, in 100 ns steps			
Output pulse format	LVTTTL or NIM			
Output pulse width	10 ns			
Optical coupling	Optical fibre (MMF62.5)			
Efficiency range ⁽¹⁾ calibrated at $\lambda = 1550$ nm	10%, 15%, 20%, 25%			
Extended efficiency range ⁽²⁾	30%, 35%			
Timing jitter @ 25% efficiency level	Maximum 200 ps (150 ps typical)			
Noise performance @ efficiency level ⁽³⁾	10%	15%	20%	25%
ULN model (Max. dark count rate)	< 300 Hz	< 500 Hz	< 800 Hz	< 1'200 Hz
Gate-in max frequency	1 MHz			
Gate-in min pulse duration	500 ns			
Gate-in voltage range	-2 V to 3 V			
Gate-in coupling	50 Ω DC			
Gate-in threshold voltage range	-2 V to 2 V, in 1 mV steps			
Output connector	SMA			
Operating temperature	+10°C to +35°C, max. 60% humidity			
Dimensions (W x H x L)	133 mm x 95 mm x 95 mm			
Weight	1 kg			
Cooling time @ power-on	< 5 minutes			
Power supply	100-240 VAC ; 1.4 A ; 50-60 Hz			
Storage temperature	+5°C to +50°C, max. 60% humidity			

Supplied Accessories:

- +12V, 60 W, AC/DC power adapter, with AC power cord
- Region adapted power cord
- 1.8 m USB cable
- Optical fibre cleaner (fibre-coupled model)
- Optical table mechanical adapter (M4 taps)
- 4 x Adhesive rubber feet

Notes:

⁽¹⁾ Additional efficiency levels can be calibrated on demand.

⁽²⁾ The extended detection range is provided without guarantees of the device's noise performance. Above 25% efficiency, ID Qube devices start exhibiting non negligible afterpulsing, and detector dark counts can rise significantly. However, detector timing jitter has also been observed to improve with increasing detection efficiency.

⁽³⁾ Dark count rate measured in free running mode with a 50 µs deadtime.



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