

INFRARED SINGLE-PHOTON COUNTER

ID230 FREE-RUNNING InGaAs/InP PHOTON COUNTER WITH 50Hz DARK COUNT RATE AT 10% QUANTUM EFFICIENCY

The ID230 is a major breakthrough for single photon detection in free-running mode at telecom wavelengths. Based on the existing ID220, this new series offers a significantly decreased dark count rate thanks to an improved cooling system and adapted electronics. The avalanche photodiode working in Geiger mode is cooled down to -100°C . This series has been especially designed for applications in which asynchronous photon detection is essential. The module can operate at detection probability levels of up to 25%, with a deadtime that can be set between $1\mu\text{s}$ and $100\mu\text{s}$. The photon arrival time is reflected by a 100ns LVTTTL pulse, with a timing resolution of 200ps at 25% efficiency. A simple USB interface allows the user to set the efficiency, the temperature of the avalanche photodiode and the deadtime. A standard FC/PC connector is provided as optical input.



KEY FEATURES

- 900-1700nm
- Asynchronous detection (free-running)
- Best-in-class dark count rate
 - < 50Hz at 10% quantum efficiency
 - < 200Hz at 20% quantum efficiency
- Adjustable quantum efficiency up to 25%
- Adjustable deadtime from 1us to 100us
- Adjustable temperature from -50°C to -100°C
- Single mode fiber optical input
- User-friendly and intuitive Labview interface

APPLICATIONS

- Quantum cryptography
- Fiber optics characterization
- Single-photon source characterization
- Failure analysis of electronic circuits
- Eye-safe Laser Ranging (LIDAR)
- Spectroscopy, Raman spectroscopy
- Singlet oxygen measurement
- Photoluminescence
- Fluorescence lifetime measurement

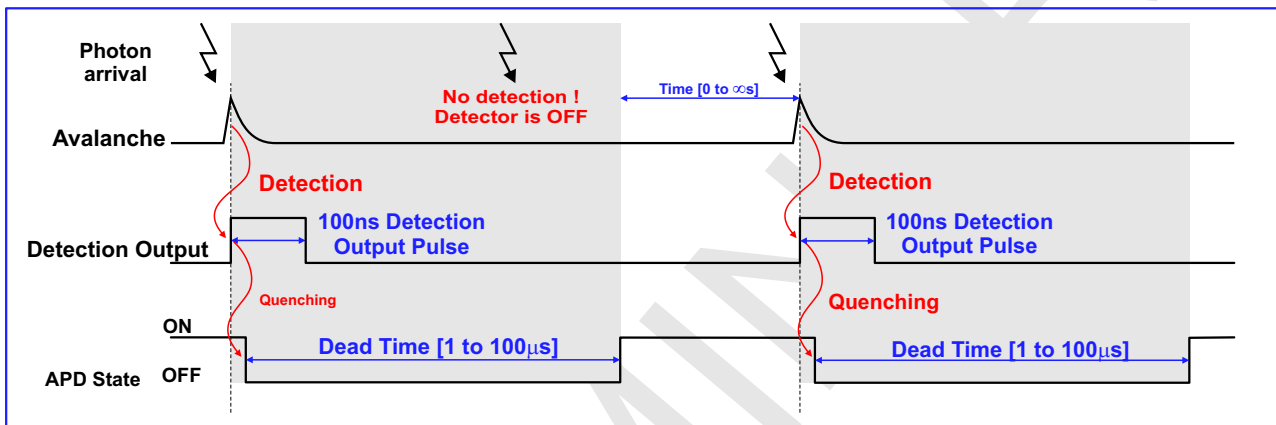


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In contrast to most detectors based on InGaAs/InP avalanche photodiodes (APDs), which operate in gated mode, the ID230 operates in free-running (asynchronous) mode. The APD is biased above its breakdown voltage, i.e. in Geiger mode. Upon photon absorption, the photon arrival time is reflected by the rising edge of a 100ns width LVTTTL pulse at the output of the detector. The ID230 has been designed to provide fast avalanche quenching, thus limiting afterpulsing. This allows the operation at reasonably short deadtimes of values that can be optimized depending on the applications and efficiency setting.

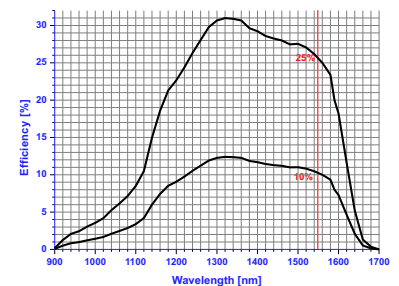
Free-running mode (asynchronous)



SPECIFICATIONS

Parameter	Min	Typical	Max	Units
Wavelength range 1	900		1700	nm
Optical fiber type		SMF		
Efficiency range at 1550nm	0		25	%
Calibrated quantum efficiencies	8 values to be defined by the customer			
Dark count rate @ -90°C 2				
10%			50	Hz
20%			200	Hz
Afterpulsing probability with 20µs deadtime [-90°C]			5	%
Deadtime range	1		100	µs
Deadtime step		1		µs
Detection output pulse	LVTTTL / 100ns width			
Output connector	SMA			
Operating temperature	+10		+30	°C
Dimensions LxWXH	400x300x300			mm
Weight	25			kg
Optical connector	FC/PC			
Power supply	550W AC/DC			
Cooling time	15			min

1 Quantum efficiency vs wavelength



2 Dark count rate vs efficiency

