

Delivering Single Photon Solutions Today

Complementing its network security activities, id Quantique has a growing optical instrumentation business, where the company's core Quantum Photonics technologies provide innovative solutions for industrial, commercial and research applications.

The company's product offering includes photon-counters for the visible and infrared regions of the optical spectrum, as well as short-pulse laser sources. These products are used in medical/environmental instrumentation, quantum optics, aerospace and defense applications.

id Quantique's customer base in the United States, Canada, Europe, Asia-Pacific, Latin America and the Middle East benefits from the company's commitment to technology leadership, its culture of innovation, its product reliability, its attention to customer service and its independence.

id Quantique operates as a privately held company headquartered in Geneva, Switzerland. For more information, visit www.idquantique.com.



id Quantique

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Single photon detection in the visible spectrum

Features

- Broad spectral range: 350 - 900nm
- Best-in-class timing resolution: 40ps
- Low dead time: 45ns
- Short IRF shift at high count rates
- Low dark count rate: 50 Hz typ.
- Low afterpulsing
- Not damaged by strong illumination
- No memory effect
- Compact, easy-to-use and reliable
- Standard 50 output with BNC connector
- No DC power supply required

Description

id Quantique offers compact and affordable single-photon counting modules with best-in-class timing resolution and record-low dead time. A reliable avalanche photodiode sensitive in the visible spectral range and an integrated quenching electronic circuit are integrated on the same silicon chip. The modules are able to detect weak optical signals down to the single photon level.

An OEM version is also available for high-volume applications.

id100 Family - Single pixel detectors

The *id100* is an easy-to-use, self-contained module that can be integrated in every optical set-up. With a timing resolution as low as 40ps, this module outperforms existing commercial detectors in all applications requiring single-photon detection with high timing accuracy. The following versions are available:

id100 - 20	- 20 μ m diameter active area - free-space coupling
id100 - 50	- 50 μ m diameter active area - free-space coupling
id100 - MMF50	- multimode fiber coupling (50 μ m; FC/PC)
id100 - OEM	- TO5 header - 50 μ m diameter active area - free-space coupling
id100 - OEM-MMF50	- TO5 header - multimode fiber coupling (50 μ m; FC/PC)

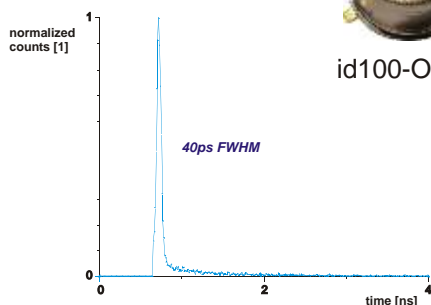
id150 Family - 1 x 10 Arrays

The *id150* is the first commercial single-photon counting module that incorporates a 1x10 linear array of highly-sensitive detectors, with best-in-class timing resolution. Based on an integrated array of reliable silicon avalanche photodiodes sensitive in the visible spectral range, the module is able to detect weak optical signals down to the single photon level. All 10 pixels can be accessed simultaneously for parallel processing. The following version is available:

id150 - 15 - 1x10	- 1x10 linear array - pixel active area diameter of 15 μ m - center-to-center pitch of 50 μ m - free-space coupling
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id100-OEM



id150

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Single photon detection in the infrared spectrum

Features

- Single photon detection at telecom wavelength
- Spectral range from 950nm to 1700nm
- InGaAs/InP avalanche photodiode
- Low noise
- Internal frequency generator
- Standard logical input / output levels
- Compact and reliable
- Stand alone unit w/ optional computer interface
- Thermo-electric detector cooling

Description

id Quantique is bringing single photon detection at near-infrared wavelengths into every optics laboratory with its *id200* detector module. Based on an InGaAs/InP avalanche photodiode biased beyond breakdown voltage, it features high detection efficiency, as well as low noise and low timing jitter.

Exploiting its experience in single-photon detection, *id Quantique* has designed its module in collaboration with researchers of the Group of Applied Physics, University of Geneva, ensuring simple operation and high performance. It also added truly invaluable functionalities, such as an internal counter and an adjustable dead-time. All instrument functions can be controlled and read through an optional RS-232 interface. Labview and C++ applications are also included with the RS-232 option.

id200 Family

The *id200* is an easy-to-use, versatile and compact module offering single photon detection at telecom wavelengths. This complete system includes a detection unit, a counter, a trigger generator, an adjustable delay and an adjustable dead time. The following versions are available:

- | | |
|----------------------------|--|
| <i>id200</i> - SMF | - single-mode fiber input (FC/PC) |
| <i>id200</i> - SMF - RS232 | - single-mode fiber input (FC/PC)
- RS-232 computer interface |
| <i>id200</i> - MMF | - multi-mode fiber input (FC/PC) |
| <i>id200</i> - MMF - RS232 | - multi-mode fiber input (FC/PC)
- RS-232 computer interface |



id200



Labview VI

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Features

- Sub-nanosecond laser pulses
- Repetition rate: 1kHz to 500MHz
- Wavelength: 850nm, 1310nm and 1550nm
- Spectral width: 1nm
- Pulse duration: 300ps
- Peak power: 1mW
- External trigger (NIM, ECL, PECL, TTL)
- Compact and reliable stand-alone unit

Description

id Quantique's id300 Short-Pulse Laser Source has been designed to meet the specific requirements of researchers who need to generate short laser pulses at a wavelength of 850nm, 1310nm or 1550nm. Other wavelengths are available on demand.

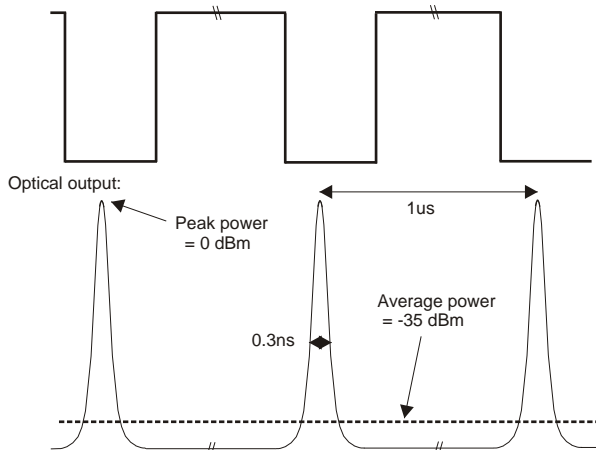
The laser source, based on a VCSEL (for 850nm) and on a MQW InGaAs/InP Fabry-Perot laser diode (for 1310nm and 1550nm), is triggered externally via a trigger input to produce sub-nanosecond laser pulses with a repetition rate ranging from 1KHz to 500MHz. Several trigger inputs can be selected at the factory (NIM, ECL, PECL, LVPECL, TTL, TTL 50).

The *id300* laser source is ideally suited to work in combination with *id Quantique's* Single Photon Detection and Counting Modules (*id200* Family). The laser source can be directly triggered by the counter's own internal trigger. Used in combination with a variable optical attenuator, this short-pulse laser source makes an ideal cost-effective single-photon source.



id300

Electrical input: e.g. NIM signal (example: frequency = 1MHz)



id300 Family

The following versions are available:

- | | |
|--------------------|--|
| id300 - 850 - XXX | - short-pulse laser source operating at 850nm |
| id300 - 1310 - XXX | - short-pulse laser source operating at 1310nm |
| id300 - 1550 - XXX | - short-pulse laser source operating at 1550nm |

Choose one of several trigger inputs:
XXX = NIM, ECL, PECL, LVPECL, TTL, TTL 50

Other wavelengths available on demand.

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Photodetector Custom Design Service

Features

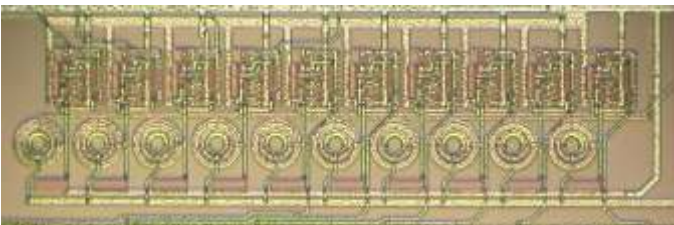
- Fabrication of 1D or 2D detector arrays
- Custom design of photon detectors
- Integration of dedicated quenching circuits
- Design of custom PIN and APD devices
- Consulting services

Description

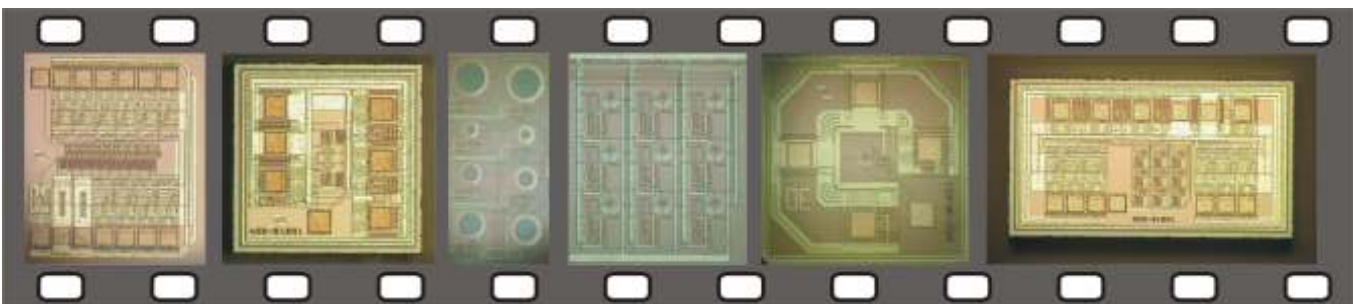
Over the years, *id Quantique* has acquired expertise in the design of silicon photodetectors, operating in linear and Geiger mode.

id Quantique now offers a design service to customers with non-standard detector needs. When photomultiplier tubes (PMTs) and silicon-based hybrid solutions (silicon APDs combined with integrated or discrete electronic circuits) do not meet your needs, *id Quantique* provides innovative solutions for industrial, commercial and research applications.

id Quantique's technology offers the possibility to fabricate compact modules, including large 1D and 2D arrays, with superior timing performances. These modules are used in biological/chemical instrumentation, quantum optics, aerospace and defense applications. The company is working with selected CMOS (Complementary Metal Oxide Semiconductor) foundries for the fabrication of its silicon detectors. The CMOS technology is widely recognized in the silicon industry as the most reliable way to fabricate ICs and sensors. Using this technology, detectors and front-end electronics can be integrated on the same silicon chip. Many of the functionalities (e.g. voltage conversion and read-out) are done directly at the chip level, thus almost completely removing the need for discrete electronic components and expensive assembly. Because only a very small number of external components are needed, the size of the module can be greatly reduced.



1x10 SPAD array



1x10 SPAD array

20 to 200um APDs

Single element

3x3 SPAD array

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