



SWISS
QUANTUM 

ENABLING QUANTUM TECHNOLOGIES THROUGH PHOTONIC SENSING SOLUTIONS

Striving towards the Quantum Internet

We are ID Quantique.

From our origins in 2001 as a small university spin-off to the global leader we are today, we have always been driven by the same core conviction: Quantum Technologies will help tackle some of the most complex problems known to mankind, and the world will be richer for it.

We are dedicated to helping researchers, governments, and enterprises to fully harness the 2nd Quantum Revolution.

Today, we make organizations ready for a quantum-safe future through Quantum Cyber Security, and help researchers to bridge the gap from experiments to real-life applications through a range of quantum sensing products and solutions.

Our goal is to empower you to build tomorrow's world.

Through continuing passion, a strong focus on innovation, and the flexibility and experience of a dedicated team, ID Quantique has developed into the bastion of unique and proven expertise in the field of quantum technology that we are today.





Quantum Cyber Security

With traditional security being challenged every day by technological advancements and malicious actors, our data confidentiality and sovereignty is under ever-greater pressure. ID Quantique provides two key technologies that address today's and tomorrow's threats:

Quantum Random Number Generation (QRNG): superior sources of random numbers that can generate strong keys based on true randomness. QRNG provides full entropy and inherent security while instantly strengthening current infrastructures.

Quantum Key Distribution (QKD): works as an overlay technology that distributes keys securely to different locations in a publicly accessible network. It is the only solution that provides proven secrecy of encryption keys and allows to reach long-term confidentiality and integrity.



Quantum Sensing

Quantum science is measuring ever-smaller gaps in time, energy, and space, bringing us closer to the fabric of reality itself. In our efforts to encourage and enable efforts towards scientific breakthroughs and emerging technologies, ID Quantique offers a range of photonic sensing solutions. Our range includes incredibly efficient and precise single-photon detectors, sensitive in the visible and near infrared regions of the optical spectrum, pulsed laser sources, as well as the electronic and photonic devices needed to measure and control these applications. From stand-alone modules to integrated solutions, IDQ's range of Swiss-made quantum optical sensing products represent incredible efficiency, speed and precision, with best-in-class reliability and ease-of-use.

At our core, our mission is to empower researchers across the globe to explore the technologies needed to create the building blocks for a Quantum Internet, unlocking the immense suite of capabilities and opportunities, as well as social and technological gains, coming from globally distributed Quantum Computing.

PHOTONIC QUANTUM SENSING

ID Quantique serves and collaborates with researchers and developers around the world, sharing our photonic sensing solutions to enable their progress in the quantum technology field, and support their development of incidental photonic sensing innovations.

Selected Use Cases



QKD BEYOND 400 KM USING ULTRA-LOW-NOISE SNSPD

Continuing to extend the range of quantum channels, for new possibilities of secure communication with existing telecom infrastructure.

Secure Quantum Key Distribution over 421 km of Optical Fiber
A. Boaron *et al.*, [Phys. Rev. Lett. 121 \(2018\) 190502](#)



HIGH-SPEED SINGLE-PHOTON DETECTION

Taking single-photon detection rates to new highs, with advances in parallel-pixel superconducting detector design.

Operation of parallel SNSPDs at high detection rates
M. Perrenoud *et al.*, [Supercond. Sci. Technol. 34 \(2021\) 024002](#)



ON-CHIP ULTRA-BRIGHT SINGLE-PHOTON SOURCES

A high-fidelity and low-noise ultrabright telecom-wavelength single-photon source, vital for quantum applications.

Ultrabright Quantum Photon Sources on Chip
Z. Ma *et al.*, [Phys. Rev. Lett. 125 \(2020\) 263602](#)



SINGLE-PHOTON RANGE-FINDING

Centimetre-precise range-finding and critical defect monitoring with single-photon optical time domain reflectometry.

Dispersion independent long-haul photon-counting optical time-domain reflectometry
B. Li *et al.*, [Optics Letters 45, no. 9 \(2020\)](#)



TOWARDS PHOTONIC QUANTUM COMPUTING

Real-time correlation recording of four-fold single-photon coincidences, for future photonic quantum computing applications.

Spectrally-resolved four-photon interference of time-frequency entangled photons

S. Merkouche et al., [arXiv:2104.05655](https://arxiv.org/abs/2104.05655)

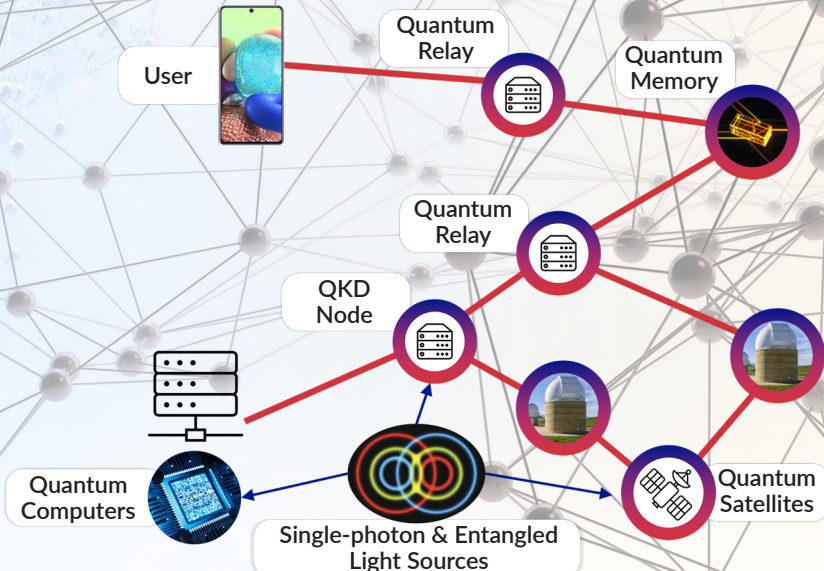


TOWARDS A QUANTUM INTERNET

Developing the infrastructure components to distribute entanglement across a quantum network for a future-proof quantum internet.

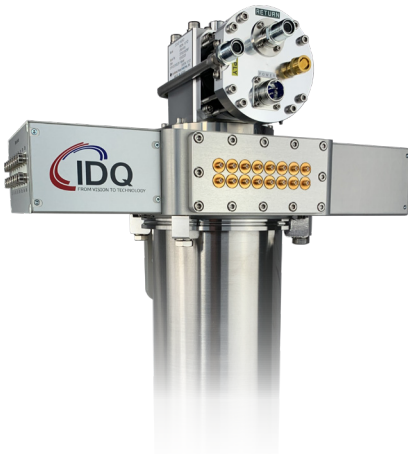
Telecom-heralded entanglement between multimode solid-state quantum memories

D. Lago-Rivera et al., [Nature 594, 37-40 \(2021\)](https://doi.org/10.1038/s41586-021-03333-3)

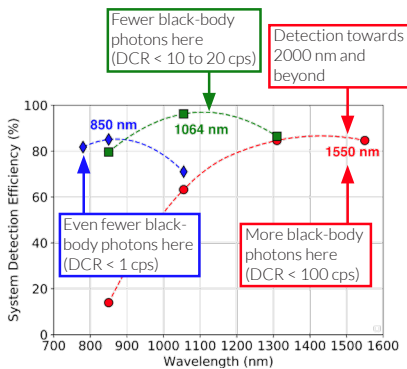


ID281 SUPERCONDUCTING NANOWIRE SERIES

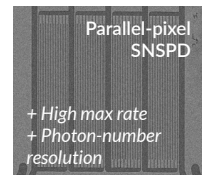
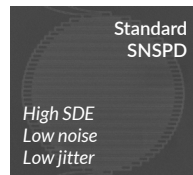
Turnkey high-performance multi-channel solutions with timing electronics, representing the very best in single-photon detection.



- ✓ Near-perfect detection efficiency: > 90% and can exceed 95%
- ✓ Ultra-low noise: as low as < 1 Hz dark count rate
- ✓ Superb precision: as low as < 30 ps timing jitter
- ✓ High count rates: as low as < 10 ns recovery time
- ✓ Photon-number resolving detectors available
- ✓ Broadband operation: > 100 nm range of high SDE
- ✓ Mix and match detectors, and easily upgrade at any time
- ✓ Ideal for applications with very low optical powers or a high number of detector cross-correlations



Available option for a single self-contained CE-certified rack-mounted ID281 system



SWISS MADE

SINGLE-PHOTON AVALANCHE DETECTORS

Compact and cost-effective semiconductor-based single-photon detectors, for when you need reliably high efficiency, low noise and precise timing.

Visible (350-900 nm)



The ID100 Visible Single-Photon Detector: high timing precision and low dark count rate



The ID120 Visible Single-Photon Detector: 80% quantum efficiency at 800 nm wavelengths

Near infrared (900-1700 nm)



The ID Qube NIR Series: compact & cost-effective single-photon detection at telecom wavelengths

The ID230 Infrared Single-Photon Detector: NIR single-photon counter with extremely few dark counts


TIMING PRECISION

Compact and cost-effective semiconductor-based single-photon detectors, for when you need reliably high efficiency, low noise and precise timing.



The ID1000 Time Controller Series: the backbone of any single-photon experiment or application.

- 3-ps-precise time-tagging
- Real-time 4-fold coincidence filtering
- Integrated delay/pulse generation electronics



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through photonic sensing solutions...
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At ID Quantique, we have been pushing the boundaries of quantum physics for 20 years now. Quantum technologies are creating a world of opportunities across almost every aspect of modern life. It is a privilege to be helping to build the future that we all deserve.

Grégoire Ribordy, CEO and co-founder of ID Quantique



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ID Quantique (IDQ) is the world leader in quantum-safe security solutions, designed to protect data for the long-term future. The company provides quantum-safe network encryption, secure quantum key generation and quantum key distribution solutions and services to the financial industry, enterprises and government organisations globally.

IDQ also commercialises a quantum random number generator, which is the reference in the gaming and security industries.

Additionally, IDQ is a leading provider of optical instrumentation products; most notably photon counters and related electronics. The company's innovative photonic solutions are used in both commercial and research applications.