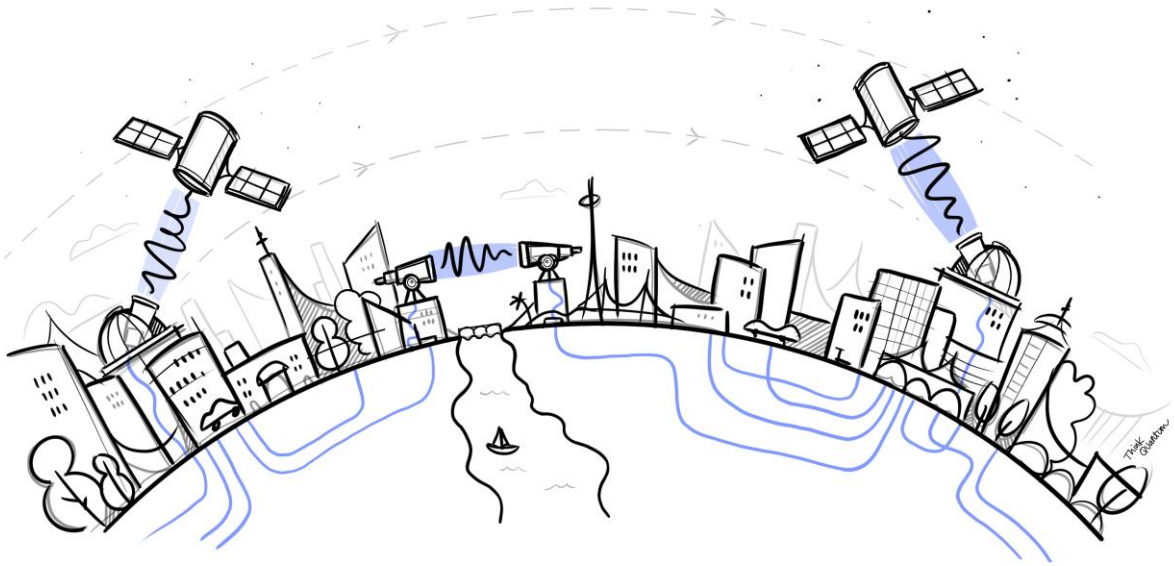

ThinkQUANTUM

QuKy

The Quantum Key Distribution Platform by ThinkQuantum

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QUKY, the Quantum Key Distribution Platform by ThinkQuantum, provides BB84-based quantum-safe cryptographic keys with high quality in terms of security (QRN2Qubit direct stream), robustness and reliability. The QKD platform includes QUKY-TX (Alice) and QUKY-RX (Bob).

Key Features

Key-Rate	High key generation thanks to the lowest QBER provided by the embedded iPognac (patented solution).
Qubit4Sync	Efficient Qubit-based self-synchronization does not require additional fibers.
True QRNG Stream	QRN2Qubit direct stream (no pseudo-random, no expansion) from embedded QRNG to Qubit Preparation Stage.
Robust & Reliable	Quick installation, robust and reliable devices coming with hot-swappable power supply system (1+1 redundant).
BB84 Protocol	QKD system based on BB84 protocol and polarization encoding.
Networking	The versatile system enables the modular implementation of complex network topologies. Compatible with ETSI 014, ETSI 004.
Modularity	Smart system designed to work with either fiber or free-space optical link.
Interoperability	Alice & Bob do not need to be matched: the same device can work with different units.
Tailored Solution	Flexible design for customized solutions (i.e. SPAD or SNSPD, co-existence of Quantum & Classical on same fiber).
EU27	ThinkQuantum, based in Italy with an Italian shareholder structure, offers a reliable European Supply Chain.

A VERSATILE PLATFORM

QUKY is available in the following configurations:

- **Standard**, designed for stable and robust quantum key distribution, it ensure the highest security standards for secure key distribution. The exceptional stability of the devices allow to deploy the system even in environment where temperature stability is not present.
- **Premium**, designed with the same high quality standards of the above version, but with enhanced performance. It allows to perform quantum key distribution over long distances with increased secure key rate.
- **SNSPD or external detector SPD**, designed to be interfaced with external single photon detectors, which can be in full control of the user or interfaced with the QUKY receiver for automated configuration and monitor. Used in conjunction with SNSPD allows for exceptional long distance quantum key distribution.
- **Research & Education**, designed for accademic and R&D labs, allows to control internal parameters of the QKD device. It gives access to the raw keys generated by the quantum states exchanged between the transmitter and the receiver.

ENCRYPTION SOLUTIONS & APPLICATIONS

QUKY has been extensively tested with major encryptor vendors. It supports standard and proprietary interfaces for secure key delivery: ETSI GS QKD 014, ETSI GS QKD 004 and other proprietary interfaces.

NETWORKING & KEY MANAGEMENT

QUKY comes with an integrated solution for key management. The device can be deployed in complex network topologies including:

- Point-to-point networks
- Relay networks
- Ring networks
- Star networks

SWITHCING MODE ENHANCING FLEXIBILITY AND RETURN ON INVESTMENT

QUKY technology natively support the presence of optical switches routing the quantum channels between nodes. One single receiver can exchange quantum states with more than one transmitter, and viceversa. Each node can be equipped down to a single QUKY device connected via an optical switch to several remote nodes. The optical switch then re-routes the quantum channel to change the peer node with which the local QUKY has to produce secure keys. The quantum channel re-routing can be done based on needs of secret key production that the network has to provide to the applications. This open the possibility of cost-saving solutions for the quantum network deployment.

Technical Specifications

Key Generation	Key security parameter	1e-15 (@ 10^7 length) [typ]
	Secret Key Rate	Standard: 2.2 kb/s (13dB) [typ] Premium: 4.4 kb/s (13dB) [typ] SNSPD: 18 kb/s (13dB) [typ]
	Max losses (length) of quantum channel (typ. @0.2 dB/km)	Standard: 20dB (100km) Premium: 24dB* (120km) SNSPD: min. 33dB (165km) and beyond*
	Encoding Scheme	Polarization 3 state efficient BB84 decoy
	Embedded QRNG	High speed QRNG enables the QRN2Qubit direct stream to Qubit Preparation Stage
Network	Key Management System	ETSI 014, ETSI 004, other proprietary interfaces (custom interface protocol on demand)
	Wavelength	C-band or O-band (other wavelengths on request)
	Service Channel	Synch channel not needed thanks to Qubit4Sync (Qubit self-synchronization)
	Quantum Channel	Dark fiber preferred (multiplex with Data DWDM, on request)
Physical Parameters	Dimensions	19'' rackmount, 2U chassis, 70 cm depth
	Interfaces	Ports: quantum (SC/UPC), service (RJ45), Key (RJ45), MGMT (RJ45).
	Operating conditions	10°C to 30°C, 80% r.h. non condensing
	Storage conditions	-10 to 60 °C, 90% r.h. non condensing (30°C)

* Custom solutions are available for longer distances.

Reported data are typical performances duly based on lab and field tests (+/- 10% uncertainty). System performances may be affected by communication infrastructure conditions such as fiber connection quality. The information reported in this document are subject to change by ThinkQuantum without prior notice.

Markets & Applications

- ❑ TLC Networks, ICT & Data Centers
- ❑ End-customer demanding for the highest security standards such as finance, insurance, data and service industries, critical infrastructures

Free-Space Optical Link

This option is the best connection for those locations not reached by fiber infrastructure or requiring fast / not-permanent deployment of a QKD link and the only solution for communication with moving platforms. ThinkQuantum develops and deploys free-space QKD terminals for full-day operations.

Further to the existing standard products, ThinkQuantum supplies tailored made turnkey solutions to meet the client's project needs.

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About ThinkQuantum

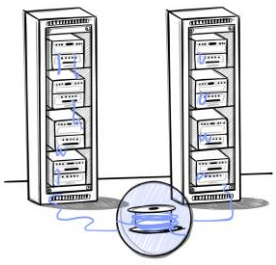
ThinkQuantum Srl, SME and spin-off of the University of Padua, offers **Optical & Quantum Solutions for Cyber Security and Communication** to ICT, Telecommunication and Space Industries.

ThinkQuantum covers the **Full Value Chain** from development and manufacturing of **quantum key distribution and quantum random numbers generation** systems to design and commissioning of tailored solutions.

ThinkQuantum, based in Italy with an Italian shareholder structure, offers a **Reliable European supply chain.**

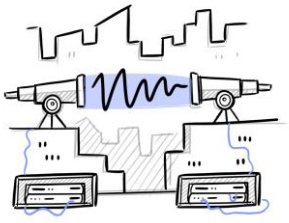
We offer products & solutions for:

Quantum Random Number Generation



QKD over optical fibers

QKD for data center



Free-space QKD

Daylight & Nighttime operation

Satellite QKD

Payload & Ground Station

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