Quell - X

Quell-X is a complete QKD system composed by 1 Alice unit and 1 Bob unit able to generate quantum secured keys for ultra-secure data communication.

Key features

- deployable on existing networks, also in complex architectures, and can implement trusted nodes in order to achieve long distances.
- ultra-versatile solution that can be used in any network configuration: point-to-point links, trusted note configuration and more advanced network topologies (i.e., ring or star networks).
- fully integrable in existing telecom networks thanks to the flexibility of the apparatuses operating both in the C-band and in the O-band configuration.

The product is available in two main versions:

- **Quell-X**, the core product of family. It ensures a reliable and high-performance QKD quantum key generation and is compatible with third parties' encryptor unit.
- **Quell-XR**, the Quell-X version for academic and research activities. It generates raw key data for custom post-processing protocols and future developments. Quell-XR is a platform open for customization and can be interfaces with third parties' detectors.

QTI & Telsy complete system

In 2021, part of **QTI** shares has been acquired by **Telsy S.p.A.**, cybersecurity and cryptography competence centre of the TIM Group.

This partnership has allowed the development of a fully entrusted end-to-end encryption system, compatible with current telecommunication infrastructure for civil and military applications.

This solution is based on the integration of Quell-XC, an optimized version of QTI QKD system, and Telsy's high speed Layer 3 encryptors.

Quantum state preparation	up to 600 MHz
QKD protocol	Discrete-variable BB84
Decoy state	1-decoy state (2-decoy states for longer links)
Error correction protocol	Cascade protocol
Key security parameter	10^{-15}
Privacy amplification protocol	Toeplitz matrix-based algorithm
Quantum state generation	Proprietary-patent for phase-randomized optical pulse generation
Link budget	Up to 20 dB (Quell-X) - Up to 30 dB (Quell-X SC)
Secret key rate	2 kb/s (@14 dB)
Key management protocol	ETSI GS QKD 014 004 ETSI GS QKD 015 2.1.1 Cisco Secure Key Integration Protocol (SKIP)
Key generated (type)	AES-256 (other formats can be implemented if required)
Interfaces	• 1x Duplex/Simplex single-mode fiber (upon request), the connector type can be selected by the user • 2x 1Gb Ethernet ports • Operating LEDs Outputs
WDM compatibility	Operability with non-dark fibers upon request upon noise verification (C/O-band wavelengths and ITU channels customized)
Stability	Automated calibration protocols
Operating temperature	10° to 35° C with no direct sunlight on the equipment
Non Operating temperature	-10° to +60° C
Operating humidity	0% to 80% relative humidity with 29° C maximum dew point
Power supply	1+1 Redundant hot-swappable
Operating Voltage	176-264 V AC, 47-63 Hz
Maximum power Consumption	Each 200W
Dimensions	Standard 19'' rack mount, height = 2U, 600 mm depth
Raw data avaibility	Quell-XR version gives raw data outputs
External detectors	Quell-XR version gives the possibility of using external detectors