



## Quantum Telecommunications Italy

QTI is the Italian leader of the **Quantum Key Distribution (QKD)** technology, born to overcome the great threat of quantum computer attacks. Its systems are certified and secure against classical and quantum attacks and with a European supply chain.

**Quantum Key Distribution** is a physical layer method that allows future-proof data encryption, exhibiting a secure way of distributing random keys between distant users. Such secret keys can therefore be used by existing cypher machines to guarantee the ultimate security of digital communication.

The association with **Telsy**, cybersecurity and cryptography competence center for the **TIM Group**, allows a fully trusted end-to-end encryption system, compatible with current telecommunication infrastructure for private and military applications.

QTI offers fully made in Italy products and solutions, designed and developed with proprietary skills and expertise using a strategic European supply chain.

# Quell-X Quantum Key Distribution System



**Quell-X** product 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. The security of the quantum keys is guaranteed by the laws of quantum physics, which allow to identify unwanted harmful eavesdroppers in the communication link.

**Quell-X** family products offer an ultra-versatile solution that can be used in any network configuration: point-to-point links, trusted node configuration and more advanced network topologies (i.e., ring or star networks). Our systems are fully integrable in existing telecom networks thanks to the flexibility of our apparatuses operating both in the C-band and in the O-band configuration.

**Quell-X** family is composed by **three main versions**:

- **Quell-X**, the core product of the family. It ensures a reliable and high-performance QKD quantum key generation. It includes the standardized key management entity and is compatible with third parties' encryptor unit.
- **Quell-XC**, the end-to-end encryption system based on **Quell-X** core. The product includes in a fully integrated solution high-speed cyphers units (from Telsy s.p.a.) and quantum keys generated by our QKD system.
- **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 interfaced with third parties' detectors.

## Applications

- Crypto keys distributor infrastructures
- Data center security
- Medical data protection
- National and cross-borders backbones
- Trusted nodes based long-distance key distribution
- Key distribution across advanced reconfigurable networks (star, ring, software defined networks)
- Governmental and financial data security
- Critical infrastructure security: airports, harbours, gas-distribution and power-grids distribution

Quantum features	Quell-X	Quell-XC	Quell-XR
Quantum state preparation	600 MHz		
Quantum protocol	Discrete variable BB84 time-bin encoding BB84 with decoy state method		
Key security parameter	$10^{-15}$		raw key data output*
Link budget	up to 16 dB (standard)		
	up to 20 dB (premium)		
Secret key rate	2 Kb/s (@ 14 dB)		raw key data output*

\*: optional SW to be installed on a control PC for the extraction of the cryptographic key

Specifications	Quell-X	Quell-XC	Quell-XR
Dimensions (for Alice or Bob)	2U - 19" rack mount	3U - 19" rack mount	2U - 19" rack mount**
Interfaces	1x Simplex Fiber (Quantum Channel C/O-band), 4x 1Gb Ethernet ports Operating LEDs outputs		
Operating temperature	10°C to 35°C (50°F to 95°F) with no direct sunlight on the equipment		
Operating humidity	0% to 80% relative humidity with 29°C (84.2°F) maximum dew point		

\*\* optional external detectors





## Contacts

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