



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.

The system is deployable on existing networks and can be complemented with trusted nodes in order to achieve long distance links.

Quell-X family products offer an ultra-versatile solution that can be used in any network configuration: point-to-point links, trusted nodes configuration and more advanced network topologies (i.e., ring or star networks).

Our systems (picture reported in Figure 1) are fully integrable in existing telecom networks thanks to the flexibility of our apparatuses operating both in the C-band or in the O-band configuration (i.e., the systems can work both in dark-fiber mode and in co-existence with classical communication data multiplexed into the same optical fiber).

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



Quell-X family Technical Specifications:

Quantum state preparation	up to 600 MHz	
QKD protocol	Discrete-variable BB84 time-bin encoding	
Decoy state	1-decoy state (2-decoy states custom)	
Error correction protocol	Cascade protocol / LDPC	
Key security parameter	10^{-9}	
Privacy amplification protocol	Toeplitz matrix-based algorithm	
Quantum state generation	Proprietary-patent for phase-randomized optical pulse generation	
Optical channel	Polarization-independent optical communication protocol and system	
Link budget	Standard Internal Detectors	Up to 30 dB
	Superconducting Detectors	Up to 45 dB
Secret key rate	Standard Internal Detectors	4 kb/s @ 10dB 2 kb/s @ 20dB 500 b/s @ 25 dB 150 b/s @ 30 dB
	Standard Internal Detectors	200 kb/s @10 dB 9 kb/s @30 dB 150 b/s @45 dB
Key management protocol	ETSI GS QKD 014 ETSI GS QKD 004 ETSI GS QKD 015 Cisco Secure Key Integration protocol Skip Compatibility with evolutionQ BaseJumpQDN	
Key generated (type)	AES-256 (other formats can be implemented if required)	
Interfaces	2 x dark fiber (C-band system) 1 x dark fiber (upon request, O-band system) 2 x 1Gb Ethernet ports Operating LEDs Outputs	
WDM compatibility	Operating with non-dark fibers upon request (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 85% relative humidity with 29° C maximum dew point
Power supply	1+1 Redundant hot-swappable
Operating Voltage	85-264 V AC, 47-63 Hz
Maximum power Consumption	Each 300W (peak)
Dimensions	Standard 19" rack mount, height = 2U, 650 mm depth
Raw data availability	Quell-XR version
External detectors	Quell-XR version