Quantum Cryptography

Toshiba flexible deployment QKD system

By adopting Quantum Key Distribution, organizations can **protect their communication infrastructure** from today's vast array of cyber-threats, as well as those of tomorrow. Already, hackers are using techniques such as harvest and decrypt, where data is scraped and stored today with the aim of decrypting it once they have the capability to do so through advances with supercomputers, the realisation of a **quantum computer**, or the discovery of new techniques for cryptanalysis. With QKD, any data which requires **long-term protection** is not only secure in today's IT landscape, but also **future-proofed** to remain protected in the impending **quantum age**.

Robust levels of security are required in many sectors. In **healthcare**, the technology has been applied to ensure the secure transmission of genome data in Japan. Within the **public sector** QKD is used to provide government with secure communications, in the **finance industry** to **protect banking network infrastructure** and in **aerospace** and **pharmaceuticals** to protect high-value long-life **Intellectual Property**. Equally, in the age of IoT and smart cities, the necessity for a robust, **tamper-proof** and **ultra-sensitive infrastructure** is essential to ensure day-to-day life operates without disruption both now and in the future.

Toshiba is the world leader in high-speed quantum cryptographic systems. Based on decades of scientific research, we have taken on the challenges of this unexplored field and have pioneered the path to practical use.

Fully automated operation with plug & play setup

Automated start-up and system optimization in real time, delivered through active stabilization technology that allows the system to distribute key material continuously, in even the most challenging operating conditions, without any user intervention.

Easy-to-use graphical user interface

A simple web-browser-based interface provides access to both real-time and historical performance data, as well as reporting any tamper attempts, providing perfect security and peace of mind.

Integrated key management / delivery system

Toshiba's Key Management System is included with QKD systems for key storage / delivery. This is compatible with many leading encryptor vendors, using ETSI industry standards.

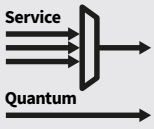
Long range

Toshiba QKD offers the longest range on fibre available commercially today, and were first to demonstrate QKD over 100km of fibre in 2004, and have demonstrated in lab conditions the Twin-Field QKD protocol capable of operating over 500km of fibre

High key rates

Toshiba QKD offers the highest secure key rates. In fact we were the first to demonstrate continuous secure key rates exceeding 1 Mb/s (in 2008) and 10 Mb/s (in 2017).

Flexible integration



The Toshiba LX provides customizable quantum and service channel wavelengths with the ability to multiplex service channels into existing fibre systems

Product details

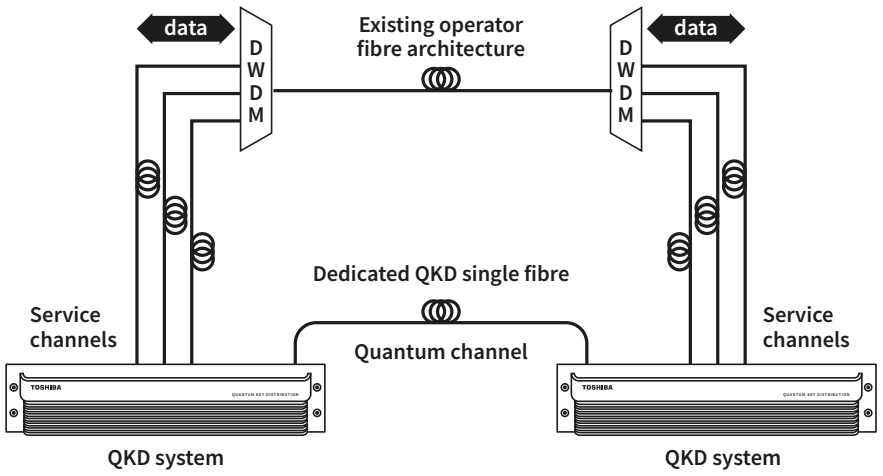
The Toshiba LX QKD system is **wavelength customisable** providing operators with **deployment flexibility** of the C-band quantum channel and associated quantum service channels. The LX system presents **dedicated optical quantum and service channel interfaces** to enable QKD integration into a variety of network architectures.

	Toshiba LX QKD system
Key Exchange Protocol	Toshiba T12 protocol (efficient BB84 protocol with decoy states and phase encoding)
Customisable Wavelengths	C-band wavelengths customisable during manufacture for quantum information and service channels. 1 x Quantum and 3 x service channels required Wavelengths for quantum and service channels should be in accordance with the ITU DWDM grid
Fibre Requirement	Dedicated single dark fibre required for the quantum channel Service channels can be multiplexed into existing fibre networks
Secure Key Rate	150 kb/s specified at 10dB channel loss
Optical Loss Budget	24dB optical loss budget specified
Security Parameter	Key failure probability $< 10^{-10}$, corresponding to less than once in 30,000 years
Monitoring functions	SNMP v2 & v3, GUI, CLI
Key Management	Key Management (key generation, key storage, proactive/on-demand key delivery). System supporting ETSI GS QKD 014 industry standard key delivery API
Standards	CE, UKCA: EN 55032:2015+A11, EN 55035:2017+A11, EN 61000-3-2:2014, EN 61000-3-3:2013, EN 63000:2018. IEC 62638-1:2014, IEC 62638-1:2020, BS EN 60825-1:2014, IEC 60825-2:2010, FCC: 47 CFR, Part 15, FDA: 21 CFR, Part J
Dimensions	Standard 19'' rack mount (3U height)

Network Integration

The Toshiba LX QKD system easily integrates into existing multiplexing and fibre architectures.

User configurable quantum and service channel options provide further configuration flexibilty.



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