QUANTUM
COMMUNICATIONS
HUB

UKQNTel

Modern society runs on electronic communications and the internet, for which optical fibre networks form the foundations. Given the serious cybersecurity threats imposed by major advances in quantum computing, there is now a growing need to incorporate new security technologies into fibre networks. Quantum Key Distribution (QKD) is a mature quantum technology, which underpins secure communications and other transactions through the secure distribution of cryptographic keys. R&D is underway investigating the integration of QKD, alongside new quantum-resistant cryptography, into existing fibre networks.

Construction of quantum networks is taking place in numerous countries across the world, with notable and well-publicised examples already operational in China and the Netherlands. In the UK, the Quantum Communications Hub is developing national quantum networking capability through construction of the UKQN (the UK's first Quantum Network) and UKQNtel.

The UKQNtel network, operational since March 2019, is a unique facility, which extends over 125km and utilises previously installed standard commercial grade optical fibre, thus providing a real-world environment for field trials of new quantum secure communications technologies and systems. The network operates with commercial QKD equipment, contains trusted nodes in BT Exchanges and, very importantly, demonstrates that quantum key signals can be sent in the same fibre as the high-rate encrypted data.

Linking a large industrial complex at BT's Adastral Park to research facilities at Cambridge's Science Park, the network has the capacity to host demonstrations of new quantum secure communication technologies and applications for user engagement. This will increase understanding of industry and customer needs, and thus how current challenges can be met – to start generating market pull.

The UKQNtel network provides a test-bed for the integration of quantum-safe communications technologies – both QKD and quantum-resistant cryptography – within the conventional communications base. This is paving the way for integration within the wider national communications infrastructure, in order to ensure cybersecurity in the future quantum-enabled world.

Schematic representation of the UKQN/UKQNtel

If you are interested in finding out more about the Quantum Communications Hub work in delivering quantum secure networks, please contact us via enquiries@quantumcommshub.net

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