Terra Quantum brings quantum-secure communications to live telecom infrastructure

Deployment across Melita's operational fiber network demonstrates that quantum key distribution can protect real-world telecom systems.

MUNICH, BAVARIA, GERMANY, May 7, 2026 /EINPresswire.com/ -- Terra Quantum, a global leader in quantum technology, together with Melita Business and Merqury Cybersecurity, a leading developer of quantum key management and quantum network control solutions, today announced the successful deployment of a Quantum Key Distribution (QKD) link connecting Melita's two main data centers in Malta. The system enables the exchange of cryptographic keys secured by quantum technology across Melita's live fiber network, demonstrating that quantum-secure communication can operate on existing telecommunications infrastructure.

The deployment represents an important milestone in bringing quantum security from research environments into operational telecom networks. Much like the transition from unencrypted to encrypted internet traffic in the early 2000s, quantum key distribution is poised to become the next foundational layer of security for global communications. As quantum computing advances, widely used public key encryption methods will become vulnerable, making quantum-secure communication increasingly important. Consequently, quantum-secure communication technologies are becoming critical for protecting telecom infrastructure, financial systems, and government networks.

Quantum security on existing telecom infrastructure

A key achievement of the deployment is that the QKD system operates over Melita's existing lit fiber infrastructure using Dense Wavelength Division Multiplexing (DWDM). Unlike many experimental quantum communication systems that require dedicated dark fiber, this

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installation demonstrates that quantum-secure key exchange can operate within active telecom networks without any infrastructure modifications.

The system connected Melita's primary data centers and enabled the secure exchange of cryptographic keys used to protect sensitive communications. By integrating Terra Quantum's QKD technology with Merqury's networking hardware and key management capabilities, the partners created a fully integrated quantum-secure networking solution. Terra Quantum's proprietary QKD technology enables provably secure encryption for critical network infrastructure.

It is a loss control-based system that delivers quantum-safe key exchange over optical fiber, including critical security components:

- Quantum Random Number Generator (QRNG) producing truly unpredictable cryptographic keys
- Optical Time-Domain Reflectometry (OTDR) to continuously monitor the fiber link and detect potential intrusion attempts

Together, these technologies enable provably secure encryption for critical digital infrastructure, ensuring that any attempt to intercept communications can be detected.

Demonstrating quantum networking in real-world conditions

During deployment, the partners successfully implemented Terra Quantum's QKD technology on active telecom fiber infrastructure and integrated the system with Merqury's key management system via a standards-aligned REST API.

The deployment has handled tens of thousands of key requests with zero unplanned client-impacting incidents, demonstrating stable operation in a live telco environment. These results validate the feasibility of integrating quantum security into live telecommunications networks and accelerate the transition toward commercial quantum-secure communication services.

"By successfully operating our quantum key distribution technology on a live telecom network, we are proving that quantum security can be integrated into existing infrastructure today, moving from research laboratories into real-world deployment. This represents a major step toward building the quantum-secure communication backbone Europe will rely on in the future." said Markus Pflitsch, Founder and CEO of Terra Quantum.

Matthew Farrugia, Technical Head of Service Delivery & Data Centre at Melita, emphasized the importance of the project: "Ensuring the highest level of security for the connection between our data centers is essential. Quantum cryptography provides a powerful new layer of protection and allows us to detect any attempt to compromise the communication link."

Noel Farrugia, Chief Technology Officer at Merqury Cybersecurity, added: “Quantum security only becomes useful when it can be deployed, controlled and monitored as any other system on a network. By integrating Terra Quantum’s QKD technology with Merqury’s quantum network management suite, we have shown that quantum-secure services can move beyond the lab and into real telecom operations.”

Toward Europe’s quantum-secure communication infrastructure

The successful deployment in Malta represents a significant step toward large-scale quantum networking and the realization of Europe’s future quantum-secure communication infrastructure. The program supports Europe’s efforts to establish a continent-wide quantum-secure communications network, ensuring long-term protection for critical data while strengthening Europe’s technological sovereignty.

About Terra Quantum

Terra Quantum Group is a leading quantum technology company based in Germany and Switzerland. It provides “Quantum as a Service (QaaS)” in three core areas, the first one being “Quantum Algorithms as a Service”. Here, customers are provided access to an extensive library of algorithms, such as hybrid quantum optimization and hybrid quantum neural networks, which can be used for solving complex logistics problems or pattern recognition, among other things. Terra Quantum also develops new quantum algorithms for its customers or adapts existing algorithms to their specific needs. Secondly, through “Quantum Computing as a Service”, Terra Quantum offers its customers access to its proprietary high-performance simulated quantum processing units (QPU), the quantum ecosystem’s physical QPUs, while also developing native QPUs. The third division is “Quantum Security as a Service,” through which Terra Quantum offers its unique solutions for secure quantum and post quantum communications worldwide. Visit us on LinkedIn and our webpage.

About Melita

Through an advanced converged nationwide network, Melita serves the growing telecommunication needs of small and large businesses, and leads the way in the fibre internet TV and mobile consumer markets. Melita provides high-quality international connectivity to the island's business sector, through redundant submarine fibre cables and Milan-based peering capabilities.

Melita Business provides smart solutions for business, combining the most powerful internet network in Europe with the most advanced mobile network to enable nationwide IoT capabilities. The purpose-built Melita Data Centre provides high security, cloud services and connectivity whilst our dedicated support teams and our fully redundant international links keep your business running. Melita started in 1992, and today provides services to more than 75% of Maltese households.

About Merqury

Merqury Cybersecurity is a Malta-based quantum cybersecurity company founded in 2022. The company develops vendor-agnostic, standards-compliant solutions for deploying and operating

quantum-safe communications across real-world networks. Its platform combines post-quantum cryptography (PQC) and quantum key distribution (QKD), with modular capabilities for key management, network management and control, and monitoring. As technical lead of Malta’s PRISM EuroQCI project, Merqury is helping develop and deploy quantum-secure communications infrastructure designed for practical adoption with minimal disruption to existing networks.

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