

Quantum security in your pocket

A handy prototype device promises unhackable personal security for banking and shopping.

- The device is small enough to slip into a pocket
- It generates secret keys at a high rate
- Applications range from finance to home automation systems

As hackers become more sophisticated, there is an urgent need for improved data security. Quantum key distribution (QKD) offers a way to share cryptographic keys protected from eavesdroppers.

So a collaboration between the UK Quantum Communications Hub and industry is developing a device for everyday QKD, designed to be small and light enough to slip into a pocket. It uses LEDs and a set of filters to encode information in the quantum state of photons. Users might take the device to a modified ATM to share a set of secret keys with their bank, which could then be used for online financial transactions. The technology could be adapted for other purposes, such as car entry systems and the Internet of Things.

Facilitated by the Hub, the UK National Quantum Technologies Programme (UKNQTP) has enabled this project to expand from a small team – John Rarity and David Lowndes at the University of Bristol – to around 10 researchers at Bristol and Oxford, along with industrial collaborators Cognizant. The Oxford team, led by Dominic O'Brien, has focused on designing the photon receiver, which would go in an ATM, using steerable mirrors to keep track of the handheld device's light. The LED transmitter is also a candidate to be put on miniature satellites for QKD, another UKNQTP project.

The UKNQTP's relatively long-term grants allow ambitious projects to be developed, says Lowndes – and the programme is also valuable because of its scale and scope. "Because we have a range of different QKD projects at Bristol, we can have someone doing software engineering for them all. Being part of a greater project means we are all pulling each other up."

For more information, visit uknqtp.epsrc.ac.uk or contact quantumtechnologies@epsrc.ukri.org

The UK National Quantum Technologies Programme aims to ensure the successful transition of quantum technologies from laboratory to industry. The programme is delivered by EPSRC, Innovate UK, BEIS, NPL, GCHQ, Dstl and KTN.