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Quantum Key Distribution for The Undergraduate Curriculum

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Quantum Key Distribution (QKD) is a process of transferring a secure key between two authorized parties. The key is then used to encrypt confidential information [1]. A communication can be achieved and proven secure through laws of quantum mechanics [1, 2]. The QKD scheme is based on transferring quantum carriers, in the form of single photons, through a quantum channel which can be either free-space or fiber optics [3, 4]. Various protocols exist for the implementation of the key distribution process, with BB84 being the most fundamental of protocols [1]. Here, we present the implementation of the QKD process using fiber optics as the quantum channel. We utilized the commercially available id 3000 clavis system and performed the BB84 and the SARG04 protocols [5]. In our setup, communication was implemented over a distance of 12 km. We characterized the system, id 3000 clavis, and constructed a comprehensive manual which will be useful to undergraduate students and researchers.

References

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yes

Level for award (Hons, MSc, PhD, N/A)?

MSc

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**Would you like to
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 Proceedings (Yes / No)?**

yes

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