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System Control Applications of Low-Power Radio Frequency Devices

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This paper conceptualizes a low-power wireless network topology design for application employment to reduce theft of portable computer devices used in educational institutions today. The aim of this study is to design and develop a network topology that can eradicate accessibility of the device's human interface. An embedded system supplied by an energy harvesting source, installed on the portable computer device, will represent one of multiple slave nodes that acknowledge regular updates or heartbeats from a standalone master station. A portable computer device which is operated in an undesignated area or in a field perimeter where master to slave communication is restricted, indicating a possible theft scenario, will initiate a shutdown of its operating system and render the device unusable. Consequently, an algorithm in the device firmware may ensure the necessary steps are executed to track the device, irrespective whether the device is enabled. Design outcomes thus far indicate that a robust wireless network topology development, using low-power embedded hardware, is feasible. By incorporating one of the latest system-on-chip Bluetooth low-energy, ANT+, ZigBee or Thread wireless technologies, an anti-theft system can be implemented that has the potential to reduce major portable computer device theft in institutions of digitized learning. Many other diverse applications of low-power RF devices exists whereby the methods utilized in this study may aid in the continuous monitoring of critical instrumentation systems found in different niche fields.

Summary

Field: Telecommunications and software engineering

Designing, simulating and development of a low-power wireless sensor network to protect computer handheld devices against theft in areas of digitized learning.

Apply to be considered for a student award (Yes / No)?

No

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

N/A

Main supervisor (name and email) and his / her institution

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**Would you like to
 submit a short paper
 for the Conference
 Proceedings (Yes / No)?**

Yes

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