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Susceptibility of a Smart Home to Intentional Electromagnetic Interference Attacks

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Abstract

Technology advancements are shaping the construction industry gradually. Smart homes have become a reality and in some cases a trend due to these advancements. Although the literature includes multitude of efforts addressing the technologies used in smart homes, integration processes, and privacy issues, little exists about their vulnerability to Intentional Electromagnetic Interference (IEMI). In an attempt to address this gap, the purpose of this paper is to investigate the proliferation of smart home technologies, their susceptibility to IEMI attacks, currently available mechanisms of defence, and to provide a cost assessment model of the most suited protection approaches to be adopted by the construction industry. To that end, the adopted research methodology collected and analysed a set of relevant peer reviewed publication within the domain and developed different construction cost estimates utilizing standard reference books, like RS Means, and direct contact with system suppliers. The outcomes of the aforementioned methodology yielded two potential protection methods, namely full protection of the home shell; and partial protection for essential components while providing a detection system of potential attacks. The average achieved costs per square foot range from $7.91 to $20.11 depending on the selection of material and type of finish. It is instigated that the outcomes of this research provide a much-needed knowledge about the propensity of smart homes to IMEI attacks and provide a guidance cost estimate for protection mechanism. It also provides a better understanding for homeowners regarding their decisions.

Keyword: Smart Homes, Electromagnetic Interference,, Intentional Electromagnetic Interference, Cost Assessment