

# Security in Open Network communications for Power Distribution Systems

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## Abstract

Power Distribution Systems usually rely on closed and fixed communication networks due to the strict requirements they must comply with. With the appearance of new communication technologies that can contribute to the assurance of those requirements (for example, 5G), open networks can be used for such systems, decreasing the overall cost of maintaining and upgrading the communication network. Although, shifting from closed communication environments to networks integrated with the Internet using 5G communication environments can expose these systems to severe threats, since they were developed to operate under closed networks not addressing security by default. Our research work analyses the security requirements for Power Distribution Systems operating on open networks, identifying the gap between such systems and the existing security mechanisms. From this analysis, we present a solution based on low cost off-the-shelf hardware, composed by a security library and a bridging device, intended to act as a security gateway for Intelligent Electronic Devices (IEDs) in Power Distribution Systems. We also evaluate the functionality of our security gateway, and analyse its impact on the stringent performance requirements of such systems.

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