

Analyzing Options for Radio Frequency Identification (RFID) Systems Based Upon RF Considerations

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RFID (Radio Frequency Identification) is an automated data collection technology that uses radio-frequency waves to transfer data between a reader and a movable item to be identified. RFID is a special case of sensor networks wherein the readers integrate sensing, data processing and communication capabilities. RFID sensor networks combine the distributed nature of networked systems with the constraints of embedded control and data integration systems.

The aim of the project is to characterize RFID systems and calculate the tag power requirements for different frequency levels, ranging from low frequency (LF) to ultrahigh frequencies (UHF). The Tag power requirements are calculated by using a Link Budget. A link budget is a balance sheet of gains and losses; it outlines the detailed apportionment of transmissions and reception resources, noise sources, signal attenuators, and effects of processes throughout the link. By using the link budget the behavior of an RFID system is captured in terms of effects of propagation, path loss, signal to noise ratio, and bit error rate for various modulation formats. One of the tools to evaluate the link budget is by using Microsoft Excel Spreadsheet. Microsoft Excel is an electronic spreadsheet program.