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Base-station design for passive UHF RFID tags with pulse-width modulated backscattering

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In this work, a base-station design is proposed for passive UHF RFID tags that use pulse-width modulation (PWM) in backscattering communication. The theoretical analysis of the PWM backscattering is presented along with the challenges it creates in the base-station design. The self-jamming issue in the base station is analyzed with a numerical case study. The theoretical analysis of the reverse communication channel is presented. A method is proposed for wired backscattering measurements, which models the path loss and reflection from the tag eliminating the need for wireless measurements in an anechoic chamber. It is shown by measurements that the base-station is capable of measuring the pulse-width of the backscattered signal with an error less than 1% at a distance of 2 meters.

Published in: 2014 10th Conference on Ph.D. Research in Microelectronics and Electronics (PRIME)

Date of Conference: 30 June 2014 - 03 July 2014

DOI: 10.1109/PRIME.2014.6872750

Date Added to IEEE Xplore: 07 August 2014

Publisher: IEEE

Electronic ISBN:978-1-4799-4994-6

Conference Location: Grenoble, France

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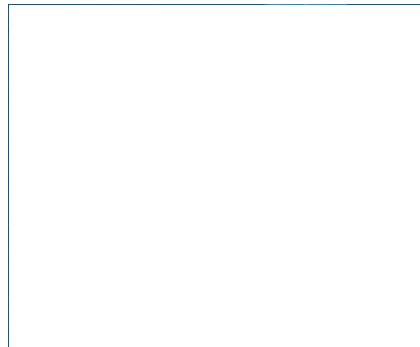
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I. Introduction

The integration of sensors with passive UHF RFID tags extends the application of RFID technology to many new fields such as environmental monitoring, healthcare, and food quality monitoring [1]. It has been shown that phase-locked loop (PLL) based sensor interfaces can be used in RFID tags with capacitive sensors to reduce the power consumption of the tags [1].



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UWB backscattering system for passive RFID tag ranging and tracking
2011 IEEE International Conference on Ultra-Wideband (ICUWB)
Published: 2011

Optimum ASK Modulation Scheme for Passive RFID Tags Under Antenna Mismatch Conditions
IEEE Transactions on Microwave Theory and Techniques
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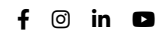
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