Título: Design And Optimization Of Passive Uhf Rfid Systems

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Precio: $1188.00

Editorial:

Año: 2006

Tema:

Edición: 1ª

Sinopsis

ISBN: 9780387352749

Radio Frequency IDentification (RFID) is an automatic identification method, relying on storing and remotely retrieving data using devices called RFID tags or transponders. An RFID tag is a small object that can be attached to

or incorporated into a product, animal or person. An RFID tag contains an antenna to enable it to receive and respond to Radio-Frequency (RF) queries from an RFID reader or interrogator. Passive tags require no internal power source, whereas active tags require a power source.

As of today (2006), the concepts of ubiquitous computing and ambient intelligence are becoming widespread. In order for these to become a reality, a number of key technologies are required. In brief, these technologies need to be sensitive, responsive, interconnected, contextualised, transparent and intelligent. RFID, and in particular passive RFID tags, are such a technology. In order to deliver the necessary characteristics that could lead to ambient intelligence, however, there are some challenges that need to be addressed.

Remote powering of the tags is probably the most important challenge. Issues concerning the antenna-tag interface and the rectifier design, that allow the RF signal to be converted to Direct Current (DC) are top priorities. Secondly, the communication link and the reader should be optimized. The RF signal that contains the tag data suffers from a power of four decay with the distance between tag and reader. As a result, both the reader sensitivity and the tag backscattered power efficiency have to be maximized. Long-range powering, as well as sufficient communication quality, are the guidelines of this work.