ABSTRACT

In recent years, the use RFID (Radio Frequency IDentification) has notably grown within the automatic identification systems sector. They have replaced other systems, like bar codes, that were not efficient enough in certain areas that fit RFDI functionalities.

Radio frequency identification was initially used to control goods thefts in stores. These old systems had a one bit data packet size but, some years later, investigators started working to increment data packet size to Kbytes. These days is possible communicate these systems with networks and work in complex applications to achieve the best performance of identification systems.

RFID systems are based on electromagnetic waves communication systems between a reader and one or more transponders. The information provided by these systems can be treated by the reader or by another system that take charge of negotiating a network of readers.

Unfortunately there are no specific laws to protect data from 'intruders' and assure the complete privacy of RFID users. In any case nowadays data protection laws are able to delimit the action range but only in some specific cases.

RFID technology has also gone, like any other new technology, through and standardization process**.** Organizations like ETSI, ISO or EPCglobal are working to achieve a global standard that includes the minimum characteristics considered necessary in order to make the best use out of the available frequencies. The best representation of this global effort is 'EPC Generation 2', which includes ETSI, ISO and EPCglobal standards.

There are some parameters that should be fixed when implementing a RFID system to adapt them for current application. These parameters are following: the frequency, the transponder's power source, the interrogation range, the system memory, etc. We should bear in mind that the information is coded and includes protocols of security and error control as well.

Our project also undertakes the design, ready to implement, of a RFID reader which works in the frequency range available in Europe (865MHz to 868MHz). It uses passive transponders (they do not need their own power source) and it is able to read one or more tags in the interrogation area. This design is based on the Chipcon's CC1000 transceptor.

The tags used in the system are EPC Class 1. These tags have information referred to their EPC code, a programmable password and a cyclic redundancy check.

The high level software design has included the transmission and reception processes, as well as the user's interface through a computer.

Finally we have simulated, by means of specialized software, the conditions that can be found in our wireless channel (multipath and a noise signal). This simulation has been done using WinIQSim, property of Rohde & Schwarz.