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## RFID Systems in Locking Technology

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Subject Area	Mobile Communications
Project Partner	Keso AG, Richterswil ZH

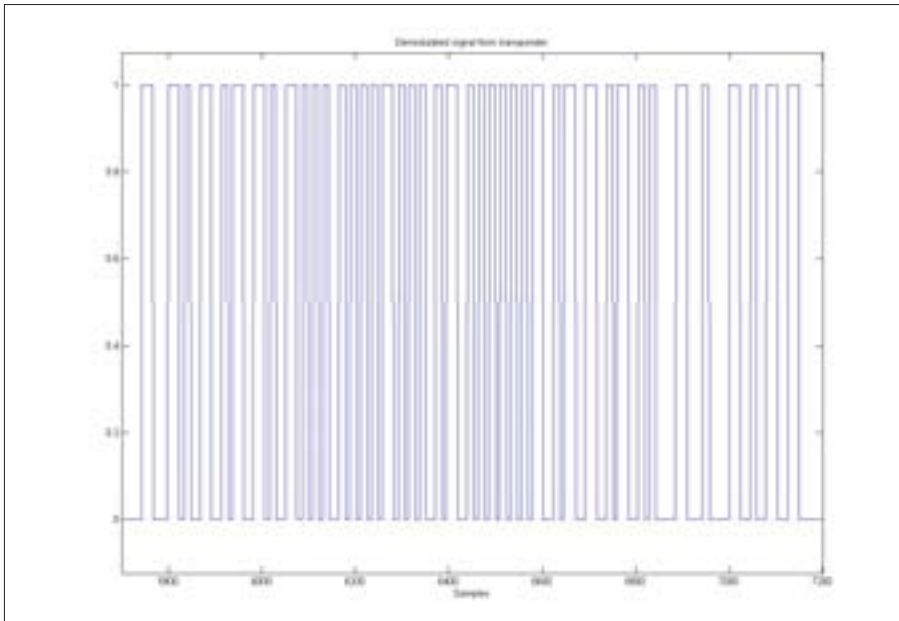


**Task:** Keso is a well-known manufacturer of access-locking systems. Nowadays, they produce not only the traditional cylinder/pin configuration, but also manufacture this product in combination with an RFID system. In the present case a 125kHz LF system is to be investigated and enhanced.

One of the key characteristics of this system is the RFID wake-up and reaction time. This is paramount with respect to customer behaviour. If a key is turned too early (before the RFID system has reacted), it could potentially jam the lock. In

this rare case, the key has to be pulled out and put in again. The probability for this situation to occur must be kept to a minimum.

**Project Goal:** Different reading times, depending on the cylindrical shape and other physical set-up parameters, have been observed. More specifically, it seems that additional metal on the top of the cylinder absorbs or deforms the magnetic field. This metal could lead to outliers in the reading time. The goal is to analyze the reading process and to find methods to reduce the outliers. Furthermore, the mean reading time, and thus



Demodulated transponder signal

the time before unbolting the lock, should be reduced to its minimum value.

**Solution:** Various tests with different materials and settings have identified the problem. A testing software, in conjunction with the PC soundcard, has been created to analyze the signals on the antenna and the demodulated signal on the print. A second testing software has been written to measure the time the electronic circuit needs from wakeup until release of the locking contact. Based on this analysis, modifications to the physical set-up of the combined RFID cylinder lock have been suggested.