

Performance Evaluation and Human Safety Issues for Radio Frequency Identification Systems

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Radio frequency identification (RFID) systems have been under intensive research focus in the last years due to the benefits provided to track physical assets [1, 2], as well as to their applications in various engineering fields, such as near field communication [3], medical treatment and imaging [4], landmine detection [5], or material characterization [6]. In this study, we present a performance evaluation of several high frequency (HF, 13.56 MHz) and ultra-high frequency (UHF, 865-945 MHz) RFID systems with respect to location tracking of moving objects. The human safety issues related to these systems are addressed according to the novel ERC Recommendation 70-03 for the use of short range devices (SRD). The experiments are performed in the shielded environment provided by a 3m TDK semi-anechoic chamber using a Rohde & Schwarz - ESU 26 EMI Test Receiver, calibrated antennas and cables. The turntable and the antenna mast were operated by using an in-house made software program. A picture of the experimental set-up inside this chamber is presented in Figure 1, while several measurements results are presented in Table I.



Figure 1: Semi-anechoic chamber (left) and an experimental set-up (right).

Freq. (MHz)	Pol.	Tbl. Ang. (deg)	QP (dBuV)	Freq. peak (MHz)	QP Margin (dB)	QP Trace (dB)
85.2	H	15.5	15.60	85.22	-24.40	0.40
135.7	H	32.2	13.58	135.68	-26.42	-1.24
158.1	V	168.2	29.40	158.05	-10.60	5.60
460.4	V	13.2	22.27	460.80	-24.73	10.63

Table I: The emission levels measured in the semi-anechoic chamber at 3 meters distance for KSW RFID

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