

“Two-Frequency CW RADAR Approach to Ranging in UHF RFID Systems”

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Abstract – Unwanted or false positive reads of tagged items have a significant impact on system performance degradation in supply chain management. The likelihood of occurrence is even higher than missing reads, especially in dense interrogator environments. UHF RFID systems are operated on the basis of narrow-band continuous wave (CW) signals. This characteristic is utilized to adopt two-frequency CW RADAR technology for radial distance measurement from interrogator to tagged item. In this paper, we describe the fundamentals and the requirements for this technique without diving into detailed physical design or implementation. We have shown that this approach leads to sufficient ranging resolution in close proximity of 1m up to 10m distance with an absolute localization error less than 0.1m.