Lowering the power demand for billions of wireless devices is one of the key aspects to take into account when designing next-gen connected sensors. To achieve this target, Tunneling Tags can play a key role.

The high tracking precision is based on a distance estimation algorithm that uses received signal phases backscattered by a frequency-hopping RFID-based Tunneling Tag operating at the 5.8 GHZ ISM band (from 5.725 GHz to 5.875 GHz). We show how both our algorithm and prototype can be used for real-time, low-powered (21.32 uW) and long-range (>15 m) precision tracking of moving objects.

Measurement Results

- At a distance of 3 meters (indoor) from the reader an error of 1.94% after calibration occurs.
- At 15 meters (both indoor and outdoor) with an uncalibrated error of 9% and 6% are seen, respectively.
- A biasing power of only 21.32 uW at 80 mV is required to operate the Tunneling Tag.