T23

Theory of operation

The T23 Bi-directional Asset Tag is a component of AeroScout Industrial's suite of enterprise visibility solutions for location-based applications. The T23 Tag adds further flexibility and scalability to track assets across a wide variety of applications. T23 operates on 2x3.6VDC battery.

Once deployed, the tag uses its bi-directional functionality to receive firmware and configuration updates from MobileView. This removes the need to manually collect, update and re-deploy tags in the field.

T23 consist LF receiver, WiFi transceiver and UWB transceiver.

LF receiver is used to turn-on the tag from sleep mode. Once a LF signal is detected by the LF receiver, the tag transmits its ID by WiFi back to the control, and then begins s short UWB pulses correspondence (RTT) with LR2000R to measure the distance using RTT distance measurement.

Also T23 is used to complement the AeroScout Wi-Fi based solution by accurately triangulating
Tags in areas where sub-meter accuracy is required.

Power

2x3.6VDC battery operated

3.3VDC regulator – used for UWB and WiFi chips

1.8VDC regulator - used for UWB and WiFi chips

UWB transceiver

UWB IC (DECA1000, Deca Wave) is served as a transceiver that can operates in one of two UWB channels: Ch2 (3994.6MHz) or ch5 (6489.6MHz), both are 500MHz BW. It operates in impulse mode to measure distance. A 38.4MHz XTAL served as a reference clock. Data is transferred to and from a Kinetis micro Processor through SPI protocol. The RF signal goes to/from an integral printed antenna through a balun.

WiFi receiver

A WiFi module (Qualcomm: AR4100P-BM2D) is served as a WiFi receiver in 802.11g (6 MBPS). Frequency bands: 2412-2462MHz. It has an internal 38.4MHz clock, and its RF is connected directly to an integral printed WiFi antenna.

LF receiver

LF receiver IC (AS3933) operates on 3.6VFC, and connected to 2 LF antennas (coils), ref clk=32KHz

MCU

Controls all signaling (Kinetis- MK22FX512VMC12), ref clk=32KHz

Sensors

Temperature, accelometer, motion.