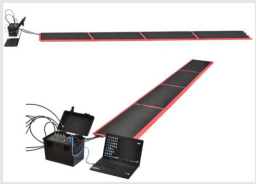

# RACE RESULT RR10 UHF Reader Instructions



Contents



## RACE RESULT RR10 UHF Reader

## Functional Description

Purpose: UHF RFID Reader for sports time keeping. This device consists of a UHF RFID Reader, a battery, and communication interfaces. It's purpose is to capture UHF transponders worn by participants of a sporting event and transmit its id, location and time stamp to a remote server. The system consists of two main parts, a reader and ID tags. The reader interrogates the tags that are attached to participants in the field created by the reader. Theory of Operation: The tags derive their power from the RF energy of the reader signal. They are not internally powered. Signaling from reader to tag is accomplished by ASK. Signaling from tag to reader is accomplished through antenna backscatter. The tag momentarily shorts its antenna terminals, which causes the transmitted power that was being absorbed into the tag to reflect back off its antenna. The receiver senses this reflected signal. Transmitter: The transmitter produces a CW signal that is modulated. In the transmitter, the phase-locked loop output is amplified and then modulated by an RF mixer that is controlled by the microprocessor. The RF signal then passes through the final amplifier stage and low pass filter and then transmitted from the TX antenna. Receiver: The sensed backscatter signal from the RX antenna is combined with a carrier cancellation signal (derived from the TX path) and amplified by a LNA and then quadrature down-converted by mixing using an LO tapped from the TX path.
The two baseband signals are amplified, filtered and AD converted as an input signal to the microprocessor. Antenna: The device has a bistatic antenna setup consisting of two integrated patch antennas with 6dBi gain. Power: The power conducted to the antenna is set to below 30 dBm. With an antenna gain of 6dBi, the effective isotropic radiated power is rated at less than 36 dBm (4 Watts). Modulated Signal Bandwidth: The 20dB bandwidth of the modulated signal is less than 500 kHz. Frequency Hopping Configuration: There are 51 hopping channels with center frequencies located at 5

## Documents / Resources

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|  | RACE RESULT RR10 UHF Reader [pdf] Instructions<br>RR10, SZO-RR10, SZORR10, RR10 UHF Reader, UHF Reader, Reader |