



User Manual of CS3156 RTLS sensor

FCC Regulations:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This device has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiated radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Note:

Caution: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

RF Exposure Information

This device meets the government's requirements for exposure to radio waves.

This device is designed and manufactured not to exceed the emission limits for exposure to radio frequency (RF) energy set by the Federal Communications Commission of the U.S. Government.

- This device complies with FCC radiation exposure limits set forth for an uncontrolled environment. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna shall not be less than 20cm (8 inches) during normal operation.

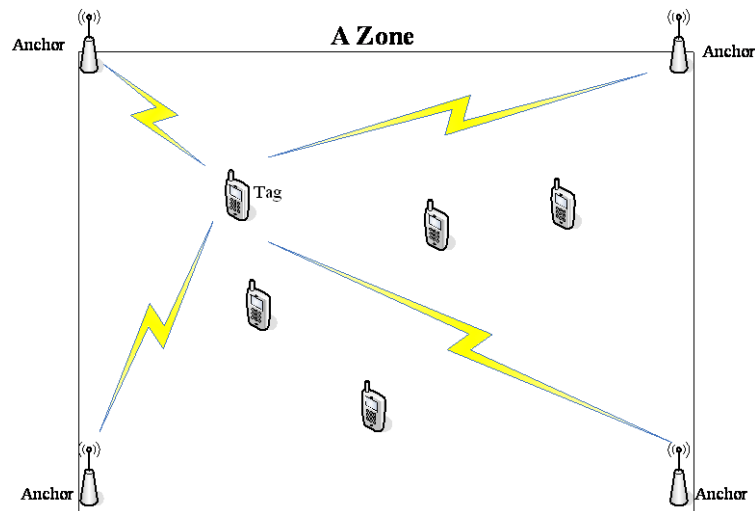
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Introduction

The CSL RTLS solution is based on the application of time of arrival technology.

In the RTLS, an anchor is the device installed in a known position inside a zone, normally, at the corners of the zone. The moving sensors within the zone can measure the range to each anchor so as to obtain the absolute positions inside the zone.



In a minimum RTLS system, 4 anchors are installed in a zone. However, the more the anchors are installed, the higher the accuracy of the sensor position to be obtained.

The accuracy of positioning is +/-1 meter.

1 Product Description and installation Procedure

1.1 CS3156

1.1.1 Product Description

CS31516 is a battery-operated RTLS sensor. Rechargeable Lithium Polymer batteries are installed for normal function. Charging interface is a 2-pin connector via a charging cable to USB type A interface. The charging voltage is +5VDC+/-10%.

1.1.2 Installation Procedure

Batteries are preinstalled in factory. CS3156 wakes up for a short period during each regular interval. When there are anchors around and beacon is detected during waking up, CS3156 will start to operate and execute RTLS tracking. When battery power is used up, CS3156 has to be recharged via the charging cable to a USB type A interface. It normally takes 4 hours for fully charging. During charging, the red charge LED will be turned on and turned off when charging is done.

1.1.3 Product Specification

Specifications:	
Physical	Plastic sealed enclosure: 90 mm x 50 mm x 20 mm;
Characteristics:	Weight 50 g
Read Range:	Up to 100 meters depending on reader power
Frequency:	2400-2483 MHz ISM license-free band
Environment:	Operating Temp: -40° C to 65° C (-40° F to 149° F)
	Storage Temp: -40° C to 85° C (-40° F to 185° F)
	Humidity: 0% to 95% RH non-condensing
Modulation:	CSS modulation
Output RF Power:	+17 dBm
Ranging Method:	Time Of Arrival (TOA)
Ranging Accuracy:	+/- 1 meter
Protocol:	CSL RTLS Protocol, orderly inventory method to handle large tag population
Battery:	Internal rechargeable Li Polymer battery
Order Code:	CS3156

1.1.4 Antenna Properties

CS3156 employs a miniaturized SMD antennas for effective RF transmission and reception. The antenna properties are as below :

Electrical Items	Specifications
Model	W3108
Type of antenna	SMD type
Frequency range	2400MHz – 2500MHz
Nominal impedance	50 ohm
Polarization	Linear
V.S.W.R	1.5 typically, mounting on CS3156
Gain	1.5dBi typically, mounting on CS3156
Mechanical Items	Specifications
Dimension in millimeter	5(W) x 2.5(L) x 5.5(H)
Weight	0.14gram

Typical Free space Radiation Patterns

