User Manual of CSL RTLS System

CS506 Tag

CS5111TD Reader

CS5112TD Reader

CS5113TD Reader with Ethernet Bridge

CS5114TD Reader with Ethernet Bridge

CS5116TD Reader

CS5118TD Reader with Ethernet Bridge

FCC Statement

FCC NOTICE: To comply with FCC part 15 rules in the United States, the system must be professionally installed to ensure compliance with the Part 15 certification. It is the responsibility of the operator and professional installer to ensure that only certified systems are deployed in the United States. The use of the system in any other combination is expressly forbidden.

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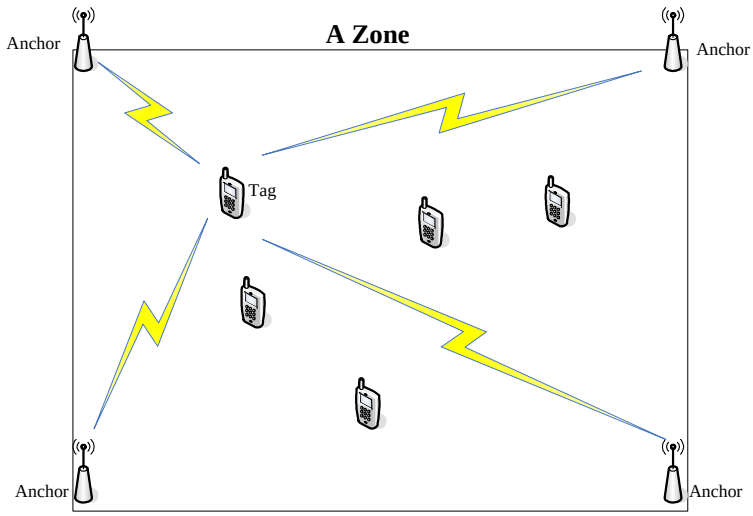
Introduction

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 tag inside the zone can measure the range to each anchor so as to obtain its absolute position inside the zone.



In a minimum system, 4 anchors – 3 slave anchors CS5111TD/CS5112TD and 1 master anchor CS5113TD/CS5114TD- are installed in a zone. However, the more the anchors are installed, the higher the accuracy of the tag position to be obtained.

The accuracy of positioning is +/-1 meter.

1 System Component Description

1.1 CS506

1.1.1 Product Description

CS506 is an active RFID tag operating in the 2.4GHz band. The power is provided via the SDIO interface of platform(such as a PDA).

1.1.2 Installation Procedure

When the CS506 is plugged into the platform, it will start to operate automatically. In the first few seconds, it is in the registration mode. Once it is registered to a CS5113LP master anchor, it will be drawn into operating mode immediately and ready for RTLS tracking.

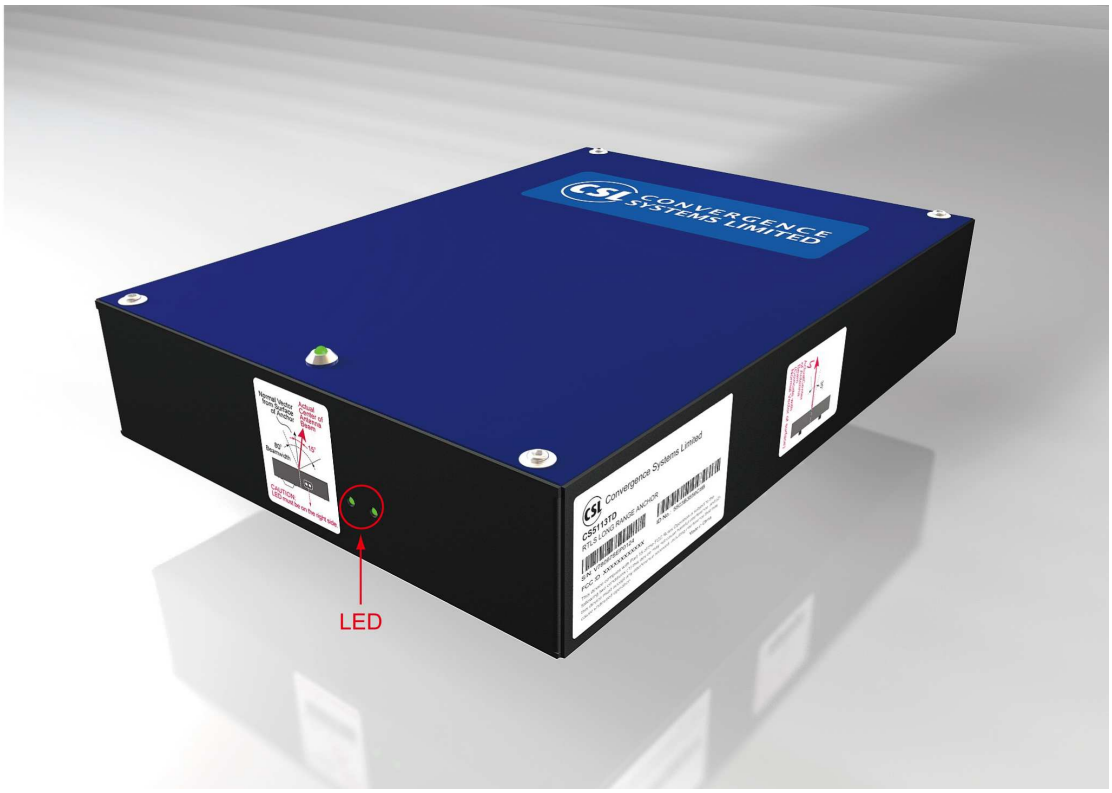
1.1.3 Product Specification

Specifications:	
Physical Characteristics:	**Plastic sealed enclosure: 57 mm x 57 mm x 18 mm; Weight 35 g for the CS506 standalone**
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
Technology:	**CHIRP**
Output RF Power:	**0 dBm EIRP**
Ranging Method:	**Time Of Arrival (TOA)**
Ranging Accuracy:	**+/- 1 meter**
Protocol:	**CSL RTLS Protocol, orderly inventory method to handle large tag population**
Power:	**+3.3V 180mA via SDIO interface**
Order Code:	**CS506**

1.2 CS5111TD/CS5112TD

1.2.1 Product Description

CS5111TD/CS5112TD are the RTLS anchor(or reader). The high gain 2.4GHz ISM band antenna and the electronics PCB are integrated into one housing for robustness and easy installation. CS5111TD/CS5112TD are designed to be mounted at the back panel.



1.2.2 Installation Procedure

CS5111TD/CS5112TD can be fed with DC voltage ranges from 12V to 24Vdc. The dc plug is 2.5mm locked type. CS5111TD/CS5112TD are fully

programmed and ready for normal operation once power is on. No extra configuration procedure is required.

1.2.3 Product Specifications

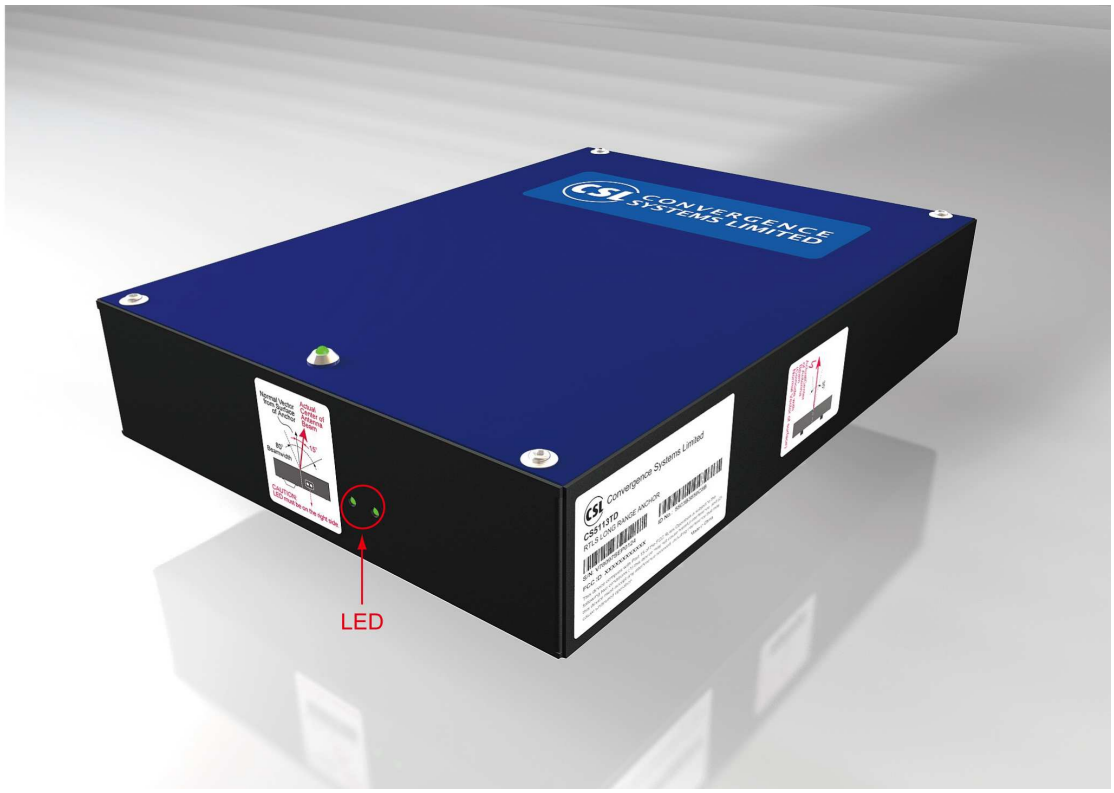
Specifications:

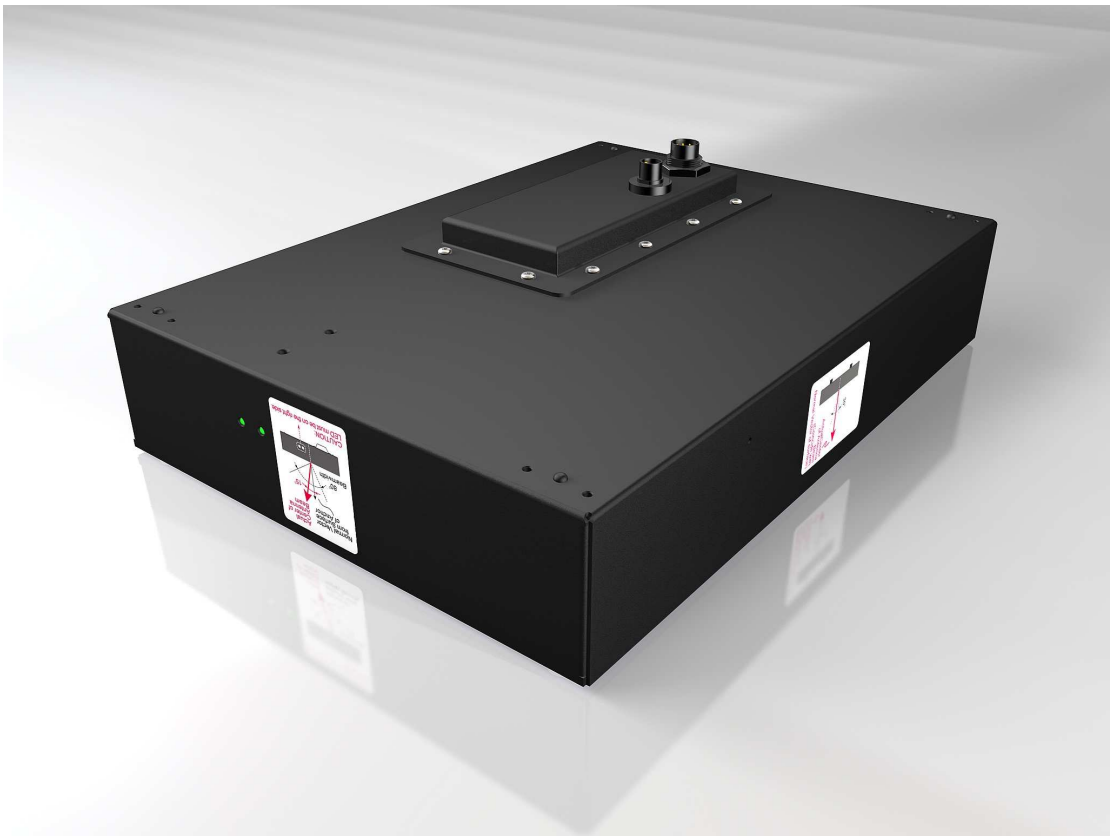
Physical Characteristics:	Sealed enclosure: 29 cm x 22.2 cm x 6.5 cm; Weight 2 Kg
Mounting:	4 mounting holes at corners for screw mounting onto surface, mounting fixture for wall mounting, ceiling mounting, table mounting, shelf mounting available
Read Range:	Up to 100 meters
Frequency Range:	2400-2483 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
Technology:	CHIRP
Output RF Power:	10 dBm EIRP
Antenna:	Embedded 12 dBi patch antenna
Ranging Method:	Time Of Arrival (TOA)
Ranging Accuracy:	+/- 1 meter
Protocol:	CSL RTLS Protocol, orderly inventory method to handle large tag population
Display:	LED x 2, Power and Signal
Power Requirement:	12 Volt DC, 50 mA; actual supply can range from 5 VDC to 24 VDC, can be operated using battery, battery low detect value needs to be software configured.

1.3 CS5113TD/CS5114TD

1.3.1 Product Description

CS5113TD/CS5114TD is the RTLS master anchor(or reader). It integrates the high gain 2.4GHz ISM band antenna and the electronics PCB into one housing for robustness and easy installation. CS5113TD/CS5114TD has Ethernet connectivity function to communicate with the server application. CS5113TD/CS5114TD is also a POE PD that can allow it to be powered through IEEE 802.3 certified PSE.



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1.3.2 Installation procedure

CS5113TD/CS5114TD can be fed with DC voltage ranges from 12V to 34Vdc. The dc plug is 2.5mm locked type. Once powered on, CS5113TD/CS5114TD is ready to communicate with server through Ethernet port for configuration and RTLS functions.

CS5113TD/CS5114TD can also be powered by a IEEE802.3 certified PSE. When the POE is in function, the DC adapter should be unplugged from the DC jack.

When connected to the server via Ethernet connection, Shielded-FTP Ethernet cables should be used to for optimal performance.

1.3.3 Product Specifications

Specifications:

Physical Characteristics:	Sealed enclosure: 29 cm x 22.2 cm x 6.5 cm; Weight 2 Kg
Mounting:	4 mounting holes at corners for screw mounting onto surface, mounting fixture for wall mounting, ceiling mounting, table mounting, shelf mounting available
Read Range:	Up to 100 meters
Frequency Range:	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
Technology:	CHIRP
Output RF Power:	10 dBm EIRP
Antenna:	Embedded 12 dBi patch antenna
Ranging Method:	Time Of Arrival (TOA)
Ranging Accuracy:	+/- 1 meter
Network Connectivity	Ethernet, POE (Power Over Ethernet)
Protocol:	CSL RTLS Protocol, orderly inventory method to handle large tag population
Display:	LED x 2, Power and Signal
Power Requirement:	2 methods, auto-select: 1. 5 VDC – 24 VDC supply, at 12 VDC, 100 mA; can be operated using battery, battery low detect value needs to be software configured 2. POE

Federal Communications Commission Interference Statement

This equipment 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 radiate 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 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 Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. 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.(3) This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.