

RTLS MODULE



User Manual for RTLS Module

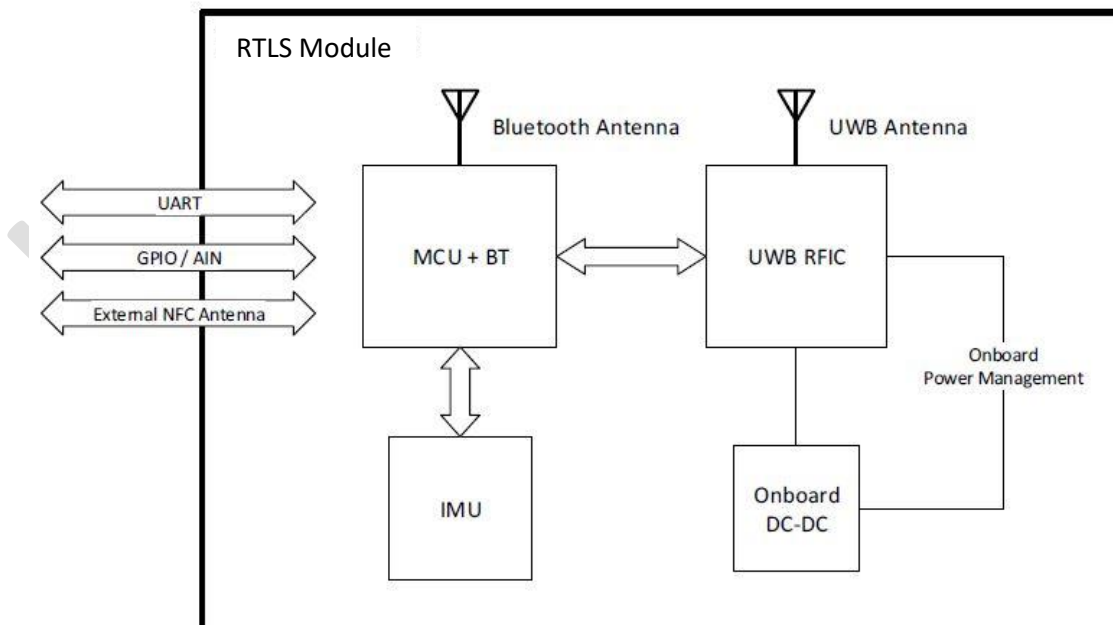
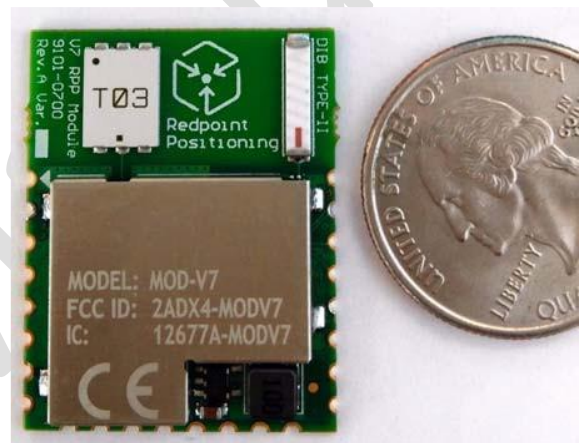
Revision History

revision	date	notes
1.0	July 2017	Initial release

Overview

The RTLS Module is a full function RTLS subsystem that self-contained in a compact dimension. This module provides high accuracy positioning, UWB communication and Bluetooth communication abilities to user's system.

The figure below shows the block diagram of the RTLS Module. RTLS Module is a single PCB design and consists of a micro-controller, a radio transceiver, two on-board chip antennas, power management circuitry, and other peripherals.



Specification

Maximum Rating

The modules should be stored indoor with relative humidity no greater than 80%, and temperature between 0 °C and 40 °C. Exposure to high heat is prohibited. Direct sunlight should also be avoided.

Parameter	Maximum Rating
Temperature (°C)	-40 ~ 85
Humidity (%)	< 90
Supply Voltage (V)	2.8 ~ 3.6

Recommended Operating Conditions

Parameter	Min	Max
Temperature (°C)	-40	85
Humidity (%)	N/A	<90

Power Supply

The RTLS Module can be powered by an external DC power supply via half holes on the edge. The power supply should be clean with current rating of 200mA or higher.

Typical Voltage and Current Consumption.

Parameter	Condition	Min	Typ	Max	Unit
Voltage (V) (for both DW3.3 and 3.3)		2.8	3.3	3.6	V
Current (A) on DW3.3			-	144.5	mA
Current (A) on 3.3			-	10.85	mA

RF Transceiver

The module operates in the unlicensed UWB band. The transmitted signal bandwidth is 500 MHz or greater. The units are calibrated such that the maximum radiated spectrum density is no more than -41 dBm/MHz and is fully compliant to the spectrum mask defined in FCC part 15. It is also compliant with the similar spectrum regulation for regions and countries including US, Canada and EU.

Parameter	Min	Max
Frequency Range (MHz)	3244	6999
10dB Bandwidth (MHz)	500	
Center Frequency* (MHz)	3494.4	6489.6
Spectrum Density (dBm/MHz)	N/A	-41

**The center frequency is software configurable. See table below for details.*

The module is software configurable to operate on 4 UWB channels. The specification of each channel is given as below.

Channel Number	F _c (MHz)	F _{min} (MHz)	F _{max} (MHz)
1	3494.4	3244.8	3744
2	3993.6	3774	4243.2
3	4492.8	4243.2	4742.4
5	6489.6	6240	6739.2

Important Regulatory Information

FCC Statements (United States)

This device complies with Part 15 of the FCC Rules:

Operation is subject to the following 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

Changes and Modifications not expressly approved by Redpoint Positioning Corp. can void your authority to operate this equipment under Federal Communications Commissions rules.

Warning: To fulfill FCC Certification requirements, users who integrate RTLS module in their system must comply with the following regulations:

The RTLS Module modular transmitter must be labeled with its own FCC ID number, and, if the FCC ID is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following:

Contains FCC ID: 2ADX4-MODV7

IMPORTANT:

This equipment 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 (FCC 15.19).

IMPORTANT Antenna Information:

To comply with FCC / ISED regulations limiting both maximum RF output power and human exposure to RF radiation, the maximum antenna gain including cable loss in a mobile-only exposure condition must not exceed;

Peak UWB Antenna Gain: 2.6dBi

Peak BLE Antenna Gain: 2.2dBi

Industry Canada (IC) Compliance Statements

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

CAUTION: Any changes or modifications not expressly approved by Redpoint Positioning Corp. could void the user's authority to operate the equipment.

The RTLS Module is labelled with its own IC ID. If the IC ID Certification Number is not visible while installed inside another device, then the device should display the label on it referring the enclosed module. In that case, the final product must be labelled in a visible area with the following:

“Contains IC: 12677A-MODV7”

Ce module est étiqueté avec son propre ID IC. Si le numéro de certification IC ID n'est pas visible lorsqu'il est installé à l'intérieur d'un autre appareil, l'appareil doit afficher l'étiquette sur le module de référence ci-joint. Dans ce cas, le produit final doit être étiqueté dans un endroit visible par le texte suivant:

“Contains IC: 12677A-MODV7”

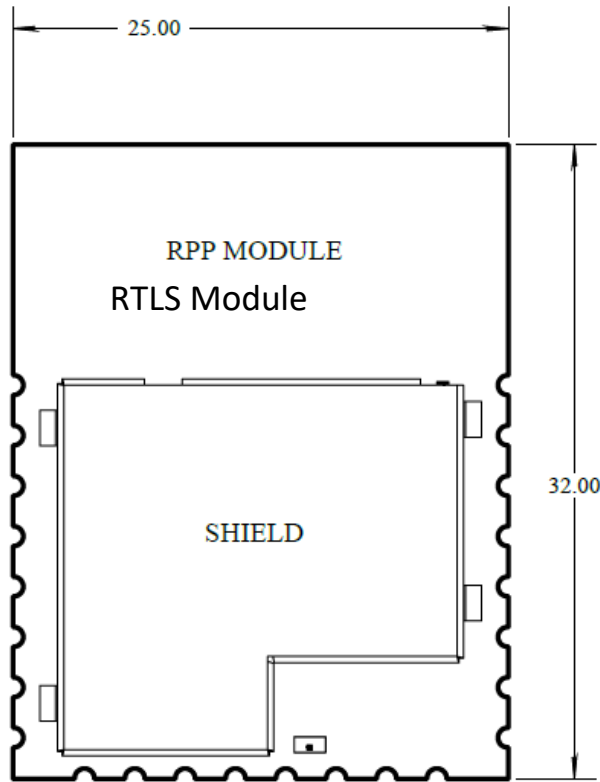
Interfaces

RTLS module provides one UART interface, one SWD programming interface, and 6 general purpose IO to the user, all GPIOs may be configured as analog input as well.

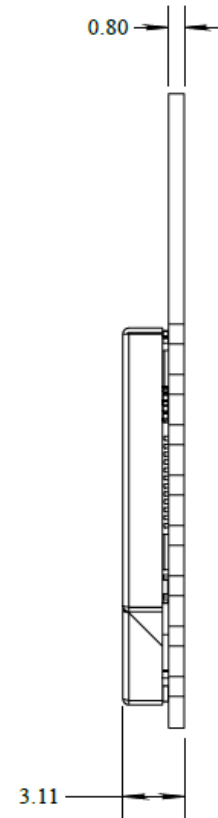
Category	pin name	type	description
Power	PWR_IN	power	3.3V
	GND	ground	
Programming Interface	SWDCLK	input	SWD programming interface
	SWDIO	Input/output	SWD programming interface
	nRESET	input	Reset input, active low
User interface	TXD	output	UART interface
	RXD	input	UART interface
NFC RF	NFC1	NFC input	NFC antenna port
	NFC2	NFC input	NFC antenna port
Analog / GPIO	AIN0 / DIO0 / RSTO0	input/output/analog	GPIO / reset output 0
	AIN1 / DIO1 / RSTO1	input/output/analog	GPIO / reset output 1
	AIN2 / DIO2 / INT0	input/output/analog	GPIO / Interrupt 0
	AIN3 / DIO3 / INT1	input/output/analog	GPIO / Interrupt 1
	AIN4 / DIO4	input/output/analog	GPIO
	AIN5 / DIO5	input/output/analog	GPIO

Mechanical and Packaging

The dimension of the module is 32mm x 25 mm. There are 24 castellation hole pin-outs around the module, the pitch is 100mil (2.54mm). Following diagram shows outline of RTL5 Module.



MODULE OUTLINE



MODULE SIDE VIEW

Order Information

Use the following part number when ordering module.

Part Number	Description
9101-0700	RTL5 Module

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