

# **R5 Board**

# **USER MANUAL**

This document is owned, prepared and copyrighted by Spectrovation.com, LLC, which sells manufactures and sells parking products in the United States and is a wholly-owned subsidiary of CivicSmart, Inc.

CivicSmart, Inc. owns several related entities including Spectrovation.com, LLC. For simplicity, these related entities are referred to as "CivicSmart" as in this document.

This document describes interfaces and usage of the R5 Board. The R5 Board is a modular processor and communications board intended to be used only in authorized products. The board is used only within authorized end products and not to be used outside of these end products.

Unless otherwise agreed upon, CivicSmart expressly warrants products against defects in materials and workmanship for twelve (12) months from the date of installation or fourteen (14) months from date of delivery (whichever is sooner). No maintenance on the products is allowed for end users and all parts under this limited warranty for repair will be managed through the relevant CivicSmart Service Center location

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.

Changes or modifications not expressly approved by Spectrovation.com, LLC. could void the user's authority to operate the equipment and are not permitted.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

## Overview

The R5 Board has the following onboard main components:

- 1) Texas Instruments MSP432P401R Microcontroller
- 2) Onboard power regulation with battery inputs
- 3) Onboard Flash memory
- 4) Onboard LoRa transceiver with antenna connector
- 5) Onboard tilt sensor
- 6) Buffered General Purpose IOs for external peripheral interfaces

## Power Source

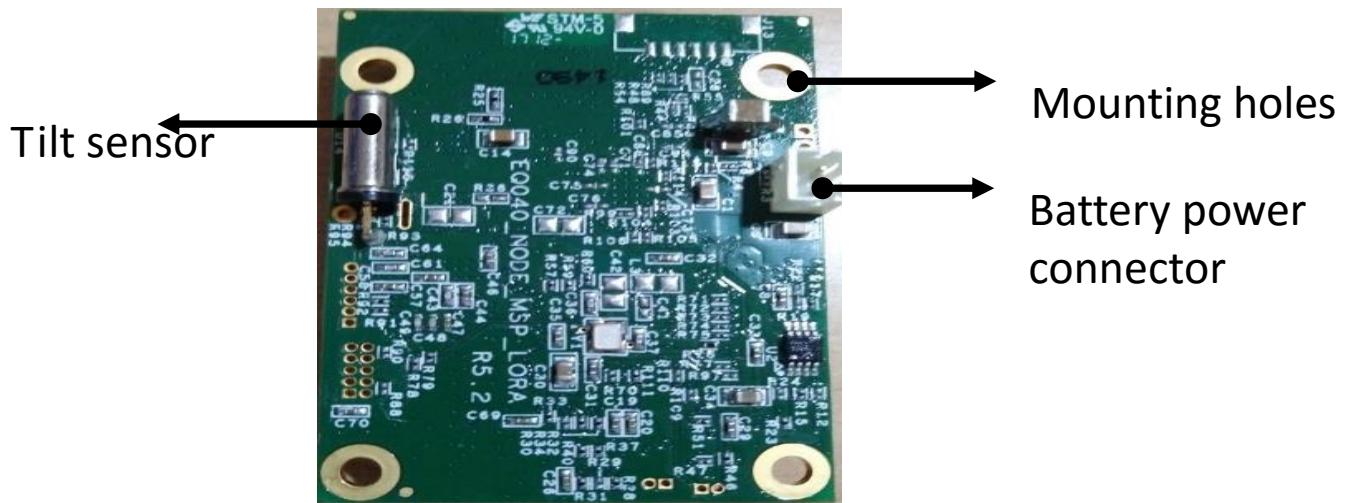
Battery power sources with nominal voltages between 3.0 and 4.1v may be used. Power source must be rated for continuous current of 200 mA.

## Approved Antennas

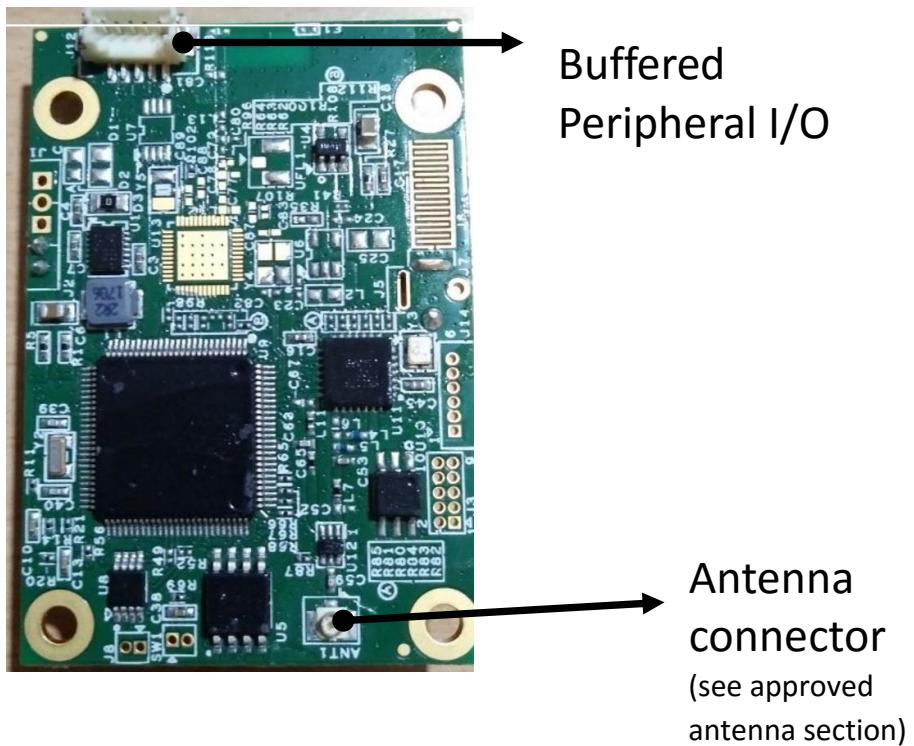
The following is approved for use with the R5 board:

1. Whip antenna or equivalent with a maximum peak gain of 1.9 dBi

## FRONT VIEW



## REAR VIEW



# Approved OEM End Products

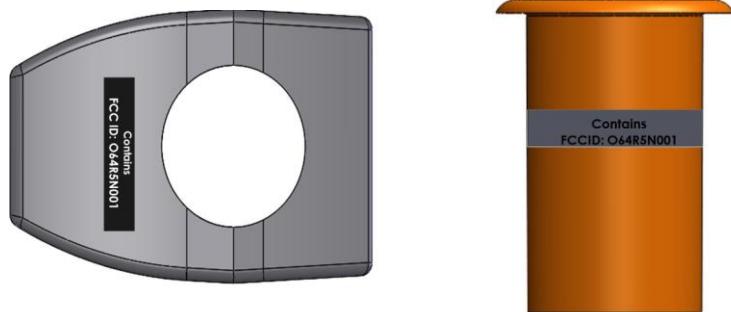
The R5 Board can be used only in specific end devices listed below (and not sold for general use). Labeling shown below are exemplary only, host labels must comply with section 15.19 of Part 15 of FCC rules. Additional testing will have to be performed on each host product that uses this module and a PCII will be required should the results show any emissions higher than the module's certified test results.

## 1. CivicSmart Parking Sensors

Parking sensors are sealed, self-contained units that contain one R5 Board and a secondary sensing element. The board is securely mounted inside with the authorized antenna and not available for external antennas. Housings are limited to approved configurations:

- 1) Subterranean
- 2) Above ground R5 models

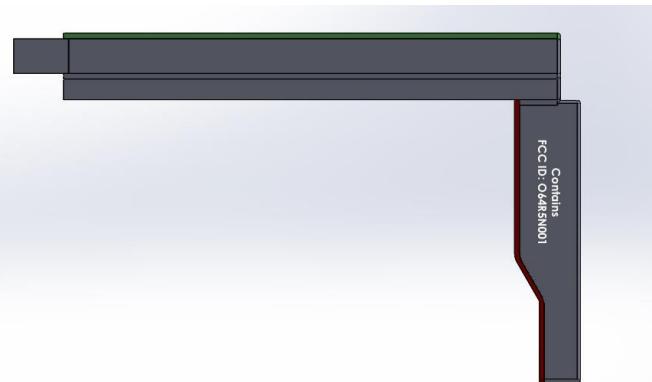
All housings contain the R5 Board with the authorized antenna.



## 2. Parking sensor data receiver dongle (by CivicSmart)

The R5 with the authorized antenna can be used within a data receiver dongle unit. The unit gets external power from a 5V source and has buffered outputs for dry contact relays.

The sensors and data receivers are deployed in limited locations and registered by CivicSmart.



Note: For all approved products:

Place the following FCC 2-part warning on device:

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.

Per section 15.19 and other applicable rules, where host product surfaces are too small (generally less than 4'x4"), placement in host manual only will suffice.

Place the following note in the host product manual:

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 equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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