Cognosos PCA-10017 Radio Module
User's Manual

The PCA-10017 Radio Module is a small, battery powered 433MHz UHF and 2.4GHz BLE transceiver with integrated sensors. This module is extremely low power and is used to create end devices that operate on Cognosos' radio networks. The baseline application for the end products includes asset tracking and sensor network applications. In use, a combination of events trigger the module to gather and relay sensor data to a Cognosos' radio network.

The PCA-10017 module communicates over a long-range UHF waveform. The BLE radio provides short range, higher data rate communication. Each communication mode is internally limited for compliance with the associated FCC/IC regulations. The end application may use the various transmission methods to communicate operational events, provide event-based alerts, assist device localization, or for system interrogation and maintenance.

The Radio Module also contains an L1 GPS receiver with SAW and LNA on board. The GPS receiver is used for localization information.

Product Models:

For compatibility with multiple end-product designs, the PCA-10017 module comes in several variants, with the only difference being the direction the LEDs face or population of the optional serial port connector. Contact Cognosos at www.cognosos.com for more detailed information.

Operational Modes

Tracker Tag – This is the default mode of the PCA-10017. The tag is highly configurable with use case profiles. Profiles change device operation within regulatory requirements. Typically, profiles are used to enable or disable certain behaviors and reported data related to motion. As per FCC rules, devices only send UHF data with physical user interaction.

Storage Mode – The PCA-10017 in tracker tag mode will sleep if the device is in the storage mode orientation. This orientation is dictated by the profile configuration. This mode is useful for transport and storage to minimize battery life.

BLE Activator Mode – The PCA-10017 can act as a 'BLE Activator'. In this mode, a configurable BLE advertisement will be sent per the BLE specifications. This activator is meant to provide contextual information to another PCA-10017 to aid with asset localization.

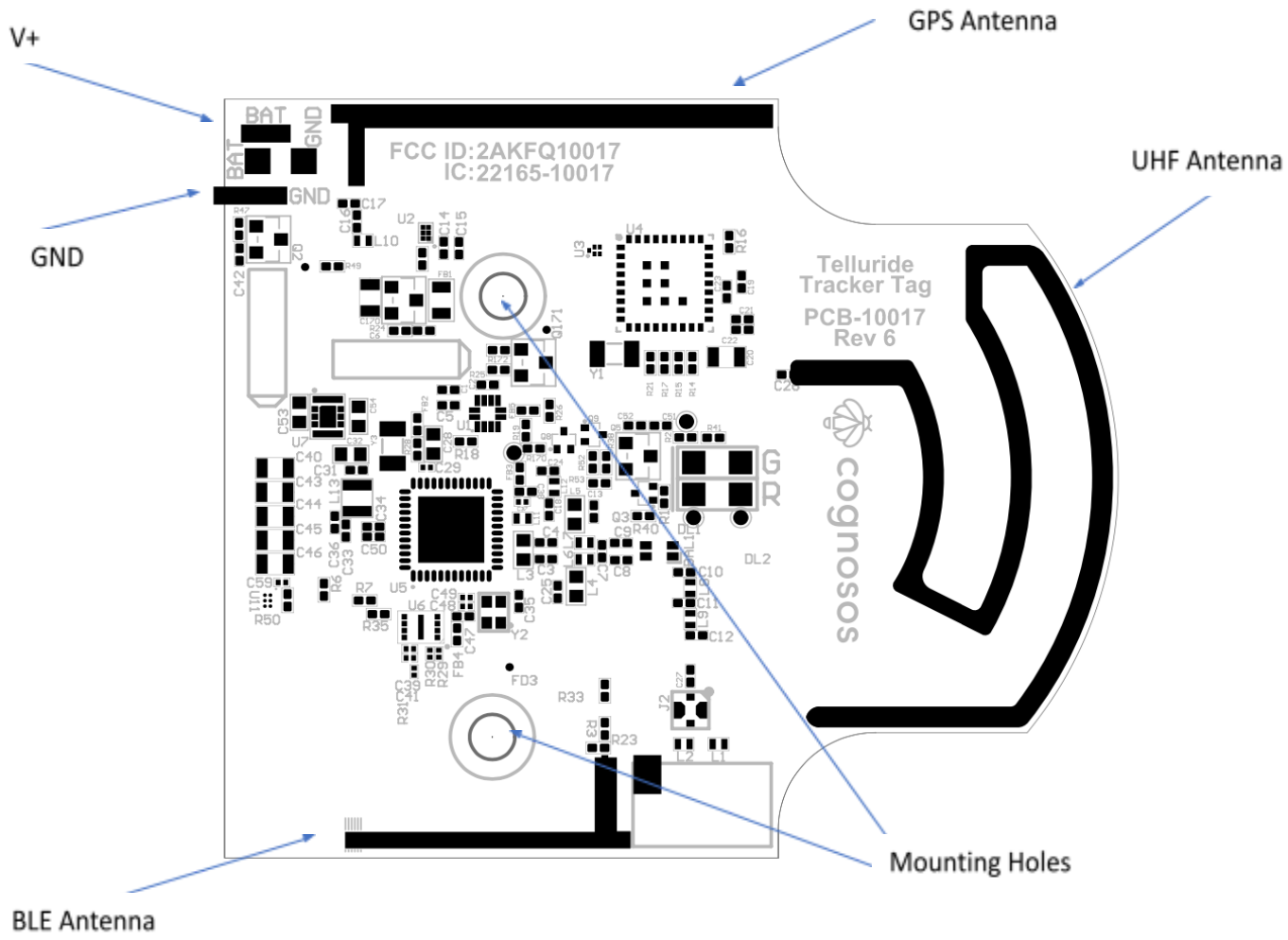
System Operation

A system comprises of multiple PCA-10017's. An end-product containing a PCA-10017 will be installed onto an asset that is desired to be tracked. A gateway device will receive UHF messages from PCA-10017's to determine the location of that asset. Additional PCA-10017's configured in activator mode will provide localization support and influence the packet data sent to the gateway. In some cases the activator message will contain enough contextual information to bypass the GPS sequence.

Host Integration:

The PCA-10017 module is always integrated into a host device. When connecting to a host device, the following connections are made:

PCA-10017 Module Connections



Power: To power the module, apply 2.0-3.6 VDC across the VDC input and ground terminals. The module is protected against reverse voltage connection. Energizer L91 batteries should be used.

Mounting: Two size 4 screw holes are provided for module mounting.

Antennas: All antennas are integrated on the PCA-10017 module. For maximum performance, care should be taken to avoid metal in the area of the antennas.

FCC and IC Labeling Requirements: When the PCA-10017 module is used in a host product, the host product is required to display "Contains FCC ID: 2AKFQ10017" and "Contains IC: 22165-10017" respectively to comply with FCC and IC rules. These marking must be on the outside of the unit in 4-point font minimum.

Regulatory

Warning: Changes or modifications to this device not expressly approved by Cognosos Inc. could void the user's authority to operate the equipment.

FCC ID: 2AKFQ10017
IC: 22165-10017

This equipment complies with the FCC RF radiation exposure limits set forth for an uncontrolled environment. This shall be installed and operated with a minimum separation distance of 20cm between the radiator and any part of the human body.

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.

NOTE: 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 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.

Radio/broadcast products shall comply with the requirements to include required notices and/or statements to the user of the product for each unit of the product offered for sale. The required notices shall comply with the following requirements:

- The notices shall be as specified in the applicable RSS regulation(s) to the product.

- These notices shall be shown in a conspicuous location in the user manual for the product, or to be displayed on the product - variable formats are acceptable for providing the notices (i.e. in paper form, CD, DVD, or insert with download link on the company's website).
- If more than one notice is required for multiple product versions, the product version to which each notice pertains should be identified.
- The suppliers of radio equipment shall provide the notices and/or statements in both English and French.
- In cases where the user notifications are only available in one language (English or French) at the time of the certification process, the applicant shall provide a declaration in writing that the user notices and/or statements to the user of the product will be in both English and French when the product is for sale and/or lease in Canada.

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 present appareil est conforme aux CNR d'lndustrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisee aux deux conditions suivantes : (1) /'appa reil ne do it pas produire de brouif/age , et (2) /'ut ilisateu r de /'appare il doit accepter tout brouif/age
radioe lect rique sub i, meme si le brouif/age est susceptible d'en compromettre le fonctionnement.

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