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PBC beacon BC91/403000

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Prepared by:

Distribution (Check all appropriate):

Precyse Only Project Team Only Customer and Supplier

c:\hardwarews\production\pd-915\bc915\documents\fcc\bc91403000 user manual.docx

Revision Record

Rev.	Effective Date	Description
1.0	10/08/2008	1 st release
1.1	11/08/2008	Revised according to comments by Michael
1.2	4/11/2008	Added antenna specifications
1.3	21/6/2012	Updated to regulatory requirements
1.4	24/6/2012	Added marketing information

Reference documents

#	Doc #	Description
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Regulatory Information/disclaimers

Installation and use of this Wireless Radio device must be in strict accordance with the instructions included in the user documentation provided with the product. Any changes or modifications made to this device that are not expressly approved by the manufacturer may void the user's authority to operate the equipment. The Manufacturer is not responsible for any radio or television interference caused by unauthorized modification of this device, of the substitution or attachment. Manufacturer and its authorized resellers or distributors will assume no liability for any damage or violation of government regulations arising from failing to comply with these guidelines.

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.

Instructions concerning human exposure to radio frequency electromagnetic fields:

To comply with FCC Section 1.307 (b) (1) for human exposure to radio frequency electromagnetic fields, implement the following instruction:

A distance of at least 20cm. between the equipment and all persons should be maintained during the operation of the equipment. The minimum distance will be determined after testing has been completed.

The FCC Wants You to Know

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:

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

FCC Warning

Modifications not expressly approved by the manufacturer could void the user authority to operate the equipment under FCC Rules.

Abstract

This document describes the iLocate system hardware:

1. PBC beacon, Precyse part # BC91/403000, referred to as the PBC.

Product description

PBC beacon:

The PBC is used to define a location zone. It is based on a microcontroller and 4 RF transceivers.

It uses the iLocate proprietary protocol which provides a 2 way, half duplex communication with the base station and to transmit its ID to the SATs.

The unit is DC powered, 12 – 24Vdc, up to 100mA.

Technical Data Sheet – Beacon 915

Compatibility:

PBC Beacon, 915MHz, versions: BC91/403000

Performance:

Read range: up to 500 m. (Within line of sight)

Write range: up to 500 m. (Within line of sight)

Read rate: 250 Kbps.

Write rate: 250 Kbps.

Communication:

Frequency: 905.00 to 915.00 MHz ISM license free band

Modulation: 2FSK

EIRP: Up to 9.4 dBm, digitally controlled

Communication protocol: 2WiSAP, optional AES128 Encryption

Transmission: Event base and on demand (TOM/SOM)

External interfaces: USB

Electrical:

Power supply: 12-24 V DC, up to 250 mA

Safety: CE, UL compatible

Environmental:

Size: W 112mm X L 125mm X H 45mm

Operating temperature: 0°C to +55°C (-5°F to +185°F)

Humidity: 90% non-condensing

Enclosure: IP54

Antennae

The Antennae for the PBC are EAD# ST-918

Specifications:

Type: Quarter wave Monopole

Gain: 0dBi

Impedance: 50Ohm

VSWR: < 2.0:1

Polarization: Vertical

Radiation pattern: Omni

Schematics

Will be provided on demand and under confidential agreement (not for public use)

System test configuration

Beacon

The unit was configured for normal operation. In this mode the beacon transmits its ID packet continuously, with 20% duty cycle.

For intermodulation tests, the unit was configured to transmit on all 4 channels simultaneously.

The unit transmission channels were set to 0 (905.0MHz), 8 (911.4MHz) and 16 (917.8MHz).

Method of operation

The PBC has 4 independent transceivers. The transceivers cannot operate as MIMO or phase array (beam shaping).

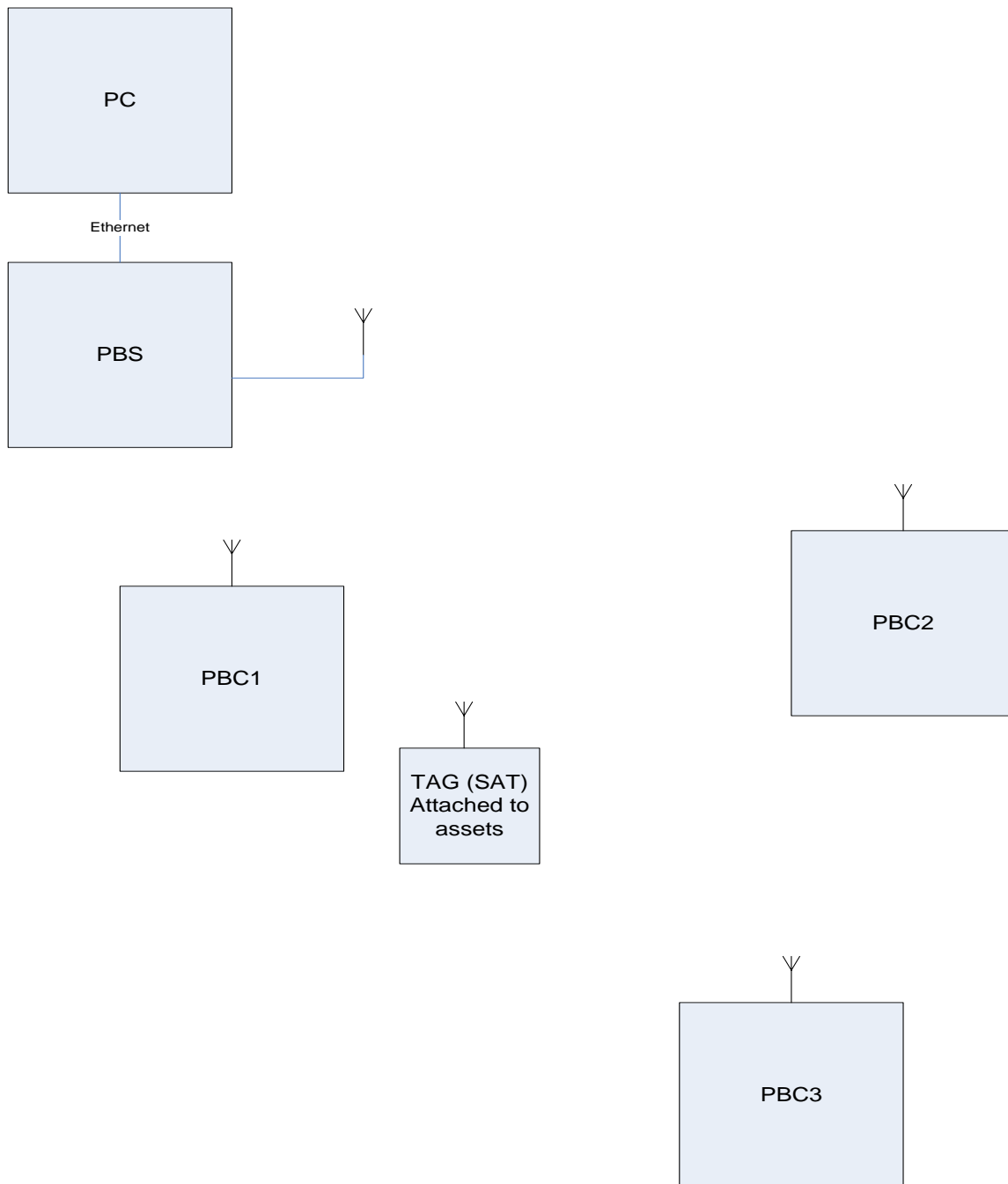
All the transceivers are connected to a single low power microprocessor unit. Each transceiver in the unit transmits its identification packet at 20% or lower duty cycle.

Each transceiver operates at a different 800KHz band (905.0, 905.8, 906.6 etc).

One of the channels (One which has the best reception from the base station) acts as a communication channel to the base station.

This unit's function is to provide location information to the mobile agents (tags). Upon packet reception, the tag transmits its signal strength (RSSI) and ID to the base station, and its location can be calculated using various algorithms.

iLocate system block diagram



Unit definitions:

Base station, referred to as PBS: A radio device that transmits data to and from the tag (SAT) to a personal computer (PC), also provides synchronization signal. The unit is powered by a DC power supply.

Beacon, referred to as PBC: A radio device that defines a location. Location detection can be realized through one or more PBCs. The unit is powered by a DC power supply.

Tag (SAT): A radio device that is used to track and monitor assets. It communicates with the PBS and can detect the PBC signals.

Marketing and installation

1. EUT intended use and application: The BC91403000 (PBC) is used as a radio beacon for the iLocate system. By transmitting a constant signal, it allows the tags (SA24003000) to identify their location. The EUT is installed either indoors or outdoors (inside an appropriate sealed box). The installation requirements are proper site planning, infrastructure (AC supply with an AC to DC adapter or DC supply, mechanical mounting, clearance around it), sealed box (Per Precyse tech requirements, an IP55 or equivalent box uninterrupted power supply where required, etc).
2. Marketing: The EUT is sold to system integrators only. It is not available for non qualified persons or integrators.