PRECYSE
TECHNOLOGIES

Document No.
Revision   1.2

PBC beacon BC24/403000

Release Date: 13:01 2008/08/10
Prepared by:

Distribution (Check all appropriate):
☐ Precyse Only ☐ Project Team Only ☐Customer and Supplier
t:\r&d\documents\fcc required documents\beacon24\bc24403000 user manual.docx

Revision Record

Rev.	Effective Date	Description
1.0	10/08/2008	1st release
1.1	11/08/2008	Revised according to comments by Michael
1.2	4/11/2008	Added antenna specifications

Reference documents

#	Doc #	Description
1		

TABLE OF CONTENTS

Abstract

This document describes the iLocate system hardware:
1. PBC beacon, Precyse part # BC24/403000, 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 2.4

Compatibility:

PBC Beacon, 2.4GHz, versions: BC24/403000

Performance:

Read range: up to 500 m. (Within line of sight)
Write range: up to 500 m. (Within line of sight)
Read rate: 256 Kbps.
Write rate: 256 Kbps.

Communication:

Frequency: 2400 – 2483.5 MHz ISM license free band
Modulation: Q-PSK (DSSS)
EIRP: Up to 18 dBm, digitally controlled
Communication protocol: 2WiSAP, optional AES128 Encryption
Transmission: Event base and on demand (TOM/SOM)
External interfaces: Ethernet

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: -20°C to +85°C (-5°F to +185°F)
Humidity: 90% non-condensing
Enclosure: IP54

Antennae

The Antennae for the PBC are Nearson #S141AM-2450
Specifications:
Type: Half wave dipole
Gain: 2dBi
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)
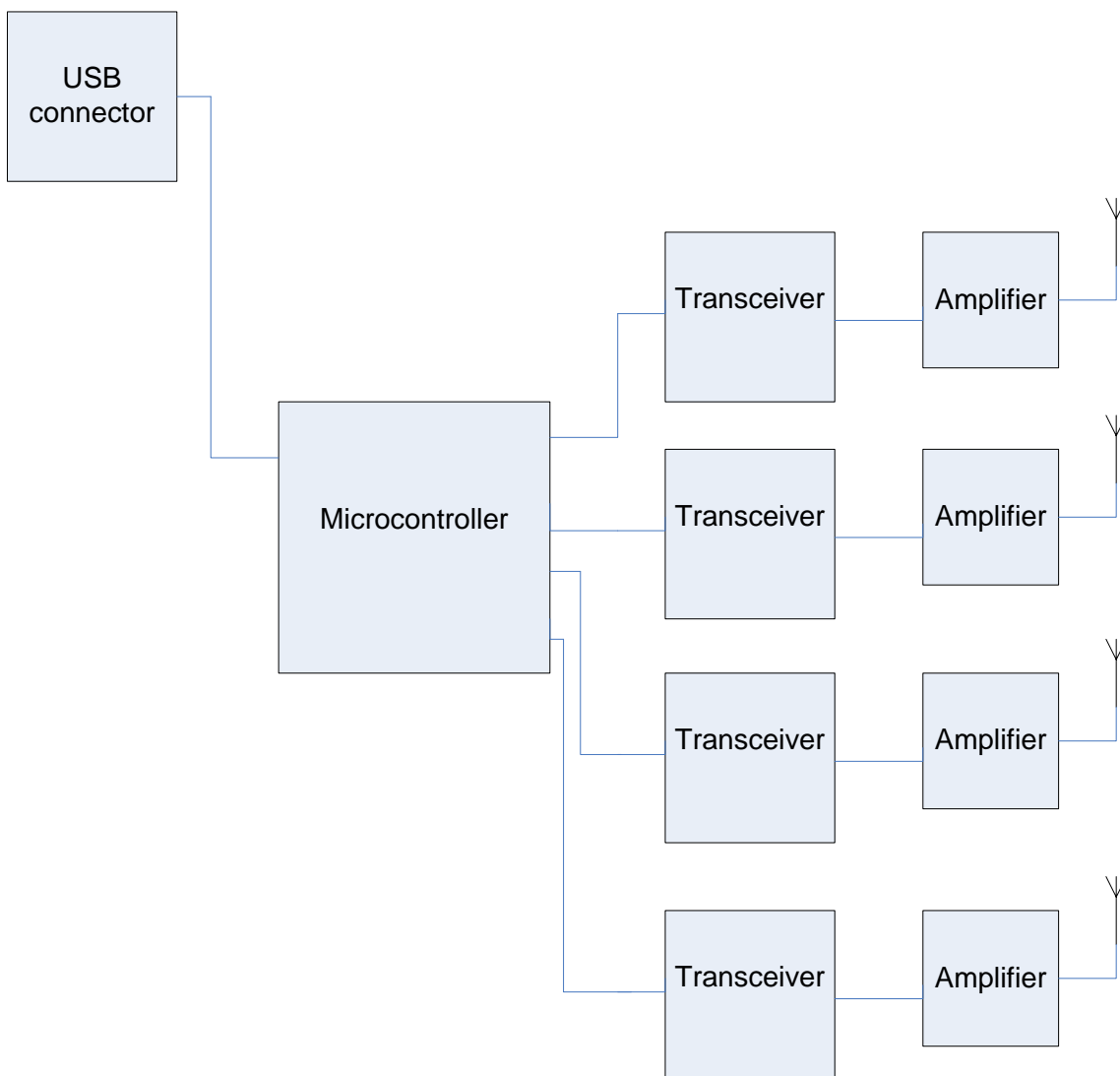
System test configuration

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.

Block diagrams

Beacon PBC

```
┌──────────┐
│   USB    │
│ connector│
└──────────┘
                                    ┌────────────┐   ┌──────────┐
                                    │ Transceiver│   │ Amplifier│──── Y
                                    └────────────┘   └──────────┘

              ┌──────────────┐      ┌────────────┐   ┌──────────┐
              │              │      │ Transceiver│   │ Amplifier│──── Y
              │Microcontroller│      └────────────┘   └──────────┘
              │              │
              └──────────────┘      ┌────────────┐   ┌──────────┐
                                    │ Transceiver│   │ Amplifier│──── Y
                                    └────────────┘   └──────────┘

                                    ┌────────────┐   ┌──────────┐
                                    │ Transceiver│   │ Amplifier│──── Y
                                    └────────────┘   └──────────┘
```

Theory of operation

The Beacon transmits continuously its ID, thus defining a location zone. When a tag receives this ID, it reports to the base station and the user application knows the SAT's location.

iLocate system block diagram

PC

Ethernet

PBS

PBC1

PBC2

TAG (SAT)
Attached to
assets

PBC3
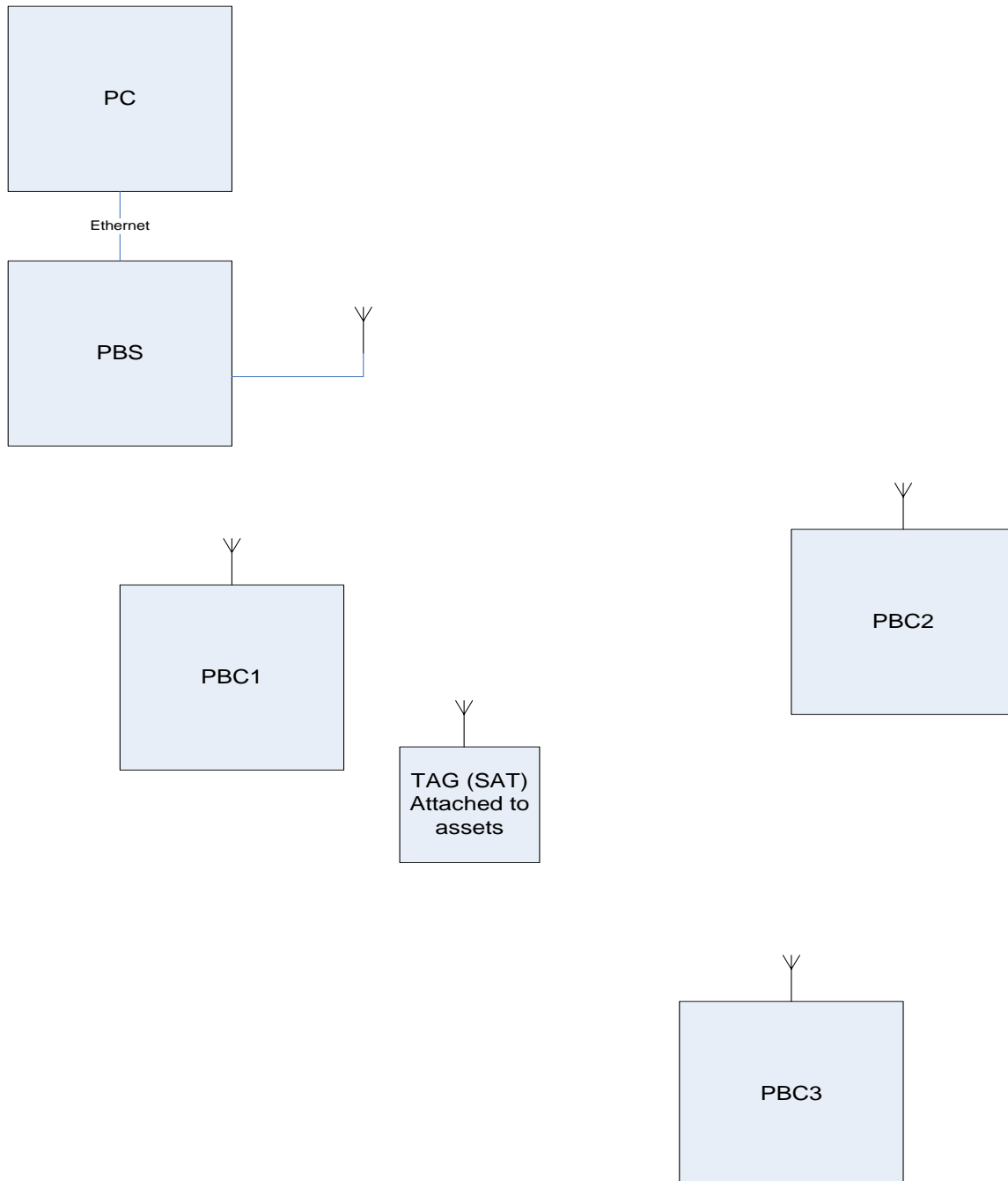
Unit definitions:

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.