Specification
Ver.0b

iBS03 Specification

iBS03 Waterproof Sensor Beacon

iBS03 is an IP67 waterproof BLE(Bluetooth LE or Bluetooth Smart) beacon with different sensor options. The BLE is a very low power 2.4G radio that can transmit the beacon information efficiently. The typical beacon battery life is 6.8 year in default settings. iBS03 is a rugged design for working in tough condition.

Features

General

- ARM Cortex™-M0 32-bit processor
- Support Bluetooth LE 4.2
- IP67 waterproof
- 2M of drop protection
- Powered with 1XCR2450 battery
- Long battery life: close to 7 year in typical beacon setting
- Android APP for configuration
- Panic/alarm button
- Power on/off switch(internal)
- Sensor activity wake up mechanism to save power
- Size: 43mmx43mmx14.8mm
- Operating temperature: -20°C to 60°C (-30°C~70°C in verifying)
- Certificate: CE/FCC/TELEC (pending).

Sensor

- Hall sensor with magnet to detect open/close event
- Temperature sensor for environment monitoring
- Accelerometer for motion detection or activity monitoring

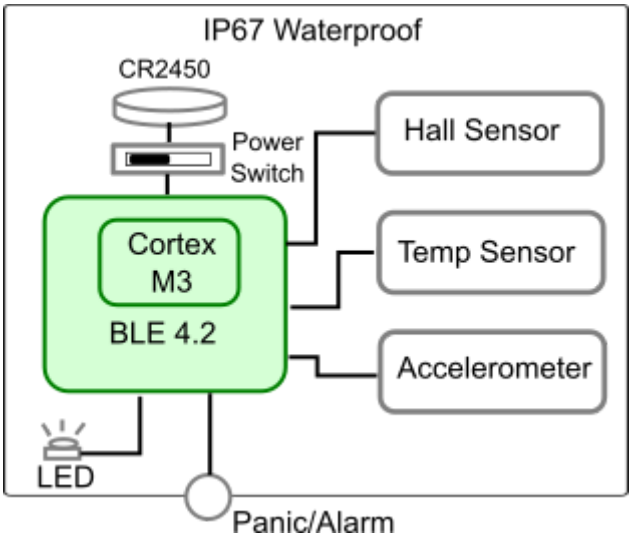
RF

- 2.4GHz frequency band
- Maximum transmit power +5dB
- Receiver sensitivity: -97 dBm @1Mbps, 0.1% BER
- On board PCB antenna
- 50M range in open space(planned)

Applications

- Beacon for location tracking
- Sensor network
- Building automation
- Health and wellness monitoring
- Activity monitoring
- Security
- Smart home
- Access management
- Advertisement
- Industrial automation

Block Diagram



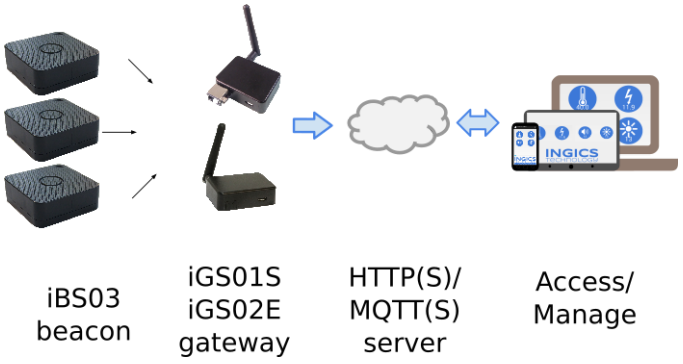
Models

Model Name	Description	Advertising interval	Note
iBS03	Basic beacon for tracking the position of people or asset. (a Hall sensor is built in for open/close detection)	User configurable from 100ms~1 min. Default: 5 s	Sensor status change(magnet moving closer or moving away) will trigger a series of transmit to inform the status change
iBS03T	Beacon with temperature sensor for environment monitoring	User configurable from 100ms~1 min. Default: 5 s Sensor updated at 0.5X (advertising interval), min.10s	
iBS03G	Beacon with accelerometer for motion event detection, including the fall detection.	User configurable from 100ms~1 min. Default: 5 s	Sensor status change(still->motion, motion ->still, or falling) will trigger a series of transmit to inform the status change.
iBS03RG	Beacon with accelerometer for activity monitoring	Not configurable. Fixed at 300 ms	Every 300 ms, it will broadcast 3 records of accelerometer value(one record in 100ms). Each record has x,y,z axis acceleration value.

Typical Usage

1. Beacon is always broadcasting message including status and sensor data. User can use APP to receive the message. We also have the beacon gateway iGS01S(WiFi) or iGS02E(Ethernet) can be used as a receiver.

2. Use iGS01S or iGS02E beacon gateway to receive the beacon message and send to cloud server. User can access and manage the data anytime anywhere.



Specification

Absolute Maximum Rating

Supply Power	CR2450 battery
Storage Temperature	-40° to 85° Celsius

Recommendable Operation Condition

Operating Temperature	-20° to 60° Celsius (-30°C~70°C in verifying)
Humidity	Max 95%, Non condensing, relative humidity
VDD	+3V by CR2450 battery
IP67	30min.@1 Meter water

Current Consumption

iBS03	Average: 12.43uA*, in default 5s transmit period.
iBS03T	Average: 12.38uA*, in default 5s transmit period
iBS03G	Average: 16.13uA*, in default 5s transmit period and 120 times/day of active event
iBS03RG	Average: 117.68uA*, in default 300ms transmit period w/ power saving (working at 12H/day)

* Measured with Panasonic CR2450 battery.

Battery Life Simulation

iBS03	4.4 yr*, in default transmit period.
iBS03T	4.4 yr*, in default transmit period.
iBS03G	3.4 yr*, in default transmit period.
iBS03RG	6.4 month**, in default transmit period and power saving (working at 12H/day).

* Calculated with one CR2450 battery with 600mAH capacity. Considering the battery discharge characteristic, only 80% of capacity is used for calculation. This value is just for reference and may be varied with component tolerance and different environment.
** w/ power saving mode, the iBS03RG will stop advertising the G-value when the value is not changed for a certain time. When the value changes over the threshold, it will start to advertise again.

Hall Sensor Characteristic

Operation point	Typ : 1.8mT(N or S)
Release point	Typ : 1.1mT(N or S)
Hysteresis width	Typ: 0.7mT(N or S)

Temperature Sensor Characteristic

Temperature accuracy	Sensor: Typ. : +-0.22 °C, Max: +-0.32 °C Whole unit: TBC
Response time	Typ. : TBC
Long term stability	Typ. : <=0.01 °C/yr

Accelerometer Characteristic

Acceleration range	+-2G, +-4G(default), +-8G, +-16G
Sensitivity	+-2G: 4mg/digit +-4G: 8mg/digit +-8G: 16mg/digit +-16G: 32mg/digit
Offset Accuracy	+-40mg

BLE RF Specification

Transmit Power	Max.: +5dBm
Receiver Sensibility	-97 dBm @1Mbps, 0.1 %BER
Maximum Received Signal Strength at <0.1% PER	+4dBm @1Mbps, 0.1 %BER
Frequency band	2.400 – 2.483 GHz
Frequency Deviation	+-350 kHz @1Mbps
Antenna	on board PCB antenna
Range	50M in open space(BLE 4.2)

Dimension

Dimensions L x W x H (mm)	43 x 43 x 14.8
Weight(g)	24

Packing

One packing boxes(size: 11cmX5.5cmx6.5cm) contains 8 units of iBS03.

8X 

Revision History

DATE	REVISION	CHANGES
Sep 17, 2018	0a	Initial release
Oct 22, 2018	0b	Fix power consumption value and battery life simualtion