Specification
Ver.1e

iBS01 Specification

iBS01 Series Sensor Beacon

iBS01 is a 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 2.8year in default settings.

Features

General

- ARM Cortex™-M0 32-bit processor
- Support Bluetooth Smart 4.1
- Powered with 2XCR2032 battery or external USB
- Long battery life: 2.5 year in typical beacon setting
- Android APP for configuration
- Panic/alarm button
- Power on/off switch
- Sensor activity wake up mechanism to save power
- Size: 58mmx42mmx10mm
- Operating temperature: -20'C to 60'C
- Certificate: CE/FCC/TELEC/NCC.

Sensor

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

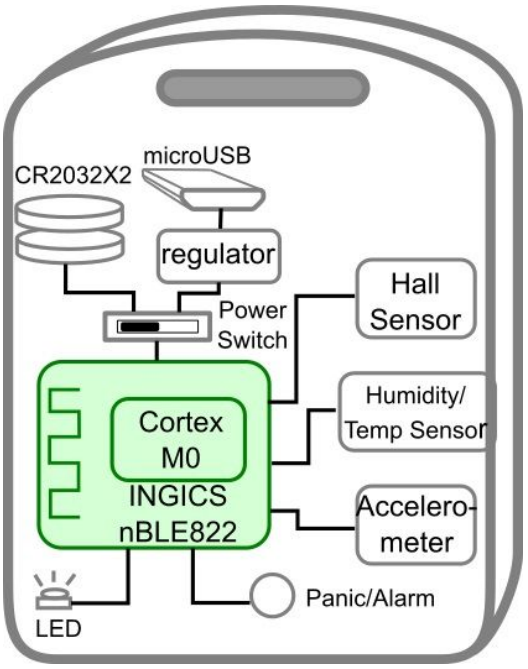
RF

- 2.4GHz frequency band
- Maximum transmit power +4dB
- Receiver sensitivity: -96 dBm @250kbps, 0.1% BER
- On board PCB antenna
- 30M range in open space

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



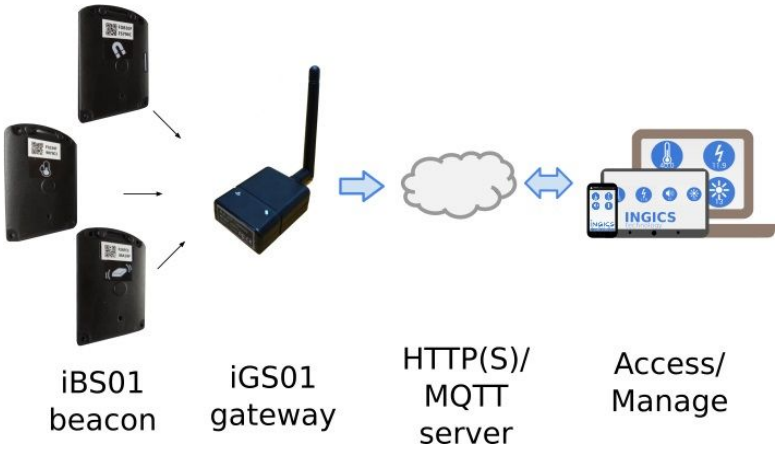
Models

	Mark	Description	Advertising interval	Others
iBS01		Basic beacon for tracking the position of people or asset.	User configurable from 100ms~10 s Default: 5 s	
iBS01H		Beacon with hall sensor for open/close detection.	User configurable from 100ms~10 s Default: 10 s	Sensor status change(magnet moving closer or moving away) will trigger a series of transmit to inform the status change
iBS01T		Beacon with humidity/temperature sensor for environment monitoring	User configurable from 100ms~10 s Default: 5 s Sensor updated: 10s	
iBS01G		Beacon with accelerometer for motion event detection, including the fall detection.	User configurable from 100ms~10 s Default: 10 s	Sensor status change(still->motion, motion ->still, or falling) will trigger a series of transmit to inform the status change.
iBS01RG		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 Applications

1. Beacon is always broadcasting message including status and sensor data. You can use APP to receive the message. We also have a beacon gateway iGS01 can be used as a receiver.

2. Use iGS01 beacon gateway to receive the beacon message and send to cloud server. You can then access and manage the data anytime anywhere.



Specification

Absolute Maximum Rating

Supply Power	Max. +5.5 Volt
Storage Temperature	-40° to 85° Celsius
Voltage Ripple	+-2%

Recommendable Operation Condition

Operating Temperature	-20° to 60° Celsius
Humidity	Max 95%, Non condensing, relative humidity
VDD	+5 Volt +- 5% by USB power or +3V by CR2032 battery

Current Consumption

iBS01	Average: 12.41uA*, in default transmit period.

iBS01H	Average: 11.48uA*, in default transmit period and 120 times/day of open/close event
iBS01T	Average: 16.87uA*, in default transmit period
iBS01G	Average: 14.35uA*, in default transmit period
iBS01RG	Average: 213.31uA*, in default transmit period w/ power saving mode

* Measured with CR2032 battery.

Battery Life Simulation

iBS01	2.8 yr*, in default transmit period.
iBS01H	3.1 yr*, in default transmit period and 120 times/day of open/close event
iBS01T	2.1 yr*, in default transmit period.
iBS01G	2.5 yr*, in default transmit period.
iBS01RG	60 days**, in default transmit period and power saving mode.

* Calculated with 2 X CR2032 with 220mAH capacity. Considering the battery discharge characteristic, only 70% 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 iBS01RG will stop advertising the G-value when the value is not changed for a certain time. When the value change is 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)

Humidity/Temperature Sensor Characteristic

Humidity accuracy	0-80%RH: Typ +-2%, max +-3% 80-100%RH: Typ +-3%, max +-4.5%
Response time	Typ : 18 s, at 1m/s airflow
Drift	Typ : 0.05 %RH/°C
Long term stability	Typ : <=0.25 %RH/yr
Temperature accuracy	-10°C-85°C: Typ : +-0.3 °C, Max: +-0.4 °C -20°C: Typ : +-0.43 °C, Max: +-0.57°C
Response time	Typ : 5.1 s
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.: 4dBm
RF Power Accuracy	+- 4 dB
Receiver Sensibility	-96 dBm @250kbps, 0.1% BER -90 dBm @1Mbps, 0.1 %BER
Maximum Received Signal Strength at <0.1% PER	0dBm
Frequency band	2.400 – 2.483 GHz
Frequency Deviation	+-250 kHz @BLE
Antenna	on board PCB antenna
Range	30M in open space

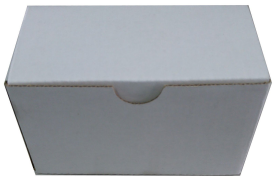
Dimension

Dimensions L x W x H (mm)	58 x 42 x 10

Packing

One packing boxes(size: 11cmX5.5cmx6.5cm) contains 10 units of iBS01. The CR2032 battery is not included inside iBS01.

10X 



Revision History

DATE	REVISION	CHANGES
May 4, 2016	1	Initial release
May 4, 2016	1a	* Enhance iBS01T current consumption and battery life by optimizing iBS01T firmware parameter.
June 29, 2016	1b	1. Model iBS01G add fall detection description in page 2. Also modify the default advertising interval from 5s to 10s. 2. Modify the sensitivity description from 4096LSB/g to 4mg/digit(actually they are the same) at accelerometer characteristic 3. Add current consumption and battery life simulation information of iBS01G and iBS01RG 4. Update certification status

Oct 19, 2016	1c	Add temperature sensor accuracy in -20°C condition in page 4.
Aug 11, 2017	1d	Default accelerometer range change to +-4G
Aug 10, 2018	1e	Modify/add more characteristic on accelerometer sensor