

iBS03 Specification

iBS03 Waterproof Sensor Beacon

iBS03 is an IP67 waterproof BLE 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 4 years in default settings. iBS03 is a rugged design for working in tough conditions.



Features

General

- ARM Cortex™-M3 32-bit processor
- Support BLE 4.2 and BLE 5 long range
- IP67 waterproof
- 2M of drop protection
- Powered with 1XCR2450 battery
- Long battery life: 4 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 75°C
- Certificate: CE/FCC/IC/TELEC/NCC.

Sensor

- Hall sensor with magnet to detect open/close event
- Temperature/Humidity sensor for environment monitoring (**iBS03T adds a humidity sensor from SN:2006...**)
- Accelerometer for motion detection or activity monitoring

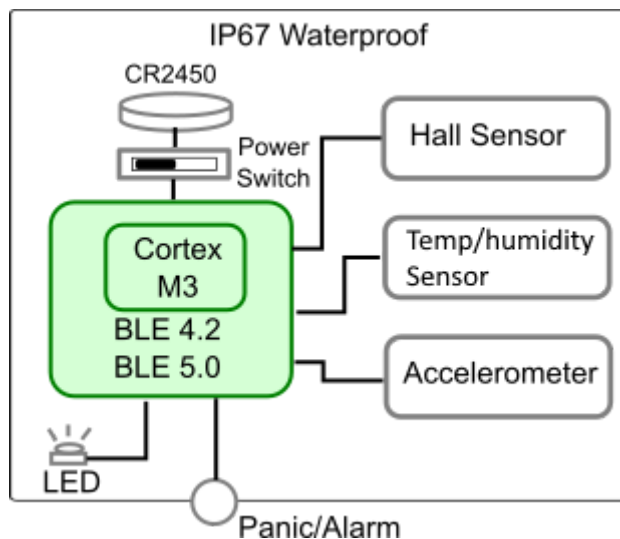
RF

- 2.4GHz frequency band
- Maximum transmit power +5dB
- Receiver sensitivity: -97 dBm @1Mbps, 0.1% BER
- On board PCB antenna
- >100M 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



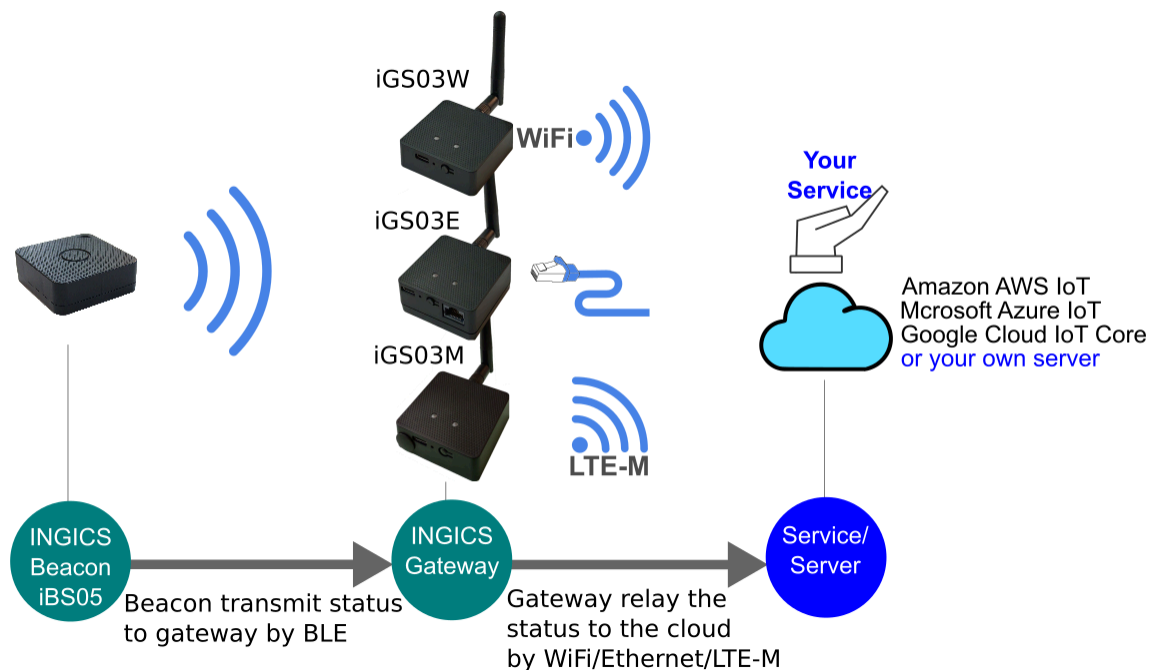
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Models

| Model Name | Description | Advertising interval | Note |
|------------|--|---|--|
| iBS03 | Basic beacon for tracking the position of people or assets. (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/ humidity 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 transmissions 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 an x,y,z axis acceleration value. |

Typical Usage

Works with the latest iGS03W, iGS03E, or iGS03M beacon gateway(or iGS01S/iGS02E) to receive the beacon message and send it to the cloud server. Users 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 75° Celsius |
| Humidity | Max 95%, Non condensing, relative humidity |
| VDD | +3V by CR2450 battery |
| IP67 | 30min.@1 Meter water |

Average Current Consumption

| | |
|---|--|
| iBS03 (120 times/day of sensor active event) | 12.43uA*, in default 5s transmit period. 17.2uA*, in 10s transmit period@125Kbps(long range). |
| iBS03T | 12.38uA*, in default 5s transmit period 16.0uA*, in 10s transmit period@125Kbps(long range). |
| iBS03G (120 times/day of sensor active event) | 16.13uA*, in default 5s transmit period. 20.9uA*, in 10s transmit period@125Kbps(long range). |
| 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 5s transmit period@1Mbps. 3.2 yr*, in 10s transmit period@125Kbps(long range). |
| iBS03T | 4.4 yr*, in default 5s transmit period@1Mbps. 3.4 yr*, in 10s transmit period@125Kbps(long range). |
| iBS03G | 3.4 yr*, in default 5s transmit period@1Mbps. 2.6 yr*, in 10s transmit period@125Kbps(long range). |
| 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 environments.

** 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) |

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 | 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 |
| Resolution | +2G: 4mg +4G: 8mg +8G: 16mg +16G: 32mg |
| Offset Accuracy | +40mg |

BLE RF Specification

| | |
|-------------------------|---|
| Transmit Power | Max.: +5dBm |
| RSSI Accuracy | +/- 4 dB@1Mbps |
| Receiver Sensibility | -97 dBm @1Mbps, 0.1 %BER -103dB @125Kbps, 0.1 %BER |
| Maximum Received Signal | +4dBm @1Mbps, 0.1 %BER >+5dBm @125Kbps, 0.1 %BER |
| Frequency band | 2.400 – 2.483 GHz |
| Frequency Deviation | +350 kHz @1Mbps, -260~310KHz @125Kbps |
| Antenna | on board PCB antenna |
| Range | >100M in open space(BLE 4.2) |

Dimension

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

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Packaging

One package box(size: 12.7cmX6.1cmx6.9cm) contains 10 units of iBS03, 10 pc of double side tape, and 20pc of stainless screw .

10X



Certification

Japan MIC Regulatory
211-180707

IC Regulatory
21379-IBM40R2

FCC Regulatory
2AH2IIBM40R2

NCC Regulatory
iBS03 CCAH23LP5040T3
iBS03G CCAH23LP5042T7
iBS03T CCAH23LP5041T5

Statement

Federal Communication Commission Interference Statement

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 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.

FCC Caution: To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. (Example - use only shielded interface cables when connecting to computer or peripheral devices).

FCC Radiation Exposure Statement This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. The antennas used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

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.

Industry Canada Statement

This device complies with Industry Canada licence-exempt RSS standard. 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 présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

IC Radiation Exposure Statement

This equipment complies with IC RSS-102 radiation exposure limit set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

Cet équipement est conforme aux CNR-102 d'Industrie Canada. Cet équipement doit être installé et utilisé avec une distance minimale de 20 centimètres entre le radiateur et votre corps. Cet émetteur ne doit pas être co-localisées ou opérant en conjonction avec autre antenne ou émetteur. Les antennes utilisées pour cet émetteur doivent être installés et fournir une distance de séparation d'au moins 20 centimètre de toute personne et doit pas être co-située ni fonctionner en conjonction avec une autre antenne ou émetteur.

NCC 警語

「取得審驗證明之低功率射頻器材，非經核准，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。低

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功率射頻器材之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前述合法通信，指依電信管理法規定作業之無線電通信。低功率射頻器材須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。」

CE Regulatory

iBS03/iBS03G/iBS03T have been tested and comply with the essential requirements of the DIRECTIVE 2014/53/EU and LOW VOLTAGE DIRECTIVE 2014/35/EU. Below is the copy of the CE Declaration of Conformity.

UKCA Regulatory

iBS03、iBS03G、iBS03T series have been tested and complies with the essential requirements of the Radio Equipment Regulation 2017 with reference to the Standards applied listed in the following page.

DECLARATION OF CONFORMITY

Under EU RED - DIRECTIVE 2014/53/EU -
Under EU-LOW VOLTAGE DIRECTIVE 2014/35/EU

This Declaration that the following designated product

Sensor Beacon
Model No.: iBS03
Multi-listing Model No.: iBS03, iBS03T, iBS03G
Brand Name: INGICS

.....
(Product identification)

complies with the essential requirements of the **EU RED - DIRECTIVE 2014/53/EU, EU-LOW VOLTAGE DIRECTIVE 2014/35/EU** on the approximation of the laws of the Member States relating to **Radio Spectrum Matters**.

Assessment of compliance of the product with the requirements relating to radio spectrum matters was based on Annex IV of the Directive **2014/53/EU** and the following standard:

| | | |
|--|---|---|
| EMC EN 301 489-1: V2.2.3 (2019-11) EN 301 489-17:V3.2.4 (2020-09) | Radio Spectrum EN 300 328 :V 2.2.2(2019-07) | Safety EN 62368-1:2014/COR1:2015 and EN 62368:2014/A11:2017 Health EN 62479(2010) |
|--|---|---|

.....
(Identification of regulations / standards)

This declaration is issued from
INGICS TECHNOLOGY.
2F., No.15-2, Changshou St.,
Shulin Dist., New Taipei City 238,, Taiwan, R.O.C.

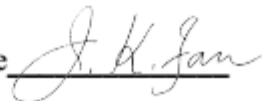
.....
(Name / Address)

Furthermore we declare that our product will be produce in correspondence with all requirements according to the Directive 2014/53/EU, LOW VOLTAGE DIRECTIVE 2014/35/EU.

Name: J.K.Fan

Title: President

Signature



Date: 2021. 7.27

UK DECLARATION OF CONFORMITY (DoC)

Hereby we,

Name of Manufacturer: INGICS TECHNOLOGY CO.,LTD.
Address: 2F.,No.15-2, Changshou St., Shulin Dist.
Post Code & City: New Taipei City 238
Country: Taiwan(R.O.C)
Telephone Number: +886-2-26868632

Declare that this DoC is issued under our sole responsibility and that this product:

Product Description: Sensor Beacon
Type Designation(s): iBS03 、 iBS03G 、 iBS03T
Trademark: INGICS
Batch / Serial Number: After 2107XX000001



Is in conformity with the Radio Equipment Regulation 2017 with reference to the following Standards applied:

Radio Equipment Regulations 2017

EN 301 489-1:V 2.2.3(2019-11)

EN 301 489-17:V 3.2.4(2020-09)

EN 300 328(V 2.2.2, 2019-07)

IEC 62368-1:2014/COR1:2015 and EN 62368-1:2014/A11:2017

EN 62479(2010)

Signed for and on behalf of:

2024. 06.11
Date of issue

JK Fan, President
Name, Function, Signature 

F058 v.2

Revision History

| DATE | REVISION | CHANGES |
|--------------|----------|--|
| Sep 17, 2018 | 0a | Initial release |
| Oct 22, 2018 | 0b | Fix power consumption value and battery life simulation |
| Jun 4, 2019 | 0c | <ol style="list-style-type: none"> 1. Change packing box size and more detail in package 2. Modify RF distance with verified value 3. Support ble 4.2 and ble 5 long range |
| Dec 12, 2019 | 01 | <ol style="list-style-type: none"> 1. Wording fix 2. Add regulation statement |
| Jul 28, 2020 | 01a | iBS03T added a humidity sensor from SN:2006... So add humidity sensor spec |
| Sep 11, 2020 | 01b | Enhanced operation temperature from 70°C to 75°C |
| Sep 24, 2020 | 01c | <ol style="list-style-type: none"> 1. Update block diagram with BLE 5 and temp/humidity sensor 2. Typical battery life changed from 7 year to 4 year(7 year is calculated at 0dB and 10 sec transmit period) 3. Update BLE RF specification table with more BLE5 long range parameters 4. Add BLE 5 long range current consumption and battery life estimation |
| June 3, 2021 | 01d | <ol style="list-style-type: none"> 1. Add Certification section 2. Rearrange page and fix typo |
| Apr 6, 2022 | 01e | Update CE Declaration of Conformity to the latest one |
| Dec 1, 2022 | 01f | To avoid mis-understanding, in Accelerometer Characteristic sector, change Sensitivity to Resolution |
| Jun 09, 2023 | 01g | Update NCC regulatory number to the latest one |
| Jul 04, 2023 | 01h | Update typical usage section |
| June 11,2024 | 01i | Update UKCA Certification information |