Specification
Ver.0d

iBS03AD Specification

iBS03AD Analog/ Digital Input Detection Sensor

iBS03AD is an IPx7 waterproof BLE beacon with analog/digital(AD) input. The BLE is a very low power 2.4G radio that can transmit the beacon information efficiently. iBS03AD supports **Bluetooth® Low Energy(BLE)** in Bluetooth 5. The typical beacon battery life is over 7 years in default settings. iBS03AD is a rugged design for working in tough conditions. The AD input can also be connected to a NTC thermistor and becomes a temperature sensor.

Features

General

- ARM Cortex™-M3 32-bit processor
- Support BLE 4.2 and BLE 5 long range
- IPx7 waterproof
- 2M of drop protection
- Powered with 1XCR2450 battery
- Long battery life: over 7 year in typical beacon setting(30s)
- Android APP for configuration
- Power on/off switch(internal)
- Main unit Size: 43mmx43mmx14.8mm
- Operating temperature: -20°C to 75°C

AD input type

- V: Analog voltage input
- A: 4-20mA current input
- D: Digital input
- NTC: NTC temperature sensor

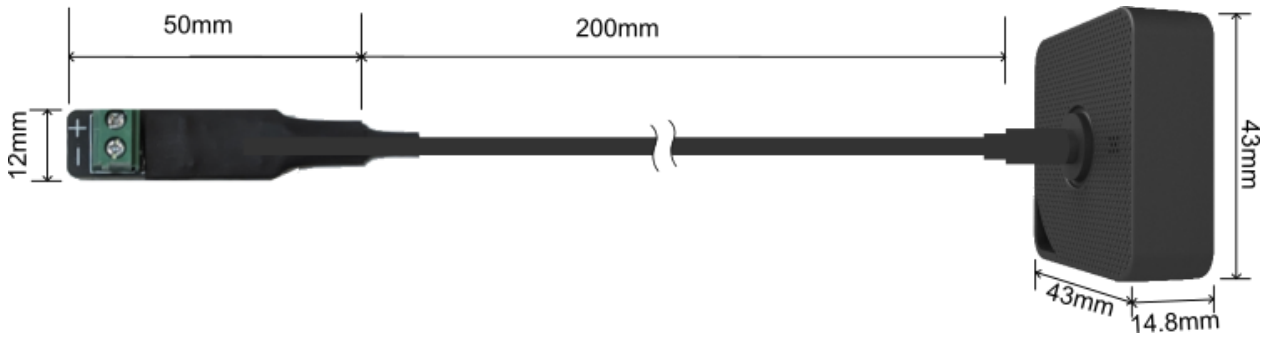
RF

- 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

Certification

- Bluetooth
- FCC/IC/TELEC/CE

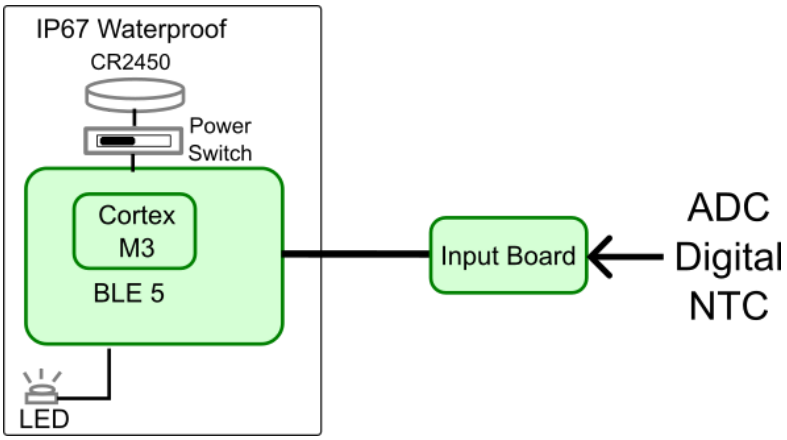
Dimension



Applications

- Temperature monitoring
- Access management
- Industrial automation
- Activity monitoring
- Sensor network
- Industrial automation
- Medical

Block Diagram



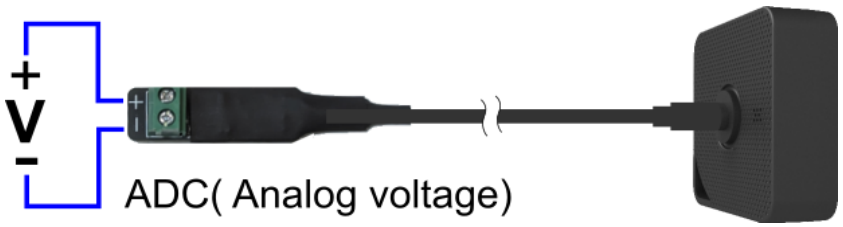
Models

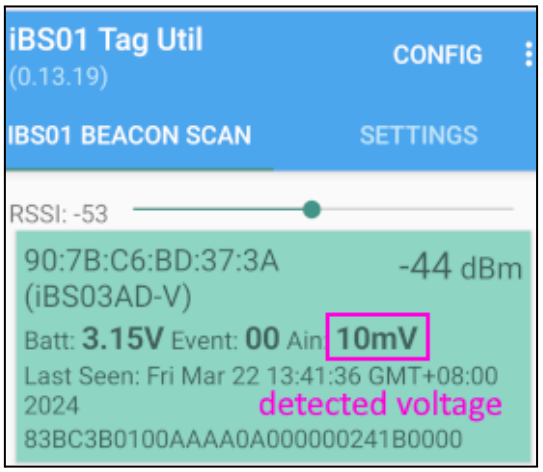
Model Name	Description	Advertising interval	Note
iBS03AD-V	Analog input voltage detection	User configurable from 100ms~60 min. Default: 30 s	Range: 0~24000mV
iBS03AD-A	4-20mA current detection	User configurable from 100ms~60 min. Default: 30 s	Range: 0~23.278mA
iBS03AD-D	Digital input detection (Dry/ Wet contact)	User configurable from 100ms~60 min. Default: 30 s	Input status change(H->L or L->H) will trigger immediate advertising to inform the status change
iBS03AD-NTC	NTC temperature detection	User configurable from 100ms~60 min. Default: 30 s	Default FW is optimized for **10K NTC** with B(25-85)=**3970**(K)

Typical Usage

1. Detect the analog input voltage

Connect a 0~24V analog voltage to “+” pin and ground to “-” pin.

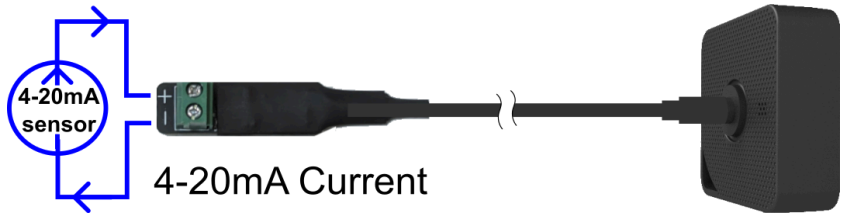


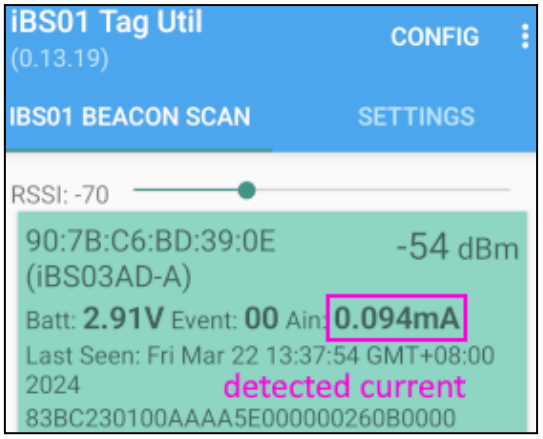


The detected voltage range is 0~24000mV.

2. Detect 4-20mA current

Connect the conventional 4~20mA sensor output to the “+” pin and loop the signal back from the “-” pin.

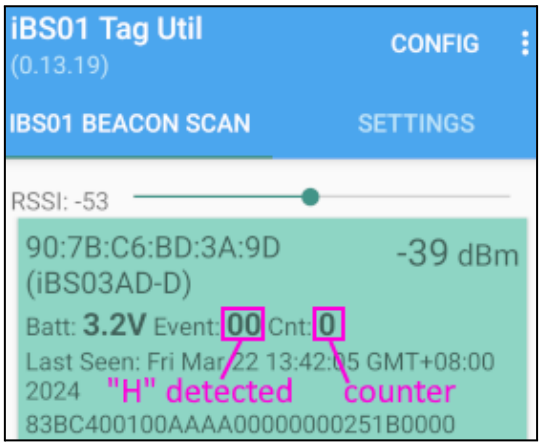




The detected current range is 0~23.278mA

3. Detect H/L status of the digital input

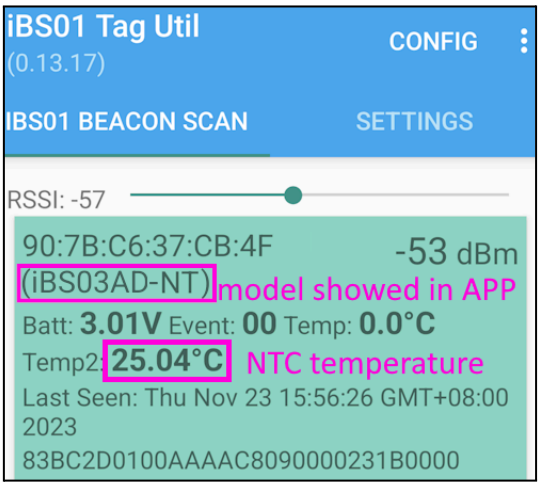
Connect the digital signal to the “+” pin and the ground to “-” pin. It will detect H/L status of the signal, including the often seen wet/dry contact. The accepted voltage range is as high as 50V DC. There is also a counter that will count the times of the H/L status change.



Event 00: “H” detected or no connection
Event 40: “L” detected
Counter: For each “L” detected, it will add 1 in the counter

4. Connect a NTC thermistor to detect the temperature

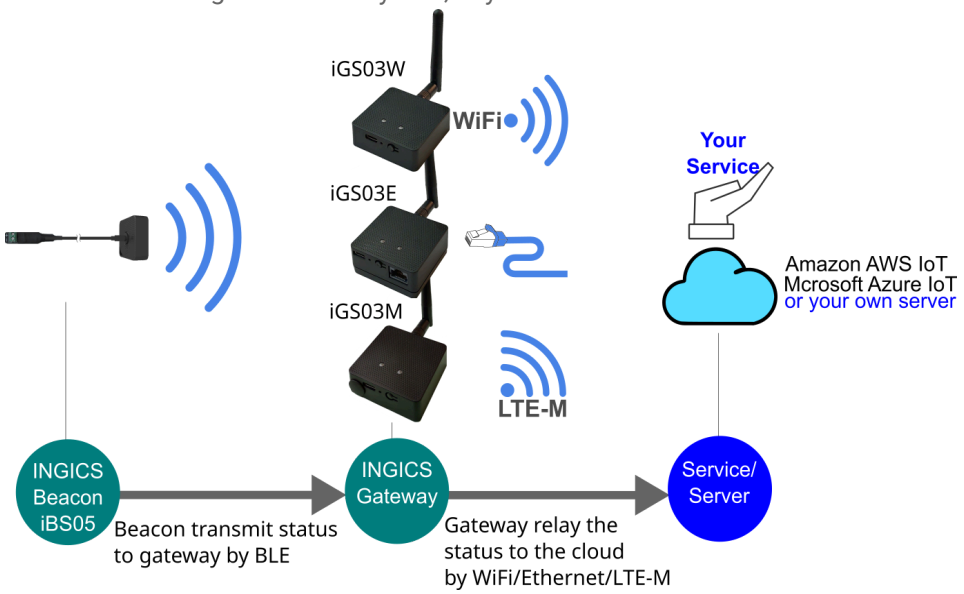
iBS03AD-NTC is optimized with 10K NTC with B value 3970(K). Please connect the NTC between “+” and “-” pins.



10K NTC with B(25-85)=3970(K)

4. Uploads the data to the server.

Works with the latest iGS03W, iGS03E, or iGS03M beacon gateway 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/ Humidity(main unit)	-20° to 75° Celsius 0 to 95% RH(no condensation)
VDD	+3V by CR2450 battery
IPx7	30min.@1 Meter water (the wire connection board is not included)

Current Consumption

iBS03AD-30s	Average: 8.17uA*, in default 30s transmit period.

* Measured with Panasonic CR2450 battery.

Battery Life Simulation

iBS03AD-30s	> 6 yr*, in default 30s transmit period.

* 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.

Analog Input Voltage Specification(for iBS03AD-V model)

Maximum Input Range	0 to 26000 mVDC
Recommendable Input Range	0 to 24000 mVDC
Resolution	10.8mV
Zero Offset	43.2mV(typical)

Accuracy	Typical: +-21.6mV

4-20mA Input Current Specification(for iBS03AD-A model)

Maximum Input Range	0 to 25.218mADC
Recommendable Input Range	0 to 23.278mADC
Resolution	0.001mA
Zero Offset	0.1mA(typical)
Accuracy	Typical: +-1% of reading

Digital Input Voltage Specification(for iBS03AD-D model)

Maximum Input Range	0 to 50VDC
Digital Input level	VinL: < 0.5V VinH: > 2.4V

Optimal NTC Specification(for iBS03AD-NTC model)

Resistance @ 25 °C	10K ohm
B constant (25°C-85°C)	3970(K)
Temperature range	-40°C ~ +105°C
Accuracy*	Typical: +-0.3°C @25°C

* It's the accuracy of the iBS03AD. The NTC has its own accuracy and is not included. The wire length will also contribute some error to the accuracy and is not included too.

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	>100M in open space

Dimension

Dimensions L x W x H (mm)	43 x 43 x 14.8(main unit)
Weight(g)	31

Packaging

One box contains 2 units of iBS03AD and 2 pieces of VHB double sided tape. Box size: 110mmx55mmx65mm

Waste Electrical and Electronic Equipment Recycling

Our product is compliant with the WEEE directive for re-use/recovery/recycling. This cross-out wheeled-bin symbol is a reminder that this product should not be treated as household waste. Instead, hand it over to the appropriate collection point for the recycling of electrical and electronic equipment in accordance with local environmental regulations for waste disposal.

Since our product is not sold directly to the end user and generally it is a part of our customer's solution, our customer is recognized as a professional seller. Our customer has the responsibility to comply with the requirement of the directive too. To help our customers, when necessary, we will provide a WEEE compliant assessment report for registering and communicating with the local authorities and recycling agency.

Certification

Bluetooth SIG Qualification

Model number: iBS03AD
Declaration ID: D053258
Description: iBS sensor beacon

FCC Regulatory

2AH2IIBM40R2

Japan MIC Regulatory

211-180707

IC Regulatory

21379-IBM40R2

CE Regulatory

iBS03AD has been tested and complies with the essential requirements of the DIRECTIVE 2014/53/EU. Below is the copy of the CE Declaration of Conformity.

UKCA Regulatory

iBS03AD has 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.

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 êtreinstallé et utilisé avec une distance minimale de 20 centimètres entre le radiateur et votrecorps. Cet émetteur ne doit pas être co-localisées ou opérant en conjonction avec autreantenne ou émetteur. Les antennes utilisées pour cet émetteur doivent être installés etfournir 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.

DECLARATION OF CONFORMITY

Under EU RED - DIRECTIVE 2014/53/EU -

This Declaration that the following designated product

Sensor Beacon
Model No.: iBS03TP
Multi-listing Model No.: iBS03AD, iBS03F, iBS03Q, iBS03QY
Brand Name: INGICS

.....
(Product identification)

complies with the essential requirements of the EU RED - DIRECTIVE 2014/53/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	Radio Spectrum	Health
EN 301 489-1: V2.2.3 (2019-11)	EN 300 328 :V 2.2.2(2019-07)	EN 62479(2010)
EN 301 489-17:V3.2.4 (2020-09)		**Safety**
		IEC 62368-1:2018 and
		EN IEC 62368-1:2020+A11:2020

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

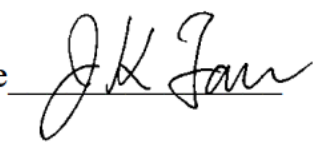
This declaration is issued from

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.

Name: JK Fan Title: President

Signature 

Date: 2023.08.22

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):	**iBS03TP, iBS03AD, iBS03F, iBS03Q, iBS03QY**
Trademark:	**INGICS**
Batch / Serial Number:	**After 2307xx000001**

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 62368-1:2018 and EN IEC 62368-1:2020+A11:2020

EN 62479(2010)

Signed for and on behalf of:

_2024. 06.11_____
Date of issue

__JK Fan, President_____
Name, Function, Signature

Revision History

DATE	REVISION	CHANGES
Jan 8, 2024	0a	Initial release
Mar 13, 2024	0b	Add 4-20mA model
Mar 22, 2024	0c	1. Refine the model name to iBS03AD-V, -A, -D for voltage, 4-20mA, and digital model 2. Adjust the resolution of iBS03AD-A from 0.01mA to 0.001mA
Jun 11, 2024	0d	Add UK DOC