

Specification
Ver.01g

iGS03W/E/M Specification

BLE Beacon Gateway

iGS03W/E/M is INGICS's third generation of BLE(Bluetooth® Low Energy) beacon gateway and bridge. It supports the latest Bluetooth 5 standard and reads iBeacon and Eddystone like beacon or customized BLE Tag(w/ sensor) format and sends to standard servers, like TCP, HTTP, and MQTT through WiFi, Ethernet, or LTE-M(CAT-M1). It also supports general cloud servers, such as Amazon AWS-IoT, Microsoft Azure-IoT, and Google Cloud-IoT-Core. Users can configure the gateway through a simple web UI or Telnet command console.

Models

- iGS03W: 2.4G WiFi
- iGS03E: 10/100M POE Ethernet
- iGS03M: LTE-M(CAT-M1)

Certification

- Bluetooth
- TELEC
- CE/FCC
- KC/NCC (planned and pending)



Features

General

- Size(not including the antenna)
 - 54mmx54mmx19mm: iGS03W, iGS03M
 - 54mmx54mmx24mm: iGS03E
- Power Input through USB Type C connector
 - 5V,1A: iGS03W, iGS03E
 - 5V,2A: iGS03M
- Operating temperature
 - -20°C to 60°C: iGS03W, iGS03E
 - -20°C to 50°C: iGS03M
- Low power consumption
 - iGS03W: 90mA average working current
 - iGS03E: 90mA average working current
 - iGS03M: 240mA average working current
- Remote software upgrade
- Reads multiple BLE devices in the same time
 - 200 BLE packets received per second
- Support TCP/HTTP(S)/MQTT(S) server
- Support popular cloud service
 - Amazon AWS-IoT
 - Microsoft Azure-IoT
 - Google-Cloud-IoT-core
- Support JSON format upload
- Enhanced security
 - Support Root CA/User certificate and private key uploading
 - WPA2-enterprise (iGS03W)

WiFi(iGS03W)

- Support 802.11b/g/n(single stream)
- 2.4GHz frequency band
- Transmit power:
 - +19.5 dBm @802.11b
 - +13 dBm @802.11n
- Data rate up to 150 Mbps
- internal PCB Antenna
- 100M range in open space(TBC)

LTE(iGS03M)

- CAT M1, Max. 375 Kbps (DL & UL)
- Max. power: 23dBm
- Micro SIM card
- Internal chip antenna
- LTE Band:
 - B1/B2/B3/B4/B5/B8/B12/B13/B19/B20/B28
- GNSS
 - Support GPS, GLONASS, and Galileo
 - 2M external active antenna(optional)

Ethernet(iGS03E)

- 10/100M Ethernet
- Auto power saving while Link-off
- IEEE 802.3az Energy Efficient Ethernet
- Auto MDI/MDIX crossover function

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BLE

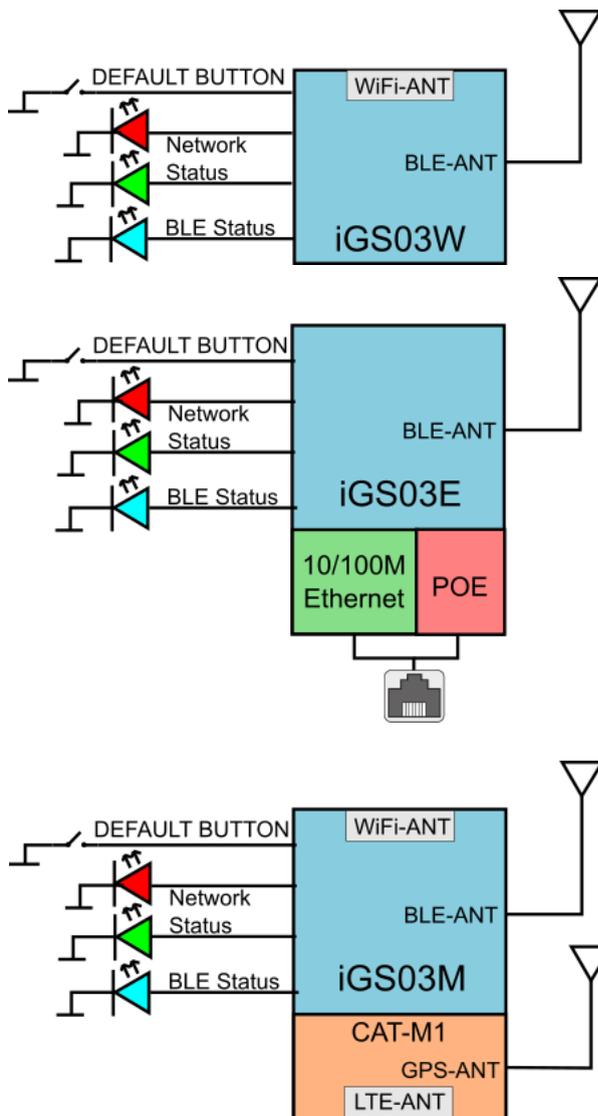
- Support Bluetooth Low Energy in **Bluetooth 5** standard
- Support **Long Range** mode(LE Coded PHY)
- Standalone 2dBi dipole antenna
- Reads message advertised from BLE device
- >100M range in open space

- IEEE802.3x flow control for Full-Duplex mode
- Embedded POE function
 - IEEE 802.3af, 37 Vdc~57 Vdc input
 - Support mode A(power from 1-2, 3-6) and mode B(power from 4-5, 7-8)

Applications

- iBeacon/Eddystone/tag receiver for location tracking
- BLE sensor reader for sensor network
- Building automation
- Health and wellness monitoring
- Cycling, biking
- Security
- Location tracking
- Access management
- Advertisement
- Industrial automation
- Transportation

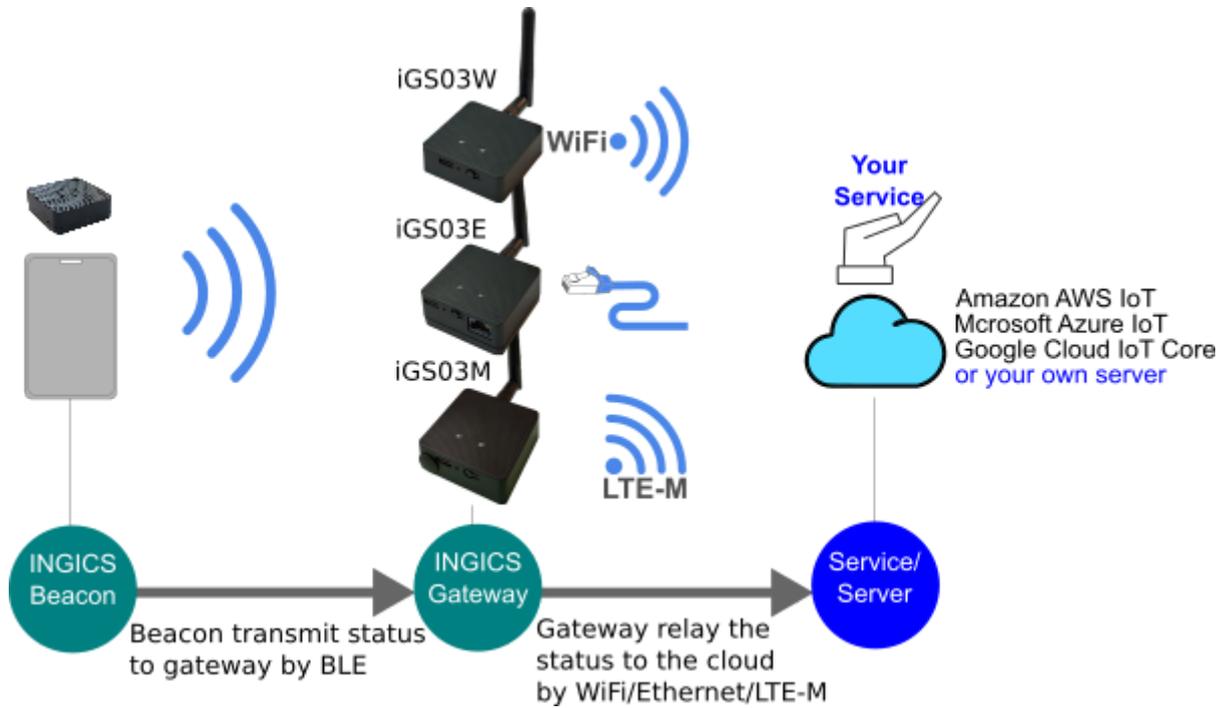
Block Diagram



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Typical Applications

Collecting BLE sensor data or location tracking payload and sending to AWS IoT, Azure IoT, Cloud IoT Core, or your own server in the cloud.



Specification

Absolute Maximum Rating

Supply Power	Max. +5.5 Volt
Storage Temperature	-40° to 85° Celsius

Recommendable Operation Condition

Operating Temperature	iGS03W: -20° to 60° Celsius iGS03E: -20° to 60° Celsius iGS03M: -20° to 50° Celsius
Humidity	Max 95%, Non condensing, relative humidity
Supply Power	iGS03W: +5 Volt +- 5%, 1A through USB type-C connector iGS03E: +5 Volt +- 5%, 1A through USB type-C connector Or +44~57Volt, 350mA through Ethernet connector(IEEE 802.3af) iGS03M: +5 Volt +- 5%, 2A through USB type-C connector

Power Consumption

Working mode (reads BLE and sends to HTTP server)	iGS03W: 0.45W averagely iGS03E: 0.45W averagely iGS03M: 1.2W averagely
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LTE Specification

Frequency Band	B1/B2/B3/B4/B5/B8/B12/B13/B19/B20/B28
Output Power	23dBm±2dB
Receive Sensitivity	-106 dBm~ -107.7dBm
Data Rate	Max. 375 Kbps (DL)/375 Kbps (UL)
Antenna	Chip antenna

GNSS Specification

Frequency Band	GPS: 1575.42±1.023 MHz GLONASS: 1597.5~1605.8 MHz Galileo: 1575.42±2.046 MHz BDS: 1561.098±2.046 MHz
Sensitivity	Cold start: -146 dBm Reacquisition: -157 dBm Tracking: -157 dBm
TTF (open sky, Autonomous)	Cold start: 31 s Warm start: 21 s Hot start: 2.7 s
Accuracy(open sky)	<2.5M(CEP-50)
Antenna Gain	+17dB(typical)

WiFi Specification

Wireless	IEEE 802.11b/g/n(single stream)
Network modes	infrastructure, Ad-Hoc
Data rate	IEEE 802.11b, 11Mbps IEEE 802.11g, 54 Mbps IEEE 802.11n(2.4GHz), 150 Mbps
Frequency band	2.412 - 2.484 GHz
Number of selectable Sub channels	11 channels (channel 12,13 requires customization)
Channel Bandwidth	20MHz/40MHz (802.11n)
Modulation	OFDM, DSSS (Direct Sequence Spread Spectrum), DBPSK, DQPSK, CCK, 16QAM, 64QAM
Receive Sensitivity	- 88 dBm(11b, 11Mbps) - 75 dBm (11g, 54 Mbps) - 73 dBm (11n, HT20, MCS7) - 70 dBm (11n, HT40, MCS7)
Transmit Power	19.5 dBm (typical)@ 802.11b 16 dBm (typical)@ 802.11g, 54Mbps

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	13 dBm (typical)@ 802.11n
Antenna	PCB antenna
Security	WPA/WPA2 WPA2-Enterprise: EAP-TLS EAP-PEAP (PEAP-MSCHAPv2 only) EAP-TTLS (TTLS-MSCHAPv2 only)

Ethernet Specification

Speed	10/100M Ethernet
crossover	Auto MDI/MDIX crossover function
POE	IEEE 802.3af, +44 Vdc~57 Vdc input
POE mode	mode A(power from 1-2, 3-6) mode B(power from 4-5, 7-8)

BLE Specification

Transmit Power	Max.: +4dBm
Receiver Sensitivity	-97 dBm @1 Mbps -104 dBm @125 Kbps(LE Coded PHY, long range)
RSSI Accuracy	±2 dB(typical), in valid range -90 to -20 dBm
Antenna	2dBi dipole antenna
Range	>100M in open space

Dimension and Weight

Dimensions L x W x H (mm)	iGS03W,M: 54 x 54 x 19 (not including antenna and antenna connector) iGS03E: 54 x 54 x 24 (not including antenna and antenna connector)
Weight(g)	Unit only (without BLE antenna) iGS03W - 28g iGS03M - 52g iGS03E - 46g Packing iGS03W - 98g iGS03M - 159g(not including GPS antenna) iGS03E - 116g

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Packaging

iGS03W and iGS03M industrial packaging

Each main unit has it's accessory, including BLE antenna, holder, and 1M USB type-C cable, and an optional GNSS antenna is available for iGS03M ordering.



Optional GNSS Antenna

Two packaging boxes(size: 12.4cmX6cmx6.7cm) contain 5 units of iGS03W or iGS03M and accessories.



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iGS03W and iGS03M Single Packaging

Each main unit has its accessory, including BLE antenna, 1M USB type-C cable, holder, 2A adapter(US, EU, or UK type) and an optional GNSS antenna is available for iGS03M ordering.



Optional GNSS Antenna

One packaging box (size: 11cmX5.5cmX6.5cm) contains one set of iGS03W or iGS03M and accessories.



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iGS03E:

Each main unit has it's accessory, including BLE antenna , holder, and 1M USB type-C cable.



Two packaging boxes(size: 12.4cmX6cmx6.7cm) contain 4 units of iGS03E and accessories



Certification

Bluetooth SIG Qualification

Model number: iGS03W/iGS03M/iGS03E
Declaration ID: D048813
Description: Beacon gateway

Japan MIC Regulatory

iGS03W with below certified number
201-200584, 217-204070

iGS03E with below certified number
201-210049, 217-204070

iGS03M with below certified number
201-200584, 217-204070, 003-180062,
D180034003

FCC Regulatory

iGS03W
FCC ID:2AH2IIGS03W
contains
FCC ID:2AC7Z-ESP32WROOM32E

iGS03E
FCC ID:2AH2IIGS03E
contains
FCC ID:2AC7Z-ESP32WROOM32E

iGS03M
FCC ID:2AH2IIGS03W
contains
FCC ID:XMR201707BG96
FCC ID:2AC7Z-ESP32WROOM32E

Statements

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

CE Regulatory

iGS03W/E/M has been tested and complies with the essential requirements of the DIRECTIVE 2014/53/EU and DIRECTIVE 2014/35/EU. Below is the copy of the CE Conformity of Declaration.

DECLARATION OF CONFORMITY

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

This declares that the following designated product

BLE Beacon Gateway
Model No.: iGS03W
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/RF Exposure/Health 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	Safety
EN 301 489-1: V 2.2.3 (2019-11)	EN 300 328: V 2.2.2 (2019-07)	IEC 62368-1: 2014/COR1:2015
EN 301 489-17: V 3.2.4 (2020-09)		and EN 62368-1: 2014/A11:2017
		Health
		EN 62311 (2020)

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

This declaration is issued by
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 produced in correspondence with all requirements according to the Directive 2014/53/EU and LOW VOLTAGE DIRECTIVE 2014/35/EU.

Name: J.K.Fan

Title: President

Signature 

Date: 2020. 11.16

DECLARATION OF CONFORMITY

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

This declares that the following designated product

LTE Beacon Gateway
Model No.: iGS03M
Brand Name: INGICS

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(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/RF Exposure/Health 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: V 2.2.3 (2019-11) EN 301 489-17: V 3.2.4 (2020-09) EN 301 489-19: V 2.1.1 (2019-04) EN 301 489-52: V 1.1.0 (2016-11) Draft	Radio Spectrum EN 300 328: V 2.2.2 (2019-07) EN 303 413: V1.1.1 (2017-06) EN 301 908-1: V13.1.1 (2019-11)	Safety IEC 62368-1: 2014/COR1:2015 and EN 62368-1: 2014/A11:2017
		Health EN 50385 (2017)

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

This declaration is issued by
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Shulin Dist., New Taipei City 238,, Taiwan, R.O.C.

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(Name / Address)

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Name: J.K.Fan Title: President

Signature 

Date: 2020. 11.16

DECLARATION OF CONFORMITY

EU RED - DIRECTIVE 2014/53/EU -
EU-LOW VOLTAGE DIRECTIVE 2014/35/EU -
EU EMC-DIRECTIVE 2014/30/EU -

This Declaration that the following designated product

BLE Beacon Gateway
Model No.: IGS03E
Brand Name: INGICS

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complies with the essential requirements of the **EU RED - DIRECTIVE 2014/53/EU, EU-LOW VOLTAGE DIRECTIVE 2014/35/EU, EU EMC-DIRECTIVE 2014/30/EU** on the approximation of the laws of the Member States relating to **Radio Spectrum Matters/RF Exposure**.
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	Safety
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
		Health EN 62479 (2010)

EMC
EN 55032 Class B (2015A/A11:2020),
EN55035 (2017/A11:2020), ((IEC/EN61000-4-2 (2009)/-3 (2020)/-4 (2012)/
-6 (2014)/-8 (2010))

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

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Furthermore we declare that our product will be produced in correspondence with all requirements according to the Directive 2014/53/EU, LOW VOLTAGE DIRECTIVE 2014/35/EU and Council Directive 2014/30/EU.

Name: J.K.Fan

Title: President

Signature 

Date: Feb 02, 2021

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DATE	REVISION	CHANGES
Sep 25, 2020	01	Initial release
Nov 17, 2020	01a	1. Add FCC/CE regulatory information and FCC statement 2. Update product photo and wording fix
Dec 10, 2020	01b	1.Add iGS03E packaging 2.Fix Supply Power description
Feb 02, 2021	01c	1. Modify POE input voltage range 2. Add iGS03E FCC, CE and MIC regulatory information
Feb 09, 2021	01d	Update iGS03W and iGS03E packaging information
Mar 30, 2022	01e	Update supported WiFi channel with correct description
Jun 07, 2022	01f	Update WiFi receive sensitivity and Tx power parameters in Feature section and WiFi Specification section)
Jul 03, 2023	01g	Update packaging section of iGS03W and iGS03M