

iBS Sensor Beacon Payload Format

Introduction

The document is a summary of INGICS beacon payload format.



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Overview

iBS beacons ADV structure as:

AD1 Length (1 Byte)	AD1 Type (1 Byte)	AD1 Flags (1 Byte)	AD2 Length (1 Byte)	AD2 Type (Manufacturer Spec) (1 Byte)	Manufacturer Spec Data (17 Bytes < 26)
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AD1 (Length, Type, Flags)	BLE Advertising Flags
AD2 Length	depends on payload length
AD2 Type	fixed to 0xFF (for manufacturer)
Manufacturer Spec Data	manufacturer defined payload

Example: (output from iGS01S)

\$GPRP,EAC653D3AA8D,CCB97E7361A4,-44,02010612FF0D0083BC290110FFFFFFFFF000001000000

The Manufacture Data Part:

MFG Code (2 Bytes)	Beacon Code/ Type (2 Bytes)	Tag Batt (2 Bytes)	Event Status (1 Byte)	Sensor 1 (2 Bytes)	Sensor 2 (2 Bytes)	User (2 Bytes)	Sub Type (1 Byte)	Reserved (3 Bytes)
5	7	9	11	12	14	16	18	19

* Endianness: little endian

General Field:

Field	Description	Field Offset from start of packet
MFG Code	Manufacturer vendor code, fixed	5
Beacon Code and Type	Magic Code to identify packet format schema	7
Tag Batt	batt voltage of tag in 0.01v unit	9
Event Status Bitmask	8-bit bitmask -- 0x01: button, 0x02: moving, 0x04: hall sensor, 0x08: free fall, 0x10: PIR, 0x20: IR,	11

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	0x40: external digit-in / prox1 (for iBS03Q) / Flood (for iBS03F)	
Subtype	0x01: iBS02PIR2 0x02: iBS02IR2 0x03: iBS01 0x04: iBS01H/iBS02H/iBS02M2 0x05: iBS01T 0x06: iBS01G 0x10: iBS03 0x12: iBS03P 0x13: iBS03R 0x14: iBS03T_RH 0x15: iBS03T 0x16: iBS03G 0x17: iBS03TP 0x18: iBS04i 0x19: iBS04 0x1B: iBS03F 0x1C: iBS03Q 0x30: iBS05 0x31: iBS05H 0x32: iBS05T 0x33: iBS05G 0x40: iBS06	18

iBS01/iBS01H/iBS01T/iBS01G

The Manufacture Data Part:

MFG Code (2 Bytes)	Beacon Code (2 Bytes)	Tag Batt (2 Bytes)	Event Status (1 Byte)	Temperature (2 Bytes)	Humidity (2 Bytes)	Reserved (2 Bytes)	Sub Type (1 Byte)	Reserved (3 Bytes)
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Field	Description
MFG Code	Manufacturer vendor code, fixed
Beacon Code and Type	Magic Code to identify packet format, fixed to 0xBC80
Temperature	Temperature in 0.01 C unit (signed 16bit) -- only applied for iBS01T
Humidity	Relative Humidity in 1% -- only applied for iBS01T
Subtype	0x03: iBS01 0x04: iBS01H 0x05: iBS01T 0x06: iBS01G

Example:

\$GPRP,EAC653D3AA8D,CCB97E7361A4,-44,02010612FF590080BC4D0100FFFFFFFFFFFF04FFFFFF
→ **Button Released, Not Moving, Hall Inactive (Magnet far away)**

\$GPRP,EAC653D3AA9D,CCB97E7361A4,-44,02010612FF590080BC4D0102FFFFFFFFFFFF06FFFFFF
→ **Moving**

\$GPRP,EAC653D3AB8D,CCB97E7361A4,-43,02010612FF590080BC4D0101FFFFFFFFFFFF03FFFFFF
→ **Button Pressed**

\$GPRP,EAC653D3CA8D,CCB97E7361A4,-60,02010612FF590080BC4D0100FFFFFFFFFFFF04FFFFFF
\$GPRP,EAC653D3CA8D,CCB97E7361A4,-43,02010612FF590080BC4D0104FFFFFFFFFFFF04FFFFFF
→ **Hall Active (Magnet nearby)**

\$GPRP,EAC653D3CA8D,CCB97E7361A4,-43,02010612FF590080BC4D0105FFFFFFFFFFFF04FFFFFF
→ **Hall and Button Active**

\$GPRP,FCF009C0C673,CCB97E7361A4,-54,02010612FF590080BC4A0101A10A3F00FFFF03FFFFFF
→ **Batt: 0x014A (3.3V), Temp: 0x0AA1 (27.21), RH: 0x003F (63%)**

iBS01RG

The Manufacture Data Part:

MFG Code (2 Bytes)	Beacon Code/Type (2 Bytes)	BATT/ACT (2 Bytes)	Accel 1X,Y,Z (6 Bytes)	Accel 2 X,Y,Z (6 Bytes)	Accel 3 X,Y,Z (6 Bytes)
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Field	Description
MFG Code	Manufacturer vendor code, fixed
Beacon Code and Type	Magic Code to identify packet format, fixed to 0xBC81
Tag Batt / Act	Bit[13]: Button pressed, bit[12]: ACT/INACT, bit[0-11] BATT voltage of tag in 0.01v unit
Accel X, Y, Z	raw data, 2 byte for each axis, in 0.004G unit

Parameter	Value
Accel Sampling Period	100ms
Adv Interval	300ms (3 samples per packet)

Example:

\$GPRP,EAC653D3AA8D,CB412F0C8EDC,-57,02010619FF**590081BC**4B01F5FFFEFFFE800F4FFFCFFE700F5FFF
BFFE800

→ F5FF FEFF E800 (x: 0xFFF5=-11, y: 0xFFFE=-2, z: 0x00E8=232) in 0.004G unit

\$GPRP,CC5B2813FE55,DB024BFC4863,-58,02010619FF**590081BC**4B313A00D6FFF0003800D4FFF8003A00D6F
FF6

→ Button Pressed, Moving (3)

iBS02PIR2/iBS02IR2/iBS02M2

The Manufacture Data Part:

MFG Code (2 Bytes)	Beacon Code (2 Bytes)	Tag Batt (2 Bytes)	Event Status (1 Byte)	Reserved (2 Bytes)	Reserved (2 Bytes)	User (2 Bytes)	Sub Type (1 Byte)	Reserved (3 Bytes)
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Field	Description
MFG Code	Manufacturer vendor code, fixed
Beacon Code and Type	Magic Code to identify packet format, fixed to 0xBC83
Tag Batt	batt voltage of tag in 0.01v unit
User	Configurable by user through App
Subtype	0x01: iBS02PIR2 0x02: iBS02IR2 0x04: iBS02M2

Example:

\$GPRP,EAC653D3AA8D,CCB97E7361A4,-44,02010612FF0D0083BC290110FFFFFFFF000001000000
→ **iBS02PIR object detected**

\$GPRP,EAC653D3AA8D,CCB97E7361A4,-44,02010612FF0D0083BC290100FFFFFFFF000001000000
→ **iBS02PIR object not detected**

\$GPRP,EAC653D3AA8A,CCB97E7361A4,-44,02010612FF0D0083BC290120FFFFFFFF000002000000
→ **iBS02IR proximity detected**

\$GPRP,EAC653D3AA8A,CCB97E7361A4,-44,02010612FF0D0083BC290100FFFFFFFF000002000000
→ **iBS02IR proximity not detected**

\$GPRP,EAC653D3AA8E,CCB97E7361A4,-44,02010612FF0D0083BC290140FFFFFFFF000004000000
→ **iBS02M2 external input triggered**

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iBS03/iBS03T/iBS03G/iBS03TP/iBS03P/iBS03R/iBS03F/iBS03Q/iBS04/
iBS04i

The Manufacture Data Part:

MFG Code (2 Bytes)	Beacon Code (2 Bytes)	Tag Batt (2 Bytes)	Event Status (1 Byte)	Temperature (2 Bytes)	Humidity / Ext Temperature / Distance (2 Bytes)	User (2 Bytes)	Sub Type (1 Byte)	Reserved (3 Bytes)
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Field	Description
MFG Code	Manufacturer vendor code, fixed
Beacon Code and Type	Magic Code to identify packet format, fixed to 0xBC83
Temperature	Temperature in 0.01 C unit (signed 16bit) -- only applied for iBS03T
Humidity / Ext Temperature / Distance	Relative Humidity in 1% -- only applied for iBS03T with humidity sensor External Probe Temperature in 0.01 C unit (signed 16bit) -- only apply for iBS03TP/iBS03P Distance -- ranger in mm (unsigned 16-bit) -- only apply for iBS03R
User	16-bit user configurable content
Subtype	0x10: iBS03 0x12: iBS03P 0x13: iBS03R 0x14: iBS03T_RH (with humidity sensor) 0x15: iBS03T (without humidity sensor, old model) 0x16: iBS03G 0x17: iBS03TP 0x18: iBS04i 0x19: iBS04 0x1B: iBS03F 0x1C: iBS03Q

Example:

\$GPRP, EAC653D3AA8D, CCB97E7361A4, -44, 02010612FF0D0083BC4A0100A10A4000000014000000
→ iBS03T, Batt: 0x014A (3.3V), Temp: 0x0AA1 (27.21), RH: 64%

\$GPRP, EAC653D3AA8C, CCB97E7361A4, -44, 02010612FF0D0083BC290102FFFFFFF000016000000
→ iBS03G, Moving

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\$GPRP,EAC653D3AA8E,CCB97E7361A4,-44,02010612FF0D0083BC290104FFFFFFFF000010000000
→ **iBS03, Hall sensor activated**

\$GPRP,EAC653D3AA8E,CCB97E7361A4,-44,02010612FF0D0083BC290101FFFFFFFF000010000000
→ **iBS03, Button pressed**

\$GPRP,1804ED7D9C72,CCB97E7361A4,-44,02010612FF0D0083BC29010044094309000017030000
→ **iBS03TP, Batt: 0x0129 (2.97V), Temp: 0x0944 (23.72), Probe Temp: 0x0943 (23.71)**
\$GPRP,F88A5EB8F040,F008D1789294,-67,02010612FF0D0083BC170100AAAA19010000130B0600
→ **iBS03R, Batt: 0x0117 (2.79V), Range: 0x0119 (281 mm)**

iBS03AD-V/iBS03AD-D/iBS03AD-A/iBS03AD-NTC

The Manufacture Data Part:

MFG Code (2 Bytes)	Beacon Code (2 Bytes)	Tag Batt (2 Bytes)	Event Status (1 Byte)	Reserved (2 Bytes)	Voltage / Probe Temperature / Event Count (2 Bytes)	User (2 Bytes)	Sub Type (1 Byte)	Reserved (3 Bytes)
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Field	Description
MFG Code	Manufacturer vendor code, fixed
Beacon Code and Type	Magic Code to identify packet format, fixed to 0xBC83
Event Status	8-bit bitmask -- 0x40: Digital-in triggered
Voltage / Probe Temperature / Event count / Current	iBS03AD-V – Voltage in 1 mV unit iBS03AD-NTC – NTC Temperature in 0.01 C unit iBS03AD-D – Event count iBS03AD-A – Current in 1 uA unit
User	16-bit user configurable content
Subtype	0x23: iBS03AD-NTC 0x24: iBS03AD-V 0x25: iBS03AD-D 0x26: iBS03AD-A

iBS03RG

The Manufacture Data Part:

MFG Code (2 Bytes)	Beacon Code/Type (2 Bytes)	BATT/ACT (2 Bytes)	Accel 1X,Y,Z (6 Bytes)	Accel 2 X,Y,Z (6 Bytes)	Accel 3 X,Y,Z (6 Bytes)
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Field	Description
MFG Code	Manufacturer vendor code, fixed to 0x000D
Beacon Code and Type	Magic Code to identify packet format, fixed to 0xBC81
Tag Batt / Act	Bit[13]: Button pressed, bit[12]: ACT/INACT, bit[0-11] BATT voltage of tag in 0.01v unit
Accel X, Y, Z	raw data, 2 byte for each axis in 0.004G unit

Parameter	Value
Accel Sampling Period	100ms
Adv Interval	300ms (3 samples per packet)

Example:

\$GPRP,EAC653D3AA8D,CB412F0C8EDC,-57,02010619FF**0D0081BC**4B01F5FFFEFFFE800F4FFFCFFE700F5FFF
BFFE800

→ F5FF FEFF E800 (x: 0xFFF5=-11, y: 0xFFFE=-2, z: 0x00E8=232) in 0.004G unit

\$GPRP,CC5B2813FE55,DB024BFC4863,-58,02010619FF**0D0081BC**4B**31**3A00D6FFF0003800D4FFF8003A00D6F
FF6

→ Button Pressed, Moving (3)

iBS04i (iBeacon format)

iBS04i ADV (refer to iBeacon format)

Prefix					MFG Code (2bytes)		Beacon Code/Type (2Bytes)		UUID																MAJOR		MINOR		MEAS TX	
02	01	06	1A	FF	4C	00	02	15	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	00	00	01	02	XX	

iBS04i Scan Response (refer to iBS03/iBS04 format)

Prefix					MFG Code (2bytes)		Beacon Code/Type (2Bytes)		Tag Batt (2Bytes)		Event Status (1Byte)	Reserved (2Bytes)		Reserved (2Bytes)		User (2Bytes)		Sub Type (1Byte)	Reserved (3Byte)		
02	01	06	12	FF	0D	00	83	BC	XX	XX	XX	FF	FF	FF	FF	00	XX	18	00	00	00

SubType: 0x18: iBS04i

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iBS05/iBS05H/iBS05T/iBS05G/iBS06

The Manufacture Data Part:

MFG Code (2 Bytes)	Beacon Code (2 Bytes)	Tag Batt (2 Bytes)	Event Status (1 Byte)	Temperature (2 Bytes)	Triggered Count (2 Bytes)	User (2 Bytes)	Sub Type (1 Byte)	Reserved (3 Bytes)
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Field	Description
MFG Code	Manufacturer vendor code, fixed to 0x082C
Beacon Code and Type	Magic Code to identify packet format, fixed to 0xBC83
Temperature	Temperature in 0.01 C unit (signed 16-bit) -- only applied for iBS03T
Triggered Count	iBS05H -- hall sensor triggered count, 16-bit rounding
User	16-bit user configurable content
Subtype	0x30: iBS05 0x31: iBS05H 0x32: iBS05T 0x33: iBS05G 0x40: iBS06

Example:

\$GPRP,E23C6634400A,CCB97E7361A4,-44,02010612FF**2C0883BC**490100**F00A**FFFF0000**32**110400

→ iBS05T, Batt: 0x0149 (3.29V), Temp: 0x0AF0 (28.00 deg C)

\$GPRP,D96B50085149,CCB97E7361A4,-44,02010612FF**2C0883BC**4A0102AAAAFFFF0000**33**110400

→ iBS05G, Moving

\$GPRP,C70BAA5EBB08,CCB97E7361A4,-44,02010612FF**2C0883BC**4B0104AAAAFFFF0000**31**110400

→ iBS05H, Hall sensor activated

\$GPRP,D43050A548C4,CCB97E7361A4,-44,02010612FF**2C0883BC**4B0101AAAAFFFF0000**30**110400

→ iBS05, Button pressed

iBS05i/iBS06i (iBeacon format)

iBS05i/iBS06i ADV (refer to iBeacon format)

Prefix					MFG Code (2bytes)		Beacon Code/Type (2Bytes)		UUID																MAJOR		MINOR		MEAS TX	
02	01	06	1A	FF	4C	00	02	15	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	00	00	01	02	XX	

iBS05i/iBS06i Scan Response (refer to iBS05/iBS06 format)

Prefix		MFG Code (2bytes)		Beacon Code/Type (2Bytes)		Tag Batt (2Bytes)		Event Status (1Byte)	Reserved (2Bytes)		Reserved (2Bytes)		User (2Bytes)		Sub Type (1Byte)	Reserved (3Byte)		
12	FF	2C	08	83	BC	XX	XX	XX	FF	FF	FF	FF	00	XX	XX	00	00	00

SubType:

0x35: iBS05i

0x36: iBS06i

iBS05RG

The Manufacture Data Part:

MFG Code (2 Bytes)	Beacon Code/Type (2 Bytes)	BATT/ACT (2 Bytes)	Accel 1X,Y,Z (6 Bytes)	Accel 2 X,Y,Z (6 Bytes)	Accel 3 X,Y,Z (6 Bytes)	Reserved (2 Bytes)
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Field	Description
MFG Code	Manufacturer vendor code, fixed to 0x082C
Beacon Code and Type	Magic Code to identify packet format, fixed to 0xBC86
Tag Batt / Act	Bit[13]: Button pressed, bit[12]: ACT/INACT, bit[0-11] BATT voltage of tag in 0.01v unit
Accel X, Y, Z	raw data, 2 byte for each axis in 0.004G unit

Parameter	Value
Accel Sampling Period	100ms
Adv Interval	300ms (3 samples per packet)

iBS08T

The Manufacture Data Part:

MFG Code (2 Bytes)	Beacon Code (2 Bytes)	Tag Batt (2 Bytes)	Event Status (1 Byte)	Temperature (2 Bytes)	Humidity (2 Bytes)	Illumination (2 Bytes)	Reserved (8 Bytes)	Sub Type (1 Byte)	Reserved (3 Bytes)
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Field	Description
MFG Code	Manufacturer vendor code, fixed (0x082C)
Beacon Code and Type	Magic Code to identify packet format, fixed to 0xBC88
Temperature	Temperature in 0.01 C unit (signed 16-bit)
Humidity	Relative Humidity in 0.1%
Illumination	Illumination value in lux (unsigned 16-bit)
Subtype	0x45: iBS08T

Example:

\$GPRP, 80C41B29B2F0, F008D1789200, -55, 0201061AFF2C0888BC0C0100F70AA7012201000000000000000045090900

→iBS08T, Batt: 0x010C(2.68V), Temp: 0x0AF7(28.07), Rh: 0x01A7(42.3), Lux: 0x0122(290)

\$GPRP, 40F3B0154996, F008D1789200, -50, 0201061AFF2C0888BC2C01002F0B850185000000000000000045070F00

→iBS08T, Batt: 0x012C(3V), Temp: 0x0B2F(28.63), Rh: 0x0185(38.9), Lux: 0x0085(133)

Summary

iBS01 Series

Prefix					MFG Code (2bytes)		Beacon Code/Type (2Bytes)		Tag Batt (2Bytes)		Event Status (1Byte)	Temperature (2Bytes)		Humidity (2Bytes)		User (2Bytes)		Sub Type (1Byte)	Reserved (3Bytes)		
02	01	06	12	FF	59	00	80	BC	XX	XX	XX	FF	FF	FF	FF	XX	XX	XX	00	00	00

iBS01RG

Prefix					MFG Code (2bytes)		Beacon Code/Type (2Bytes)		Tag Batt (2Bytes)		Accel X,Y,Z (6Bytes)						Accel X,Y,Z (6Bytes)						Accel X,Y,Z (6Bytes)					
02	01	06	19	FF	59	00	81	BC	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX

iBS02 Series

Prefix					MFG Code (2bytes)		Beacon Code/Type (2Bytes)		Tag Batt (2Bytes)		Event Status (1Byte)	Reserved (2Bytes)		Reserved (2Bytes)		User (2Bytes)		Sub Type (1Byte)	Reserved (3Byte)		
02	01	06	12	FF	0D	00	83	BC	XX	XX	XX	FF	FF	FF	FF	00	XX	XX	00	00	00

iBS03/iBS04 Series

Prefix					MFG Code (2bytes)		Beacon Code/Type (2Bytes)		Tag Batt (2Bytes)		Event Status (1Byte)	Temperature (2Bytes)		Temperature / Humidity (2Bytes)		User (2Bytes)		Sub Type (1Byte)	Reserved (3Byte)		
02	01	06	12	FF	0D	00	83	BC	XX	XX	XX	FF	FF	FF	FF	00	XX	XX	00	00	00

iBS05/iBS06 Series

Prefix					MFG Code (2bytes)		Beacon Code/Type (2Bytes)		Tag Batt (2Bytes)		Event Status (1Byte)	Temperature (2Bytes)		Triggered count (2Bytes)		User (2Bytes)		Sub Type (1Byte)	Reserved (3Byte)		
02	01	06	12	FF	2C	08	83	BC	XX	XX	XX	FF	FF	FF	FF	00	XX	XX	00	00	00

iBS03RG

Prefix					MFG Code (2bytes)		Beacon Code/Type (2Bytes)		Tag Batt (2Bytes)		Accel X,Y,Z (6Bytes)						Accel X,Y,Z (6Bytes)						Accel X,Y,Z (6Bytes)					
02	01	06	19	FF	0D	00	81	BC	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX

iBS08T

Prefix					MFG Code (2bytes)		Beacon Code/Type (2Bytes)		Tag Batt (2 Bytes)		Event Status (1Byte)	Temperature (2 Bytes)		Humidity (2 Bytes)		Illumination (2Bytes)		Reserved (8Byte)								Sub Type (1Bytes)	Reserved (3Byte)		
02	01	06	1A	FF	2C	08	88	BC	XX	XX	XX	XX	XX	XX	XX	XX	XX	0000000000000000								45	XXXXXX		

Revision History

DATE	REVISION	CHANGES
Dec 15, 2020	01	Initial release
Jan 19, 2021	02	Add iBS03P (wide range probe)
Apr 29, 2021	03	Add iBS05 series
Dec 15, 2021	04	Add iBS05i payload format
Aug 3, 2022	05	Add iBS06/iBS06i payload format
Jun 19, 2023	06	Add iBS03F/iBS03Q/iBS08
Aug 15, 2023	07	Add iBS05RG
Mar 29, 2024	08	Add iBS03AD-V/iBS03AD-NTC/iBS03AD-D/iBS03AD-A
Aug 18, 2025	09	Add iBS08T