

iBS Sensor Beacon Payload Format

Introduction

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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,-44,02010612FF0D0083BC290110FFFFFFFF000001000000

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, 0x20: moving, 0x04: hall sensor, 0x80: free fall, 0x10: PIR, 0x20: IR,	11

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	0x40: external digit-in	
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	18

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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%)**

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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 0.04G unit

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

Example:

\$GPRP,EAC653D3AA8D,CB412F0C8EDC,-57,02010619FF590081BC4B01F5FFFEFF800F4FFFCFFE700F5FFF
BFFE800

→ F5FF FEFF E800 (x: 0xFFF5=-11, y: 0xFFFE=-2, z: 0x00E8=232) in 0.04G unit

\$GPRP,CC5B2813FE55,DB024BFC4863,-58,02010619FF590081BC4B313A00D6FFF0003800D4FFF8003A00D6F
FF6

→ Button Pressed, Moving (3)

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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)	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 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/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 (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 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
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

Example:

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

\$GPRP, EAC653D3AA8C, CCB97E7361A4, -44, 02010612FF0D0083BC290102FFFFFFFF000016000000
→ **iBS03G, Moving**

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

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

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\$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)

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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
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 0.04G unit

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

Example:

\$GPRP,EAC653D3AA8D,CB412F0C8EDC,-57,02010619FF0D0081BC4B01F5FFFEFFFE800F4FFFCFFE700F5FFF
BFFE800

→ F5FF FEFF E800 (x: 0xFFF5=-11, y: 0xFFFE=-2, z: 0x00E8=232) in 0.04G unit

\$GPRP,CC5B2813FE55,DB024BFC4863,-58,02010619FF0D0081BC4B313A00D6FFF0003800D4FFF8003A00D6F
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	XX	00	00	00

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DATE	REVISION	CHANGES
Dec 15, 2020	01	Initial release
Jan 19, 2021	02	Add iBS03P (wide range probe)