MOKO SMART

H7 Beacon

Product Specification

Version 1.0

About document

Scope

This document is applicable to H7 Beacon, and mainly introduced product brief, electronic specifications, quick guidance, and function descriptions based on firmware BXP-C V2.0 series.

Revision history

Version	Date	Change log	Author
1.0	2021/12/22	Initial version	Daniel

H7 Helmet Beacon

The H7, also called Helmet Beacon, is an IP67 industrial designed Bluetooth LE beacon ideal for enabling access control, personnel tracking and man-down alarm in construction scenarios. This Beacon also features an NFC antenna and independent panic button for system wake-up and motion detection.

Powered by a replaceable CR3032 coin cell battery, H7 Helmet Beacon has an outstanding lifetime of up to 3 years.

- *Rugged IP67 Waterproof*
- *Temp range -20℃ to +60℃*

- *Replaceable CR3032 coin cell battery*
- *Up to 3 years lifetime*

- *Over-the-air updates (firmware)*
- *Versatile installation options*
- *Various configurable parameters*

- *Up to 150 meters*
- *Multiple advertising format*
- *Customized services provided*

For What

Asset
Material
Vehicle
Machinery
Equipment
Animals

For Whom

Construction
Manufacturing
Warehousing
Healthcare
Exhibition
Pasture

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1. Product Brief

The industrial Bluetooth® H7 Helmet BEACON is compatible with Bluetooth® 4.2 standard and it is designed to full-fill all requirements for personal tracking/falling down alarm/SOS alarm in most industrial and construction use cases, or extending to animal statistics and location tracking in harsh outdoor environments.

As well, thanks to its ultra-low power consumption, the beacon guaranties un-surpassed battery life time up to 3 years on top of CR3032.

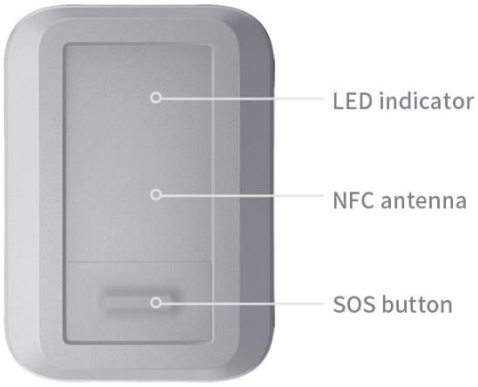

Figure 1: Top view of H7 Beacon

Figure 2: Back view of H7 Beacon

2. Application Scenarios

Scenario 1: Safer construction site

>>Man-down detection.

>>Hat off alarm

Integrated with 3-axis sensor, when workers take off protective helmet, it will trigger the “Hat off alarm” to avoid unsafe operations. As well, it will trigger “Man-down alarm” if workers fell accidentally, thus ensuring timely assistance.

>>Access control

Integrated with NFC/RFID optional, H7 can also provide convenient access management.

>>Abnormal static alarm

With H7 attached in the helmet, it can provide the real-time track and monitor of line workers; If there have happened accidental event which caused lone workers in abnormal static for a specific time, then it will broadcast customized advertisement to trigger the alarm and ensure the timely assistance.

Scenario 2: Livestock management

>>Livestock tracking

Fasten the H7 Beacon to cattle, sheep and goats through its cable tie in some small pastures, and with spread BLE node, it can provide the tracking data and even geofence alarm if animals deviated designated area.

>>Stock counting

To suitable for some small or medium sized pastures, H7 BLE Beacon is the best choice for livestock counting in terms of battery consumption. With H7 installed in cattle, it can count stock within a matter of minutes and prevent livestock theft.

Scenario 3: Positioning and Evacuation in the Mining Industry

>>Server-side positioning in case of danger

Each employee is equipped with H7 in the form of Helmet Beacon. H7 send signals which are received by the Locator Nodes and forward to cloud platform. In case of danger, the position can be determined here and displayed to security staff in an application.

>>Eliminating vehicle collisions

There have BLE scanner installed in the vehicles and H7 attached in employee helmet. When a person is within proximity to a vehicle or motorized equipment, then BLE scanning system in vehicles will be alarmed and avoid collisions in advance.

3. Specification

3.1 General specifications

General specifications	
Main Chip	Nordic nRF52 series
Bluetooth	Bluetooth 4.2(Hardware compatible with Bluetooth 5.1)
Dimension	57.4mm x 41.4mm x 18.7mm
Range	Up to 150 meters (in the open area and no obstacles)
Weight	32.0g (With battery)
Material	ABS+PC & TPU
Waterproof	IP67
Color	Gray
Installation	Sticker, Armband
Button	Mechanical button
LED	Single red LED
Sensor	3-axis accelerometer sensor (optional)
Operating temperature	General -20°C / + 60°C -40°C / + 85°C can be customized
Storage temperature	-20°C / + 70°C (without battery) 10°C / + 25°C (with battery)
Humidity	0% ~ 95% (non-condensing)
Antenna Type	PCB onboard
Power supply	Replaceable 550mAh lithium coin CR3032 battery

Table 1: General specifications

3.2 Electronic specifications

3.2.1 Battery consumption

Here described battery consumption in various situations which refer to different use cases. You can refer to below table to create the use case and estimate battery life time.

3-axis Acc sensor sampling rate	SLOT1			Consumption (uA)	Life time*
	Advertising format	Tx power	Advertising interval		
10Hz	Device Info	0dBm	100ms	178.70	3.5 months
10Hz	Device Info	0dBm	500ms	47.28	13 months
10Hz	Device Info	0dBm	1000ms	31.53	19 months
10Hz	Device Info	0dBm	2000ms	22.61	27 months
10Hz	Device Info	4dBm	100ms	210.89	3 months
10Hz	Device Info	4dBm	500ms	54.19	11 months
10Hz	Device Info	4dBm	1000ms	34.64	18 months
10Hz	Device Info	4dBm	2000ms	25.62	24 months
10Hz	Device Info	-4dBm	100ms	160.31	4 months
10Hz	Device Info	-4dBm	500ms	43.56	14 months
10Hz	Device Info	-4dBm	1000ms	29.93	20 months
10Hz	Device Info	-4dBm	2000ms	22.53	27 months

Table 2: Battery consumption in various situations

** Above battery life time are estimated under continuous single advertising slot with 0dBm Tx power.*

3.2.2 Life time

Different life time in various typical scenarios.

- Typical scenario 1 – Fall detection.

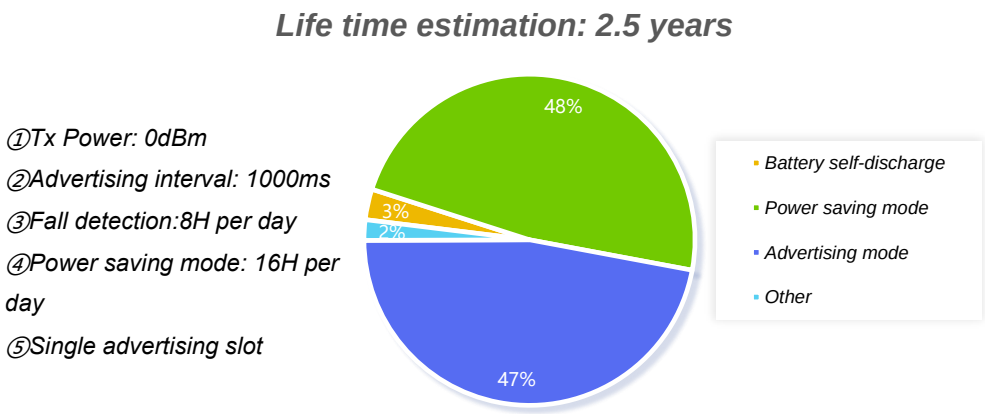

Figure 3: Life time in fall detection scenario

- Typical scenario 2 – Personnel tracking

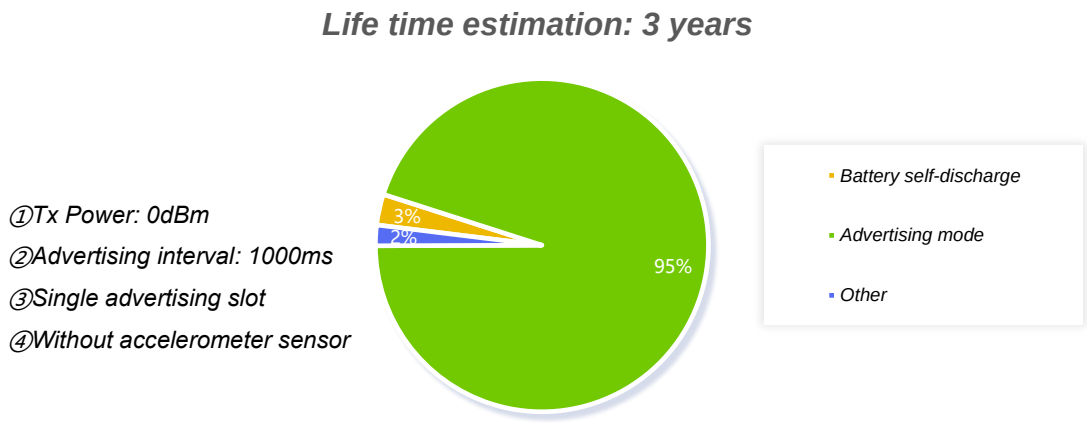

Figure 4: Life time in personnel tracking scenario

Disclaimer: The contents of this battery estimation are for informational purposes only, and while effort has been made to ensure their accuracy, they are not to be construed as warranties or guarantees, express or implied, regarding the products or services described herein or their use or applicability.

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4. User guidance

4.1 How to wear/install H7?

Multiple installation options of H7 like armband with cable tie or double-sided sticker can be selected by user.

Option 1：Double-sided sticker.

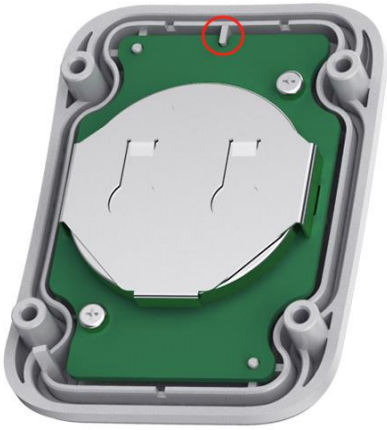
Option 2：Hanging with lanyard

4.2 How to replace battery on H7?

Operation flow:

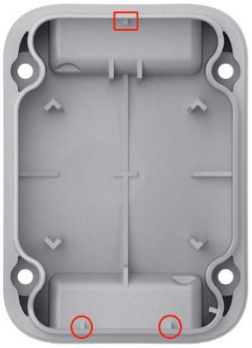
Step 1: Take off four screws of back cover.

Step 2：Take off screws on the PCBA and then take out PCBA to replace the battery.
Remark: Positive side of battery needs to faces up and connect to elastic piece of battery holder.



Step 3: Assemble PCBA. Please pay attention to the notch and then lock screws.

Step 4：Assemble front cover and back cover. Please pay attention to the snap structure which should be aligned and then lock screws.



4.3 How to Power ON/OFF H7?

There has a mechanical button on H7, and NFC as well, so you can refer to below operation flow to power on/off device.

- Power ON:
  Method 1: Long press mechanical button for more than 3 seconds, and LED will keep red blinking for 3 seconds to power on.
  Method 2: Put device near the NFC scanner, and device will keep red blinking for 3 seconds and power on directly.
- Power OFF: Long press mechanical button for more than 3 seconds, and LED will keep solid red for 3 seconds.

4.4 How to restore factory settings?

There have two ways to restore factory settings.

- Independent mechanical button (Hardware reset): In power-off mode, long press inner mechanical button for 10s or more, then release button and single press button within 2s, device will proceed on factory reset.

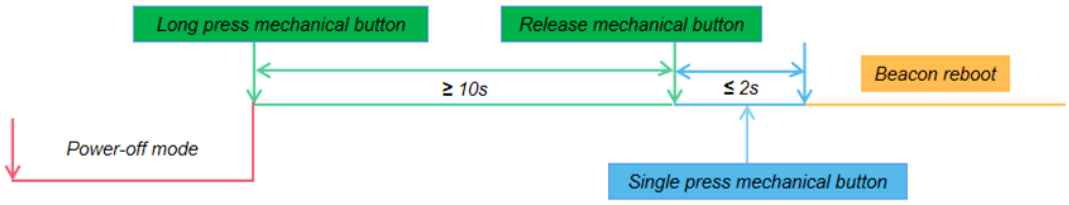


Figure 5: H7 Beacon Factory reset flow

- APP (Software reset*): Remote factory reset through APP if H7 connected with phone APP.

**** Software reset will not reset connection password.***

4.5 How to connect to APP and issue configurations?

Please download “BeaconX Pro” APP from play store directly. For more configuration details, please refer to document - “BeaconX Pro series Beacon User Manual”.

5. General function

5.1 Multiple advertising type

H7 support multiple advertising type to comply with customers' requirements, such as primary Eddystone (UID/URL/TLM) and iBeacon protocol. What's more, H7 also support the MOKO customized protocol to display beacon information and sensor data in real time, thus extending more application scenarios.

a) Google Eddystone-UID
Please refer to below standard Eddystone-UID format:

Byte offset	Field	Default Value	Description
00	Data length	0x02	2-bytes
01	Data type	0x01	1-byte, Flags
02	Advertising type	0x06	BR/EDR not supported / LE general discoverable mode
03	Data length	0x03	3-bytes
04	Data type	0x03	Complete List of 16-bit Service Class UUIDs
05-06	Service UUID	0xAA FE	Google Eddystone UUIDs
07	Data length	0x17	23-bytes
08	Data Type	0x16	Service Data
09-10	Service UUID	0xAA FE	Google Eddystone UUIDs
11	Frame type	0x00	Google Eddystone frame type, 0x00: UID
12	RSSI@0m	0x00	Calibrated Tx power at 0 m
13-22	Namespace ID	-	10-bytes Name space
23-28	Instance ID	-	6-bytes Instance
29-30	RFU	0x00 00	2-bytes reserved for future use, must be 0x00

Table 3: Advertisement frame of Google Eddystone - UID

b) Google Eddystone-URL
Please refer to below Eddystone-URL format:

Byte offset	Field	Default Value	Description
00	Data length	0x02	2-bytes
01	Data type	0x01	1-byte, Flags
02	Advertising type	0x06	BR/EDR not supported / LE general discoverable mode

Byte offset	Field	Default Value	Description
03	Data length	0x03	3-bytes
04	Data type	0x03	Complete List of 16-bit Service Class UUIDs
05-06	Service UUID	0xAA FE	Google Eddystone UUIDs
07	Data length	-	4-23 bytes range
08	Data Type	0x16	Service Data
09-10	Service UUID	0xAA FE	Google Eddystone UUIDs
11	Frame type	0x10	Google Eddystone frame type, 0x10: URL
12	RSSI@0m	0x00	Calibrated Tx power at 0 m
13	URL Scheme	-	Encoded Scheme Prefix, 0x00 – 0x03 0x00: http://www. 0x01: https://www. 0x02: http:// 0x03: https://
14+	Encoded URL	-	0-17 bytes Range

Table 4: Advertisement frame of Google Eddystone – URL

c) Google Eddystone-TLM (unencrypted)

Please refer to below standard Eddystone-TLM (unencrypted) format:

Byte offset	Field	Default Value	Description
00	Data length	0x02	2-bytes
01	Data type	0x01	1-byte, Flags
02	Advertising type	0x06	BR/EDR not supported / LE general discoverable mode
03	Data length	0x03	3-bytes
04	Data type	0x03	Complete List of 16-bit Service Class UUIDs
05-06	Service UUID	0xAA FE	Google Eddystone UUIDs
07	Data length	0x11	17 bytes
08	Data Type	0x16	Service Data
09-10	Service UUID	0xAA FE	Google Eddystone UUIDs
11	Frame type	0x20	Google Eddystone frame type, 0x20: TLM
12	RSSI@0m	0x00	Calibrated Tx power at 0 m
13-14	Battery voltage	-	2-bytes, unit: mV
15-16	Beacon temperature	-	2-bytes, Chipset temperature
17-20	ADV_CNT	-	4 bytes; Advertising PDU count
21-24	SEC_CNT	-	4bytes; Time since power-on or reboot

Table 5: Advertisement frame of Google Eddystone - TLM

d) MOKO Customized - iBeacon

This MOKO customized iBeacon advertisement frame is combined with two parts, one is standard APPLE iBeacon format which exactly complying with APPLE iBeacon regulations, another one is customized scan response advertisement, in order to show more information in iOS APP due to iOS system restrictions.

Below described standard APPLE iBeacon format:

Byte offset	Field	Default Value	Description
00	Data length	0x02	2-bytes
01	Data type	0x01	1-byte, Flags
02	Advertising type	0x06	BR/EDR not supported / LE general discoverable mode
03	Data length	0x1A	26-bytes
04	Data type	0xFF	Manufacture Specific Data
05-06	Service UUID	0x4C 00	Apple Inc. <0x004C> (Little-endian)
07	Data type	0x02	Apple defined data type, 0x02: Beacon
08	Data length	0x15	21-bytes
09-24	iBeacon UUID	-	16-bytes, iBeacon UUID
25-26	Major	-	2-bytes, iBeacon Major
27-28	Minor	-	2-bytes, iBeacon Minor
29	RSSI@1m	-	1byte, Calibrated Tx power at 1 m; Configuration range: -100~0dBm

Table 6: Advertisement frame of Customized – iBeacon

Below described customized scan response advertisement:

Byte offset	Field	Default Value	Description
00	Data length	0x02	2-bytes
01	Data type	0x0A	Tx Power Level
02	Tx power	0x00	Tx Power, unit: dBm
03	Data length	0x1A	26-bytes
04	Data Type	0x16	Service Data
05-06	Service UUID	0xAB FE	MOKO defined UUIDs
07	Frame type	0x50	MOKO advertisement frame type; 0x50: ibeacon frame
08	RSSI@1m	-	1byte, Calibrated Tx power at 1 m; Configuration range: -100~0dBm
09	Adv interval	0x0A	Slot advertisement interval, unit: 100ms
10-25	iBeacon UUID	-	16-bytes, iBeacon UUID
26-27	Major	-	2-bytes, iBeacon Major
28-29	Minor	-	2-bytes, iBeacon Minor

Table 7: Advertisement frame of Customized – iBeacon response packet

e) MOKO Customized - 3-axis accelerometer sensor

MOKO customized advertising format for broadcasting 3-axis sensor raw data, battery voltage etc. Please refer to below table for details.

Byte offset	Field	Default Value	Description
00	Data length	0x02	2-bytes
01	Data type	0x01	1-byte, Flags
02	Advertising type	0x06	BR/EDR not supported / LE general discoverable mode
03	Data length	0x02	2-bytes
04	Data type	0x0A	Tx Power Level
05	Tx power	0x00	Tx Power, unit: dBm
06	Data length	0x18	24 bytes
07	Data Type	0x16	Service Data
08-09	Service UUID	0xAB FE	MOKO defined UUIDs
10	Frame type	0x60	MOKO advertisement frame type; 0x60: 3-axis accelerometer frame
11	Ranging data	0x00	Value that's put into the advertising data that declares to receiving devices what the power should be at a specific distance. Configuration range: -100~0dBm
12	Adv interval	0x0A	Slot advertisement interval, unit: 100ms
13	Sampling rate	0x01	Sampling rate of 3-axis accelerometer sensor, 10Hz by default.
14	Full-scale	0x00	Full-scale of 3-axis accelerometer sensor, ±2g by default
15	Motion threshold	0x01	Motion threshold to judge movements, 0.1g by default.
16-17	X-axis Raw data	-	2-bytes, X-axis raw data
18-19	Y-axis Raw data	-	2-bytes, Y-axis raw data
20-21	Z-axis Raw data	-	2-bytes, Z-axis raw data
22-23	Battery voltage	-	2-bytes, unit: mV
24	RFU	0x00	Reserved for future use, 0x00 by default
25-30	MAC address	-	Beacon MAC address

Table 8: Advertisement frame of Customized – 3-axis Acc

f) MOKO Customized - Device info

MOKO customized advertising format for broadcasting device status info. Please refer to below table for details.

Byte offset	Field	Default Value	Description
00	Data length	0x02	2-bytes

01	Data type	0x01	1-byte, Flags
02	Advertising type	0x06	BR/EDR not supported / LE general discoverable mode
03	Data length	0x02	2-bytes
04	Data type	0x0A	Tx Power Level
05	Tx power	0x00	Tx Power, unit: dBm
06	Data length	0x12	18 bytes
07	Data Type	0x16	Service Data
08-09	Service UUID	0xAB FE	MOKO defined UUIDs
10	Frame type	0x40	MOKO advertisement frame type; 0x40: Device info frame
11	Ranging data	0x00	Value that's put into the advertising data that declares to receiving devices what the power should be at a specific distance. Configuration range: -100~0dBm
12	Adv interval	0x0A	Slot advertisement interval, unit: 100ms
13-14	Battery voltage	-	2-bytes, unit: mV
15	Device property indicator	0x00	Lock state status, 0x00: Password verification enabled, 0x02: Password verification disabled
16	Switch status indicator	0x01	Connectable status, 0x00: Unconnectable, 0x01: Connectable
17-22	MAC address	-	Beacon MAC address
23	Firmware type	0x00	1-byte firmware type, 0x00: BXP-C
24	Firmware version	-	1-byte firmware version; Bit 0-3: secondary version Bit 4-7: Main version

Table 9: Advertisement frame of Customized – Device info

In this customized device info advertisement frame, there have corresponding response package which contains device name.

Byte offset	Field	Default Value	Description
00	Data length	-	2-22 bytes range
01	Data type	0x09	Complete local name
02-21	Advertising type	0x06	1-20 bytes device name, comply with US-ASCII standard. BeaconX pro by default.

Table 10: Advertisement frame of Customized – Device info response packet

5.2 Multiple advertising slot

H7 can support up to 6 advertising slots and each slot configurations are independent. It means that user can issue different configurations which include Tx power/ Adv interval/ Adv type and other parameters in each slot.

5.3 Motion detection

3-axis accelerometer sensor could be able to identify H7 motion status, and then switch into pre-configured advertising status or data. As well, user can also set motion detection trigger to achieve power saving mode. For more, please refer to “chapter 5.5.2 motion trigger”.
Regarding to 3-axis accelerometer sensor directions, you can refer to below hardware design and sensor specifications.

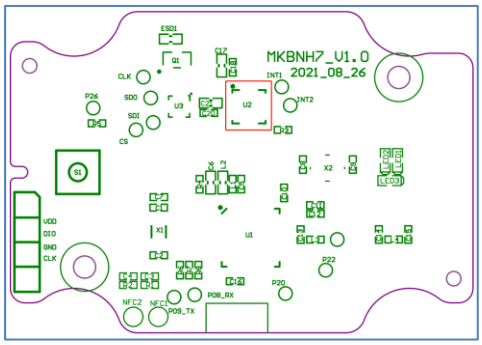


Figure 6: H7 Beacon PCBA design

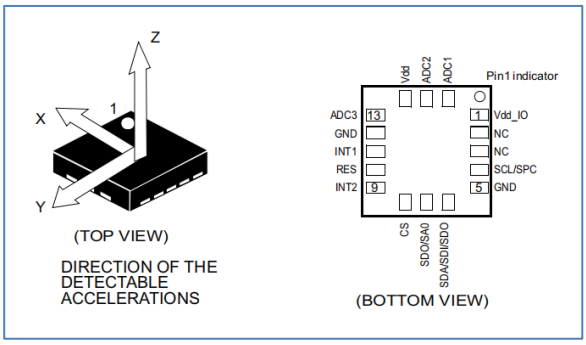


Figure 7: 3-axis accelerometer sensor specification

Based on this, we have drawn the direction sketch map of Beacon’s 3-axis accelerometer sensor. When you need to do fall detection or other movements analysis, then you can refer to this for further design.

Figure 8: H7 Beacon PCBA design

For H7 Beacon sensing direction with 3-axis accelerometer sensor, please refer to figure 8.

5.4 Sensor sampling

H7 can broadcast or notify 3-axis accelerometer sensor data in real time, so you can achieve the sensor sampling data through advertisement or Connection Notify property. It could be used for personnel tracking and falling detection.

Use case: Assuming that lone workers suffer accidental falls but cannot call for help immediately by themselves, if wearing with H7 Beacon, it can broadcast real-time 3-axis accelerometer sensor data to cloud platform and recognize the fall behavior through algorithm, thus arranging the corresponding solutions.

5.5 Trigger mechanism

Trigger mechanism is designed for some emergency states switching or some specific use cases such as motion detection. Currently H7 Beacon can support mechanical button trigger and motion trigger, please refer to below trigger table.

Trigger type	Trigger condition
Button trigger	Press button twice
	Press button three times
Motion trigger	Device moves

User can set the different trigger type, as well as trigger response. When the trigger condition takes effect, then it will have corresponding trigger response.

For instance, user set the trigger type - motion trigger, and set the trigger response - stop advertising for a while (30s). When device is in idle status, if user move device and then 3-axis accelerometer sensor data exceed to threshold value (motion detected), then it will activate trigger response and device will stop advertising for 30s.

5.5.1 Button trigger

- Description

There have two kinds of trigger conditions regarding of button trigger, that is double-click button and triple-click button.

- Trigger response

a) Always advertising
After trigger type occurred, then device will start broadcasting and keep always broadcasting until you change to other trigger response or cancel trigger type.

b) Start advertising for a while
After trigger type being occurred, then device will start advertising for a while, and advertising time is configurable. It is set 30s by default.

c) Stop advertising for a while
After trigger type being occurred, then device will stop advertising for a while, and advertising time is configurable. It is set 30s by default.

- Use cases

a) SOS emergency & call services

5.5.2 Motion trigger

- Description

When device changed from idle to motion status, 3-axis accelerometer sensor sampling data exceed to threshold value, it will be recognized as an effective motion and then activate trigger response.

- Trigger response

a) Always advertising
After trigger type occurred, device will start advertising and keep always advertising until you change to other trigger response or cancel trigger type.

b) Start advertising after a static period of specific time
Device will start to broadcast after a static period of specific time, and it stops broadcasting again once a movement occurred. It is set 30s by default.

c) Stop advertising after a static period of specific time
Device will stop broadcasting after a static period of specific time, and it starts to broadcast again once a movement occurred. It is set 30s by default.

- Use cases

a) Power saving mode & Normal mode switch
b) Asset status monitoring

5.6 Operating mode

Regarding to H7 Beacon, there have several operating modes which reflect on different features and states. Please refer to below operating mode flow.

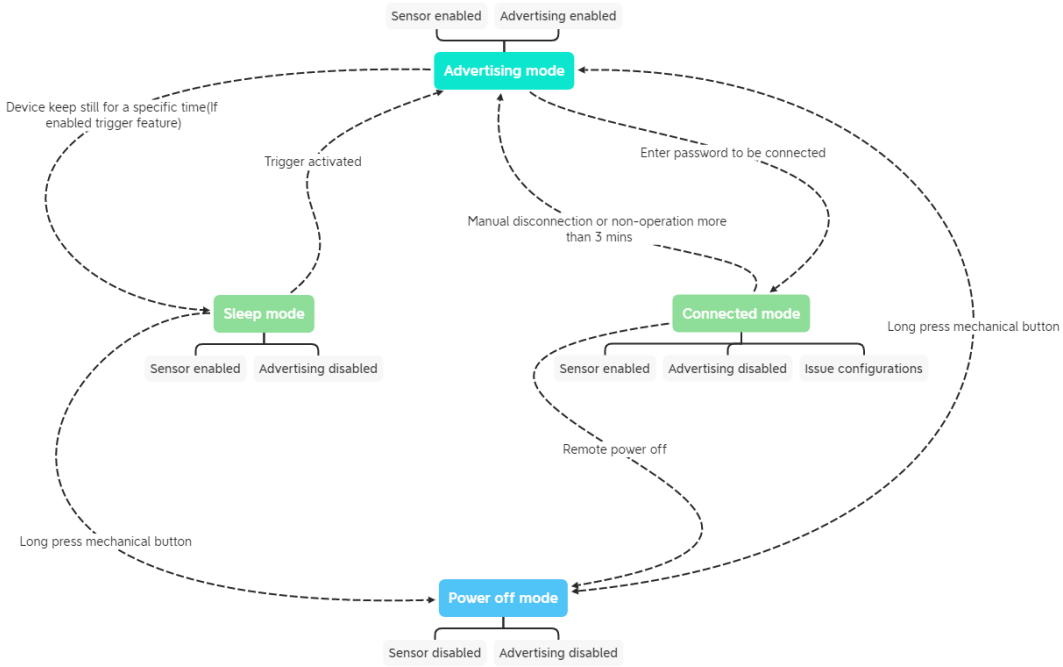


Figure 9: H7 Beacon Operating mode flow

5.6.1 Advertising mode

In advertising mode, H7 Beacon is broadcasting and sensor is working, meanwhile it can be scanned by central device.

5.6.2 Power-off mode

MCU will enter low power mode to wait for power on event, beyond that, all services which include advertisement, sensor, RTC etc. will be disabled.

5.6.3 Connected mode

In this mode, central device (phone, gateway, or other master devices) is connected with H7 Beacon and can configure parameters through GATT services.
When a connection is made to H7, the part will stay in a connected state until the master breaks the connection or is out of range. On disconnection, H7

returns to the broadcasting state unless a reset was initiated during the connection.

** In connected mode, H7 Beacon will not broadcast but sensor will keep working still.*

5.6.4 Sleep mode

In sleep mode, H7 is not connected with central device and not broadcasting as well, but sensor is working to wait for motion trigger or button trigger.
For instance, after device keep in idle status for a specific time (default 30s and parameters configurable), then device will stop broadcasting but keep sensor sampling working to maintain motion detection feature, that is also called power saving mode.

5.8 Beacon temperature monitoring

In H7 Beacon, nRF52832 equipped with a built-in temperature sensor and temperature data will be broadcast through TLM frame. User can monitor the beacon temperature and do forewarning measures.

5.9 Monitoring duration statistics

In TLM frame, there have SEC_CNT and ADV_CNT value that represents working time and advertisement quantities since beacon power-up or reboot. User can do monitoring duration statistics through this value.

Use case - Products promotion

When customer pick up specific goods, motion detection in H7 beacon will be triggered. The merchant can calculate the trigger frequency by combining the motion trigger times and total monitoring duration, thus providing the customer preference analysis.

5.10 Low battery alert

When battery percentage is lower than 5%, LED blinks twice at 10s interval to remind user.

** Low battery alert threshold can be customized regarding of customer requirements.*

5.11 Remote power off

Device firmware can support remote power off feature. This function should be realized through APP.

5.12 Remote reboot

Device firmware can support remote reboot feature. This function should be realized through APP.

5.13 DFU update

Device support DFU firmware update, and you can do DFU operations through official "***nRF Connect***" APP or MOKO "***BeaconX Pro***" APP.

During firmware update period, LED will keep red blinking; After successful update, LED will keep red solid for 3s and then device reboot. For more detail instructions, you can refer to document - "***BeaconX Pro series Beacon User Manual".***

5.14 Remote parameters configuration

Device support various configurable parameters and you can issue below

parameters through “BeaconX Pro” APP directly.

- Advertising format and data
- Beacon name
- Advertising interval
- Trigger options
- Advertising slot
- Tx power
- Connection password
- Sensor parameters

6. Certifications

6.1 FCC certification

FCC 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 an 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 correct the interference by one or more of the following measures:

- Re-orient or relocate the receiving antenna.
- Increase the separation between the equipment and the 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.

OEM Responsibilities

WARNING: Changes or modifications not expressly approved by Laird could void the use's authority to operate the equipment.

FCC Warning

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.

6.2 CE regulatory

CE-RED

Manufacturer	MOKO TECHNOLOGY LTD.
Product	H7
Product Description	IP67, Helmet Bluetooth Beacon
EU Directives	2014/53/EU - Radio Equipment Directive (RED)

Reference standards used for presumption of conformity:

Article number	Requirement	Reference standard(s)
3.1(a)	Health & Safety	EN 62311:2008 EN 50665:2017 EN 50385:2017 EN 62368-1:2014
3.1(b)	Protection requirements – EMC compatibility	EN 301 489-1 V2.2.0 (2017-03) EN 301 489-17 V3.2.0(2017-03)
3.2	Means of the efficient use of the radio frequency spectrum (ERM)	EN 300 328 V2.1.1 (2016-11)

RoHS

All products that are manufactured by MOKO TECHNOLOGY LTD. follow the Directive 2011/65/EU of the European Parliament & of the Council & Commission Delegated Directive (EU) 2015/863, on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

REACH

Two hundred and eleven (211) substances in the Candidate List of Substances of Very High Concern (SVHC) for authorization published by European Chemicals Agency (ECHA) on - (EC) No 1907/2006 concerning the REACH.
we confirm that：
1. None of our products are intended to release any hazardous chemicals.
2. We have or will contact suppliers who supply us with substances that may likely require registration under REACH regulations to request confirmation that the chemicals of concerns were either registered or they have requested their downstream suppliers to do so.
3. We will take appropriate action in response to any to business risks arising through supplier failure to co-operate and support us in this project.
4. We will do our utmost to ensure that continuity of supply of our products will not be adversely affected by issues arising from the REACH regulations.

7. Ordering information

7.1 Beacon ordering information

The H7 Beacon is available as a finished product in a plastic housing with full FCC, RoHS, REACH and CE certifications.
The H7 Beacon ordering information is shown in Figure 10 and Table 11.

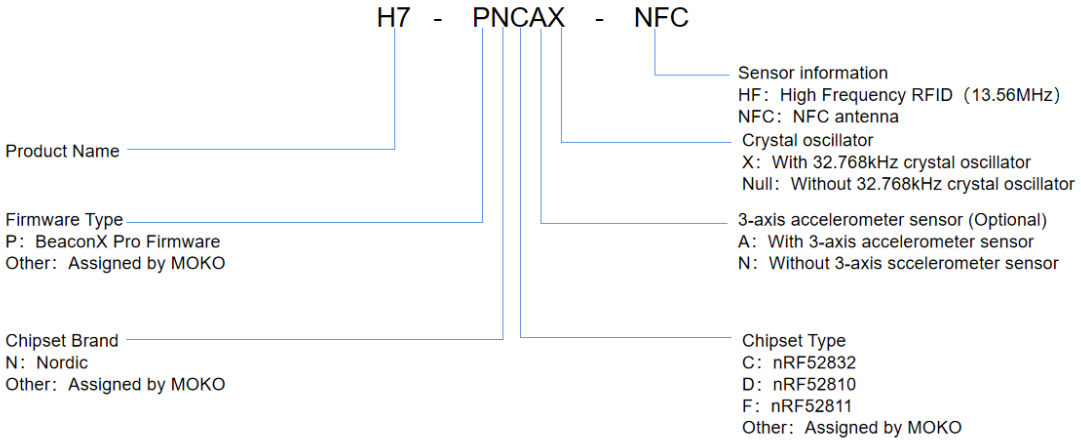


Figure 10: H7 Beacon Ordering Information

Order number		Description			
	Chipset	3-axis Acc sensor	NFC	RFID	Clock oscillator
H7-PNCAX-NFC	nRF52832	√	√	○	√
H7-PNCA-NFC	nRF52832	√	√	○	○
H7-PNCN-NFC	nRF52832	○	√	○	○
H7-PNDA-HF	nRF52810	√	○	√	○
H7-PNDN-HF	nRF52810	○	○	√	○

Table 11: H7 Beacon Ordering Information

8. Customization services

To realize all-round marketing services, MOKO can provide below customized services:
a) Firmware
b) Hardware design
c) Laser logo
d) Packaging
e) Label
f) Certifications

The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction.