

HRBC021

Beacon Module



User Manual
Version 1.0



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Revision and Iteration History

Version	Publication Date	Authors	Summary of Changes and Updates
1.0.0	08/3/2016	wf	Document Creation

FCC Information

FCC Notice

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. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more 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 technician for help.

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.

MODIFICATION: Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the device.

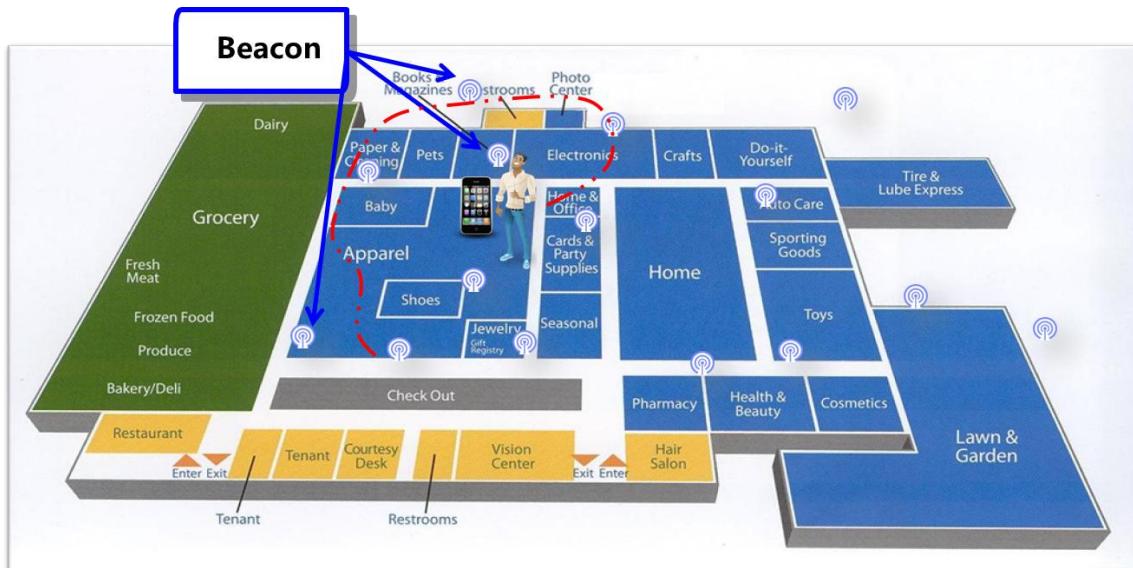
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1 Overview

A beacon is a small Bluetooth radio transmitter that enables Bluetooth-equipped devices to perform different actions when they're in proximity. iBeacon is a communication protocol developed by Apple on top of Bluetooth Smart technology. It allows developers to create mobile apps aware of location context provided by beacons. HRBC021 Beacons are compatible with iBeacon.

HRBC021 Beacon module is HangRuiTuoYu's first Beacon device, is only a piece of hardware broadcasting radio signal. The HRBC021 Beacon is a very popular and modern Beacon with ARM core chipset nRF51822 and leverage BLE 4.0 technology; it has a smart design for the case and battery hatch, so it is very easy to replace the battery without any tool. It widely used in the commercial advertising and indoor location-based service.

HRBC021 Beacons broadcast 2.4GHz radio signals at regular and adjustable intervals. HRBC021 Beacon can be heard and interpreted by iOS and Android BLE-enabled devices that are equipped with many mobile apps.



2 Features

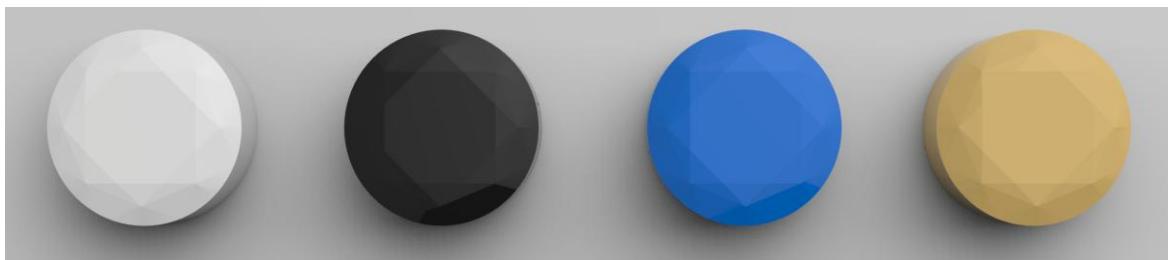


- Simultaneous iBeacon+Eddystone operation modes available
- Fully compliant with Apple® iBeacon standard and Eddystone (TM)
- Password-protected over-the-air configuration
- Developers can use iOS 7 and/or Android 4.3 (and up) standard BLE libraries
- Black rubber case, ready to use
- Bluetooth low energy technology (Bluetooth 4.0)
- Enable proximity based applications
- Battery included · Powered by Coin battery
- High performance, he max. 100 meters advertising distance
- Ultra-low power consumption chipset nRF51822 with ARM core, low power consumption
- iBeacon, Eddystone, CE, FCC and RoHS certified



Technical Date

Feature	Value	Additional info.
Battery model	CR2477 (HRBC021-A) CR2477N(HRBC021-B)	Coin battery, 3.0Vdc
Case Color	White, Black, Blue	Other colors can be customized
Operation Voltage	3V	DC
Operation Frequency	2400-2483.5MHz	
Frequency Error	+/- 20KHz	
Modulation	GFSK	
Broadcasting Interval	100mS-2000mS	Programmable
Transmission current	10mA	Test at 0dBm Output Power
Standby current	7uA	
Output Power	-30 to 4 dBm	Programmable
Receiving Sensitivity	-93dBm	High gain mode
Transmission distance	max. 100 meters	BER<0.1%, Open space
Antenna	50ohm	Onboard, PCB Antenna
Weight	20g	
Size	Φ42mm*16mm	



3 Specifications

- Compatibility



- Supported iOS 7.0+ and Android 4.3+ system;
- Compatible with Apple iBeacon™ standard;
- Compatible with Eddystone (TM) standard;
- Compatible with all Bluetooth 4.0 (BLE) devices;
- Long Battery Lifetime and Battery Level



- More than 24 months @ default settings;
- Rotatable case, easy to replace the battery;
- Easy to get the real-time battery level notification;

- Soft-reboot
 - Reboot the device via command without any tools;
- OTA and J-Link
 - Supported upgrade via Over-The-Air;
 - Reserved J-Link port on the board for programming;
- Connection Mode
 - Advertising mode, non-connectable;
 - Configuration mode, connectable;
- Configurable Parameters
 - UUID, Major, Minor, Device Name, Password etc.
 - Special Configuration APP;

Item	Default Setting
UUID	FDA50693-A4E2-4FB1-AFCF-C6EB07647825
Major	0
Minor	0
Measured Power	-59(0xc5)
Transmission Power	-8dBm
Broadcasting Interval	500mS
Change Password	HRNBC021 (Must be 8 characters)
Serial ID	Random(Unique serial ID for beacon)
iBeacon Name	Hrtuoyu Beacon
Connection Mode	0 (connectable, configuration mode)
Soft Reboot	Hrtuoyu_beacon_firmware-1.3.2.

Configurable Parameters

- Transmission Power Levels
 - 8 adjustable levels, range from 0 to 7

- Transmission power range: -30dBm to +4dBm;
- Long Range
 - The max. Range 100 meters in the open space;
 - The range depends on the physical environment;
- Security
 - 8 characters password (Lock/Unlock parameters);
 - Broadcast the encrypted data if needed;
 - AES HW encryption
- Mounting
 - 3M branded adhesive for direct mounting to wall;



Beacon mounted on the wall

4 Absolute Maximum Ratings

Parameter	Conditions	Min	Type	Max	Units
Voltage on any Pin			3		V
Maximum Total Current through VCC, AV+, GND, and AGND, RFGND				20	mA
Maximum Output Current Sunk by any Port pin				20	mA
Maximum Output Current Sunk by any other I/O pin				10	mA
Maximum Output Current Sourced by any Port pin				20	mA
Maximum Output Current Sourced by any other I/O				20	mA
Storage Temperature		-20		85	°C

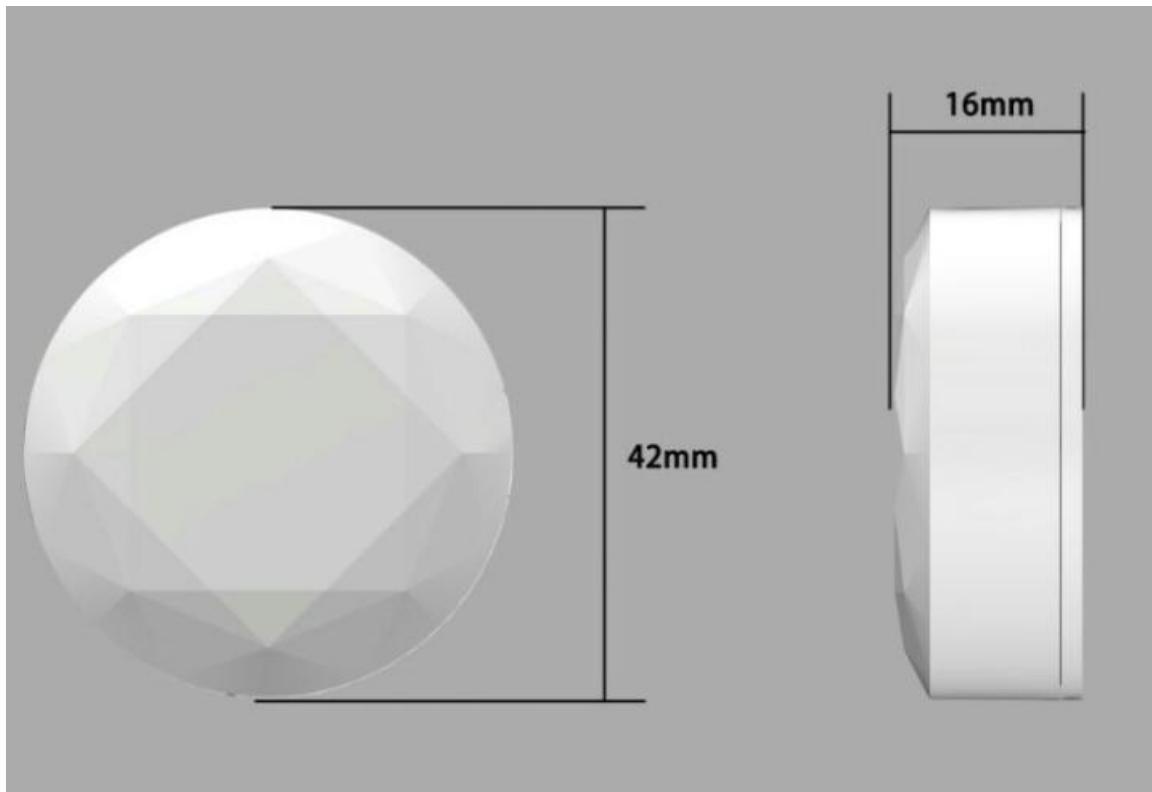
*Note: The absolute maximum ratings given above should under no circumstances be violated. Stress exceeding one or more of the limiting values may cause permanent damage to the device.

5 Operating Conditions

HRBC021-A Parameter	Conditions	Min	Type	Max	Units
Supply voltage		3		V	
Operating ambient temperature range		-30		60	°C
Humidity(non-condensing)		10%		90%	

HRBC021-B Parameter	Conditions	Min	Type	Max	Units
Supply voltage		3		V	
Operating ambient temperature range		-40		85	°C
Humidity(non-condensing)		10%		90%	

6 Mechanical Drawings



HRBC021 Beacon Dimensions

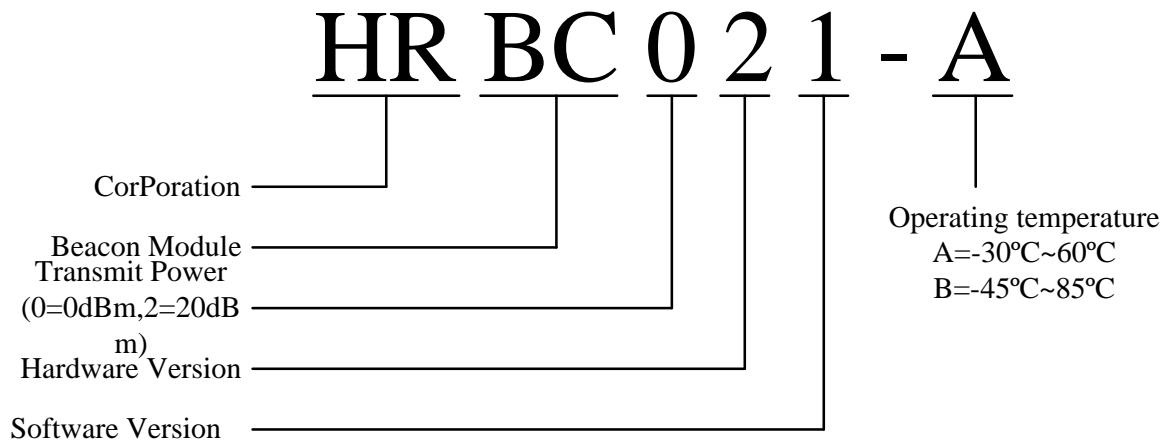
7 Packing Information



Details	Parameter	Additional info
Quantity	500pcs	130pcs per layer, 4 layers per Carton.
Weight	12KG	Include the battery
Size	525mm*315mm*235mm	

8 Ordering Information

8.1 Ordering Information



8.2 Photos of Product



HRBC021-A



HRBC021-B

Please contact HangRui sales team to ask more related information if need.