iBKS105 Datasheet

ABSTRACT

iBKS105 Technical Data

AUDIENCE

This document is primarily focused for engineers or other users with a technical profile

FEATURES

- Advertising **Beacon** Device
- **Bluetooth Low Energy®**
- Full **Eddystone** & **iBeacon** compatible
- 100% Configurable Parameters
- Firmware update **Over The Air** (OTA)
- Waterproof optional kit
- Logo and color customizable (MOQ)
- Provided with your own configuration (MOQ 50 units)
- No tools needed for maintenance
- Additional optional sensors available

Revision 3 | January 2017

Table of Contents

FCC Statement

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.

FCC Caution:

Changes or modifications not expressly approved by the part responsible for compliance could void the user's authority to operate the equipment.

FCC 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 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 radio/TV technician for help."

RSS-Gen & RSS-210 statement:

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.
Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2)

l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

RSS-102 Statement:

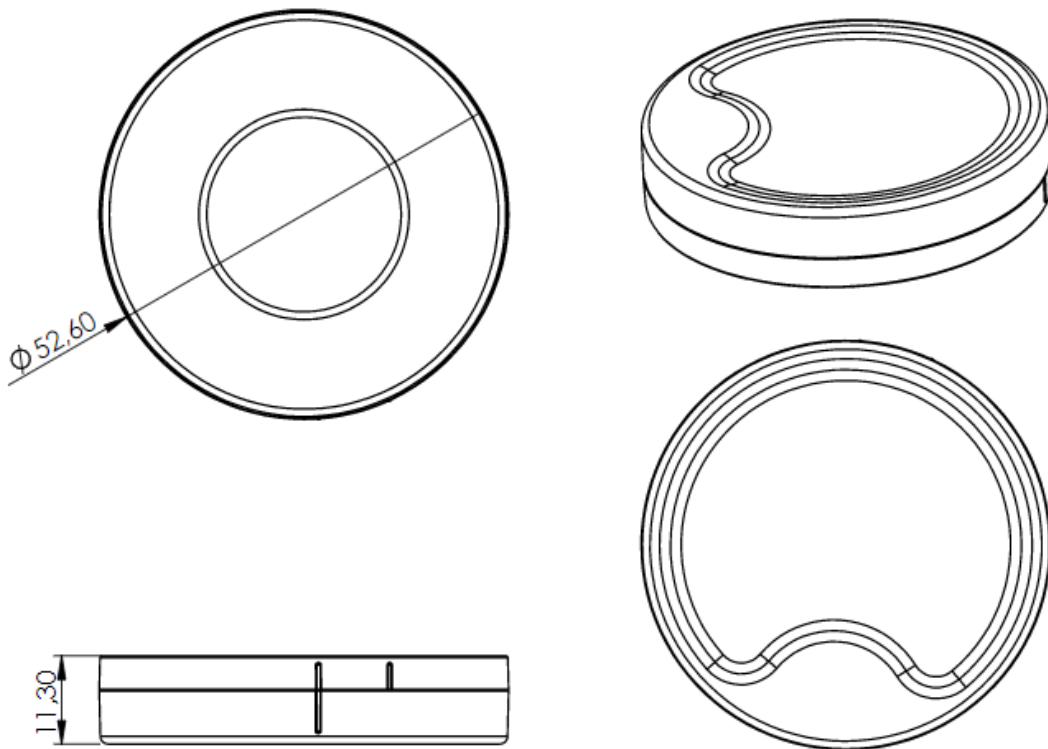This equipment complies with Industry Canada radiation exposure limits set forth for an uncontrolled environment.
Cet équipement est conforme à l'exposition aux rayonnements Industry Canada limites établies pour un environnement non contrôlé.

IC Statement

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.
Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This equipment complies with Industry Canada radiation exposure limits set forth for an uncontrolled environment.
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1.   Specifications

This section contains electrical, mechanical and software specifications for iBKS105

Dimensions	Ø52.6 x 11.3 mm	**Case material**	ABS
Weight	24g	**Case finish**	Matte white
Core	Nordic nRF51822	**Fixing method**	Double side sticker
Radio Protocol	Bluetooth® Low Energy	**Operating Temperature**	-25 to +60ºC
Distance Range	Up to 50m	**Storage Temperature**	0 to +35ºC
Battery	Coin Cell CR2477 3V – 1000mAh	**Beacon Protocols**	iBeacon Eddystone: UID, URL, TLM & EID
Optional Sensors	Hall Accelerometer	**Firmware Update**	OTA (Over The Air)
Idle Current Consumption	2.4µA	**Certifications**	CE, FCC, IC, Anatel

2.   iBKS105 Mechanical Draws

All dimensions in mm

3.   Battery Life Estimation

> IMPORTANT:
>
> Battery life estimation applies from firmware version EDSTEID V5.2016.06.29.1 onwards.
>
> **Notice all values shown in this chapter are just an estimation. Real battery life might differ depending on the environment where the iBKS105 is placed.**

3.1 Estimation Scope

In order to estimate the battery life, the following configurable items have been considered:

- Number of slots enabled

- Type of slot: iBeacon or Eddystone (UID, URL, TLM and EID)

- TX power defined for each slot

- Advertising period defined for each slot

- Beacon mode: connectable or non-connectable.

3.2 Common Use Cases

The common use cases shown in the table have been estimated under the following conditions:

- All the slots enabled advertise at the same TX power.

- All the slots enabled, except Eddystone Telemetry (TLM), have the same advertising period: 950ms.

- The advertising period for Eddystone TLM is set to 60s.

- The iBKS is in always non-connectable mode.

- EID Rotation Period (K) is set to 10 which means that every 17 minutes approximately a new ephemeral ID is calculated.

The Battery Capacity used is 1000mAh.

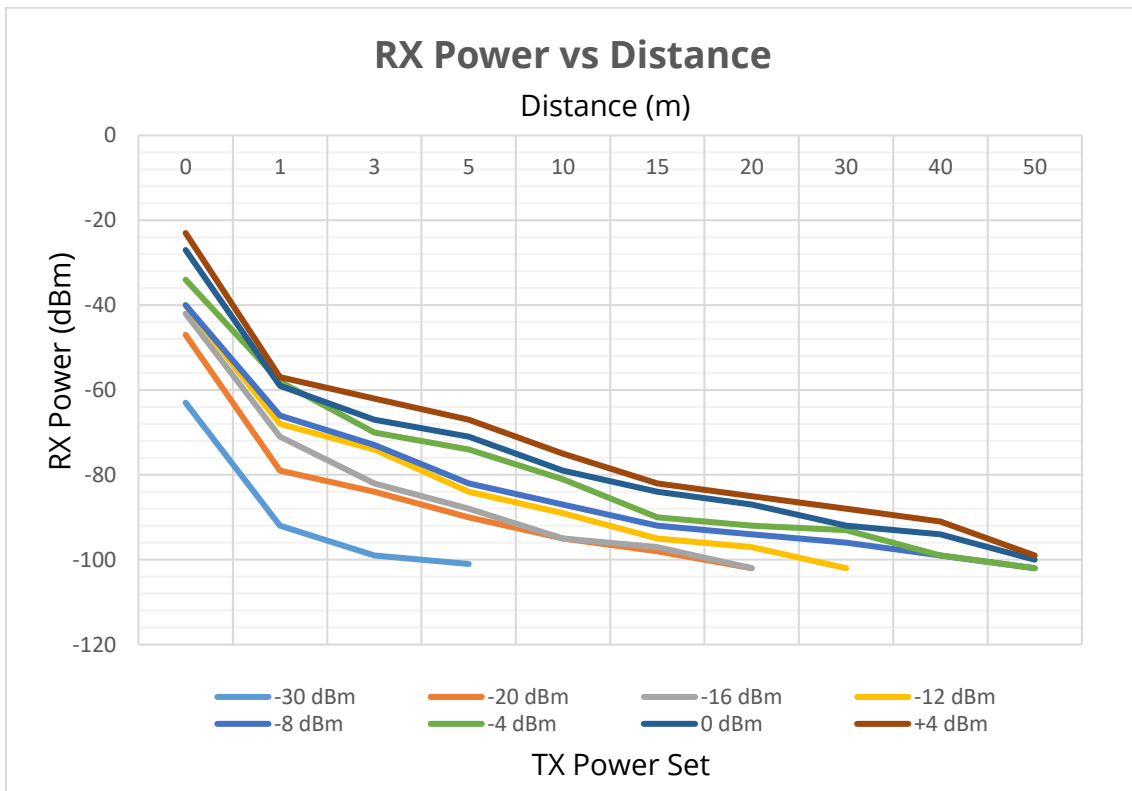| Slots Enabled	Tx Power (dBm)							
	-30	-20	-16	-12	-8	-4	0	+4
iBeacon	46	46	45	44	43	41	38	31
UID Eddystone	45	45	44	43	42	40	37	31
URL Eddystone	45	45	44	43	42	40	37	31
EID Eddystone	48	48	47	46	45	44	41	34
iBeacon + TLM Eddystone	39	39	39	38	37	36	33	28
iBeacon + URL Eddystone	25	24	24	23	22	22	20	16
UID Eddystone + TLM Eddystone	39	38	38	37	36	35	32	27
UID Eddystone + URL Eddystone	24	24	24	23	22	21	19	16
URL Eddystone + TLM Eddystone	39	38	38	37	36	35	32	27
EID Eddystone + URL Eddystone	25	25	24	24	23	22	20	17
EID Eddystone + TLM Eddystone	41	41	40	39	39	37	35	30
iBeacon + URL Eddystone + TLM Eddystone	24	24	24	23	22	21	20	16
UID Eddystone + URL Eddystone + TLM Eddystone	24	24	23	23	22	21	19	16
EID Eddystone + URL Eddystone + TLM Eddystone	25	25	24	24	23	22	20	17

Notes: Battery Life in months. Battery Capacity: 1000mAh

4. RX Power (dBm) vs Distance

The following table and graph show the RX power received (dBm) in comparison with distance (m) for all configurable TX powers.

Distance (m)	TX Power (dBm)							
	-30	-20	-16	-12	-8	-4	0	+4
0	-63	-47	-42	-40	-40	-34	-27	-23
1	-92	-79	-71	-68	-66	-58	-59	-57
3	-99	-84	-82	-74	-73	-70	-67	-62
5	-101	-90	-88	-84	-82	-74	-71	-67
10		-95	-95	-89	-87	-81	-79	-75
15		-98	-97	-95	-92	-90	-84	-82
20		-102	-102	-97	-94	-92	-87	-85
30				-102	-96	-93	-92	-88
40					-99	-99	-94	-91
50					-102	-102	-100	-99

IMPORTANT:

This chapter applies from firmware version EDSTEID V5.2016.06.29.1 onwards.

Notice all values shown in this chapter have been tested in an open field of a city. Depending on the environment where the iBKS105 is placed these values might differ.

Revision History

The following revision history table summarizes changes contained in this document.

Revision Number	Revision Date	Description of Changes
Rev 0	10/2015	Initial Release
Rev 1	08/2016	☾ Design changed ☾ Specifications updated ☾ Added mechanical draws ☾ Added battery life estimation ☾ Added RX Power vs Distance
Rev 2	09/2016	☾ Battery life estimation values updated
Rev 3	01/2017	☾ Added FCC & IC Statement ☾ Added IC Certification in the specifications