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BlueBeacon

Bluetooth LE proximity-beacon with iBeacon(TM) technology

Services and Characteristics

A BlueBeacon is a Bluetooth Low Energy (BLE) proximity beacon that periodically broadcasts an advertising packet formatted according iBeacon technology specifications.

As every BLE device, a BlueBeacon implements Services, each of which contains one or more Characteristics, whose value can be read and/or written. Characteristics are used to store device information or control parameters.

A BlueBeacon has 5 Services: 3 standard BLE Services (identified by a 16-bit UUID) and 2 BlueBeacon-specific Services (identified by a 128-bit UUID).

Characteristics can be of four types:

- readable, fixed: such as the beacon unique serial number or model;
- readable, variable: such as the battery level;
- readable, writable: such as the beacon parameters (as the Proximity UUID);
- writable: such as the access passkey

The following tables and notes contain the description of each Service and Characteristic. These information are useful to access the BlueBeacon using a standard BLE app or for implementing your own app for configuring and controlling the beacon.

In order to access the BlueBeacon, as for all BLE devices, it is required that your mobile phone (based on iOS, Android, Windows or Blackberry) supports Bluetooth 4.0 or successive, at both hardware and operating system level.

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Generic Access Service
UUID: 0x1800

Name Device name	**UUID** 0x2a00	
Description Name of the device	**Default value** “BlueUp-XX-YYYYYY” where XX = model number and YYYYYY = serial number	**Properties** Read, fixed

Name Appearance	**UUID** 0x2a01	
Description Appearance of the device	**Default value** 512 (Generic tag)	**Properties** Read, fixed

Device Information
UUID: 0x180a

Name Manufacturer Name String	**UUID** 0x2a29	
Description Name of the manufacturer	**Default value** BlueUp	**Properties** Read, fixed

Name Model Number String	**UUID** 0x2a24	
Description Number of the model	**Default value** XX (01 = Mini, 02 = Maxi, 12 = USB, 04 = Forte)	**Properties** Read, fixed

Name Serial Number String	**UUID** 0x2a25	
Description Unique serial number (SN)	**Default value** XXXXXX (6 decimal digits, from 000000 to 999999)	**Properties** Read, fixed

Name Hardware Revision String	**UUID** 0x2a27	
Description Revision of the hardware	**Default value** X.y	**Properties** Read, fixed

Name Firmware Revision String	**UUID** 0x2a26	
Description Revision of the firmware	**Default value** X.y.z.w	**Properties** Read, fixed

Name Software Revision String	**UUID** 0x2a28	
Description Revision of the software	**Default value** X.y	**Properties** Read, fixed

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Beacon Service
UUID: 0x8336*1900*-4d55-445b-b374-d53db987ead8

Name	**UUID**	
ProximityUUID	0x8336*2010*-4d55-445b-b374-d53db987ead8	
Description	**Default value**	**Properties**
UUID of the beacon region	0xacfd065e-c3c0-11e3-9bbe-1a514932ac01	Read/write

Name	**UUID**	
Major number	0x8336*2011*-4d55-445b-b374-d53db987ead8	
Description	**Default value**	**Properties**
Major number of the beacon region	0x0000	Read/write

Name	**UUID**	
Minor number	0x8336*2012*-4d55-445b-b374-d53db987ead8	
Description	**Default value**	**Properties**
Minor number of the beacon region	0x0000	Read/write

Name	**UUID**	
TX power level	0x2A07	
Description	**Default value**	**Properties**
Transmission power of the beacon	0xF8 (Mini, Maxi, Forte) [-8dBm] – Note 1 0x0E (USB) [0dBm] – Note 1	Read/write

Name	**UUID**	
Advertising interval	0x8336*2013*-4d55-445b-b374-d53db987ead8	
Description	**Default value**	**Properties**
Advertising interval (expressed in units of 100 msec)	0x03 (Mini, Maxi, Forte) [300 msec] 0x01 (USB) [100 msec]	Read/write

Name	**UUID**	
Calibrated RSSI	0x8336*2014*-4d55-445b-b374-d53db987ead8	
Description	**Default value**	**Properties**
Received RSSI at 1m in front of the beacon with TX power set to 0dBm	0xCA (Mini, Maxi, Forte) [-54dBm] – Note 2 0xC3 (USB) [-61dBm] – Note 2	Read/write

Name	**UUID**	
Power-on mode	0x8336*2015*-4d55-445b-b374-d53db987ead8	
Description	**Default value**	**Properties**
Power-on mode (on/off) of the beacon	0x01 [on] – Note 3	Read/write

Name	**UUID**	
Operating mode	0x8336*2016*-4d55-445b-b374-d53db987ead8	
Description	**Default value**	**Properties**
Operating (connectable/non-connectable) mode of the beacon	0x01 [connectable] – Note 4	Read/write

Name	**UUID**	
Non-connectable period	0x8336*2017*-4d55-445b-b374-d53db987ead8	
Description	**Default value**	**Properties**
Hours in non-connectable mode	0x00 [indefinite] – Note 5	Read/write

Name	**UUID**	
Beacon name	0x8336*2018*-4d55-445b-b374-d53db987ead8	
Description	**Default value**	**Properties**
Alphanumeric beacon descriptor	“BlueUp-XX-YYYYYY” where XX = model number and YYYYYY = serial number	Read/write

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Notes

1. TX power level is expressed in two different scales:

   Mini, Maxi, Forte: power level ranges from 0xEC (-20dBm) to 0x04 (+4dBm). Also values equal to 0xE2 (-30dBm) and 0xC9 (-55dBm) are supported

   USB: power level is expressed in a scale from 0x0 (0) to 0xF (15), ranging from -24dBm to +3dBm

2. Calibrated RSSI represent the power received by the smartphone at distance of 1 meter in front of the beacon. This value is broadcast by the beacon, and is used for proximity ranging (in iOS, it is used by iOS CoreLocation APIs). The default value is set in production. It is strongly recommended to update this value in the actual installation environment.
3. By default the beacon is ON. In order to switch-off the beacon function, this value must be reset to 0x00. When the beacon is OFF, it is still connectable, but the ranging function is disabled (e.g. it is not received by iOS CoreLocation).
4. By default the beacon is connectable. In order to set the beacon in non-connectable mode, this value must be reset to 0x00. Non-connectable mode is required by Apple iBeacon specifications and also increases battery life (up to +30%). When beacon is in non-connectable mode, it can be set in connectable mode in two ways:
   - by removing and reinserting the battery: for a limitied time lapse the beacon is connectable and can set in connectable mode;
   - by imposing a finite time for non-connectable mode operating mode (see Note 5)
5. By default, when the beacon is set in non-connectable mode, it works in this mode indefinitely. It is possible to set a finite period for non-connectable mode, by setting a non-zero value. Maximum value is 0x78 (120 hours).

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Security Service
UUID: 0x8336*2900*-4d55-445b-b374-d53db987ead8

Name Passkey enable	**UUID** 0x8336*2020*-4d55-445b-b374-d53db987ead8	
Description Enable passkey protection	**Default value** 0x00 [disabled] – Note 6	**Properties** Read/write

Name Passkey	**UUID** 0x8336*2021*-4d55-445b-b374-d53db987ead8	
Description Write access passkey	**Default value** N/A – Note 7	**Properties** Write

Name Set passkey	**UUID** 0x8336*2022*-4d55-445b-b374-d53db987ead8	
Description Set a new passkey	**Default value** 00000000 – Note 8	**Properties** Write

Battery Service
UUID: 0x180f

Name Battery level	**UUID** 0x2a19	
Description Estimated residual capacity of the battery, expressed in percentage of nominal capacity	**Default value** Vale ranges from 0x64 (=100%) to 0x00 (=0%)	**Properties** Read, variable

Notes

6. By default, passkey protection is disabled. In order to enable passkey protection, the value must be set to 0x01. When passkey protection is enabled, all writable characteristics are modifiable only when correct passkey is inserted.
7. Characteristics used to write the access passkey (access passkey is a 8-digit decimal number). When passkey protection is enabled, at connection, the user has 30 seconds to enter the passkey. If passkey is not entered within 30 seconds or passkey is wrong, beacon disconnects, and starts working for 1 hour in non-connectable mode. During this period, the beacon is properly working, but it is not connectable (see Note 4). If the user forget the passkey, a reset passowrd can be used: reset password will be communicated on the base of beacon model and serial number.
8. Default passkey can be changed, when logged in with passkey enabled. Any decimal value from 00000000 to 99999999 can be used. It is strongly suggested to use a different passkey for every beacon.