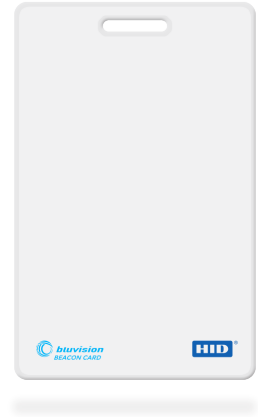


# SPECIFICATION SHEET



## EMPLOYEE CARD VER 2.0



## HARDWARE SPECIFICATION

<b>Battery</b>	Three CR2016 Rated At 80 mAh each. Total 240mAh
<b>Size</b>	2.14" x 3.39" (54mm x 86mm)
<b>Weight</b>	0.5 oz (14 gr)
<b>Temperature Range</b>	-25°C to +65°C
<b>Bluetooth Type</b>	Bluetooth Low Energy 4.1
<b>Bluetooth Sensitivity</b>	-97dBm
<b>Bluetooth Max Power Output</b>	+5dBm
<b>Bluetooth Antenna</b>	0dBm Single Antenna, Omni Directional
<b>Frequency Supported</b>	<ul style="list-style-type: none"><li>• 2.4 Ghz ISM</li><li>• Bluetooth LE channels: 1- 40 &amp; Adv Ch: 37;38;39</li><li>• Non Bluetooth Channels: SDR from 2400Mhz to 2500Mhz</li></ul>
<b>Bluetooth Data Rate</b>	1Mbit/s / 2Mbit/s*
<b>Bluetooth Security</b>	128 bit AES
<b>Power Consumption - RX</b>	7.5mA RX Active Mode
<b>Power Consumption - TX</b>	6.5mA TX Active Mode
<b>Power Consumption - Sleep</b>	1.6 µA (SRAM retention and RTC running)

<b>Operational Life Running</b>	<ul style="list-style-type: none"> <li>• iBeacon power saving mode: 4.5 years at 0dB and 1000ms advertisement rate</li> <li>• iBeacon + Eddystone at 2000ms advertisement each: 2 years</li> <li>• RTLS mode, dynamically advertisement when walking at 500ms and when no motion at 5000ms: 2 years</li> </ul>
<b>Power Output (Range)</b>	<ul style="list-style-type: none"> <li>• -40dBm to +5dBm. Can be configured over the air (Phone or from Cloud via BluFi)</li> <li>• -40 dBm is equivalent to approx. 3m Line of Sight range</li> <li>• +5 dBm is equivalent to approx. 150m Line of sight range</li> </ul>
<b>CPU</b>	<b>Dual Core: ARM Cortex M3 and M0</b> <b>Smart sensor processing and learning capabilities</b>
<b>Sensors</b>	<p><b>3 Axis Accelerometer</b></p> <ul style="list-style-type: none"> <li>• 12Bit Digital</li> <li>• ODR from 1.56hz to 800hz</li> <li>• Four embedded Ch of configurable motion detection: (Freefall, Motion, Pulse, Transient)</li> <li>• Maximum Digital Sensitivity 1024 counts/g</li> <li>• Custom detection: Step counting and human movement</li> </ul> <p><b>High Accuracy Temperature Sensor (Optional)</b></p> <ul style="list-style-type: none"> <li>• Accuracy without calibration: 0.5c (max) from -25c to +65c</li> <li>• Accuracy with calibration: 0.2c from -30c to +70c</li> <li>• Resolution: 12bits (0.0625c)</li> <li>• NIST Traceable</li> <li>• Conversion time 26ms</li> </ul> <p><b>Magnetometer (Optional)</b></p> <ul style="list-style-type: none"> <li>• High performance 3-axis magnetometer</li> <li>• 16 bit data output</li> <li>• <math>\pm 4/\pm 8/\pm 12/\pm 16</math> gauss magnetic full scale</li> </ul> <p><b>Light Sensor (Optional)</b></p> <ul style="list-style-type: none"> <li>• Dynamic range from 0.01 lux to 64k lux</li> <li>• 16 bit resolution</li> </ul>
<b>NFC and RFID Integration</b>	[Optional] Supports HID iClass or NFC
<b>Internal Flash Memory</b>	<b>55KB Flash standard</b> Can record internally step counting and human movement for over 1 month
<b>LED</b>	Red LED
<b>Certifications</b>	FCC / CE

# SOFTWARE SPECIFICATION

## **Bluision proprietary Bluetooth Stack - Can be customized for beacon operation:**

- Simultaneous support iBeacon + full Eddystone frames
- Bluetooth band support and Out-Of-Bnd (2.4Ghz ISM) support with auto scan for noise
- Fully compliant with Bluetooth Smart 4.1
- Dual Mode Support: Central and Peripheral
- Central supports multiple BLE connections at the same time with peripherals (Supports connecting at the same time to multiple beacons)
- Peripheral supports multiple BLE connections at the same time with central devices (Supports connecting at the same time to multiple phones)
- Supports Multiple Peripheral Protocols (iBeacon, Eddystone, sBeacon, etc. in same frames)
- Supports Peripheral Reverse RSSI
- Fully configurable
- Can log temperature and acceleration – See sensor & internal flash above

## **Security**

- Bluzone Cloud – Key-vault managed security
- Unique internal key per individual beacon
- Unique Device ID per individual beacon (sBV2 ID)
- Internal Unix time clock /timer since 'On' (Manufacture)
- RSA Private/Public (With Bluzone Cloud key-vault) - Communication from/to beacon encrypted using RSA

## **RTLS Mode:**

- Out-Of-Band adaptive scan advertisement
- 1dB TX Output Accuracy

# BLUVISION BLE STACK SPECIFICATION

## Key Features

- Bluetooth 4.0 compliant single mode protocol stack
  - GAP, SM, GATT, ATT, L2CAP and Link layer protocols
  - Peripheral and broadcaster roles
  - Central role
  - Observer and limited master role
  - Fully embedded software architecture. No bifurcation between Host and Controller
- GATT: Server role. Limited client role
- Advertising
  - Reverse RSSI
  - Configurable interval
  - Configurable adaptive advertisement mode for lower power consumption
- Security Manager: Unauthenticated no MITM. Just Works. OOB
- GAP: Limited Discoverable, General Discoverable
- Operating System
  - Bare metal implementation
  - Callback functions for handling events and interrupts
  - Asynchronous
  - Basic scheduler with interrupt based timer events
- Memory
  - ~54 kB stack and application size (Flash non-volatile memory)
  - ~8 kB RAM requirement
  - No memory Isolation between Application and protocol stack
- Over the Air device firmware update
- Link-Layer
  - Packets per connection interval - Configurable up to 12
  - Connection parameters update
  - Connection channel map update
  - Connection graceful terminate
  - AES128 Encryption request and response
- Calibration
  - Individual, per beacon, calibration TX offset in dBm

## Applications/Services/Profile

- iBeacon support
- sBeacon support
- Eddystone support
- Fully open and easily configurable for 3rd party Beacon protocol