

## IoT Sensor Solution Kit

SY010-PCB-B-WU-IMEAL

SY010-PCB-B-WU-IMEL

SY010-PCB-B-W-IM



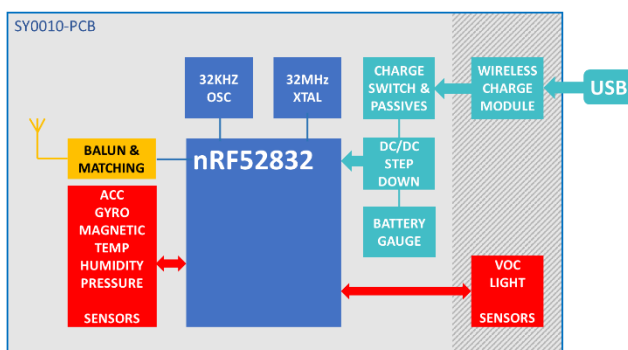
### KEY FEATURES

- **PCB core module**
  - Multiprotocol Bluetooth® Low Energy
  - Antenna-on-Module
  - Low power ARM microcontroller
  - Low power 3-axis accelerometer
  - Low power 3-axis gyroscope
  - Low power 3-axis geomagnetic sensor
  - Temperature
  - Humidity
  - Air Pressure
  - Battery fuel gauge
  - LiPo charger
- **PCB additional sensor & wireless charge module (optional):**
  - VOC
  - Light Sensor
  - Wireless Qi Power Receiver
  - USB connector for power supply

### OVERVIEW

The Sensry Kallisto® embeds sensing, processing, energy management and radio communications in one monolithic size-optimized PCB module. The PCB module also provides core and an optional part of sensors and power management add-ons to enable a huge variety of IoT applications.

Moreover, the Sensry Kallisto® ecosystem provides a hardware abstraction layer that allow developers to seamlessly interact with the module and its features in order to reduce the development cycle. This includes also OTA updates of the firmware SDK and the user software.



Bluetooth® LE antenna and matching network on-PCB; embedded low power sensors: 16-bit IMU and geomagnetic sensor; optional ambient sensors and wireless charge capability. Firmware and software development tools; Pre-programmed Bluetooth LE protocol stack; over-the-air firmware updates. Designed to be seamlessly integrated in different architectures, to allow for shorter development cycles and stimulate the creation of new IoT solutions.

### TARGET APPLICATIONS

- Wireless Wearable Technology
- Wireless connected sensors for healthcare, sport, fitness and industrial applications
- Wireless for IoT applications
- Wireless connected objects
- Wireless connected presence sensors
- Wireless Home automation
- Beacons

## TECHNICAL DATA

<b>Package dimensions</b>	High density PCB 28 x 11.5 (L x W)
<b>Bluetooth Low Energy (BLE) Antenna on-PCB</b>	2.5dBi Gain (2.44GHz)
<b>Supply Voltage</b>	2.2V...5.5V (compatible with Li-Ion, Li-SOCl, Li-MnO <sub>2</sub> and 2 Alkaline batteries) Internal Step-down converter for 1.8V Up to 90% efficiency at 10μA
<b>Digital Interface</b>	TWI and SWD (for Programming/Debugging)
<b>MCU</b>	32bit ARM Cortex M4F – Nordic nRF52 512KB Flash memory, 64kB RAM SWD debug interface OTA (over the air) firmware update
<b>3-axis Accelerometer</b> (Bosch BMI160)	Acc. ranges: ±2g, ±4g, ±8g, ±16g ±2g: 16384 LSB/g ±4g: 8192 LSB/g ±8g: 4096 LSB/g ±16g: 2048 LSB/g
<b>3-axis Gyroscope</b> (Bosch BMI160)	Gyro. ranges: ±125°/s, ±250°/s, ±500°/s, ±1000°/s, ±2000°/s Gyro. typical sensitivity: ±125°/s: 262.4 LSB/°/s ±250°/s: 131.2 LSB/°/s ±500°/s: 65.6 LSB/°/s ±1000°/s: 32.8 LSB/°/s ±2000°/s: 16.4 LSB/°/s
<b>3-axis Magnetometer</b> (Bosch BMM150)	EMF ranges: ±1300 μT (x-, y-axis); ±2500 μT (z-axis) Resolution: 0.3 μT – 12 Bit
<b>Temperature</b> (Bosch BME280)	-40 ... 85°C Accuracy: 0 ... 64°C: ±1.0°C -20 ... 0°C: ±1.25°C -30 ... -20°C: ±1.5°C
<b>Relative Humidity</b> (Bosch BME280)	0 ... 100% rel. humidity Response time: 1s Accuracy tolerance: ±3% rel. humidity Hysteresis: ±1% rel. humidity
<b>Pressure</b> (Bosch BME280)	Pressure Range: 300 ... 1100 hPa RMS Noise: 0.2 Pa, equiv. to 1.7cm Offset temp. coeff.: ±1.5 Pa/K
<b>Light</b> (TI OPT3002)	Optical Spectrum: 300nm – 1000nm Measurement levels: 1.2nW/cm <sup>2</sup> - 10mW/cm <sup>2</sup>
<b>Air quality</b> (AMS CC811)	eTVOC (equivalent Volatile Organic Compound): 0 ppb ... 32768 ppb

Data and specifications are preliminary and subject to change without notice.

## BOARD LAYOUT

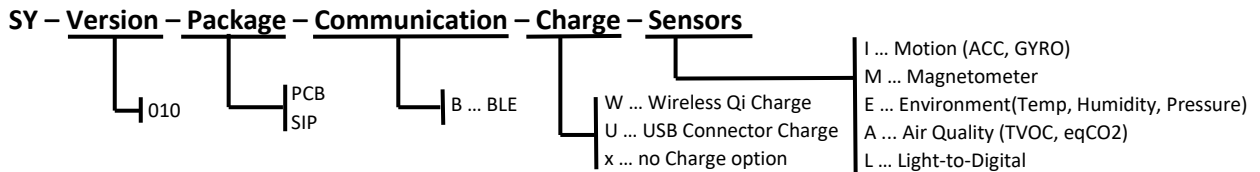
**TOP**

**BOTTOM**

Pad	Description
1	SCL
2	NC
3	SDA
4	5V
5	GND
6	VBAT
7	GND
A1	GND
A2	VBAT
A3	Wireless Charging Coil 1
A4	Wireless Charging Coil 1

- JTAG Debug Interface (can be removed)
- Core Module
- Additional Sensors & Wireless Power

The Sensry Kallisto® platform can be delivered in different assemblies according functionality. The naming convention for assembly options are following the scheme:



Three different standard versions can be ordered as standard products:

<b>SY-010-PCB-WU-IMEAL</b>	BLE, Wireless & USB Charge, IMU, Mag., Environment, Air Quality, Light
<b>SY-010-PCB-WU-IMEL</b>	BLE, Wireless & USB Charge, IMU, Mag., Environment, Light
<b>SY-010-PCB-W-IM</b>	BLE, Wireless Charge, IMU

Other combinations can be assembled on request.