Bluetooth® low energy Sensor Kit
Overview

June 9, 2020

Contents

1. *Bluetooth*® low energy Sensor Kit Product Overview

2. Benefits of *Bluetooth*® low energy Sensor Kit

3. Contents of *Bluetooth*® low energy Sensor Kit

4. *Bluetooth*® low energy Sensor Kit Contents

5. Connection example

6. Handling of sockets

7. Introduction of *Bluetooth*® low energy Development Tools
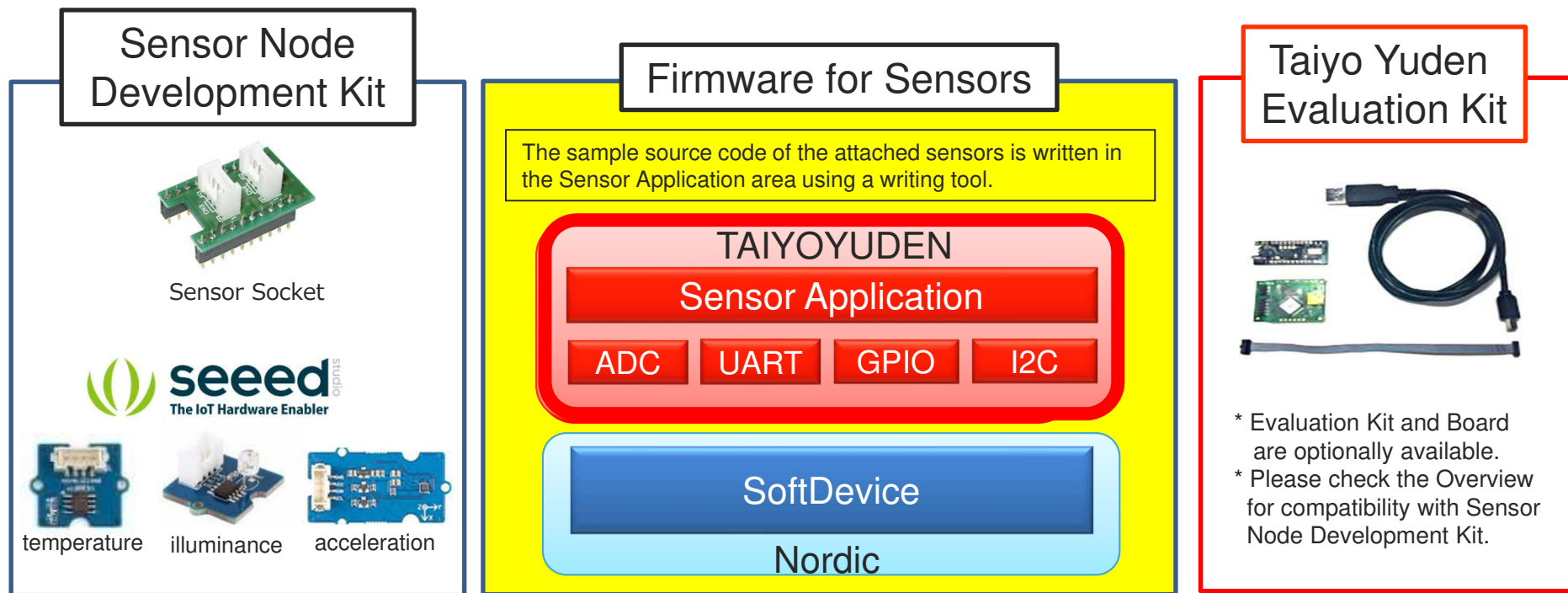
8. *Bluetooth*® low energy Module Reference

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1. *Bluetooth®* low energy Sensor Kit Product Overview

Easy startup of Internet-of-Things with low-power wireless technology

Realize sensor data transmission using TAIYO YUDEN's 2.4GHz (IEEE802.15.1) Evaluation Board and various sensors for temperature, illuminance and acceleration.
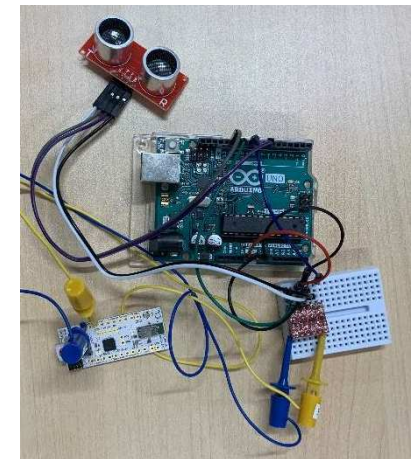＊**EBSKJNZWB is compatible with 802.15.1 / 4**

Best suited for foretaste of IoT and your proof of concept or hypothesis verification.

Sensor Node Development Kit

Sensor Socket

seeed The IoT Hardware Enabler

temperature   illuminance   acceleration

Firmware for Sensors

The sample source code of the attached sensors is written in the Sensor Application area using a writing tool.

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Sensor Application

| ADC | UART | GPIO | I2C |

SoftDevice

Nordic

Taiyo Yuden Evaluation Kit

* Evaluation Kit and Board are optionally available.
* Please check the Overview for compatibility with Sensor Node Development Kit.

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2. Benefits of *Bluetooth*® low energy Sensor Kit (1)

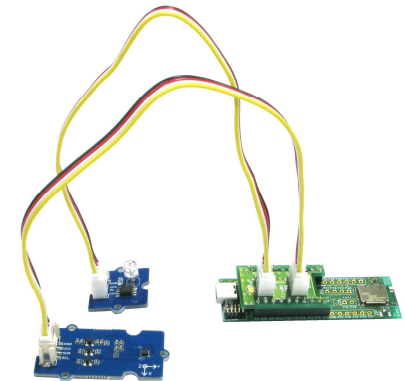## Challenges for creating sensor network…

- Need complex system development : Software developments and configurations are required for each product every time.
  - → Larger development man-hours
- Larger system structure
  - → Less design flexibility

  Example of conventional system structure :
    Arduino (Raspberry Pi)＋ Wireless function+ Sensors
- Need preparation of test environment for various evaluations such as BLE communication, sensor operation, etc.
  - → Required evaluation environment preparation
- Take more time to build prototype and finish product because the design should be started at early PoC stage.
  - → Larger man-hours for design and evaluation

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2. Benefits of *Bluetooth®* low energy Sensor Kit (2)

Resolve the problems with BLE Sensor Node Development Kit !!

- Easy system development
  Sensor node will work without development as just write accompanying firmware. Provide technical assistance by source code, various manuals and development support.
  → Minimize development man-hours
- Smaller system configuration
  → Maximize design flexibility
  System structure with BLE sensor Kit :
  Module with Nordic SoC (ARM) + Sensor socket + Sensors
- Applications are available for various evaluations such as BLE communication, sensor operation, etc. For Android OS and iOS.
  → No need evaluation environment preparation
- Readily evaluate with close configuration to prototype or product
  → Minimize man-hours for design and evaluation

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3. Contents of *Bluetooth*® low energy Sensor Kit

PN: EY1SENSOR-KIT	PN: EY1SENSOR-SKT
■ Sensor Kit	■ Sensor Socket

Seeed Technology

- Sensor Socket
- Temperature Sensor (Part Number: 101020015)
- 3-Axis Digital Accelerometer (Part Number: 101020582)
- Light Sensor(Part Number: 101020132)

Sensor Socket

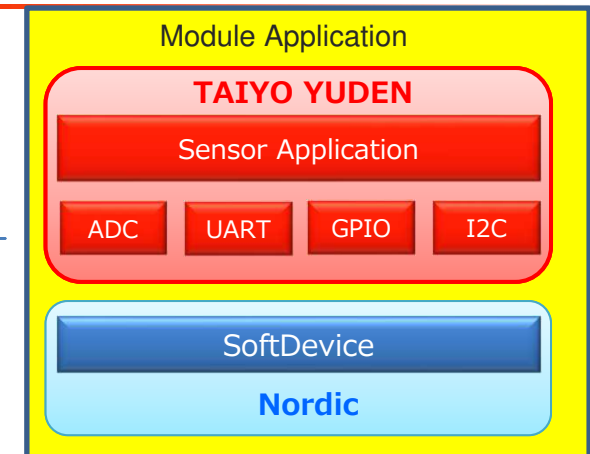* When you place an order, please specify the product name of "EY1SENSOR-KIT" or "EY1SENSOR-SKT".

Supported Evaluation Boards

Board Part No.	EBSKJNZWB	EBSHCNZWZ	EBSHJNZWZ	EBSHSNZWZ	EBSLCNZWW	EBSLSNZWW
SoC	nRF52840	nRF52832	nRF52832	nRF52832	nRF52810	nRF52810
Board Size [mm]	19.4x44.2x8.1	19.8x60.0x8.1	19.4x44.2x8.1	19.4x44.2x8.1	19.8x60.0x8.1	19.4x44.2x8.1
Module Size [mm]	5.1x11.3x1.3	9.6x12.9x2.0	5.1x11.3x1.3	3.25x8.55x0.85	9.6x12.9x2.0	3.25x8.55x1.00
Board I/F	UART	UART	UART	UART	UART	UART
Module I/O	UART, SPI, I2C, I2S, PDM	UART, SPI, I2C, I2S, PDM	UART, SPI, I2C, I2S, PDM	UART, SPI, I2C, I2S, PDM	UART, SPI, I2C, PDM	UART, SPI, I2C, PDM
SoftDevice	S140	S132	S132	S132	S112	S112
Remark	Long Range					

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4. *Bluetooth®* low energy Sensor Kit Contents

Module Application

Type	File Name
Firmware for Beacon	Multisensor_Borad_"Partnumber"_beacon.zip
Sample code for Beacon	Multisensor_Borad_Beacon_vX.YY.zip
Connection firmware for thingy	Multisensor_Borad_"Partnumber"_connection_by_thingy.zip

Module Application

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Sensor Application

| ADC | UART | GPIO | I2C |

SoftDevice

Nordic

Smartphone and tablet application

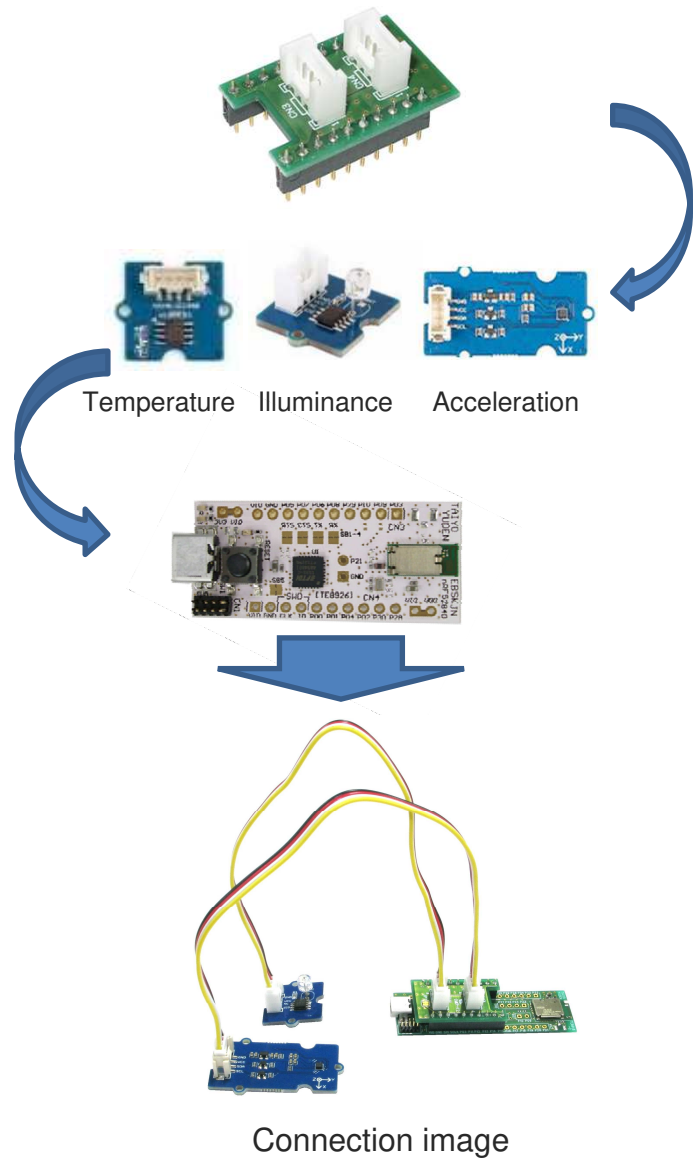| Applecation Name	Supported OS	Provider
TY's Terminal	iOS : 12.1 or later, Android : 4.3 or later	Taiyo Yuden
Thingy	iOS : 9.0 or later, Android : 4.3 or later	Nordic

TY's Terminal

iOS   **Android**

Document

Document Name	Document File
Overview	Sensor_Kit_Overview_20200608.pdf
Sensor Node Development Kit operation manual	Multisensor_Board_Startup_Guide_EN.pdf
BLE manual	BLE-Development-Guide_EN.pdf
Beacon apprication operation manual	Multisensor_Board_Beacon-Terminal_UserManual_EN.pdf
Beacon application development manual	Multisensor-Board-Beacon-DevGuide_EN.pdf
Connection for Thingy operation manual	Multisensor_Board-Thingy_UserManual_EN.pdf

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5. Connection example

Sensor Kit and Smartphone

Smartphone Application

Smartphone

TY's Terminal

Temperature   Illuminance   Acceleration

Advertise

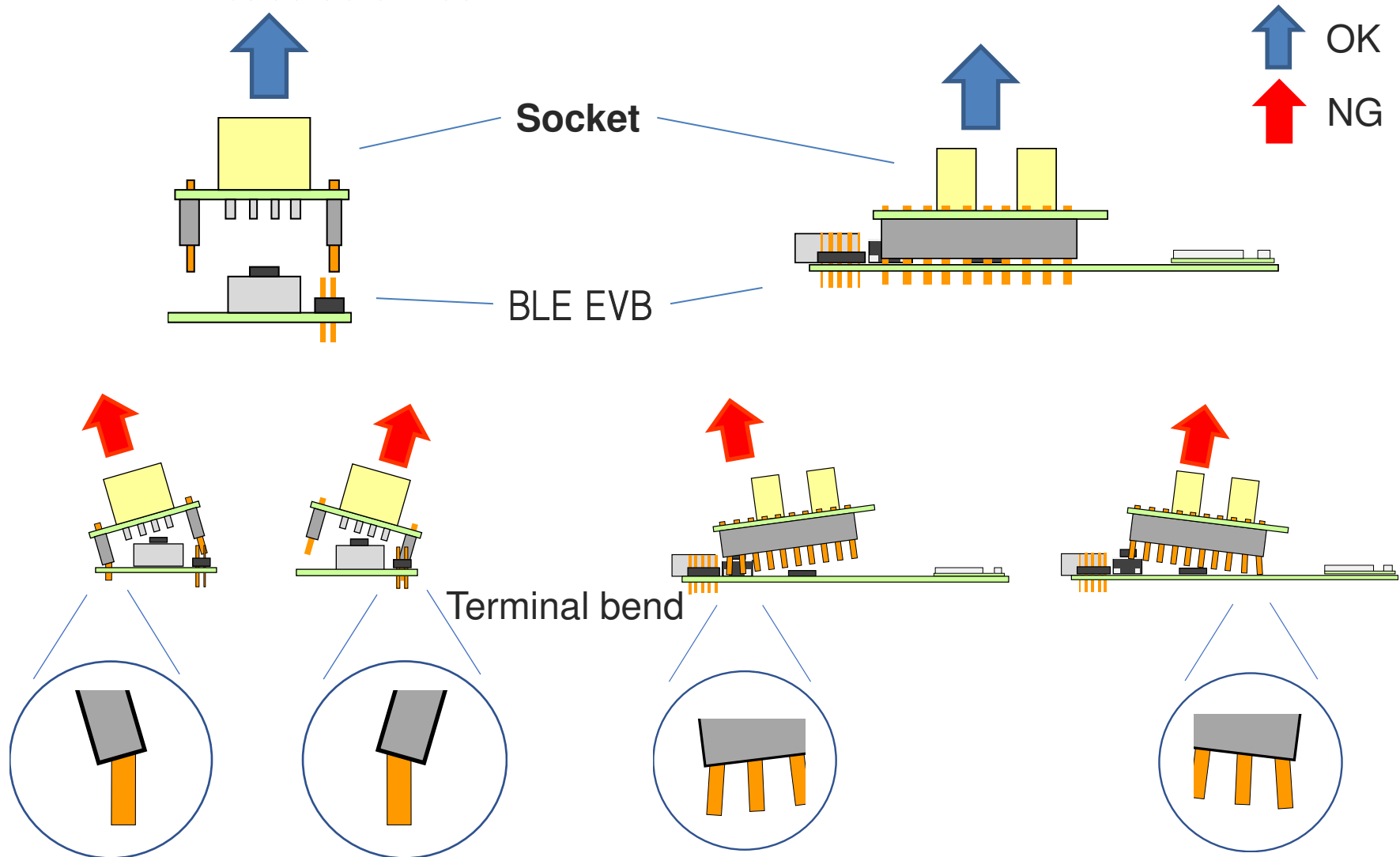Connection

Connection

Connection image

Nordic Thingy

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6. Handling of socket

Note! : When you pull out the socket, be careful not to tilt it so that its terminals will not be deformed.

Socket

BLE EVB

OK

NG

Terminal bend

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7. Introduction of *Bluetooth*® low energy Development Tool

Current consumption　Simulation and Measurement

Nordic Online Simulator

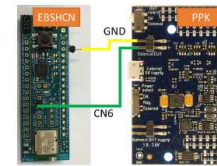https://devzone.nordicsemi.com/nordic/power

- Supports nRF52832, nRF52840, nRF52810.
- By setting parameters, current waveform and current consumption can be simulated.

Nordic Power Profiler Kit

https://www.nordicsemi.com/Software-and-tools/Development-Kits/Power-Profiler-Kit

<App. Screen>　<Connection example with TY module>

- Can measure current consumption without a special measuring instrument.
- When developing an application, you can easily evaluate current consumption under the actual operating condition.

Measure VSWR of antenna circuit

When incorporating the module in the board or housing, the resonance frequency of the antenna may shift. At such time, you can easily evaluate the resonance frequency and VSWR.
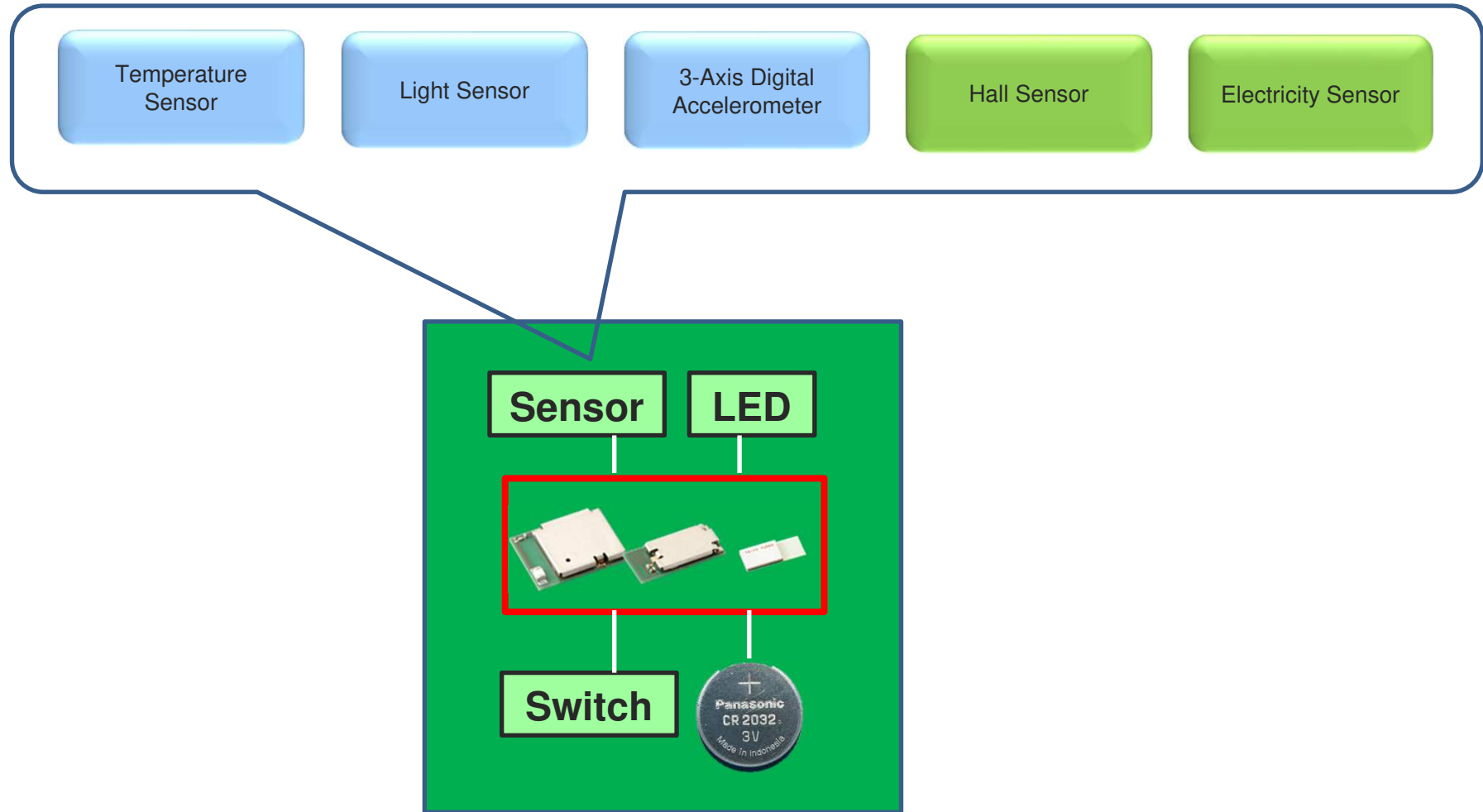
MS46121B series
1-port USB Vector network analyzer

Direct connection to DUT, antenna, etc.

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8. *Bluetooth*® low energy Module Reference

Control by embedded CPU
Temperature Sensor, Beacon, etc.

| Temperature Sensor | Light Sensor | 3-Axis Digital Accelerometer | Hall Sensor | Electricity Sensor |

Sensor   **LED**

Switch   Panasonic CR 2032 3V Made in Indonesia

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