Aerospace & Defence | Lighting | Power Management | Internet of Things | Transportation

Components – EMEA

ESC – Software Solutions

RSL1000(S)

Revision 1.2 20-Aug-21

Getting Started

Five Years Out

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Revision History

Revision, Date	Subject (major changes)
Revision 1.0	Initial Document
Revision 1.1	RSL1000S – board with RSL10 SiP variant
Revision 1.2	Corrected Pinout

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1. RSL1000(S) Overview

Features

- RSL10 Bluetooth 5 certified SoC (RSL10 in SiP in RSL1000S board variant)
- NCP5623 - Triple Output I2C Controlled RGB LED Driver
- NOA1305 - Ambient Light Sensor with I2C Interface and Dark Current Compensation
- PCA9655 - Remote 16-bit I/O Expander for I2C Bus with Interrupt
- LIS3DH - MEMS digital output motion sensor
- Integrated J-Link OB debugger

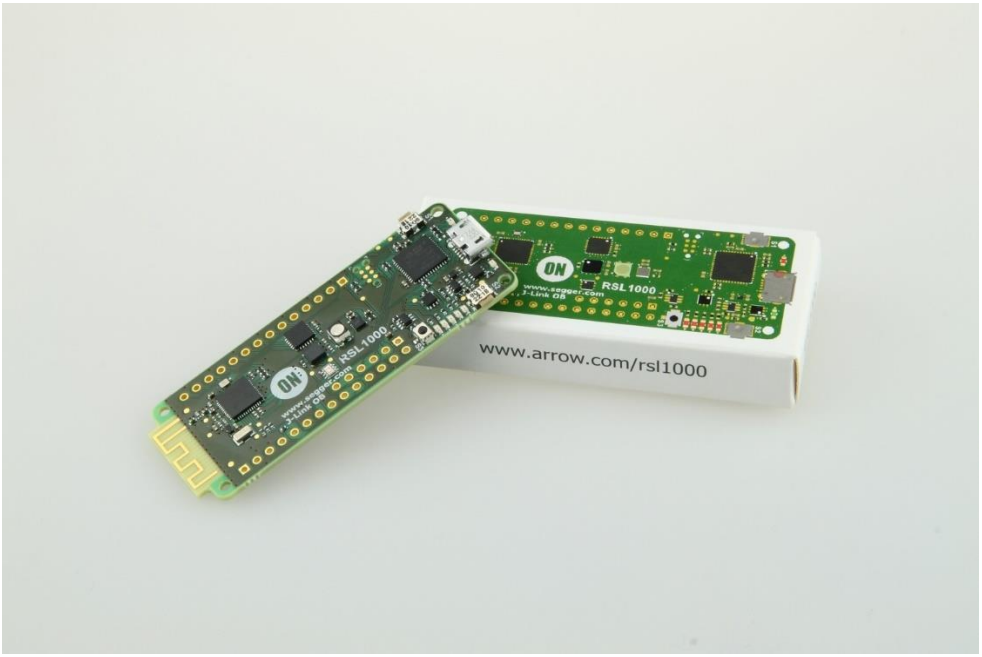
Description

RSL1000(S) is a solution board for Internet of Things(IoT), based on the newest RSL10 Bluetooth 5.0 System on Chip (SoC). Integrated on-board J-Link debugger and available software package simplify and speed up bringing the user application to market. It is ideal for developing IoT Edge-Node devices, prototyping wearables or utilizing latest features of Bluetooth 5.0

Kit contents

The following items are included in the box:

- 1x RSL1000(S) Evaluation Board



2. **Requirements**

Hardware

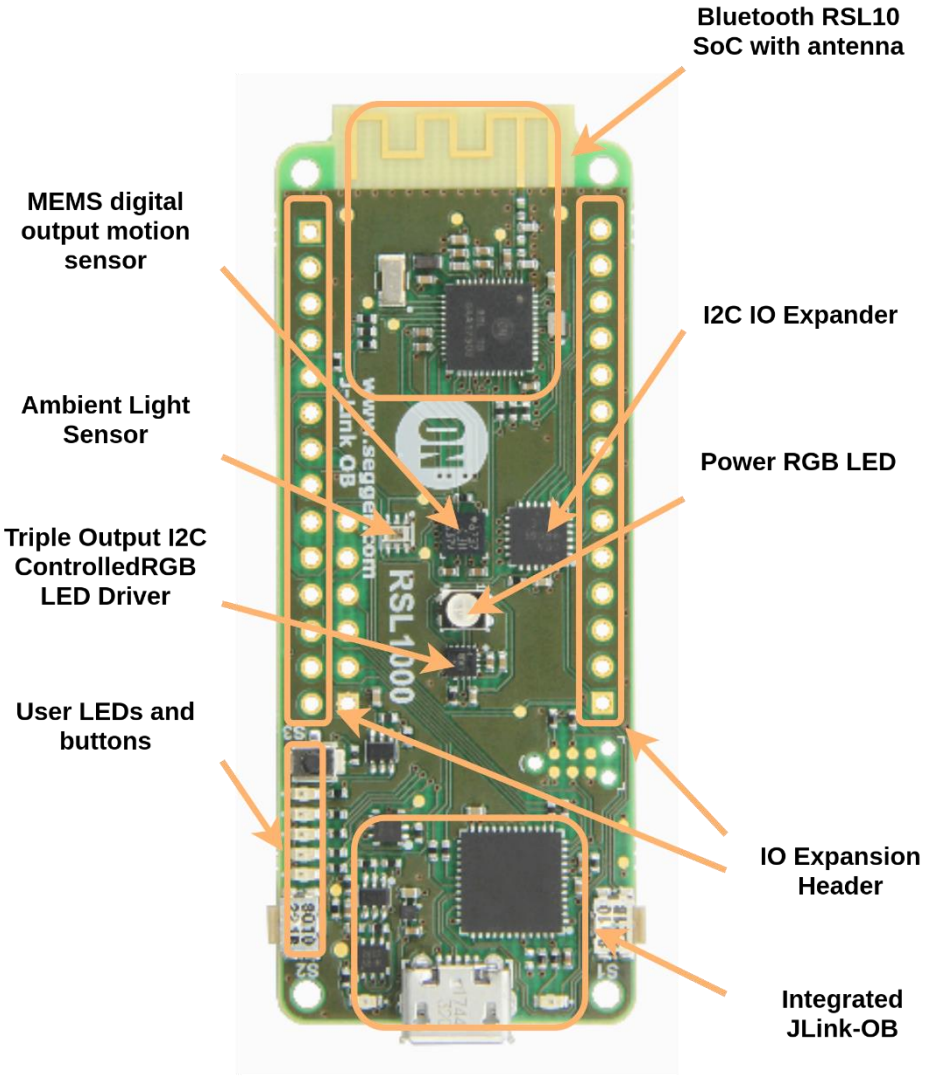
1. RSL1000 or RSL1000S board
2. Micro USB cable and USB charger, power bank or PC port
3. iPhone 7 or newer
4. Android device 5 or higher with Bluetooth Low Energy support

Software

5. iPhone Sensors Demo App
6. Android Dashboard App

3. RSL1000(S) Evaluation Board

Components



RSL10 Bluetooth 5 certified SoC

RSL10 is an ultra−low−power, highly flexible multi−protocol 2.4 GHz radio specifically designed for use in high−performance wearable and medical applications. With its Arm® Cortex®−M3 Processor and LPDSP32 DSP core, RSL10 supports Bluetooth low energy technology and 2.4 GHz proprietary protocol stacks, without sacrificing power consumption.

You can find documentation on below link or go to onsemi.com and enter “RSL10” in the search field!

https://www.onsemi.com/pub/Collateral/RSL10-D.PDF

NCP5623 - Triple Output I2C Controlled RGB LED Driver

The NCP5623 mixed analog circuit is a triple output LED driver dedicated to the RGB illumination or backlight LCD display.

More documents at below link or go to onsemi.com and search for “NCP5623D”!

https://www.onsemi.com/pub/Collateral/NCP5623-D.PDF

NOA1305 - Ambient Light Sensor with I2C Interface and Dark Current Compensation

The NOA1305 ambient light sensor (ALS) is designed for handheld applications and integrates a 16−bit ADC, a 2−wire I2C digital interface, internal clock oscillator and a power down mode. The built in dynamic dark current compensation and precision calibration capability coupled with excellent IR and 50/60 Hz flicker rejection enables highly accurate measurements from very low light levels to full sunlight. The device can support simple count equals lux readings in interrupt−driven or polling modes. The NOA1305 employs proprietary CMOS image sensing technology from ON Semiconductor to provide large signal to noise ratio (SNR) and wide dynamic range (DR) over the entire operating temperature range. The optical filter used with this chip provides a light response similar to that of the human eye.

More documents at below link or go to onsemi.com and search for “NOA1305”!

https://www.onsemi.com/pub/Collateral/NOA1305-D.PDF

PCA9655 - Remote 16-bit I/O Expander for I2C Bus with Interrupt

The PCA9655E provides 16 bits of General-Purpose parallel Input / Output (GPIO) expansion through the I2C−bus / SMBus. The PCA9655E consists of two 8−bit Configuration (Input or Output selection); Input, Output and Polarity Inversion (active−HIGH or active−LOW operation) registers. At power on, all I/Os default to inputs. Each I/O may be configured as either input or output by writing to its corresponding I/O configuration bit. The data for each Input or Output is kept in its corresponding Input or Output register. The Polarity Inversion register may be used to invert the polarity of the read register. All registers can be read by the system master. The PCA9655E provides an open−drain interrupt output which is activated when any input state differs from its corresponding input port register state. The interrupt output is used to indicate to the system master that an input state has changed. The power−on reset sets the registers to their default values and initializes the device state machine. Three hardware pins (AD0, AD1, AD2) are used to configure the I2C−bus slave address of the device. Up to 64 devices are allowed to share the same I2C−bus / SMBus.

More documents at below link or go to onsemi.com and search for “PCA9655E”!

https://www.onsemi.com/pub/Collateral/PCA9655E-D.PDF

LIS3DH - MEMS digital output motion sensor

The LIS3DH is an ultra-low-power high-performance three-axis linear accelerometer belonging to the “nano” family, with digital I2C/SPI serial interface standard output. The device features ultra-low-power operational modes that allow advanced power saving and smart embedded functions.

More documents at below link or go to st.com and search for “LIS3DH”!

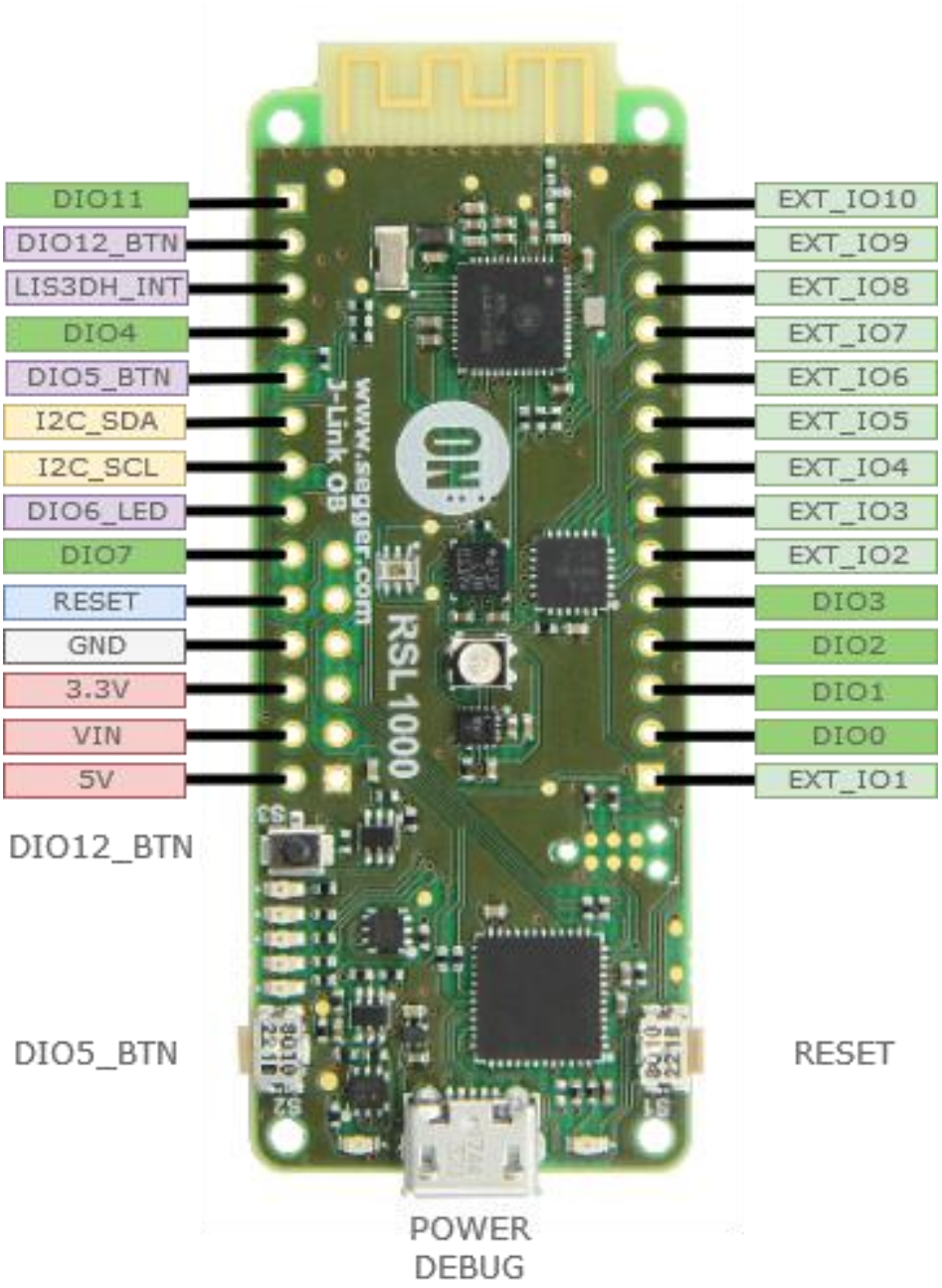
https://www.st.com/resource/en/datasheet/cd00274221.pdf

Integrated J-Link OB debugger
J-Link OB is an on-board debug probe as part of RSL1000 eval board. The microcontroller has a USB-interface on one side and a JTAG/SWD + SWO etc. interface on the device side. It allows debugging the target device on the board it comes with, without the need for an additional debug probe. J-Link OB is used on various eval boards by several eval board manufacturers for various target CPUs.

Note: Microsoft Windows users have to install device drivers prior to using debugging functionalities.

https://www.segger.com/products/debug-probes/j-link/models/j-link-ob/

Pinout diagram



4. Mobile Applications

iPhone – installation

Sensors Demo App is available through beta test program, for details contact your local Arrow Office and ask for Engineer Solutions Center support (iot.gdansk.pl@arrow.com)

- Make sure you have a recent device (i.e. iPhone 7 with iOS 12)
- Open AppStore and search for TestFlight
- Install the TestFlight app
- Once the invitation arrives install the Sensors Demo App via TestFlight

Android – installation

- Download the latest apk version from the: https://arrow.com/rsl1000
- Use your phone and save directly on the target device or download to your computer and copy to the device using USB cable
- Unlock **"Install unknown apps**" (or similar option) in the device system settings
- Find apk file using file browser and tap to install

5. Demonstration software

RSL1000 Evaluation Board

- The RSL1000 Evaluation Board is ready to use right out-of-the-box, however for the best user experience the recommendation is to upgrade firmware to the newest version (available on https://arrow.com/rsl1000)

To start using RSL1000 Evaluation Board connect Micro USB to power supply. It can be either:

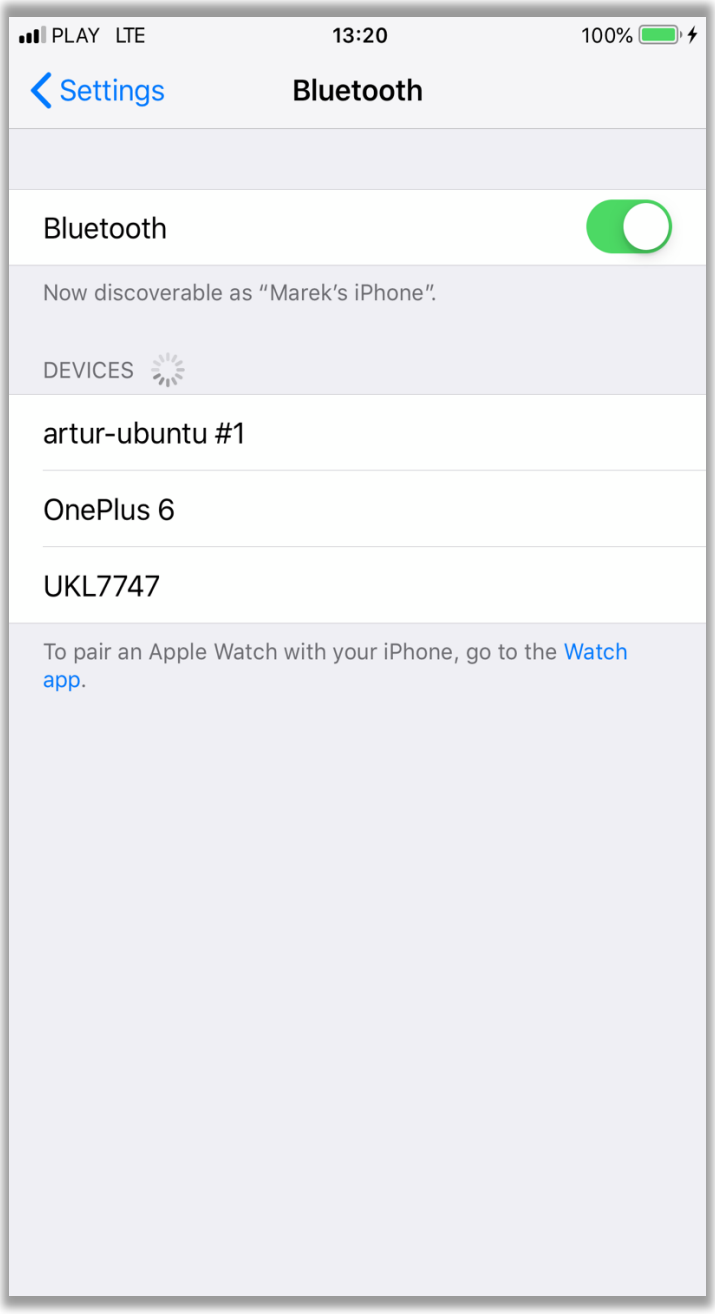
- PC USB port
- USB charger
- Power Bank

User LEDs will start illuminating if demonstration firmware in RSL10 SoC is running properly.

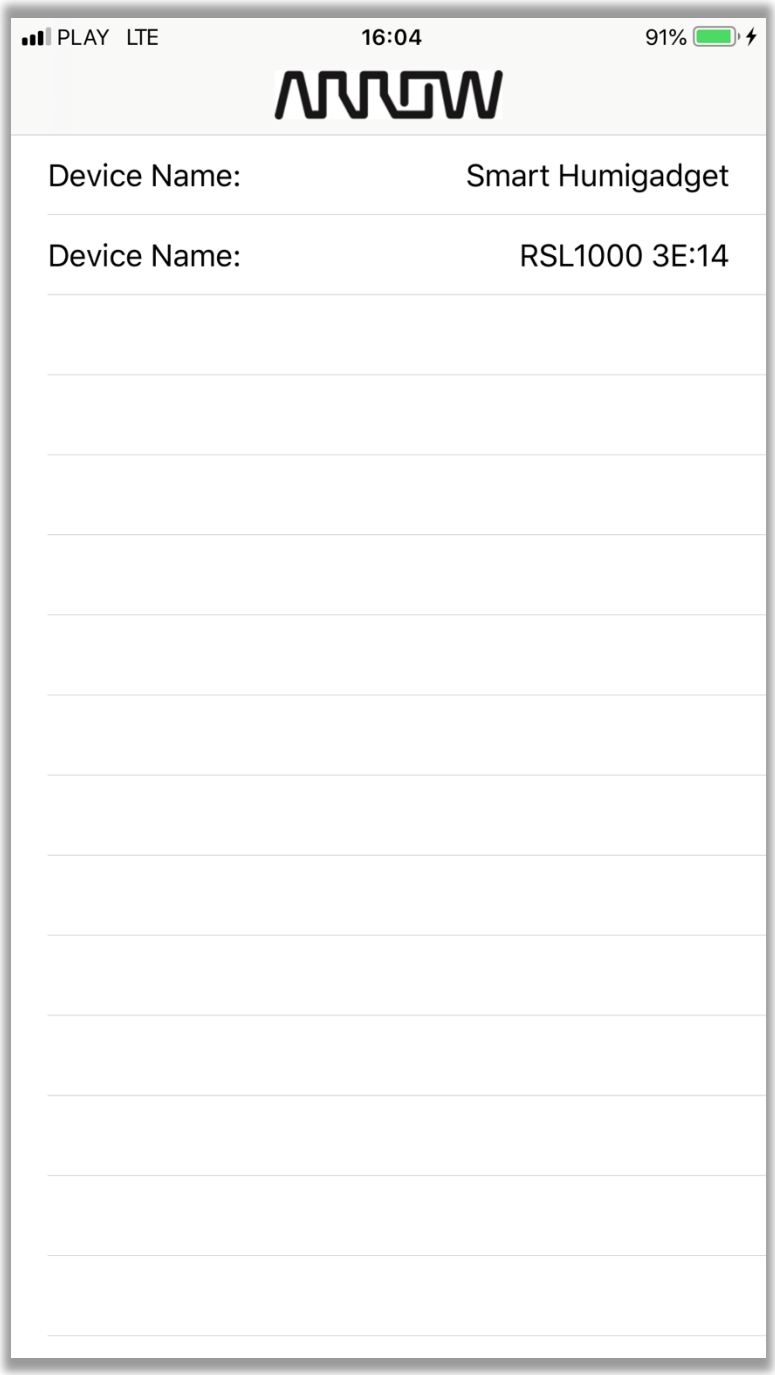
Sensors Demo App

Connect to RSL1000 Evaluation Board

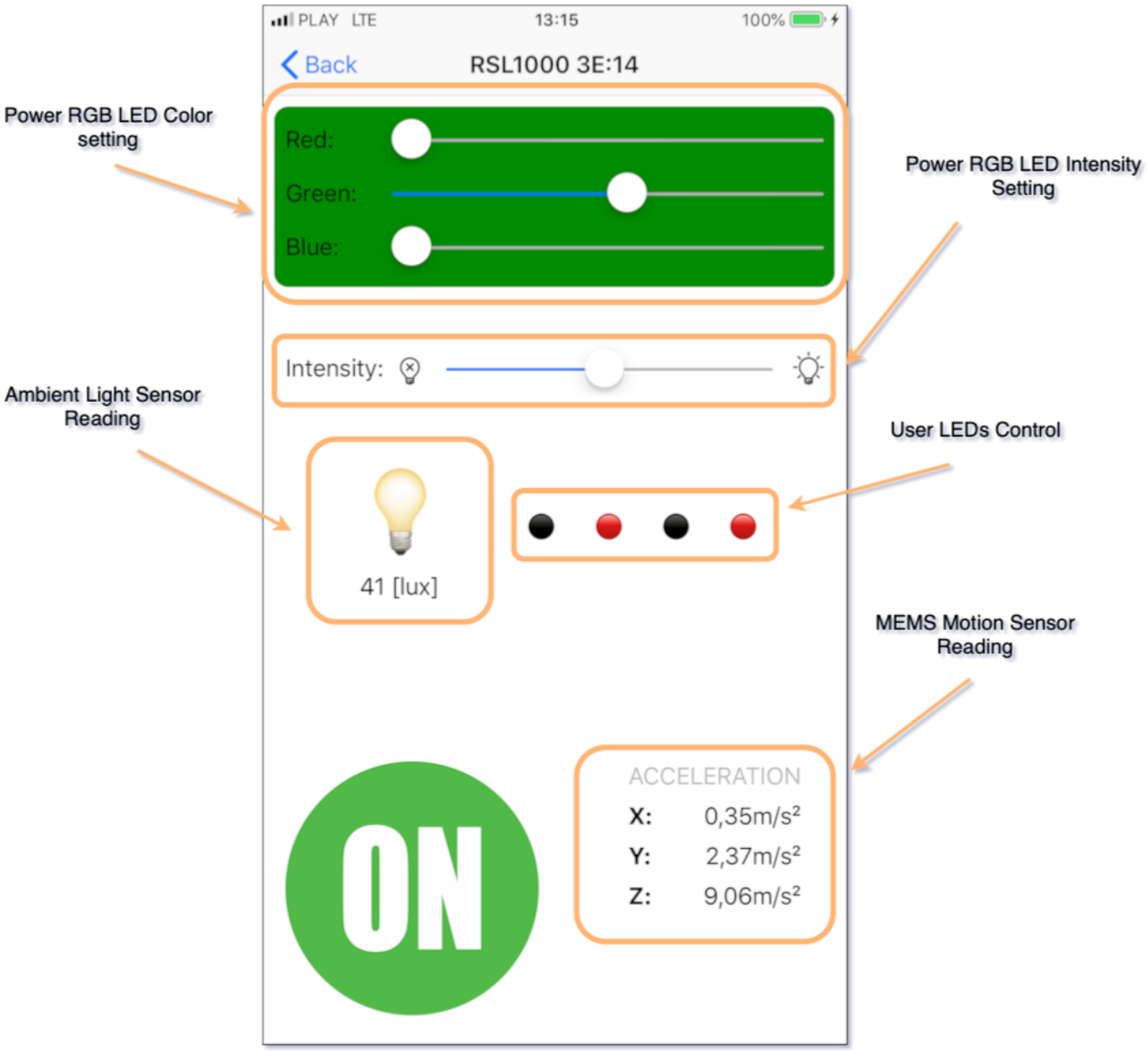
- Before application starts please turn on Bluetooth:



- Application will refresh device list:

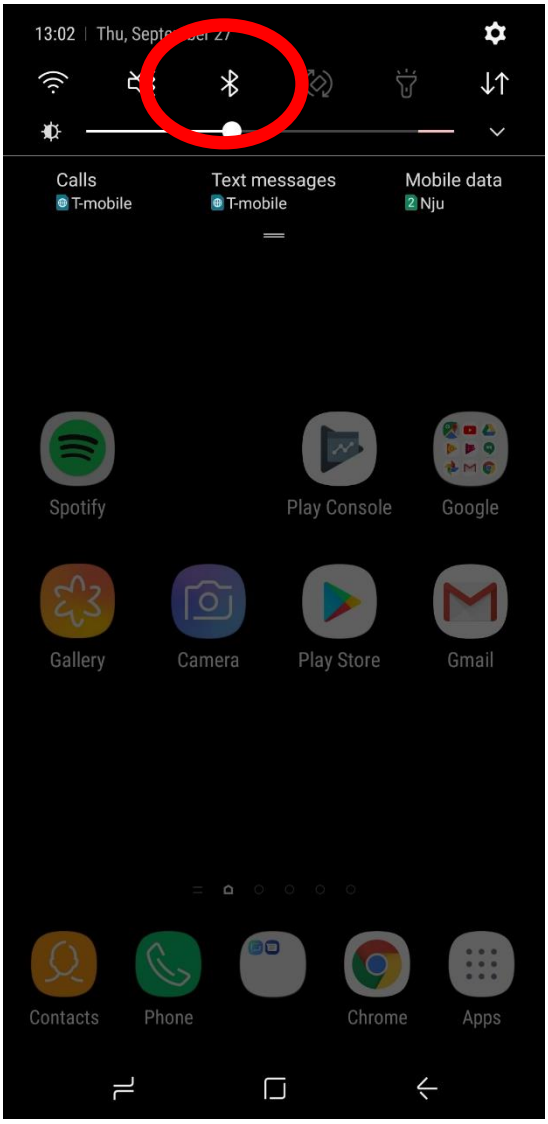


Application components

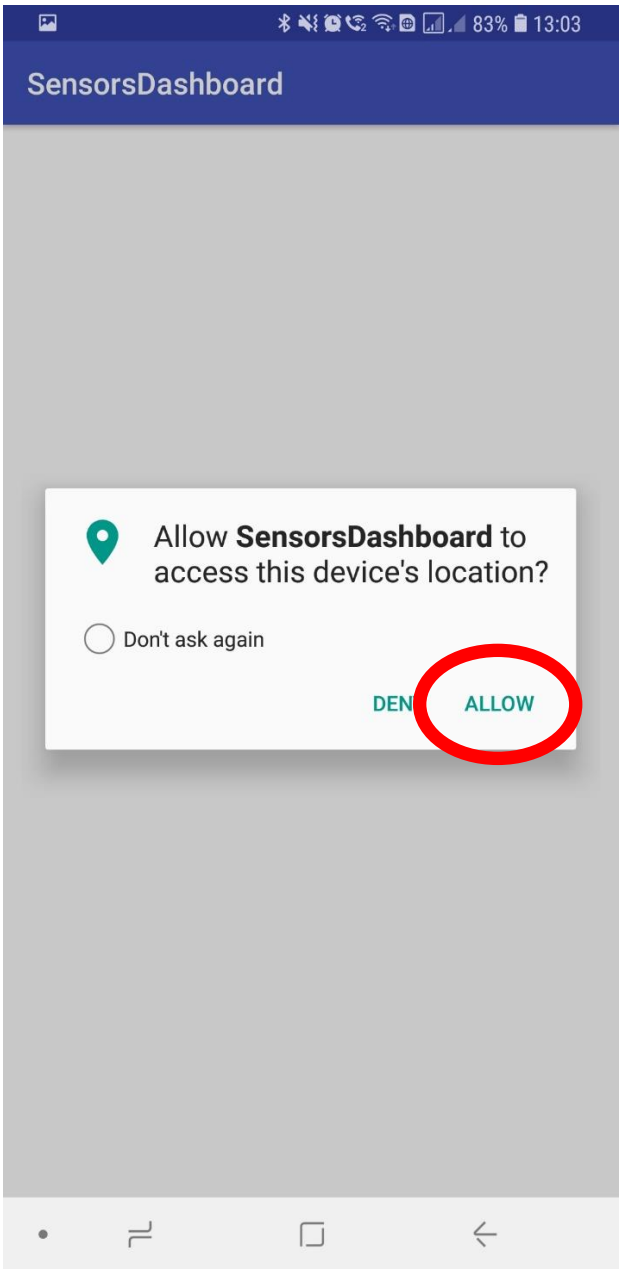


Android Sensors Dashboard

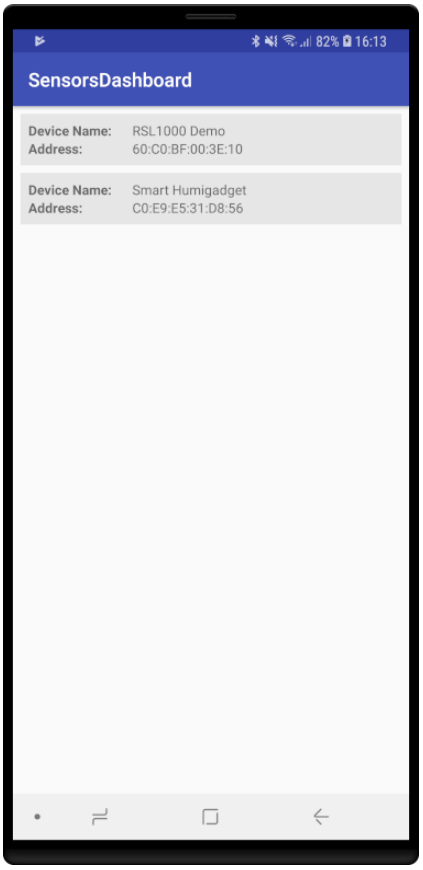
7. Before application start please turn on your Bluetooth



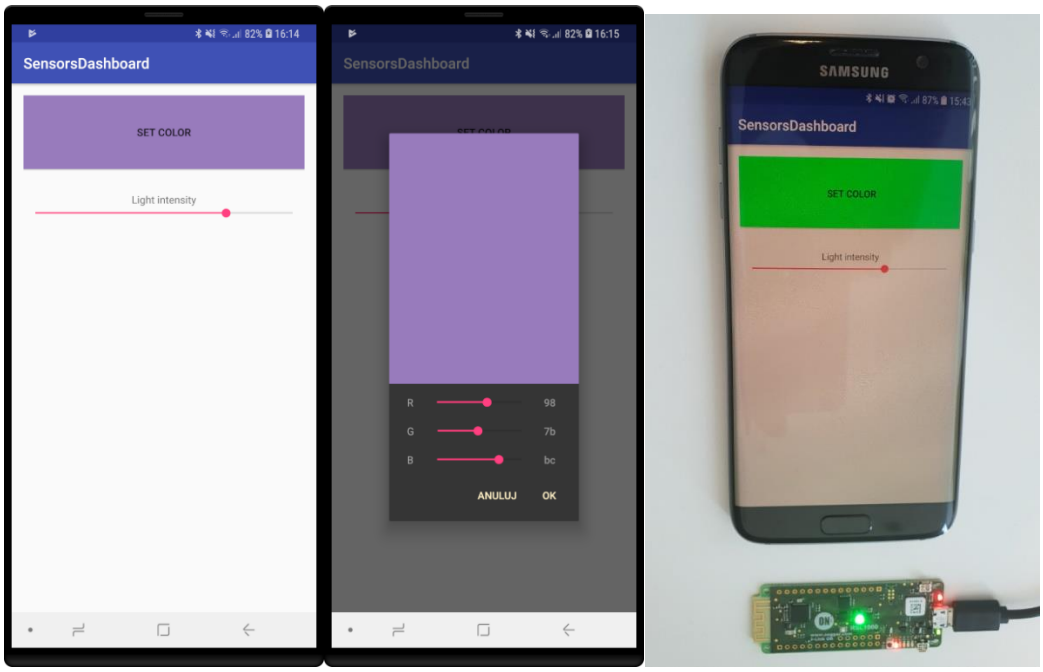
7.1. Run an application and allow location permission



7.2. Application will automatically refresh device list



7.3. If you want to manually refresh device list, please use the pull to refresh feature
7.4. Tap selected device to display detailed view



7.5. Press back button to disconnect sensor and go to device list screen