e-peas Bluetooth Low Energy minidemo user guide

This document provides users with a guide to set up e-peas Bluetooth Low Energy (BLE) minidemo.

Table of contents

1 **General Description** 2

2 **Installing the Android application** 3

3 **Starting the end-node** 9

4 **Using the Android application** 10

Copyright © 2019 e-peas SA

1 General Description

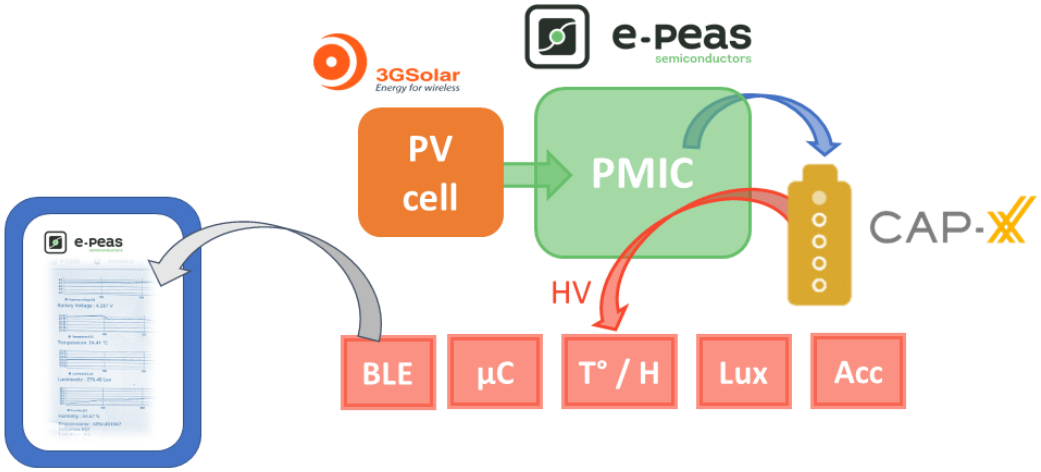
e-peas BLE minidemo demonstrates the ability of our AEM10941 PMIC to power a real-world IoT application.

The complete demonstration consists of the following elements :

- An end-node module with an e-peas AEM10941 PMIC, a 3G-Solar solar cell, a microcontroller (MCU) with BLE radio and various sensors (luminosity, temperature, humidity and an accelerometer).
- An Android tablet or smartphone to visualize the data.

Solar energy is harvested with a 3GSolar photovoltaic cell and the power available is managed with the AEM10941 to the storage element and the load.

The end-node sends periodic messages (called "beacon messages") every 10 s, which contain the sensors data and the storage element (supercapacitor) voltage. Those data are received by the tablet/smartphone which displays them on a time line.

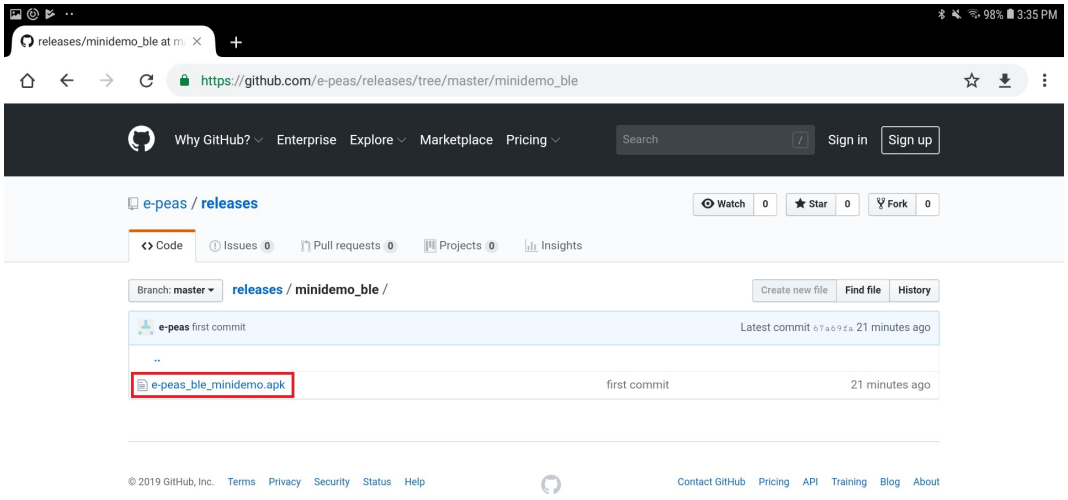


Copyright © 2019 e-peas SA

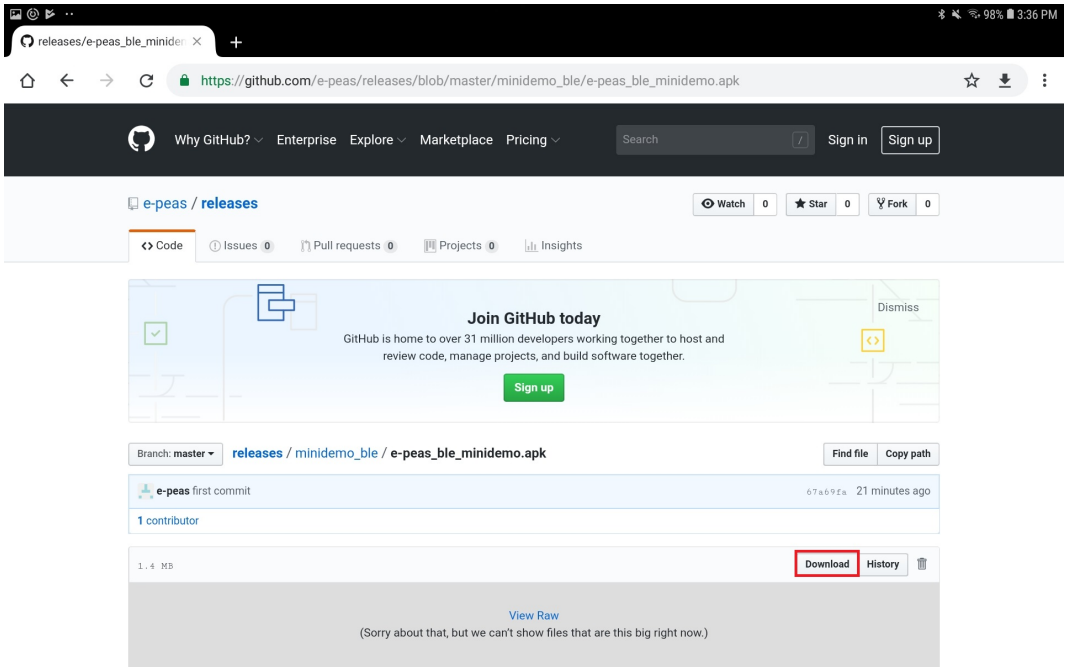
2 Installing the Android application

- Make sure the tablet is connected to the internet with mobile network or WiFi
- with a web browser (typically Google Chrome) go to https://github.com/e-peas/releases/tree/master/minidemo_ble
- click "e-peas_ble_minidemo.apk"

  Note : if using the BLE demonstration board with embedded accelerometer/fall detector, the apk file name is "e-peas_ble_minidemo_acc.apk" *instead of* "e-peas_ble_minidemo.apk"



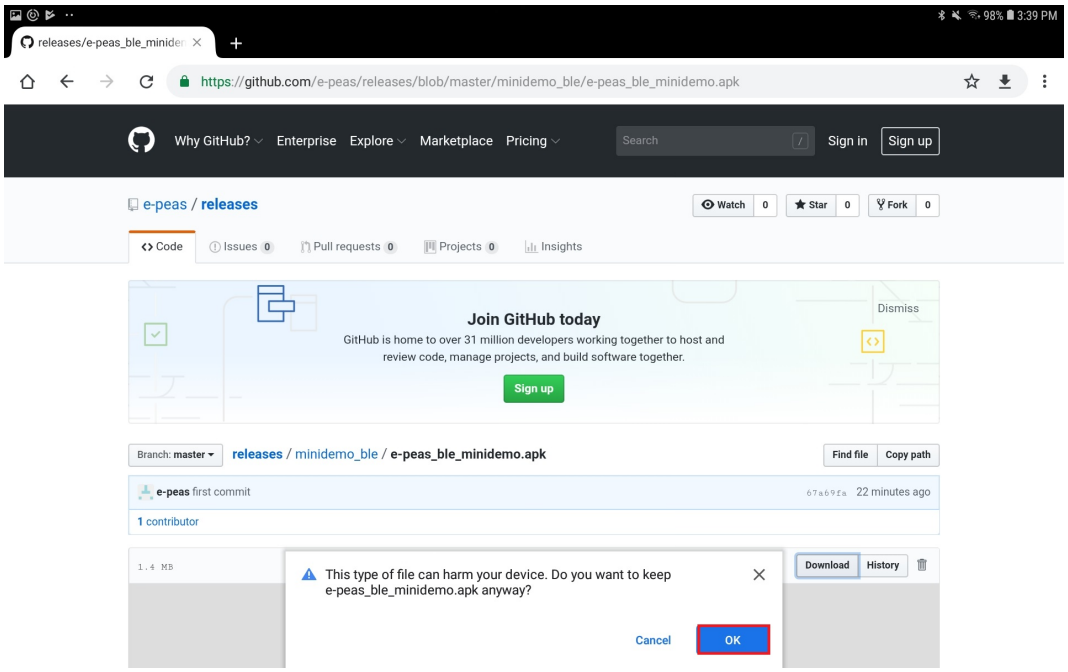
- Click on "Download"



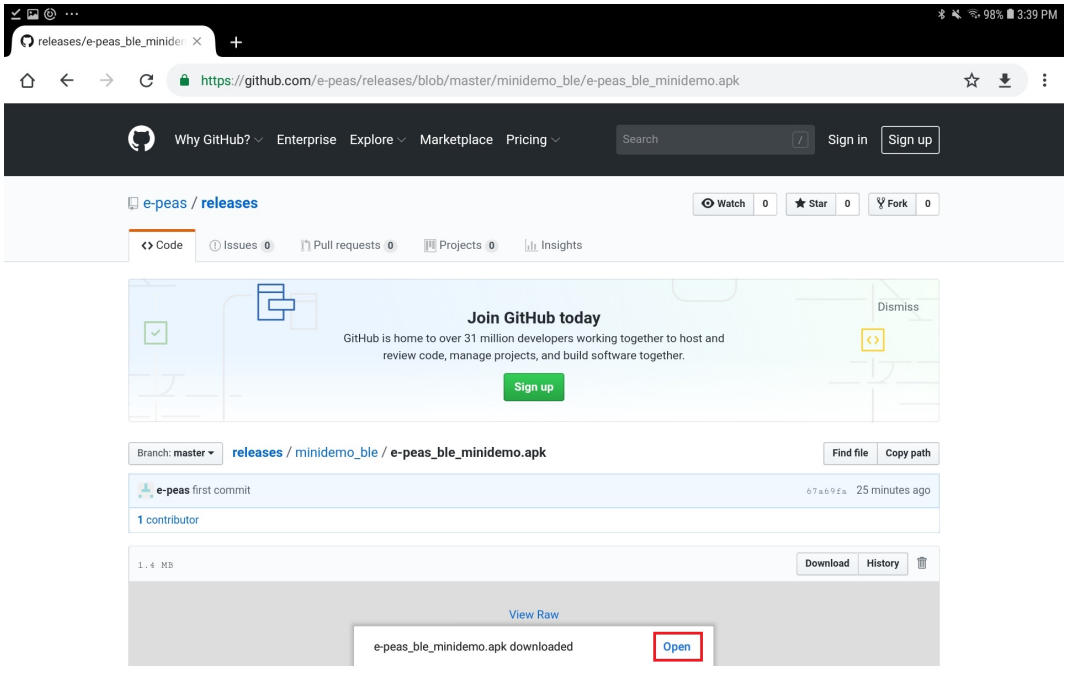
- If asked, please do accept to allow Google Chrome to access you files to continue

Copyright © 2019 e-peas SA

- Accept to keep the file

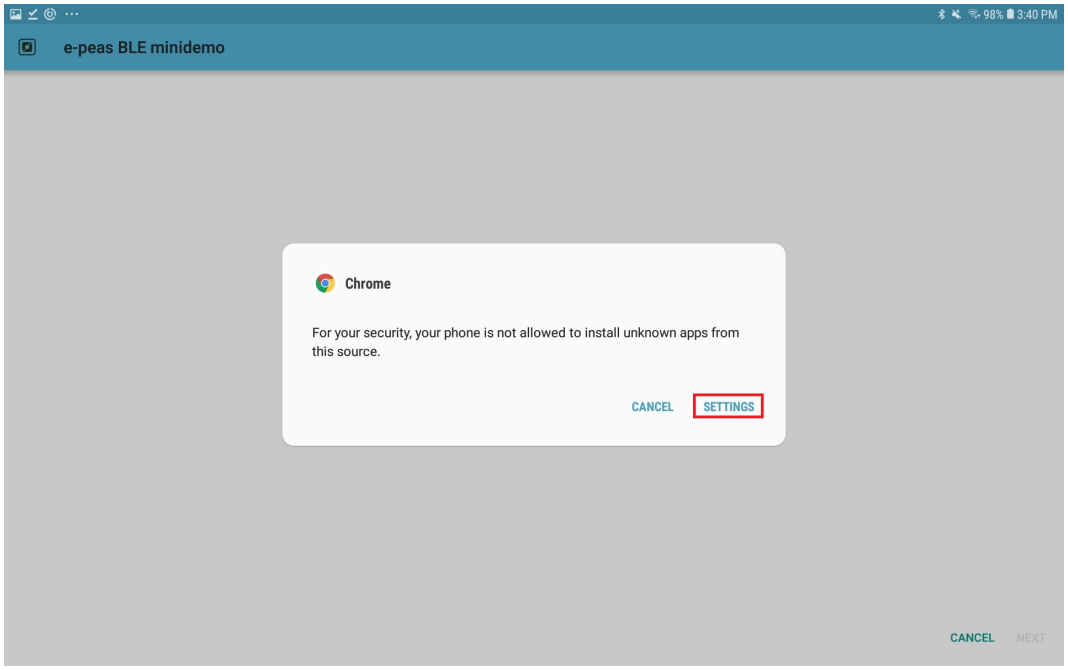


- Click "open" to run the application installer. In case you waited too long and the prompt disappeared, open a file browser application (for example "My Files" on Samsung tablets), go to the "Downloads" folder and launch `"e-peas_ble_minidemo.apk"` from there).

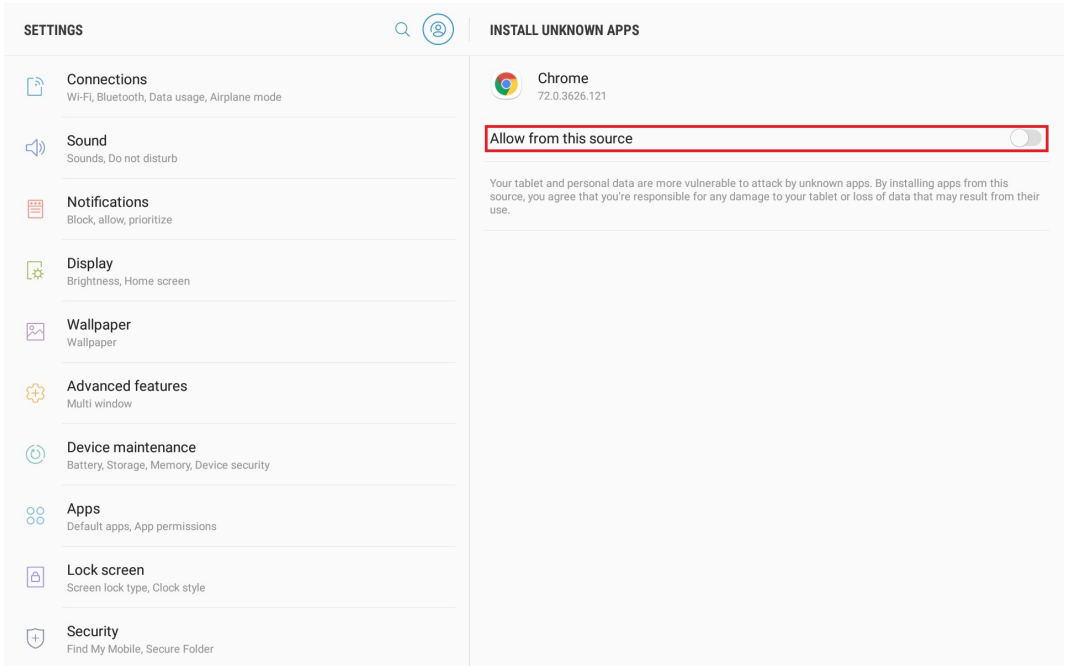


Copyright © 2019 e-peas SA

- Please note that if it is the first time you install an "unknown" application on the tablet, you need to allow installing applications from unknown sources. To do so, click "Settings" as shown here below.

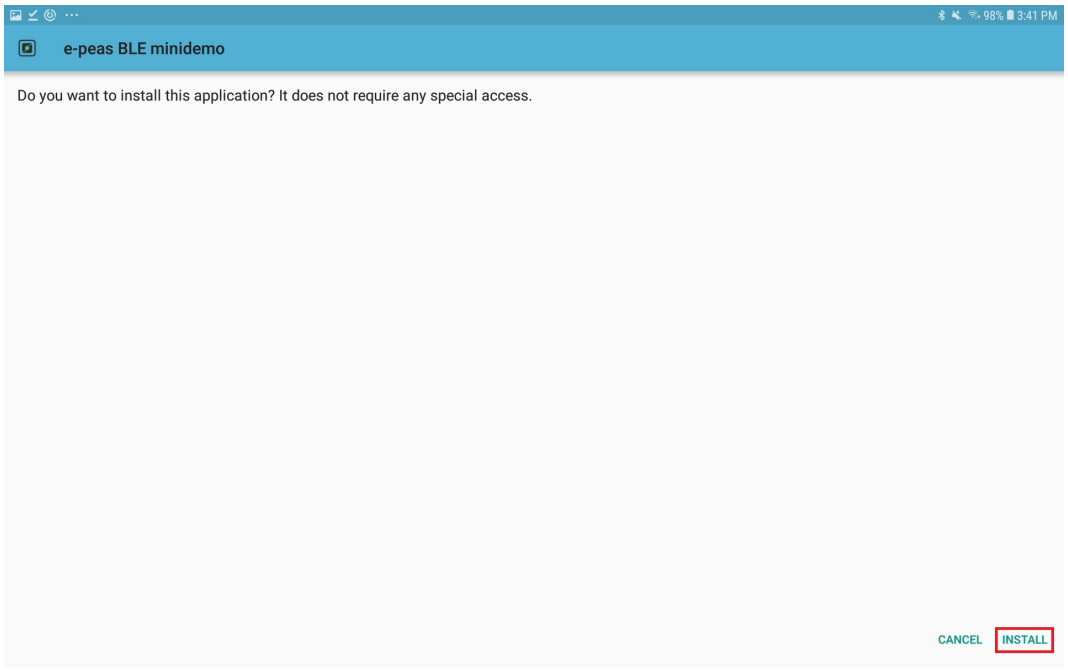


- Click "allow from this source"

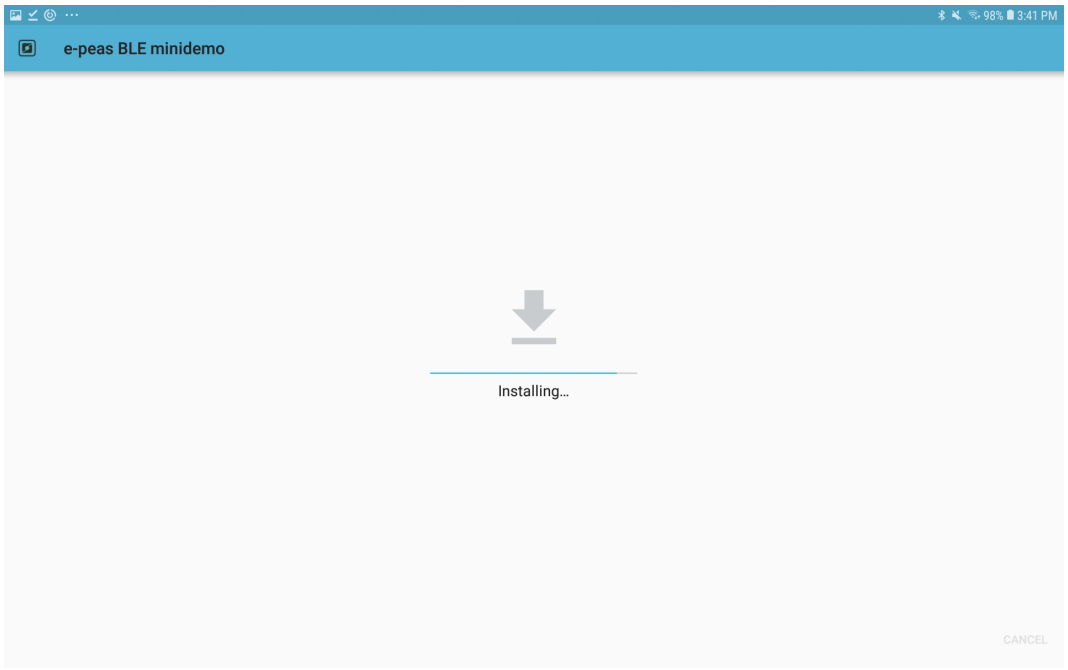


Copyright © 2019 e-peas SA

- Confirm you want to install the application by clicking "install"

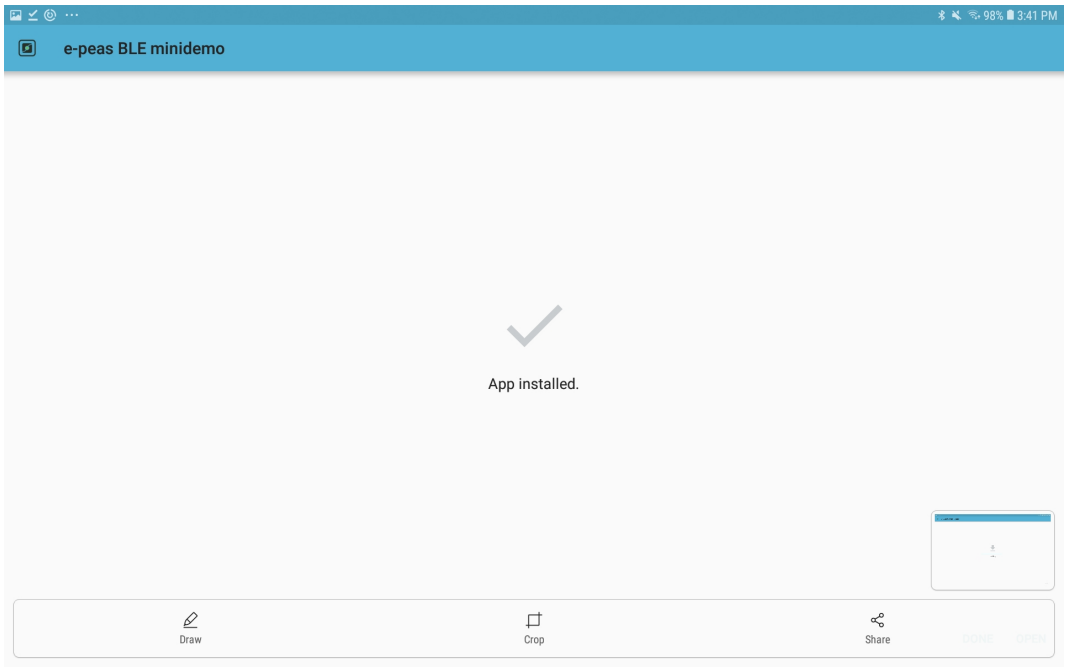


- Wait for the installation to complete

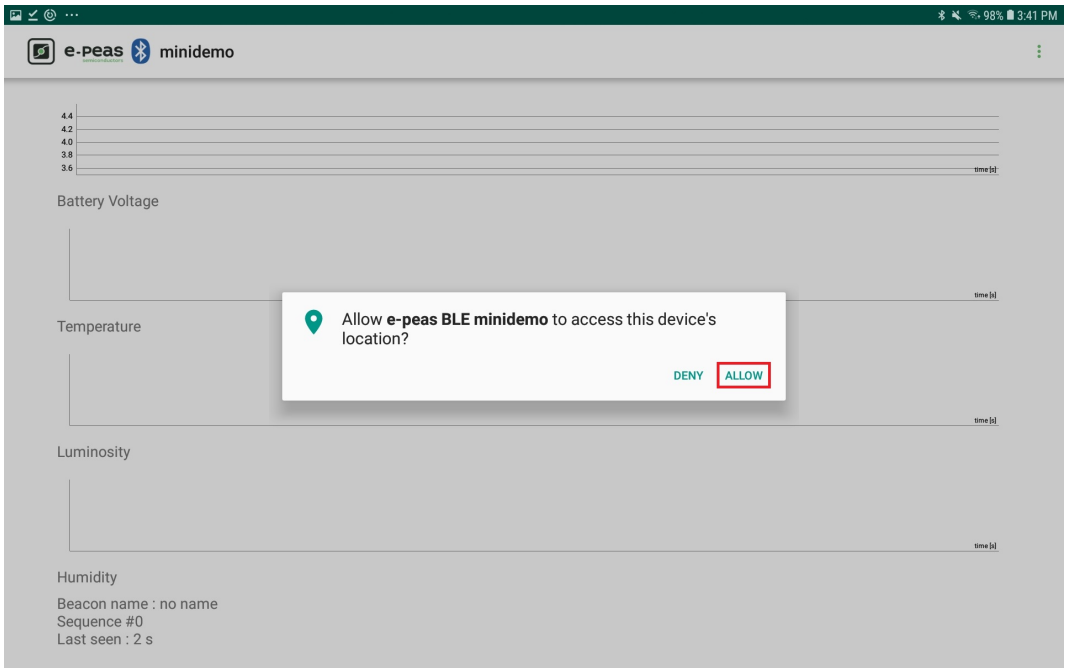


Copyright © 2019 e-peas SA

- If the installation finished correctly, you should see "App installed".



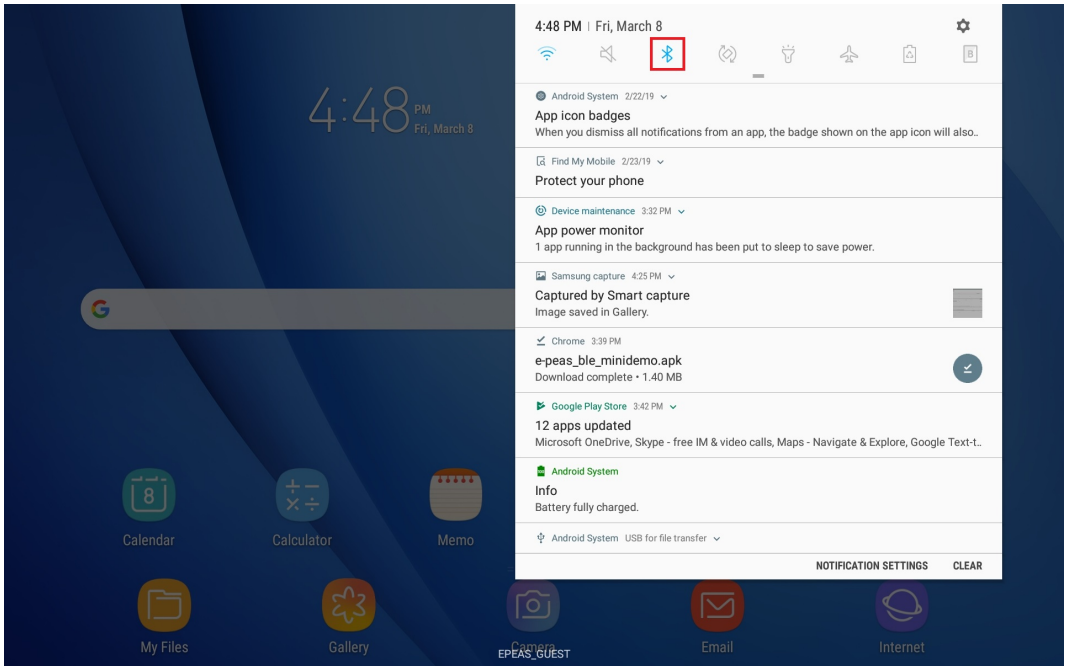
- Allow the application to access to the device's location. Please note that this step is mandatory for Android to access Bluetooth data.



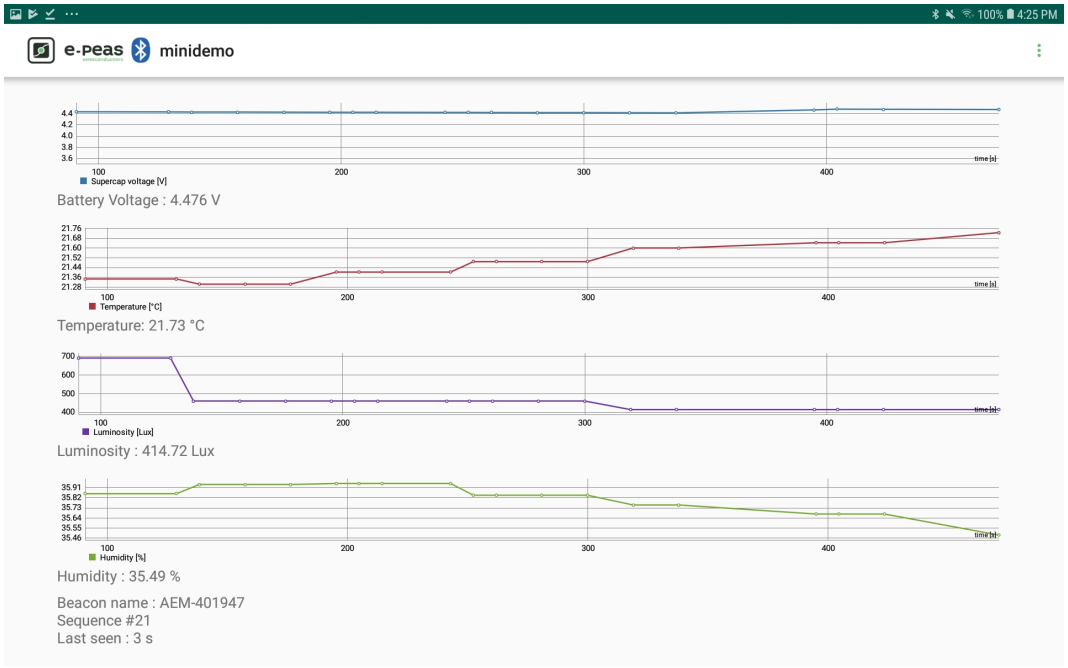
- Close the application

Copyright © 2019 e-peas SA

- Make sure that Bluetooth is activated on the tablet : sweep down from the top of the screen and click on the Bluetooth icon in case it is greyed.



- Start the application again for the location access permission to take effect
- When the end-node is sending beacon messages you will see the data plotted on the screen. See section 4 for more in-depth information on how to use the application.



Copyright © 2019 e-peas SA

3 Starting the end-node

To start the end-node, simply put the ON/OFF switch in the upper position.

- If the supercap is already charged up to Vchrdy level (3.67 V) , the end-node should start sending beacon messages
- If the supercap is not charged yet to Vchrdy level, please leave the end-node below 200 lux (minimum) until the storage element voltage reaches the Vchrdy level. Once the supercap is sufficiently charged the end-node will start sending beacon messages.

Please note that the charge time of the storage element depends on the available power at the source. under low light condition, it might take a significant amount of time. As a example, below indoor light around 1000 lux, it takes around 66 min to charge it from 0 V. This time can be reduced by working with a smaller supercapacitor (which implies less autonomy).

However, please note that after the first charge (from 0 V), the AEM won't discharge the supercapacitor (since it gets disconnected when the storage voltage goes below Vovdis). Starting the end-node after a long period without light only requires to charge the actual storage voltage to the Vchrdy level.
To save power, please use the ON/OFF switch to stop the application if not necessary.

Once the end-node has started, we recommend to leave it on (ON/OFF switch in the upper position) and in a place where light is present during the day. It will turn off during the night in the absence of light and restart in the morning. The time the end-node takes to restart after a period without light depends on the light available and also on the time it was off due to the supercapacitor leakage. After 16 h without light and with 1000 lux, the end-node takes about 15 min to start sending beacon messages again.

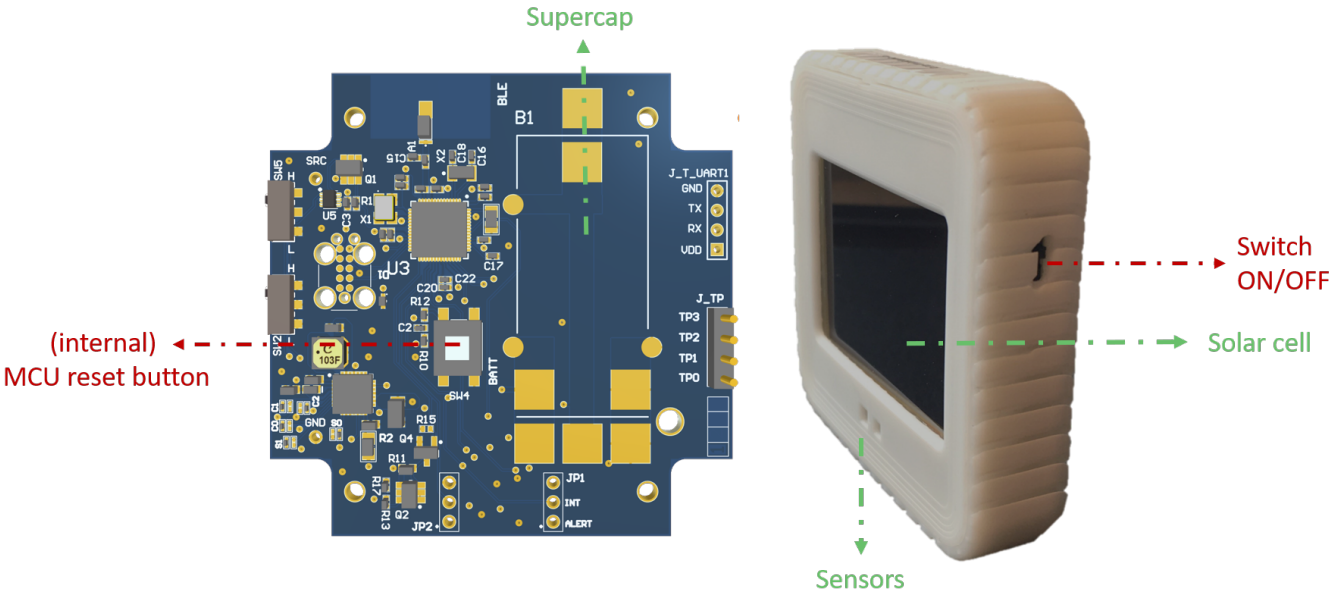


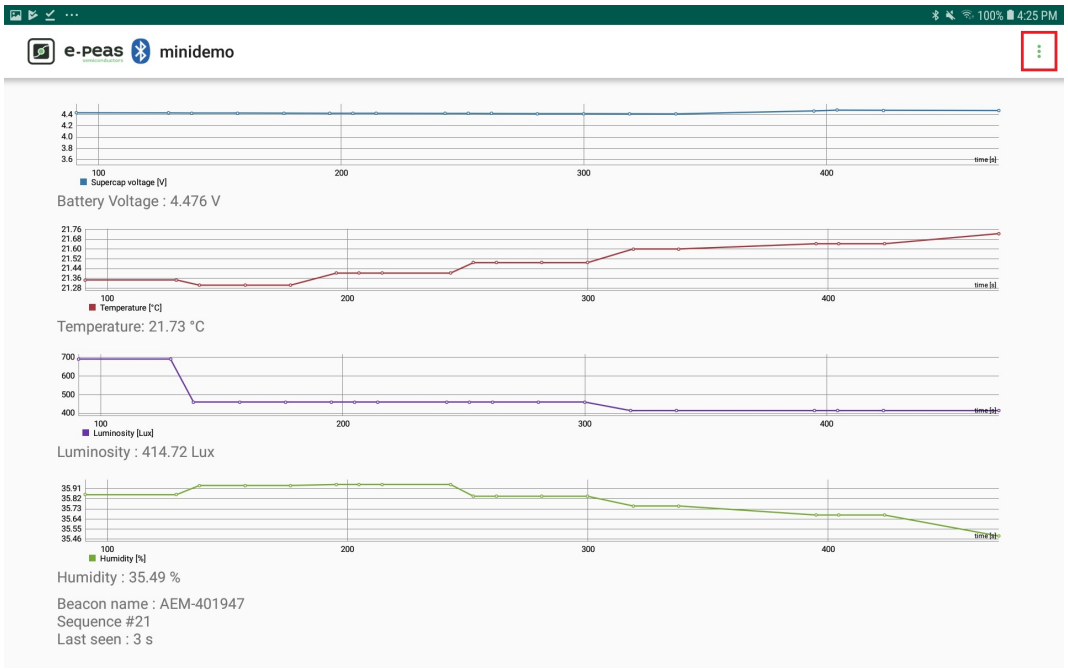
Figure 1: End-node

Copyright © 2019 e-peas SA

4 Using the Android application

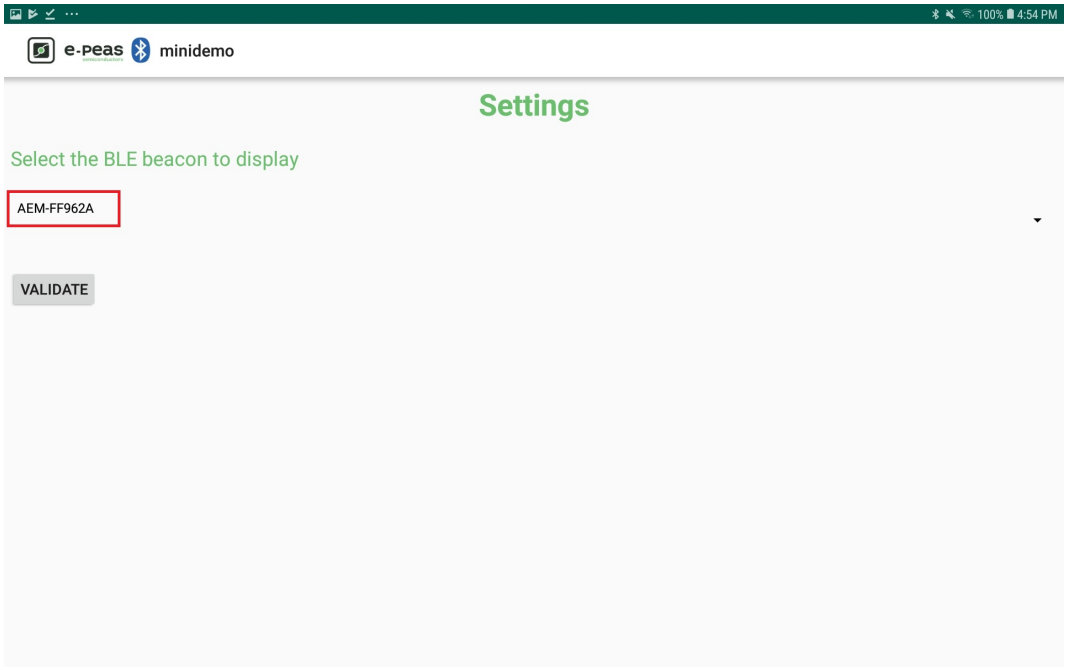
The use of the Android application is pretty straightforward:

- Open the application
- The application plots the sensors values when receiving beacon messages from an end-node. The last received value is displayed under each graph. If the accelerometer detects a shock, a warning message is displayed and instead of the humidity infos there will be shown the 3 axis accelerometer values for the last minute after the shock. Please note that the data is not stored.
- The current end-node name is displayed at the bottom of the screen, as well as the sequence number and the time since a beacon message has last been seen. Note that, depending on the quality of tablet's Bluetooth hardware and the RF environment (like on a tradeshow), a significant number of beacon messages can be missed.
- If you have multiple end-nodes used at the same spot, the application displays only the first one it has seen when it has started, but each time it receives a message from an end-node it hasn't seen yet it adds this end-node to a list. To display another end-node, click on the three dots icon on the top right of the screen and click "Settings".



Copyright © 2019 e-peas SA

- On the opened page, click on the end-node name and select the one you wish to display on the main screen. Click on "validate" to validate your choice and return to the main page.



Copyright © 2019 e-peas SA

e-peas.com 代理商联系方式:
样品,报价,评估板,参考设计,技术支持
电话:0755-82565851
邮件:dwin100@dwintech.com
手机:156-2521-4151
网址: www.dwintech.com/e-peas_SA.html
深圳市南频科技有限公司
D-Win Technology(HongKong) Co.,Ltd