UM2070
User manual

STSW-IDI005APK: Android app for SP1ML-868 RF module evaluation using the STEVAL-SP1ML868 dongle

Introduction

The STEVAL-SP1ML Android app lets you evaluate the SP1ML-868 RF module by running the app on any Android™ smartphone or tablet with USB host support to connect the STEVAL-SP1ML868 dongle via micro USB adapter. The Android application is similar to tools based on hyper-terminal for Windows and Linux platforms.

The STEVAL-SP1ML868 dongle includes the RF module, an on-board RF antenna, and a USB connector to connect the dongle to a PC, access the sub GHz RF module and power the dongle. The default STEVAL-SP1ML868 configuration lets you create a SPIRIT1 link with simple AT commands.

There are two modes: command mode allows module configuration and status interrogation using an extended ‘AT’ style command set, while in operating mode, the module primarily serves as a wireless transceiver.

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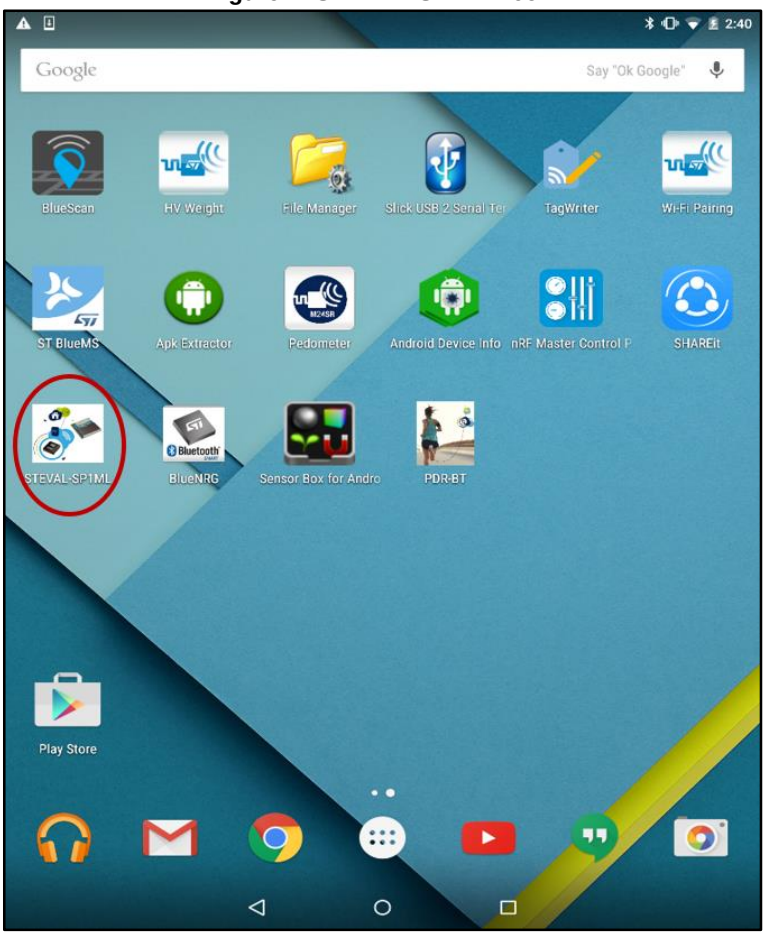
1 STEVAL-SP1ML application setup

1.1 Installing the app

The STEVAL-SP1ML app can be downloaded and installed from Google Play™ (*https://play.google.com/store/apps/details?id=com.st.sp1ml&hl=en*), or by transferring the STEVAL-SP1ML.apk file from PC to smartphone in USB mass storage mode and subsequently selecting the file with your smartphone to begin installation.

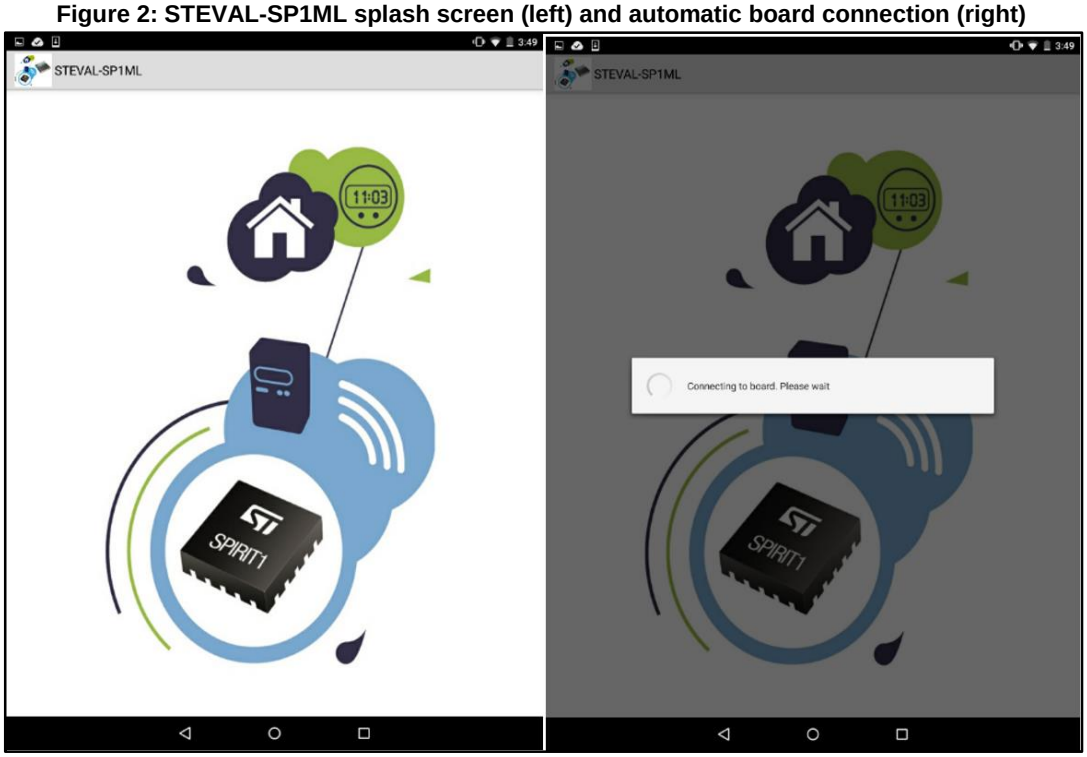
Once installed, the STEVAL-SP1ML application can be launched from your smartphone apps window.

Figure 1: STEVAL-SP1ML icon



1.2 Connecting the dongle

Figure 2: STEVAL-SP1ML splash screen (left) and automatic board connection (right)



When launched, the app displays a splash screen and automatically attempts connection if the board is already plugged in.

If the dongle is not yet physically plugged in, connect the STEVAL-SP1ML868 USB dongle to the tablet using the USB host cable as shown below.

Figure 3: Physical USB connection of SP1ML module

The application prompts for USB permissions, as shown below. Click OK and proceed.

Figure 4: USB permissions window

Select “Connect STEVAL-SP1ML” from the options menu to open a device and communicate with the USB UART.

Figure 5: STEVAL-SP1ML main app page

A message at the bottom of the main page confirms whether or not the app has connected successfully.

Figure 6: Successful connection with the board

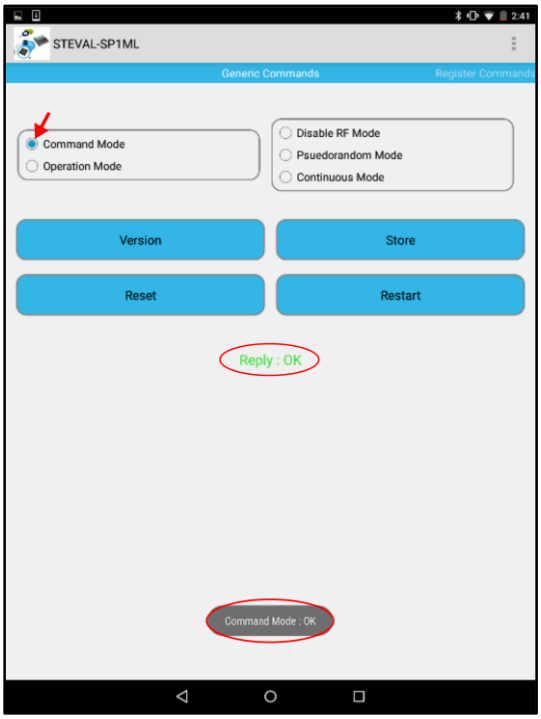
2 Using the STEVAL-SP1ML application

2.1 The main interface

Select the Command Mode radio button; a “Command Mode: OK” confirmation appears if the module is successfully set.

The SP1ML module “Reply: OK” return message appears in green.

Figure 7: SP1ML module set in command mode.



You can obtain hardware and firmware version information by clicking the Version button.

Figure 8: Module version data

Select “Disable RF Mode” from the radio group; the “Disable RF test mode: OK” message appears if the test mode is set successfully.

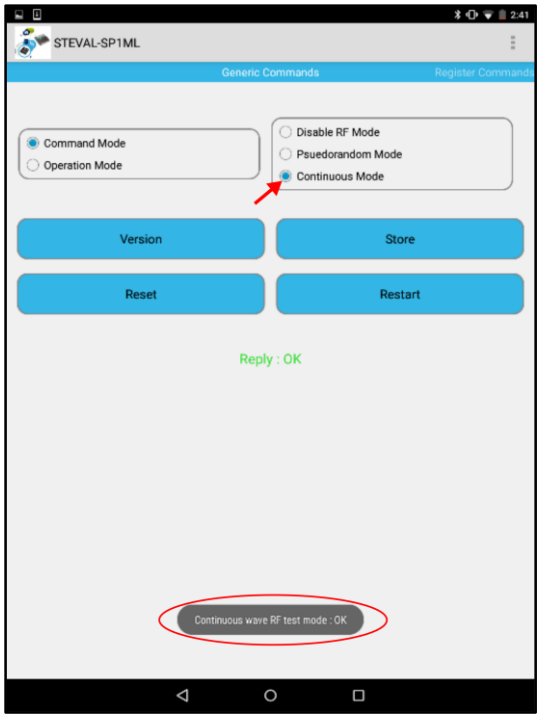
Figure 9: Disable RF test mode.

Select “Pseudorandom Mode” from the radio group; the “Pseudorandom binary sequence RF test mode: OK” message appears if the test mode is set successfully.

Figure 10: Pseudorandom binary sequence RF test mode

Select “Continuous Mode” from the radio group; the “Continuous wave RF test mode: OK” message appears if the test mode is set successfully.

Figure 11: Continuous wave RF test mode



The Store button to store current module configuration registers, which are reloaded whenever the module is restarted via the Restart button.

The Reset button resets all module configuration registers to factory default values.

2.2 Configuration and information registers

Swipe from right to left to read and write the configuration and information registers.

Figure 12: Configuration and information registers

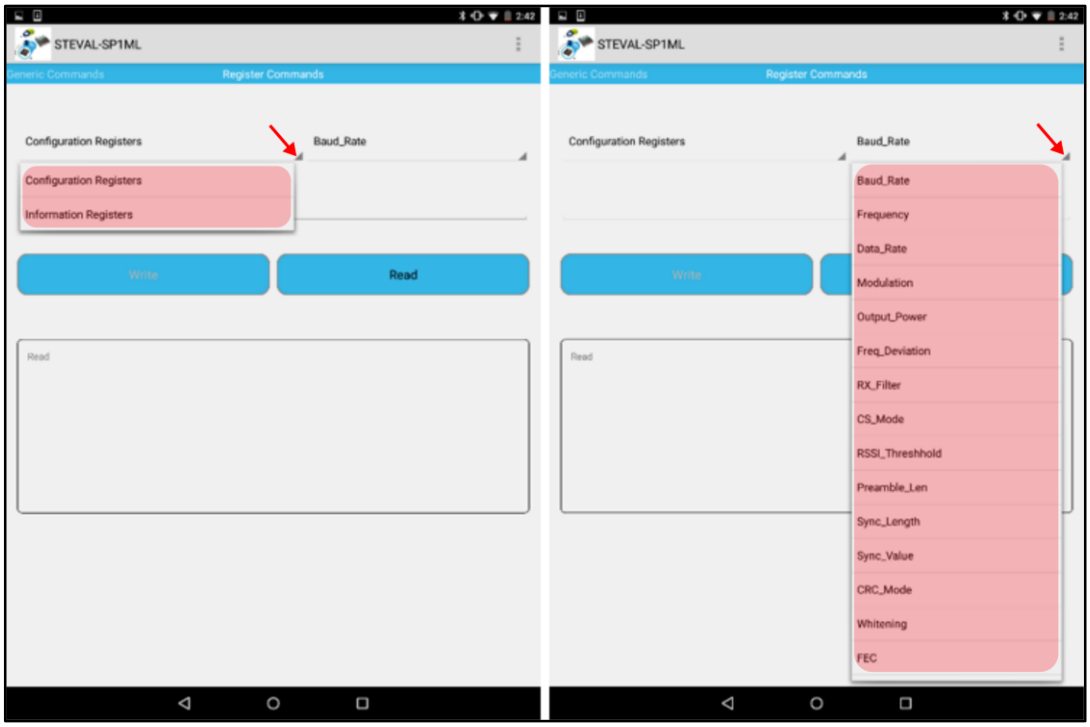
2.2.1 Reading configuration and information register data

To read a configuration register, select “Configuration Registers” from the first list and the register from the second list; then click the Read button to view the register data.

the module must be in command mode to read the registers

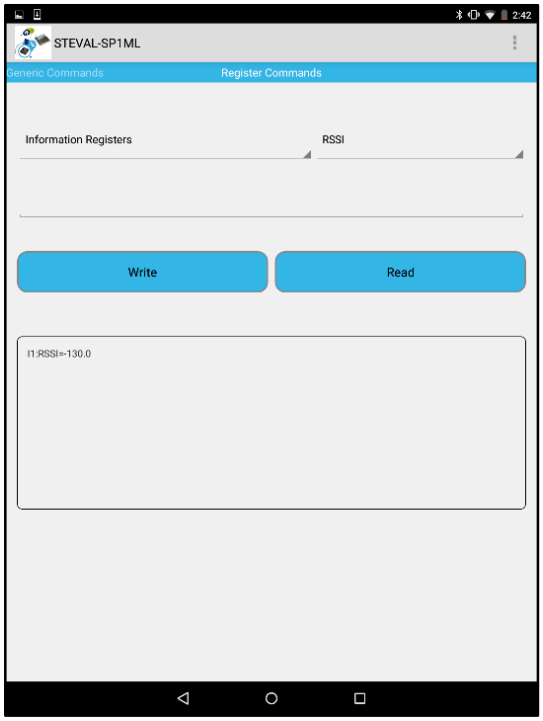
Figure 13: Reading configuration registers

Figure 14: Selecting single configuration registers



To read an information register, select Information Registers from the first list and the register from the second list; then click the Read button to view the register data.

Figure 15: Reading information registers

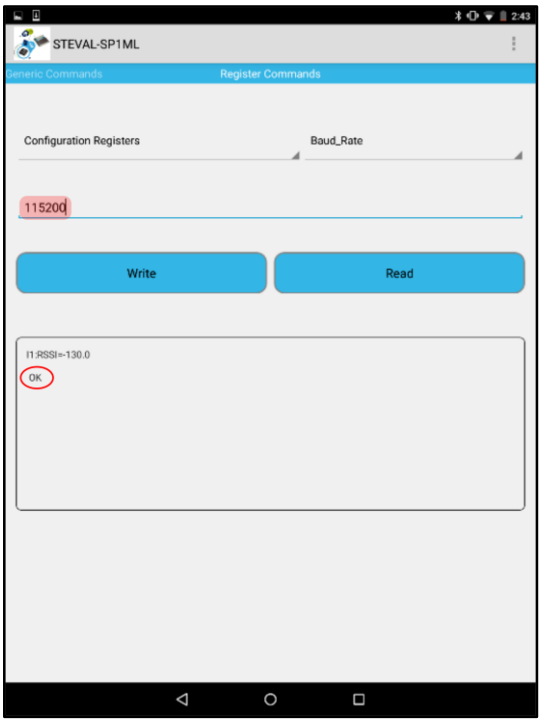


2.2.2 Writing configuration and information register values

To write new configuration or information register values, select the appropriate register type and register name as per the register reading procedure right, enter the new value and click on the Write button.

An “OK” confirmation message is returned if the new value is recorded.

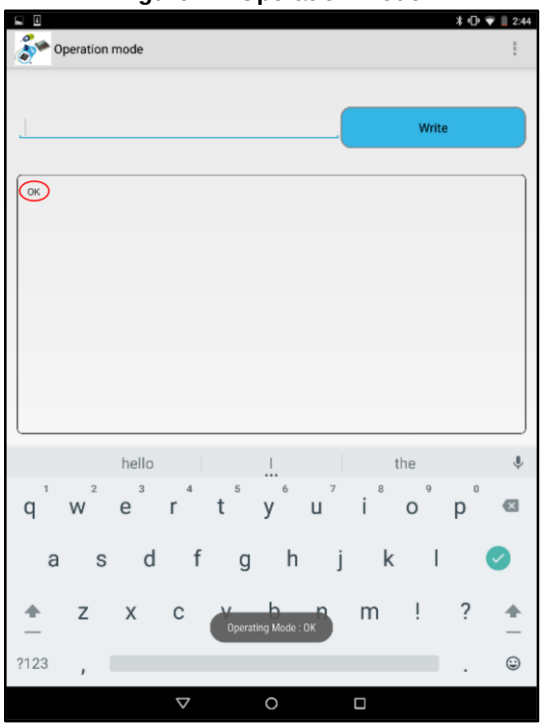
Figure 16: Writing to configuration and information registers



2.3 Configuring the module as a wireless transceiver

Swipe from left to right and select Operation Mode from the radio group to configure the module as a wireless transceiver. The application opens a new page and returns an “OK” confirmation message if the operation is successful.

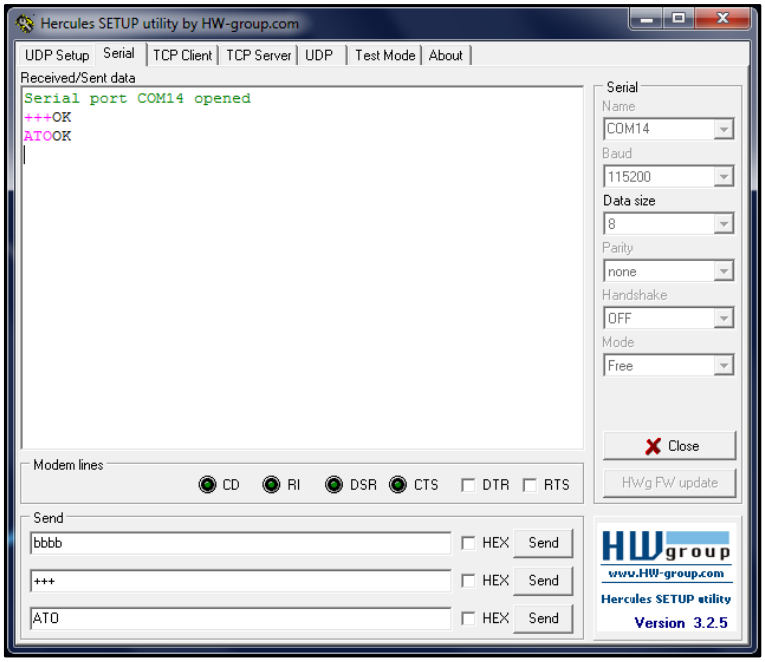
Figure 17: Operation mode



To establish communication:

1. Launch “hercules_3-2-5.exe” on your PC.
2. Connect another STEVAL-SP1ML module to the PC.
3. In the Serial page, configure the port settings in the Serial panel and click “Open”.
4. Send the `+++` command (to set the module in command mode).
5. Send `ATO` command and hit enter (to set the module in operation mode).

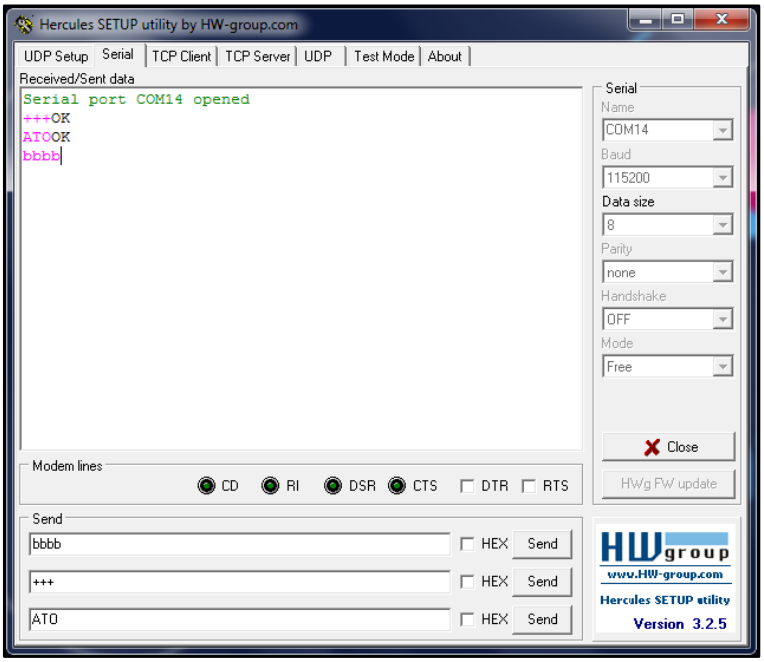
Figure 18: Setting the module in operation mode via PC



2.3.1 Sending and receiving data

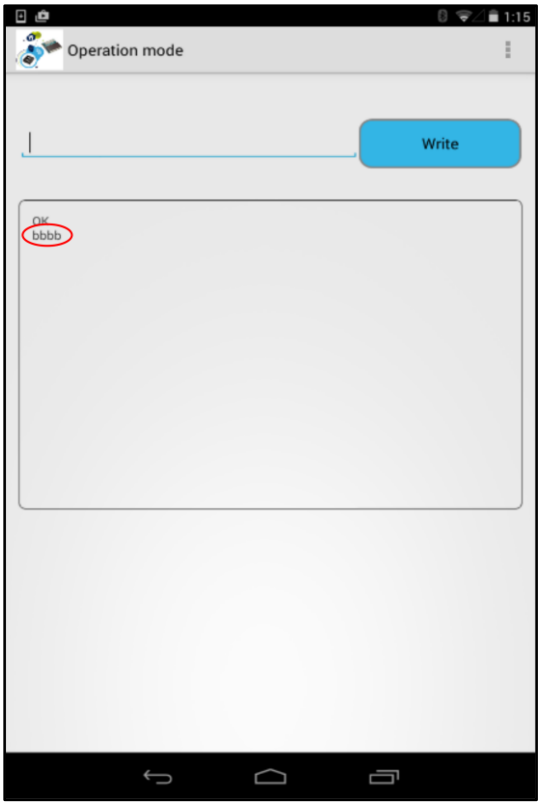
Send any data using Hercules to another SP1ML module connected to the Android phone as shown below.

Figure 19: Sending data with Hercules



The sent data is received on the Android phone.

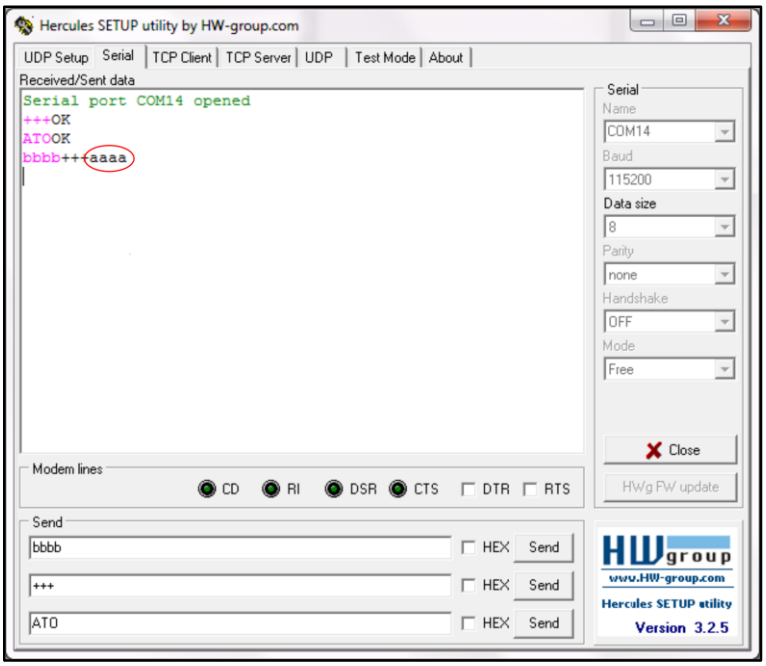
Figure 20: Hercules data received by the Android device



In the Android application, enter data to be sent and click on the Write button.

The data is received and appended in the Hercules window, as shown below.

Figure 21: SP1ML connected to Android phone sending data to another SP1ML module connected to PC



3 Working with STEVAL-IDI005V1 board

3.1 Connecting with the STEVAL-IDI005V1 board

Select STEVAL-IDI005V1 Click in the options menu to work with the STEVAL-IDI005V1 board.

Figure 22: Main page options menu

If the board is connected, the app opens a new page; otherwise the ‘SP1ML Dongle is not connected’ message appears.

Figure 23: SP1ML Dongle connected to mobile and STEVAL-IDI005V1 in active mode.

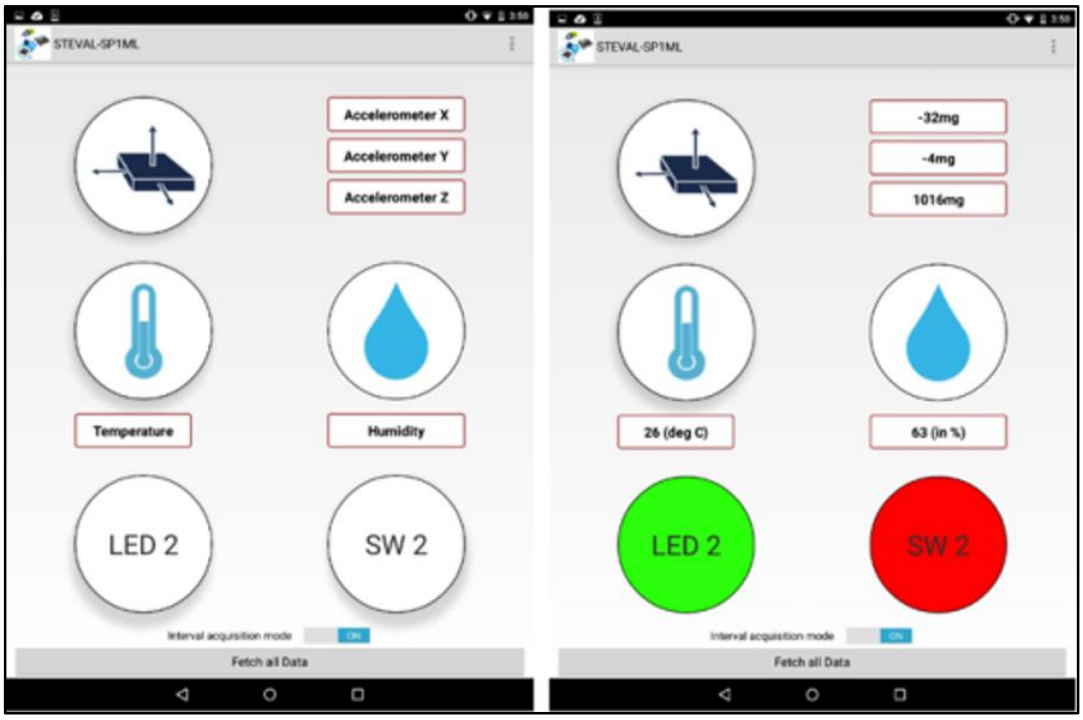
3.2 Fetching STEVAL-IDI005V1 board data

The new window is specifically for working with the STEVAL-IDI005V1 board. If the board is active, the app will fetch data periodically: if it isn’t active, the “Unable to fetch data. Put STEVAL-IDI005V1 in active mode and try again” message appears.

To activate the STEVAL-IDI005V1 press one of the SW1 or SW2 on-board switches.

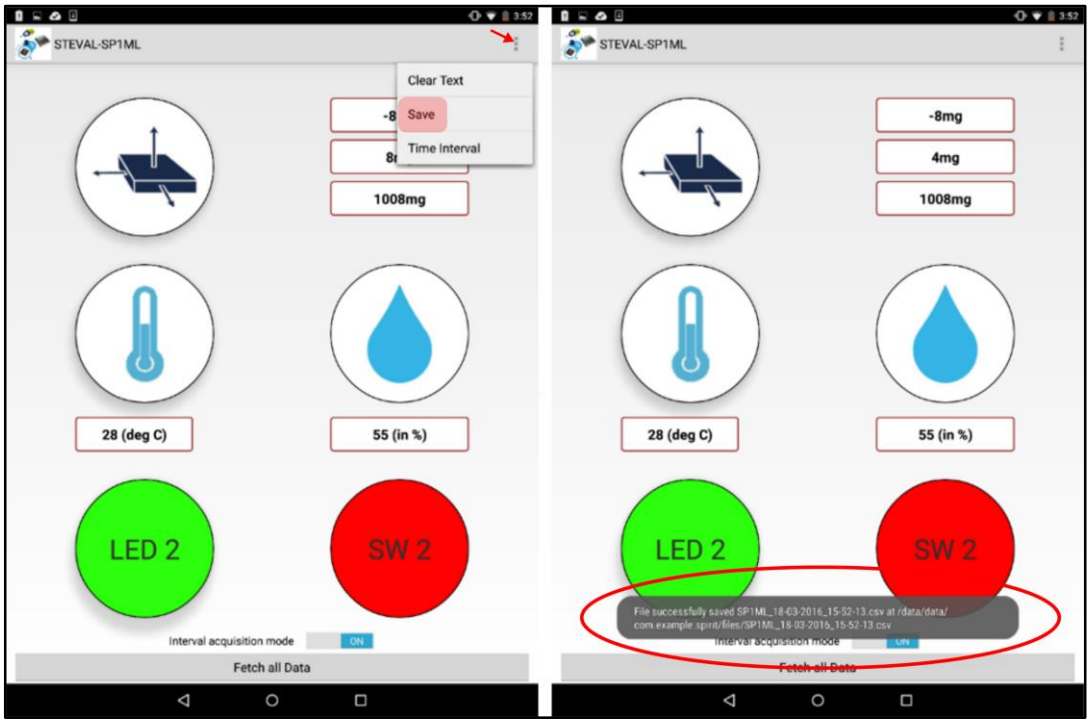
Retrieved data is fetched every five seconds by default. If the STEVAL-IDI005V1 module is active, the app automatically commands the dongle to fetch data from the board and displays the retrieved data, otherwise the app remains idle until the STEVAL-IDI005V1 activates.

Figure 24: View to fetch data in burst mode from STEVAL-IDI005V1.



To save the retrieved data in local storage in .csv format, click on the menu ‘Save’ option; a save confirmation message will appear with the file path and file name.

Figure 25: Saved retrieved data in csv format.

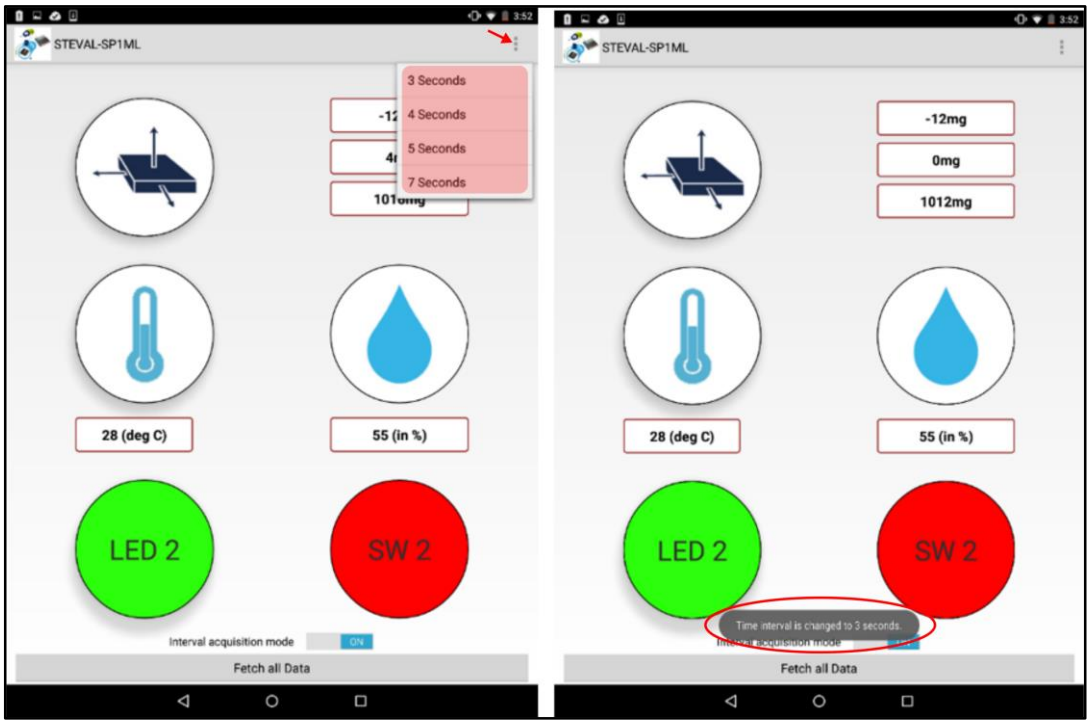


The frequency can be changed by clicking on the Time Interval option and selecting from the available periods.

The color of LED 2 denotes its status: Red represents LED OFF and Green LED ON.

The Clear text option resets all the fetched data.

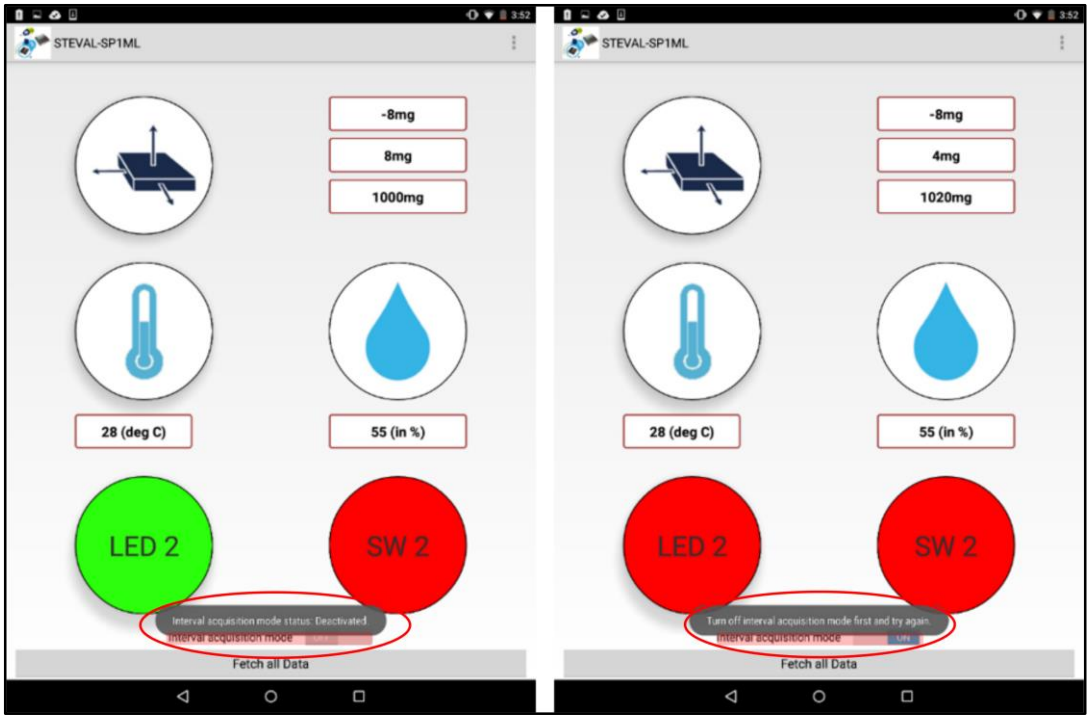
Figure 26: Changing time interval



If you click on the LED 2 icon or the Fetch all Data button while the interval fetch mode is ON, the ‘Turn off interval acquisition mode first and try again’ message appears.

When you toggle the Interval acquisition mode button to OFF, the ‘Interval acquisition mode status: Deactivated’ message appears.

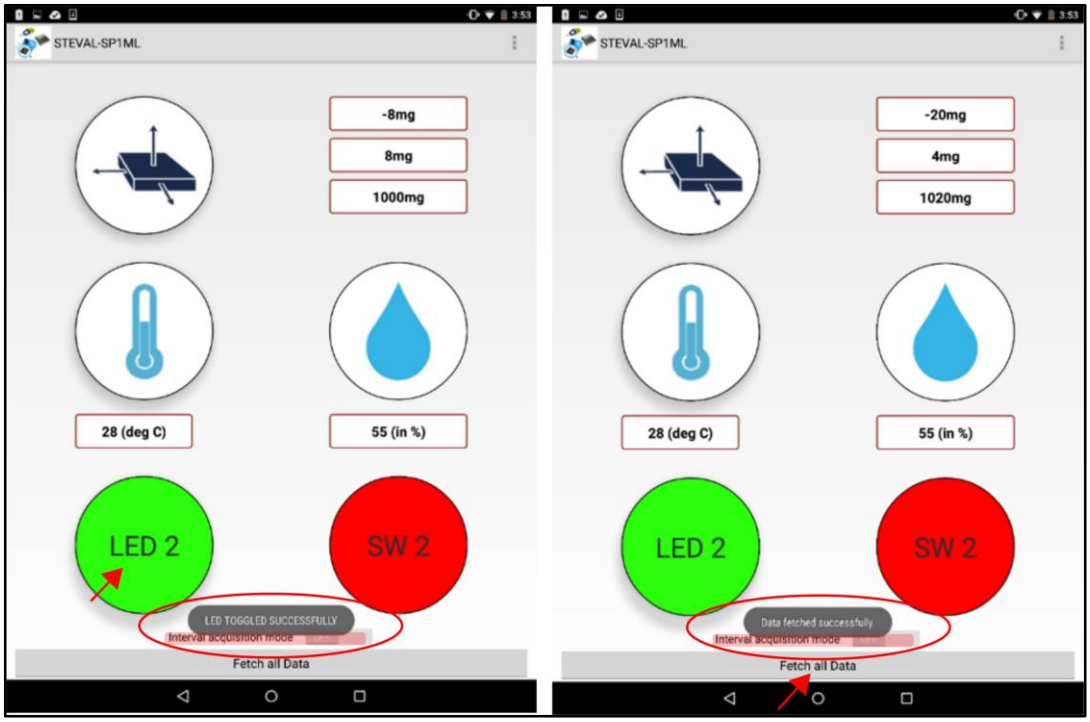
Figure 27: Toggling interval fetch mode.



Once interval fetch mode is deactivated, the STEVAL-IDI005V1 enters low power mode and does not respond if you do not send any commands within 10 seconds; the on-board switches SW1 or SW2 will reactivate the board

With the interval acquisition mode off, you can now interact with the LED 2 icon and send the Fetch all Data command.

Figure 28: Toggling LED D2 and fetching data



Toggle Interval acquisition mode to ON to recommence sending periodic commands to the dongle to fetch data from the active STEVAL-IDI005V1 board and show this data on the application display page; if the board is not active, the app will of course remain idle until it is active.

4 Revision history

Table 1: Document revision history

Date	Version	Changes
01-Jun-2016	1	Initial release.

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