



BlueDev/Eva+Sxx Evaluation Kit User Guide

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APPLICABILTY TABLE

PRODUCTS

- BLUEDEV+S50+AM
- BLUEEVA+S50+AS
- BLUEDEV+S42/LUA+AM
- BLUEEVA+S42/CEN+AS
- BLUEEVA+S42/TWI+AS
- BLUEDEV+S42+AM
- BLUEDEV+S42M/3ATH+AM
- BLUEEVA+S42M/3ATH+AS
- BLUEEVA+S42M+AS

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1. INTRODUCTION

1.1. Scope

This document describes the usage of the BlueDev/Eva+Sxx evaluation kit equipped with BlueMod+Sxx BT/BLE modules.



The description text “BlueMod+Sxx” in this document refers to all modules “+Sxx” listed in the applicability table unless otherwise noted.

1.2. Audience

This document is intended for Telit customers, especially system integrators, about to implement Bluetooth modules in their application.

1.3. Contact Information, Support

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- TS-SRD@telit.com

Alternatively, use:

<http://www.telit.com/support>

For detailed information about where you can buy the Telit modules or for recommendations on accessories and components visit:

<http://www.telit.com>

Our aim is to make this guide as helpful as possible. Keep us informed of your comments and suggestions for improvements.

Telit appreciates feedback from the users of our information.

1.4. Text Conventions



Danger – This information **MUST** be followed or catastrophic equipment failure or bodily injury may occur.



Caution or Warning – Alerts the user to important points about integrating the module, if these points are not followed, the module and end user equipment may fail or malfunction.



Tip or Information – Provides advice and suggestions that may be useful when integrating the module.

All dates are in ISO 8601 format, i.e. YYYY-MM-DD.

1.5. Related Documents

1.5.1. Hardware User Guides

- [1] BlueMod+S42M Hardware User Guide, 1VV0301379
- [2] BlueMod+S42 Hardware User Guide, 1VV0301303
- [3] BlueMod+S50 Hardware User Guide, 1VV0301505

1.5.2. Software User Guides

- [4] BlueMod+S42M Software User Guide, 1VV0301391
- [5] BlueMod+S42 Software User Guide, 1VV0301318
- [6] BlueMod+S50/Central Software User Guide, 1VV0301506

1.5.3. Other Documents

- [7] BlueMod+S42M AT Command Reference, 80527ST10839A
- [8] BlueMod+S42/Central AT Command Reference, 80512ST10771A
- [9] BlueMod+S42/ADC/LUA AT Command Reference, 80512ST10860A
- [10] BlueMod+S42/ADC/TWI AT Command Reference, 80512ST10874A
- [11] BlueMod+S50/Central AT Command Reference, 80578ST10890A
- [12] UICP+ UART Interface Control Protocol, 30507ST10756A
- [13] BlueMod+S42 Test mode Reference, 80512NT11496A
- [14] BlueMod+S42 Lua API Documentation 30512ST10861A
- [15] Bluetooth SIG Core Specification V4.2
- [16] Nordic: nRF52_Series_Reference_Manual
- [17] Nordic: nRF52832_PS v1.x.pdf (Product Specification)
- [18] BlueDev/Eva+Sx Schematics

2. PACKAGE CONTENT

The BlueDev/Eva+Sxx package contains the following components:

- 1 x BlueDev/Eva+Sxx board
- 1 x Mini USB cable
- 1 x Battery CR2032
- 1 x Debugger Cable (BlueDev+Sxx Only)



Figure 1: BlueDev/Eva+Sxx Package Content

3. HARDWARE

This section describes the BlueDev/Eva+Sxx hardware and its different blocks.

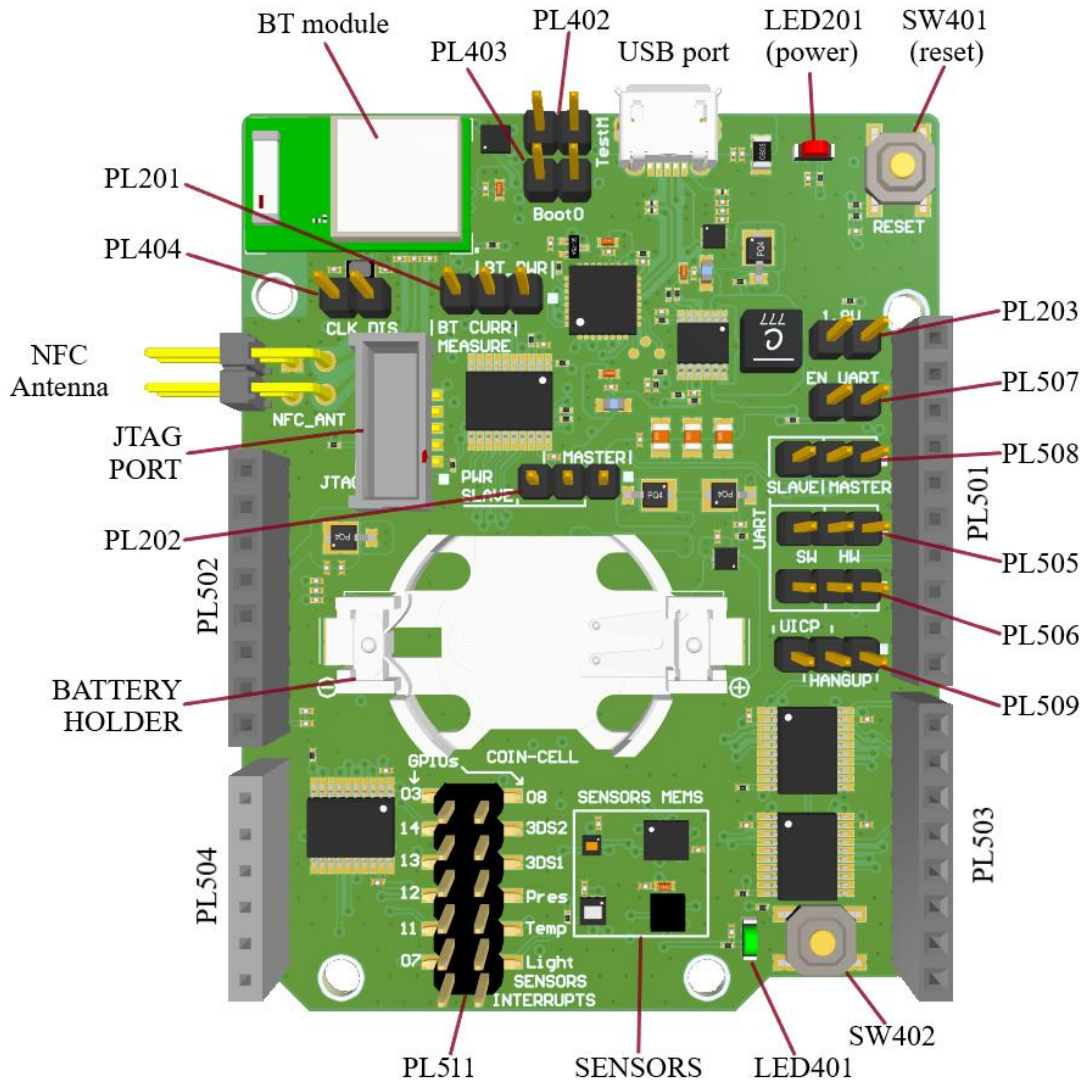


Figure 2: BlueDev/Eva+Sxx Top Board View

3.1. BT Module

The BlueDev/Eva+Sxx can be equipped with any of the modules listed in the Applicability Table.

3.2. Reset

The BlueDev/Eva+Sxx is equipped with a reset button. Pressing the reset button will trigger the BlueMod+Sxx module to perform a HW reset. The USB port is not affected by the reset.

3.3. USB Interface

The BlueDev/Eva+Sxx provides an USB interface and Power when the board is used as standalone or as Arduino like in master mode. The USB interface is equipped with an FTDI for USB to UART bridge, interfacing the serial port of the BlueMod+Sxx.

The serial port is a high-speed UART interface at CMOS levels defined in PL203, 3V3 or 1V8, and supports the following features:

- Transmission speed: 9,600 – 921,600 bps (115200 default)
- Character representation: 8 bits, no parity, 1 stop bit (8N1 default)
- Hardware flow-control with RTS/CTS (active low) (default)

For more details, please refer to the specific BlueMod+Sxx Hardware User Guide [1],[2],[3].

3.4. LEDs

The BlueDev/Eva+Sxx provides 2 LEDs for functional indication.

Interface	Function
LED201	Indicates the presence of power supply voltage
LED401	Connected to GPIO[3], (function depending on firmware support)

3.5. Jumpers

3.5.1. Jumper PL201: Current Measurement

This jumper provides the possibility to measure the supply current of the BlueMod+Sxx.

PL201 Position	Function
1-2	BlueMod+Sxx: Powered from internal switching regulator
2-3	BlueMod+Sxx: External power for current measurement

3.5.2. Jumper PL202: Master and Slave Mode

This jumper allows to change the direction of power supply between BlueDev/Eva+Sxx and an external board.

PL202 Position	Function
1-2	MASTER: Provides power to shields plugged into the Arduino connectors PL501/2/3/4
2-3	SLAVE: Get the Power supply from the external Arduino board plugged into its connectors PL501/2/3/4

3.5.3. Jumper PL203: Supply Voltage

This jumper provides the possibility to have the main module's supply voltage from 3V3 to 1V8.

PL203 Position	Function
(open)	Set 3V3 as supply voltage
1-2 (closed)	Set 1V8 as supply voltage

Please refer to the schematic [18].

3.5.4. Jumpers PL402, PL403: Test Mode and Bootloader

These jumpers allow to set, where available, 4 different operation modes:

- Test Mode
- Direct Test Mode (DTM)
- Bootloader
- Normal Mode

3.5.4.1. Test Mode

For homologation purposes, the presence of “Test Mode” or “Direct two wire UART Test Mode” (DTM) is mandatory. The DTM is defined by the Bluetooth SIG and both modes are present in any chip and any firmware.

It is recommended to use the test mode for EMC measurements.

For enabling the different test modes, the BlueMod+Sxx provides two IO pins

- The pin Test Mode is active LOW. Active in the following table means connect to GND.
- The pin Boot0 is active HIGH. Active in the following table means connect to VDD.
- The other two combinations start the bootloader for firmware update of the programmed firmware. These two modes are not the scope of this document.

Following table shows the possible combinations:

Test Mode# (PL402)	Boot0 (PL403)	Mode
Active	Inactive	Test Mode
Active	Active	DTM
Inactive	Active	Bootloader
Inactive	Inactive	Firmware for Normal Mode

Please note the UART is required for operation of test modes. Refer to the BlueMod+Sxx Test Mode Reference [13].



Boot0 signal at PL403 is available on boards equipped with BlueMod+S42 and BlueMod+S50 modules only.

3.5.5. Jumper PL404: External Clock

The jumper PL404 allows to disable the external 32kHz clock.

The BlueDev/Eva+Sxx provides the possibility to have an external 32kHz crystal. By default, the external crystal is enabled and connected to the BlueMod+Sxx, but it can be disabled by plugging the PL404 jumper.

For using the internal oscillator refer to the BlueMod+Sxx Hardware User Guides [2], [3].



External clock are available on boards equipped with BlueMod+S42 and BlueMod+S50 modules only.

3.5.6. Jumpers PL505, PL506, PL507, PL508: UART

PL505 and PL506 set the main UART, at Arduino connector's, in Hardware or Software mode.

PL505/6 Position	Function
1-2	Set the Hardware UART
2-3	Set the Software UART

PL507 and PL508 allow to enable the UART and choose Master or Slave mode.

Jumper Position	Function
1-2(PL507) 1-2(PL508)	Set the UART as Master
1-2(PL507) 2-3(PL508)	Set the UART as Slave

3.5.7. Jumper PL509: Hang up and UICP

Jumper PL509 is used for either Hang up or UICP functionality.

In Hang-up mode DTR# is connected to the GPIO-HANGUP (GPIO[4]). Driving GPIO[4] to logic High during a data transfer phase will “hang-up” the connection and disconnect the Bluetooth link.

In UICP mode DTR# is used as IUR-IN# signal. UICP is an advanced power management protocol: using UICP reduces the supply current from the mA range to the μ A range in idle phases which are the highest percentage of the use time in long life design scenarios.

For further information about UICP, please refer to the UICP+UART Interface Control Protocol Specification [12].

PL509 Position	Function
1-2	HANGUP mode: DTR# connected to GPIO-HANGUP
2-3	UICP mode: DTR# connected to IUR-IN#

3.5.8. Jumper PL511: GPIOs and Sensors Interrupts

This jumper allows to manage the sensor's interrupts. For details, please refer to the BlueDev/Eva+Sxx Schematic [18].

PL511 Position	Function
1-2	Connects GPIO[07] to the light sensor interrupt ¹
3-4	Connects GPIO[11] to the temperature sensor interrupt ¹
5-6	Connects GPIO[12] to the pressure sensor interrupt ¹
7-8	Connects GPIO[13] to the 3D sensor interrupt_2 ^{1,2}
9-10	Connects GPIO[14] to the 3D sensor interrupt_1 ^{1,2}
Pin 11	Direct access to GPIO[08]
Pin 12	Direct access to GPIO[03]

(1) Sensors mems are available only for board equipped with BlueMod+S42 and BlueMod+S50 modules

(2) 3D sensor's interrupt jumper should not be placed in Arduino Slave Mode to avoid I2C interference from Arduino Board.

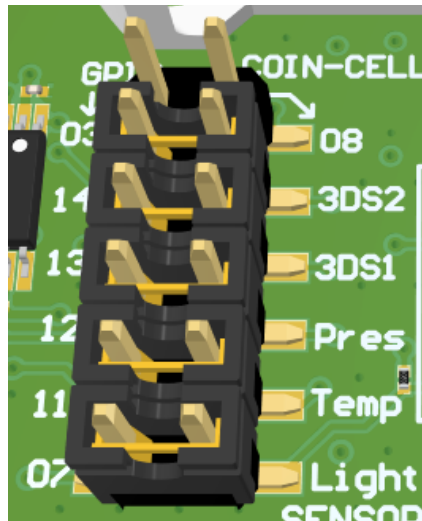


Figure 3: PL511 Setup for Sensor's Interrupts control



Sensor's interrupts are available on boards equipped with BlueMod+S42 and BlueMod+S50 modules only.

The BlueDev/Eva+S42M/AI do not mount sensors on board since some of them are already inside the BlueMod+S42M+3ATH: 3Axis and Temperature/Humidity sensors.



In Arduino Slave mode (used as Shield), the 3D sensor's interrupts should not be connected to the Arduino board to avoid interference with the I2C. Jumpers at 3DS1 and 3DS2 should not be placed.

3.6. Power Supply

The board manages 3 different power sources with the following priority mechanism: External 5V from Arduino Connector, VUSB and last one the Battery. The presence of any correct supply voltage is indicated by LED P1.

For more details, please refer to the schematics [18].



The maximum output current of the internal switching regulator is 1A.

3.6.1. USB Power Supply

The 5.0V at the USB connector powers the whole circuit including the Arduino interface.

3.6.2. Connector Power Supply

Mode	PL502 Position	Function
Master	1-2	VUSB is used to Power the whole board including the Arduino Connectors. NOTE: Arduino 5.0V is driven directly from USB port.
Slave	2-3	Arduino 5.0V is used to Power the whole board and any shield plugged on top of us. For non-Arduino standard boards, the external input voltage range we can manage can vary from: 1.8V to 5.5V.



Do not to exceed the maximum BlueDev/Eva input voltage of 5.5V.

3.6.3. External Power Supply

Pin 2-3 in PL201 jumper provides the possibility to connect an external power supply to BlueMod+Sxx module and perform current measurements.

Voltage range: 3.0V_{DC} Typical; 1.7V_{DC} Minimum, 3.6V_{DC} Max



Do not to exceed the maximum BlueMod input voltage of 3.6V

3.6.4. Battery Holder

The battery holder provides the possibility to run the BlueDev/Eva+Sxx without any external power source. Use a 3V0 coin cell battery, CR2032.

3.7. Switches

The BlueDev/Eva+Sxx is equipped with two push buttons.

Position	Function
SW401	Reset button. Will trigger the BlueMod+Sxx module to perform a HW reset. The USB port is not influenced by the reset.
SW402	Connected to GPIO[8] (1)

(1) Function depending on firmware support

3.8. Connectors PL501, PL502, PL503, PL504: Shield Connectors

These connectors have the same position as those of Arduino Uno board and they permit to use the BlueMod+Sxx board as an Arduino Controller (Master) with respect to another external Arduino's shield board or to act as an Arduino Shield (Slave) on top of it.

For further information, please refer to the BlueDev/Eva+Sxx Schematic [18].



The voltage level of all signals listed below refer to the voltage IOREF at pins 2 and 5 of the PL502.

Position	EVK Signals	BlueMod+Sxx Signals	Type	Description
PL502-1	NC	-	-	-
PL502-2	IOREF	+5V0	PWR	5V0 Supply voltage input/output ¹
PL502-3	RESET	GND	I-PU	User reset
PL502-4	3V3	+3V3/+1V8	PWR	3V3/1V8 Supply voltage input/output *(2)
PL502-5	IOREF	5V0	I/O	5V0 Supply voltage input/output ¹
PL502-6	GND	GND	PWR	Ground
PL502-7	GND	GND	PWR	Ground
PL502-8	VIN	NC	PWR	-
PL504-1	GPIO_07	GPIO[7]	I/O-PU	GPIO / Light sensor interrupts ^{3,6}
PL504-2	GPIO_09	GPIO[9]	I/O	GPIO ⁴
PL504-3	GPIO_11	GPIO[11]	I/O	GPIO / Temperature & Humidity sensor interrupts ^{3,6}
PL504-4	GPIO_12	GPIO[12]	I/O	GPIO / Pressure sensor interrupts ^{3,6}

Position	EVK Signals	BlueMod+Sxx Signals	Type	Description
PL504-5	GPIO_13	GPIO[13]	I/O	GPIO / 3D sensor interrupt 1 ^{3,6}
PL504-6	GPIO_14	GPIO[14]	I/O	GPIO / 3D sensor interrupt 2 ^{3,6}
PL503-1	RX master/TX slave	UART-RXD	I/O	UART data IN
PL503-2	TX master/RX slave	UART-TXD	O/I	UART data OUT
PL503-3	UART_RX_SW	UART-RXD	I	UART (software) data OUT
PL503-4	UART_TX_SW	UART-TXD	O	UART (software) data OUT
PL503-5	UART_CTS_SW	UART-CTS#	I	Flow control
PL503-6	UART_RTS_SW	UART-RTS#	O	Flow control
PL503-7	UART_DTR_SW	IUR-IN#	I	IUR data IN (hangup or UICP) ⁵
PL503-8	UART_DSR_SW	IUR-OUT#	O	IUR data OUT
PL501-1	GPIO_06	GPIO[6]/AIN	I/O	GPIO ⁴
PL501-2	GPIO_04	GPIO[4]/AIN	I/O	GPIO / BT connection hangup ⁴
PL501-3	SPI_CS	GPIO[3]/AIN	I/O	GPIO / Serial peripheral Chip Select ^{4,6}
PL501-4	SPI_MOSI	GPIO[2]/SPI_MOSI	I/O	GPIO / Serial peripheral Master Output Slave Input ^{4,6}
PL501-5	SPI_MISO	GPIO[5]/AIN/SPI-MISO	I/O	GPIO / Serial peripheral Master Input Slave Output ^{4,6}
PL501-6	SPI_CLK	GPIO[8]/SPI-SCK	I/O	GPIO / Serial peripheral Clock ^{4,6}
PL501-7	GND	GND	PWR	Ground
PL501-8	AREF	NC	-	-
PL501-9	I2C_SDA	GPIO[1]/AIN/I2C-SDA	I/O-PU	GPIO / I2C bus ⁴
PL501-10	I2C_SCL	GPIO[0]/I2C-SCL	I/O-PU	GPIO / I2C bus ⁴

PU = Pull-Up, PD = Pull-Down, PP = Push-Pull, I-DIS = Input Buffer Disconnected

(1) Function of PL202 jumper configuration and firmware support

(2) Function of PL203 jumper configuration and firmware support

(3) Function of PL511 jumper configuration and firmware support

(4) Function depending on firmware support

(5) Function of PL509 jumper configuration

(6) Only for board equipped with BlueMod+S42 and BlueMod+S50 modules

3.9. Sensors

The board includes 4 sensors:

- Humidity & Temperature sensor (HDC2010, slave write address = 0x82)
- Accelerometer Gyroscope 3D sensor (LSM6DS3TR, slave write address = 0xD6)
- Light sensor (MAX44009, slave write address = 0x96)
- Pressure sensor (LPS25HTR, slave write address = 0xBA)

All the above sensors are accessible via TWI (I2C) and their interrupt signals are available at the jumper PL511. (refer to the paragraph “Jumper PL511: GPIOs and Sensors Interrupts”).

For further information about the sensors, refer to the schematic [18].

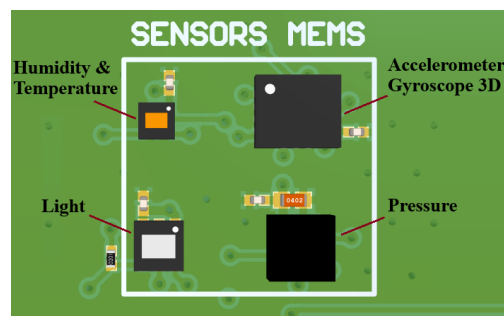


Figure 4: Sensors Area



Sensors are available on boards equipped with BlueMod+S42 and BlueMod+S50 module only.

All sensor's interrupts lines are present at PL511. See chapter §3.5.8 for detailed info.

3.10. JTAG Port

JTAG connector is used for Software Debugging of the BlueMod+Sxx module's applications (for example, LUA scripts).

3.11. NFC Antenna

The NFC antenna coil must be connected to this connector. For further information, see chapter 0.



NFC is available on boards equipped with BlueMod+S42 and BlueMod+S50 modules only.

3.12. Board Configuration

The default board configuration is as standalone, which no Arduino connector enabled.

The Sensor's interrupts are not available on none of the BlueDev/Eva+S42M configuration.

3.12.1. BlueDev/Eva+S42/S50+AM as Standalone

Position	Function
PL507: open	Disable Arduino connector, UART and GPIOs at PL501, PL503, PL504
PL201: 1-2	Select 3V3 voltage for BlueMod+Sxx
PL202: 1-2	Shield powered from BlueDev/Eva+Sxx via IOREF pins of PL502
PL505: 1-2	Set hardware mode for UART TX
PL506: 1-2	Set hardware mode for UART RX
PL508: 1-2	Set UART at PL503 as master
PL511: 1-2	Makes light sensor interrupt available to BlueMod+Sxx module and to an external board
PL511: 3-4	Makes temperature and humidity sensor interrupt available to BlueMod+Sxx module and to an external board
PL511: 5-6	Makes pressure sensor interrupt available to BlueMod+Sxx module and to an external board
PL511: 7-8	Makes 3D sensor interrupt_1 available to BlueMod+Sxx module and to an external board
PL511: 9-10	Makes 3D sensor interrupt_2 available to BlueMod+Sxx module and to an external board

3.12.2. BlueDev/Eva+S42/S50+AM as Arduino Master

Position	Function
PL507: 1-2	Enable Arduino connector, UART and GPIOs at PL501, PL503, PL504
PL201: 1-2	Select 3V3 voltage for BlueMod+Sxx
PL202: 1-2	Shield powered from BlueDev/Eva+Sxx via IOREF pins of PL502
PL505: 1-2	Set hardware mode for UART TX
PL506: 1-2	Set hardware mode for UART RX
PL508: 1-2	Set UART at PL503 as master
PL511: 1-2	Makes light sensor interrupt available to BlueMod+Sxx module and to an external board
PL511: 3-4	Makes temperature and humidity sensor interrupt available to BlueMod+Sxx module and to an external board
PL511: 5-6	Makes pressure sensor interrupt available to BlueMod+Sxx module and to an external board
PL511: 7-8	Makes 3D sensor interrupt_1 available to BlueMod+Sxx module and to an external board
PL511:9-10	Makes 3D sensor interrupt_2 available to BlueMod+Sxx module and to an external board

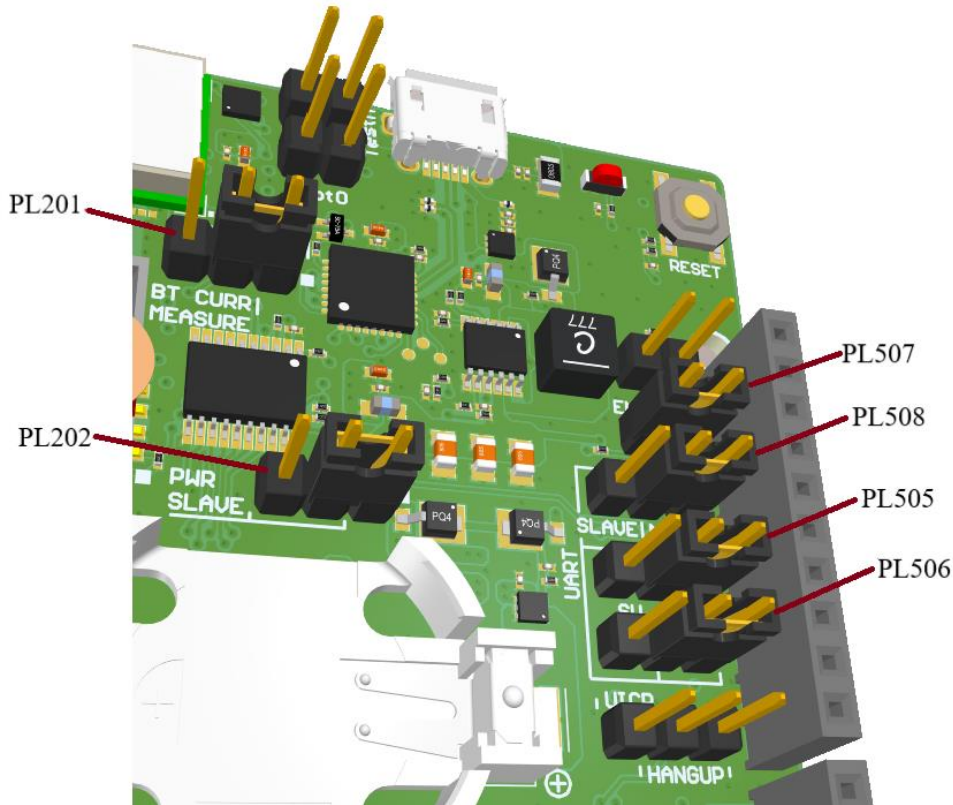


Figure 5: PL201, PL202, and PL505-508 Setup for BlueDev/Eva+Sxx as Master

3.12.3. BlueDev/Eva+S42/S50+AS as Arduino Slave

Position	Function
PL201: 1-2	Select 3V3 voltage for BlueMod+Sxx module
PL202: 2-3	Board BlueDev/Eva+Sxx powered by IOREF pins of PL502
PL505: 2-3	Set hardware mode for UART TX
PL506: 2-3	Set hardware mode for UART RX
PL507: 1-2	Enable UART and GPIOs at PL501, PL503, PL504
PL508: 2-3	Set UART at PL503 as slave
PL511: 1-2	Makes light sensor interrupt available at BlueMod+Sxx module and at the external board
PL511: 3-4	Makes temperature and humidity sensor interrupt available at BlueMod+Sxx module and at the external board
PL511: 5-6	Makes pressure sensor interrupt available at BlueMod+Sxx module and at the external board
PL511: 7-8	Leave Unconnected. 3D sensor's interrupt_1 should not be placed in the Arduino Slave Mode to avoid I2C interference from Arduino Board.
PL511: 9-10	Leave Unconnected. 3D sensor's interrupt_2 should not be placed in the Arduino Slave Mode to avoid I2C interference from Arduino Board.

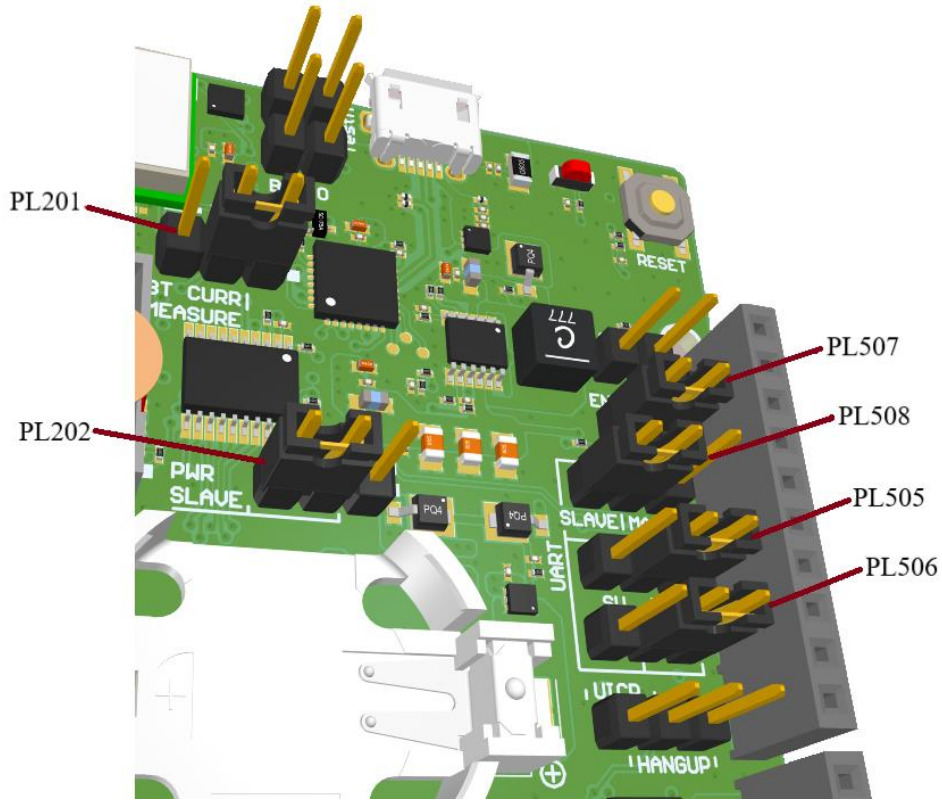


Figure 6: PL201, PL202, and PL505-508 Setup for BlueDev/Eva+Sxx as Slave



Sensor's Interrupt lines are not available on BlueMode+S42M board.

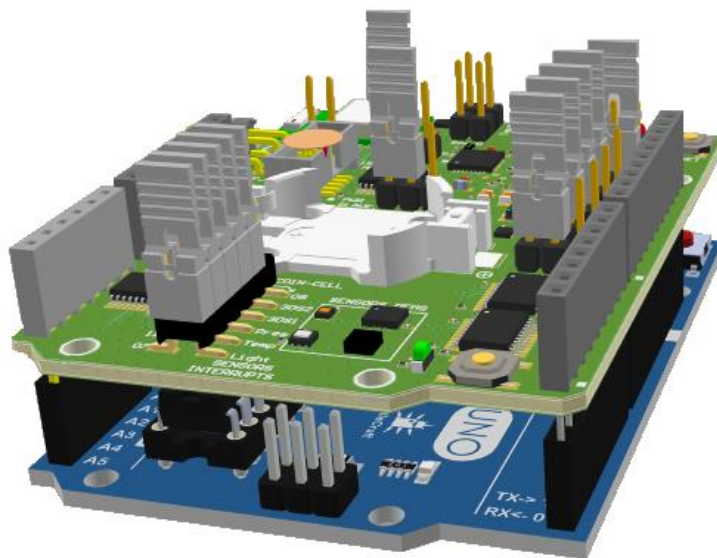


Figure 7: 3D Rendering of an Arduino UNO using Telit BlueDev/Eva+Sxx as Slave

4. GETTING STARTED

4.1. System Requirements

Before you begin, ensure that you have the following:

- PC with Windows® XP or higher
- 1 free serial USB port
- Adobe Acrobat® Reader for reading the documentation

4.2. Startup

Connect the BlueDev/Eva+Sxx board to the computer as shown below.

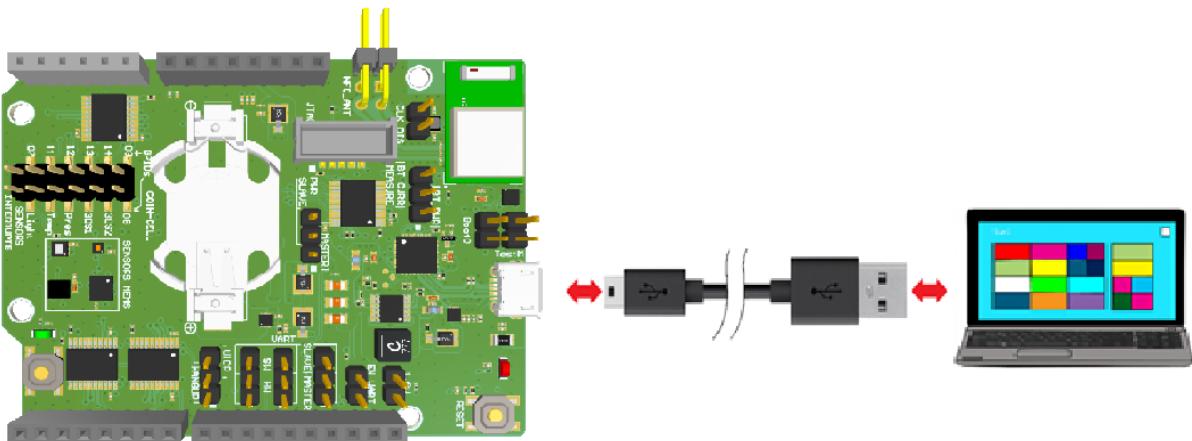


Figure 8: Connect the BlueDev/Eva+Sxx to your PC

4.3. Installation of the BlueDev/Eva+Sxx USB Driver

If required download the latest FTDI VCP USB to UART driver from:

www.ftdichip.com/Drivers

Connect the BlueDev/Eva+Sxx to a free USB port of a PC and install the USB device drivers by following the instructions of the Windows® Hardware Wizard using the downloaded FTDI VCP USB to UART driver.

The USB connection is used for power supply and for UART communication to a PC over a virtual COM port. This lets you use a terminal emulation program to perform the configuration or to control the Bluetooth connection.

5. BLUEDEV/EVA+SXX USAGE

5.1. Configure the BlueDev/Eva+Sxx

The BlueDev/Eva+Sxx works at 115,200 bps, using the 8N1 data format (8 data bits, no parity, 1 stop bit). If the BlueDev/Eva+Sxx is correctly connected to the PC, the Telit AT Controller (version 3.4.11 or higher), or any other terminal emulation program, can be used to read and modify the configuration settings.



LUA firmware version does not support Telit AT controller. Alternatively, you can use any other serial terminal emulation program such as Tera Term.


Perform the following steps to configure the BlueDev/Eva+Sxx using a Telit AT Controller.

1. Download and install the Telit AT Controller in your PC.

Note: The Telit AT Controller is available for download from the Telit-Download Zone.



Figure 9: Telit AT Controller Main Menu

2. Click  **Settings** to setup the Telit AT Controller.
3. Select the **Port Settings** as shown below (for example COM7 as shown in the below example) and click OK.

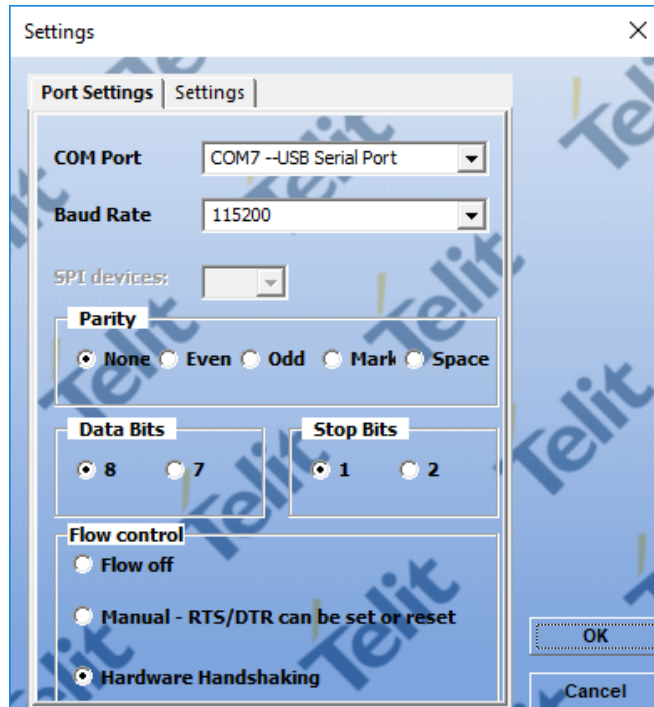


Figure 10: Telit AT Controller Settings



4. Click  (“Connect”) to synchronize the serial terminal and the BlueDev/Eva+Sxx Kit. The following information will be displayed.
 - BT Address
 - Manufacturer
 - Model
 - FW Release



Figure 11: Telit AT Controller Device Information

5. Click  (“Start”), to display the **AT Terminal** window.
6. Type the AT Commands in the text box and click **Execute**, to communicate with the BlueDev/Eva+Sxx. For example, set the local device name with the command “`at+aname=my_BT_board`”.

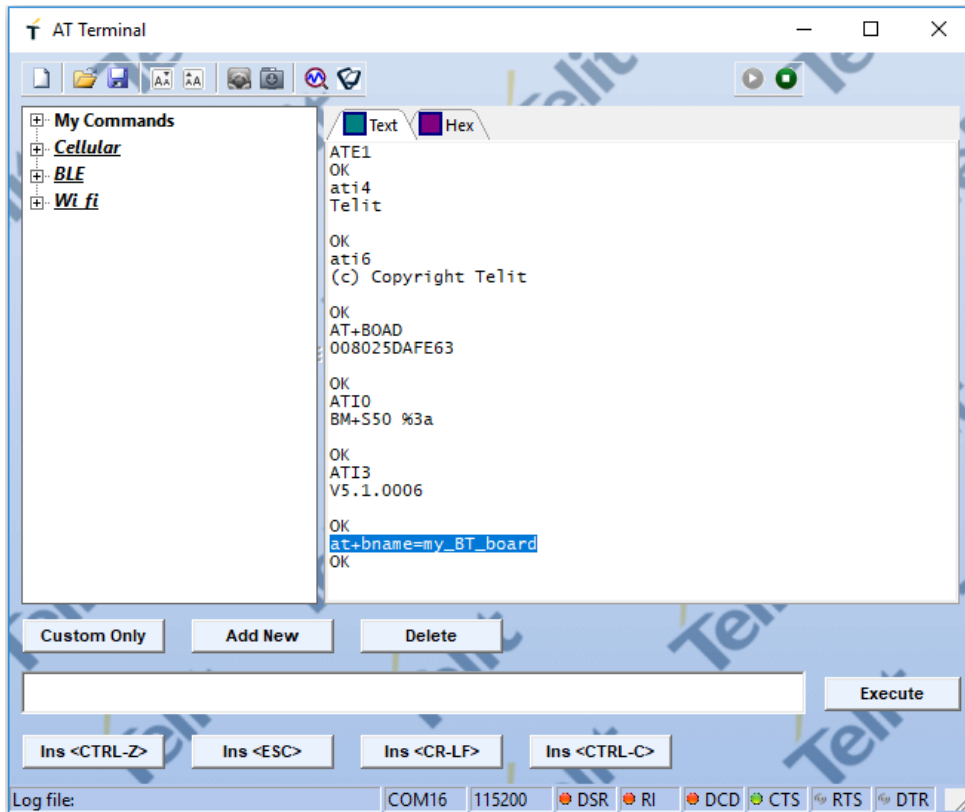


Figure 12: AT Terminal Communication

For more detailed description of the AT commands used for this purpose, please refer to our BlueMod+Sxx AT Command Reference [3].

5.2. Terminal IO Utility App

Telit provides the “Terminal IO Utility” App for iOS and Android devices which can be used to establish a Bluetooth Low Energy connection from a smartphone to the BlueDev/Eva+Sxx.

The following QR-Codes provide the link to download the “Terminal IO Utility”.



Figure 13: Terminal IO Utility QR-Codes to Download iOS or Android Version

The “Terminal IO Utility” App for iOS and Android, allows the user to connect to Terminal I/O peripheral devices and exchange data providing a simple terminal emulation.

5.2.1. Typical Connection Sequence

Below is an example using the “Terminal IO Utility” App for iOS device.

1. Press the “Scan” button to search for available Terminal I/O peripheral devices.

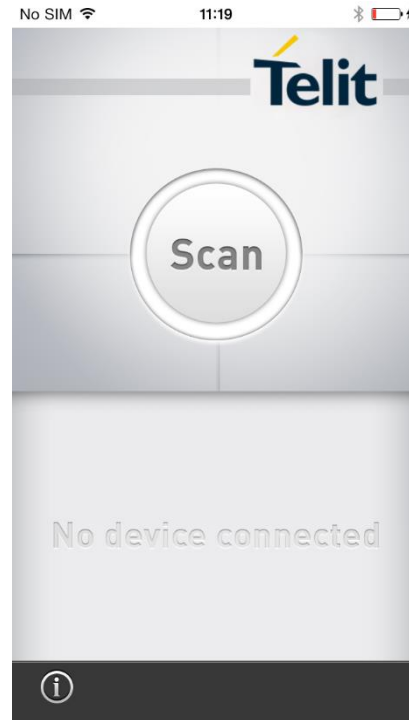


Figure 14: Search BT Devices

2. Once the BM+Sxx device is available, press the “Connect” button to establish the connection to the board.

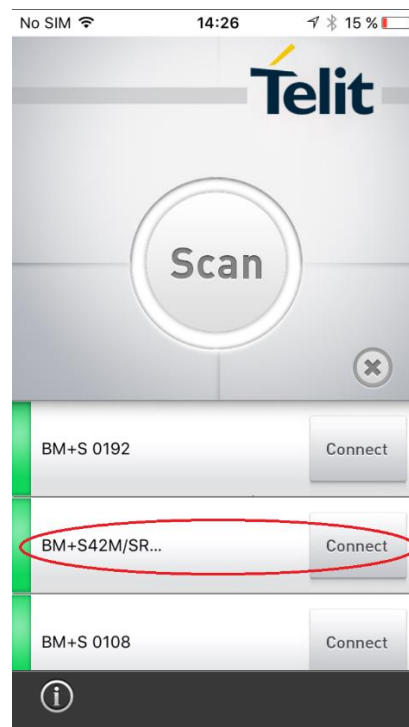


Figure 15: Connect Devices

- The first connection attempt will last some seconds. If the connection attempt succeeds the device status changes to “connected”.

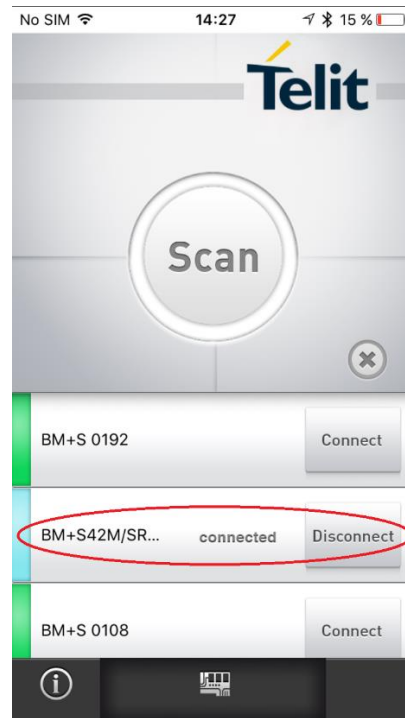


Figure 16: Device Connected

- The BM+Sxx device sends a RING message followed by a CONNECT TIO 0x00 message at the serial port.

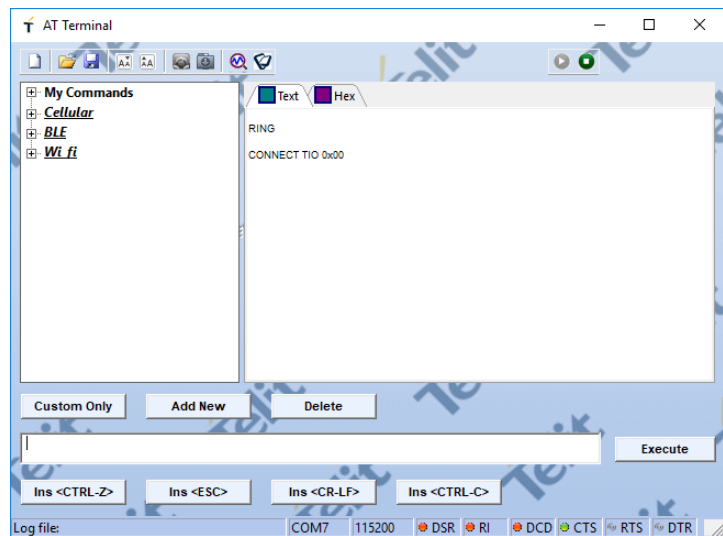


Figure 17: AT Terminal displays “CONNECT TIO”

5. For transmitting data to the BM+Sxx device tap the icon at the bottom of the screen.

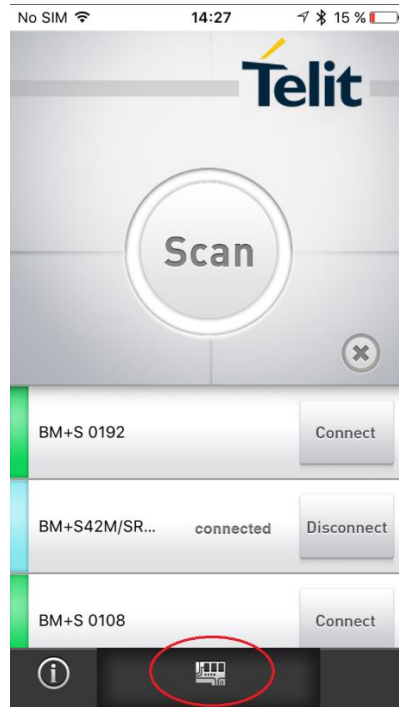


Figure 18: Transmit Data

6. Enter data in the corresponding field and press the "Send" button.



Figure 19: Send "Hello World"

7. The BM+Sxx device receives the sent data.

To send data from the BM+Sxx device to the iPhone just enter the data in the terminal emulation program (data are not echoed in the example).

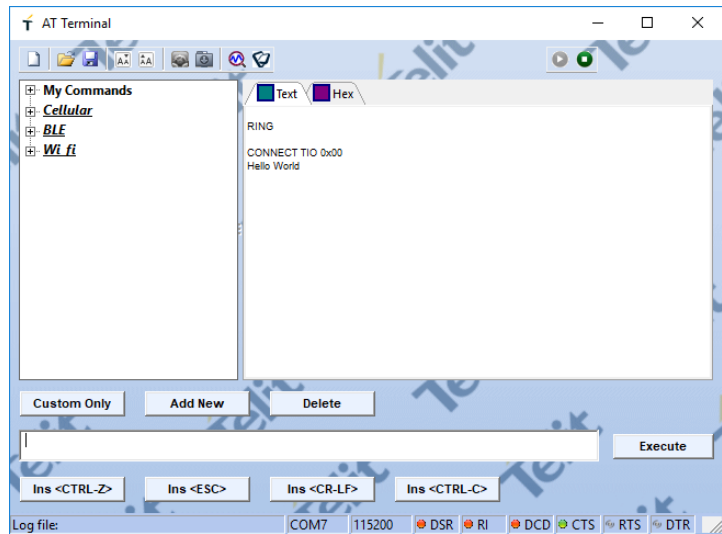


Figure 20: AT Terminal receives “Hello World”

8. The “Terminal IO Utility” app on the iPhone will receive the data.

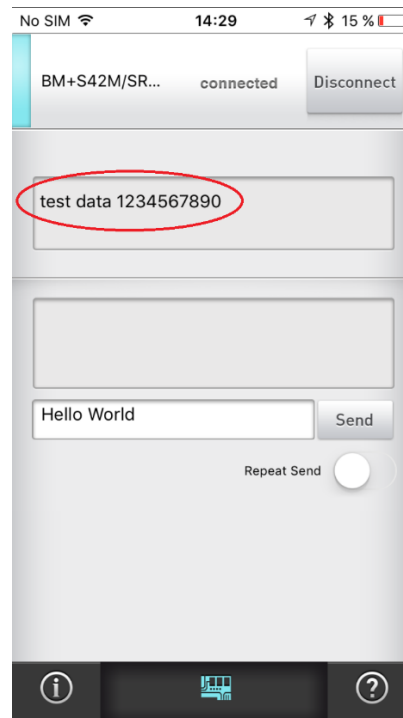


Figure 21: Terminal IO receives “test data ...”

9. To terminate the connection, press the “Disconnect” button.



Figure 22: Disconnect Device

10. After the connection is terminated the BlueMod+Sxx device sends a NO CARRIER 0x00 message.

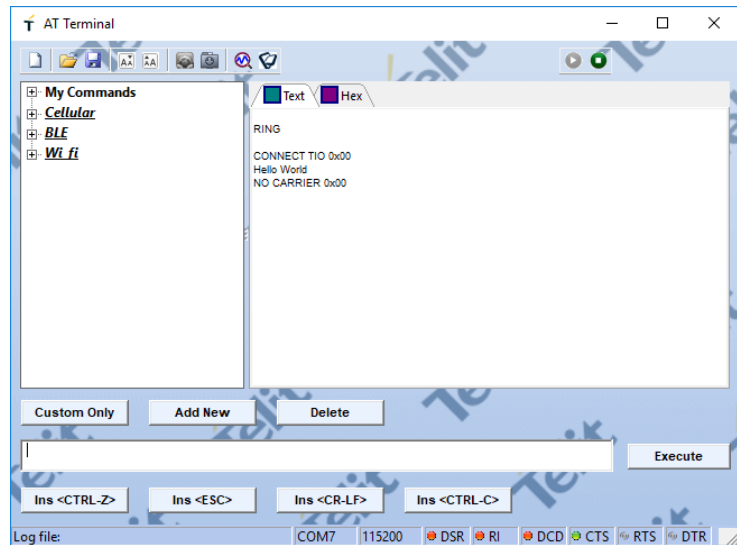


Figure 23: AT Terminal Disconnected

5.3. NFC Handover

This section provides information on how to simplify the Bluetooth pairing via NFC by using the BlueDev/Eva+S50/Central and the NFC Utility app for NFC enabled Android devices.

5.3.1. Prerequisites

The Smartphone must be equipped with the following:

- Android 4.1 or higher
- NFC supported
- Bluetooth and NFC activated

5.3.2. Configure the BlueDev/Eva+S50/Central for NFC Handover

To use the NFC functionality, connect an NFC antenna to the BlueDev/Eva+S50/Central board.

Then, connect the BlueDev/Eva+S50/Central to a free USB port on your PC and open the Telit AT Controller, press the “Connect” button and start the AT Terminal. The serial port settings are the same as described in section 5.2 Terminal IO Utility App.

Enable the NFC Handover functionality using the following AT command:

```
“at+nfcmode=1”
```

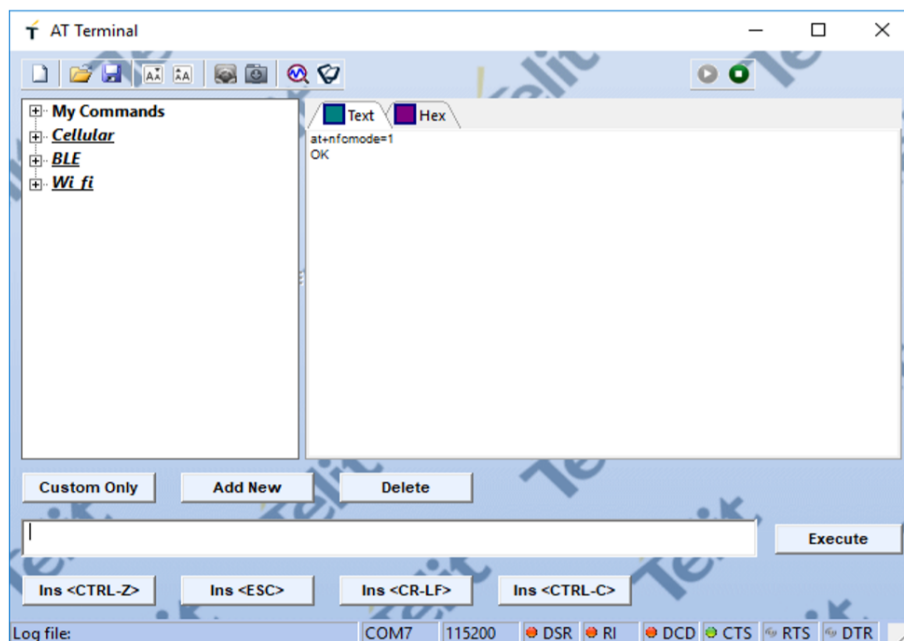


Figure 24: Enable NFC Handover

5.3.3. NFC Handover Example

1. Move the smartphone close the NFC antenna. The Bluetooth address will be read out from the tag and the smartphone initiates a Bluetooth pairing request to the device of the given Bluetooth address and a Bluetooth pairing request message will appear.

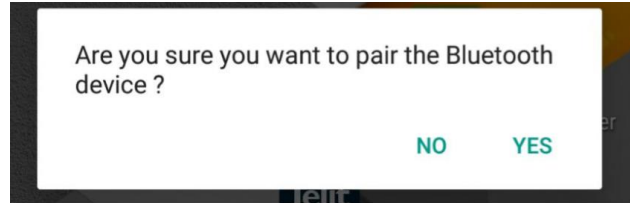


Figure 25: Bluetooth Pairing via NFC

2. Now continue with “Yes” (or “Pair”) to accept the Bluetooth pairing request scenario.
3. After the pairing request ended successfully you will find the new paired device within the Bluetooth settings of your smartphone.

5.4. Hang up a BT connection

When a BT connection is up, is it possible to hang up the connection using the RTS signal from a serial connection.

The jumper configuration is function of the type of connection as shown in the next paragraphs.

5.4.1. Hang up from Serial Software Connection

- PL202 (PWR_MASTER/PWR_SLAVE): jumper in 2-3 position (PWR_SLAVE)
- PL507 (EN_UART): jumper in 1-2 position (UART enabled)
- PL508 (SLAVE/MASTER): jumper in 2-3 position (SLAVE)
- PL505 (UART TX HW/SW): jumper in 2-3 position (TX SW)
- PL506 (UART RX HW/SW): jumper in 2-3 position (RX SW)
- PL509 (HANGUP/UICP): jumper in 1-2 position (hang up enabled)

5.4.2. Hang up from USB Connection (virtual port com)

- PL202 (PWR_MASTER/PWR_SLAVE): jumper in 1-2 position (PWR_MASTER)
- PL507 (EN_UART): no jumper (UART disabled)
- PL509 (HANGUP/UICP): jumper in 1-2 position (hang up enabled)

We can use a terminal emulation program such as “SerialTester” to verify the hang up in this condition: select and release “DTR” to hang up the BT connection.

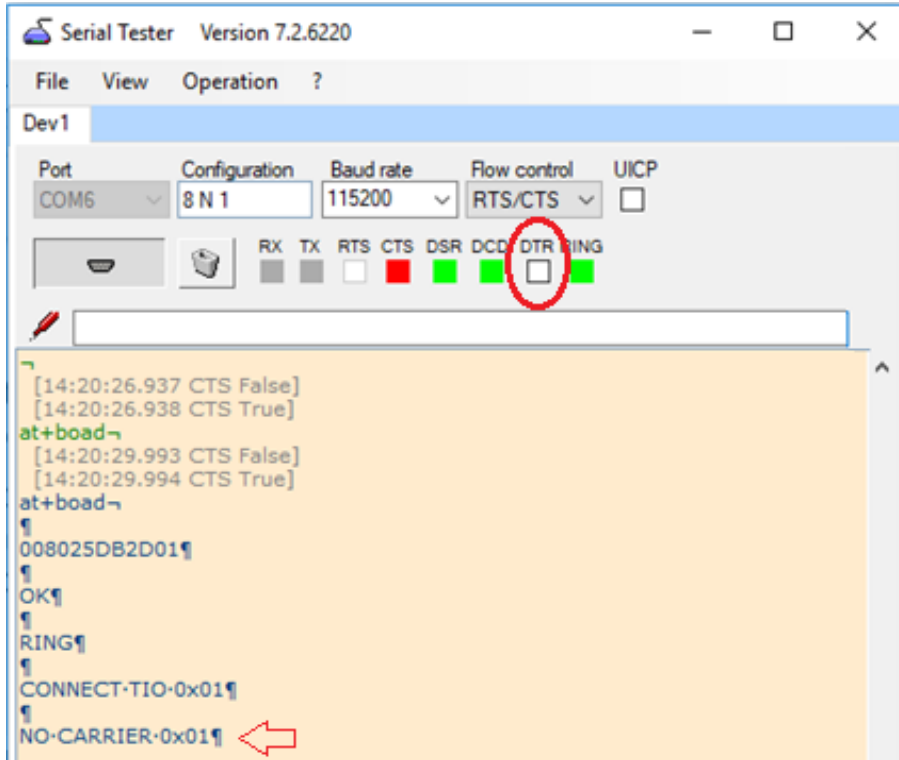


Figure 26: Hang up the BT connection using DTR

5.5. UICP Mode

If the UICP (UART Interface Control Protocol) mode is enabled, the BlueMod+Sxx goes in sleeping mode to saving power during idle phases.

Jumper configuration:

- PL202 (PWR_MASTER/PWR_SLAVE): jumper in 1-2 position (PWR_MASTER)
- PL507 (EN_UART): no jumper (UART disabled)
- PL509 (HANGUP/UICP): jumper in 2-3 position (UICP enabled). It's necessary to reset the board.

To use the UICP mode, it is necessary to verify if it is enabled: send the AT command “`at+uicp?`”, an answer “0” means “deactivated”. In this case:

- Send “`at+uicp=1`” to enable the UICP mode
- Send “`at&w`” to flash the memory

In the Terminal Window we must select “UICP”. See the figure below.

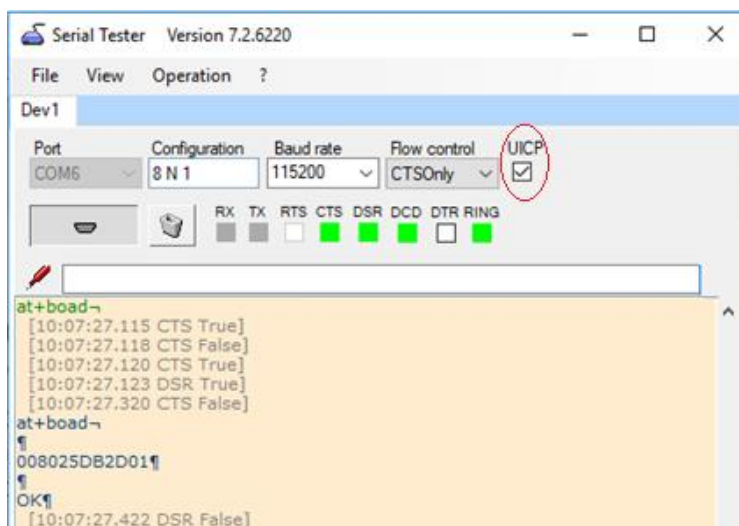


Figure 27: Use of UICP mode

5.6. LED401

LED401 is connected to IOB pin, GPIO3, which function depends on GPIO use or special function assigned by the firmware.

Check the “BlueMod+Sxx AT Command Reference” for more info.

5.7. LUA scripts and Arduino code Application Example

For application software info, libraries and examples download read the:

“BlueDev+Sxx and BlueMod+Sxx Application Notes”

6. FIRMWARE UPDATE

This section describes the step-by step procedure of updating the firmware on a BlueMod +Sxx via the local UART interface. New firmware update can add new features, as well as provide a way to fix bugs, and protects you from security vulnerabilities.

A firmware update can be performed using the Telit IoT Updater tool or Over the air.

6.1. Telit IoT Updater

The Telit IoT Updater is a Windows™ program that contains the firmware and uses a PC with a serial port for the update. The file name of the executable program consists of version and patch information.

Please follow the instructions below for updating the firmware:

1. Connect the BlueDev/Eva+Sxx to the USB port of a PC (make sure the FTDI VCP USB to UART driver is already installed).
2. Start the BM+S42M_xxx_FWupdate.exe program.

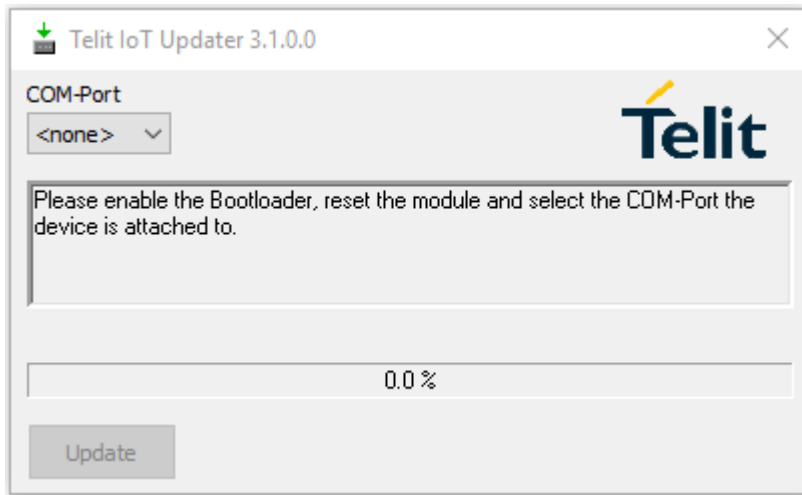


Figure 28: Telit IOT Updater COM-port selection

3. Select the assigned COM port and press the “Update” button.

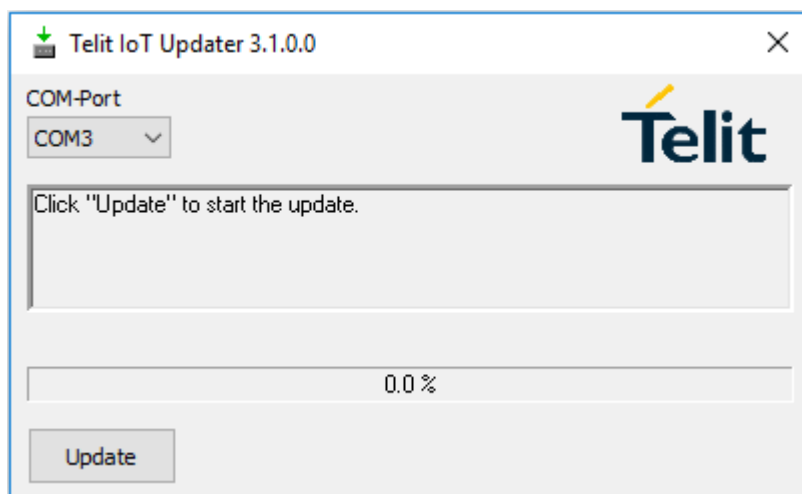


Figure 29: Telit IoT Updater - Select “Update”

- The firmware will be uploaded.

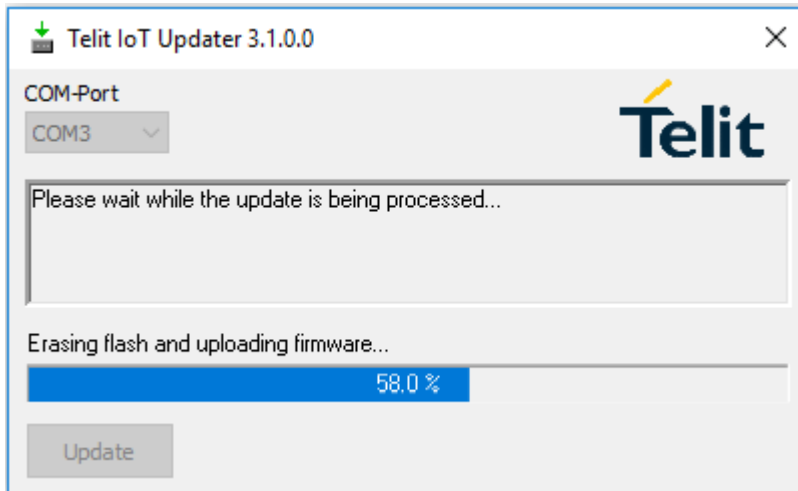


Figure 30: Telit IoT Updater - "Update in Progress"

- Once the update is completed, click the "Finish" button.

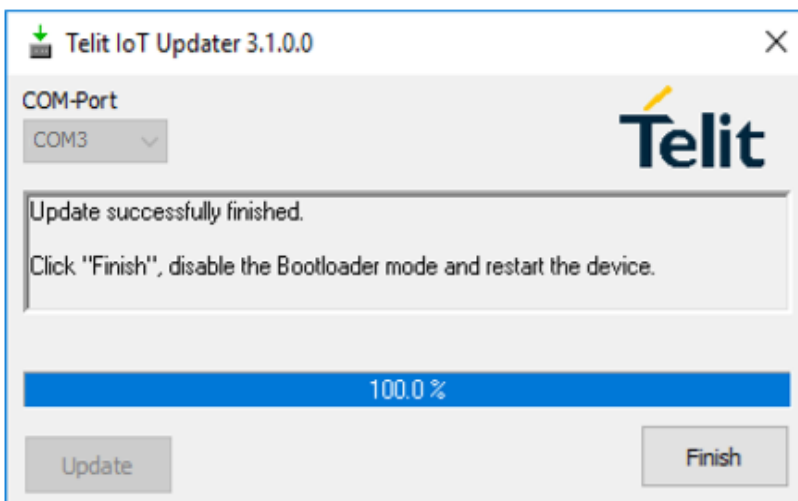


Figure 31: Telit IoT Updater - Finish



Do not disconnect the device while the update is in progress, otherwise the update will fail and has to be repeated. In case, it is not possible to update the module please contact the Telit support (email: ts-srd@telit.com).

6.2. Firmware Update Over the Air (OTA)

The BlueMod+S50 and BlueMod+S42 (TWI or CEN) supports firmware update over the air. The firmware update over the air can be performed by using the Nordic nRF Toolbox app available for iOS and Android or by using the Nordic Master Control Panel and the corresponding Nordic Bluetooth hardware.

The firmware over the air update will be enabled with the commands below:

- AT+DFUMODE=2
- AT+DFUSTART

After sending the AT+DFUSTART command the BlueMod+S50/42 is visible in the air as “BM+S_DFU” (name configured with command AT+DFUNAME) for a period of 2 minutes. If no firmware update is performed during this time the BlueMod+S50/42 will continue with normal operation.

6.2.1. Firmware Update Over the Air using Nordic nRF Toolbox on Android

1. Make sure BlueMod+S50/42 has already activated the firmware over the air update.
2. Open the “nRF Toolbox” app on the smartphone and select “DFU”.

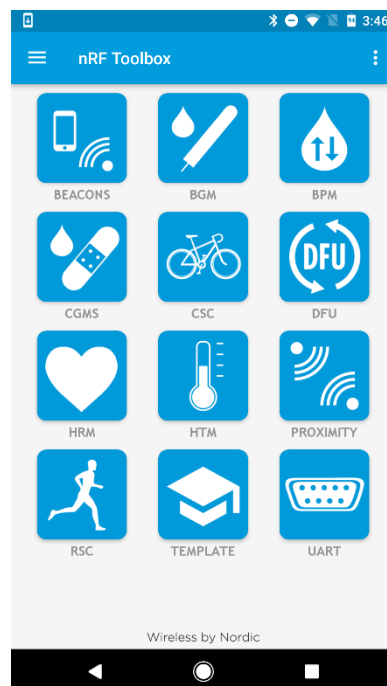


Figure 32: nRF Toolbox App

3. Press the button "SELECT FILE".

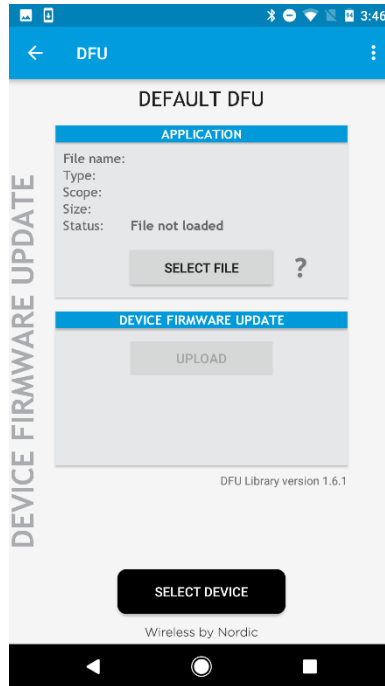


Figure 33: Select File Option

4. Select file type "Distribution packet (ZIP)".

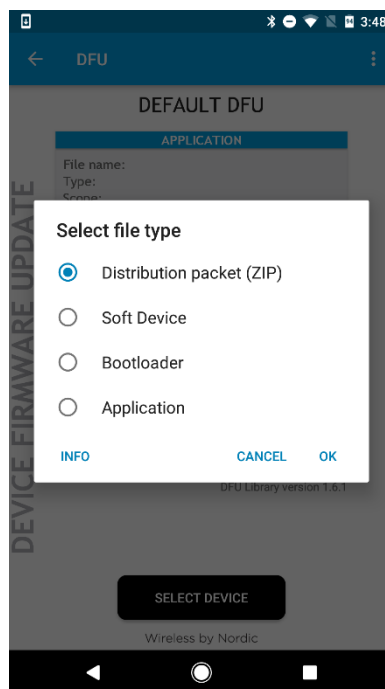


Figure 34: Select File Type

5. Select scope "All".

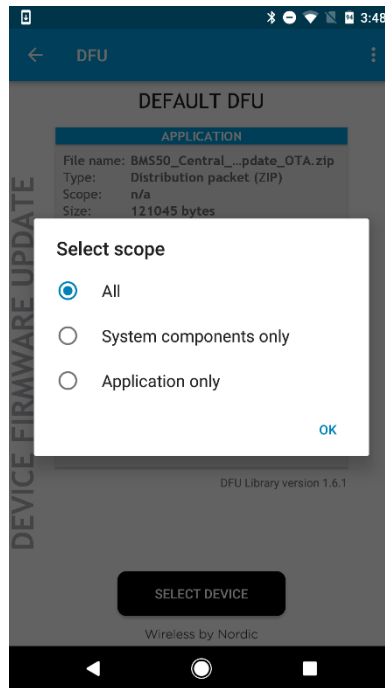


Figure 35: Select "Scope"

6. Search via file manager for the firmware package which was previously copied to the smartphone (For example, BMS50_Central_V5_0_0005_FWupdate_OTA.zip as show below).

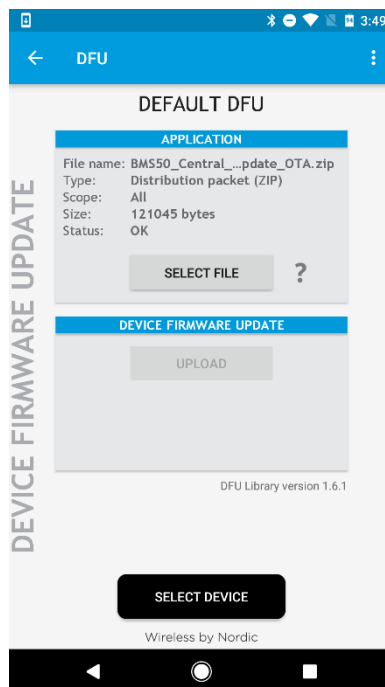


Figure 36: Select Previous File

- Press the button “SELECT DEVICE” and select the “BM+S_DFU” from the list of available devices.

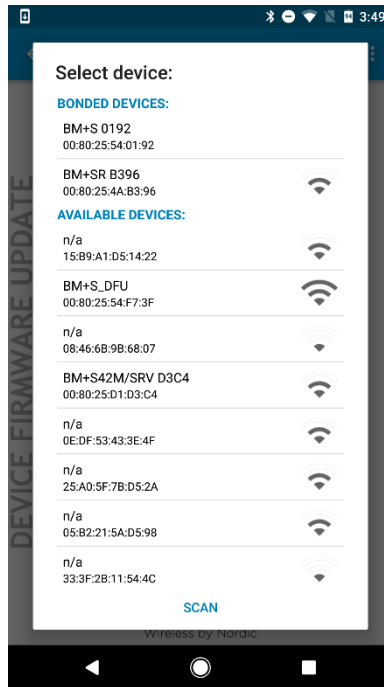


Figure 37: Select Device

- Press the “UPLOAD” button to upload the firmware package over the air to the BlueMod+S50/42.

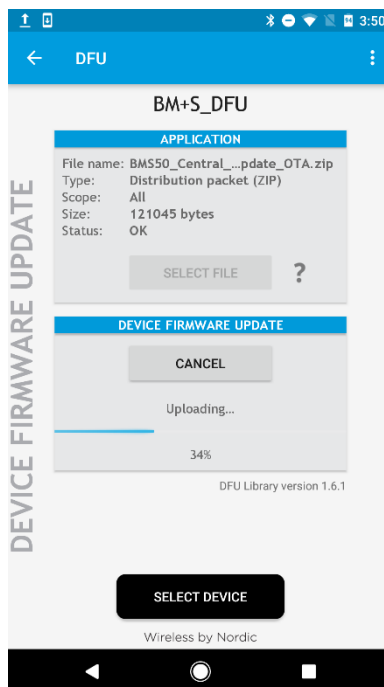


Figure 38: Upload the Firmware Package

- Once the file is uploaded successfully the BlueMod+S50/42 will start with the new firmware.

7. DOCUMENT HISTORY

Revision	Date	Changes
0	2019-02-26	First release



SUPPORT INQUIRIES

Link to www.telit.com and contact our technical support team for any questions related to technical issues.

www.telit.com



Telit Communications S.p.A.
Via Stazione di Prosecco, 5/B
I-34010 Sgonico (Trieste), Italy

Telit Wireless Solutions Inc.
3131 RDU Center Drive, Suite 135
Morrisville, NC 27560, USA

Telit Wireless Solutions Ltd.
10 Habarzel St.
Tel Aviv 69710, Israel

Telit IoT Platforms LLC
5300 Broken Sound Blvd, Suite 150
Boca Raton, FL 33487, USA

Telit Wireless Solutions Co., Ltd.
8th Fl., Shinyoung Securities Bld.
6, Gukjegeumyung-ro8-gil, Yeongdeungpo-gu
Seoul, 150-884, Korea

Telit Wireless Solutions
Tecnologia e Servicos Ltda
Avenida Paulista, 1776, Room 10.C
01310-921 São Paulo, Brazil

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