# BlueEva+S42M
# Evaluation Kit User Guide

1VV0301390 Rev. 0 – 2017-07-06

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# APPLICABILITY TABLE

## PRODUCTS

- BLUEMOD+S42M

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# CONTENTS



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# 1. INTRODUCTION

## 1.1. Scope

This document describes the usage of the evaluation kit for the Bluetooth module BlueMod+S42M.

## 1.2. Audience

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

## 1.3. Contact and Support Information

For general contact, technical support services, technical questions and report documentation errors contact Telit Technical Support at:

- 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.

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## 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.

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## 1.5. Related Documents

- [1] BlueMod+S42M Hardware User Guide, 1VV0301379
- [2] UICP+ UART Interface Control Protocol, 30507ST10756A
- [3] BlueMod+S42M AT Command Reference, 80527ST10839A
- [4] BlueEva+S42M Schematics

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# 2. PACKAGE CONTENT

The BlueEva+S42M package contains the following components:

- 1 x BlueEva+S42M board
- 1 x Mini USB cable
- 1 x Battery CR2032
- 1 x Printed card with download instructions

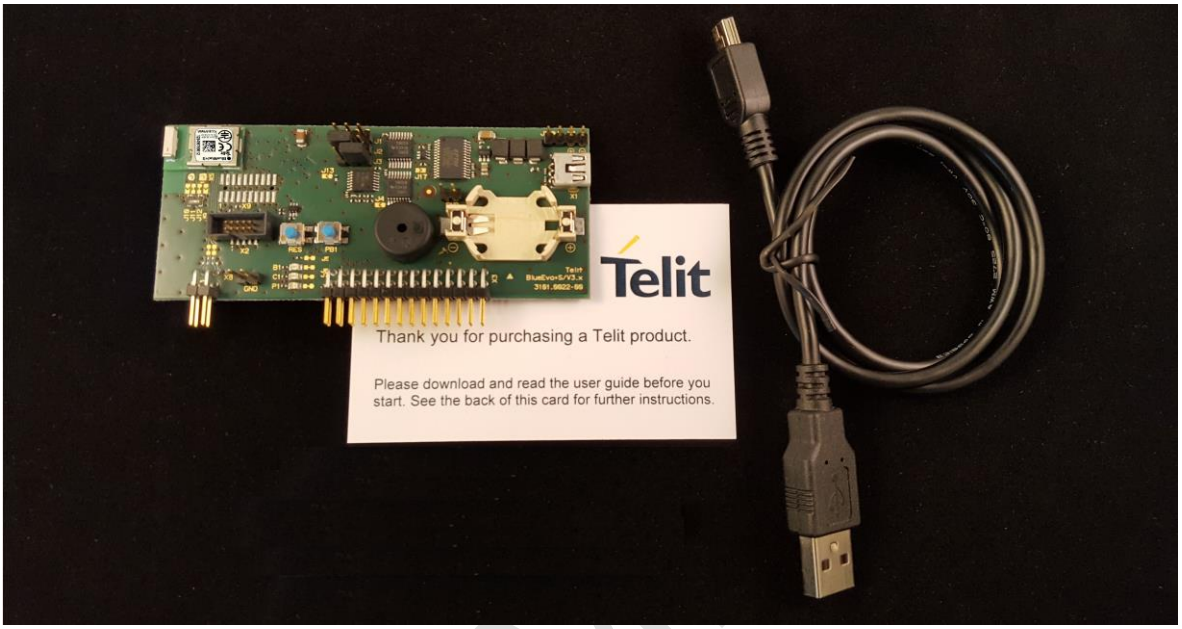


*Figure 1: BlueEva+S42M package content*

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# 3. HARDWARE

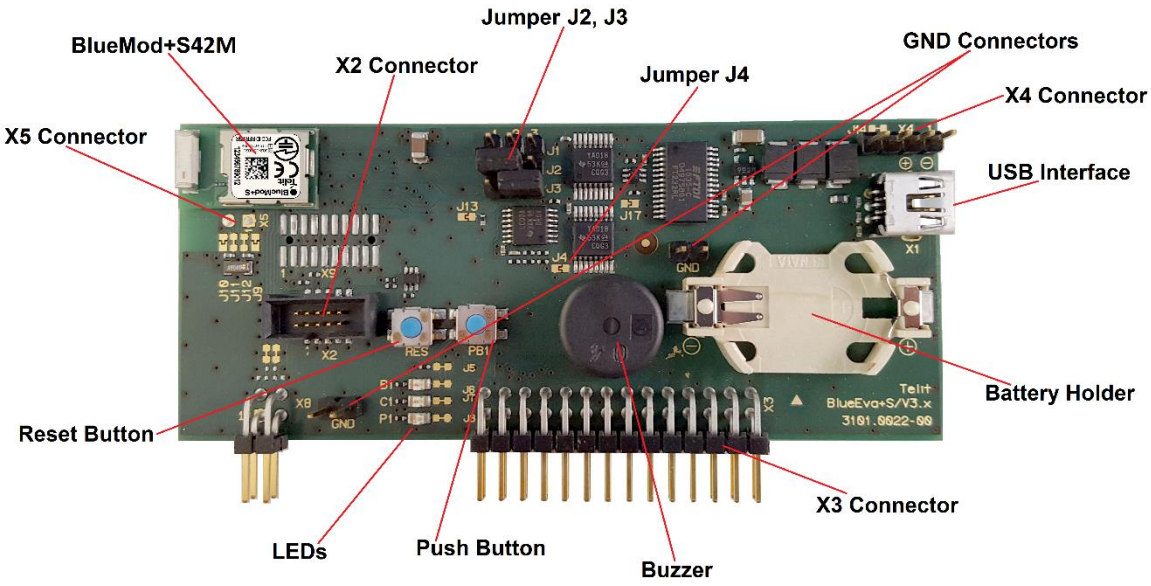


*Figure 2: BlueEva+S42M*

## 3.1. BlueMod+S42M

The BlueEva+S42M is equipped with a BlueMod+S42M Bluetooth module.

## 3.2. Reset

The BlueEva+S42M is equipped with a reset button. Pressing the reset button will trigger the BlueMod+S42M module to perform a reset. The USB port is not influenced by the reset.

## 3.3. USB Interface

The BlueEva+S42M provides an USB interface which is used to connect the evaluation board to the host and as power supply.

The USB interface is equipped with an FTDI USB to serial bridge, interfacing the serial port of the BlueMod+S42M.

The serial port is a high-speed UART interface at CMOS levels and supports the following features:

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

For details please refer to the BlueMod+S42M Hardware User Guide [1].

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## 3.4. LEDs

The BlueEva+S42M provides several LEDs for functional indication.

| Interface | Position | Function |
|---|---|---|
| LEDs | B1 | Connected to GPIO-IOB (1) |
| | C1 | Not supported by BlueMod+S42M |
| | P1 | Indicates the presence of power supply voltage |

(1) *Function depending on firmware support*

## 3.5. Connectors / Jumpers

### 3.5.1. Jumper J2

Jumper J2 is not supported by BlueMod+S42M.

### 3.5.2. Jumper J3

Jumper J3 is used for either hangup or UICP functionality.

In hangup mode DTR# is connected to GPIO-HANGUP. An existing connection is terminated by DTR drop (high signal on DTR#).

In UICP mode DTR# is used as IUR-IN# signal. UICP is an advanced power management protocol. For further information about UICP please refer to the UICP UART Interface Control Protocol Specification [2].

| J3 Position | Function |
|---|---|
| 1-2 | DTR# connected to IUR-IN# |
| 2-3 | DTR# connected to GPIO-HANGUP |

### 3.5.3. Jumper J4

Jumper J4 provides the possibility to disable (by closing it with a soldering point) the USB to serial bridge. With a closed jumper J4, the in- and outputs of the FTDI chip are disconnected. Therefore the modules serial port can be controlled via Connector X3 (see chapter 0).

When using BlueEva+S42M, be sure to connect a serial interface via connector X3 only when jumper J4 is closed. Otherwise the serial interface and the USB to serial bridge will collide.

### 3.5.4. Connector X2

Connector X2 is used as “Debug in” to connect a debugger to the BlueMod+S42M module.

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### 3.5.5. Connector X3

Connector X3 is a 28 pin extension header exposing all module signals.

| Pin Number | Signal BlueMod+S42M | Signal EVK | Type | Description |
|---|---|---|---|---|
| 1 | +3V0 | +3V0 | PWR | Supply voltage output |
| 2 | +3V0 | +3V0 | PWR | Supply voltage output |
| 3 | GND | GND | PWR | Ground |
| 4 | GND | GND | PWR | Ground |
| 5 | SCL | GPIO[0] | I/O | I²C bus(1) |
| 6 | SDA | GPIO[1] | I/O | I²C bus(1) |
| 7 | - | GPIO[2] | NC | Not connected |
| 8 | GPIO-IOB | GPIO[3] | I/O | GPIO (1) |
| 9 | GPIO-HANGUP | GPIO[4] | I/O | BT connection hangup (1) |
| 10 | - | GPIO[5] | NC | Not connected |
| 11 | - | GPIO[6] | NC | Not connected |
| 12 | - | GPIO[7] | NC | Not connected |
| 13 | GPIO-IOA | GPIO[8] | I/O | GPIO (1) |
| 14 | - | GPIO[9] | NC | Not connected |
| 15 | - | GPIO[10] | NC | Not connected |
| 16 | - | GPIO[11] | NC | Not connected |
| 17 | - | GPIO[12] | NC | Not connected |
| 18 | - | GPIO[13] | NC | Not connected |
| 19 | - | GPIO[14] | NC | Not connected |
| 20 | | PO26_AIN0 | | See schematic (1) |
| 21 | | PO27_AIN1 | | See schematic (1) |
| 22 | EXT-RES# | EXT-RES# | I-PU | User reset |
| 23 | UART-TXD (2) | UART-TXD (2) | O-PP | IUR data OUT |
| 24 | UART-RXD (2) | UART-RXD (2) | I | IUR data IN |
| 25 | UART-CTS# (2) | UART-CTS# (2) | I | Flow control |
| 26 | UART-RTS# (2) | UART-RTS# (2) | O-PP | Flow control |
| 27 | IUR-IN# (2) | IUR-IN# (2) | I/O | GPIO (1) |
| 28 | IUR-OUT# (2) | IUR-OUT# (2) | I/O | GPIO (1) |

PU = PullUp, PD = PullDown, PP = PushPull, I-DIS = InputBufferDisconnected

*(1) Function depending on firmware support*

*(2) BlueEva+S42M: Disconnected from module, when jumper J4 is open*

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### 3.5.6. Connector X4

Connector X4 provides the possibility to measure the supply current of the BlueMod+S42M and to power the evaluation board with an external power supply.

| Pin Number | Signal |
|---|---|
| 1 | GND |
| 2 | ext. PWR |
| 3 | +3V0 |
| 4 | +3V0-BT |

## 3.6. Current Measurement

Current measurement can be performed by opening (cut off) jumper J14 and measuring the current drawn by BlueMod+S42M between pin 3 and 4 of connector X4. The currents drawn by other peripherals on BlueEva+S42M are not included in this measurement.

For measuring the minimum current, the serial interface must be disconnected from the module. This can be achieved by disconnecting the USB plug and powering the board via external or battery supply or by closing solder jumper J4.

## 3.7. Power Supply

The three power sources are decoupled from each other by diodes connected in series. The presence of the supply voltage is indicated by LED P1.

### 3.7.1. USB Power Supply

VBUS of the USB connector X1 directly powers the USB to serial converter and via a voltage regulator the rest of the circuitry.

### 3.7.2. External Power Supply

Pin 1 and 2 of connector X4 provides the possibility to connect an external power supply (see BlueMod+S42M Hardware User Guide [1]).

### 3.7.3. Battery Holder

The battery holder provides the possibility to run the BlueEva+S42M without external power (via USB or external power supply) by using a 3V coin cell battery CR2032. Opening jumper J8 will disconnect the power LED P1 and thus save 1.8mA of battery current. For safety reasons there should be permanently connected no other power supply, when a battery is inserted.

## 3.8. Buzzer

The Buzzer is not supported by BlueMod+S42M.

## 3.9. Push Button

The Push Button is not supported by BlueMod+S42M.

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## 3.10. How To Interface the UART Lines on TTL level

If you want to access the UART lines directly it is important to disable the onboard USB to serial bridge by closing jumper J4 with a soldering point.

All UART signals are available at connector X3 and can be connected to your application.

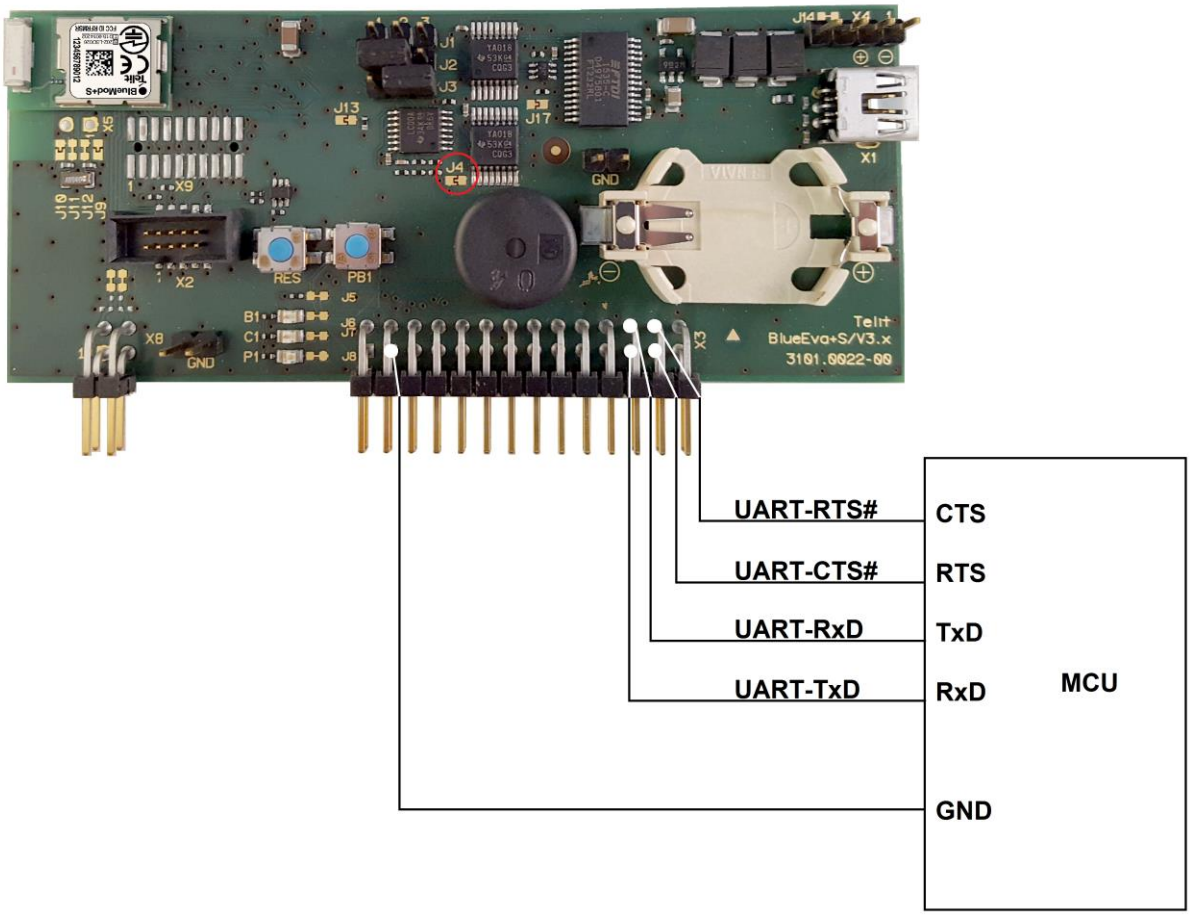


*Figure 3: MCU connected to UART lines*

## 3.11. Default Configuration

The BlueEva+S42M is preconfigured as described below:

| Jumper Number | Position | Function |
|---|---|---|
| J2 | 1-2 | Not supported by BlueMod+S42M |
| J3 | 2-3 | DTR# connected to GPIO-HANGUP |

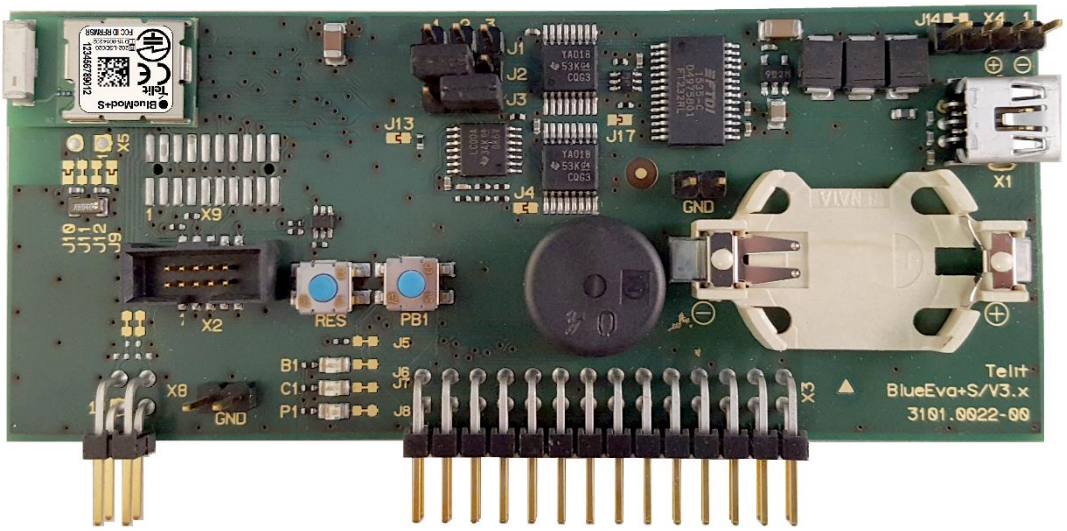


*Figure 4: BlueEva+S42M default configuration*

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# 4. SETUP

## 4.1. System Requirements

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

## 4.2. Startup

To install the BlueEva+S42M connect it as follows.

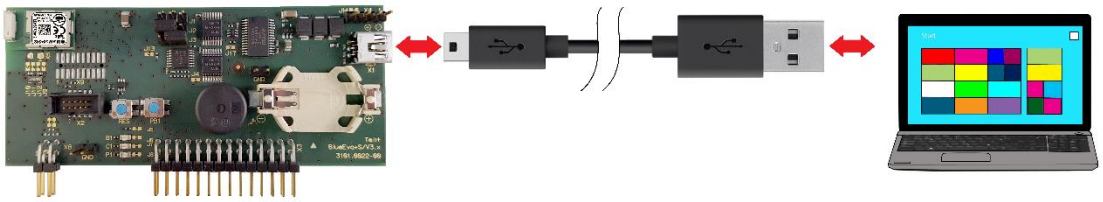

*Figure 5: Connect the BlueEva+S42M to your PC*

## 4.3. Installation of the BlueEva+S42M USB Driver

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

http://www.ftdichip.com/Drivers/VCP.htm

Connect the BlueEva+S42M 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.

You may download the TeraTerm terminal program from the official open source web site:

https://en.osdn.jp/projects/ttssh2/releases/

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# 5. USAGE OF THE BLUEEVA+S42M

## 5.1. Configuration of the BlueEva+S42M

If the BlueEva+S42M is correctly connected to the PC, a terminal emulation program can be used to read and modify the configuration settings.

For a more detailed description of the AT commands used for this purpose, please consult our BlueMod+S42M AT Command Reference [3].

As shipped by the factory, the BlueEva+S42M works at 115,200 bps, using the 8N1 data format (8 data bits, no parity, 1 stop bit). Please configure your terminal emulation program accordingly. Select the COM port the BlueEva+S42M is connected to (COM9 in the example below).

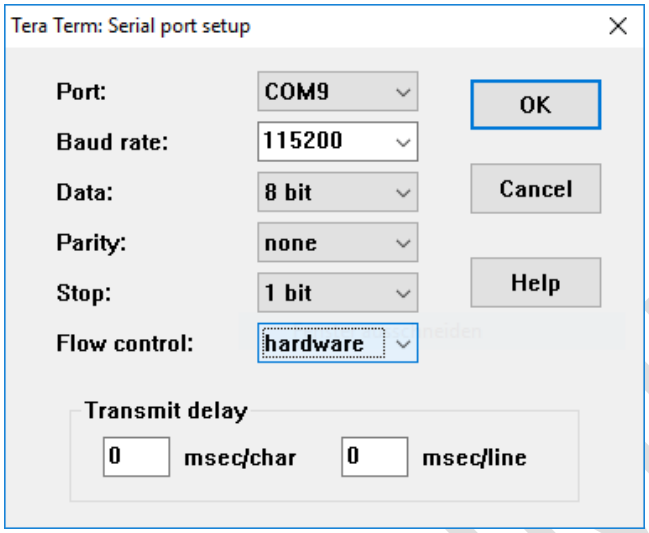


*Figure 6: COM port configuration with TeraTerm*

Once you have successfully configured the terminal emulation program, issuing the “AT” command without parameters should prompt the BlueEva+S42M to return OK.

Now you can readout information about the type of the connected device using the “ATI” command.

In the next step, you should issue the “ATI99” command to determine the firmware version installed and check to see whether that is the most recent version.

Finally, you should use the “AT+BOAD” command to determine the Bluetooth address of the BlueEva+S42M. The Bluetooth address is unique, letting you identify the correct device for each Bluetooth address.

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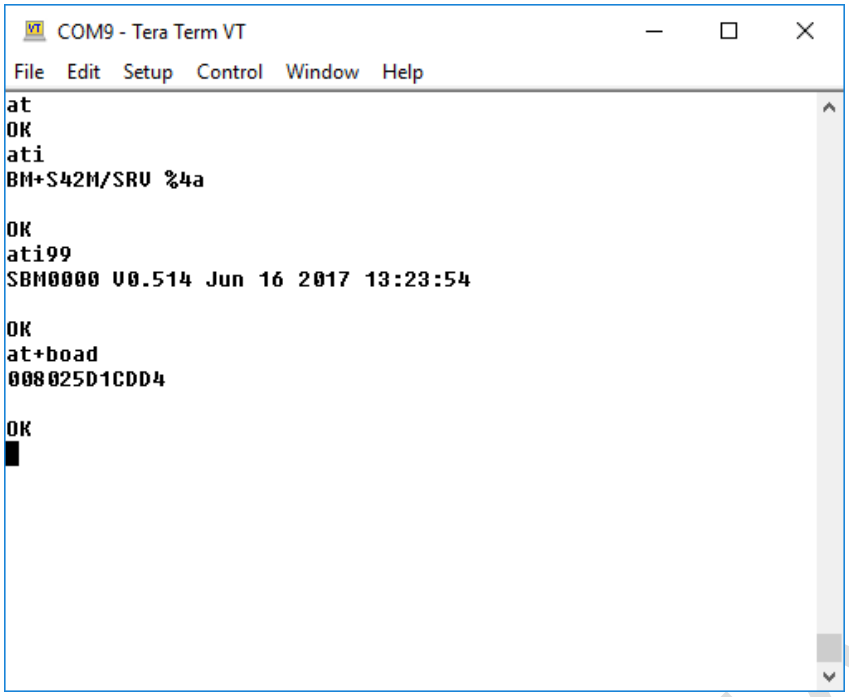


*Figure 7: Reading some BlueEva+S42M settings with TeraTerm*

## 5.2. Connection with Telit “Terminal IO Utility” App

Telit provides the "Terminal IO Utility" App for iOS and Android which can be used to establish a Bluetooth Low Energy connection from a smartphone to the BlueEva+S42M.

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

| iOS | Logo | Android |
|---|---|---|

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

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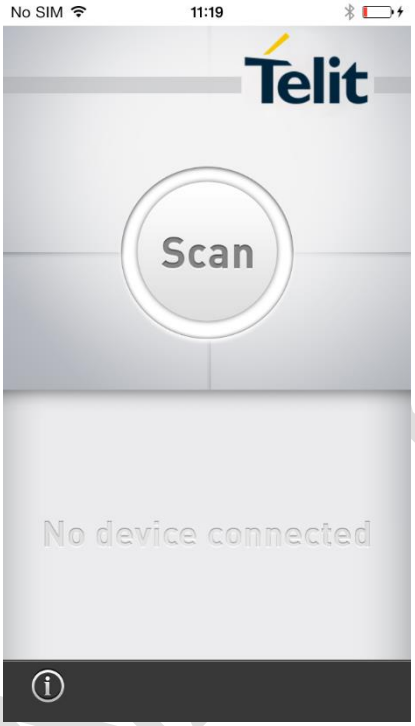
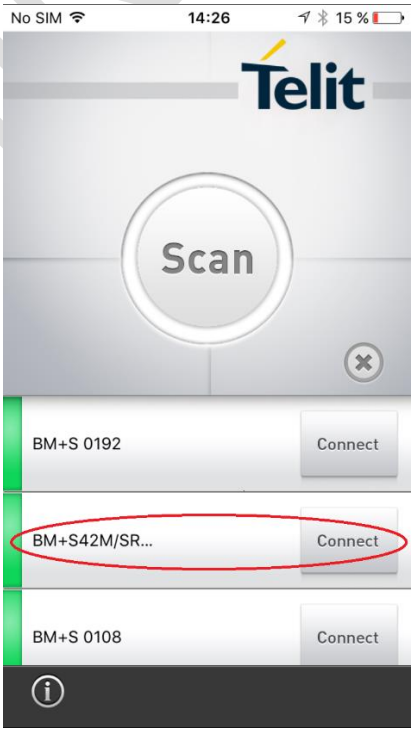
Please find below an example using the “Terminal IO Utility” App for iOS:

| | |
|---|---|
| Press the “Scan” button to search for available Terminal I/O peripheral devices. |  |
| Check if your BlueEva+S42M device (BM+S42M/SRVxxx) is found and press the “Connect” button to establish the connection to the BlueEva+S42M. |  |

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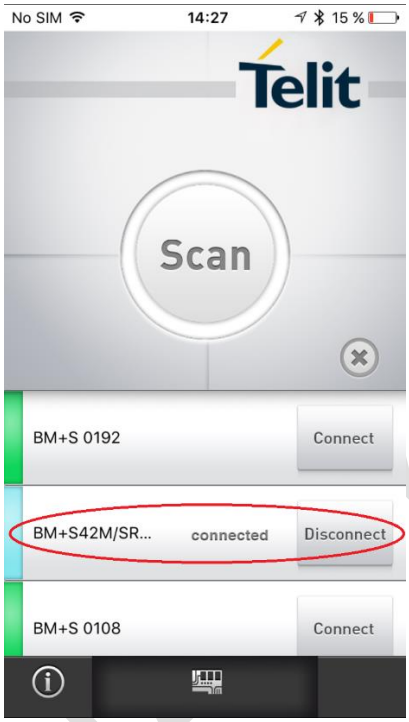
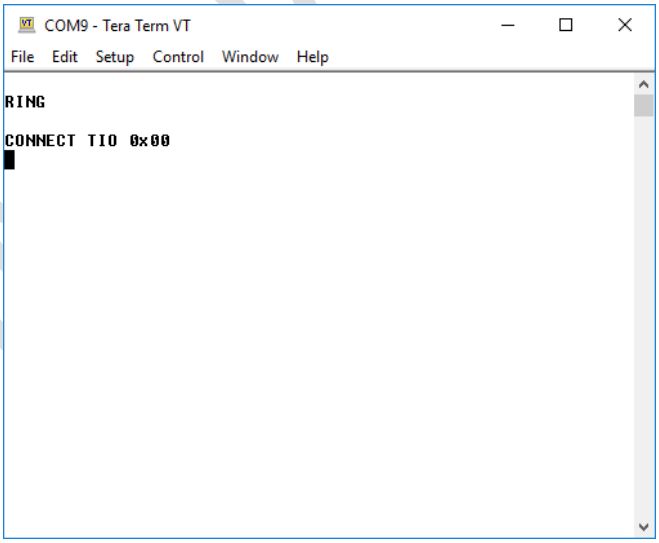
| | |
|---|---|
| The first connection attempt will last some seconds. If the connection attempt succeeded the device status is changed to “connected”. |  |
| The BlueEva+S42M is sending a RING message followed by a CONNECT TIO 0x00 message at the serial port. |  |

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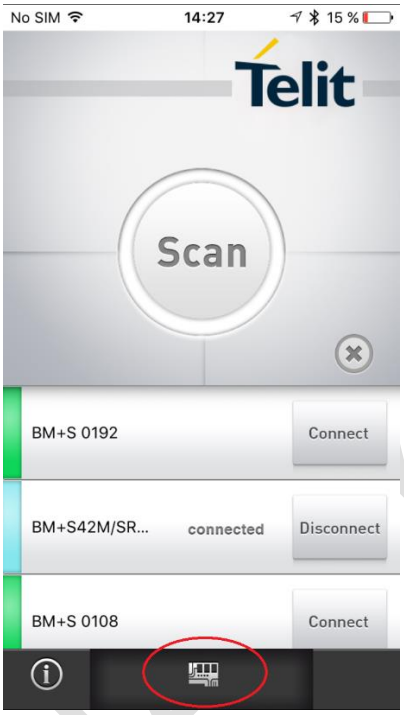
| | |
|---|---|
| For transmitting data to the BlueEva+S42M click on the icon at the bottom of the page. |  |
| Enter data in the corresponding field and press the “Send” button. |  |

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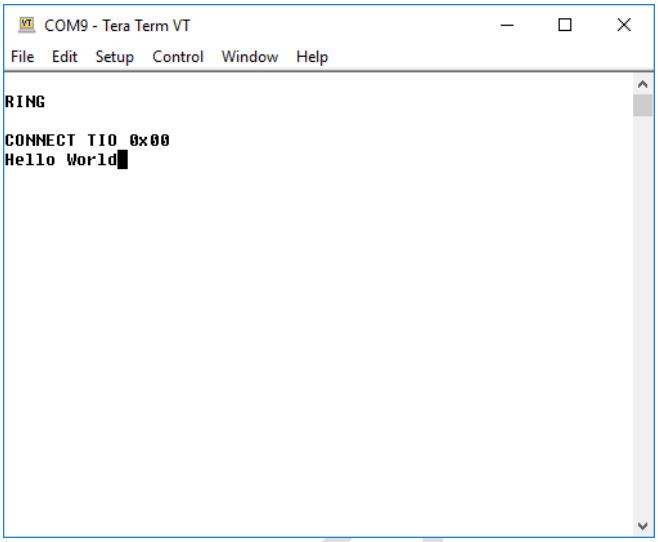
| | |
|---|---|
| The BlueEva+S42M is receiving the sent data.<br><br>To send data from the BlueEva+S42M to the iPhone just enter the data in the terminal emulation program (data are not echoed in the example). |  |
| The “Terminal IO Utility” app on the iPhone is receiving the data. |  |

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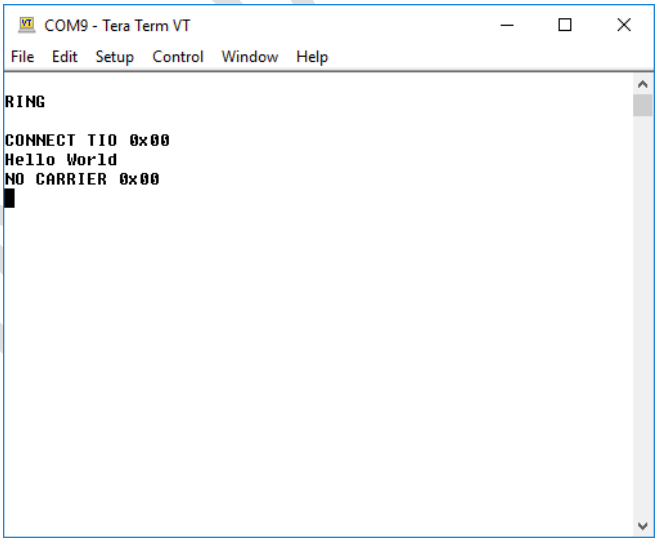
| | |
|---|---|
| To terminate the connection press the “Disconnect” button. |  |
| After the connection is terminated the BlueEva+S42M is sending a NO CARRIER 0x00 message. |  |

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# 6. FIRMWARE UPDATE

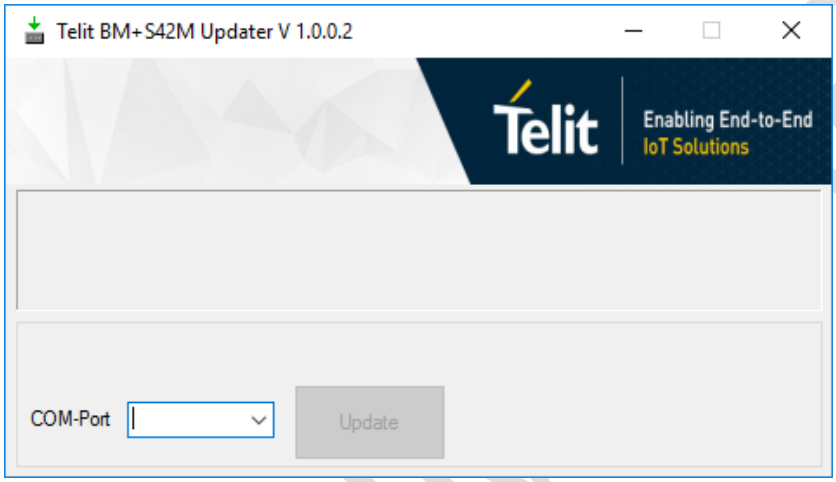
The firmware of the BlueEva+S42M can be updated via the local UART interface by using the BM+S42M Updater tool or over the air.

## 6.1. BM+S42M Updater

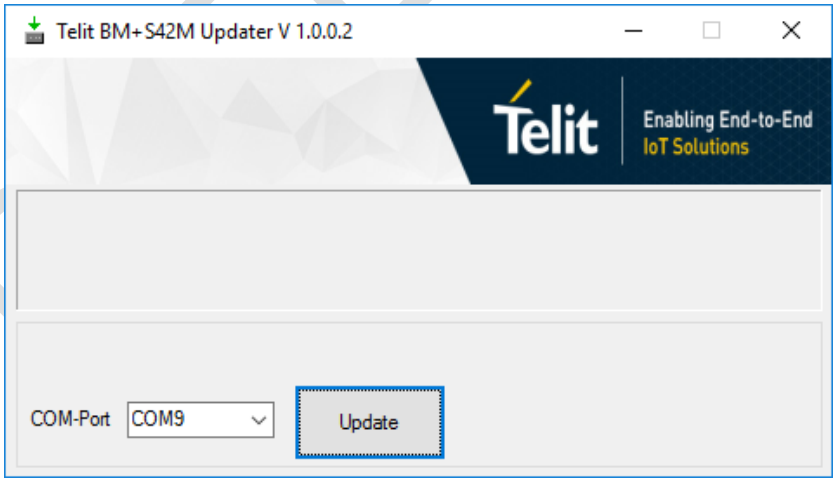
The BM+S42M Updater is a Windows™ program that contains the firmware and uses a PC with a serial port for the update. The file name of the executable program consists of version and patch information.

Please follow the instructions below for updating the firmware:

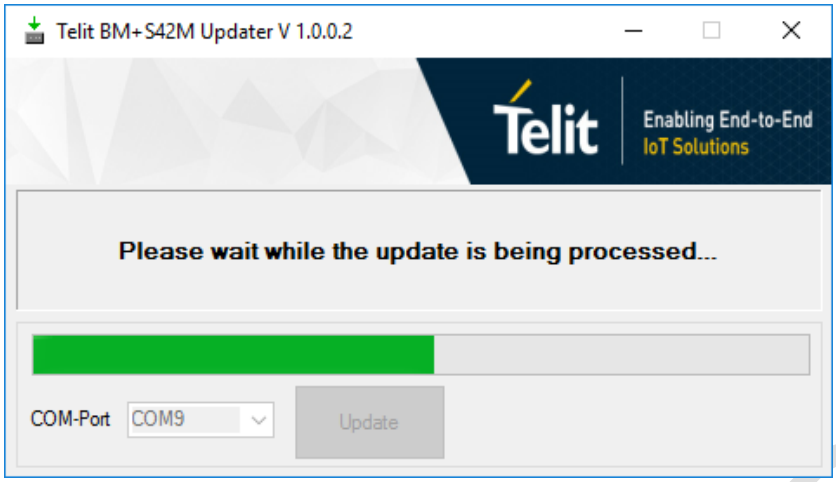
- Connect the BlueEva+S42M to the USB port of a PC (make sure the FTDI VCP USB to UART driver is already installed).
- Start the BM+S42M_xxx_FWupdate.exe program.



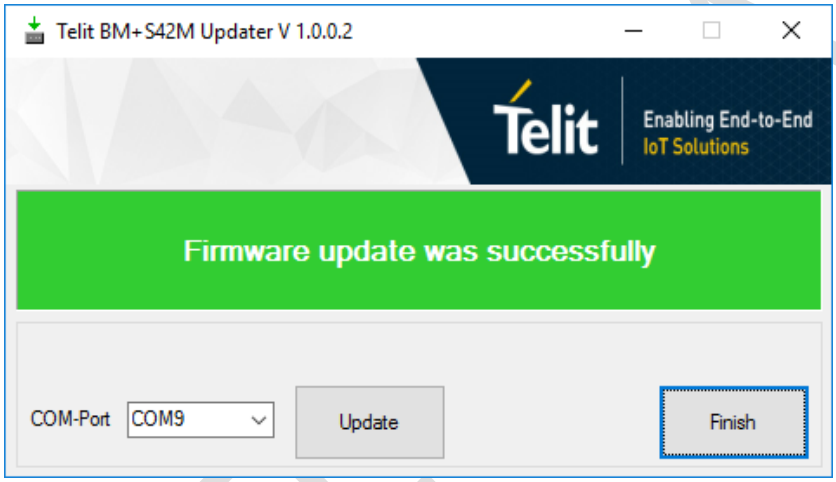

- Select the COM port the BlueEva+S42M is connected to and press the “Update” button.



- The firmware will be uploaded.




- After the update is completed click the “Finish” button.




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 (mailto:ts-srd@telit.com).

## 6.2. Firmware Update Over the Air (OTA)

Firmware update over the air will be available in future version.

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# 7. DOCUMENT HISTORY

| Revision | Date | Changes |
|---|---|---|
| r0 | 2017-07-06 | First issue |
| | | |

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# SUPPORT INQUIRIES

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