



# SW User Guide

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**TELIT**  
**TECHNICAL**  
**DOCUMENTATION**

# BlueEva+SR

## Evaluation Kit User Guide

Release r04

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## 1 Introduction

This documentation describes the usage of the Bluetooth evaluation board BlueEva+SR.

*Note: Please check our website for further and/or updated documentation.*  
<http://www.telit.com/support/technical-support/> and select “Downloadzone”.

## 2 Package Contents

The BlueEva+SR package contains the following components:

- 1 x BlueEva+SR board
- 1 x NFC board “NTAGI2CEvalv1.0” incl. the corresponding flat ribbon cable
- 1 x USB cable
- 1 x Printed quick install guide

## 3 Hardware

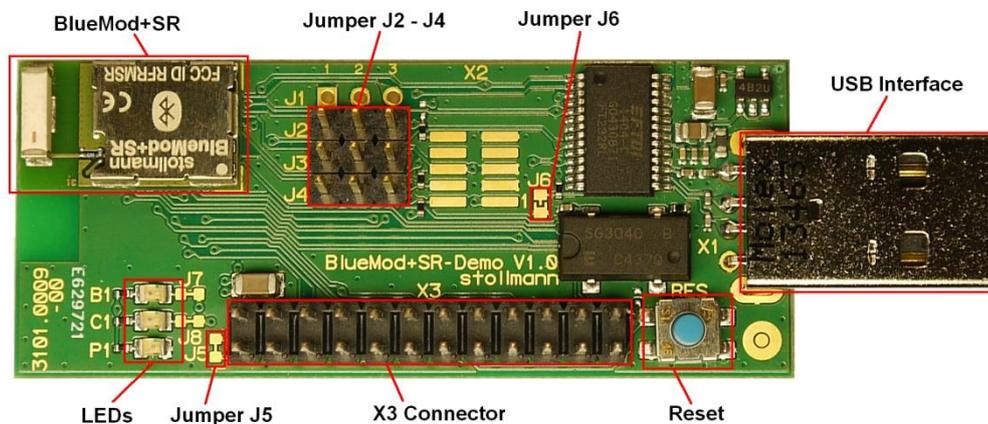


Figure 1: BlueEva+SR

### 3.1 BlueMod+SR

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

### 3.2 Reset

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

### 3.3 USB Interface

The BlueEva+SR provides an USB interface which is used to connect the evaluation board to the host and as power supply. The presence of the supply voltage is indicated by LED P1.

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

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
- Hardware flow-control with RTS/CTS

For details please refer to the *BlueMod+SR Hardware Reference*.

### 3.4 LEDs

The BlueEva+SR provides several LEDs for functional indication.

Interface	Position	Function
LEDs	P1	Indicates the presence of power supply voltage
	B1	Connected to module signal iOB
	C1	Connected to module signal iOC <sup>1</sup>

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<sup>1</sup> Function depending on firmware support

## 3.5 Connectors / Jumpers

### 3.5.1 Jumper J2

Jumper J2 provides the possibility to invoke the STM32 bootloader at start-up. This is required for firmware update.

Jumper Number	Position	Function
J2	1-2	Normal operation mode at start-up
J2	2-3	Invoke STM32 bootloader at start-up (BOOT0)

### 3.5.2 Jumper J3

Jumper J3 is used for either hangup or UICP functionality.

In hangup mode USB\_DTR# is connected to GPIO[4]. An existing connection is terminated by DTR drop (high signal on USB\_DTR#).<sup>2</sup>

In UICP mode USB\_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*.

Jumper Number	Position	Function
J3	1-2	USB_DTR# connected to IUR-IN# for using UICP
J3	2-3	USB_DTR# connected to GPIO[4]

### 3.5.3 Jumper J4

Jumper J4 provides the possibility for feeding the BlueMod+SR with an external 32.768 kHz slow clock. Using the external slow clock reduces the power consumption during power down modes. For demonstrating purposes an external low power oscillator is available on the BlueEva+SR.

Jumper Number	Position	Function
J4	1-2	Use module internal slow clock
J4	2-3	Use external 32.768 kHz slow clock (SLCK)

### 3.5.4 Jumper J5

Jumper J5 provides the possibility (by opening/cutting off the jumper) for current measurement of the BlueMod+SR.

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<sup>2</sup> Function depending on firmware support

### 3.5.5 Jumper J6

Jumper J6 provides the possibility to disable (by closing it with a soldering point) the USB to serial bridge.

### 3.5.6 Connector X3

Connector X3 is a 24 pin extension header.

Pin Number	Signal	Dir.	Description
1	+3V3	O	Supply voltage output
2	+3V3-BT	I	Supply voltage to BlueMod+SR
3	GND		Ground
4	GND		Ground
5	GPIO[0]	I	GPIO
6	GPIO[1]	I	GPIO
7	GPIO[2]	I/O	IOC, user IO
8	GPIO[3]	I/O	IOB, user IO
9	GPIO[4]	I-PD	HANGUP
10	GPIO[5]	I/O	IOD, user IO
11	GPIO[6]	O-PP	Reserved
12	GPIO[7]	I-PD	GPIO
13	GPIO[8]	I/O	IOA, user IO
14	EXT-RES#	I/O-PU	User reset
15	UART-TXD	O-PP	IUR data OUT
16	UART-RXD	I-PD	IUR data IN
17	UART-CTS#	I-PD	Flow control / IUC
18	UART-RTS#	O-PP	Flow control / IUC
19	IUR-IN#	I-PD	UICP control
20	IUR-OUT#	O-PP	UICP control
21	BT-ACT	O	WLAN coexistence
22	BT-STAT	O	WLAN coexistence
23	WLAN-DNY	I-PD	WLAN coexistence
24	BT-PER	O	WLAN coexistence

PU = PullUp, PD = PullDown, PP = PushPull

## 3.6 Current Measurement

Current measurement of the BlueMod+SR can be performed by opening (cut off) jumper J5 and measuring the current between pin 1 and 2 of connector X3.

### 3.7 How To Interface the UART Lines on TTL level

If you want to access the UART lines directly you can disable the onboard USB to serial bridge by closing jumper J6 with a soldering point (sets all outputs to TRISTATE). All signals are available at connector X3 and can be connected to your application.

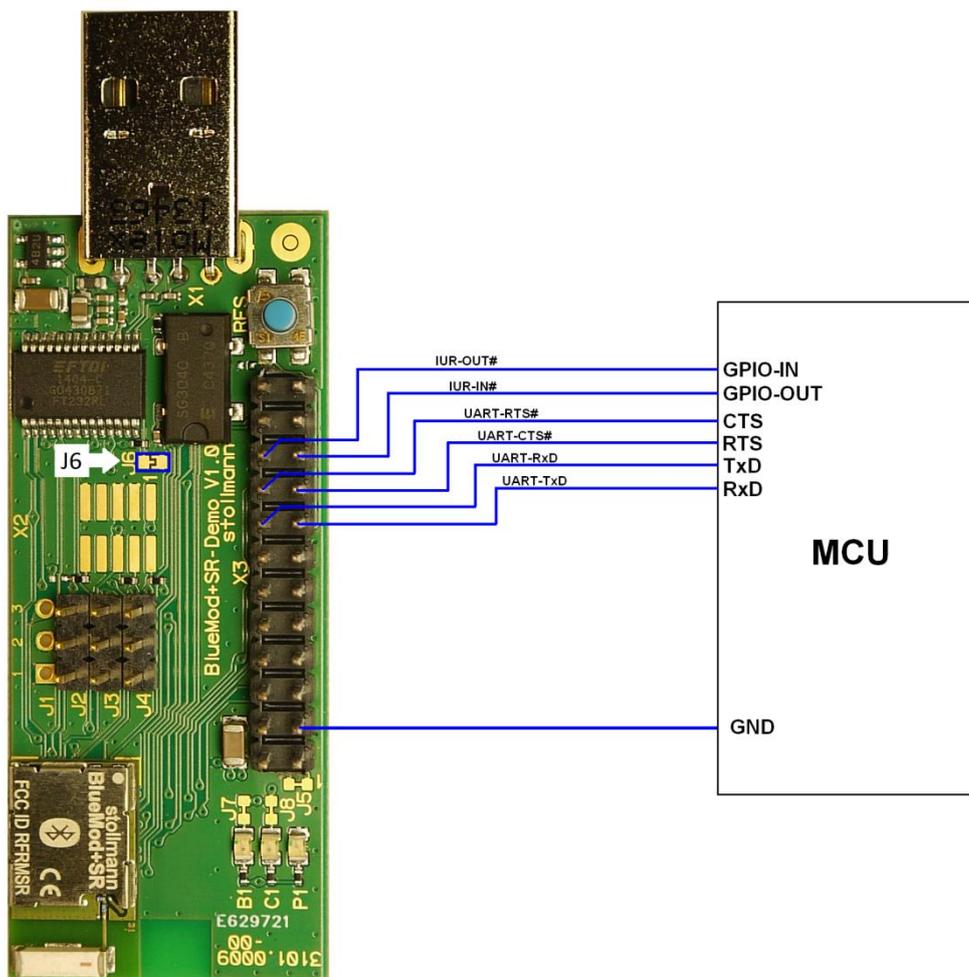


Figure 2: MCU connected to UART lines

### 3.8 Default Configuration

The BlueEva+SR is preconfigured as described below:

Jumper Number	Position	Function
J2	1-2	Normal operation mode at start-up
J3	2-3	USB_DTR# connected to GPIO[4]
J4	2-3	Use 32.768 kHz slow clock (SLCK)

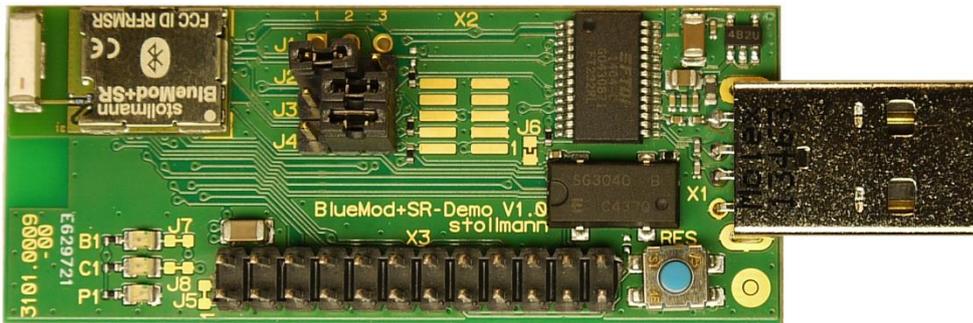


Figure 3: BlueEva+SR default configuration

## 4 Setup

### 4.1 System Requirements

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

### 4.2 Startup

To install the BlueEva+SR connect it as follows.

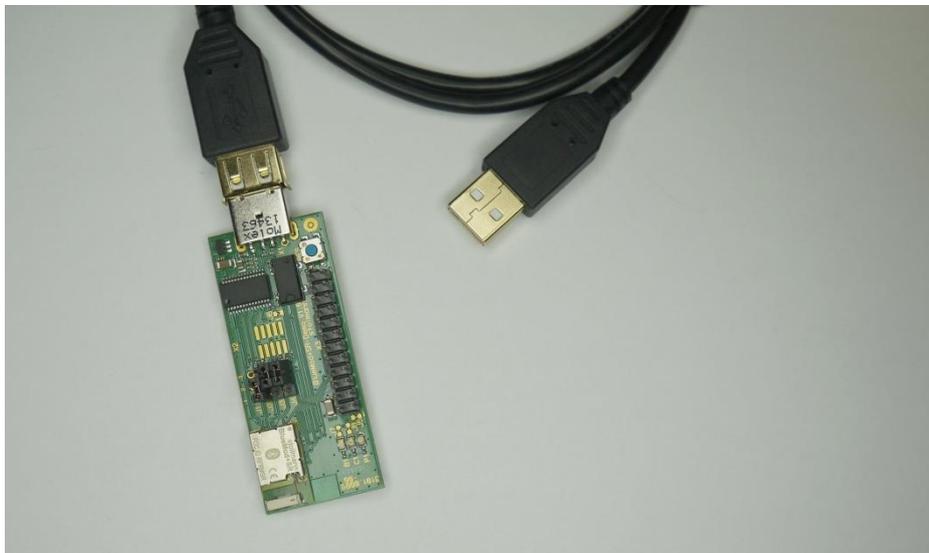


Figure 4: BlueEva+SR without connected NFC board



Figure 5: BlueEva+SR with connected NFC board

### 4.3 Installation of the BlueEva+SR USB Driver

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

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

Connect the BlueEva+SR 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 our web site:

<http://www.stollmann.de/en/support/downloads/tools.html>

## 5 Usage of the BlueEva+SR

### 5.1 Configuration of Serial Port Profile (SPP)

If the BlueEva+SR 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+SR AT Command Reference*.

As shipped by the factory, the BlueEva+SR 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+SR is connected to (COM4 in the example below).

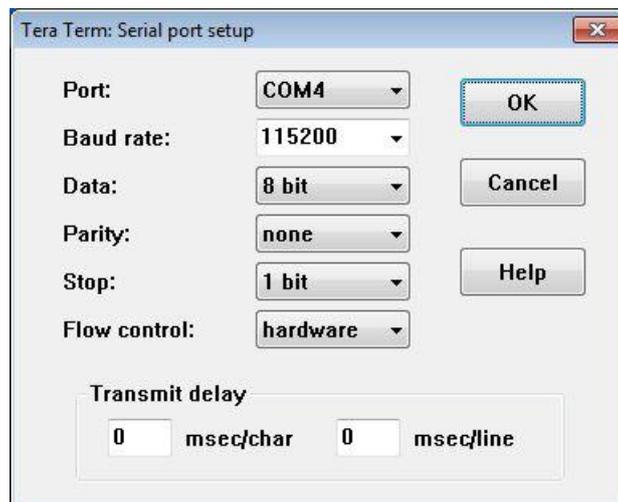


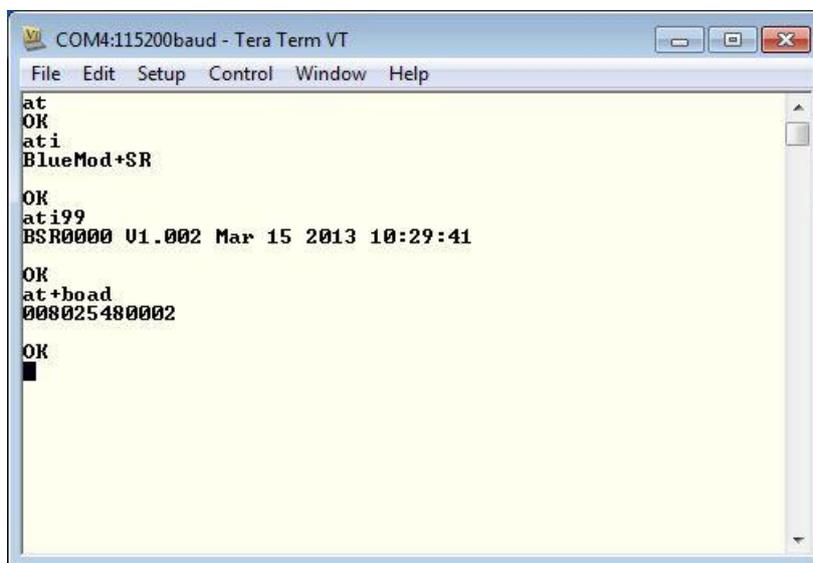
Figure 6: COM port configuration with TeraTerm

Once you have successfully configured the terminal emulation program, issuing the “AT” command without parameters should prompt the BlueEva+SR 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+SR. The Bluetooth address is unique, letting you identify the correct device for each Bluetooth address.

A screenshot of a TeraTerm VT terminal window. The window title is "COM4:115200baud - Tera Term VT". The menu bar includes "File", "Edit", "Setup", "Control", "Window", and "Help". The terminal text shows the following sequence: "at" followed by "OK"; "ati" followed by "BlueMod+SR"; "OK"; "ati99" followed by "BSR0000 V1.002 Mar 15 2013 10:29:41"; "OK"; "at+boad" followed by "008025480002"; and finally "OK" followed by a cursor. The terminal background is yellow.

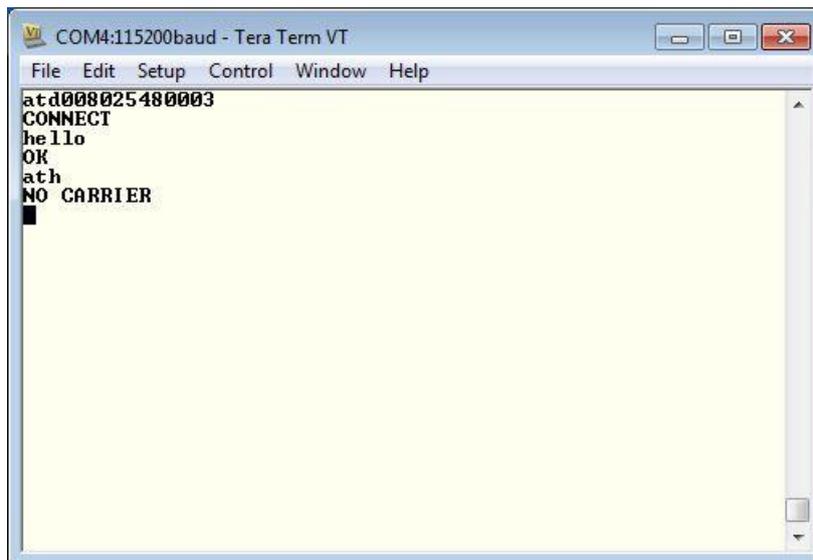
```
COM4:115200baud - Tera Term VT
File Edit Setup Control Window Help
at
OK
ati
BlueMod+SR
OK
ati99
BSR0000 V1.002 Mar 15 2013 10:29:41
OK
at+boad
008025480002
OK
█
```

Figure 7: Reading some BlueEva+SR settings with TeraTerm

## 5.2 Outgoing SPP Connection

Open the terminal emulation program and use the “ATD<Bluetooth address>” command to establish a SPP connection to a remote device.

The remote device can be another BlueEva+SR or any other Bluetooth device supporting SPP (for necessary configuration of the remote device please refer to the documentation of the remote device).



The screenshot shows a terminal window titled "COM4:115200baud - Tera Term VT". The window contains the following text: "atd008025480003", "CONNECT", "hello", "OK", "ath", and "NO CARRIER". A cursor is visible at the end of the "NO CARRIER" line.

If the connection was established successfully, the BlueEva+SR will respond with a CONNECT message. You can now exchange data transparently between the BlueEva+SR and the remote device.

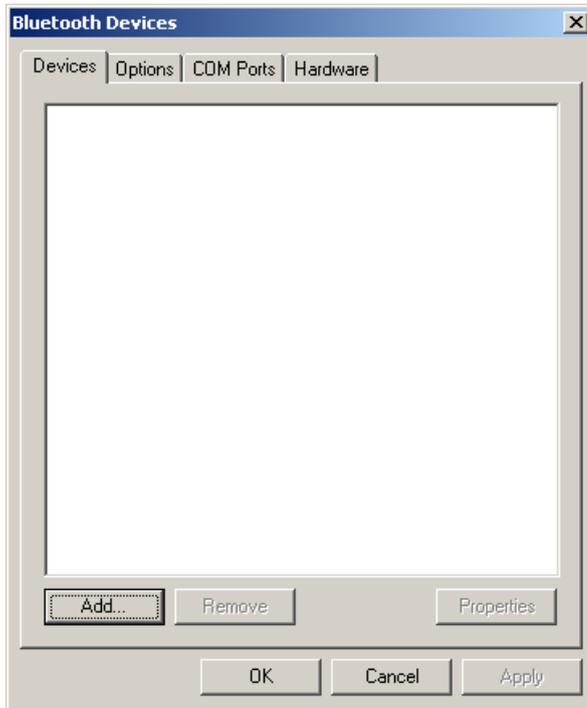
To terminate the Bluetooth connection, send “+++” and “ATH” command.

The BlueEva+SR will respond with a NO CARRIER message.

### 5.3 Incoming SPP Connection

The example below describes how to setup a SPP connection from the Windows XP Bluetooth stack to the BlueEva+SR.

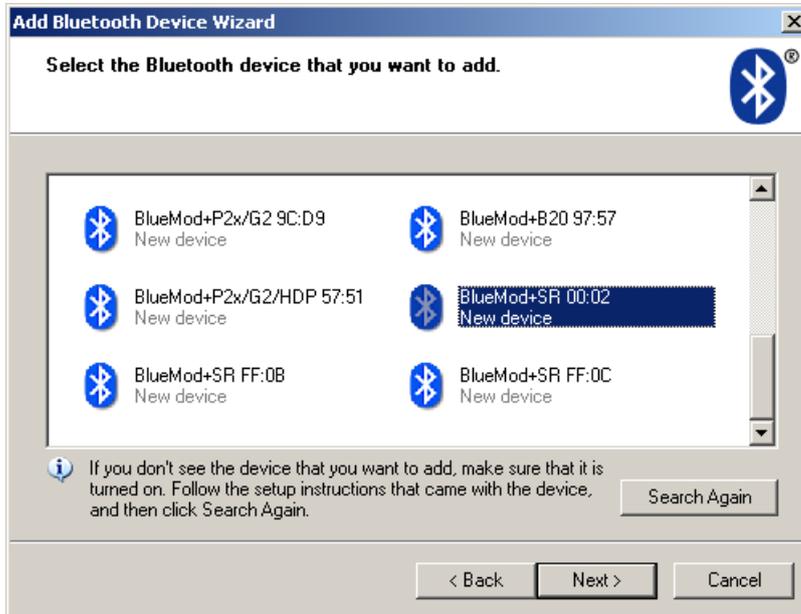
Open the Bluetooth control panel and click the “Add” button.



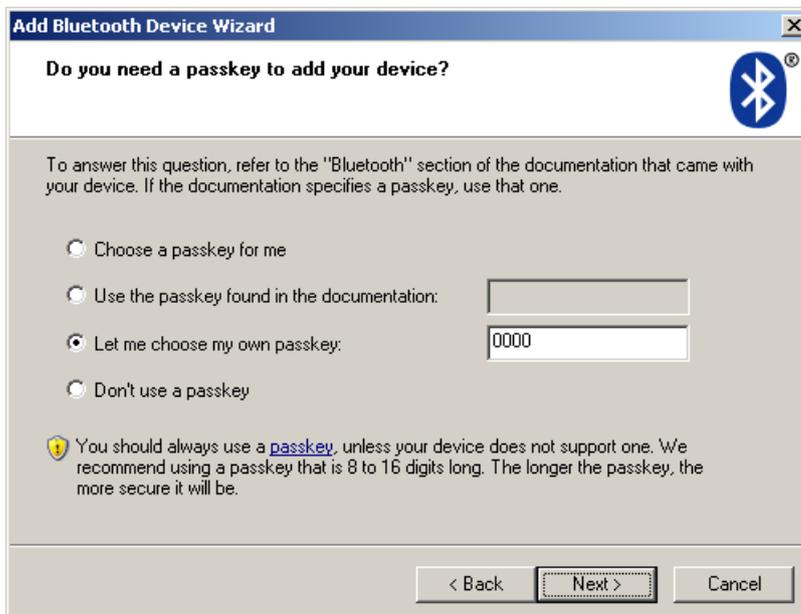
Enable the control “My device is set up ...” and click “Next”.



Wait until the search is completed and check if a BlueMod+SR device was found. If yes, select the device (BlueMod+SR 00:02 in the example below) and click “Next”.



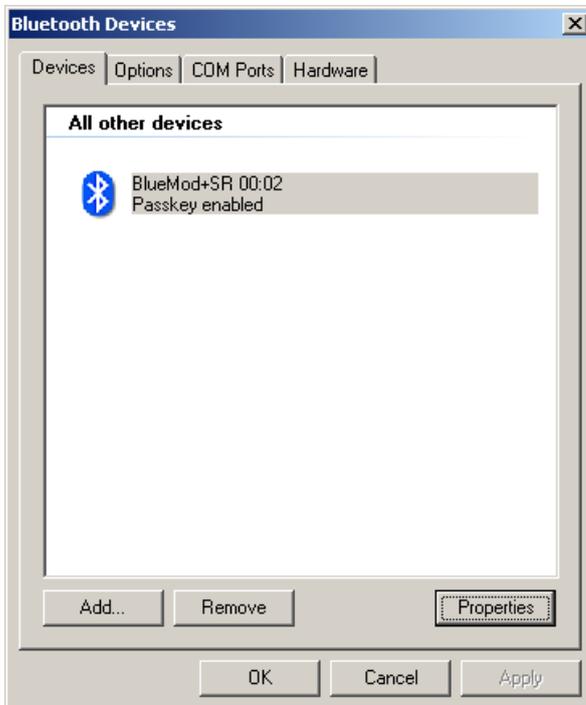
In case you are using a Bluetooth 2.0 device with your Windows XP, you will be asking to enter the passkey. The default passkey of the BlueMod+SR is “0000”. Please enter the valid passkey and click “Next”.



After successful passkey exchange the BlueMod+SR is connected to your computer. Click “Finish” to complete the installation.



Please check the properties of the new connected BlueMod+SR device.



In the “Services” tab you will find the available COM port of the BlueMod+SR for an incoming SPP connection (COM13 in the example below).



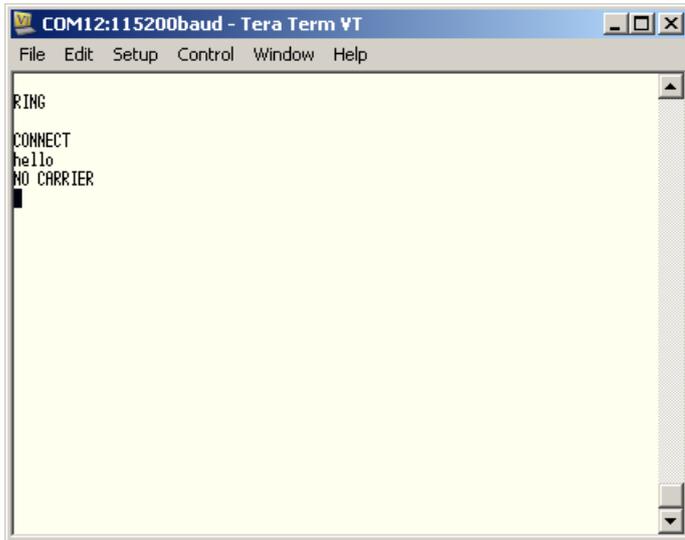
Start your terminal emulation program and open the COM port where the BlueEva+SR is connected to (COM12 in the example below).

Start a second instance of your terminal emulation program and open the COM port of the Windows XP Bluetooth stack which uses the “Serial port (SPP)” connection to the BlueMod+SR (COM13 in the example below).

When opening this COM port an incoming SPP connection to the BlueEva+SR is initiated and the BlueEva+SR respond with a RING message. In case the automatic call acceptance is activated (this is the default value), the BlueEva+SR will immediately accept the incoming call and respond with a CONNECT message.

Now you can exchange data between your PC and the BlueEva+SR.

When closing COM13 the Bluetooth connection is terminated. The BlueEva+SR respond with a NO CARRIER message.



## 5.4 NFC Handover

This chapter shows how to simplify the Bluetooth pairing via NFC by using the BlueEva+SR and the NFC Utility app for NFC enabled Android devices.

Requirements regarding the smartphone:

- Android 4.1 or higher
- NFC supported
- Bluetooth and NFC activated
- “Stollmann NFC Utility” app installed<sup>3</sup>
- “Bluetooth Chat” app installed

### 5.4.1 Configure the BlueEva+SR for NFC Handover

From the packaging the NFC board is already connected to the flat ribbon cable. Please plug the other side of the flat ribbon cable onto the BlueEva+SR connector X3 (take out the connector assignment from the picture *Figure 5*).

Then connect the BlueEva+SR to a free USB port on your PC and open a terminal program (e.g. TeraTerm). The serial port settings are the same as described in chapter 5.1.

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<sup>3</sup> “NFC Utility” and “Bluetooth Chat” app will be provided from Telit.

Enable the NFC Handover functionality by using the following AT command:



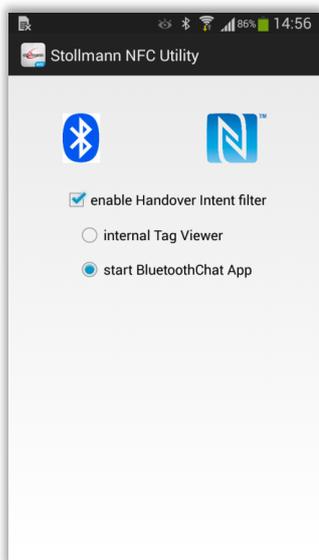
```
COM3:115200baud - Tera Term VT
File Edit Setup Control Window Help
at+nfcmode=1
OK
```

The BlueMod+SR firmware specific behavior of the NFC Handover is described in the document *BlueMod+SR User Guide*.

This document is available onto the Telit website.

#### 5.4.2 Example to demonstrate the NFC Handover

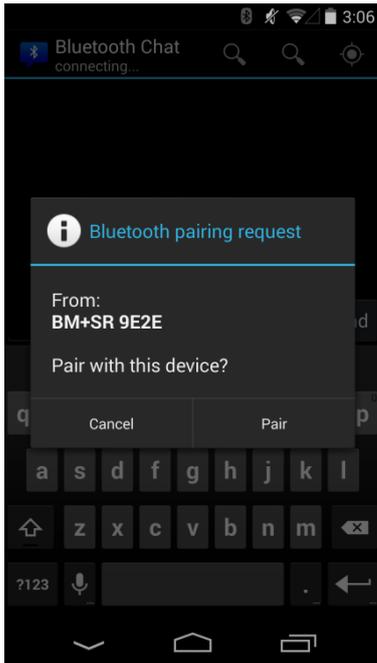
- Start the “NFC Utility” app on the smartphone and configure it as follows:



The “NFC Utility” app detects the NDEF activity onto the smartphone and can start a predefined (depend on the intent filter) application.

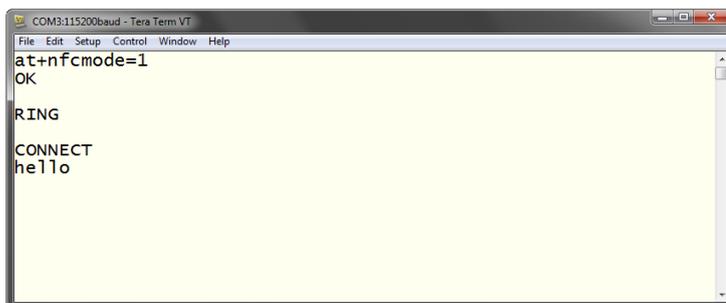
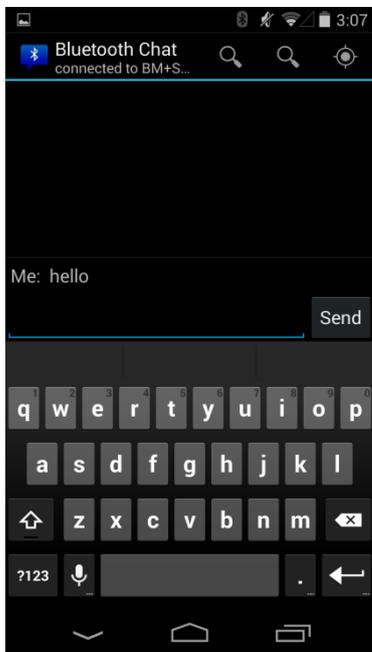
In the current configuration the “Bluetooth Chat” app will be started and initiate a Bluetooth SPP connection to the Bluetooth address given from the NDEF tag.

- Move the smartphone over the NFC board.  
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.
- The Android operating system initiates a Bluetooth pairing request and the message “Bluetooth pairing request” will appear.  
Continue with “Pair” to accept the Bluetooth pairing request scenario.



After the pairing process ended successfully the “NFC Utility” app will start the “Bluetooth Chat” app and initiate the Bluetooth connection to the BlueMod+SR.  
Now data can be exchanged between the smartphone and the BlueMod+SR.

In the following example the text “hello” was sent from the “Bluetooth Chat” app to the BlueMod+SR.



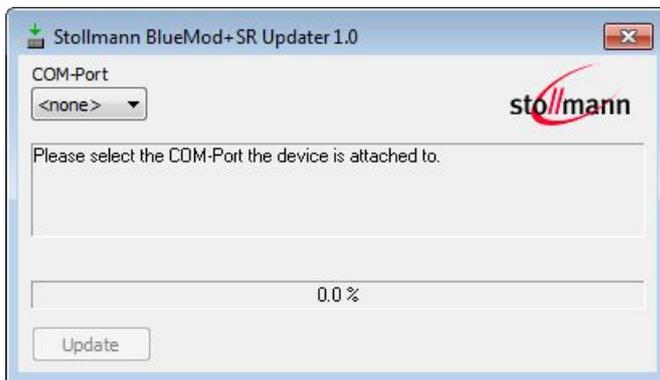
For further information regarding NFC Handover please refer to the *BlueMod+SR User Guide*.

## 6 Firmware Update

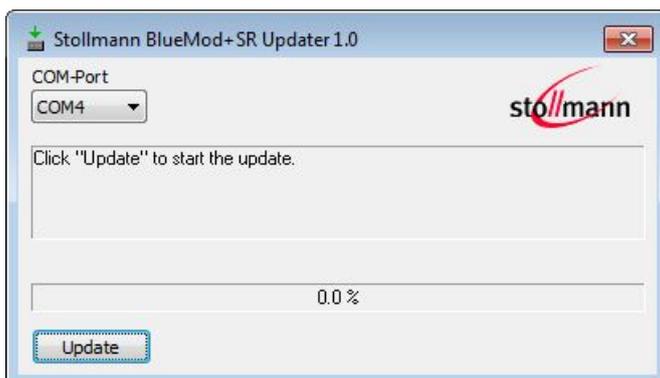
The firmware of the BlueEva+SR can be updated by using the Stollmann BlueMod+SR Updater. The file name of the executable program consists of version and patch information.

Please follow the instructions below for updating the firmware:

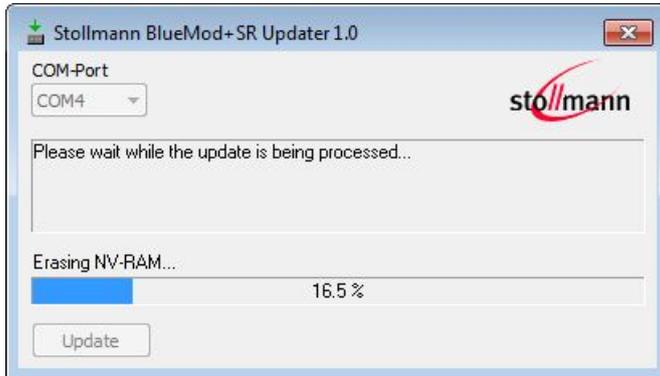
- Configure jumper J2 to position 2-3 to activate the STM32 bootloader at start-up.
- Connect the BlueEva+SR to the USB port of a PC (make sure the FTDI VCP USB to UART driver is already installed). If the BlueEva+SR is already connected to the PC perform a reset using the reset button.
- Start the *SR\_1\_xxx\_FWupdate.exe* program.



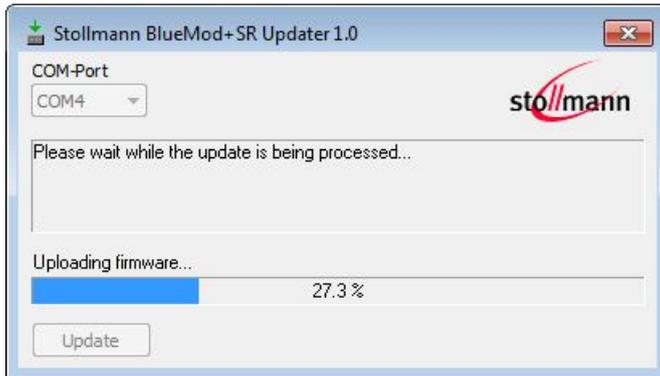
- Select the COM port the BlueEva+SR is connected to and press the “Update” button.



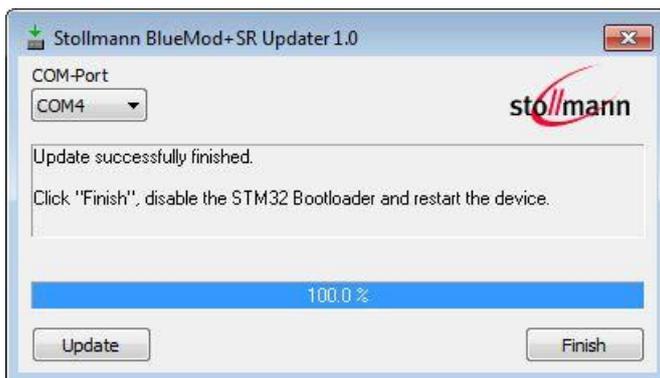
- First the NV-RAM will be erased.



- Second the firmware will be uploaded.



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



- To set back the BlueEva+SR into normal operation mode, move jumper J2 to position 1-2 again and perform a reset.
- Send the AT&F command to set the factory default values.



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*Note:*

*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 (e-mail: [ts-srd@telit.com](mailto:ts-srd@telit.com)).*

## 7 History

Version	Release Date	By	Change description
r01	21.03.2013	TA	First release
r02	03.12.2013	TA	Added description how to access the UART lines
r03	26.01.2015	NH	Pictures updated because of the assembled X3 connector, Added new chapter "NFC Handover"
r04	26.05.2016	BG	Telit cover page added

BlueEva+SR  
Evaluation Kit User Guide



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