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BlueEva+SR Evaluation Kit User Guide

1VV0301280 Rev. 5 – 2018-03-01

TELIT
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APPLICABILITY TABLE

PRODUCTS

- BLUEEVA+SR/AI

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1. INTRODUCTION

1.1. Scope

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

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:

<https://www.telit.com/contact-us/>

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

<https://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] BlueMod+SR Hardware User Guide, 1VV0301276
- [2] BlueMod+SR AT Command Reference, 80507ST10752A
- [3] BlueMod+SR Software User Guide, 1VV0301278
- [4] BlueEva+SR Schematics
- [5] UICP UART Interface Control Protocol Specification, 30507ST10756A

2. PACKAGE CONTENT

The BlueEva+SR package contains the following components:

- 1 x BlueEva+SR board
- 1 x NFC board "NTAG12CEvalv1.0" incl. the corresponding flat ribbon cable
- 1 x USB cable
- 1 x Printed card with download instructions

3. HARDWARE

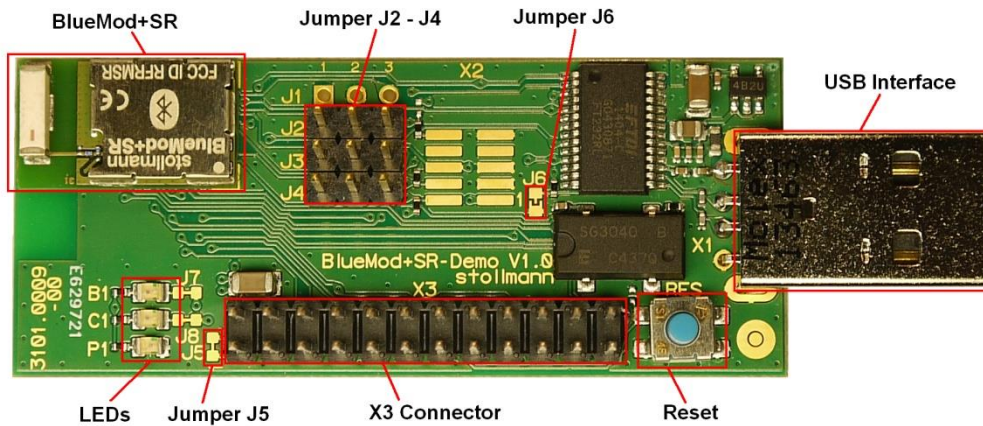


Figure 1: BlueEva+SR

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 (8N1)
- Hardware flow-control with RTS/CTS

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

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 IOB ⁽¹⁾
	C1	Connected to IOC ⁽¹⁾

⁽¹⁾ 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.

J2 Position	Function
1-2	Normal operation mode at start-up
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#). ⁽²⁾

⁽²⁾ Function depending on firmware support

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 [5].

J3 Position	Function
1-2	USB_DTR# connected to IUR-IN# for using UICP
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.

J4 Position	Function
1-2	Use module internal slow clock
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.

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 exposing all module signals.

PU = PullUp, PD = PullDown, PP = PushPull

Pin Number	Signal	Type	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

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 it is important to disable the onboard USB to serial bridge by closing jumper J6 with a soldering point (set all outputs to TRISTATE).

Take note that it is required to connect the USB port to supply power to the FTDI.

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

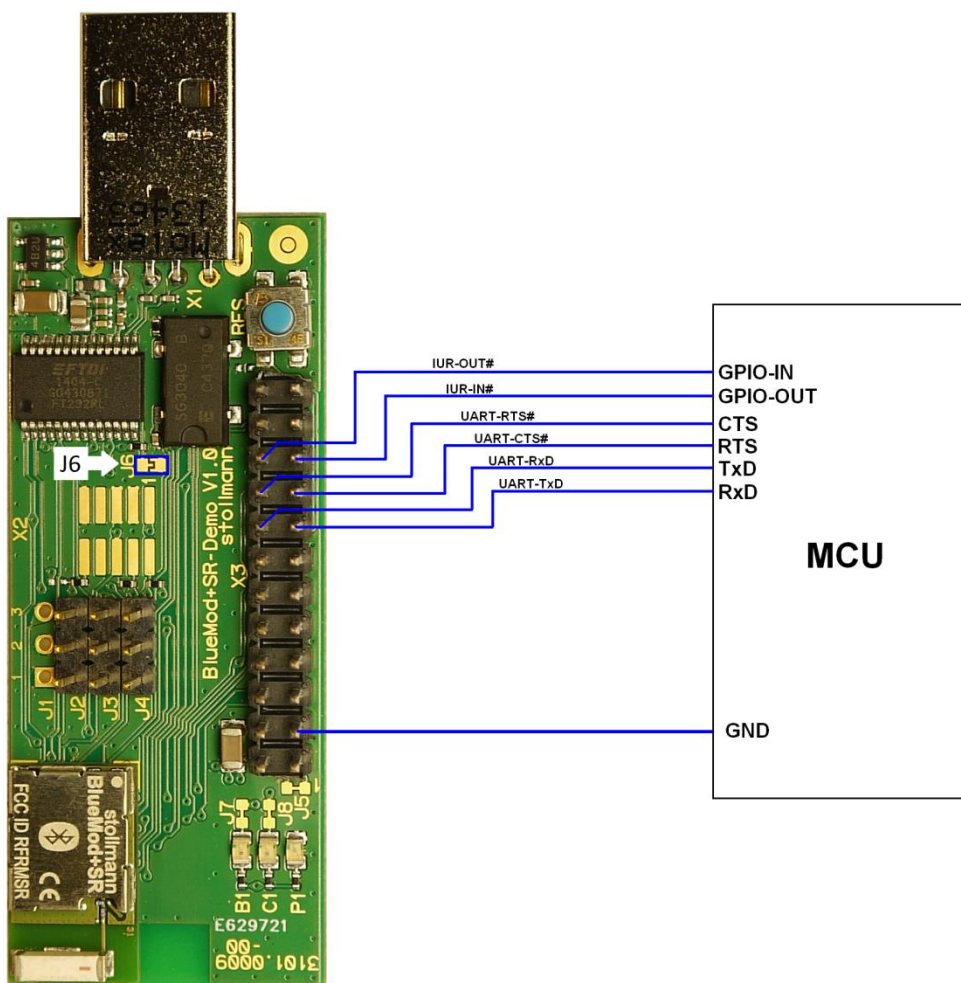


Figure 2: MCU connected to UART lines

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)

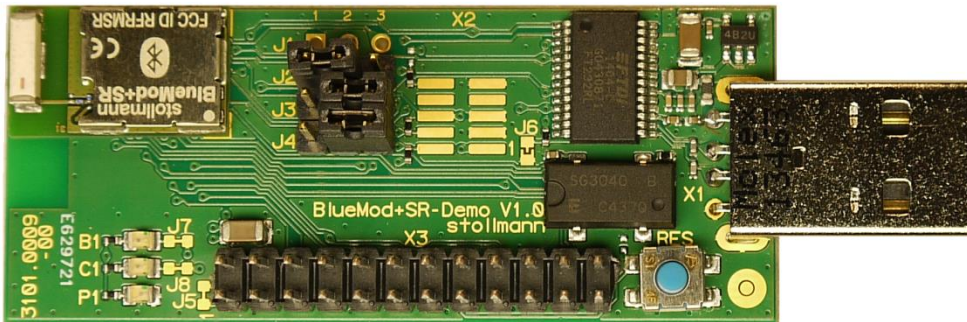


Figure 3: BlueEva+SR default configuration

4. SETUP

4.1. System Requirements

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

4.2. Startup

To install the BlueEva+SR connect it as follows.

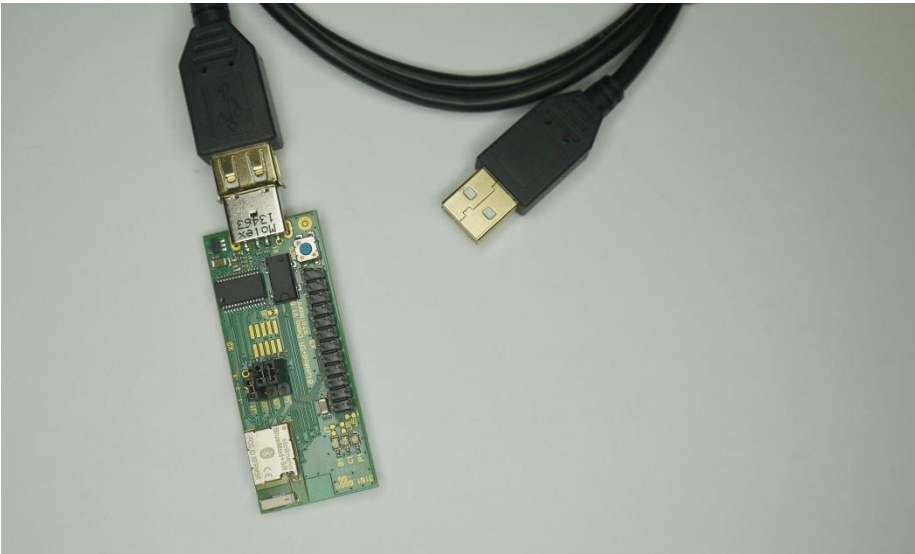


Figure 4: BlueEva+SR without connected NFC board

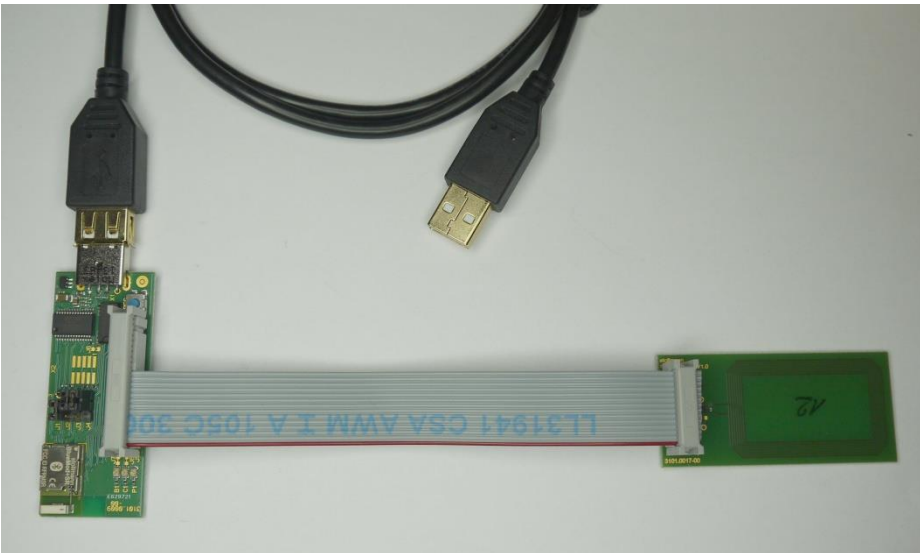


Figure 5: BlueEva+SR with connected NFC board

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 use the Telit AT Controller (version 3.4.11 or higher) to communicate with the BlueEva+SR. The Telit AT Controller is available in the download zone.

5. USAGE OF THE BLUEEVA+SR

5.1. Configuration of Serial Port Profile (SPP)

If the BlueEva+SR is correctly connected to the PC, the Telit AT Controller (or any other terminal emulation program) can be used to read and modify the configuration settings.



Figure 6: Telit AT Controller main menu

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 the Telit AT Controller accordingly. Select the COM port the BlueEva+SR is connected to (COM6 in the example below).

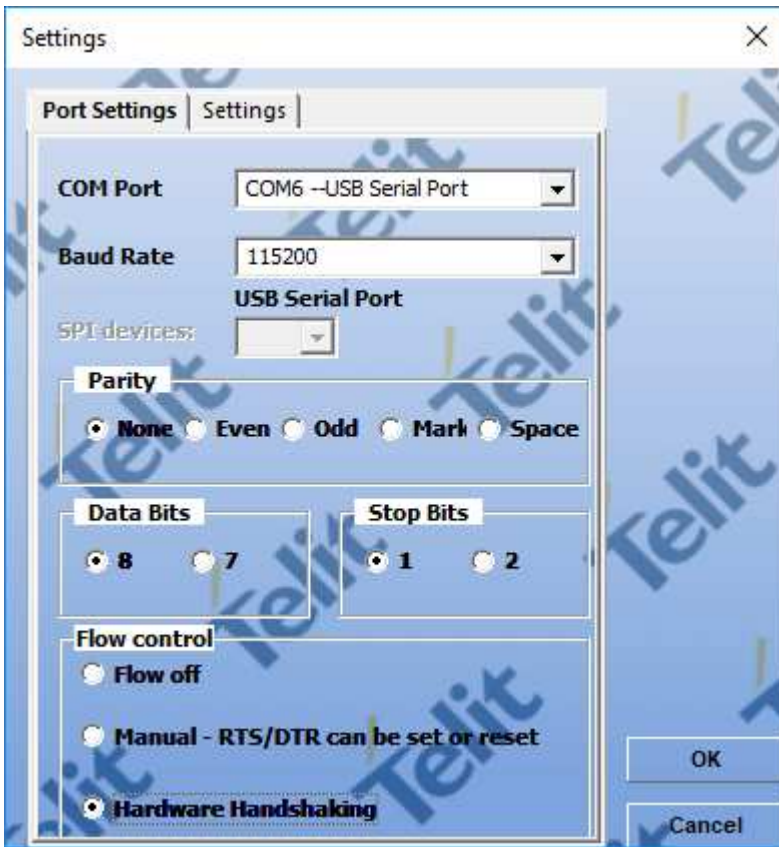


Figure 7: Telit AT Controller settings

Once you have successfully configured the Telit AT Controller press the “Connect” button to connect to the BlueEva+SR and receive the device information.



Figure 8: Telit AT Controller device information

Now you can start the AT Terminal to communicate with the BlueEva+SR using AT commands (e.g. set the local device name with `at+bname=test123`).

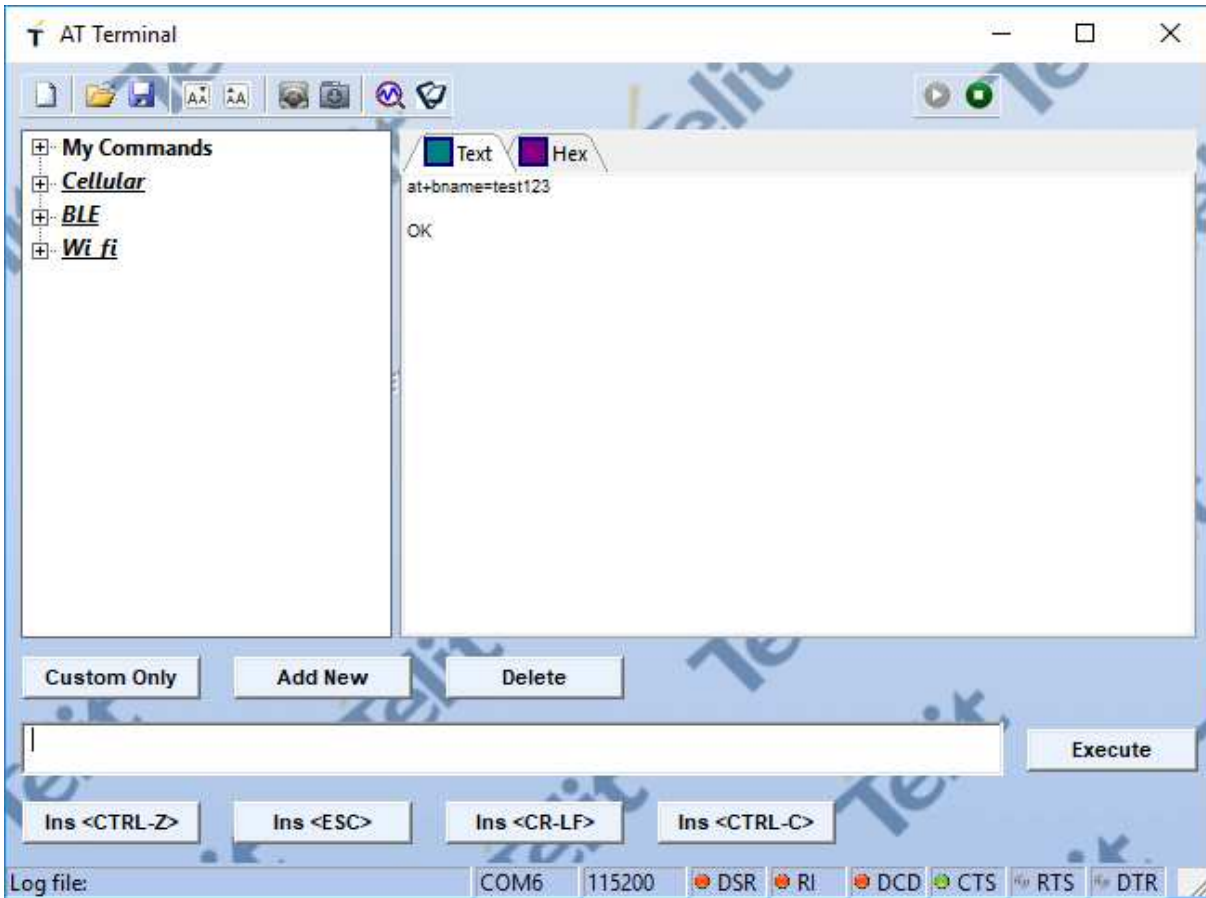


Figure 9: AT Terminal communication

For a more detailed description of the AT commands used for this purpose, please consult our BlueMod+SR AT Command Reference [2].

5.2. Outgoing SPP Connection

Open the AT Terminal 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 refers to the documentation of the remote device).

Enter the “ATD<Bluetooth address>” command and press the execute button.

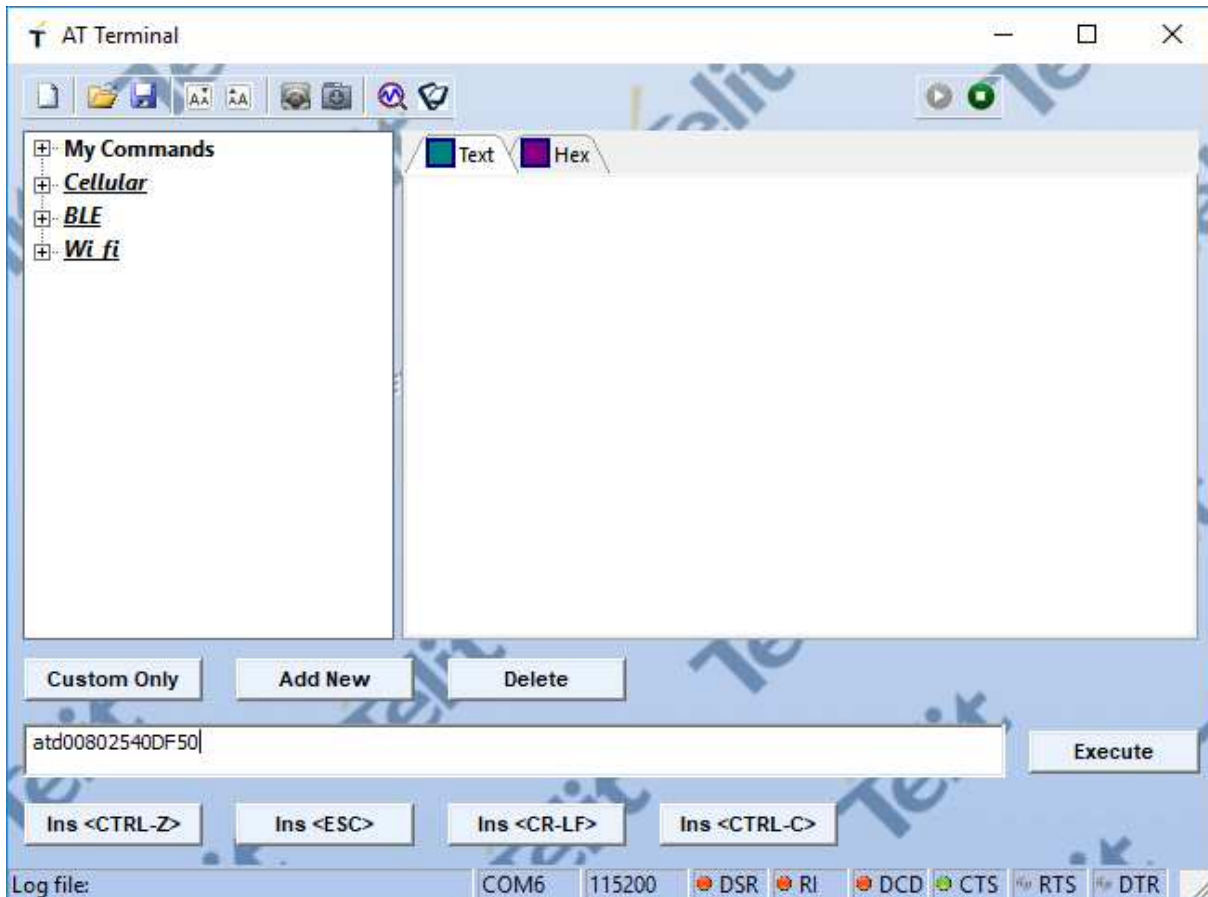


Figure 10: AT Terminal, enter ATD command

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.

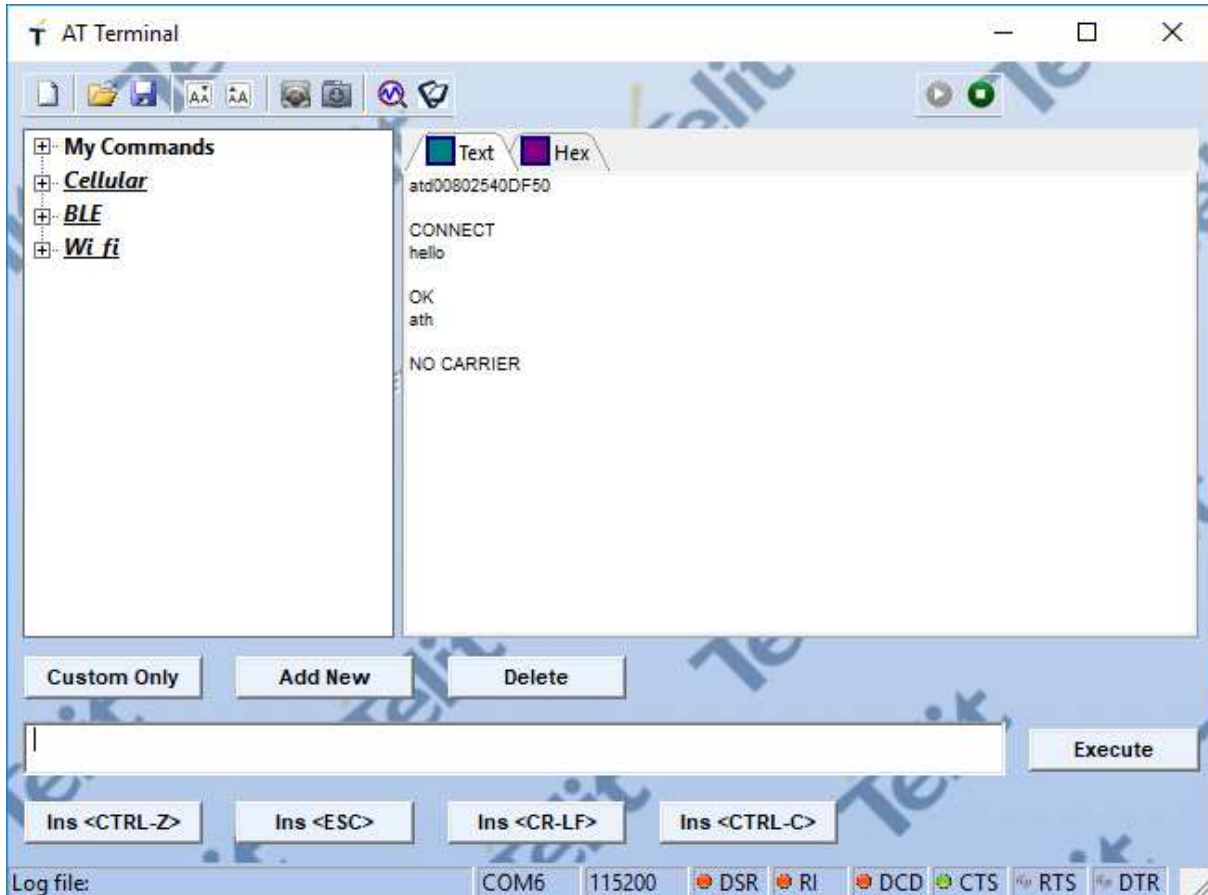
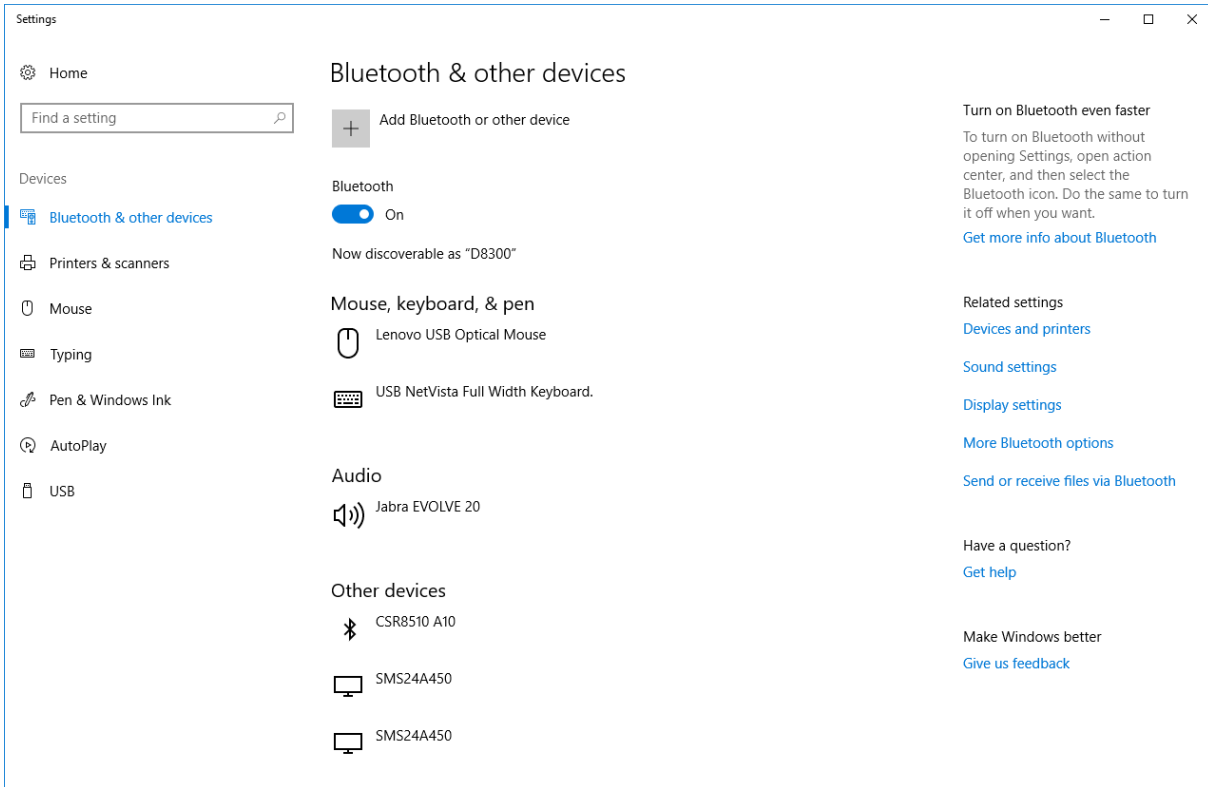


Figure 11: AT Terminal, connection establishment, data exchange, disconnect

5.3. Incoming SPP Connection

The example below describes how to setup a SPP connection from the Windows 10 Bluetooth stack to the BlueEva+SR.

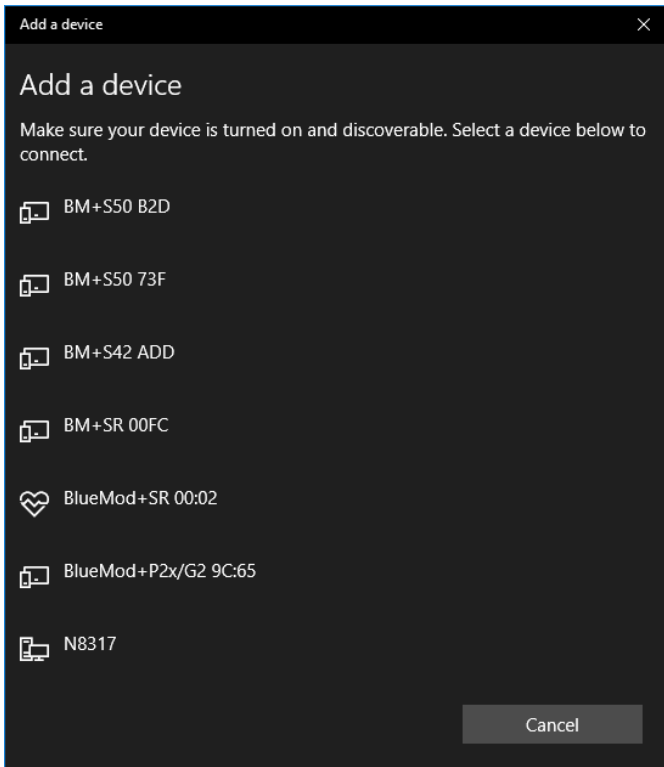
Open the Bluetooth control panel and click the “Add Bluetooth or other device” button.



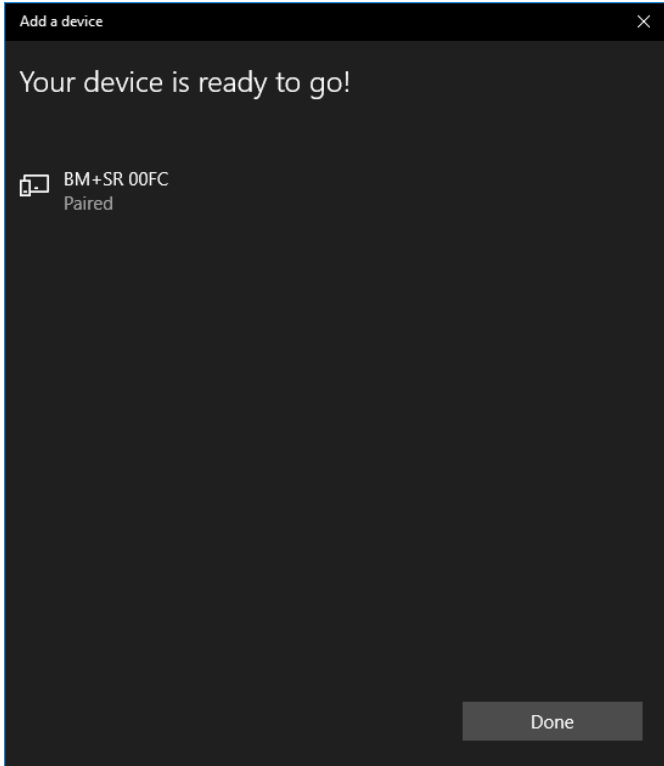
Click “Bluetooth”.



Wait until the search is completed and check if your BlueEva+SR device was found. Click on the device (BM+SR 00FC in the example below).



After successful pairing (Just Works by using the default configuration) the BlueEva+SR is connected to your computer. Click “Done” to complete the installation.



In the Bluetooth Settings under the “COM Ports” tab you will find the available COM port of the BlueEva+SR for an outgoing SPP connection (COM5 in the example below).

