Evaluation Board (EVB) for PAN1311/21

1. CONTENT

2. INTRODUCTION

This document should provide the minimum knowledge needed to establish a simple connection between two PAN1311 or two PAN1321 Evaluation Boards (EVB) using Infineon *eBMU_SPP_Toolbox* software (vers. 1.60). For this limited information is granted. To learn about all aspects of the software please refer to the related documents listed below.

2.1 RELATED DOCUMENTS

For further information on Infineon *eBMU_SPP_Toolbox* software and it's implemented AT command set please refer to:

- *T8753-2-eBMU_SPP_ToolBox_Manual_A4-7600.pdf*
- *PMB8753-2_SPP_AT_specification_R1.pdf*

3. INSTALLATION

In order to ensure power supply, connect the USB Port of the EVBs to the USB Port of the PC. The Jumper "J1" must set to the "1-2" position. The LED will flash up.

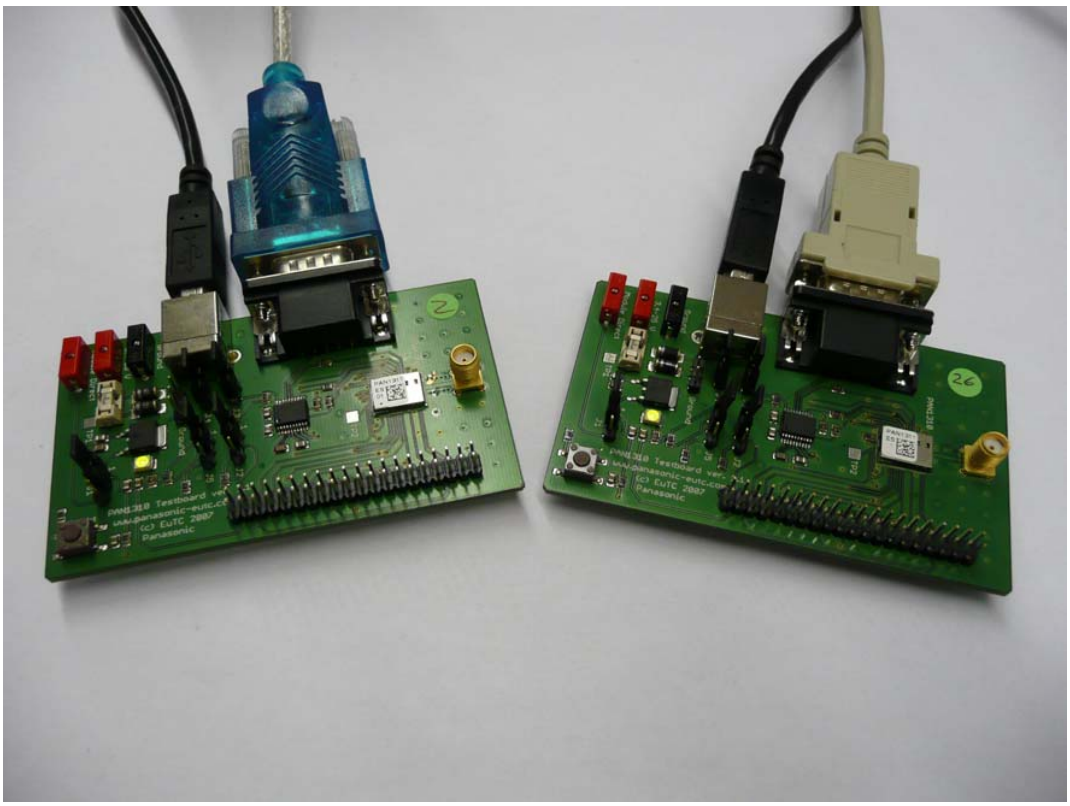

Figure 1 : connected EVBs with flashing LED

Communication and configuration is realized by the use of a PC serial port. Connect the serial cable to the Evaluation Board and the PC to realize a communication possibility. The Jumper “J2” must set to the “1-2” position. The installation of the *eBMU_SPP_Toolbox* software is required to configure the PAN1311/21 modules. Version 1.60 of the software from *Infineon Technologies AG* is provided.

4. FUNCTIONAL OVERVIEW

The figure below shows an overview of the Evaluation Board with four different sections: Module Section, UART Section, Connector Section and Power Supply Section.

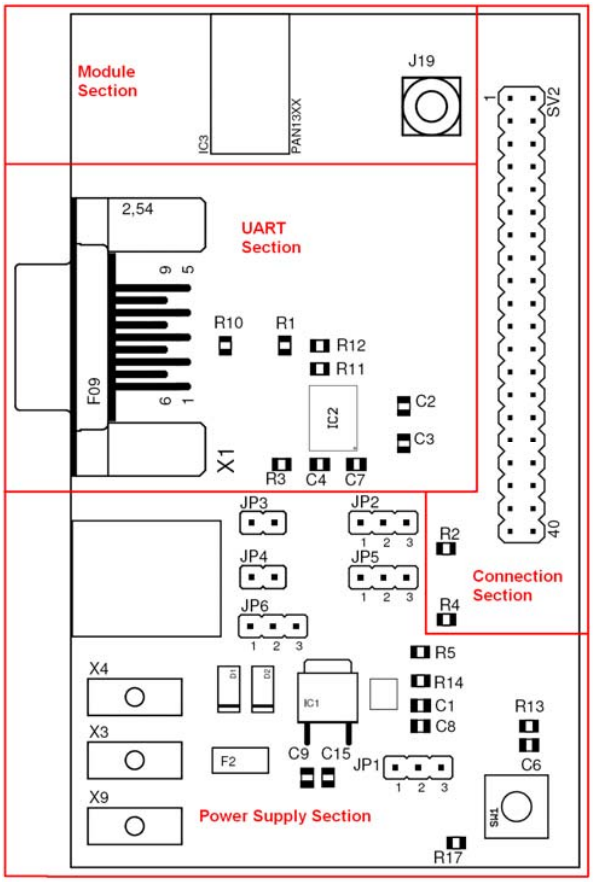

Figure 2 : Evaluation Board Overview

The figure also shows the five jumpers of the Evaluation Board. The function of each jumper is described in the chapter *Jumper Settings*. The four sections from above are described in the following:

4.1 MODULE SECTION

In this section the Bluetooth module is installed. The PAN1311 is not equipped with an internal antenna. An external antenna is part of this Evaluation Board. This antenna provides good RF performance and range for most applications. The PAN1321 however has an antenna onboard.

4.2 UART SECTION

The serial port of the PAN1311/21 module is directly connected to a MAX232-type level converter. This allows a direct connection of the module`s serial port to a PC. The *eBMU_SPP_Toolbox* software sets up the connection to the PAN1311/21 module via the serial port of the PC.

4.3 CONNECT SECTION

The connect section provides a 40 Pin connector which offers access to the important pins of the PAN1311/21 module. It is possible for own applications to interface to the module using this connector.

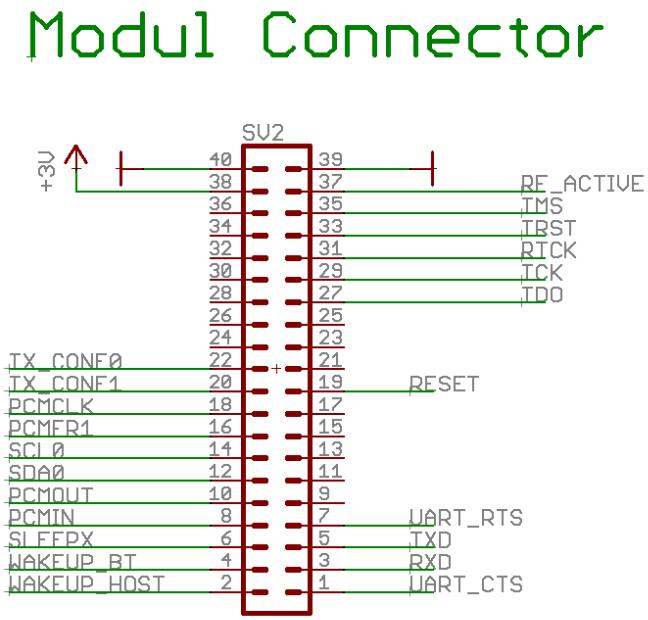

Figure 3 : Module Connector

All available pins on the module connector are listed in the following table with their names and a short description of their functions. For further information see the datasheet of the PAN1311/21 modules.

Pin	Name	Function
1	UART_CTS	Port 0.7 or UART CTS flow control
2	WAKEUP_HOST	Port 1.8 or Host wake-up signal
3	RXD	Port 0.5 UART receive data
4	WAKEUP_BT	Port 1.7 or Bluetooth wake-up signal
5	TXD	Port 0.4 or UART transmit data
6	SLEEPX	Sleep indication signal
7	UART_RTS	Port 0.6 or UART RTS flow control
8	PCMIN	Port 0.2 or PCM data in
9	nc	
10	PCMOUT	Port 0.3 or PCM data out
11	nc	
12	SDA0	Port 0.12 or I2C data signal
13	nc	
14	SCL0	Port 0.13 or I2C clock signal
15	nc	
16	PCMFR1	Port 0.0 or PCM frame signal
17	nc	
18	PCMCLK	Port 0.1 or PCM Clock
19	RESET	
20	TX_CONF1	Port 0.11 or WLAN coexistence interface
21	nc	
22	TX_CONF0	Port 0.14 or WLAN coexistence interface
23	nc	
24	nc	
25	nc	
26	nc	
27	TDO	Port 1.3 or JTAG interface or WLAN coexistence interface
28	nc	
29	TCK	Port 1.1 or JTAG interface
30	nc	
31	RTCK	Port 1.4 or JTAG interface
32	nc	
33	TRST	JTAG interface
34	nc	
35	TMS	Port 1.0 or JTAG interface
36	nc	
37	RF_ACTIVE	Port 1.2 or JTAG interface or WLAN coexistence interface
38	3V	3V
39	GND	Ground
40	GND	Ground

Table 1 : Module Connector Pins

4.4 POWER SUPPLY SECTION

The power supply section provides a regulated +3V DC voltage for the PAN1311/21 modules and the Evaluation Board circuitry. For convenience a wider choice of input options exists. These options have to be used alternatively. While protection mechanisms against parallel connection of different power supplies exist, it is recommended to check thoroughly that only one supply voltage is present. The following supply options exist:

- 2mm Lab-connectors: This allow a voltage range of 3.4 – 15 V DC
- USB-connector: Only used for power supply! 5 V DC will be taken from the USB port

4.4.1 DIRECT SUPPLY MODE

For measurement purposes it may be helpful to directly supply the module only. This is mainly required for tests without a regulator. To enable direct supply mode please set the “JP1” jumper in the “2-3” position. The module is now directly connected to the 2mm Lab-connector. To power the rest of the on-board circuitry, especially the RS232 interface driver, please note that it is required to use one of the two options of power supply, described in the section before.

ATTENTION : Please make sure that the voltage does not exceed 3.6 volts in this mode. Operation above this level will result in permanent damage to the module.

4.5 JUMPER SETTINGS

Figure 2 in chapter *Functional Overview* shows the position of the five Jumpers on the Evaluation Board. See the following table for a description of the jumpers and make sure that are all jumpers are set up correctly.

Jumper	description	Pos. 1-2	Pos. 2-3
JP1	Power selection external/internal	3V intern	external
JP2	ON/OFF When the ON/OFF pin is low, the internal regulator on the PAN1311/21 module is turned OFF	ON	OFF
JP5	Mode selection port 1 ON : JTAG OFF : Port	ON (3V)	OFF(GND)
JP6	Ground		

Jumper	description	Open	Closed
JP3	PCM Power Supply	OFF	3 Volt
JP4	UART Power Supply	OFF	3 Volt

Table 2 : Jumper settings

5. CONNECTION SETUP

This chapter describes how to use the *eBMU_SPP_Toolbox* software in order to send simple data packages from one EVB to the other.

5.1 SOFTWARE START AND NAVIGATION

Browse to the folder where the *eBMU_SPP_Toolbox_v1.60.exe* file is located and start it. The user interface (figure 2) is shown.

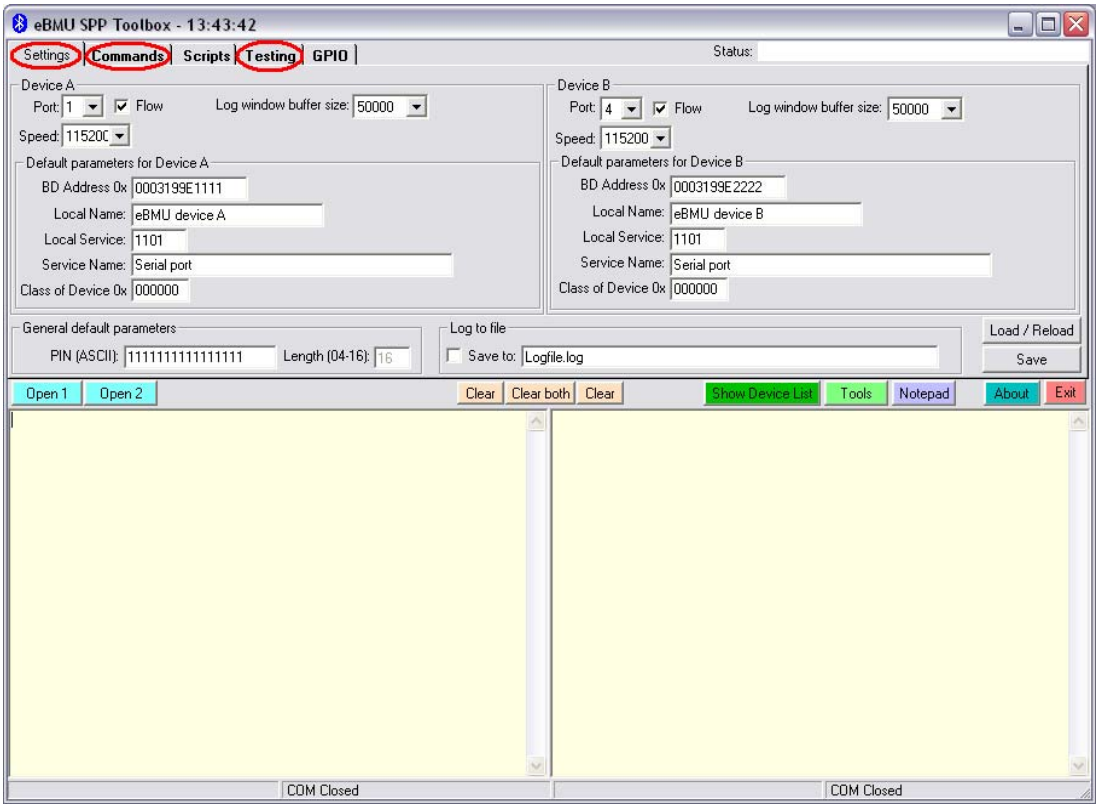

Figure 4 : Toolbox start up screen

Notice on figure 2 three tabs important to this quick start guide:

- Settings,
- Commands and
- Testing.

Below the interface splits, each half represents one of the EVBs. At the bottom of the screen are two text fields on which issued commands and received responses are displayed. Use the *clear* and *clear both* buttons above to clear these text boxes.

5.2 PORT CONFIGURATION

On the *settings* tab the communication via COM port are handled. It is possible to set a number of default parameters for both EVBs and to save/load all the changes made to this page (saving the settings will also make the program remember the selected port numbers).

Please select the right port numbers for both EVBs (found at: control panel → system → hardware → device manager → Ports (COM & LPT)) and click the buttons *open/close 1* & *open/close 2*. A status message should appear below the text fields (figure 3). Leave the rest unchanged for now.

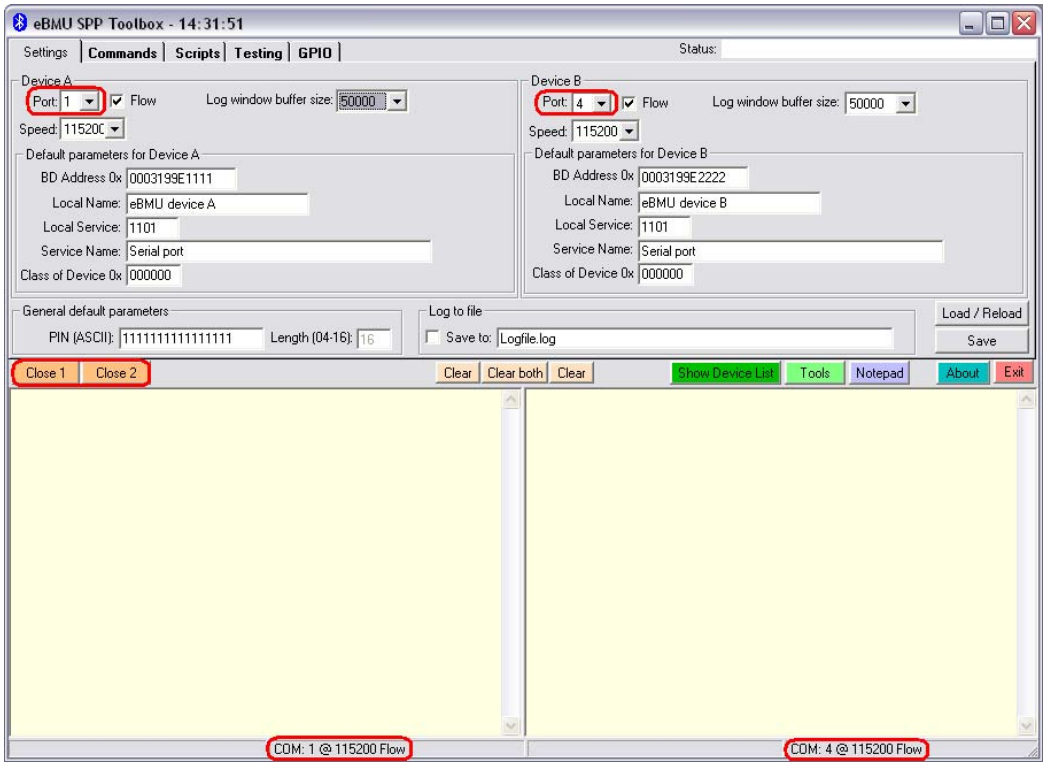

Figure 5 : COM port setup

5.3 FIRMWARE HANDLING

At the *testing* tab firmware can be downloaded (*Download image*) to the EVB and a number of changes can be made to it (*Change BD-data*) like giving each device a unique BD address (e.g. 0003199E8B**73**). Make sure that the *Production mode* is enabled before any of these buttons on this tab are used. To do this mark *On* and confirm with a click on *Production mode*. The text field should inform you about of success of this procedure. Be advised to do a hardware reset (push button on EVB) after all changes were made.

Please note:
If you have EVBs with a software image earlier then the R1 release you will need to use the old SPP Toolbox or issue the command by yourself to do the image update since the download command has changed.

- Old download command: AT+JDAF
- New download command: AT+JDOI

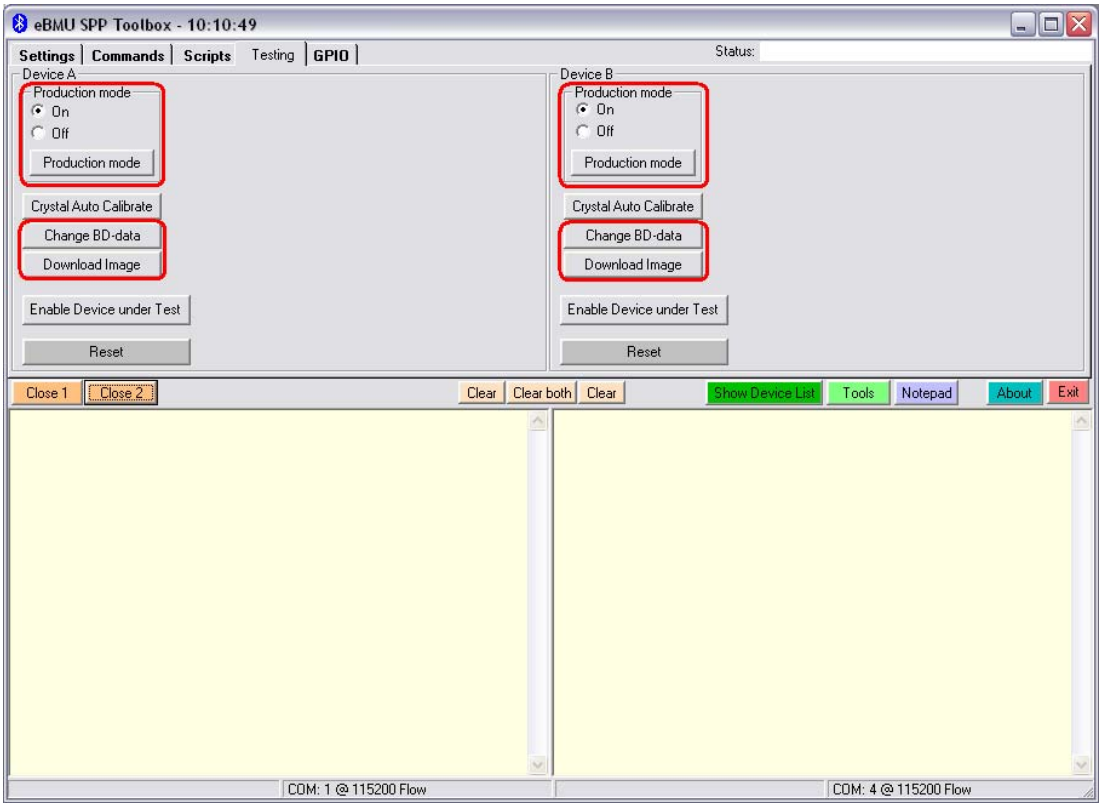

Figure 6 : Testing tab

5.4 COMMAND TAB NAVIGATION

At the *Commands* tab are several commands listed for easy click-and-use. Note the colour coding identifying commands by their intended usage:

- Yellow: Settings and informational commands.
- Pink: Security related commands.
- Green: Connection related.
- Red: Disconnection commands.
- Blue: Data transfer
- Light blue: Accept connection
- White: Sniff (during connection)

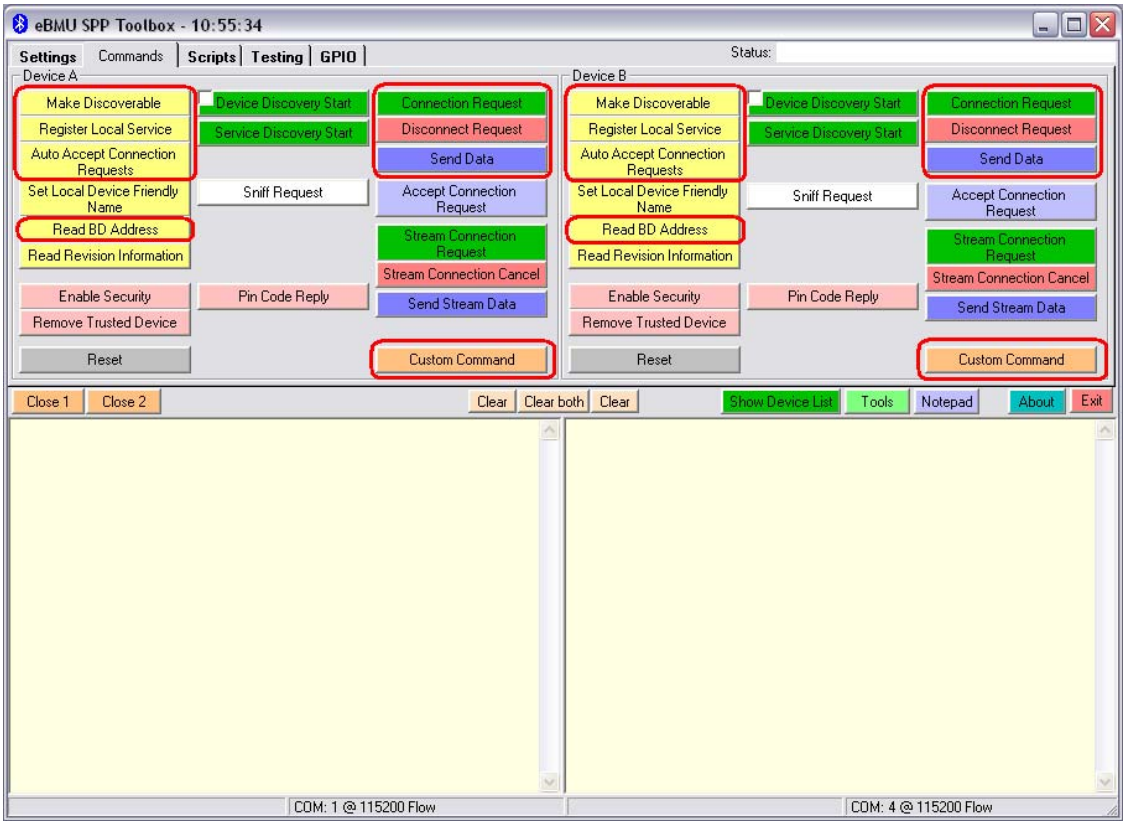

Figure 7 : Command tab and used commands

For simple data transfer find the needed commands marked in figure 5. The Custom Command button can be used to issue any command of the command set (refer to *PMB8753-2_SPP_AT_specification_R1.pdf*).

5.5 CREATING A CONNECTION

To send data from one EVB to the other one of them must be prepared for connection, while the other will request a connection. Follow these steps:

1. Click on *Make Discoverable* on Device A. Choose option 3: *Inquiry_Page Scan enabled*. The text field should state the issued command sent (→ arrow) and the *OK* response (← arrow). Now device A can be found by other devices by both available scan methods.
2. Click on *Register Local Service*. There are some options to change identification of the new service but the default values are ok. Simply choose *Send*. This service now can be found by other devices of the network.
3. Click the *Auto Accept Connection Requests* command and choose option 1. EVB A will auto accept connection requests from now on. Device A is now ready for connection!
4. Get the address of EVB A with the help of *Read BD Address*. In the text field you will find the desired information (e.g. "[…] <-- +RRBDRES=**0003199E8B73**, […]"). With this Device A can be addressed when…
5. …issuing *Connection Request* from **Device B**. Type or copy the BD address of Device A into the *BD Address 0x* text field. Name the *service channel* under which the service of Device A was registered in step 2. If no changes were in step 2 *service channel* 01 should do. Click *send*. After a short while both Devices should state *connected*.
6. Done! Now data strings can be sent from one EVB to the other with the *Send Data* command. Data send and received will be displayed in the text fields. Another click on *Send Data* will close its dialog box.

Your text fields should look like Figure 6 or alike after step 1 to 5 were made. If problems or errors are encountered feel free to hardware reset (EVB push button) both boards and start over with step 1.

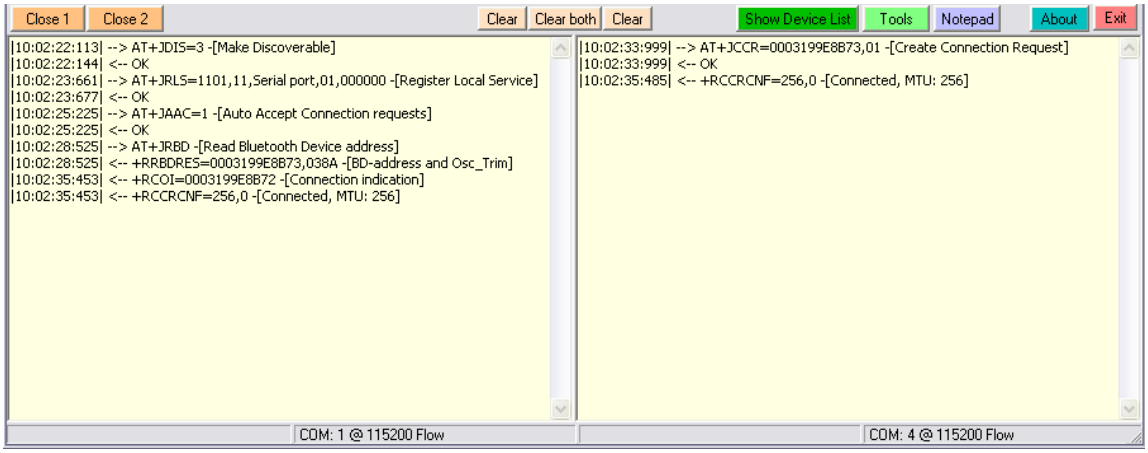

Figure 8 : text field output from step 1 to 6

6. SCHEMATIC

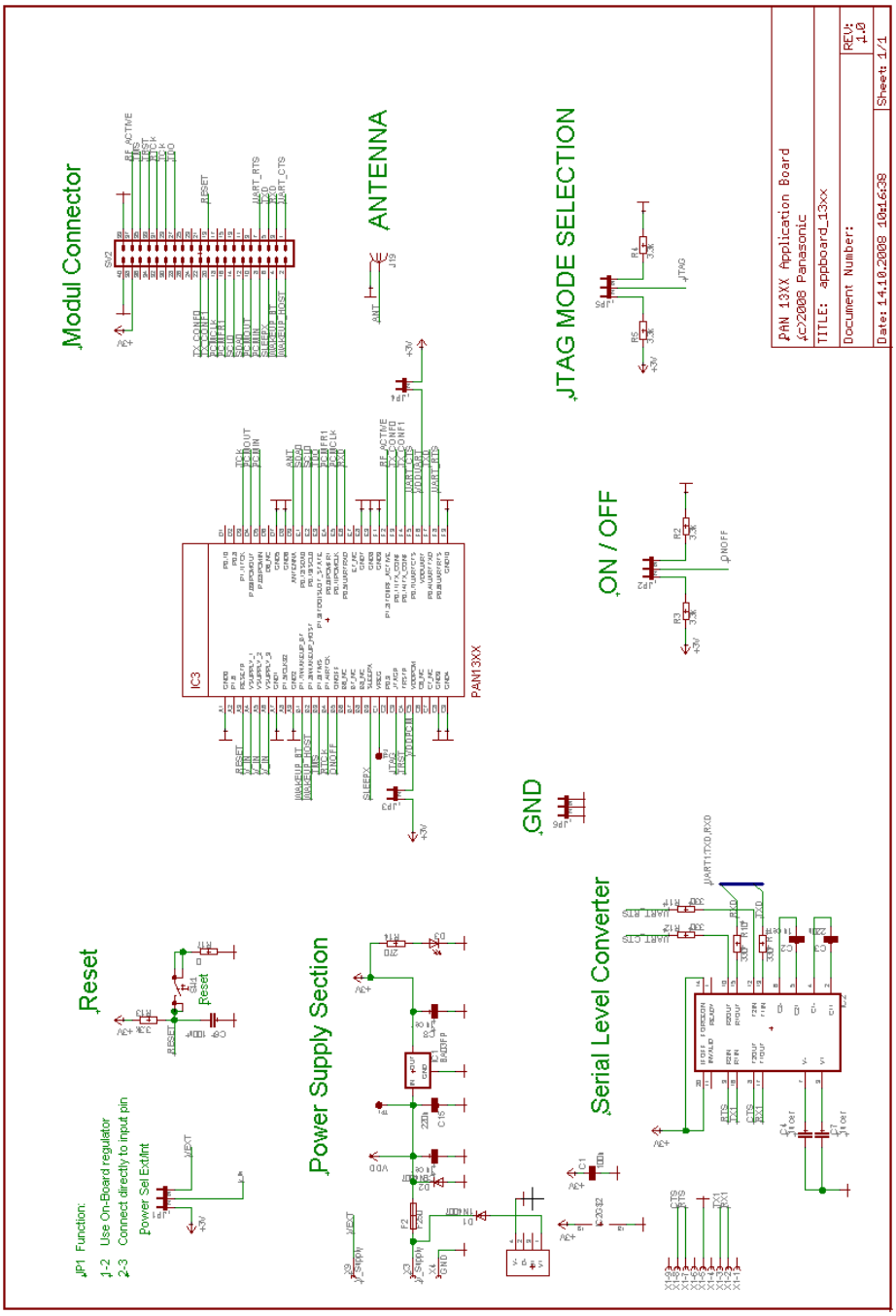

Figure 9 : EVB Schematic

7. DOCUMENT INFORMATION

Revision Version	Date Datum	Modification / Remarks Änderungen / Bemerkungen
A	09.07.2008	Initial version
B	15.07.2008	Chapter 4 added, minor corrections
C	07.08.2008	EVB Schematic added, document renamed
D	14.10.2008	DS now describing PAN1311 & PAN1321 EVBs, minor corrections

Table 3 : Document version

8. GENERAL INFORMATION

This product description does not lodge the claim to be complete and free of mistakes.
Please contact the related product manager in every case.

If we deliver samples to the customer, these samples have the status Engineering Samples. This means, the design of this product is not yet concluded. Engineering Samples may be partially or fully functional, and there may be differences to be published Data Sheet.
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