

# BlueEva+P25/G2

## Evaluation Kit User Guide

Release r04

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## 1 Introduction

This documentation describes the usage of the Stollmann Bluetooth evaluation board BlueEva+P25/G2 V04.

## 2 Package Contents

The BlueEva+P25/G2 package contains the following components:

- 2 BlueEva+P25/G2 boards
- 2 power supply, 5 VDC
- 2 USB cables
- 10 additional jumpers
- BlueEva+P25/G2 CD-ROM

## 3 Deployment

### 3.1 Startup

To deploy the BlueEva+P25/G2, connect it as follows.



Figure 1: BlueEva+P25/G2 with components and accessories as delivered

The USB connection is used for UART communication to a PC over a virtual comport. This lets you use a terminal emulation program (such as TeraTerm included on the BlueEva+P25/G2 CD) to perform the configuration or to control the Bluetooth connection.

As an alternative to the USB power supply interface, the 5 VDC mains adapter can be used for power supply (set jumper J4 to PWR).

## 3.2 Getting Started

The following chapter is for the evaluation kit with Serial Port Profile only.

For instructions regarding the Health Device Profile development kit please refer to *BlueMod+P2x-HDP User Guide* and *BlueDev+HDP Application User Guide*.

Please note that the Health Device Profile does not support any Serial Port Profile specific AT commands.

The command interface for the Health Device Profile is the Local Transport Protocol (LTP). Please refer to the *LTP Interface Specification*.

### 3.2.1 Installation of BlueEva+P25/G2 USB Driver

Connect the BlueEva+P25/G2 to a PC USB port and install the FTDI VCP USB to UART driver (included on the BlueEva+P25/G2 CD or download at

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

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

If the BlueEva+P25/G2 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 *BlueRS+ AT Command Reference*.

As shipped by the factory, the BlueEva+P25/G2 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.

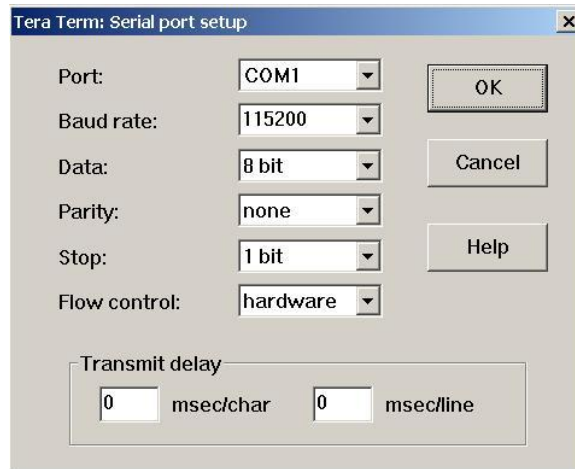


Figure 2: COM port configuration with TeraTerm

Once you have successfully configured the emulation program, issuing the “AT” command without parameters should prompt the BlueEva+P25/G2 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+P25/G2 and note it down. The Bluetooth address is unique, letting you identify the correct device for each Bluetooth address.

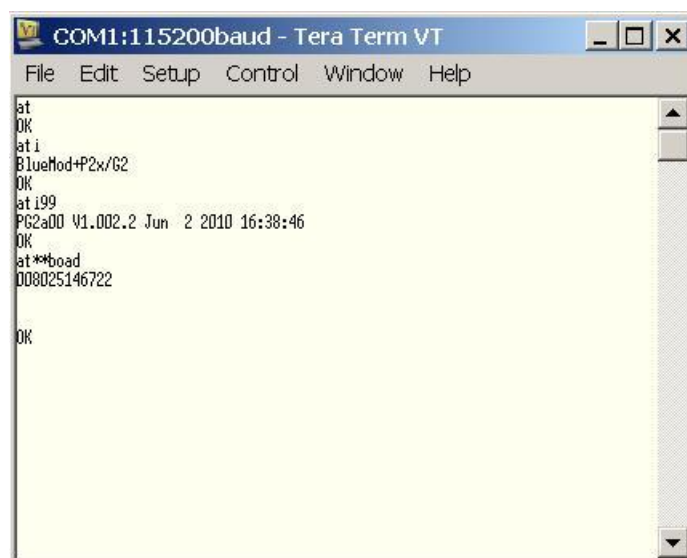


Figure 3: Reading some BlueEva+P25/G2 settings with TeraTerm

### 3.2.3 Establishing a Bluetooth Connection between two BlueEva+P25/G2 using the Serial Port Profile (SPP)

First of all, determine the Bluetooth addresses of the two BlueEva+P25/G2. To do so, connect each of the BlueEva+P25/G2 to the PC and readout the Bluetooth address using the “AT\*\*BOAD” command as described in chapter 3.2.2 Configuration.

You can either use a single PC with 2 USB ports or two separate PCs with one USB port each.

Now you can establish a connection from one BlueEva+P25/G2 to another by issuing the “ATD<Bluetooth address>” command.

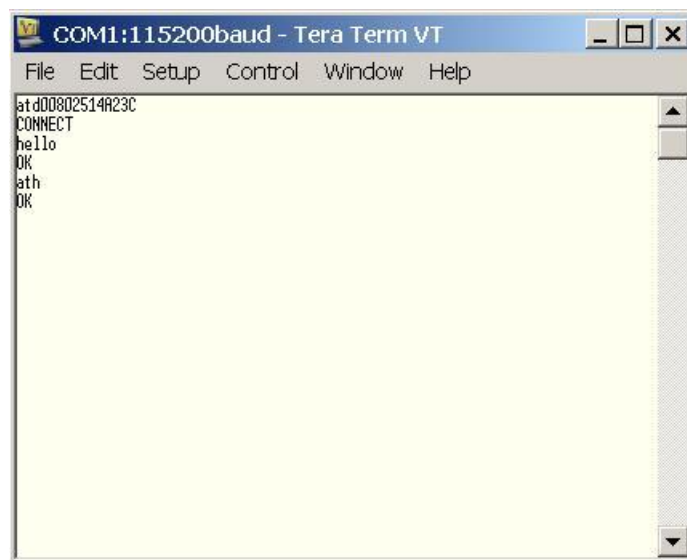


Figure 4: Establishing a Bluetooth connection between two BlueEva+P25/G2

If the connection was established successfully, the originating BlueEva+P25/G2 will issue the message CONNECT. You can now send data transparently between the two BlueEva+P25/G2.

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

### 3.2.4 Automatically Establishing a Bluetooth Connection between two BlueEva+P25/G2 using “Auto Connect”

It is possible to configure the BlueEva+P25/G2 to automatically establish a Bluetooth connection to a second (remote) device without having to take control manually.

We recommend to make the configuration by using the BlueRS+ configurator. To do so, please enter the “ATCONF” command (see figure below).

First you have to store the Bluetooth address of the remote device on the BlueEva+P25/G2 using the “BRAD” command. Second you have to enable the automatic connection establishment by using the “CMDS” command (in our example CMDS=8 – automatic connection establishment after power-on). If you want to store these settings in non-volatile memory use the “SAVE” command.

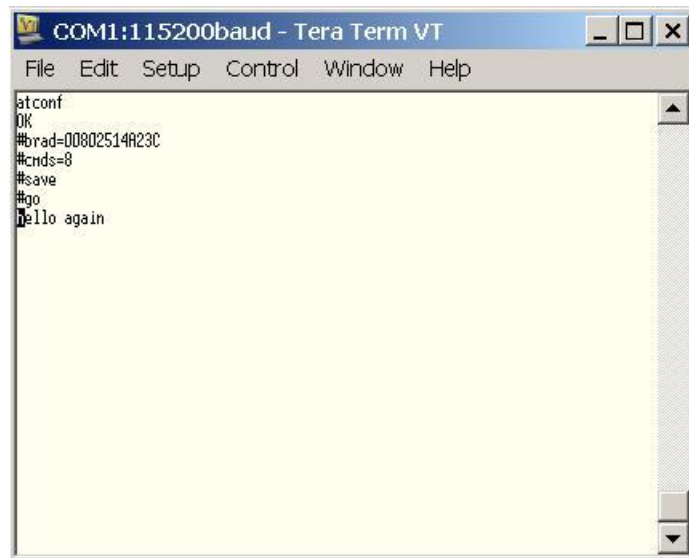


Figure 5: Establishing a Bluetooth connection with “Auto Connect”

After leaving the BlueRS+ configurator with the “GO” command, the BlueEva+P25/G2 will attempt to automatically establish a Bluetooth connection to the remote device, which in our example is the second BlueEva+P25/G2.

If the connection was established successfully, the remote BlueEva+P25/G2 will issue the CONNECT message. You can now send data transparently between the two BlueEva+P25/G2.

To terminate the “Auto Connect” mode, you will have to turn off the originating BlueEva+P25/G2. Regardless of which command set is used, the BlueEva+P25/G2 can be configured after power-on using the BlueRS+ configurator. To enter the BlueRS+ configurator after power-on, perform the steps below (only applicable if the startup message has been enabled with “AT\*\*RSTMSG=1”):

- Start your terminal emulation program (e.g. HyperTerminal) with the following settings: 9,600 bps, 8 data bits, no parity, 1 stop bit (8/N/1).
- Power on the BlueEva+P25/G2 and wait until the startup message is displayed.  
**+++ Press <CR>,<CR>,<ESC>,<ESC> to enter BlueRS+ configurator +++**
- Type in quickly the sequence <CR> <CR> <ESC> <ESC> to enter the BlueRS+ configurator.
- The BlueRS+ configurator acknowledges the sequence by outputting version information and a “#” prompt.

Now you can load the factory defaults of the BlueEva+P25/G2 using the “DEFA=1” command and if necessary store it in non-volatile memory use the “SAVE” command.

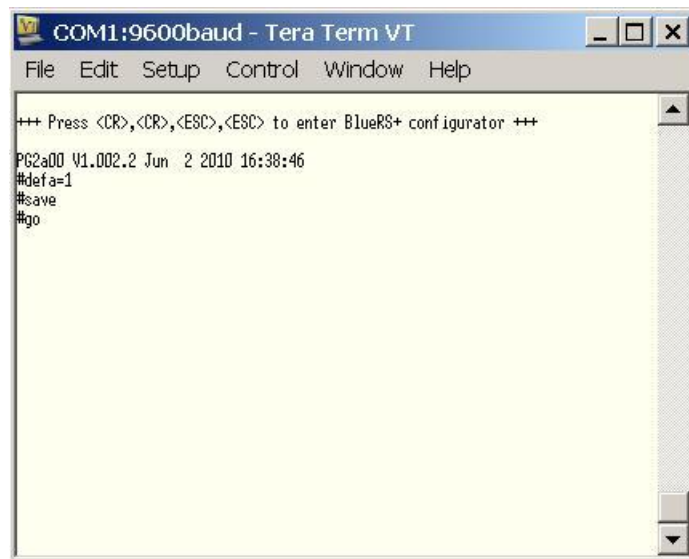


Figure 6: Terminate “Auto Connect” mode and loading factory defaults

For more detailed information about all commands, please consult our *BlueRS+ AT Command Reference*.

## 4 Hardware

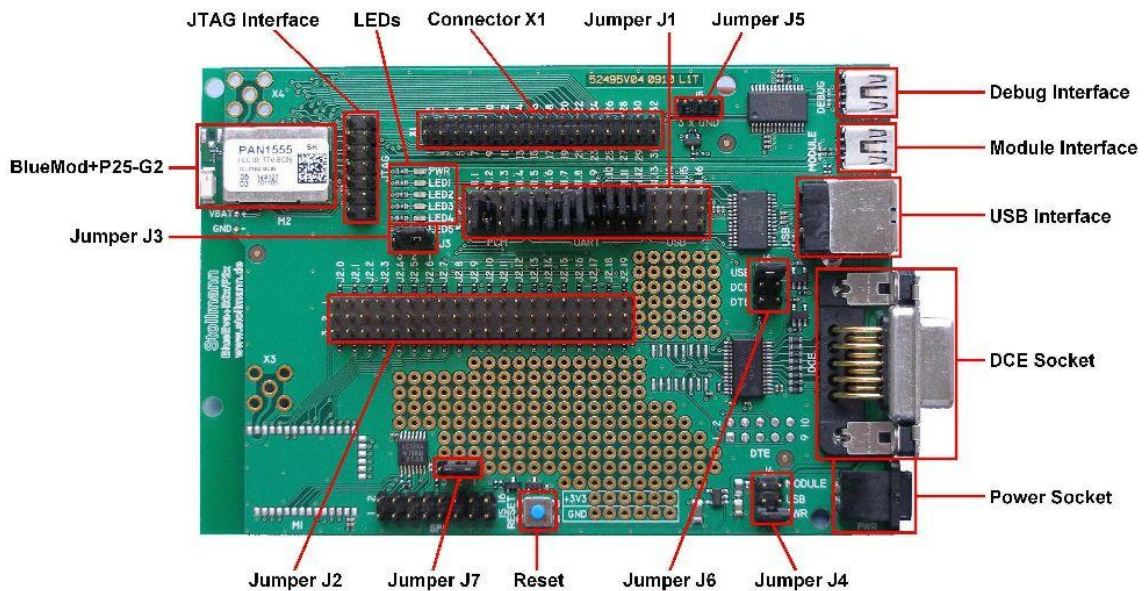


Figure 7: BlueEva+P25/G2

### 4.1 BlueMod+P25/G2

The BlueEva+P25/G2 is populated with a BlueMod+P25/G2 Bluetooth module.

### 4.2 Power Supply

There are two variants of supplying power to BlueEva+P25/G2:

- +5VDC  $\pm 10\%$  via the USB interface connector (default).
- +5VDC  $\pm 10\%$  via the external power supply connector.

### 4.3 Reset

The BlueEva+P25/G2 is equipped with a reset button. Pressing the reset button will trigger the BlueMod+P25/G2 module to perform a reset. The USB port is not influenced from the reset.

#### 4.4 USB Interface

The BlueEva+P25/G2 provides a USB interface which is used to connect the evaluation board to the host. The USB interface is equipped with a FTDI USB to serial bridge interfacing the serial port of the BlueMod+P25/G2.

#### 4.5 Serial Interface (DCE Socket)

The BlueEva+P25/G2 provides a serial interface which is used to connect a communication device for transmitting data or a PC for controlling the BlueEva+P25/G2. The serial interface corresponds to the V.24 / RS-232 standard and supports the following features:

- Transmission speed: 1,200 – 230,400 bps (asynchronous)
- Character representation: 8 bit, even/odd/no parity, 1 or 2 stop bits
- Hardware flow-control with RTS/CTS

The BlueEva+P25/G2 is used in DCE mode and can be attached to a PC.

#### 4.6 LEDs

The BlueEva+P25/G2 provides several LEDs for functional indication or to use for free disposal.

Interface	Position	Function
LEDs	PWR	Indicates the presence of power supply voltage
	LED1	Attached to PIO2 via J1.16/2-3
	LED2	Attached to PIO7 via J1.4/2-3
	LED3	Attached to PIO8 via J1.3/2-3
	LED4	Attached to PIO9 via J1.2/2-3
	LED5	Attached to PIO10 via J1.1/2-3

## 4.7 Connectors / Jumpers

### 4.7.1 Jumper J1 – Signal Routing

Jumper J1 is used for signal routing.

Jumper Number	Function	
	Position 1-2	Position 2-3
J1.1	GPIO10 - PCM_OUT	GPIO10 - LED5
J1.2	GPIO9 - PCM_CLK	GPIO9 - LED4 – startup of firmware
J1.3	GPIO8 - PCM_IN	GPIO8 - LED3
J1.4	GPIO7 - PCM_SYNC	GPIO7 - LED2 – device ready
J1.5	GPIO6 - RI	GPIO6 - RI
J1.6	GPIO5 - DSR output	GPIO14 - DSR output
J1.7	GPIO4 - DTR input	GPIO13 - DTR input
J1.8	GPIO3 - DCD	GPIO15 - DCD
J1.9	Module RTS to V.28 level shifter	-
J1.10	Module TXD to V.28 level shifter	-
J1.11	Module RXD to V.28 level shifter	-
J1.12	Module CTS to V.28 level shifter	-
J1.13	GPIO4 - DEBUG TX	-
J1.14	GPIO5 - DEBUG RX	-
J1.15	USB_ON – GPIO3 (BlueMod+P25/G2)	USB_ON – GPIO4 (BlueMod+B20)
J1.16	GPIO2 – USB Pull-up	GPIO - LED1

#### 4.7.2 Jumper J2 – GPIO Input

All pins 1 of jumper J2 are connected to +3V3 supply voltage with a resistor of 330Ω and all pins 3 of jumper J2 are connected to GND with a resistor of 330Ω. When using the GPIOs or AIOs as inputs, this arrangement allows to place jumpers in position 1-2 to generate a HIGH and to place jumpers in position 2-3 to generate a LOW input. When using the GPIOs or AIOs as outputs, pin 2 will be used to access the signal.

Jumper Number	Description
J2.0	GPIO0
J2.1	GPIO1
J2.2	GPIO2
J2.3	GPIO3
J2.4	GPIO4
J2.5	GPIO5
J2.6	GPIO6
J2.7	GPIO7
J2.8	GPIO8
J2.9	GPIO9
J2.10	GPIO10
J2.11	GPIO11
J2.12	GPIO12
J2.13	GPIO13
J2.14	GPIO14
J2.15	GPIO15
J2.16	GPIO16
J2.17	GPIO17
J2.18	AIO0
J2.19	AIO1

#### 4.7.3 Jumper J3 – Power Consumption

Jumper J3 is reserved for module power consumption measurement to use for BlueMod+P25/G2. Remove jumper from position 1-2 to take measurements.

#### 4.7.4 Jumper J4 – Power Source

The power source can be selected by jumper J4.

Jumper	Position	Function
J4	Module	Reserved
	USB	The module is powered via the USB interface
	PWR	Power from power socket

The presence of the power supply voltage is indicated by the PWR LED.

#### 4.7.5 Jumper J5 – Ground Connection

This jumper provides 3 pins with ground connection (0V) for measuring.

#### 4.7.6 Jumper J6 – Module Serial Interface Activation

Jumper J6 is used to activate the different serial interfaces.

Jumper	Position	Function
J6	USB	Activates the USB to serial bridge connected to USB
	DCE	The V.28 level shifter and the interface on the DCE socket is activated.
	DTE	Reserved

#### 4.7.7 Jumper J7 – Reset Button

Jumper J7 is used for module reset button. Remove jumper from position 1-2 to ignore reset button.

#### 4.7.8 Connector X1 – Extension Header

Connector X1 is an extension header; all module signals are accessible on this header.

Pin Number	Signal	Dir.	Description
1	+3V3	O	Supply Voltage Output
2	GND	-	Ground
3	GPIO16	I/O	Digital Input/Output
4	AIO1	I/O	Analogue Input/Output
5	AIO0	I/O	Analogue Input/Output
6	RESET#	I/O	Reset Input/Output (active LOW)
7	PCM_OUT	O	PCM Data Output
8	PCM_CLK	I/O	PCM Clock (Slave = I, Master = O)
9	PCM_IN	I	PCM Data Input
10	PCM_SYNC	I/O	PCM Frame Sync (Slave = I, Master = O)
11	GPIO15	I/O	Digital Input/Output
12	GPIO14	I/O	Digital Input/Output
13	GPIO13	I/O	Digital Input/Output
14	GPIO12	I/O	Digital Input/Output
15	GPIO11	I/O	Digital Input/Output
16	GPIO10	I/O	Digital Input/Output
17	GPIO9	I/O	Digital Input/Output
18	GPIO8	I/O	Digital Input/Output
19	GPIO7	I/O	Digital Input/Output
20	GPIO6	I/O	Digital Input/Output
21	GPIO5	I/O	Digital Input/Output
22	GPIO4	I/O	Digital Input/Output
23	GPIO3	I/O	Digital Input/Output
24	GPIO2	I/O	Digital Input/Output
25	GPIO1	I/O	Digital Input/Output
26	GPIO0	I/O	Digital Input/Output
27	UART_RTS	O	Request To Send
28	UART_TX	O	UART Transmit Data
29	UART_RX	I	UART Receive Data
30	UART_CTS	I	UART Clear To Send
31	+3V3	O	Supply Voltage Output
32	GND	-	Ground

#### 4.7.9 JTAG Interface

The JTAG1 interface is used for manufacturing and development purpose.

Interface	Position	Function
JTAG1	1	+3V3
	2	GND
	3	TRST
	4	GND
	5	TDI
	6	GND
	7	TMS
	8	GND
	9	TCK
	10	GND
	11	TDO
	12	Open
	13	+3V3
	14	GND

#### 4.7.10 Debug Interface

This interface is reserved for later usage.

#### 4.7.11 Module Interface

This interface is reserved for later usage.

#### 4.8 Default Configuration

The BlueEva+P25/G2 is preconfigured to USB mode, using serial control lines and external power supply. The jumpers are configured as described below:

Jumper Number	Position	Function
J1.2	2-3	LED4 – Startup of Firmware
J1.4	2-3	LED2 – Device Ready
J1.5	2-3	Module RI
J1.6	2-3	Module DSR
J1.7	2-3	Module DTR
J1.8	2-3	Module DCD
J1.9	1-2	Module RTS
J1.10	1-2	Module TXD
J1.11	1-2	Module RXD
J1.12	1-2	Module CTS
J3	1-2	Module power consumption
J4	USB	Power from USB interface
J6	USB	UART interface from USB
J7	1-2	Reset button

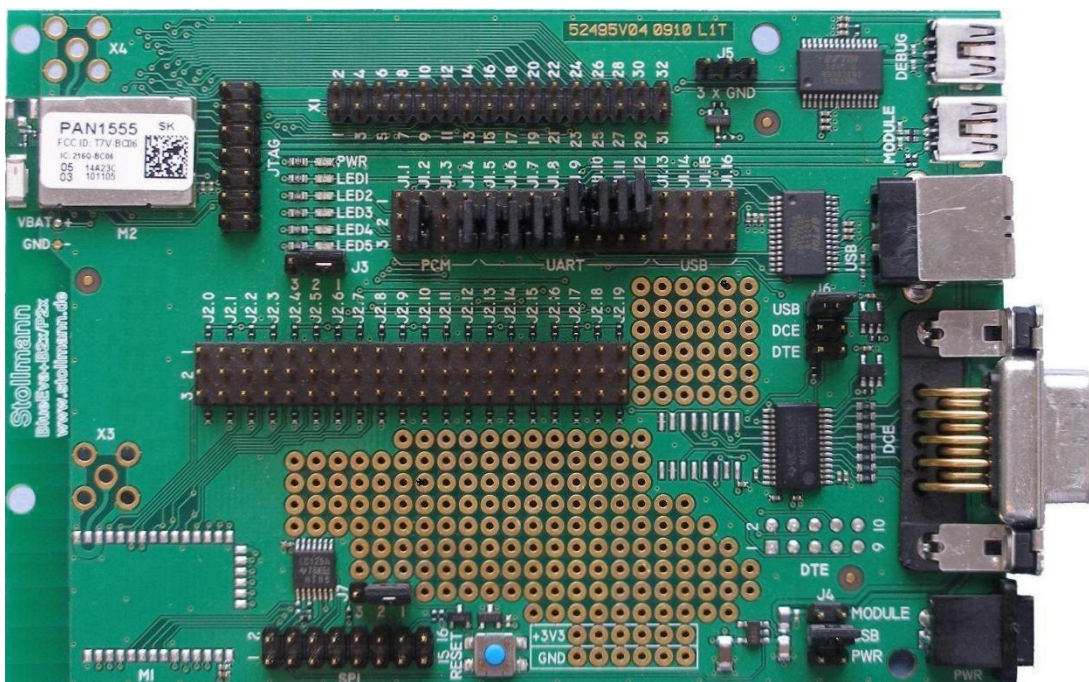


Figure 8: BlueEva+P25/G2 default configuration

## 5 History

Version	Release Date	By	Change description
r01	20.03.2009	TA	Added chapter 3 Deployment
r02	18.09.2009	MB	Modified chapter "3.2 Getting started" removed chapter "5 Software"
r03	16.02.2011	MB	Modified to EvaBoard V04
r04	21.04.2011	TA	Replaced HyperTerminal by TeraTerm terminal program



Stollmann Entwicklungs- und Vertriebs-GmbH  
Mendelssohnstraße 15 D  
22761 Hamburg  
Germany

Phone: +49 (0)40 890 88-0  
Fax: +49 (0)40 890 88-444  
E-mail: [info@stollmann.de](mailto:info@stollmann.de)  
[www.stollmann.de](http://www.stollmann.de)