Atmel AVR2090: REB232ED Evaluation Kit Quick Start Guide

Features

This application note briefly describes how to set up and run the pre-flashed performance test application included with the Atmel® REB232ED evaluation kit.

The Atmel Controller Base Board (CBB) is intended to serve as the microcontroller platform for the Atmel Radio Extender Board (REB) family. A REB connected to a CBB forms a battery powered, fully functional and portable wireless node. The REB232ED evaluation kit was created for evaluating the Atmel AT86RF232 radio transceiver.

1 Kit contents

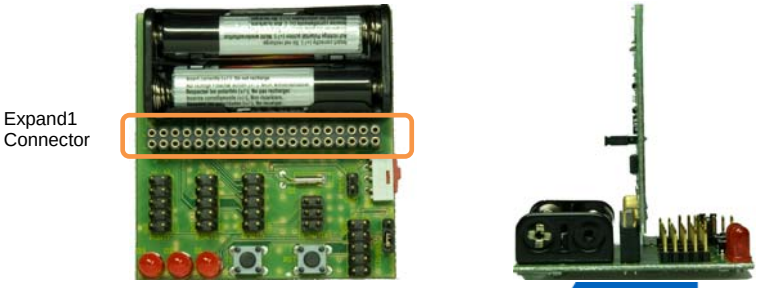
2 x Atmel Controller Base Board (CBB)
2 x REB232ED Radio Extender Board (REB)
2 x RS232 level shifter cable
4 x AAA battery
1 x Quick start guide
1 x MS-147 to SMA cable



From left to right: 2 x CBB, 2 x REB, 2 x RS232 cable, MS-147 to SMA cable.

2 Board assembling

1. Check/set power switch off on the two CBBs.
2. Insert two batteries in each CBB.
3. Connect each REB to a CCB to create two REB-CBB assemblies.



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Application Note

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Plug each REB vertically into the 2x20 female Expand1 connector header on the CBB:

- Ensure that the pin 1 marking on the REB header aligns with the corresponding pin 1 marking on the CCB Expand1 connector header
- The top side of the REB, which has the radio transceiver and antenna, should be facing towards the batteries on the CBB

3 Simple range measurement

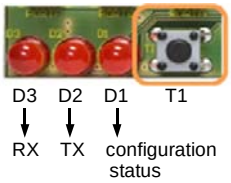
The pre-flashed performance test suite on the REB232ED evaluation kit assemblies features a simple range measurement application. Each assembly operates in a standalone manner, and is able to transmit or receive data frames. A successful transmit or receive operation is indicated by a blinking LED.

3.1 Power up the assemblies



Apply power to both REB-CBB assemblies by switching on the power switch located on the top side of the CBB. The assemblies run a power-on check, and indicate the successful completion by switching on the second of the three LEDs, LED-D2.

3.2 Run simple range measurement application



Choose one of the REB-CBB assemblies, and press button T1 to start the simple range measurement application.

First, the REB-CBB initiates a connection and configuration procedure by sending broadcast frames and waiting for a response from the second REB-CBB. After a successful configuration, the REB-CBBs turn on LED-D1 to indicate that status. Afterwards the initiator starts to transmit data frames immediately. Each data frame transmission is indicated by blinking the TX status LED-D2. A successful data frame reception on the second node is indicated by blinking the RX status LED-D3. The RX status LED stops blinking if no data frames are received, such as when, for example, the node has left the communication range. Data frame transmission can be stopped by pressing T1 once more on the node transmitting frames.

Moreover the REB-CBBs can transmit and receive frames simultaneously. Pressing button T1 on both nodes initiates each node to transmit frames. The three LEDs indicate their respective functions: LED-D1 a successful configuration, LED-D2 transmission and LED-D3 reception.

NOTE

The node configuration gets lost when resetting or switching off the REB-CBB power supply. To restart the simple range measurement, a reset or power cycle has to be applied to both REB-CBB assemblies before pressing T1 on one (or both) REB-CBB(s) to restart the application.

4 Packet error rate measurement

The pre-flashed performance test suite is also configured with packet error rate (PER) measurement functionality (as defined in IEEE® 802.15.4), enabling the user to explore various radio transceiver features, radio transceiver registers, and performance by tuning with customized configurations. For this application, one REB-CBB needs to be connected to a PC.

4.1 Board assembling



1. Assemble the boards as described in Chapter 2, Board assembling.
2. Make sure that the power switch on both assemblies is in the off position.
3. Plug the yellow D-Sub-9 connector of one RS232 cable into the PC serial COM port. Connect the 6-pin plug of the RS232 cable onto one of both REB-CBB assemblies so that the red stripe of the ribbon cable connects to pin 1 of the CBB header, USARTD0.

4.2 Set up the terminal program on the PC

A terminal program running on the PC is used to control the application running on the two REB-CBB assemblies. Set up the terminal program as follows:

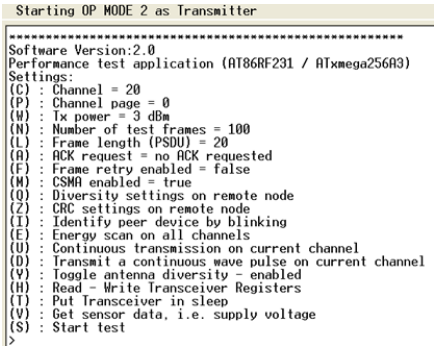
COM port:	COM1 (check for correct assignment)
Baud rate:	9600
Parity:	None
Data bits:	8
Stop bits:	1
Flow control:	Off

4.3 Power up the assemblies



Apply power to both (optional: one) REB-CBB assemblies by switching on the power switch located on the top side of the CBB. The assemblies run a power-on check, and indicate the successful completion by switching on the second of the three LEDs.

4.4 Run the packet error rate measurement



Type any character in the terminal window to initiate the configuration procedure for both REB-CBB assembly nodes and show the menu. Optionally, if no peer node is active, the search for a peer device can be aborted by pressing ENTER. The node gets configured for stand-alone operation. The packet error rate measurement can be operated through the menu options displayed on the UART terminal program. Type the character “S” to run the application.

A detailed description of the menu options can be found in the Atmel REB232ED Evaluation Kit User Guide.

5 Applications and documentation

Additional hardware and software documentation related to the REB232ED evaluation kit can be found on the kit website:
http://www.atmel.com/dyn/products/tools_card.asp?tool_id=17358

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