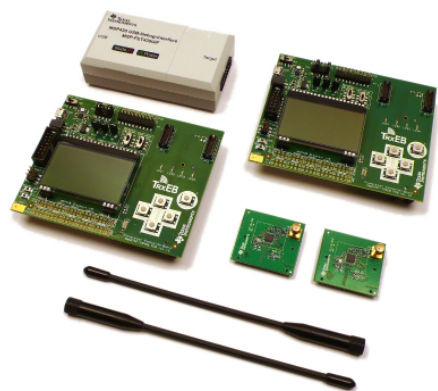


CC1120 Development Kit Quick Start Guide

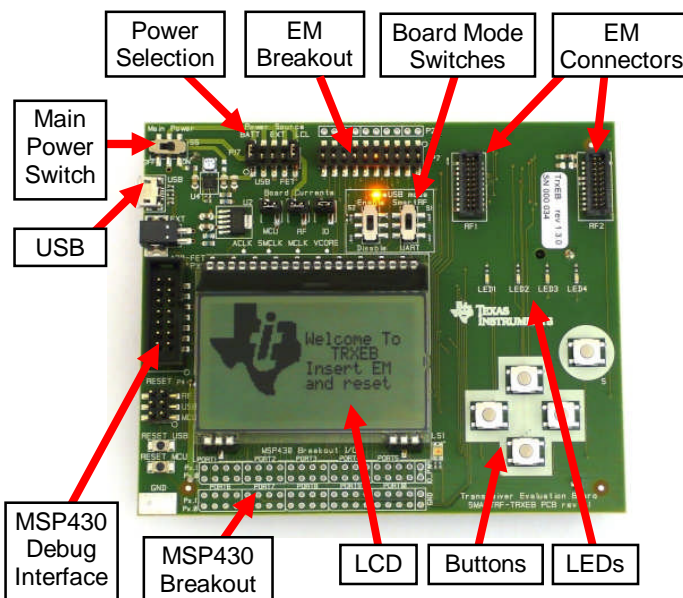
Opening the Box and Running the Packet Error Rate Test

1. Kit Contents

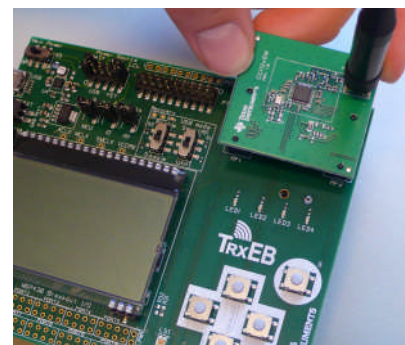


2 x SmartRF™ Transceiver EB (TrxEB)
 2 x CC1120EM 868/915 MHz
 2 x W5017 Pulse Antennas
 1 x MSP430 Debug Probe (FET)
 2 x Micro USB Cables
 1 x Standard USB Cable
 1 x 14-pin Flat Cable
 4 x 1.5 Volt AA Batteries
 Documentation

2. TrxEB Overview



3. Plug the EM into the TrxEB



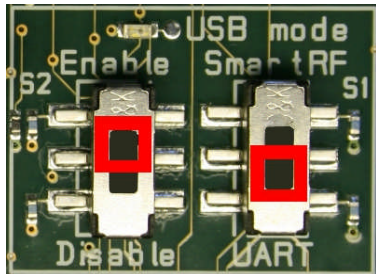
Insert a CC1120EM into the TrxEB. The connectors will only fit in one position so that the EM cannot be inserted the wrong way. Do not use excessive force on the EM. Remember to mount the antenna.



Caution! The kit contains ESD sensitive components. Handle with care to prevent permanent damage. To minimize risk of injury, avoid touching components during operation if symbolized as hot.

4. Select Board Mode

Use the switches S1 and S2 to select the operating mode of the board. For the sake of this quick start guide, please select “Enable” and “UART”. This configuration will make it possible to communicate directly with the MSP430 over a virtual COM port on the PC.



5. Power Options

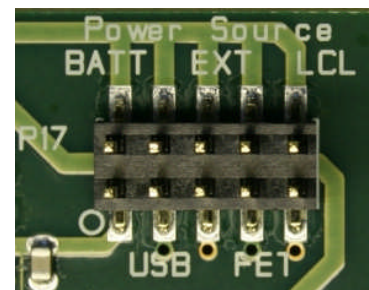
There are several ways of applying power to the TrxEB.

- 2 x 1.5 V AA batteries
- USB
- External Power Supply
- MSP430 Debugger

For the batteries and USB, there are voltage regulators on the TrxEB that will set the on-board voltage to 3.3 V. The external power supply should set a voltage that does not exceed 3.3 V. By default, the MSP430 debugger supplies 3.0 V. **Note that there should only be one active power source at any one time.**

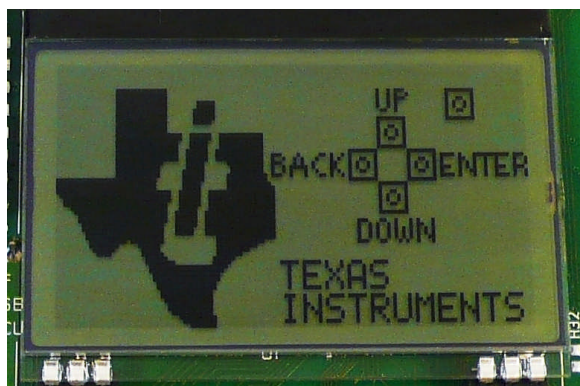
Warning! To minimize risk of personal injury or property damage, never use rechargeable batteries to power the board. Do not leave the EVM powered when unattended.

6. Select Power Source



Depending on the power source, make sure you connect jumpers to the appropriate pins on the “Power Source” header. For instance, if you use batteries, use a jumper to short-circuit pin 1 and 2 on the header. The last jumper in the row (pin 9-10) should always be mounted, unless the MSP430 FET is used as the power source.

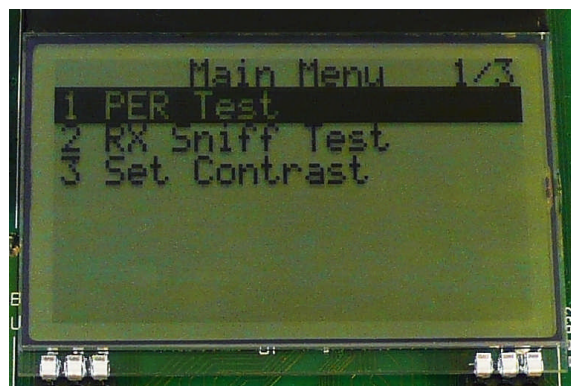
7. Welcome Screen



Turn on power with the Main Power switch. You should now see the Texas Instruments logo and a short description of the buttons on the LCD. Pushing any of the five buttons on the board will take you to the main menu.

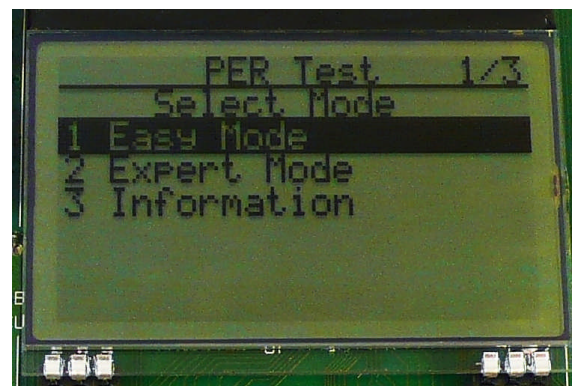
NB! If you don't see anything on the screen – don't panic. First, make sure the mode switches are in the correct positions (see step 4 above). Secondly, the first build of TrxEB unfortunately uses a connector that doesn't fit exactly to the pins of the LCD. It should be sufficient to tilt the LCD slightly to get a snug fit with the connector.

8. Packet Error Rate Test



Select the PER (Packet Error Rate) test by highlighting the selection using the up/down buttons. Confirm your selection by pressing Enter (right button).

9. Select Test Mode

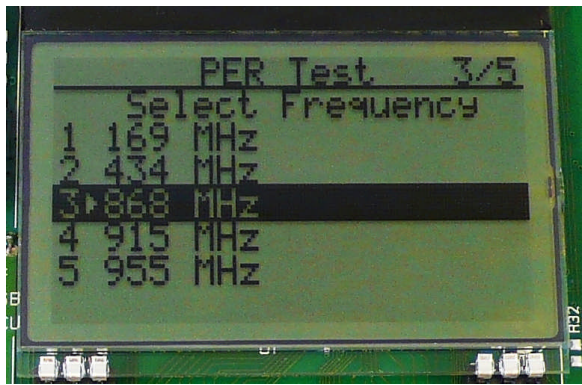


The PER test can be run in several modes. Easy Mode sets up a one-way test and uses default settings. This test is convenient for practical range testing.

The other test modes are described in the “Software Examples for CC112x, CC11xL and CC1101 User's Guide”.

To proceed, highlight “Easy Mode” and press Enter (right button).

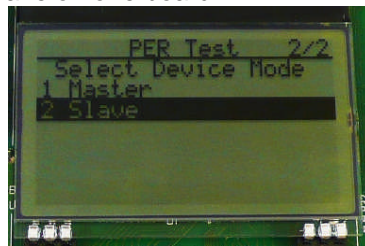
10. Select Frequency



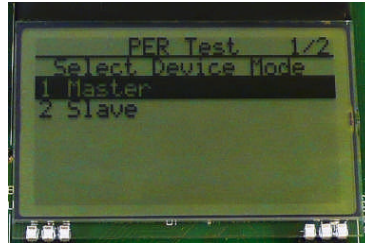
Select which frequency to use for the test. Make sure that the evaluation modules you have match the selected frequency.

11. Select Mode

One of the boards must operate as the slave (transmitter) and the other as master (receiver). Select Slave on one board...

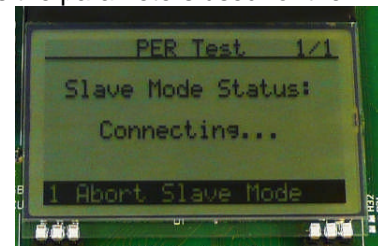


...and Master on the other board.

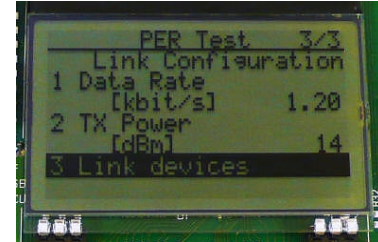


12. Establish Link

The slave node will now wait for a configuration package from the Master. The configuration contains the parameters used for the PER test.

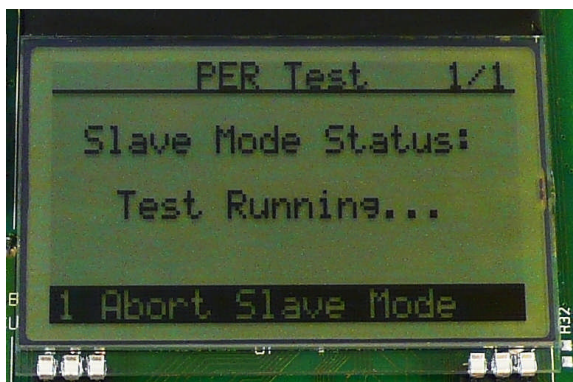


The configuration package will be sent when you select "link devices" on the master node.



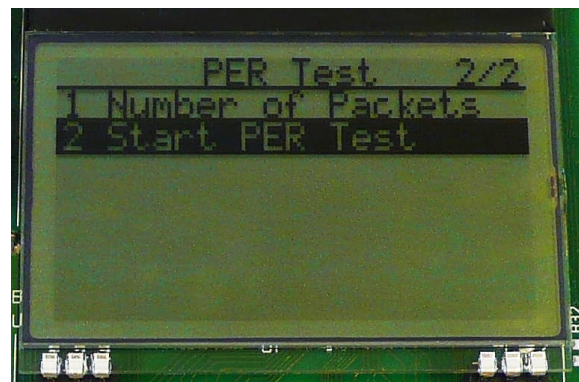
13. Link Established

When the initial linking has completed, the slave node will start the test by continuously transmitting packets to the master.



14. Start the Receiver (master)

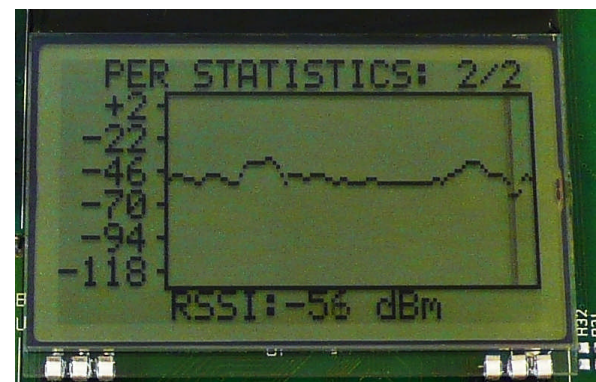
On the master node, you can select the number of packets you want to receive in order to calculate the packet error.



When selecting "Start PER Test", the master (receiver) will begin to count the number of received packets and provide some statistics.

15. PER Test Results

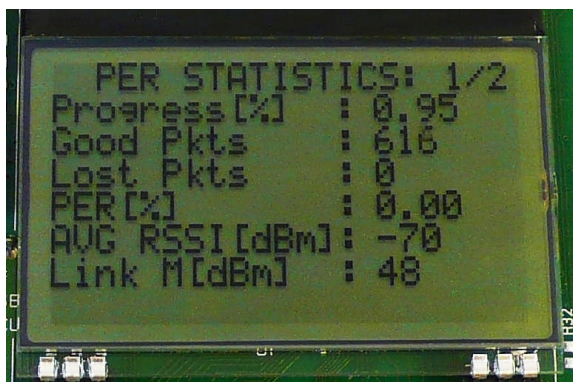
The master will display a window that plots the received signal strength (RSSI) for each packet.



Press the "Up" button to go to the detailed statistical window.

16. PER Test Results

The statistics window will show the error rate based on the number of lost or erroneous packets divided by the total number of packets that should have been received.



17. Troubleshooting

If you are experiencing problems with this test, please check the following:

- Nothing is shown in the display! Unfortunately, the first series of TrxEB uses a connector that doesn't fit exactly to the pins of the LCD. It should be sufficient to tilt the LCD slightly to get a snug fit with the connector.
- Please visit the kit web page and check for updated SW and documentation. Updated SW can be downloaded to the device using IAR EW430 or SmartRF Flash Programmer.
- If you get poor PER results at short distances, try to move the transmitter and receiver further apart. The CC1120 receiver may experience saturation if it is too close to the other CC1120 transmitting at full output power.

18. References

Please visit www.ti.com and

<http://www.ti.com/tool/cc1120dk>

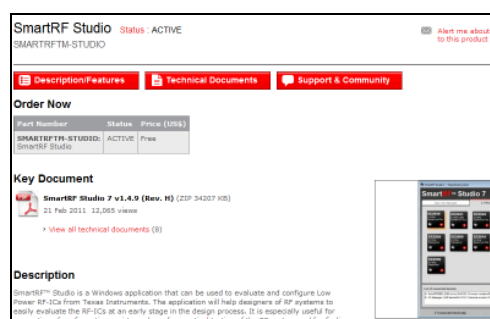
On the kit product page, you will find additional documentation, links to updated software examples and software tools like SmartRF Studio.

You will also find a lot of information on the TI E2E forum at <http://e2e.ti.com>

We hope that you will enjoy working with the CC1120 device.

SmartRF™ Studio

1. Download and Install



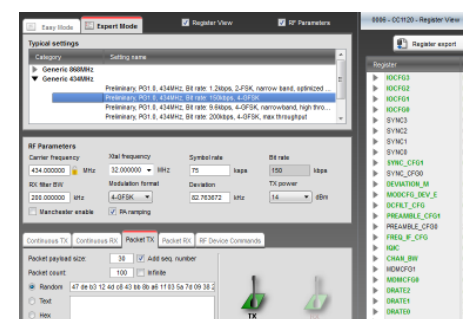
Before connecting SmartRF TrxEB to your PC, download and install SmartRF Studio from www.ti.com/smartrfstudio.

2. Launch SmartRF Studio



After installing the tool, connect the EB to the PC using the USB cable and start SmartRF Studio. Select the "Sub 1 GHz" tab and double click the highlighted CC1120 device icon.

3. Test the Radio



You can now configure the radio, run performance tests, export register settings and run link tests with another CC1120 on a SmartRF TrxEB connected to the PC.

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