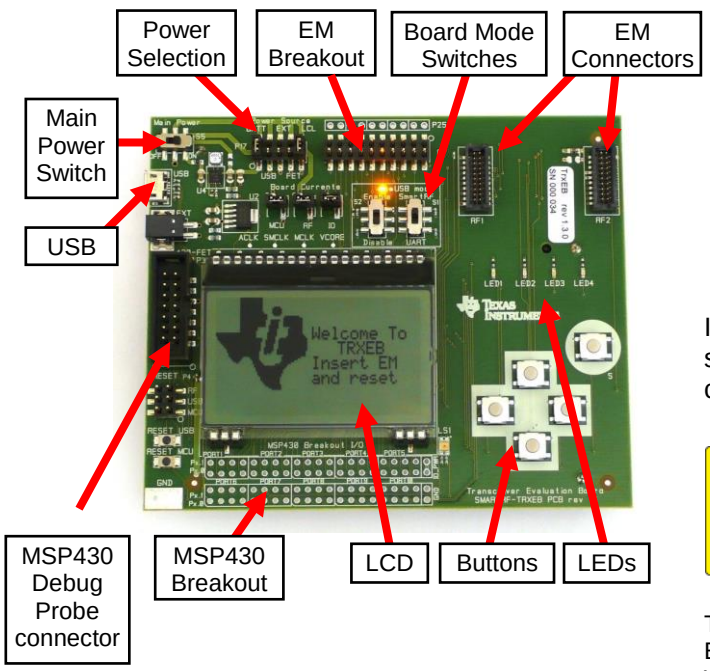
CC1125 Development Kit Quick Start Guide

Opening the Box and Running the Packet Error Rate Test

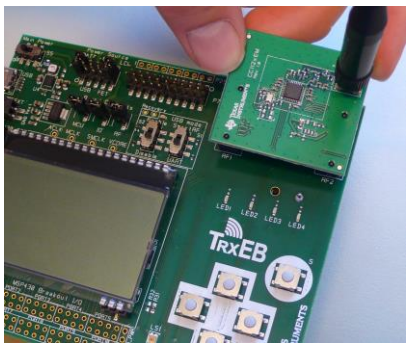
1. Kit Contents

2 x SmartRF Transceiver Evaluation Boards (TrxEB)
2 x CC1125 ETSI Cat1 868 MHz Boards (CC1125EM-CAT1-868)
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
Documentation

2. TrxEB Overview



3. Plug the EM into the TrxEB



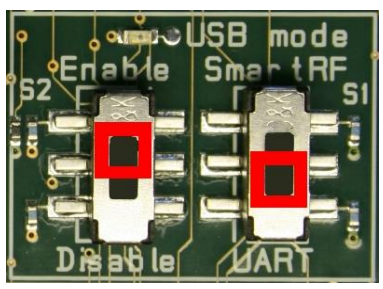
Insert a CC1125EM board into the TrxEB as shown above. Connect the antenna to the SMA connector on the EM.

Caution! The kit contains ESD sensitive components. Handle with care to prevent permanent damage.

The RF boards in this kit are tested and comply with ETSI/R&TTE over temperature from 0 to +35°C. The W5017 whip antenna from Pulse has a gain of 2 dBi. The CC1125 is a receiver category 1 device, c.f. ETSI EN 300 220-1, §4.1.1.

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.

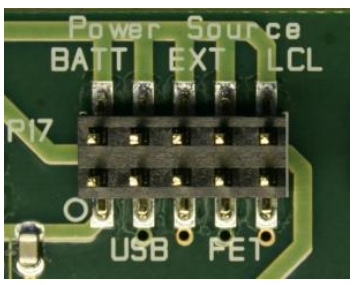
- 2 x 1.5V AA Non-Rechargeable Alkaline Batteries
- USB (5V through USB plug)
- External Power Supply (requirements below)
- MSP430 Debug Probe

When the power source is batteries or USB, the voltage regulators on the TrxEB will set the on-board supply voltage to 3.3VDC.

External Power Supply[1] Requirements:
Nom Voltage: 3.3VDC
Max Current: 800 mA
Efficiency Level V

Warning! To minimize risk of personal injury or property damage, never use rechargeable batteries to power the board.

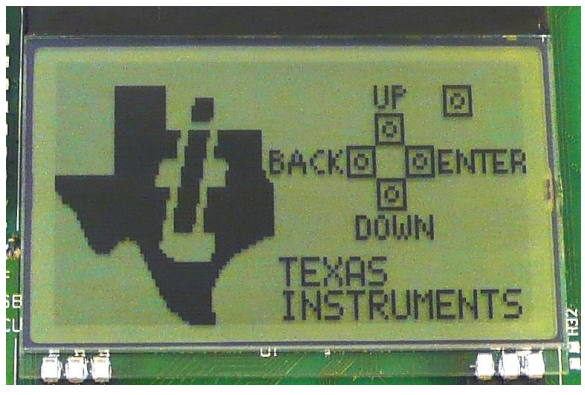
6. Select Power Source



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.

Note that there should only be one active power source at any one time. Do not leave the board powered when unattended.

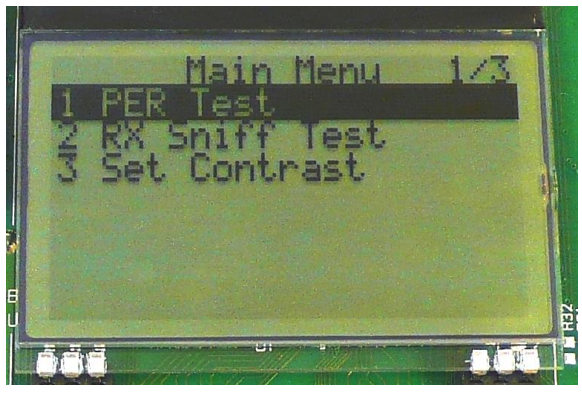
7. Welcome Screen



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.

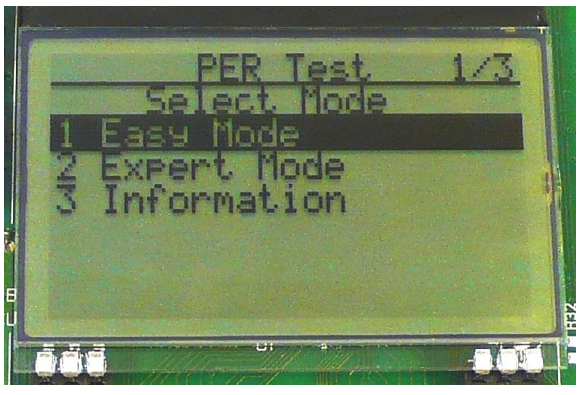
NB! If you don’t see anything on the screen make sure the mode switches are in the correct positions (see step 4 above).

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

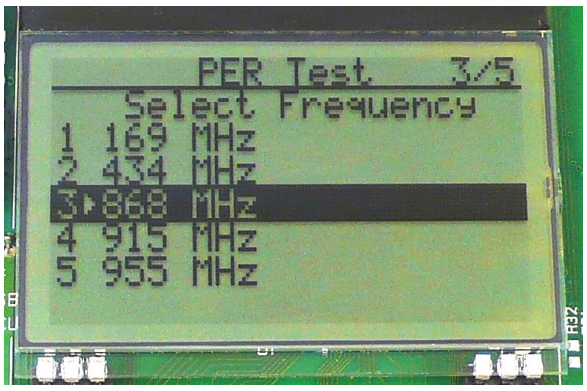


The PER test can be run is several modes. Easy Mode sets up a one-way test and uses default settings, which is convenient for range testing. To proceed, highlight “Easy Mode” and press Enter (right button).

The other test modes are described in the “**TrxEB RF PER Test Software Examples User’s Guide**”.

[1] When using an external power supply, make sure it meets the listed requirements in addition to complying with applicable regional product regulatory and safety certification requirements such as UL, CSA, VDE, CCC, and PSE.

10. Select Frequency

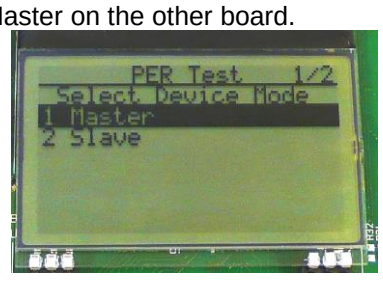


Select which frequency to use for the test. Make sure that the evaluation modules you have match the selected frequency.

11. Select Mode

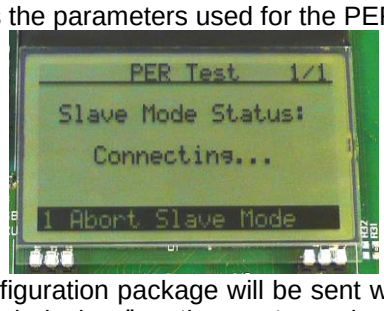
One of the boards must operate as the slave (transmitter) and the other as master (receiver). Select Slave on one board…

…and Master on the other board.

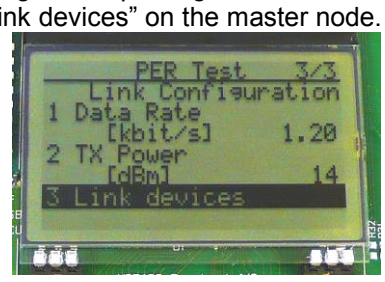


12. Establish Link

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

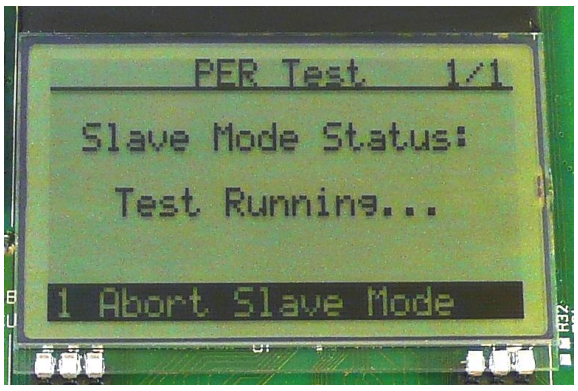


The configuration package will be sent when you select “link devices” on the master node.



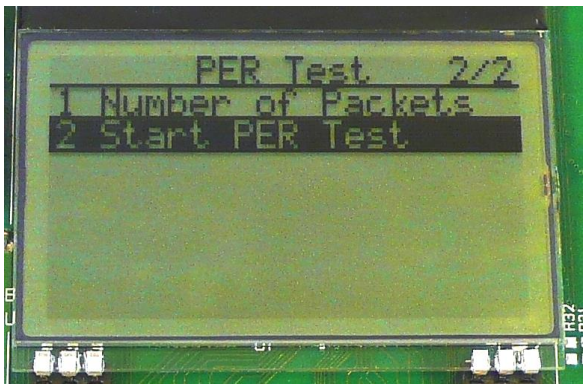
13. Link Established

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)

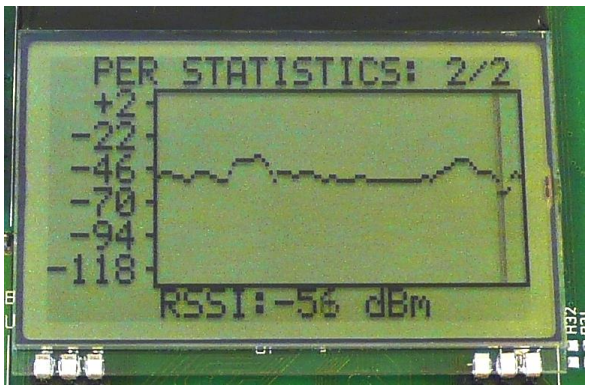
On the master node, you can select the number of packets you want to receive in order to calculate the packet error.



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

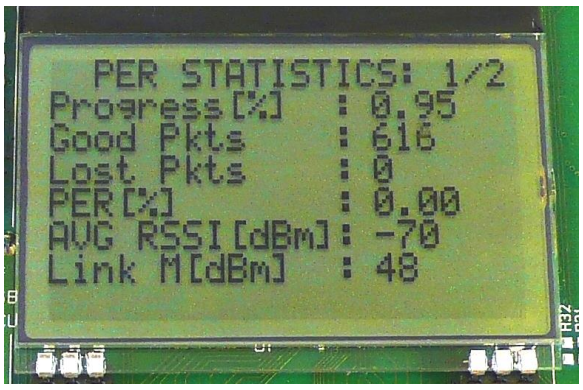
The master will display a window that plots the received signal strength (RSSI) for each packet.



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

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

- Nothing is shown in the display! Make sure the mode switches are in the correct positions (see step 4 above).
- Please visit the kit web page and check for updated SW and documentation. Updated SW can be downloaded to the device using IAR Embedded Workbench for MSP430 or SmartRF Flash Programmer.
- If you get poor PER results at short distances, try to move the transmitter and receiver further apart. The CC1125 receiver may be saturated if it is too close to the other CC1125 transmitting at full output power.

18. References

Please visit www.ti.com and

http://www.ti.com/tool/cc1125dk

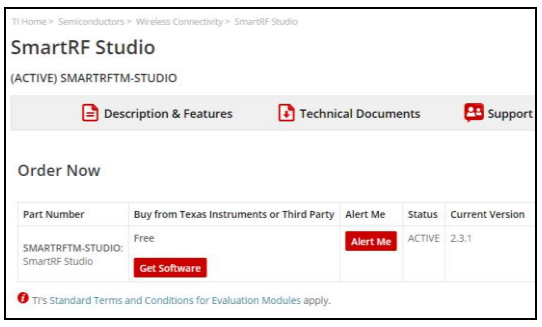
On the kit product page, you will find additional documentation, links to updated software examples and software tools like SmartRF Studio.

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 CC1125 device.

SmartRF™ Studio

1. Download and Install

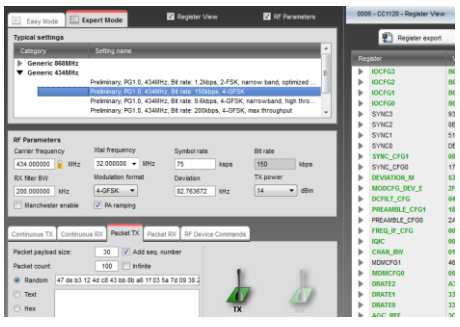


Before connecting SmartRF TrxEB to your PC, download and install SmartRF Studio from www.ti.com/smartrfstudio.

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 CC1125 device icon.

3. Test the Radio



You can now configure the radio, run performance tests, export register settings and run link tests with another CC1125 on a SmartRF TrxEB connected to the PC.

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