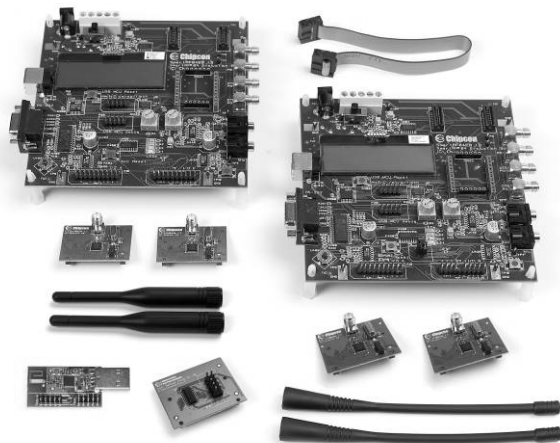


# CC1110-CC1111DK Quick Start Instructions

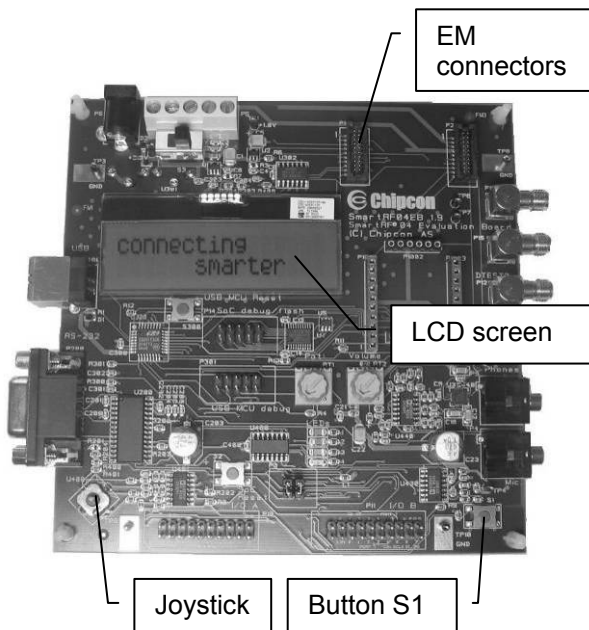
## RF/Packet Error Rate Test

### 1. Kit Contents

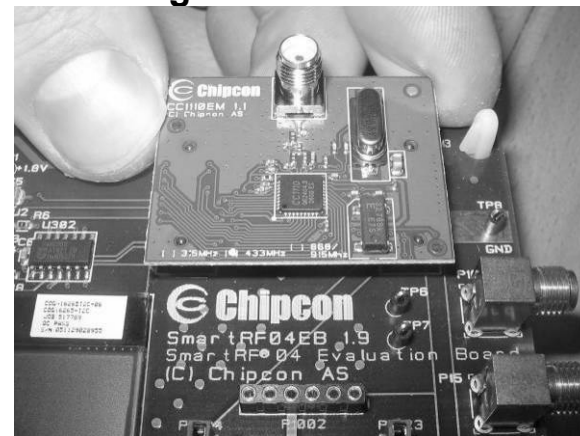


- 2 SmartRF04EB
- 2 CC1110EM 433 MHz
- 2 CC1110EM 868-915 MHz
- 1 CC1111 USB dongle 868-915 MHz
- 1 SOC\_DEM
- 2 antennas (433 MHz)
- 2 antennas (868/915 MHz)
- 2 USB cables
- 1 USB extension cable
- 1 10-pin cable

### 2. EB overview



### 3. Plug EM into EB

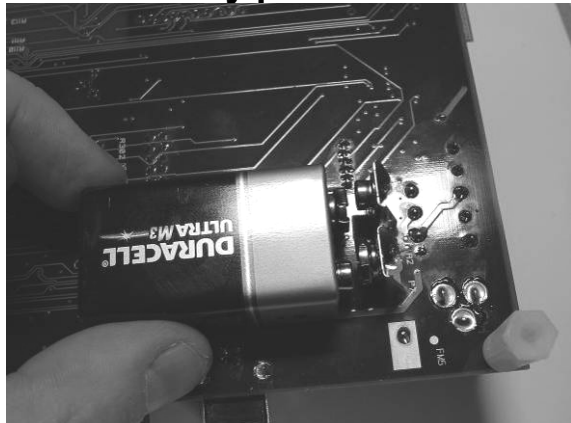


Insert a CC1110EM into both SmartRF04EBs. The connectors will only fit in one position, so that the EM cannot be inserted the wrong way. Do not force the EM. Remember to mount the antenna as well. The frequency range of the selected EM decides which antenna to use.

**NB!** Different antennas for different frequencies:



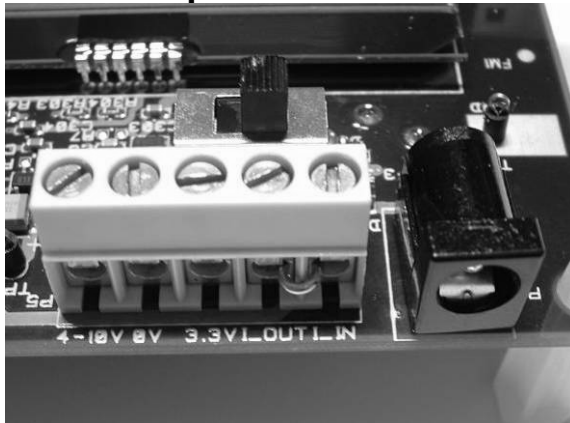
### 4a. Battery power



There are three different ways of applying power to the EB:

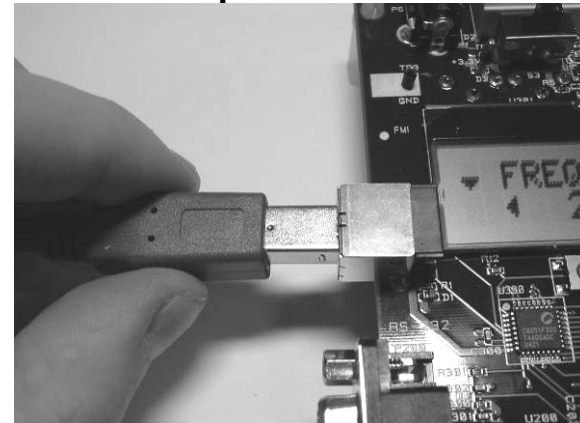
The first method involves using a battery, either a 9V or a 4xAA battery pack connected to the battery connector on the bottom side of the board

### 4b. DC power



The second method applies DC power using the DC input jack (right in picture, centre is +, sleeve is ground), or by connecting a 4-10V voltage source between the 4-10V and 0V terminals of the power connector (left in picture). It is also possible to connect a 3.3V voltage source between the 3.3V and 0V terminals. The on-board voltage regulators will be bypassed in this case.

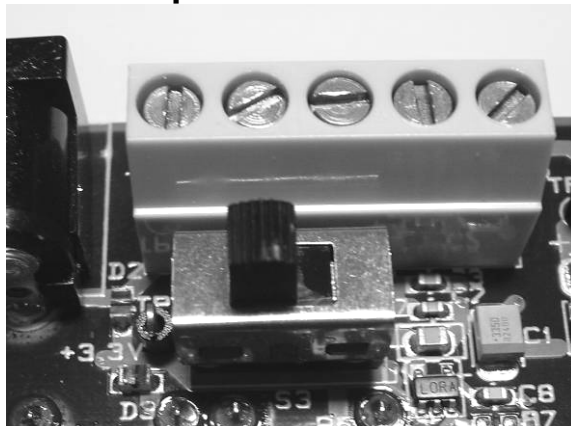
### 4c. USB power



The EB can also be powered from the USB bus. Make sure that the SmartRF® Studio software is installed before connecting the EB to the PC, otherwise you may experience problems in installing it later due to driver issues.

Note that if multiple power sources are connected, the source with the highest voltage will power the EB. This means that you should disconnect any attached battery when using a lab supply or USB power, otherwise the battery will be drained.

### 5. Set power switch



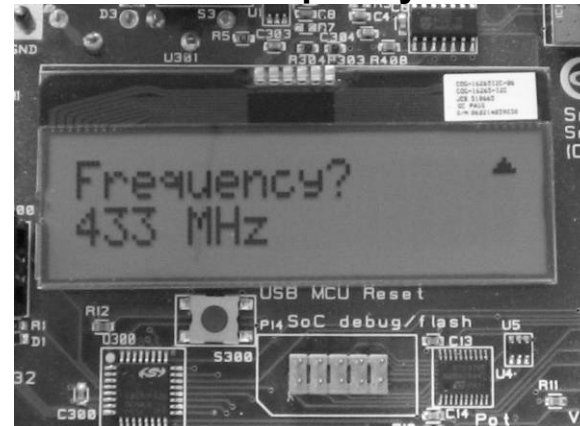
If a 3.3V source is used as described in 4b above, the switch should be set to the leftmost position. For all other cases, the switch should be set to the rightmost position. This switch can be used to turn off the EB by switching it to the opposite position of that used to turn it on.

### 6. Packet error rate test



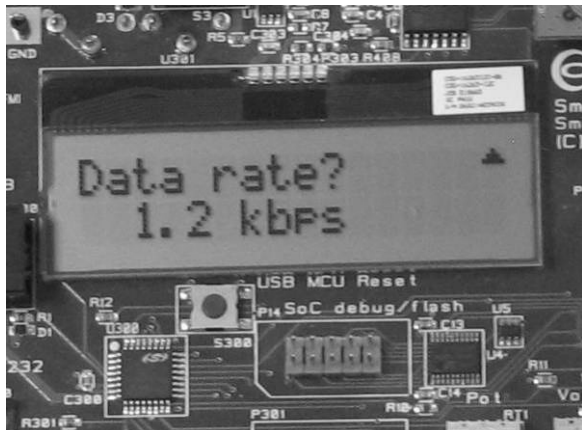
When power is applied to the board, the test program will start. You should see the Chipcon logo with chip name and revision number as shown above on the LCD display on both EBs. Pushing button S1 in the lower right corner of the board will show the first menu item.

### 7. Select Frequency



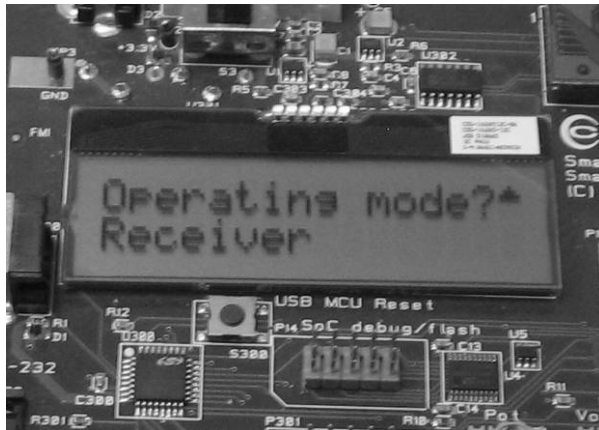
Select a frequency according to the type of EM module in use (433 MHz, 868 MHz, 903 MHz or 915 MHz). Move the joystick up or down to display the choices and push button S1 in the lower right corner of the board to select the displayed frequency.

### 5. Select Data Rate



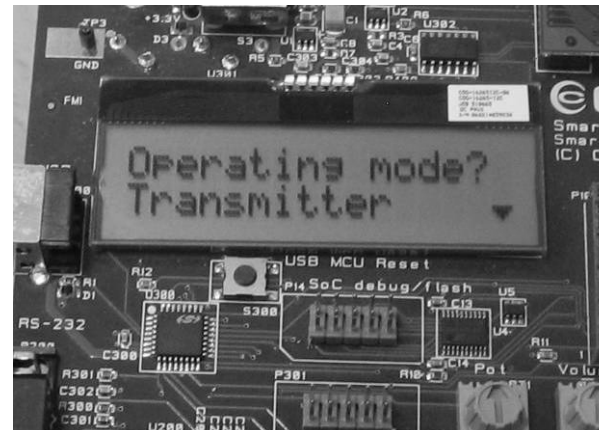
Select which data rate to use (1.2 kbps, 38.4 kbps or 250 kbps) by moving the joystick. Confirm your choice by pushing button S1.

### 6. EB 1: Select Receiver



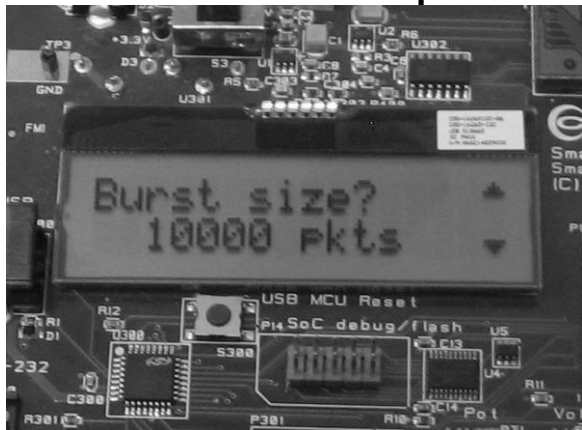
Select Receiver on the first EB by moving the joystick. Confirm by pressing button S1. The Receiving node will display "Ready to receive".

### 7. EB 2: Select Transmitter



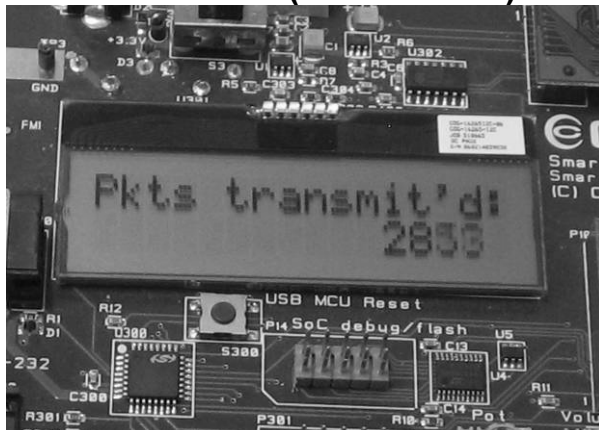
Select Transmitter on the other EB by moving the joystick upward. Confirm by pressing button S1.

### 8. EB 2: Number of packets



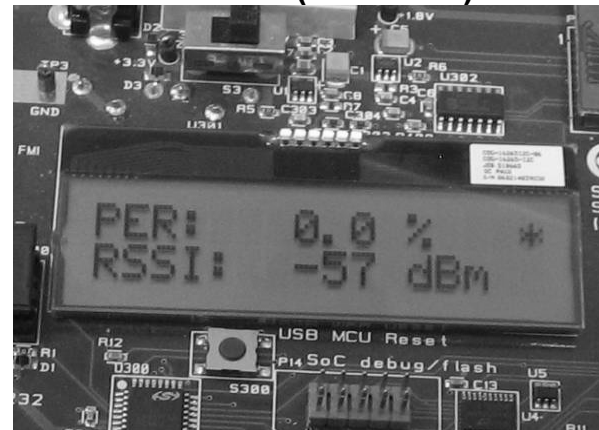
On the transmitter EB, select the number of packets to send. More packets take longer, but give a better statistical result. Confirm by pressing button S1.

### 9. PER Test (Transmitter)



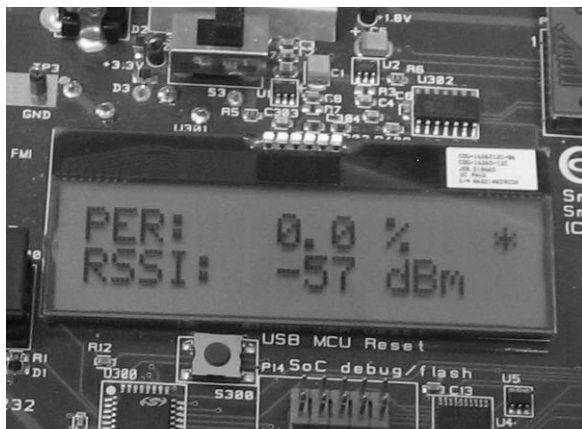
Press S1 button again to start transmitting the packet burst. The transmitter will show a running counter that shows the number of packets sent.

### 10. PER Test (Receiver)



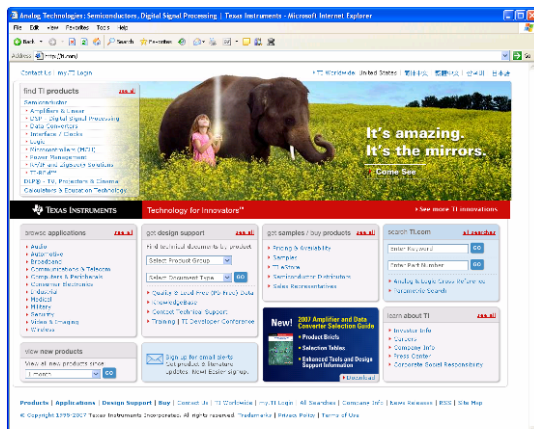
The receiver will show the total accumulated packet error rate (PER) together with the average signal strength (RSSI) of the previous 32 received packets. A symbol in the upper right corner will blink for every 32nd incoming packet to indicate whether the link is maintained.

### 11. PER Test results



When the PER test is completed, the result will be displayed on the receiver until a new test is started. A new test can be started from the transmitter.

### 12. Documentation



Please visit [www.ti.com](http://www.ti.com) to download the CC1110-CC1111DK User Manual, the SmartRF® Studio software, examples, as well as relevant datasheets and application notes.

If you for some reason cannot access the TI web site and download the files, please contact your local TI representative for assistance.

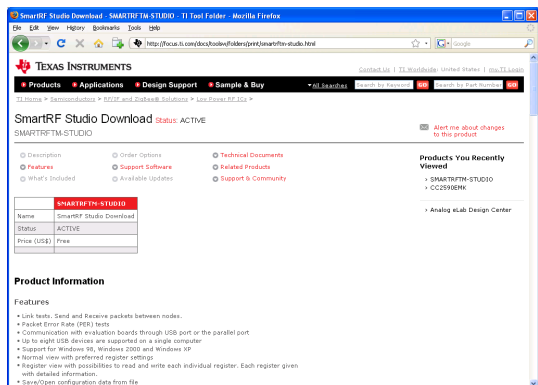
### 1. Troubleshooting/Notice

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

- Please visit [www.ti.com](http://www.ti.com) and enter CC1110-CC1111DK in the part number search box. Check for updated SW and documentation. Updated SW can be downloaded to the device using IAR or the Flash Programmer application.
- If you get poor PER results at short distances, try to move the transmitter and receiver further apart. The CC1110 may experience saturation when transmitting at full output power if the units are too close.
- The source code for the packet error rate application is available on the web. You may modify the source code to test at other frequencies or data rates.
- See "DN300 -- SmartRF04EB Troubleshooting" for general troubleshooting of your EB board.

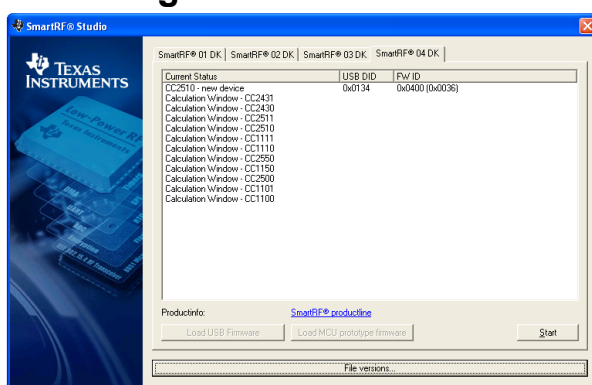
## SmartRF® Studio

### 1. Download



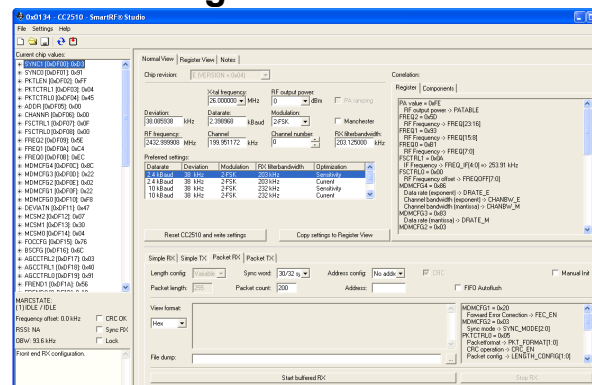
Before connecting the EB to your PC, download SmartRF® Studio from [www.ti.com/smarterfstudio](http://www.ti.com/smarterfstudio). The installer is located in the "Support Software" section. Download and run the installer.

### 2. Plug in EB



After the install program finishes, connect the EB to the PC using the USB cable. Run SmartRF® Studio. Select the SmartRF®04 tab. Select the CC1110 board at the top of the list, and click the Start button.

### 3. Configure



You can now configure the radio chip, run tests or communicate with another EB.

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