

Long Range Demo Hardware

- 2 × TrxEB
- 2 × CC1120EM with TCXO
- 2 × Antenna

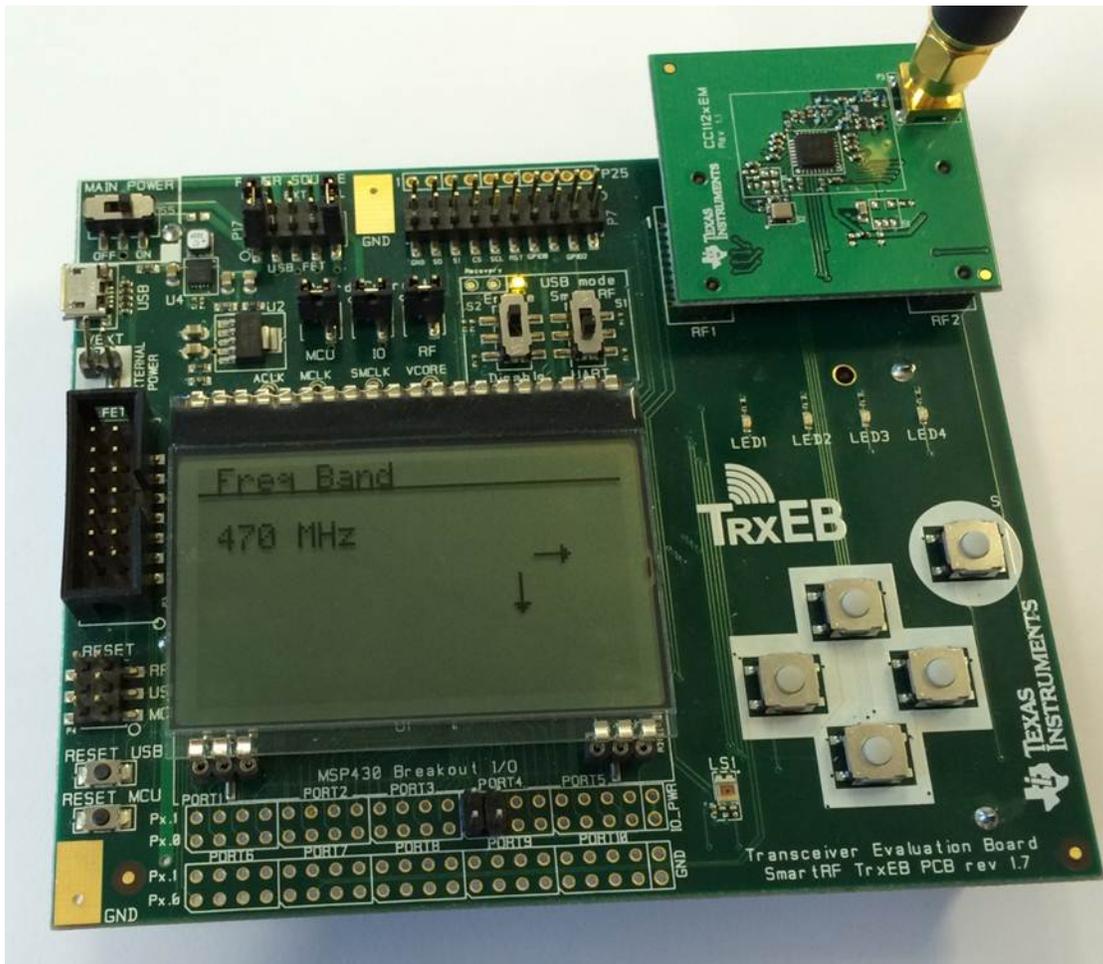
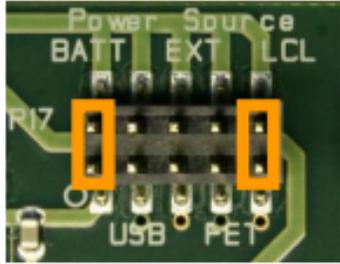
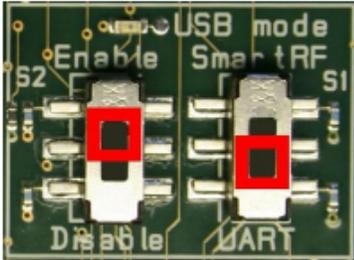


Figure 1. TIDC-CC112X-LRM-DEMO

1 Running the Long Range Demo

<p>The SmartRF™ TrxEB includes a battery holder for two 1.5-V AA batteries. The power source selection jumpers should short circuit pin 1-2 (“BATT”) and 9-10 (“LCL”) of header. P17.</p>	
<p>To run the software application from the MSP430, enable the MCU by setting the correct operating mode of the TrxEB. Set switches S1 and S2 to “UART” and “Enable”, respectively.</p>	
<p>Set the main power supply switch (S5, in top left corner of TrxEB) in the “on” position.</p>	
<p>When the board is powered up, the arrows on the LCD will show all possible ways to navigate through the menu.</p>	

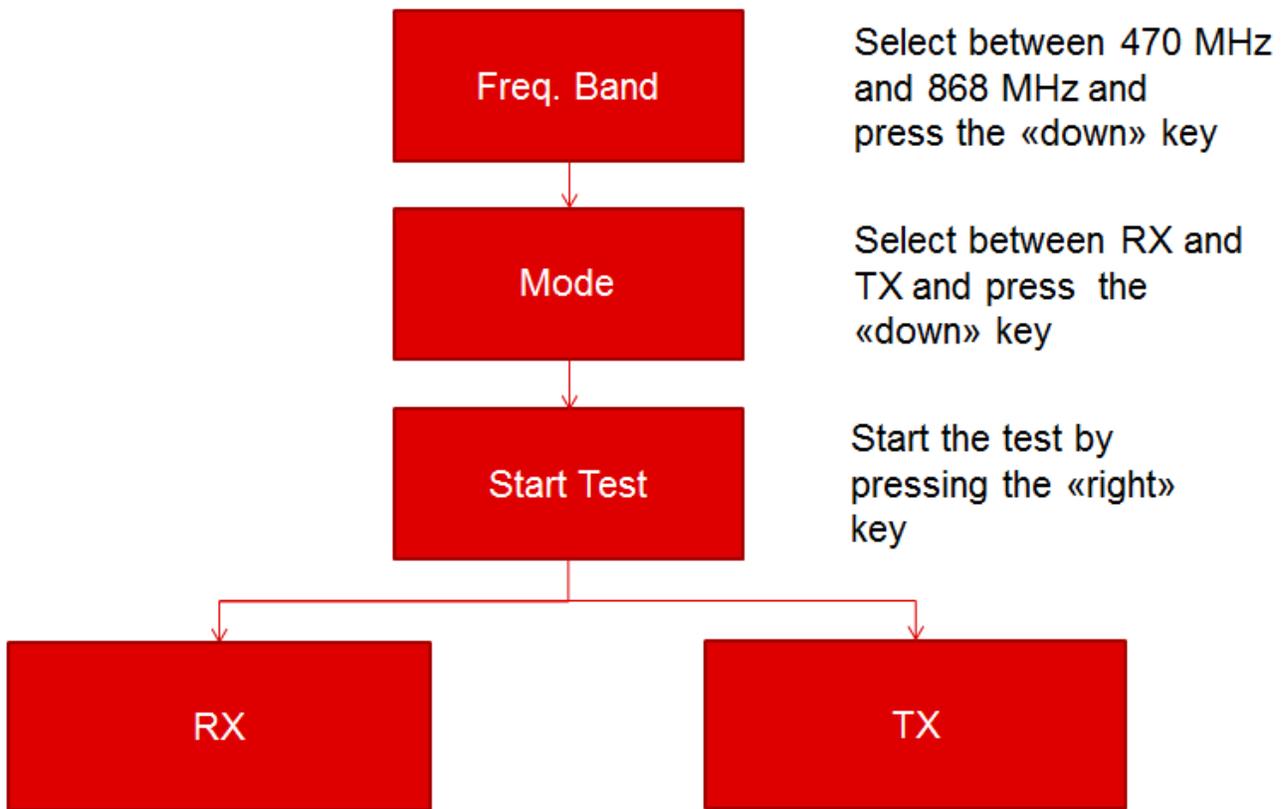


Figure 2. Demo Flowchart

1.1 Transfer (TX) Mode

In TX mode, the following data is transmitted (at 470 MHz or 868 MHz).

Table 1. Packet 1 (Containing SYNC_1 and a Dummy Byte)

0xAA 0xAA 0xAA	0x26 0x33 0xD9 0xCC	0x55	CRC CRC
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Table 2. Packet 2 (Containing SYNC_2, a 16-Bits Sequence Number, and a Dummy Byte)

0xAA 0xAA 0xAA	0x93 0x0B 0x51 0xDE	Seq. Seq. 0x55	CRC CRC
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Stop and restart TX mode by pressing any key.

1.2 Receiver (RX) Mode

In RX mode, the radio runs two different algorithms based on the frequency band selected:

- 470 MHz
 - No frequency offset compensation
 - The radio looks for Packet 2 only
- 868 MHz
 - Frequency offset compensation
 - The radio looks for Packet 1, compensates for the frequency offset, and reconfigures to look for Packet 2 using an RX filter **BW** of 7.8 kHz (compared to 12.5 kHz for Packet 1)
 - If Packet 2 is not received within a given timeout or a packet is received, the radio goes back to search for Packet 1

When RX starts, the number of received packets, the number of lost packets, and the received RSSI are displayed on the LCD as shown in [Figure 3](#).

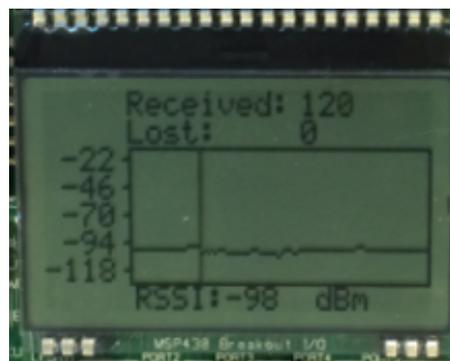


Figure 3. LCD Feedback

Stop and restart RX mode by pressing any key.

2 References

- Long range mode: http://processors.wiki.ti.com/index.php/Category:Sub-1GHz#Long_Range_Mode
- Generic PER test, simple link, and RX sniff mode: *TrxEB RF PER Test Software Example User's Guide (SWRU296)*
- For detailed information about the SmartRF TrxEB, see *SmartRF Transceiver Evaluation Board "TrxEB" User's Guide (SWRU294)*
- The TrxEB and CC1120EM can also be used with SmartRF Studio to evaluate and configure CC1120 for testing in the lab. For the software package and user's guide, see <http://www.ti.com/tool/smartftm-studio>.

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