CC1101-CC1190EMK Quick Start Guide

Opening the box and using the modules with SmartRF04EB

1. Kit Contents



2 x CC1101-CC1190EM (869 or 915 MHz)
2 x Pulse W5017 Antennas (2 dBi)

The 869 MHz RF boards are designed to comply with relevant ETSI regulatory requirements over temperatures from 0 to +35°C. The 915 MHz RF boards are designed to comply with relevant FCC and IC regulatory requirements over temperatures from 0 to +35°C.

The boards should not be modified to operate in other frequency bands than what they have been designed for.

2. How to Use the Modules

The CC1101-CC1190 Evaluation Module (EM) boards can be plugged into the SmartRF04EB (EB), which is included in the CC1101DK. This board lets you control the devices from SmartRF™ Studio and it can also be used as a development platform.

The evaluation module is also supported by the SmartRF TrxEB, included in the CC11xL, CC1120 and CC1200 development kits.

This Quick Start Guide describes how to properly power the SmartRF04EB with a CC1101-CC1190EM and how to control the combo from SmartRF Studio.

3. Plug EM into SmartRF04EB



Insert the EM into the EB. Attach the antenna firmly.

Caution! Due to potential high output power from the device, please keep a distance of at least 20 cm between the user and the antenna.

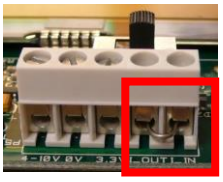
Caution! The kit contains ESD sensitive components. Handle with care to prevent permanent damage.

4a. Apply Power

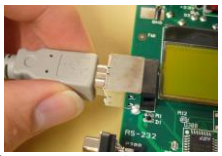
The EB can be powered from different sources: USB, Battery or an External Power Supply

The voltage regulator on the EB supplies 3.3 V to the assembly, but it can only source up to 150 mA. It *cannot* supply the CC1101-CC1190EM since it can consume more than 300 mA. An external power supply is therefore required for powering the EM.[1]

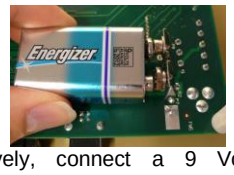
It is possible to have separate power sources for the EB and for the EM. This is controlled with the strap between I_OUT and I_IN on P5 (the screw terminal). Remove it to allow separate power supplies.



4b. Power the EB



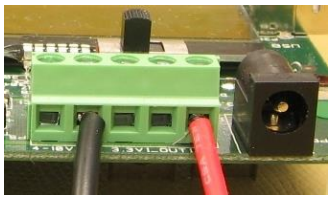
Connect the EB to a USB port on a PC.



Alternatively, connect a 9 Volt, non-rechargeable, alkaline battery to the battery connector on the bottom side of the board.

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 USB power; otherwise the battery will be drained.

4c. Power the EM

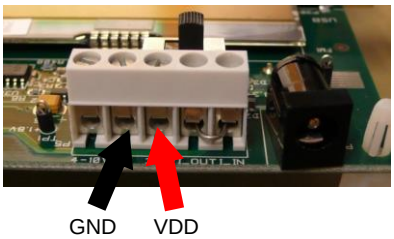


As noted in 4a, remove the strap on P5 and connect the external power supply as shown in the picture above. The red wire is the positive supply and the black wire is GND.

This will power the EM directly from the external power supply, whereas the rest of the EB will be powered from USB or the battery.

The power supply range should be within 3.0 to 3.6 V.

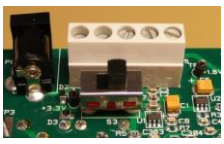
4d. Optional: Same Power Supply for both EB and EM



Connect a 3.3 V voltage source between the 3.3 V and 0 V terminals. 3.3 V is the middle terminal.

In this case, the on-board voltage regulator will be bypassed. Note that the strap on P5 should not be removed.

5. Set Power Switch



If EB and EM are powered from different sources as described in 4a-4c, the switch should be set to the rightmost position.

If EB and EM are powered from the same external supply as described in 4d, the switch should be set to the leftmost 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. External Power Supply Range

With the test setup in 4a-4c, the EB is connected to a 3.3 V supply through the on-board voltage regulator and the EM is powered by the external supply. Since the EB is powered through a regulated 3.3 V supply the signals going from CC1101-CC1190 to the EB (and vice versa) need to be within 3.0 V to 3.6 V. The external supply connected to the EM when using the setup in 4a-4c is therefore limited to 3.0 V to 3.6 V.

With the setup in 4d the supply range is limited 2.7 V to 3.6 V.

External Power Supply[2] Requirements:
Nom Voltage: 3.3VDC
Max Current: 800 mA
Efficiency Level V

[1] Note that this is not the case for the SmartRFTrxEB.
[2] 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

SmartRF™ Studio

1. Download and Install SmartRF Studio

Before connecting the EB to your PC, download SmartRF™ Studio from www.ti.com/smartrfstudio.
Install the program and follow the instructions in the wizard.

Connect the EB with a CC1101-CC1190EM to the PC using the USB cable and install the USB driver as described in the manual.

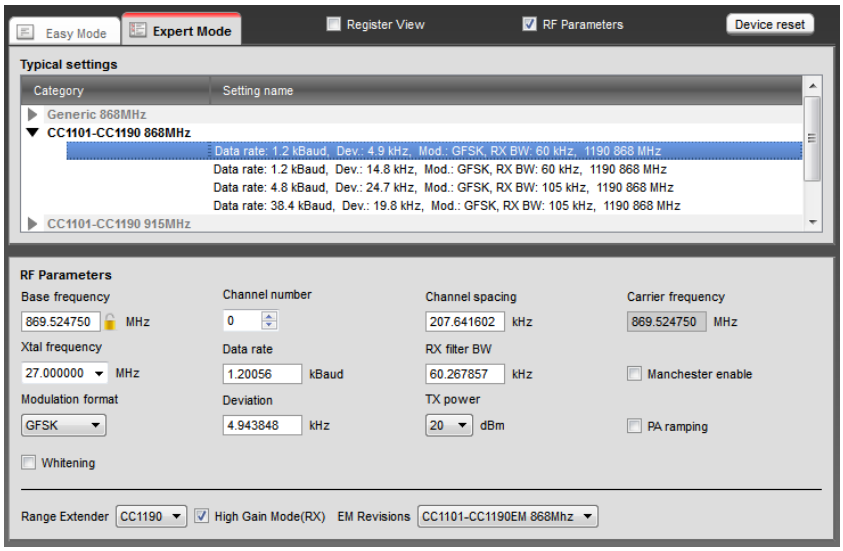
2. Launch SmartRF Studio



Launch SmartRF Studio and double click on the highlighted CC1101 device icon to get complete control of the device from the PC.

You can now configure the radio, run tests, export register settings and run link tests with another CC1101-CC1190EM on a SmartRF04EB (or SmartRF TrxEB) connected to the PC.

3. Configure the Radio



In order to control the CC1190 select CC1190 as “Range Extender” and select the appropriate “EM Revisions” as shown (either 869 or 915 MHz). You can now use all the features in Studio as for a standalone EM. Test the performance of the radio using some of these features:

- Continuous TX: Output power, spectrum
- Continuous RX: Received signal strength, synchronous/asynchronous serial RX mode
- Packet TX/RX: Link and sensitivity testing

References

Please visit

- http://www.ti.com/product/cc1190
- http://www.ti.com/tool/cc1101cc1190emk868
- http://www.ti.com/tool/cc1101cc1190emk915
- http://www.ti.com/lit/swra356 (Using the CC1190 Front End with CC1101 under EN 300 220)
- http://www.ti.com/lit/swra361 (Using the CC1190 Front End with CC1101 under FCC 15.247)

Download the SmartRF™ Studio software, as well as datasheets, reference designs and application notes.

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

We hope you will enjoy working with the CC1101 and CC1190 devices.

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