

ISM2531-USB-F ZigBee Dongle Instruction Sheet

Product Description:

Network:

- _ IEEE 802.15.4- 2.4 Ghz ZigBee

Lead-Free:

- _ RoHs compliant

Host Interface:

- _ USB 2.0 - Full Speed Device (12 Mbps)

Operating Voltage:

- _ 5 V ($\pm 5\%$)

Power Consumption < 2W:

- _ TX: < 100 mA (TDC)
- _ RX: < 70 mA (TBC)

Antenna / radio:

- _ 2.4 GHz ISM band
- _ PCB antenna – folded IFA
- _ Antenna peak gain: 4.35 dBi
- _ Radiated (EIRP) in standard power: 0 dBm
- _ Radiated (EIRP) in high power: 10 dBm

Operating Channel

- _ IEEE 802.15.4 ISM Band: Channel 11 (2.405 GHz)
to channel 26 (2.480 GHz)

Physical Specification:

- _ Dimensions: 38 x 19 x 9 mm (1.5 x 0.7 x 0.3 inch)
- _ Operating temperature: -25 °C...85 °C (-13 °F...185 °F)
- _ Storage temperature: -40 °C...85 °C (-40 °F...185 °F)

Radio certification:

- _ FCC Part 15
- _ ETSI EN 300 328 V1.

ISM2531-USB-F Setup Guide:

Step 1 – Set Up The Rx Settings on the ZigBee Dongle

- Ensure the ZigBee dongle is powered and connected to your computer via the CC Debugger.
- Hit the reset button on the debugger. It will light of green if the device is connected properly.
- Open SmartRF Studio7

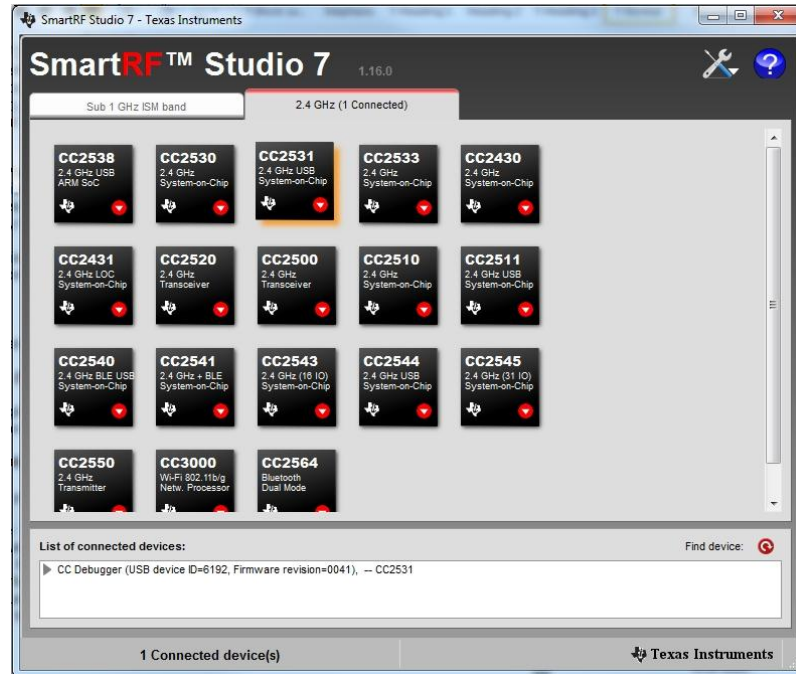


Figure 1. SmartRF Studio7

- d. Click the “2.4 GHz” Tab. The Part Number of the connected device will be highlighted in Figure 1.
- e. Double Click on the “CC2531” box to open the Device Control Panel
- f. Make sure the box next “Register View” is checked.
- g. Select the “RF Device Commands” tab
- h. Click “Cont RX” to initialize register settings
- i. In “Register View” set P0DIR, P1DIR, P0, and P1 to required value (see Table 1)
- j. Click “ISR_XON” to start receiving. See Figure 2 for image of a
- k. Observe RSSI Value.

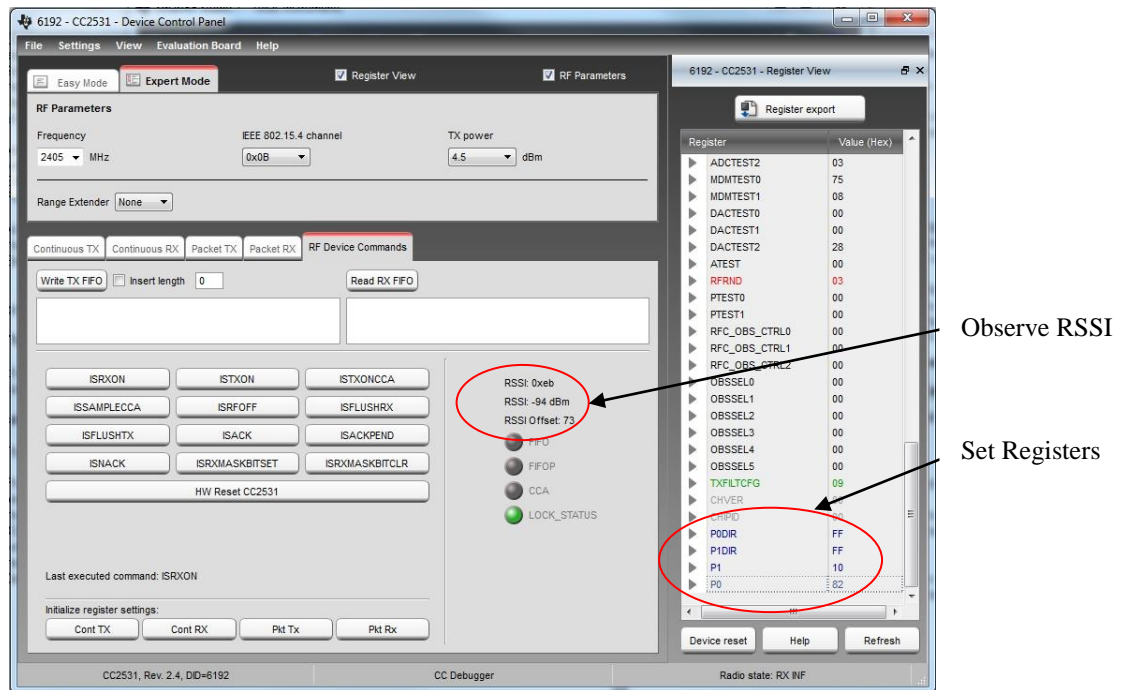


Figure 2. Device Control Panel in Receive Mode

Step 2 – Set Up The Tx Settings on the ZigBee Dongle

- a. Repeat steps a-c from step 1, with a second ZigBee dongle, and on a second computer that is located 10m from the Rx dongle
- b. Select the “RF Device Commands” tab
- c. Click “Cont TX” to initialize register settings
- d. In “Register View” set P0DIR, P1DIR, P0, and P1 to required value (see Table 1)
- e. Click “ISTXON” to start receiving
- f. Observe RSSI Value from the Rx computer

Inventek Dongle Port	P0DIR	P1DIR	P0	P1
All Off	FF	FF	0	0
Rx Bypass	FF	FF	80	10
Rx High Gain	FF	FF	82	10
Rx Low Gain	FF	FF	82	0
Tx Bypass	FF	FF	80	2
Tx High Power	FF	FF	82	2

Table 1. TX and RX Register Settings for SmartRF Studio 7

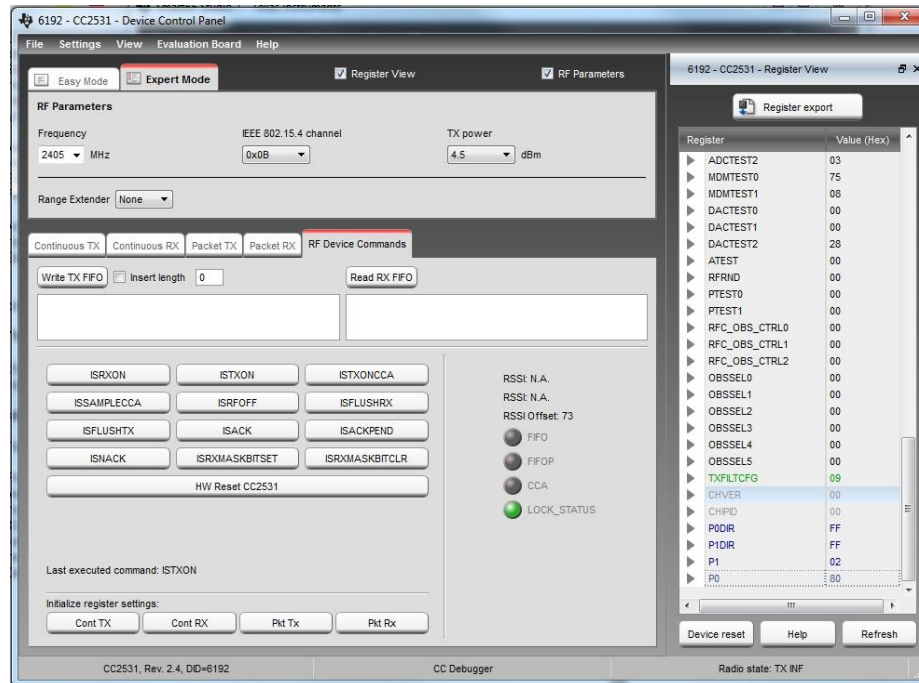


Figure 3. SmartRF Studio in Tx Bypass Mode

Step 3- Observing typical RSSI Values

- a. With the Rx Dongle in Rx Bypass Mode, observe the RSSI of the dongle in Tx Bypass and Tx High Power modes.
 - a. At a distance of 1m a passed unit will have an RSSI of -47 dBm +/- 3 dBm for a unit when dongle is in Tx Bypass and an RSSI of -25 dBm +/- 3 dBm when the dongle is in Tx High Power.
- b. Now you are able to successfully send and receive wirelessly via ZigBee.

Regulatory Notices

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- a. Reorient or relocate the receiving antenna.
- b. Increase the separation between the equipment and receiver.
- c. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- d. Consult the dealer or an experienced radio/TV technician for help.

Operation of this device is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of this device.

L'opération est soumise aux deux conditions suivantes: (1) cet appareil ne peut pas provoquer d'interférences et (2) cet appareil doit accepter toute interférence, y compris les interférences qui peuvent causer un mauvais fonctionnement de l'appareil.

Warning: changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment

The antennas used with this module must be installed to provide a separation distance of at least 20cm from all persons, and must not be co-located or transmit simultaneously with any other antenna or transmitter, except in accordance with FCC multi transmitter product procedures.

The ISM2531-USB-F ZigBee Dongle has been designed to operate with the following antenna and gain. Use with other antenna types or with these antenna types at higher gains is strictly prohibited.

Manufacturer	Type of Antenna	Model	Gain dB	Type of Connector
Inventek	Trace Antenna	Internal	4.35	Permanent integral

The radio transmitter has been approved by Industry Canada to operate with the antenna types listed above with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Cet émetteur de radio a été approuvé par Industrie Canada pour fonctionner avec les types d'antennes énumérées ci-dessus avec le gain maximal admissible et impédance d'antenne requise pour chaque type d'antenne indiqué. Types d'antennes ne figurant pas dans cette liste, ayant un gain supérieur au gain maximum indiqué pour ce type, sont strictement interdites pour l'utilisation avec cet appareil.

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

Sous la réglementation d'Industrie Canada, ce transmetteur radio ne peut fonctionner en utilisant une antenne d'un type et un maximum (ou moins) gain approuvées pour l'émetteur par Industrie Canada. Pour réduire le risque d'interférence aux autres utilisateurs, le type d'antenne et son gain doivent être choisis de manière que la puissance isotrope rayonnée équivalente (PIRE) ne dépasse pas ce qui est nécessaire pour une communication réussie.