RC1880-DK Demonstration Kit Quick Start

Intro

The Demonstration Kit from Radiocrafts is designed to make it easy for the user to evaluate the module, develop an application and build prototypes very quickly.

There are two paths the final module solution:
1. Use the demo boards/module with preloaded co-processor functionality (RC1880-COP[1])
2. Write, compile and download your own FW to the module

Included in the kit
- 2 Demonstration Boards including COP(CO-Processor) FW
- 2 Antennas
- 2 USB cables

Prerequisite

The demo board use FTDI chip for USB connection and the FTDI drivers are required on host computer. The computer will normally install these automatically when plugging in the boards.

This quick start is based on the use of terminal emulator YAT.
This is a free downloadable terminal emulator with GNU Library or Lesser General Public License version 2.0 (LGPLv2) licence.
It can be downloaded from : https://sourceforge.net/projects/y-a-terminal/
Download and install this emulator for rapid testing.

Step-by-Step setup
1. **Physically connect boards.**
   Connect the demo boards to the PC via USB. (Green LED will turn on)
   Mount the antenna
   Power on board by power switch to ON.
   (As windows will install driver for each board, it is smart to plug one board at a time and let windows finish driver installation)

2. **Open two YAT terminal windows.**

3. **Load coordinator setup to YAT**
   In first window open terminal :

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[1] This document does not give complete overview and the detail on the interface to the module. Please see link to Interface Guide under chapter *Related Documents* at the end of this document.

File>Open
RC1880_COP_Coordinator_868EU.yat

Select correct COM port after plugin and driver installation:
Terminal>Settings

To find correct COM port please access Device Manager on windows computer. Baud rate shall be 115200 as shown in figure below.

The two demonstration boards are identical and both can be used as either Coordinator or Device.
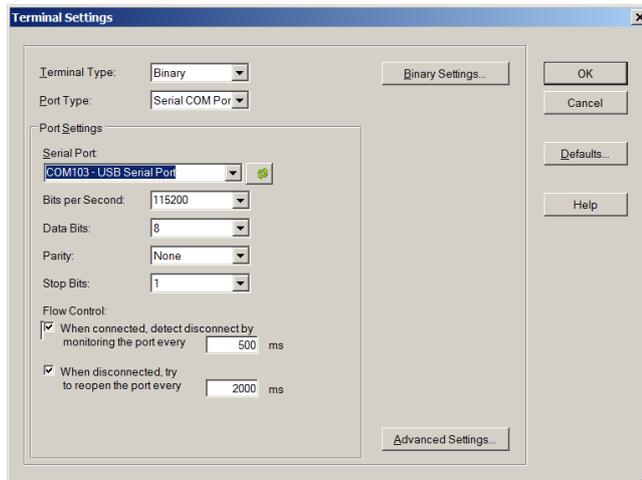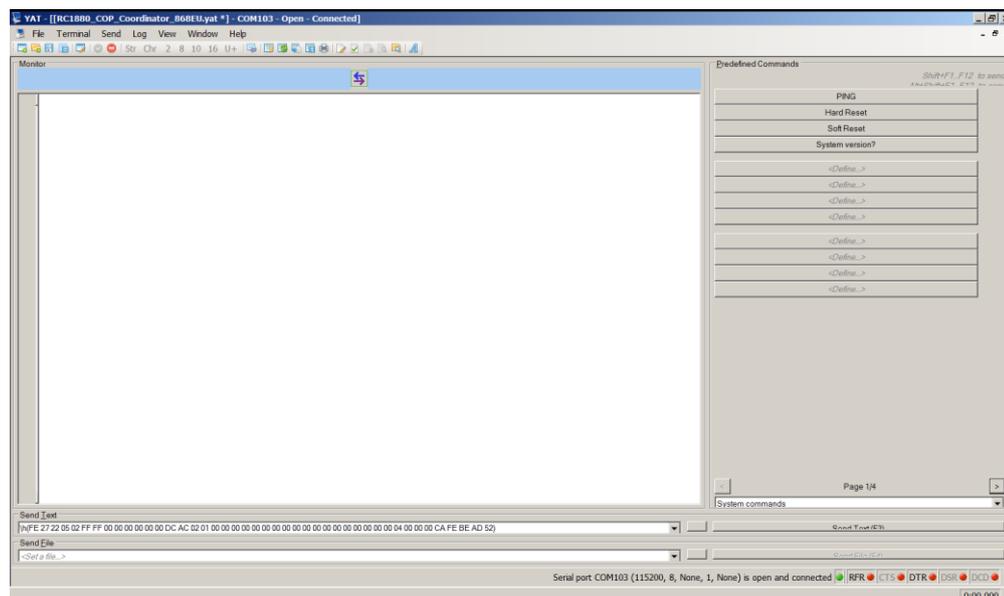

Open port:
Terminal>Open Port

4. **Load device setup to YAT**
   Repeat process in 3) for second board, but open terminal
   RC1880_COP_Device_868EU.yat

   In YAT there will be a menu of commands to send on the right side. There are several pages of commands that can selecteds.

5. **Verify board connection**
   Verify connection to each board by sending a *Hard Reset*(*SYS_RESET_REQ*)[2]
   command.
   The following will be shown in the monitor window:
   ```
   (15:44:41.503) FE 01 41 00 00 40
   (15:44:41.692) FE 06 41 80 01 03 01 02 00 01 C7
   ```

   The LEDs on board will blink quickly at reset. This can help identify which board is
   coordinator and which is **device.**

6. **Setup network by coordinator**
   On coordinator, send the following sequence of commands
   - *Set short address 12 34 (MAC_SET_REQ)*
   - *Set RX on when IDLE (MAC_SET_REQ)*
   - *Open network for joining (MAC_SET_REQ)*
   - *Start coordinator non-beacon LRM (MAC_START_REQ)*

   ```
   (15:50:48.748) FE 03 22 09 53 12 34 5D
   (15:50:48.789) FE 01 62 09 00 6A
   (15:50:50.076) FE 11 22 09 52 01 00 00 00 00 00 00 00 00 00 00
   (15:50:50.076) 00 00 00 00 00 69
   (15:50:50.139) FE 01 62 09 00 6A
   (15:50:51.059) FE 11 22 09 41 01 00 00 00 00 00 00 00 00 00 00
   (15:50:51.059) 00 00 00 00 00 7A
   (15:50:51.106) FE 01 62 09 00 6A
   (15:50:55.936) FE 2A 22 03 00 00 00 00 DC AC 00 09 83 0F 0F 01
   (15:50:55.936) 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
   (15:50:55.936) 00 00 00 00 00 00 00 00 00 0F 00 FF 3F 00 3F
   (15:50:56.006) FE 01 62 03 00 60 FE 01 42 8E 00 CD
   ```

7. **Join network by device**
   On device send the following sequence of commands
   - *Set short address (MAC_SET_REQ)*
   - *Set RX on when IDLE (MAC_SET_REQ)*
   - *Join network non-beacon LRM 868 MHz
     (MAC_ASSOCIATE_REQ)*

   ```
   (15:56:07.781) FE 01 41 00 00 40
   (15:56:07.859) FE 06 41 80 01 03 01 02 00 01 C7
   (15:56:13.676) FE 03 22 09 53 56 78 55
   (15:56:13.693) FE 01 62 09 00 6A
   (15:56:14.821) FE 11 22 09 52 01 00 00 00 00 00 00 00 00 00 00
   (15:56:14.821) 00 00 00 00 00 69
   (15:56:14.900) FE 01 62 09 00 6A
   (15:56:15.660) FE 1A 22 06 00 09 83 02 12 34 00 00 00 00 00 00
   (15:56:15.660) DC AC 02 00 00 00 00 00 00 00 01 00 00 00 E3
   (15:56:15.703) FE 01 62 06 00 65
   (15:56:17.452) FE 0E 42 82 EB FF FF 00 00 00 00 00 00 00 01 00
   (15:56:17.452) 00 00 24
   ```

8. **Send Data from coordinator to device**[3]
   From coordinator data can be sent by *Send Data to Device (MAC_DATA_REQ)*
   ```
   (10:58:28.055) FE 27 22 05 02 56 78 00 00 00 00 00 00 00 DC AC 02
   (10:58:28.055) 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
   (10:58:28.055) 00 00 00 04 00 00 00 CA FE BE AD 7C
   (10:58:28.135) FE 01 62 05 00 66 FE 10 42 84 00 01 33 13 67 00
   ```

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[2] In parenthesis is the command name from the TI-15.4-STACK-CoP Interface Guide.
[3] Actually bit pattern will vary due to variation in time parameter and signal strength.

```
(10:58:28.165) 71 00 00 00 00 00 00 00 00 00 E1
```
On device
```
(10:58:28.155) FE 37 42 85 02 12 34 00 00 00 00 00 00 02 56 78
(10:58:28.155) 00 00 00 00 00 00 CD 05 62 00 A7 00 DC AC DC AC
(10:58:28.155) 9D 00 E5 21 00 00 00 00 00 00 00 00 00 00 00 00
(10:58:28.155) 00 00 00 04 00 00 00 CA FE BE AD 8F
```

9. **Send Data from device to coordinator**

From coordinator data can be sent by pressing ***Send Data to Coordinator (MAC_DATA_REQ)*** on device:
```
(11:00:03.981) FE 27 22 05 02 12 34 00 00 00 00 00 00 DC AC 02
(11:00:03.981) 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
(11:00:03.981) 00 00 00 04 00 00 00 CA FE BE AD 74
(11:00:04.071) FE 01 62 05 00 66 FE 10 42 84 00 01 AD 4B 7F 00
(11:00:04.071) B9 00 00 00 00 00 00 00 00 F7
```

On Coordinator:
```
(11:00:04.061) FE 37 42 85 02 56 78 00 00 00 00 00 00 02 12 34
(11:00:04.061) 00 00 00 00 00 00 1C 5A 84 00 08 00 DC AC DC AC
(11:00:04.061) 9B 00 E4 9C 00 00 00 00 00 00 00 00 00 00 00 00
(11:00:04.061) 00 00 00 04 00 00 00 CA FE BE AD F2
```

Related Documents

- Module Data Sheet / User Manual (Module RF and embedded firmware description)
- RC1880DK-USB User Manual (Description of your Demo Board hardware
- TI-15.4-STACK-CoP Interface Guide
  http://dev.ti.com/tirex/content/simplelink_cc13x0_sdk_1_40_00_10/docs/ti154stack/ti-15.4-stack-cop-interface-guide.pdf
- RC18xx_Firmware_Development_User_Manual

Please visit the product page for the selected module to download all relevant documents.

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