

ZNM-CCT (Configuration and Communication Tool) User Manual

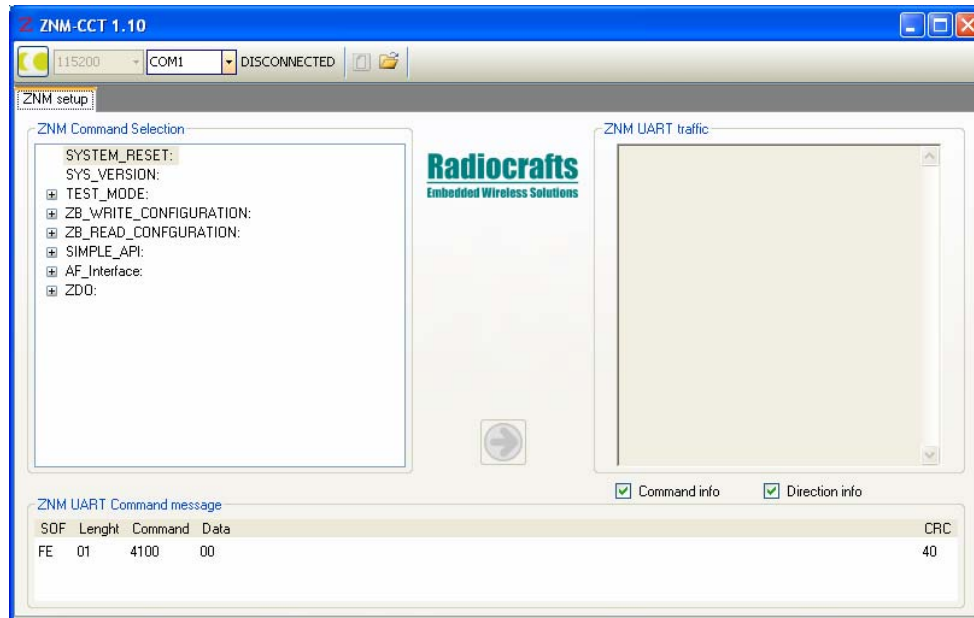


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Installation Guide

ZNM-CCT (Configuration and Communication Tool) is a PC suite tailored for use with Radiocrafts RC24xx-ZNM RF Modules.

For full installation procedure please read the RCTools Installation Guide available at www.radiocrafts.com.

The ZNM-CCT requires access to the modules UART via an available COM-port. Typically UART-access is obtained via an UART-to-RS232 or UART-to-USB converter. The Demo Boards (DB) from Radiocrafts contains an on-board level shifter for direct plug-in to a PC and further access to the related COM-port.

This version of the User Manual applies to version 1.10 of ZNM-CCT.

Screen Settings

It is recommended to run the application with screen size at least 1024x768 and font resolution 96dpi.

Introduction

The ZNM-CCT helps you to work with the Radiocrafts RC24xx-ZNM ZigBee Network Module series. The program enables you to easily configure the module and send or receive in the ZigBee network.

Getting started with ZNM-CCT

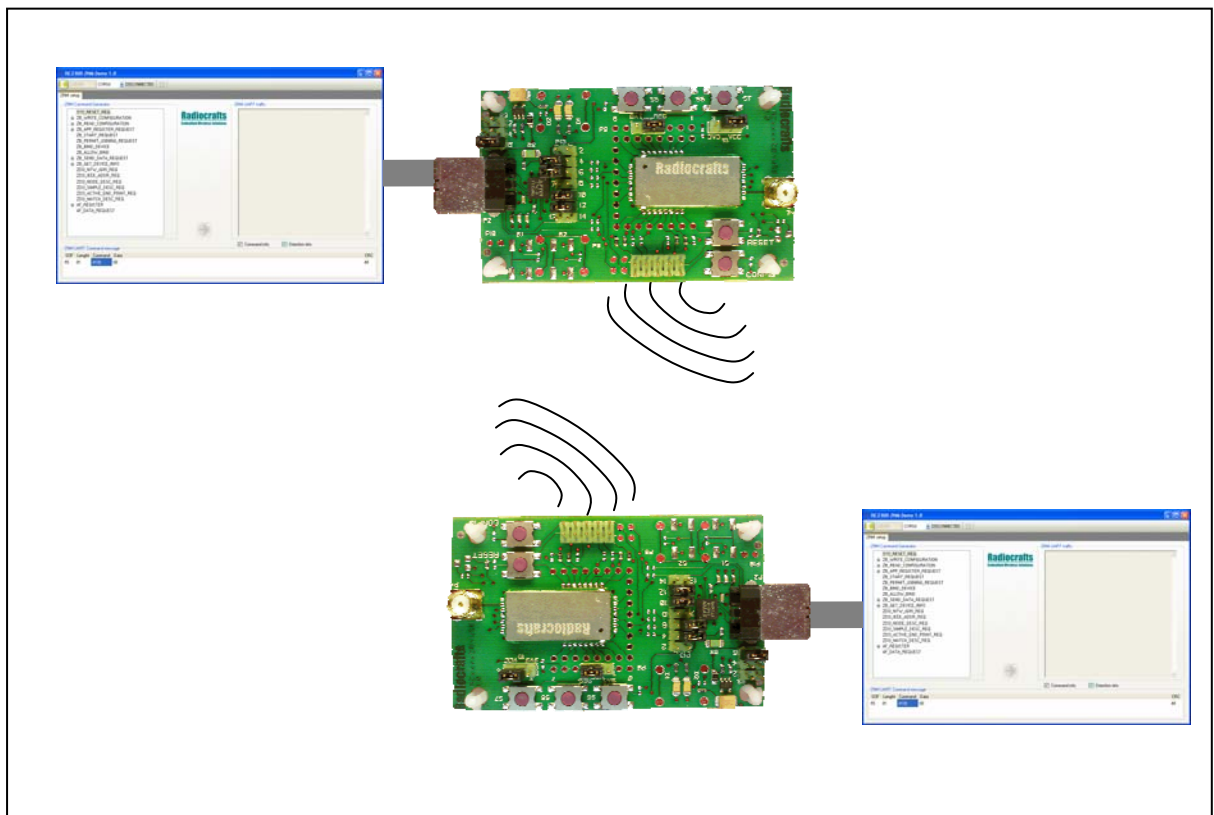


Figure 1 RC24xx-ZNM demo board with ZNM-CCT window

Connect the DB, or your own hardware with the Radiocrafts module, to the COM-port. Start the ZNM-CCT application and the main window should look similar to what is shown in Figure 1.

The first setup in the ZNM-CCT is to select the connected module com port. See Figure 2

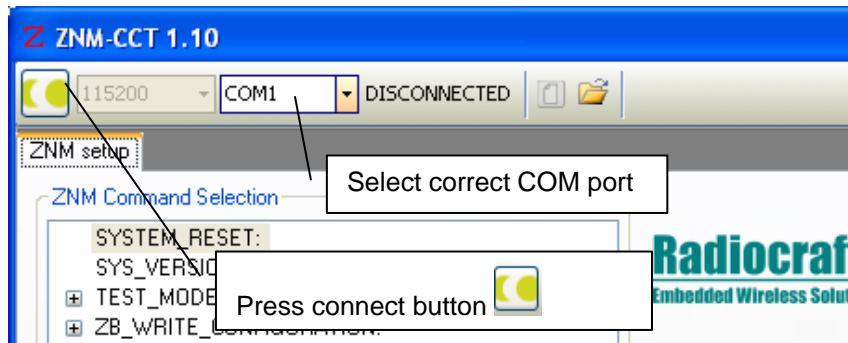


Figure 2. Connecting to the module

Main window, GUI

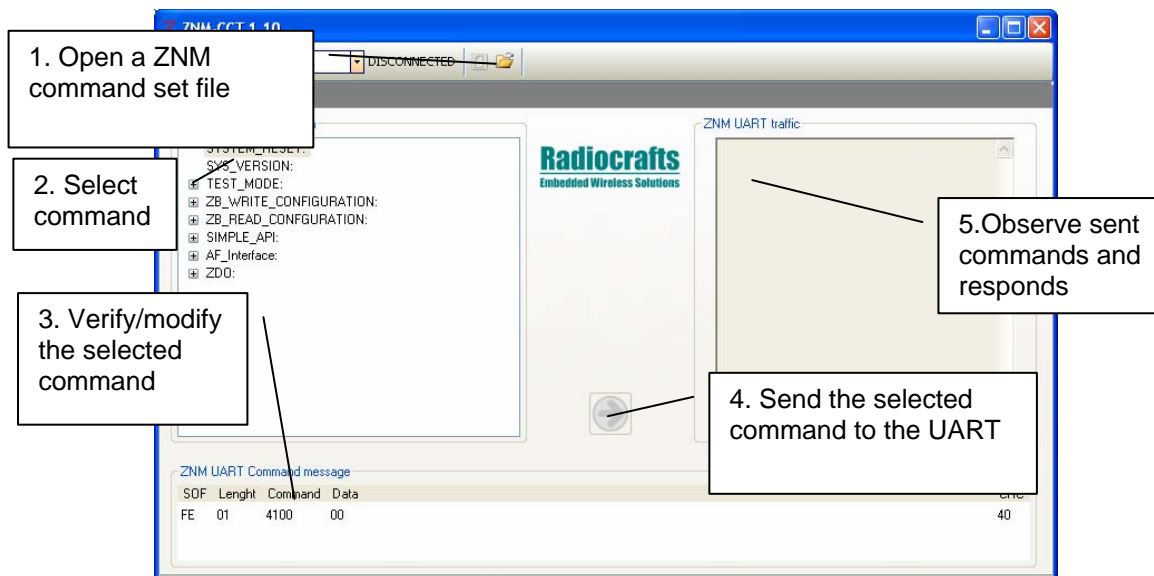


Figure 3. The boards are configured via a 4 step procedure using the ZNM-CCT tool

The use of the main window GUI consists of 5 easy steps:

- 1. Select command file**
ZNM Command files are a set of pre-stored commands that can be sent to the module. Several ZNM command files are included with the installation, but the user can also modify or make his own ZNM command file that may be more suitable for his application. See chapter *ZNM Command File* for more details on making/modifying command files
- 2. Select the command** in the command hierarchy menu on left side
- 3. Modify the command** (if needed) in lower part of screen
- 4. Send the selected command to the UART**
- 5. Observe sent commands and responds**

4. **Press send** arrow (in center of screen) to send the command to the connected Modules UART interface
5. **Observe sent and received commands** on right side of screen

ZNM Command File

The ZNM command filename must start with 'ZNM_Command' to be recognised by ZNM-CCT. The ZNM command file is a text file (*.txt) with the following format for each line:

Each line is coded as:

<Hierarchy sign> **<NAME>**: **<Command in hex>**; (**<info to user>**)

Hierarchy sign can be

- * New main entry (Level 0 in command menu)
- + Level 1 entry, sorted under last level 0 entry
- ++ Level 2 entry, sorted under last level 1 entry
- +++ Level 3 entry, sorted under last level 2 entry

NAME is a description of the command and used by the command selection menu to represent the command name.

Command in hex is ASCII representation of the hex code to be sent via UART.

The command must be according to interface specified in the RC2400-ZNM User Manual. Note that the hex shall not include length field and CRC. These are calculated automatically by the program.

Info to user is help text for the user of ZNM-CCT. When a command is selected in the command selection menu, the info is displayed together with hex command in lower part of the window. The '(' and ')' signs must be included even if no info to user is written.

Here is an example of a ZNM command file

```
*SYSTEM_RESET:FE410000;(This is the SW reset command)
*ZB_WRITE_CONFIGURATION:FE2605;()
+START_UP_OPTIONS:FE260503;()
++Clear device on reset:FE2605030103;()
+LOGICAL_TYPE:FE410000;()
++Coordinator:FE2605870100;()
*ZB_READ_CONFIGURATION:FE410000;()
+ENABLE_SECURITY:FE260464;()
*SIMPLE_API:FE0000;()
```

And the selection menu in the ZMC-CCT will look like this:

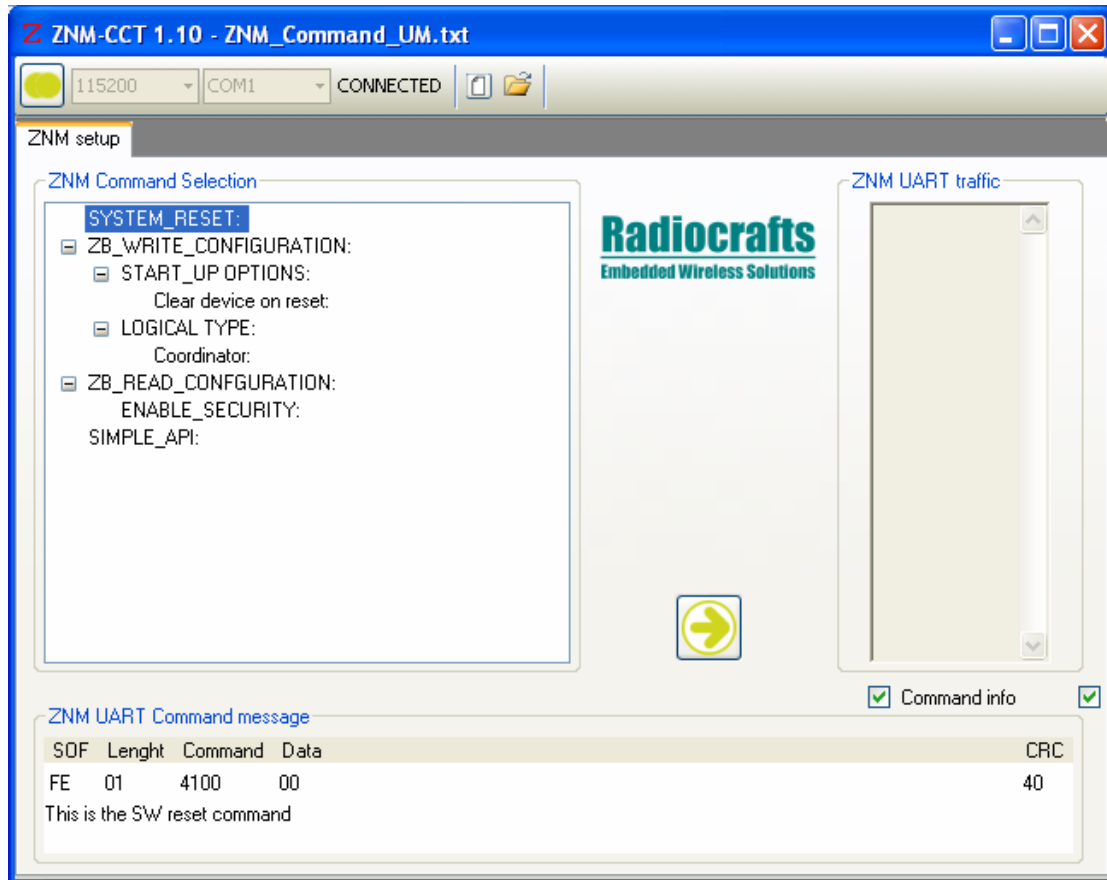


Figure 4 Selection menu when ZNM Command file is as in previous example

Step by Step Example

This is a step-by-step example for setting up a ZigBee network with two nodes. The example uses the default command file.

For the first board (Coordinator), send the following commands to the module (In the order they appear):

- SYSTEM_RESET
- ZB_WRITE_CONFIGURATION -> Start-up options -> Clear device on reset
- SYSTEM_RESET
- ZB_WRITE_CONFIGURATION -> Logical_type -> Coordinator
- SIMPLE_API -> ZB_APP_REGISTER_REQUEST-> ZB_APP_REGISTER_DUMMY_SERVER
- SIMPLE_API -> ZB_START_REQUEST

```
NM UART traffic
PC-->ZNM:(SYSTEM_RESET)
FE 01 41 00 00 40
ZNM-->PC:
FE 06 41 80 02 02 00 02 03 00 C6
PC-->ZNM:(ZB_WRITE_CONFIGURATION->START_UP_OPTIONS->Clear
device on reset)
FE 03 26 05 03 01 03 21
ZNM-->PC:
FE 01 66 05 00 62
PC-->ZNM:(SYSTEM_RESET)
FE 01 41 00 00 40
ZNM-->PC:
FE 06 41 80 02 02 00 02 03 00 C6
PC-->ZNM:(ZB_WRITE_CONFIGURATION->LOGICAL_TYPE->Coordinator)
FE 03 26 05 87 01 00 A6
ZNM-->PC:
FE 01 66 05 00 62
PC-->ZNM:(SIMPLE_API->ZB_APP_REGISTER_REQUEST->
ZB_APP_REGISTER_DUMMY_SERVER)
FE 0D 26 0A 01 01 01 01 02 01 00 01 01 00 01 00 01 22
ZNM-->PC:
FE 01 66 0A 00 6D
PC-->ZNM:(SIMPLE_API->ZB_START_REQUEST)
FE 00 26 00 26
ZNM-->PC:
FE 00 66 00 66
ZNM-->PC:
FE 01 45 C1 09 8C FE 01 46 80 00 C7
```

Figure 5 Traffic for first board (coordinator)

For the second boards (Router) send the following commands (In the order they appear):

- SYSTEM_RESET
- ZB_WRITE_CONFIGURATION -> Start-up options -> Clear device on reset
- SYSTEM_RESET
- ZB_WRITE_CONFIGURATION -> Logical_type -> Router
- SIMPLE_API -> ZB_APP_REGISTER_REQUEST-> ZB_APP_REGISTER_DUMMY_CLIENT
- SIMPLE_API -> ZB_START_REQUEST

```
ZNM UART traffic
PC-->ZNM:(SYSTEM_RESET)
FE 01 41 00 00 40
ZNM-->PC:
FE 06 41 80 02 02 00 02 03 00 C6
PC-->ZNM:(ZB_WRITE_CONFIGURATION->START_UP
OPTIONS->Clear device on reset)
FE 03 26 05 03 01 03 21
ZNM-->PC:
FE 01 66 05 00 62
PC-->ZNM:(SYSTEM_RESET)
FE 01 41 00 00 40
ZNM-->PC:
FE 06 41 80 02 02 00 02 03 00 C6
PC-->ZNM:(ZB_WRITE_CONFIGURATION->LOGICAL TYPE->
Router)
FE 03 26 05 87 01 01 A7
ZNM-->PC:
FE 01 66 05 00 62
PC-->ZNM:(SIMPLE_API->ZB_APP_REGISTER_REQUEST->
ZB_APP_REGISTER_DUMMY_CLIENT)
FE 0D 26 0A 01 01 01 01 03 01 00 01 00 01 01 01 00
23
ZNM-->PC:
FE 01 66 0A 00 6D
PC-->ZNM:(SIMPLE_API->ZB_START_REQUEST)
FE 00 26 00 26
ZNM-->PC:
FE 00 66 00 66
ZNM-->PC:
FE 01 45 C1 05 80 FE 01 45 C1 07 82 FE 01 46 80 00
C7
```

Figure 6 Traffic for second board (router)

You have now created a ZigBee network with two devices!!

The router can now send data to the coordinator with the command:
ZB_SEND_DATA->coordinator

The screenshot shows the ZNM UART interface with a list of commands on the left and a traffic log on the right. A callout box highlights the data bytes 'ABCDEF01' in the traffic log, with the text 'ABCDEF01 are the data bytes sent here'. The traffic log shows the following sequence:

```
ZNM-->PC: FE 00 66 00 66
->PC: FE 01 45 C1 05 80 FE 01 45 C1 07 82 FE 01 46 80 00
ZNM:(SIMPLE_API->ZB_SEND_DATA->Coordinator)
FE 26 03 00 00 00 01 01 01 03 04:AB CD EF 01:A7
ZNM-->PC: FE 00 66 03 65 FE 02 46 83 01 00 C6
```

Figure 7 Sending data from router

The coordinator now receives this data:

The screenshot shows the ZNM UART interface with a list of commands on the left and a traffic log on the right. A callout box highlights the data bytes 'AB CD EF 01 XE' in the traffic log, with the text 'AB CD EF 01 XE'. The traffic log shows the following sequence:

```
ZNM-->PC: FE 00 26 00 26
ZNM-->PC: FE 00 66 00 66
ZNM-->PC: FE 01 45 C1 09 8C FE 01 46 80 00 C7
ZNM-->PC: FE 0A 46 87 ED 65 00 01 04 00:AB CD EF 01 XE
```

The coordinator can now send data to the router with the command:
ZB_SEND_DATA_REQUEST-> all routers and coordinator

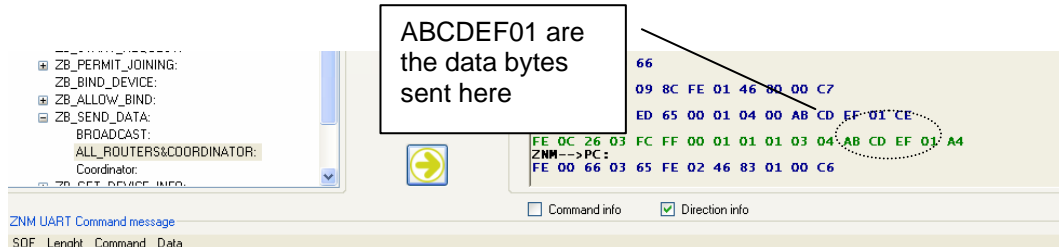
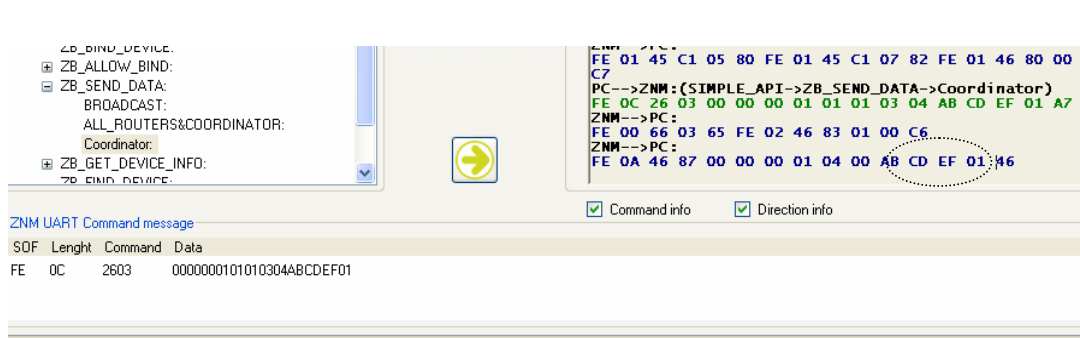


Figure 8 Sending data from coordinator

The router now receives this data



You have now created a ZigBee network and sent data between two devices.

Document Revision History

Document Revision	Changes
1.0	First release
1.1	Added step-by-step example

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