



Installing Dynamic C[®]

Insert the Dynamic C CD from the Application Kit in your PC's CD-ROM drive. If the installation does not auto-start, run the `setup.exe` program in the root directory of the Dynamic C CD. Install the software from the supplemental CD after you install Dynamic C.

ZigBee™/802.15.4 Application Kit

Application Kit Contents

- 2 CD-ROMs — *Dynamic C*[®] with complete product documentation on disk, and supplemental CD with sample programs and information related to ZigBee™/802.15.4 Application Kit.
- RCM3720 module.
- RCM3720 Prototyping Board.
- 3 Maxstream XBee™ RF modems.
- 3 RF Interface modules for use with XBee™ RF modems.
- AC adapter, 12 V DC, 1 A, for use with RCM3720 module and Prototyping Board. If you are using your own power supply, it should deliver a DC output of 7.5–15 V.
- Programming cable with 10-pin header and DB9 connections, and level-matching adapter board.
- 2 10-pin to 10-pin IDC header serial cables, one with 0.1" pitch, one with 1.27 mm pitch.
- 4 standoffs for RCM3720 Prototyping Board and 12 standoffs for RF Interface modules.
- Bag containing accessory parts, jumpers, 9 AAA batteries, 3 battery holders.
- *Getting Started* instructions.
- *Rabbit 3000 Processor Easy Reference* poster.
- Registration card.

RF Interface Module Connections

Set up all three RF Interface modules as explained in these instructions.

1. Snap in four standoffs to the four holes at the corners on the bottom side of the RF Interface module.
2. Install the XBee™ RF modem into the inside-facing sockets of header sockets J1 and J2 on the RF Interface module. Press the XBee™ modem's pins firmly into the RF Interface module header sockets.
3. Place 3 AAA batteries in a battery holder, then connect the red wire from the battery holder to the + terminal of screw terminal header J3, and connect the black wire from the battery holder to the – terminal of screw terminal header J3.

If the battery holder has an on/off switch on the opposite side, make sure the switch is in the **ON** position.

You may use your own power supply with an output of 3.5–6.0 V DC.

4. Install 5 jumpers on header J5 for the DCE configuration shown in Figure 1.
5. Use the same programming cable used to connect the RCM3720 to connect the RF Interface module to your PC to download the firmware.

Connect the 10-pin connector of the programming cable (the RCM3720 adapter board must be removed) to header J6 on the RF Interface module. Line up the colored edge of the programming cable with pin 1 of header J6 as shown. The DB9 connector end of the programming cable is attached to a COM (serial) port on the PC.

It is recommended that you assign a unique “name” to each RF Interface module, and place a sticker on the module to identify it. You will have one “coordinator” device and two “children.” The “coordinator” RF Interface module will be connected to the RS-232 header on the Prototyping Board, and the “children” can be up to 100 ft (30 m) away.

Install the XBee™ RF Modem Firmware

1. Locate and double-click **Setup_x-ctu_5013.exe** in the Dynamic C **DCRabbit... \xbbee firmware** directory to install the X-CTU application that you will use to download the firmware.
2. Start X-CTU from the desktop icon and set the “PC Settings” tab to **9600** baud, **HARDWARE** flow control, **8** data bits, parity **NONE**, **1** stop bit.
3. Under the “Modem Configuration” tab click the “Download new versions...” button, select “File,” and browse the Dynamic C **DCRabbit... \xbbee firmware** directory to select the ZIP file corresponding to your network. There are two firmware options, depending on whether you will be using a peer-to-peer (802.15.4, NonBeacon) network or a mesh (ZigBee™) network (**XBee_1yyy.zip** for a peer-to-peer network, or **XBee_8yyy.zip** for a mesh network, where **yyy** specifies the version number).
4. Select the ZIP file, click “Open,” “OK,” then “Done.”

You are now ready to load the three XBee™ RF modems with the new firmware. Repeat the remaining steps for each of the three RF Interface modules with their XBee™ RF modems installed and the programming cable connected to header J6 of the RF Interface modules. Remember to set the jumpers on header J5 for the DCE configuration shown in Figure 1.

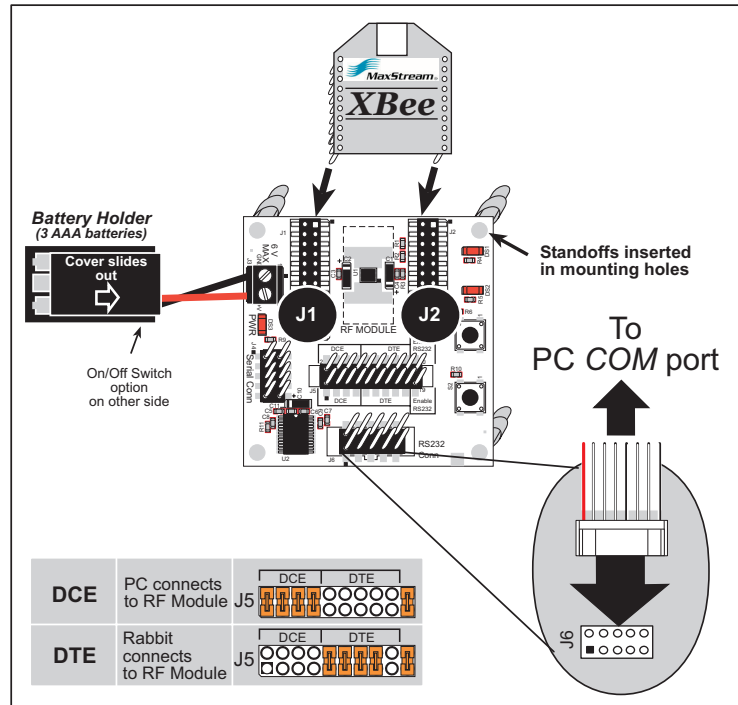


Figure 1. RF Interface Module Connections

1. Under the “Modem Configuration” tab choose “XB24” from the “Modem” pull-down menu.
2. Choose “XBEE 802.15.4” or the “COORDINATOR”/”ROUTER” from the “Function Set” pull-down menu.
3. Choose “1yyy” or “8yyy” from the “Version” pull-down menu (“1yyy” or “8yyy” matches the version number in the file name). The “8yyy” versions have options depending on whether you are configuring the coordinator or a router.
4. Check the “Always update firmware” box.
5. Click “Write” to load the XBee™ RF modem with the new firmware.

RCM3720 Module Connections

To facilitate handling the Prototyping Board, snap in the four standoffs to the four holes at the corners on the bottom side of the Prototyping Board before continuing with the remaining steps.

Attach Module to Prototyping Board

Turn the RCM3720 module so that the Ethernet jack is on the left as shown in Figure 2 below. Insert the module’s J1 header into the J5 socket on the Prototyping Board. The shaded corner notch at the bottom right corner of the RCM3720 module should face the same direction as the corresponding notch below it on the Prototyping Board.

NOTE: It is important that you line up the pins on header J1 of the RCM3720 module exactly with the corresponding pins of the J5 socket on the Prototyping Board. The header pins may become bent or damaged if the pin alignment is offset, and the module will not work. Permanent electrical damage to the module may also result if a misaligned module is powered up.

Press the module’s pins firmly into the Prototyping Board socket.

Connect Programming Cable

The programming cable with the RCM3720 adapter board connects the RCM3720 to the PC running Dynamic C to download programs and to monitor the RCM3720 module during debugging.

Attach the DB9 connector end of the programming cable to a COM (serial) port on the PC. Dynamic C uses a COM port to communicate with the target system. The default selection is COM1, but you may select a different COM port when you install or run Dynamic C.

Connect the 10-pin connector of the programming cable and adapter board to header J2 on the RCM3720 as shown in Figure 3. The adapter board converts the PC voltage to the voltage on the RCM3720. Orient the programming cable and adapter board as shown in Figure 3 so that the colored edge of the programming cable lines up with the dot on the adapter board and pin 1 on the RCM3720.

Connect the other end of the programming cable to a COM port on your PC.

NOTE: Some PCs now come equipped only with a USB port. It may be possible to use an RS-232/USB converter (Part No. 540-0070) with the programming cable supplied with this Application Kit. Note that not all RS-232/USB converters work with Dynamic C.

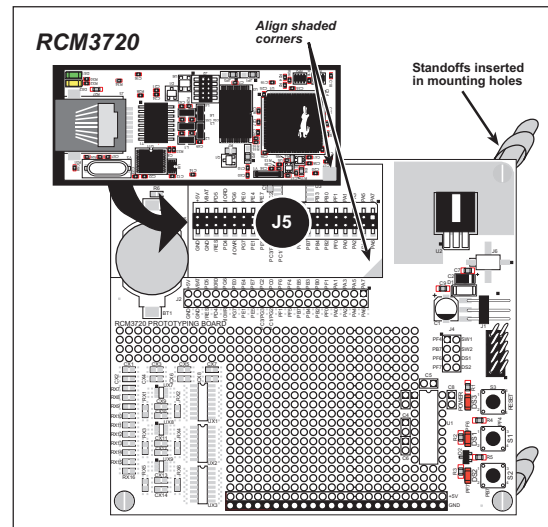


Figure 2. Install the RCM3720 Module on the Prototyping Board

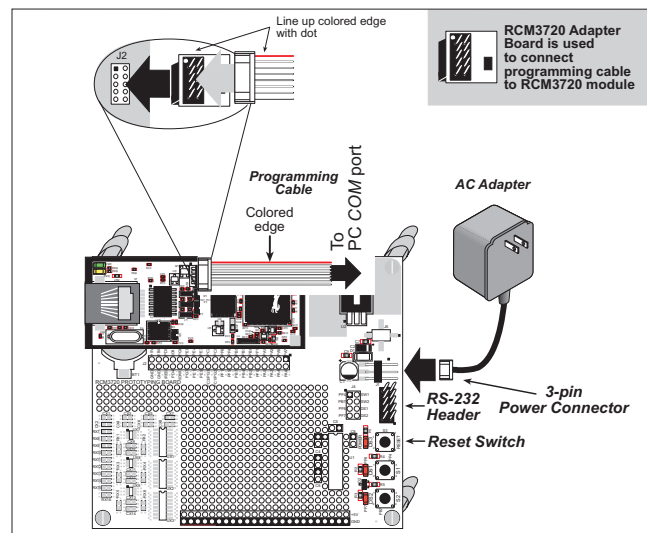


Figure 3. Connect Programming Cable and Power Supply

Connect Power

When all other connections have been made, you can connect power to the Prototyping Board. Connect the wall transformer to 3-pin header J1 on the Prototyping Board as shown in Figure 3. The connector may be attached either way as long as it is not offset to one side—the center pin of J1 is always connected to the positive terminal, and either edge pin is negative.

Plug in the wall transformer. The power LED beside the **RESET** button on the Prototyping Board should light up. The RCM3720 and the Prototyping Board are now ready to be used.

NOTE: The **RESET** button is provided on the Prototyping Board to allow a hardware reset without disconnecting power.

Alternate Power-Supply Connections

The 3-pin connector allows you to connect your own power supply—connect the center pin to the positive terminal, and connect either edge pin to the negative terminal. The power supply should deliver at least 200 mA at 7.5 V–15 V DC.

Dynamic C—RCM3720 Module

Once the RCM3720 is connected as described in the preceding pages, start Dynamic C by double-clicking on the Dynamic C icon or by double-clicking on `dcrab_XXXX.exe` in the Dynamic C root directory, where `XXXX` are version-specific characters. Dynamic C uses the serial port specified during installation.

If you are using a USB port to connect your computer to the RCM3720, choose **Options > Project Options** and select “Use USB to Serial Converter.”

Run a Sample Program

Use the **File** menu to open the sample program `PONG.C`, which is in the Dynamic C **SAMPLES** folder. Press function key **F9** to compile and run the program. The **STUDIO** window will open on your PC and will display a small square bouncing around in a box. Running this sample program successfully demonstrates that the RCM3720 module is connected correctly.

Set Up RF Interface Modules and Prototyping Board

Use a 10-pin to 10-pin IDC serial cable with a 0.1" pitch to connect header J6 of the “coordinator” RF Interface module to header J3, the RS-232 header on the RCM3720 Prototyping Board. Line up the red colored edge with pin 1. Place the “child” RF Interface modules up to 100 ft (30 m) away.

Where Do I Go From Here?

You are now ready to go on to other sample programs and to develop your own applications. Application Note AN413, *ZigBee™/802.15.4 Application Kit*, takes you through loading and using the sample programs included with the supplemental CD, and describes Rabbit Semiconductor’s software drivers. The *RCM3700 User’s Manual* provides complete hardware reference information and describes the software function calls for the RCM3720 and the Prototyping Board. The supplemental CD contains additional information about the XBee™ RF modems and their use and specifications.

Troubleshooting

- Use the Dynamic C **Help** menu to get further assistance with Dynamic C.
- Check the Rabbit Semiconductor Technical Bulletin Board at www.rabbit.com/support/bb/.
- Use the Technical Support e-mail form at www.rabbit.com/support/.

NOTE: If you purchased your ZigBee™/802.15.4 Application Kit through a distributor or through a Rabbit Semiconductor partner, contact the distributor or partner first for technical support.