

Tutorial - Configuring the XBee Modules in API Mode

In this tutorial, we will cover XBee configuration in API Mode using XCTU Software ([link](#)).

Configuring the Transmitter XBee

1. **Inserting XBee in XBee adapter** - Fix the XBee module in the XBee adapter which will connect the Xbee with PC. Figures below explain the the fixing of XBee to the adapter. **Caution: Connecting the XBee module in opposite direction can damage the XBee module.**



Figure 1: XBee Module

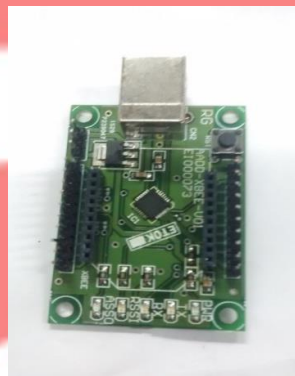


Figure 2: XBee Adapter



Figure 3: XBee on Adapter

2. **Connecting XBee module to PC** - Make the connection between laptop and XBee module using a USB cable as shown in Figure 4. Figure 5 illustrates the Power LED and Associate LED. When the connection is established, if the connection is correct, the following will happen:
 - i. Power LED on the XBee Adapter will be ON and
 - ii. Associate LED on the XBee Adapter will blink
 If not, remove and make the connection again till the above two conditions are met.
3. **Connecting XBee module to PC** - Make the connection between laptop and XBee module using a USB cable as shown in Figure 4. Figure 5 illustrates the Power LED and Associate LED. When the connection is established, if the connection is correct, the following will happen:
 - iii. Power LED on the XBee Adapter will be ON and
 - iv. Associate LED on the XBee Adapter will blink
 If not, remove and make the connection again till the above two conditions are met.



Figure 4: Connection between PC and XBee adapter

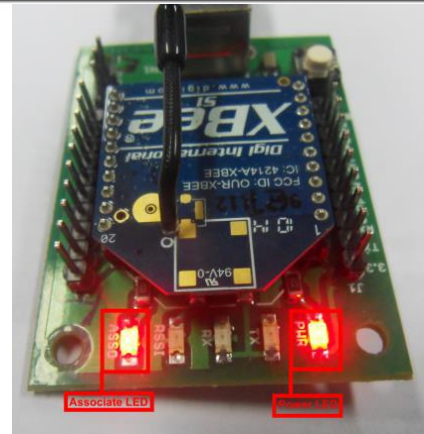


Figure 5: Associate and Power LEDs

4. **Serial Communication port setting** - After connecting XBee to the PC, check whether the necessary communication (COM) port is assigned to XBee. This can be done by using the Device Manager on your PC as shown in Figure 6. If the COM port is not detected in the Device Manager, install driver for CP2102 USB to Serial converter. (Drivers can be downloaded from the following [link](#))

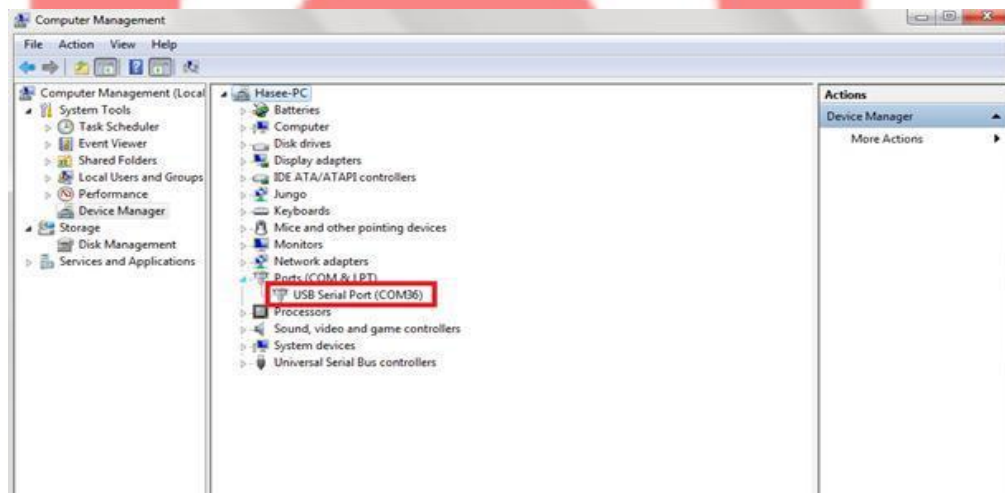


Figure 6: Device Manager

5. **Launching the X-CTU Software** - After you have downloaded the software, launch it by clicking on the Desktop icon. You should see the window as given in Figure 7. Click on the **Add Radio Module** button. The **Add Radio Device** window will open.

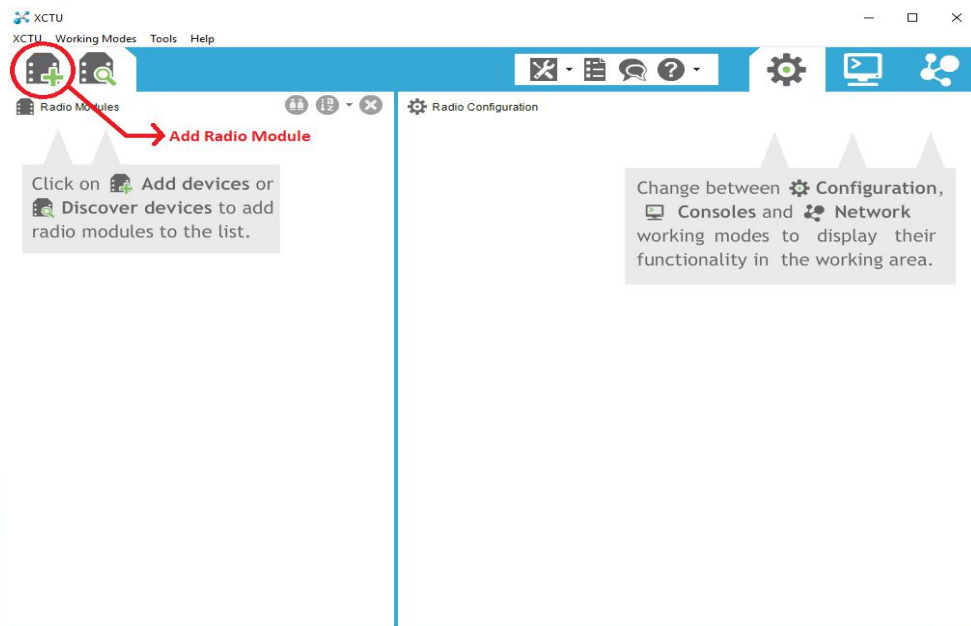


Figure 7: XCTU Software

6. In the **Add Radio Device** window, select the COM port where XBee is connected as shown in Figure 8. The Settings as shown in Figure 8 will remain default. Click on Finish.

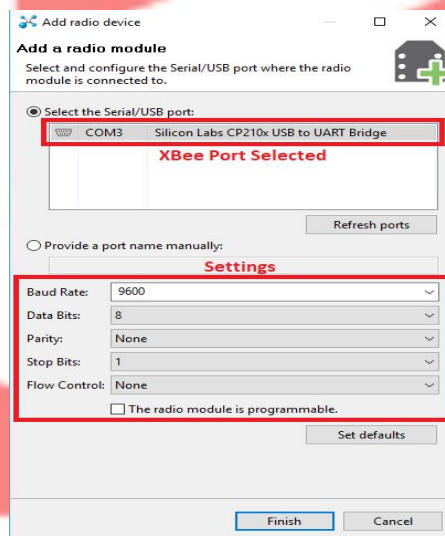


Figure 8: Add Radio Device window

7. **Updating the XBee Firmware** - Once the XBee module has been detected, click on the XBee Icon to show the **Radio Configuration Properties** (shown in Figure 9). Click on Update button.

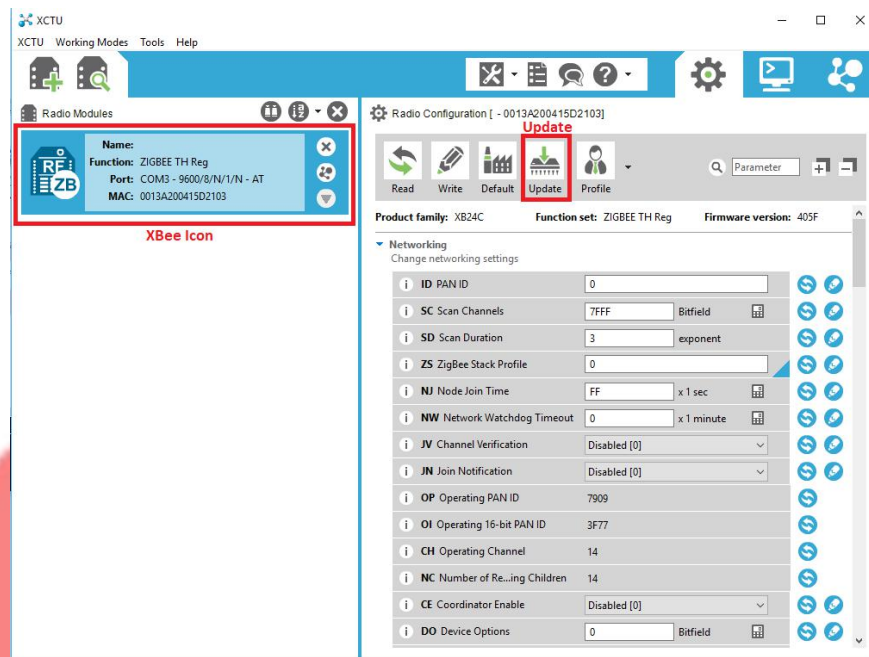


Figure 9: XCTU window

8. **Updating the XBee Firmware** - Select the Setting as shown in Figure 10 and click on Update. The Firmware Update will take a while.

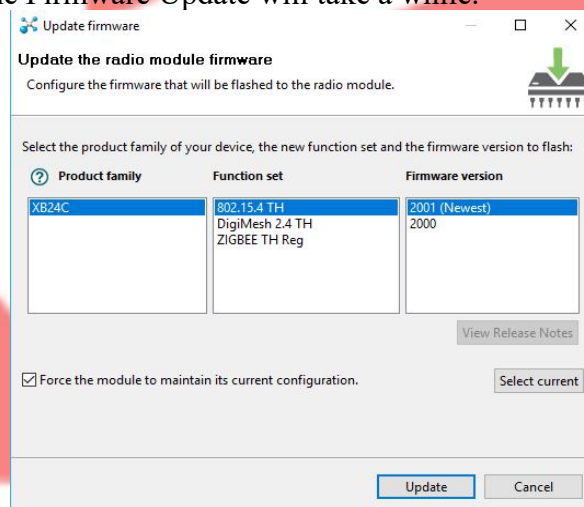


Figure 10: XBee Update Firmware

9. **Configuring the XBee settings** - Once the Firmware Update is complete, the XCTU window will resemble Figure 11.

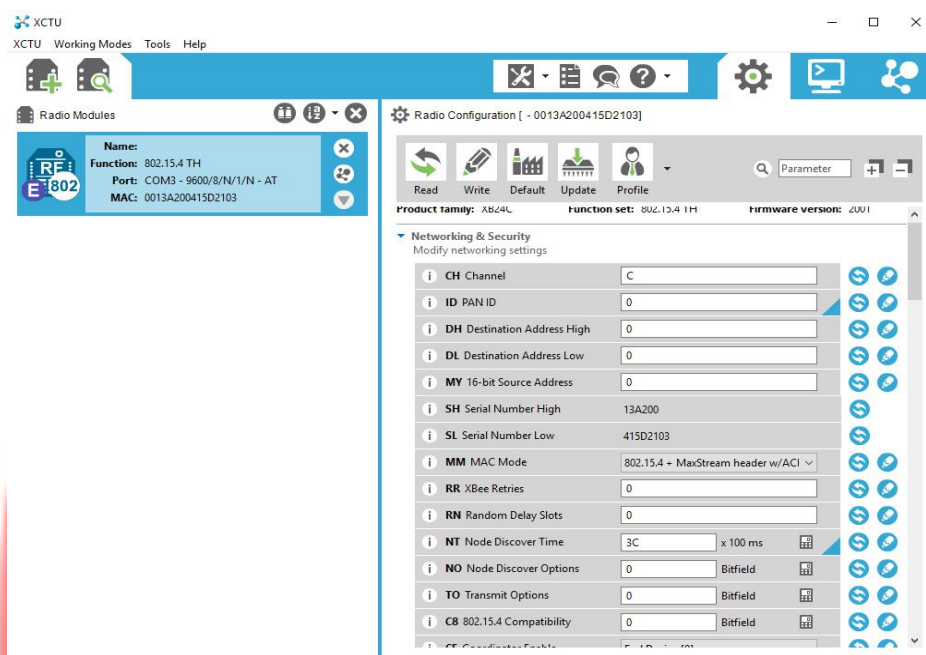


Figure 11: XCTU window

The required configuration settings for the XBee Module are as follows:

| Setting | Value | Purpose |
|------------------------------------|----------------|-----------------------------------------------------------|
| CH - Channel | C | Unique Channel ID for Network |
| ID - PAN ID | 3332 | Unique PAN ID for Network |
| DH - Destination Address High | 0 | Address of Receiver XBee |
| DL - Destination Address Low | 3 | Address of Receiver XBee |
| MY - 16 bit Source Address | 4 | Address of Transmitter XBee |
| CE - Coordinator Enable | End Device[0] | Whether device is configured as Coordinator or End Device |
| BD - Interface Data Rate | 9600[3] | Data Baud Rate |
| NB - Parity | No Parity[0] | Number of Parity Bits in Data frame |
| AP - API Enable | API Enabled[1] | Whether API mode is Enabled or Disabled. |
| D0 - DIO0 Configuration | ADC[2] | ADC Enabled on D0 |
| D1-SPI_ATTN/AD1/DIO1 Configuration | ADC[2] | ADC Enabled on D1 |
| D2-SPI_SCLK/AD2/DIO2 Configuration | ADC[2] | ADC Enabled on D2 |

| | | |
|-----------------------------------------------|-------|-----------------------------|
| D3-SPI_SSEL/AD3/ DIO3 Configuration | DI[3] | Digital Input Enabled on D3 |
| D4-SPI_MOSI/DIO4 Configuration | DI[3] | Digital Input Enabled on D4 |
| IR - Sample Rate | A | Sample Rate of 10ms |

Configuring the Receiver XBee

The required configuration for the Receiver XBee Module are:

| Setting | Value | Purpose |
|--------------------------------------|----------------|-----------------------------------------------------------|
| CH - Channel | C | Unique Channel ID for Network |
| ID - PAN ID | 3332 | Unique PAN ID for Network |
| DH - Destination Address High | 0 | Address of Receiver XBee |
| DL - Destination Address Low | 4 | Address of Receiver XBee |
| MY - 16 bit Source Address | 3 | Address of Transmitter XBee |
| CE - Coordinator Enable | End Device[0] | Whether device is configured as Coordinator or End Device |
| BD - Interface Data Rate | 9600[3] | Data Baud Rate |
| NB - Parity | No Parity[0] | Number of Parity Bits in Data frame |
| AP - API Enable | API Enabled[1] | Whether API mode is Enabled or Disabled. |

Hence this way the Transmitter and Receiver XBee Modules can be configured.