Instructions for Configuring and Testing XBee modules for Communication between PC and Arduino UNO

Zigbee network is setup by configuring XBee modules as explained below:

1. Configuring the XBee Modules

- **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

- **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.

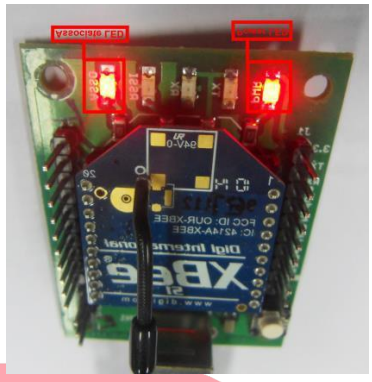

Figure 4: Connection between PC and XBee adapter Figure 5: Associate and Power LEDs

- **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)

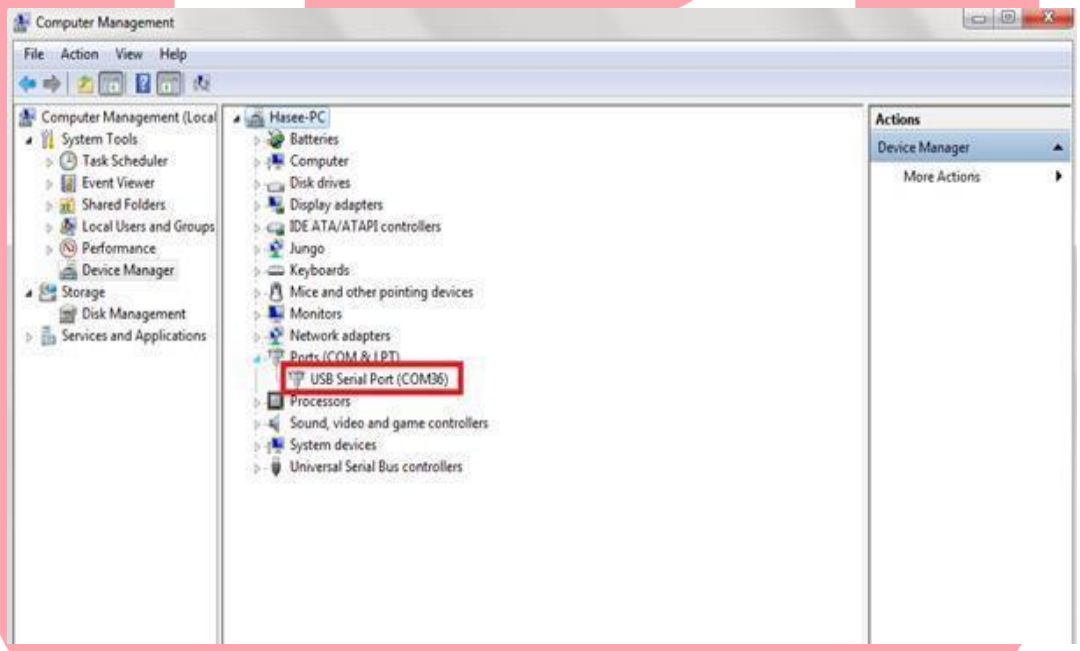

Figure 6: Device Manager

- **Installing the X-CTU Software -** Download and install the latest X-CTU software from the following link:

https://www.digi.com/products/xbee-rf-solutions/xctu-software/xctu

- **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.

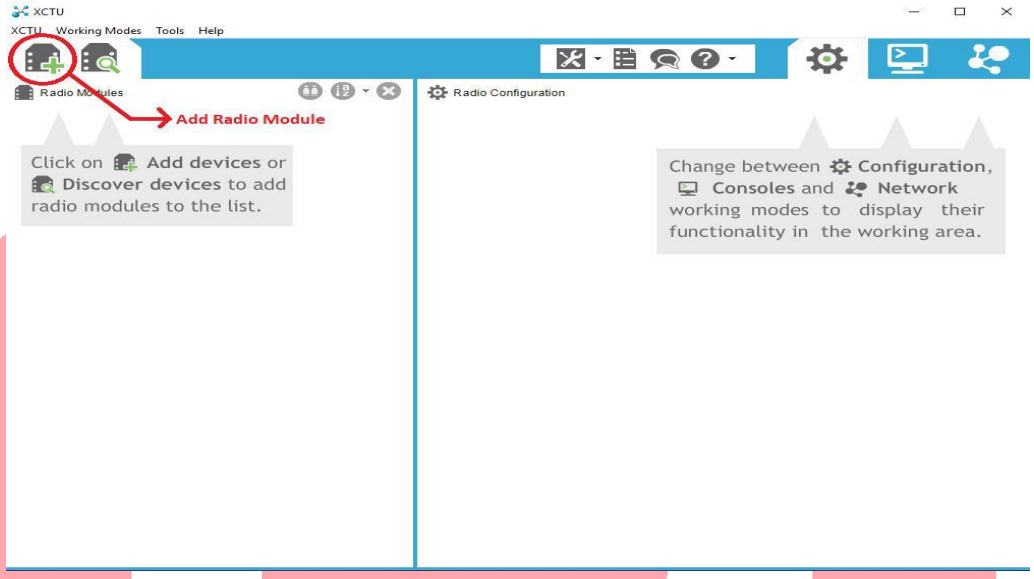

Figure 7: XCTU Software

- 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.

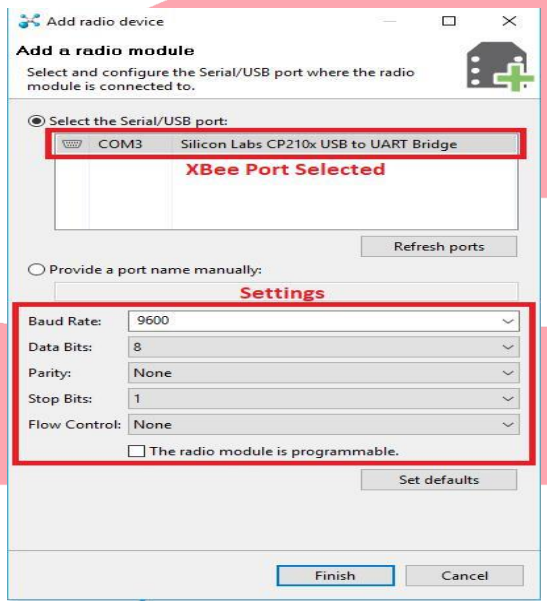

Figure 8: Add Radio Device window

- **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.

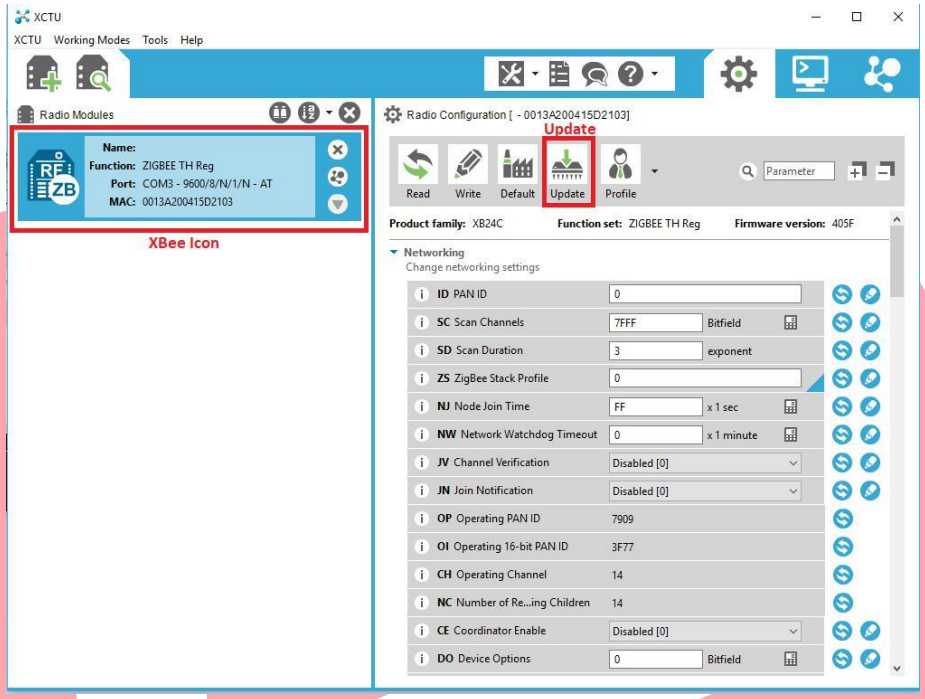

Figure 9: XCTU window

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

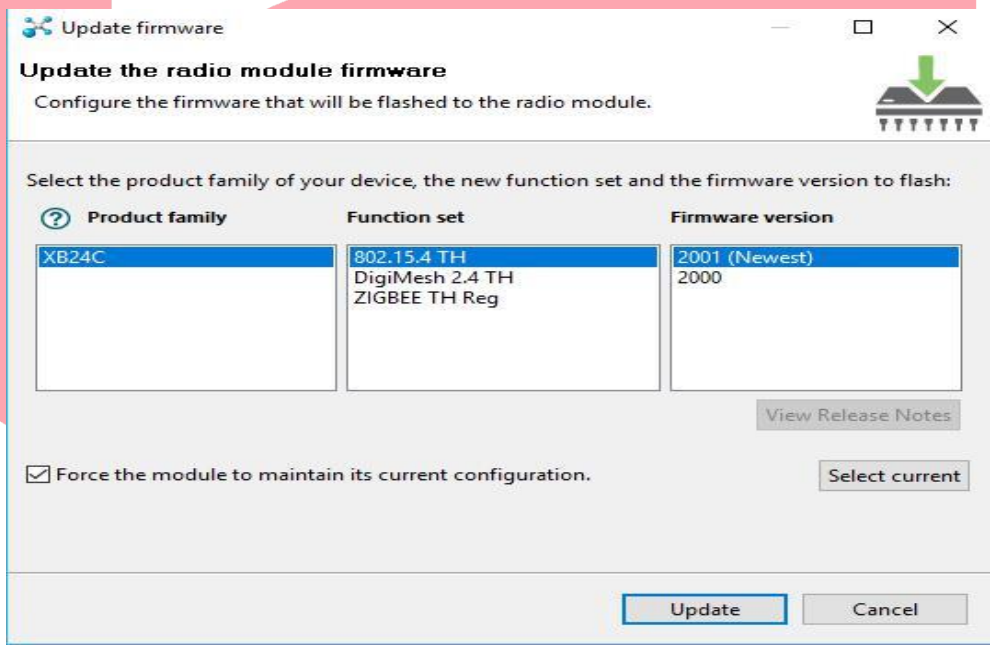

Figure 10: XBee Update Firmware

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

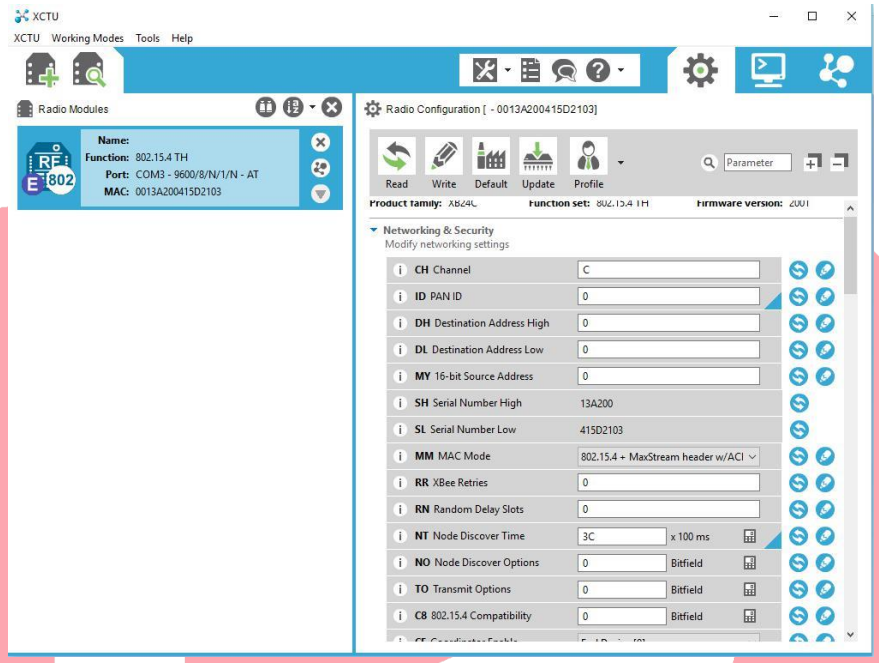

Figure 11: XCTU window

The XBee Configuration settings are given in Figure 12.

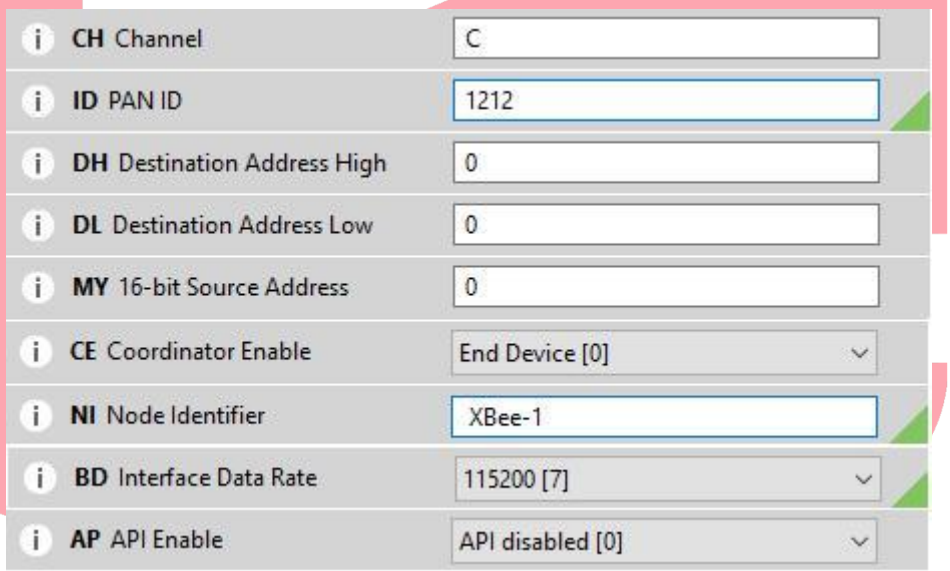

Figure 12: XBee Configuration Settings

- **Channel and PAN ID** - These 2 values should be same for all XBee modules in a Network in order for them communicate effectively. You can select Channel Values between 0x0B to 0x1A and PAN ID values between 0x0000 to 0xFFFF. Every Network should have a unique PAN ID and Channel.

  DH, DL, MY - These 3 values need to be set to 0 in all XBee modules.

  Coordinator Enable (CE) - All XBee modules should be configured as End Device.

  Node Identifier (NI) - You can give individual names to each of the XBee modules such as XBee-1, XBee-2 etc.

  Interface Data Rate (BD) - The baud rate for communication should be selected as 9600.

  API Enable (AP) - We will be using AT (Transparent) Mode, hence API Enable should be set to API disabled.

  All other settings other than these can be kept at default values. Once you are done, Click on Write to write the settings to your XBee.

- Congratulations! You have successfully configured your XBee Module. Follow the same instructions to configure the other XBee module provided to you.

- After configuration, connect one XBee module to the Arduino Uno board in the XBee slot provided and the other XBee module to the XBee adapter as shown in the figure.

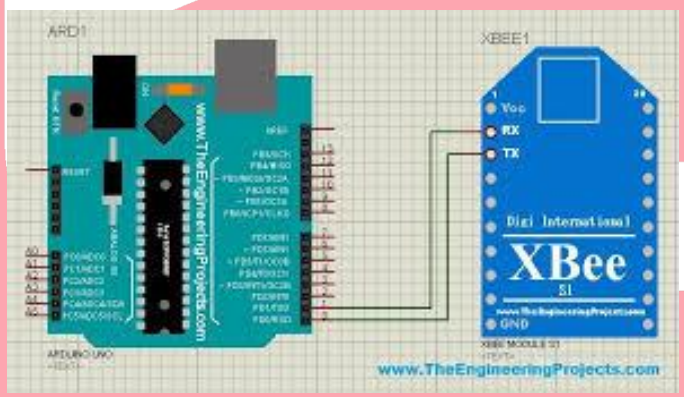

Figure 13: XBee Modules Attached to the Development Board and the Adapter