

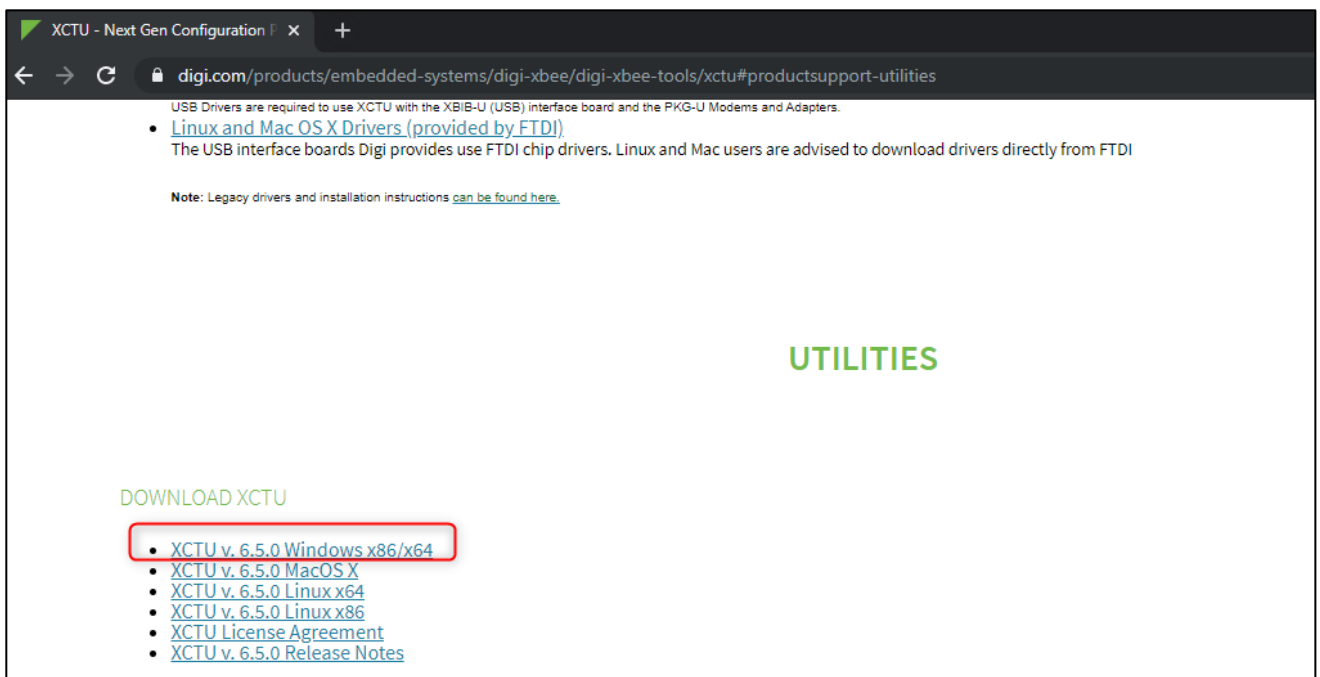
**Note:** This document is a pictorial guide to install XCTU software in windows up to configuring the Xbee modules accordingly. XCTU is a free software provided by Digi to configure and test Xbee modules.

### Sections:

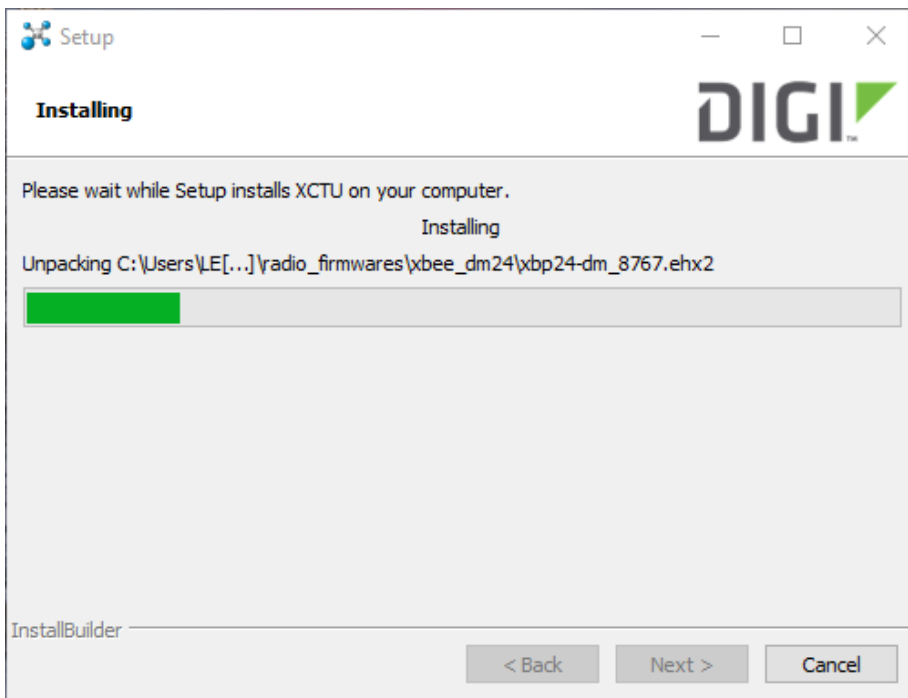
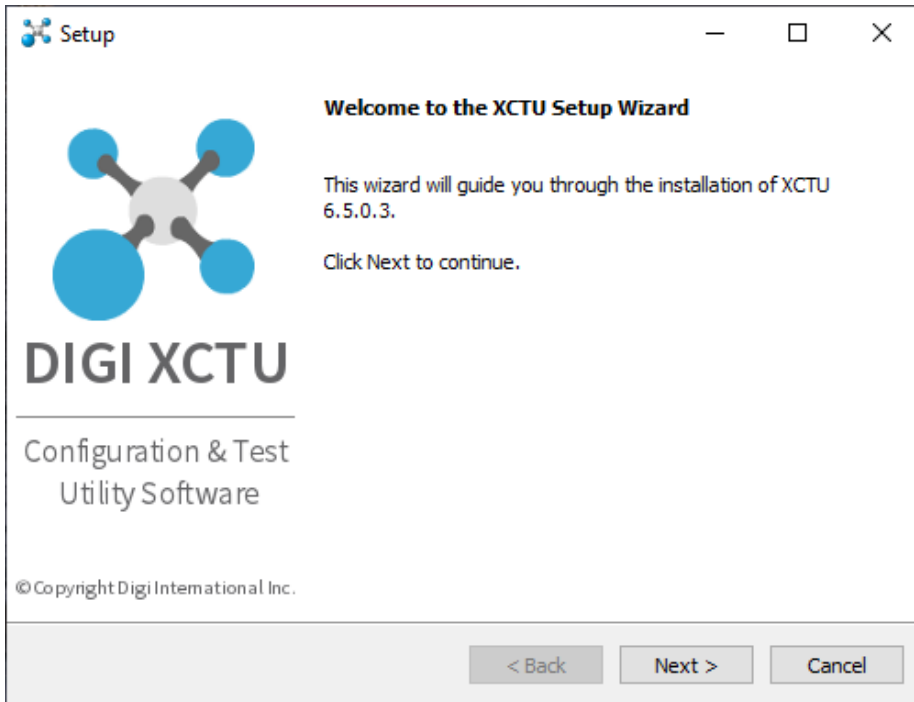
- Download XCTU software, Driver for Xbee and installing: steps 1 to 9
- Detecting the Xbee device in the XCTU software and updating the firmware of the Xbee: steps 10 to 22
- Configuring the Xbee as Transmitter
- Configuring the Xbee as Receiver

### Contents:

1. Download XCTU: [Download XCTU: https://www.digi.com/products/embedded-systems/digi-xbee/digi-xbee-tools/xctu#productsupport-utilities](https://www.digi.com/products/embedded-systems/digi-xbee/digi-xbee-tools/xctu#productsupport-utilities)



2. Install XCTU software



3. Download Driver from the same above link

## DRIVERS

GENERAL DRIVERS

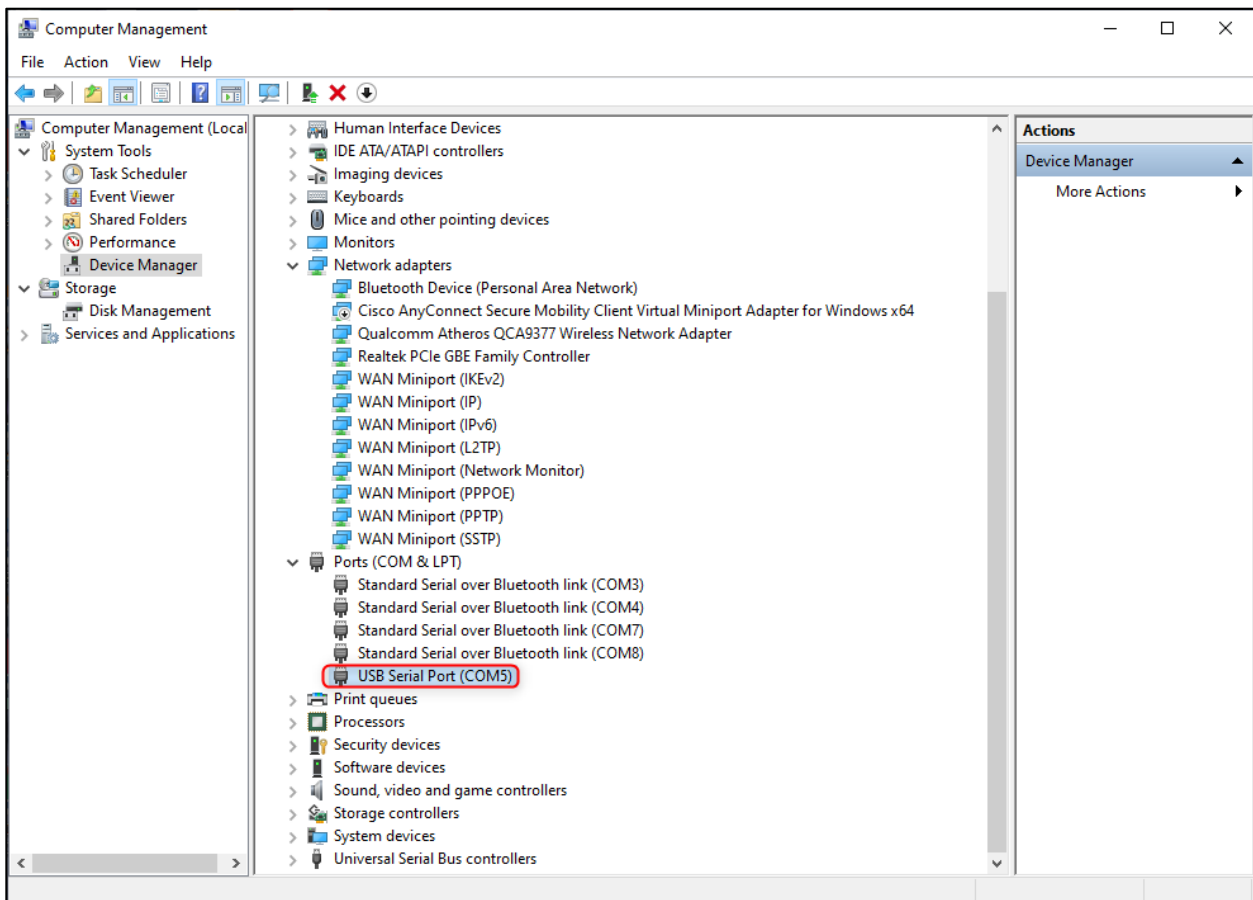
- Drivers Installer for Windows (XP, Vista, 7 and 8)**  
USB Drivers are required to use XCTU with the XBIB-U (USB) interface board and the PKG-U Modems and Adapters.
- Linux and Mac OS X Drivers (provided by FTDI)**  
The USB interface boards Digi provides use FTDI chip drivers. Linux and Mac users are advised to download drivers directly from FTDI

Note: Legacy drivers and installation instructions [can be found here](#).

UTILITIES

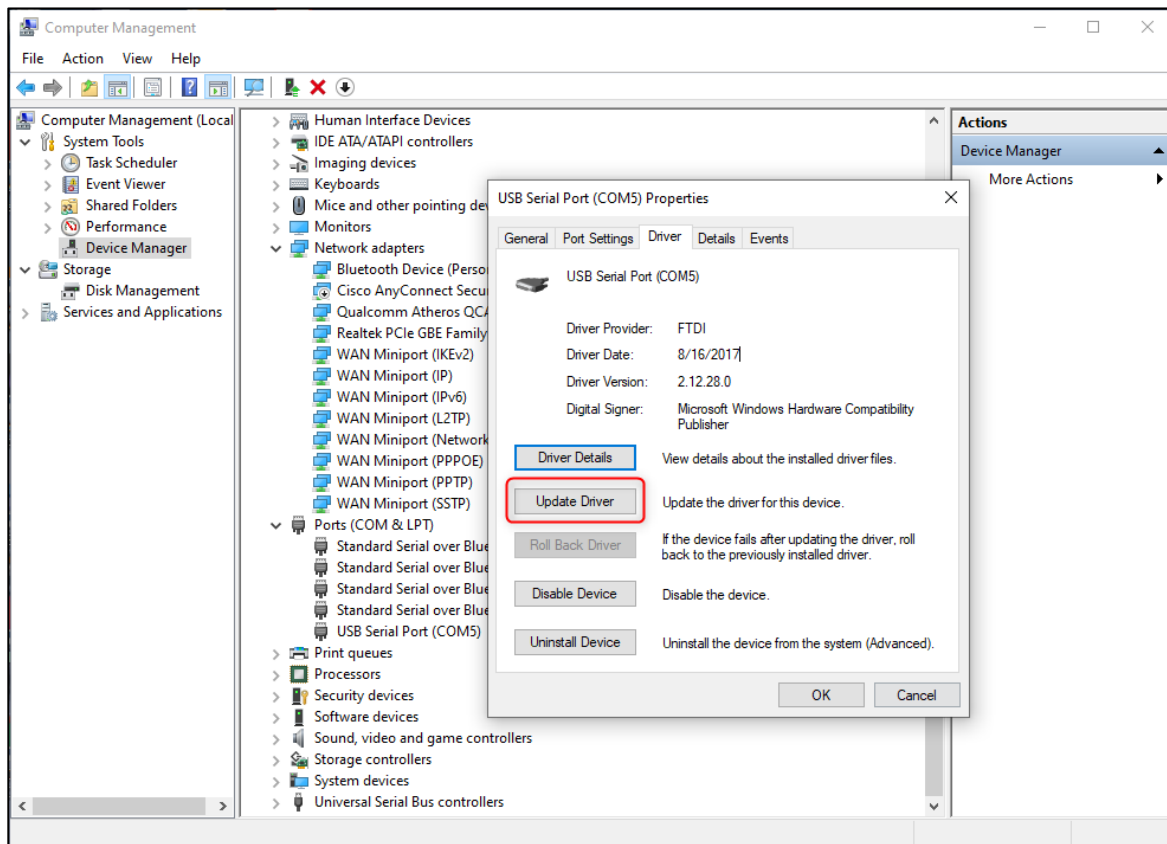
Digi\_USB\_RF\_Drive...exe

4. Connect XCTU to the PC then open device manager and open the serial port connected with the Xbee

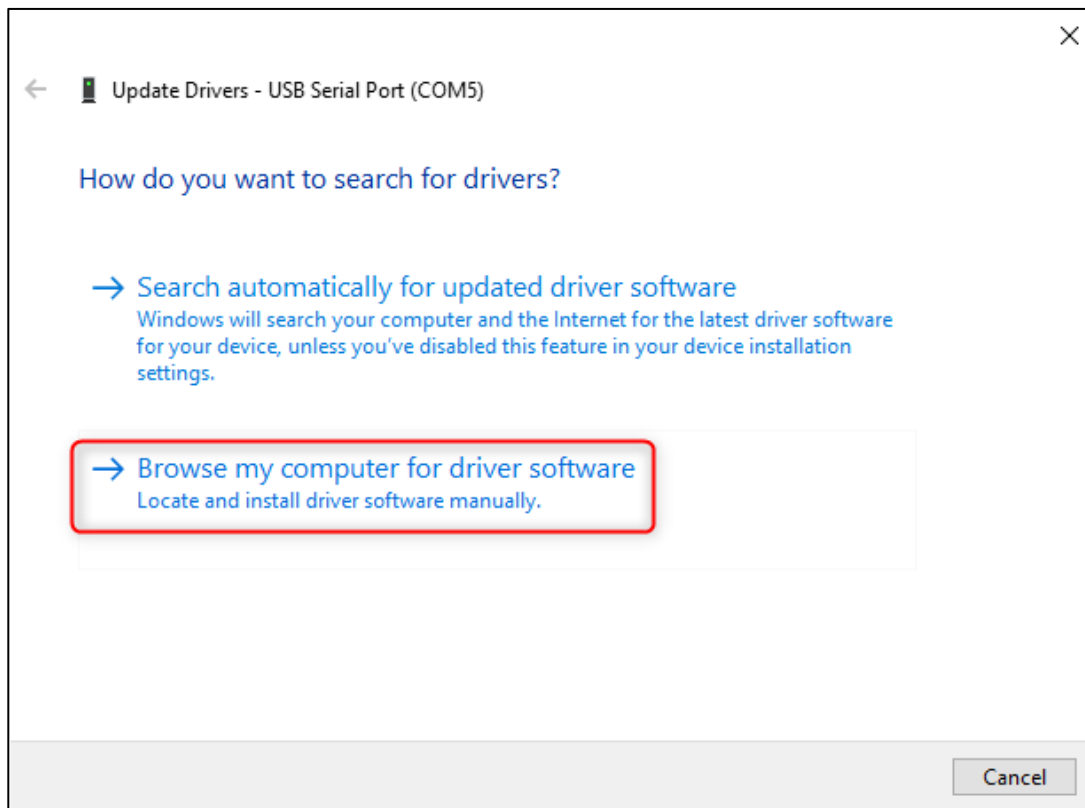


The screenshot shows the Windows Device Manager window. The left sidebar shows the navigation tree with 'Device Manager' selected. The main pane displays a list of hardware categories and their instances. Under the 'Ports (COM & LPT)' category, 'USB Serial Port (COM5)' is highlighted with a red box. Other visible items include 'Human Interface Devices', 'IDE ATA/ATAPI controllers', 'Imaging devices', 'Keyboards', 'Mice and other pointing devices', 'Monitors', 'Network adapters', 'Print queues', 'Processors', 'Security devices', 'Software devices', 'Sound, video and game controllers', 'Storage controllers', 'System devices', and 'Universal Serial Bus controllers'. The right pane shows the 'Actions' menu with 'Device Manager' and 'More Actions' options.

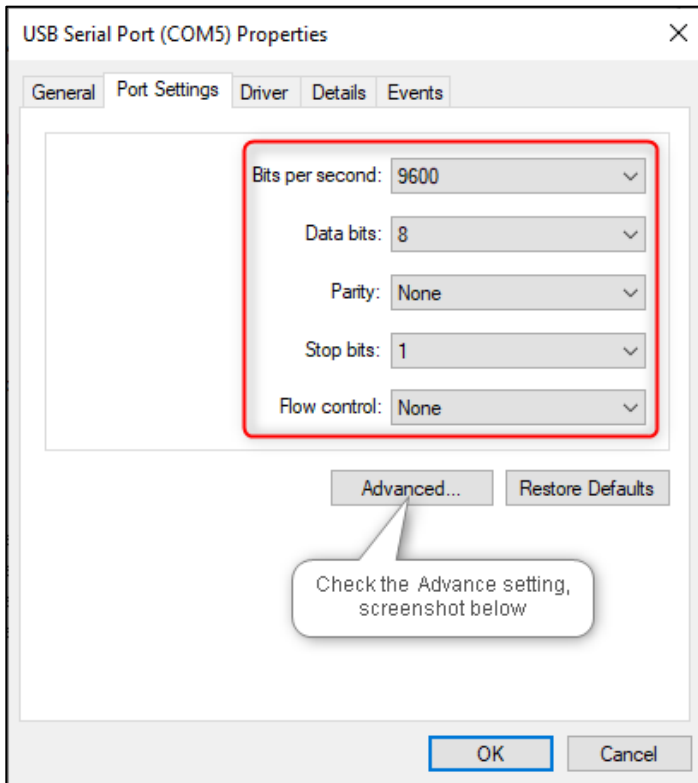
5. Update the driver



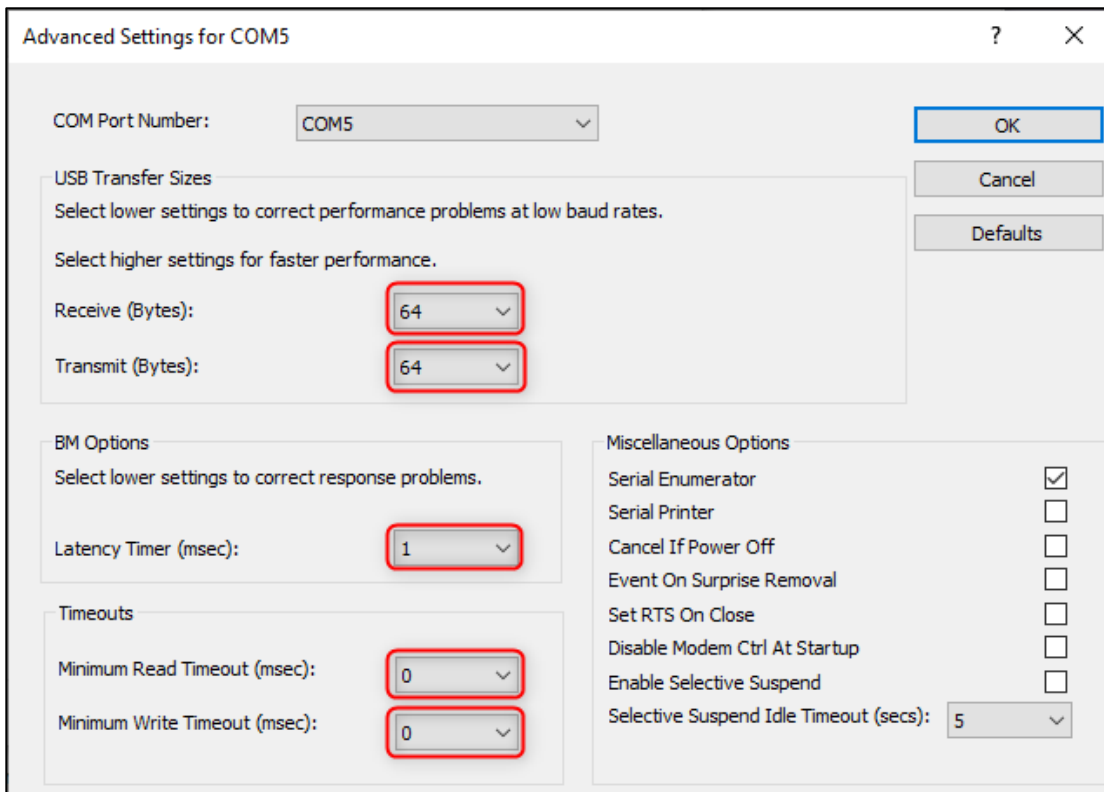
6. Browse the folder to select the driver downloaded above



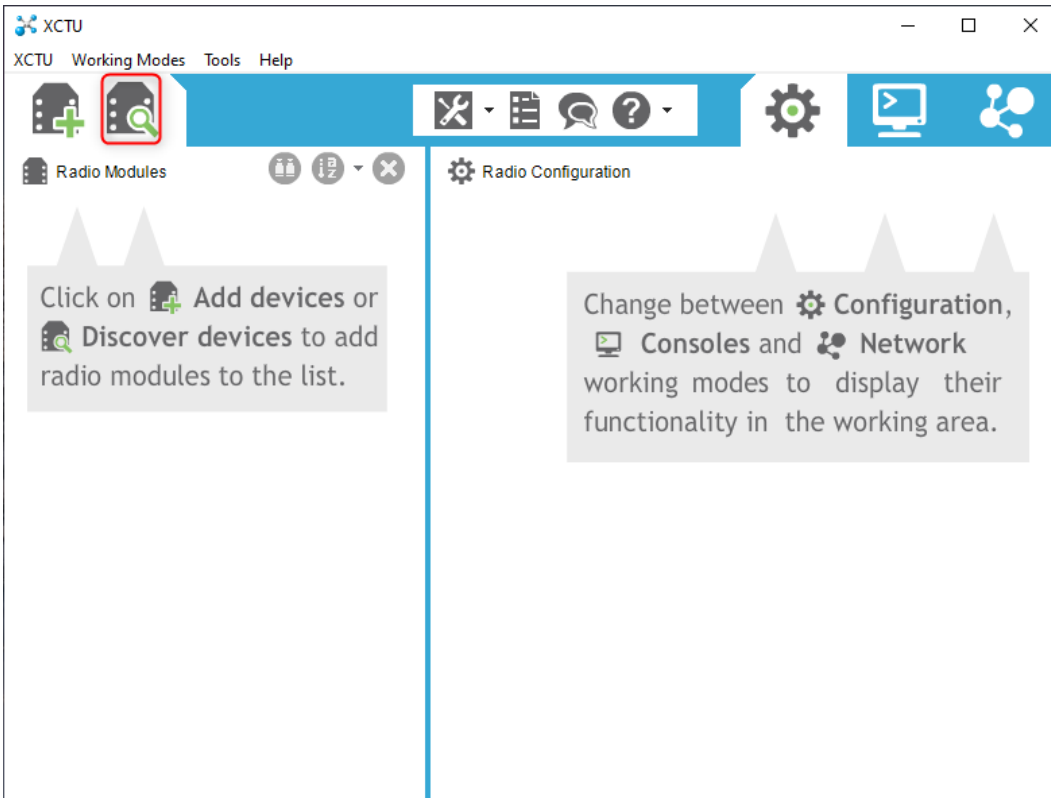
7. After updating the driver check the port setting



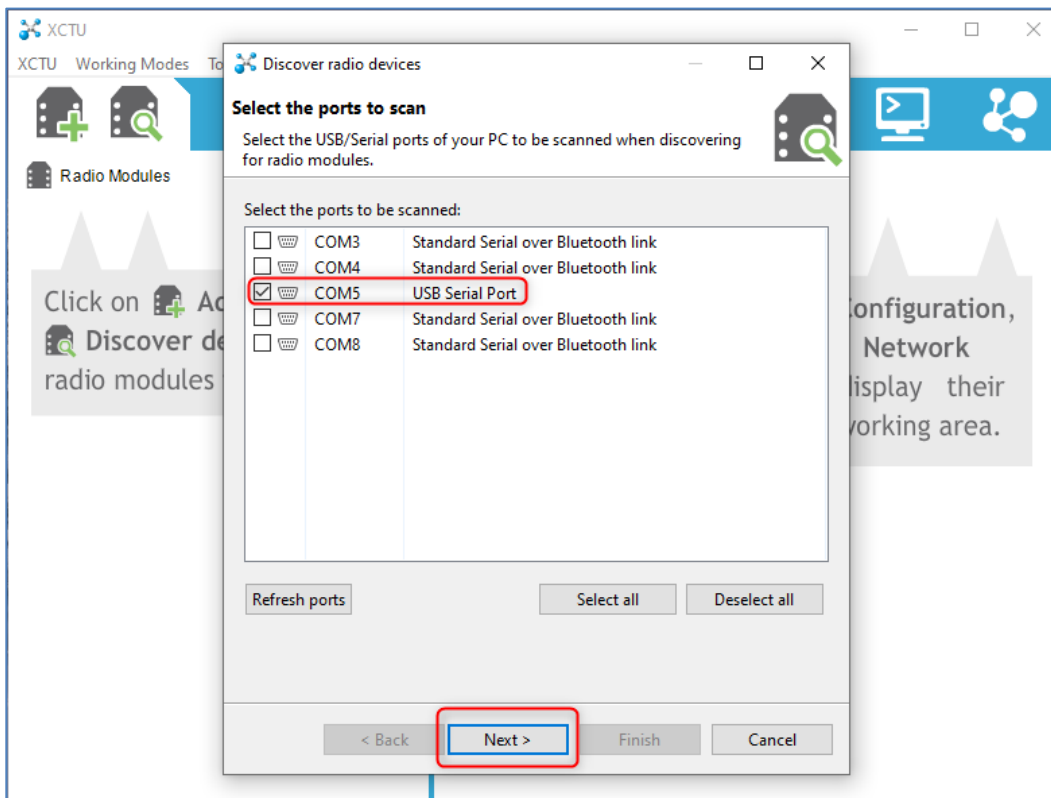
8. Then check the Advanced settings



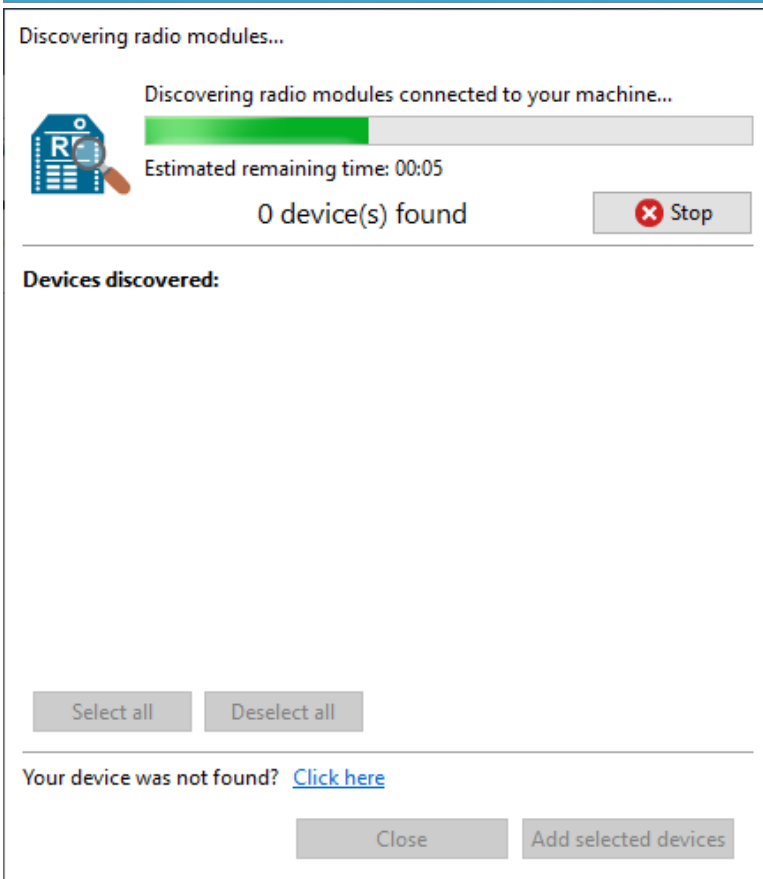
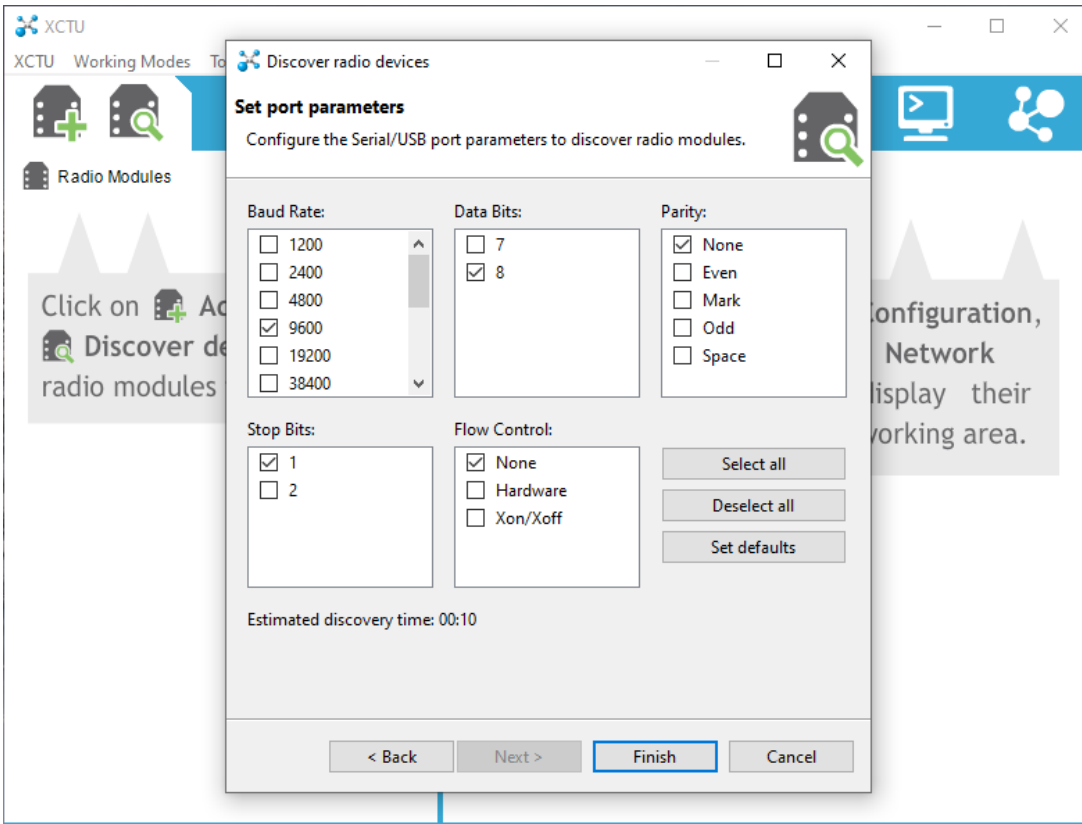
- 9. Now the software installation is complete. The Xbee module can be connected to the PC
- 10. Now let us see how to detect the device in XCTU. Open XCTU software and search for the device



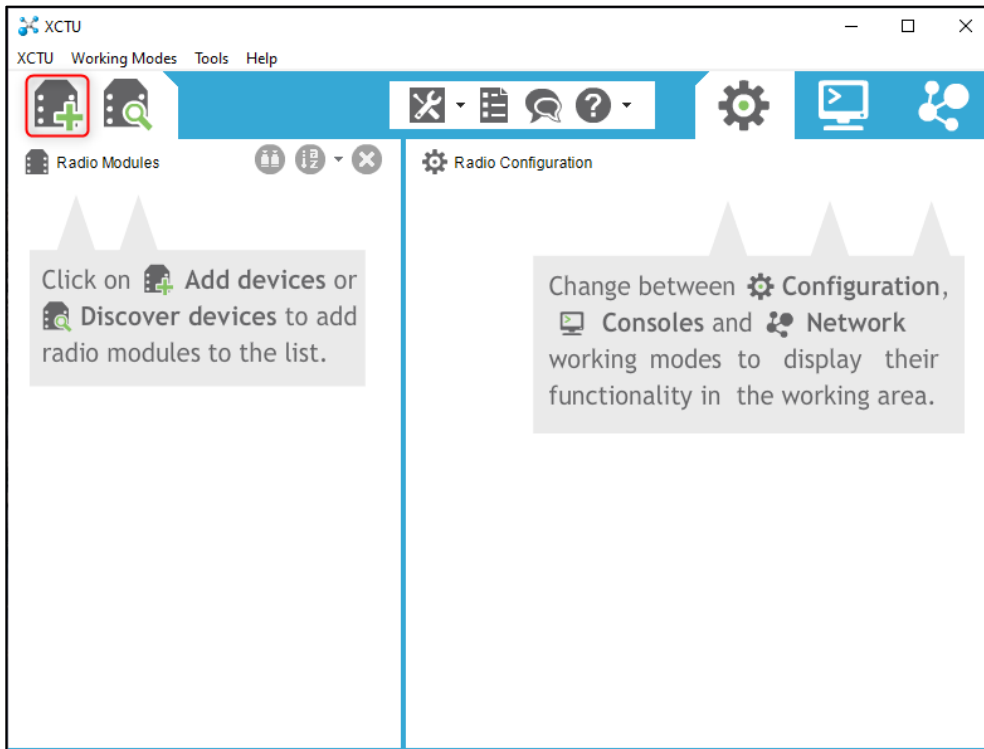
- 11. Select the serial port where Xbee is connected



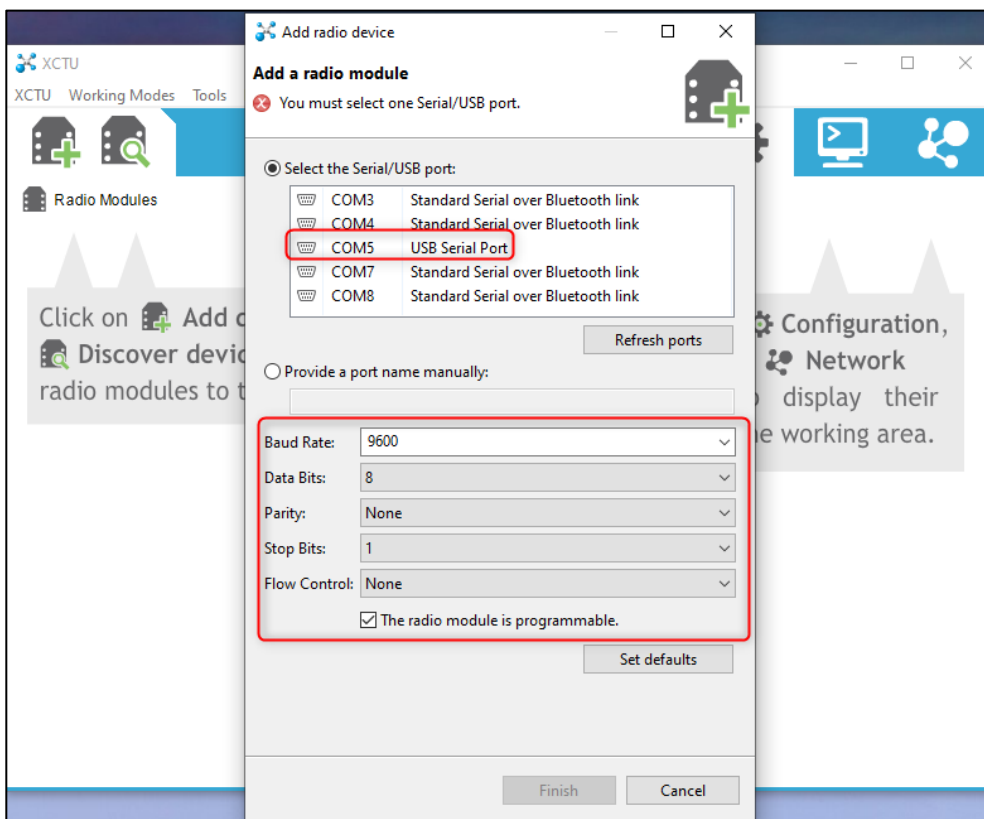
12. Click next and select below settings and then finish to find the device



13. If not found try adding the device with the Add radio module option

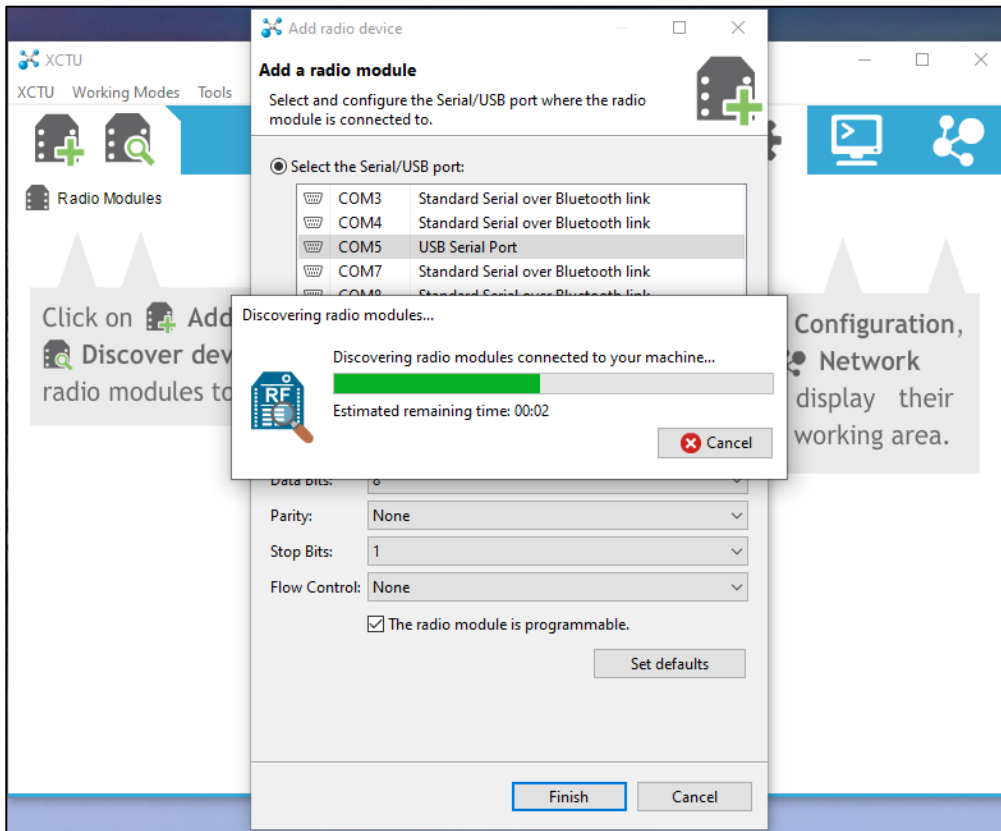


14. Select the corresponding Serial port and ensure the settings as in the screenshot, please make sure the box is ticked since the module is programmable

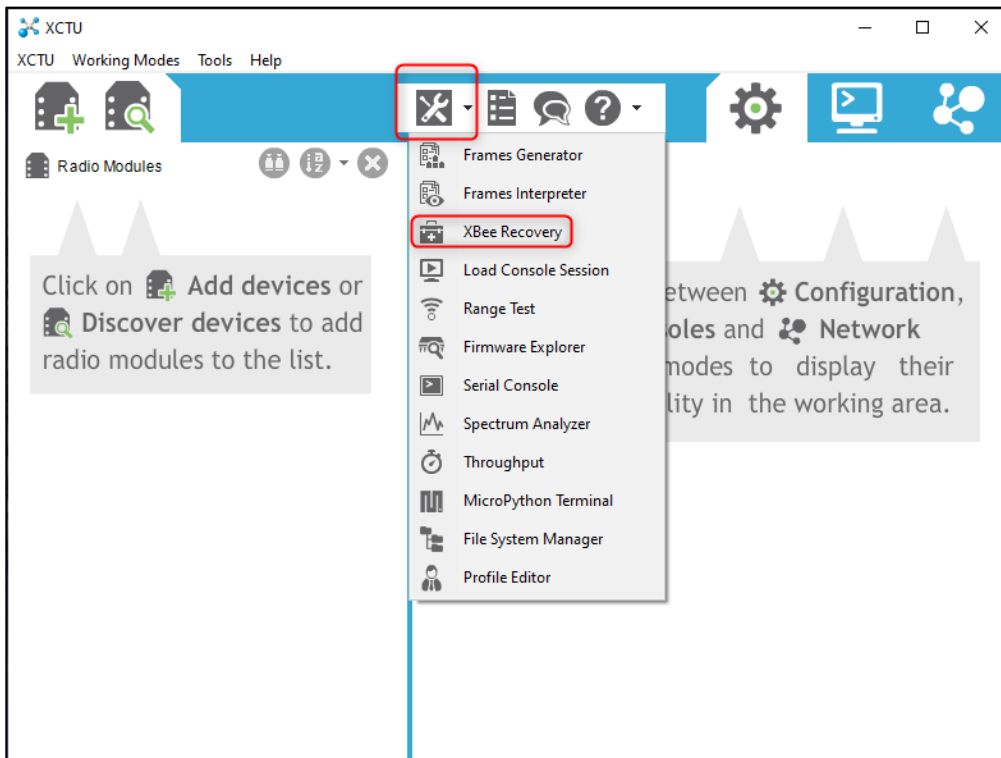




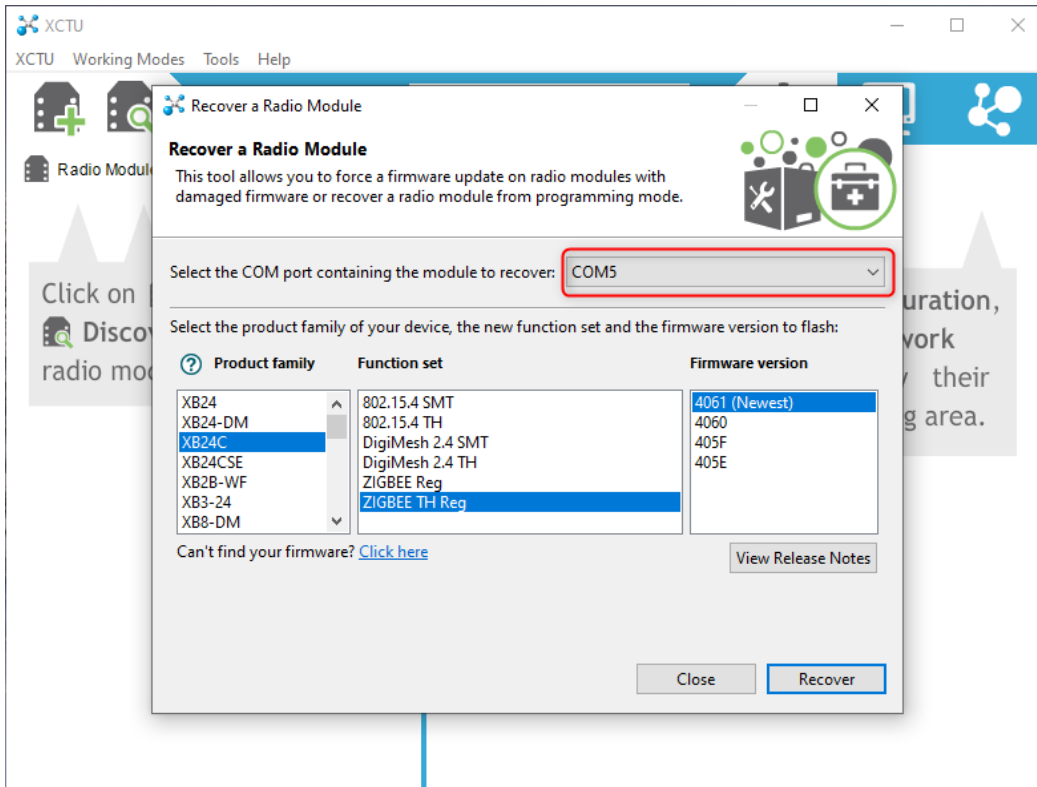
15. Click Finish and wait for the device to get connected



16. If the device is not found maybe it is because of the old firmware, so update firmware. Choose Xbee Recovery from Tools. (If Device is detected then jump to step 20)

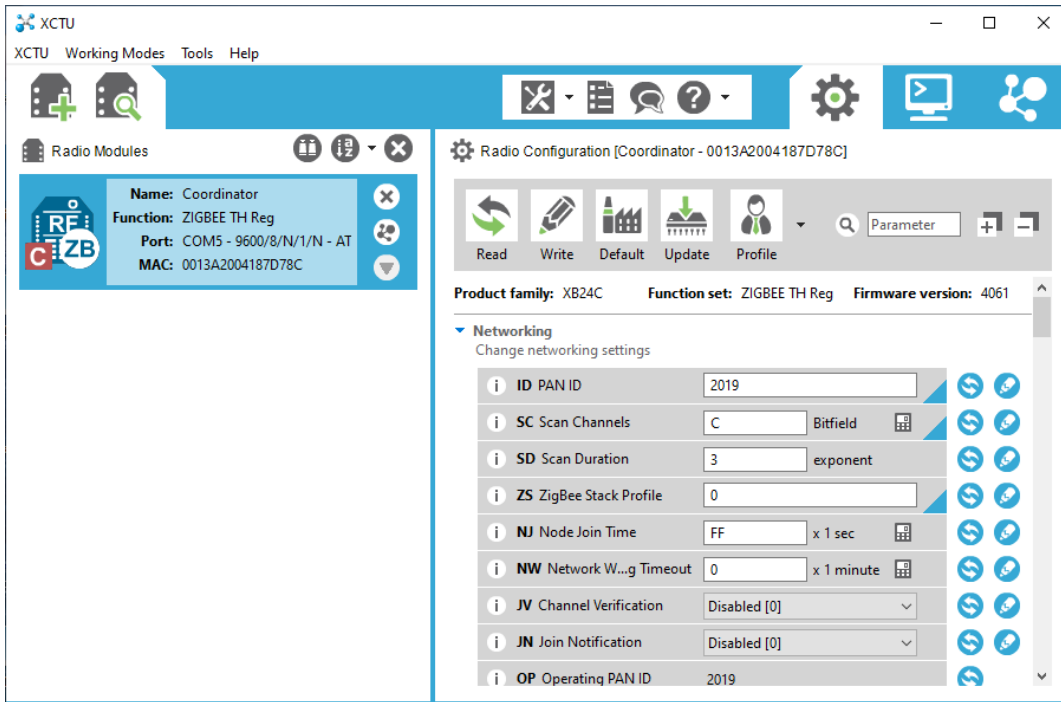


17. Then Choose the corresponding serial port with Xbee connected and select the firmware as in the screenshot

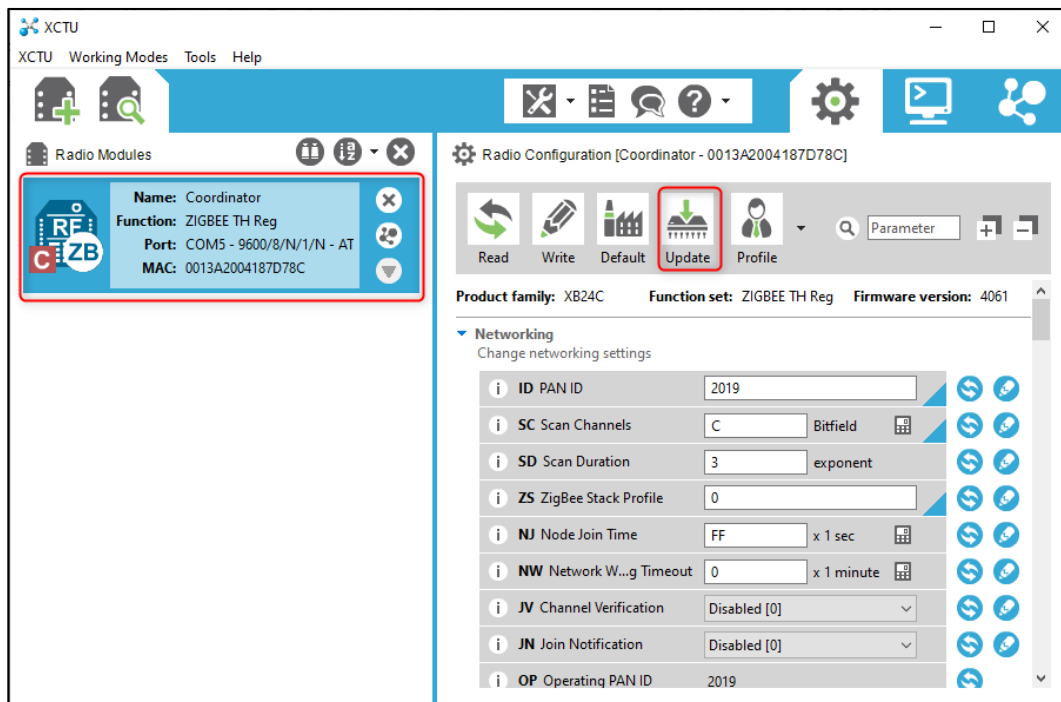


18. Wait for dialog box indicating successful update of firmware  
19. Then repeat the steps 13 to 15 accordingly

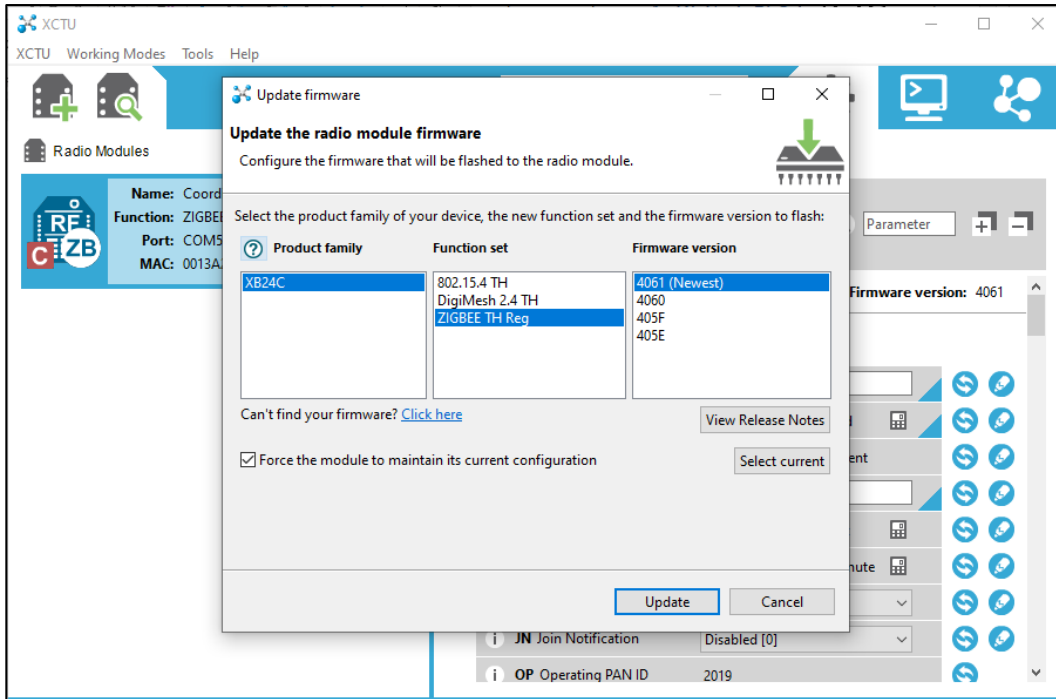
20. Once the device is recognized by XCTU then it will appear like in below screenshot



21. (Skip this step if the firmware is already updated!) Update the firmware by choosing the device and Update option



22. Choose the Firmware and Update. Wait for it to complete successfully!



23. Now the device is connected to the XCTU software and ready to configure them

## Configuring the Xbee as Coordinator/ Transmitter

*Update below fields*

1. **ID PAN ID**

PAN ID should be same for all Xbees communicating each other irrespective of Tx or Rx

Eg: 2019

2. **SC Scan Channels**

Scan channel should be same for all Xbee communicating each other irrespective of Tx and Rx

Eg: C

3. **CE Coordinator Enable**

Coordinator Enable should be Set to **Enabled[1]**

4. **DH Destination Address High**

Set to **0**

5. **DL Destination Address Low**

Set to **FFFF**

6. **NI Node Identifier**

Name of the device, it can be any name.

Eg: Coordinator

7. **BD Baud Rate**

Set to **9600 [3]**

8. **NB Parity**

Set it to **No Parity [0]**

9. **SB Stop Bits**

Set to **One stop bit [0]**

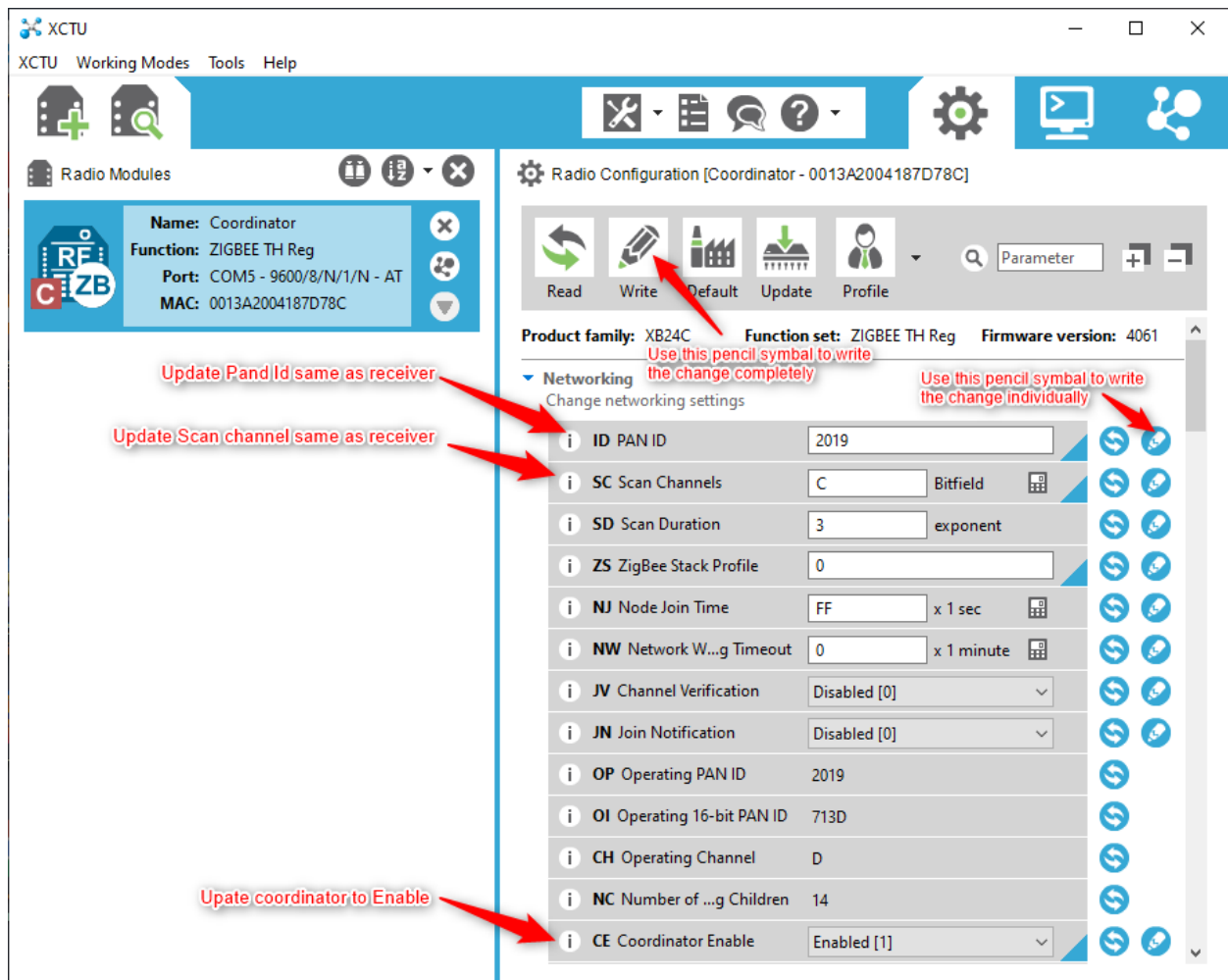
10. **D7** Pin 12 – DIO7/...Configuration

Set to **nCTS flow control [1]**

11. **AP** API Enable

Set to **Transparent mode [0]**

Below are the screenshots of XCTU software configuring Xbee as a transmitter/ coordinator



**Radio Configuration [Coordinator - 0013A2004187D78C]**

Product family: XB24C    Function set: ZIGBEE TH Reg    Firmware version: 4061

**Networking**  
 Change networking settings

ID PAN ID	2019
SC Scan Channels	C Bitfield
SD Scan Duration	3 exponent
ZS ZigBee Stack Profile	0
NJ Node Join Time	FF x 1 sec
NW Network W...g Timeout	0 x 1 minute
JV Channel Verification	Disabled [0]
JN Join Notification	Disabled [0]
OP Operating PAN ID	2019
OI Operating 16-bit PAN ID	713D
CH Operating Channel	D
NC Number of ...g Children	14
CE Coordinator Enable	Enabled [1]

Annotations:  
 - Update ID PAN ID same as receiver (points to ID PAN ID)  
 - Update Scan channel same as receiver (points to SC Scan Channels)  
 - Update coordinator to Enable (points to CE Coordinator Enable)

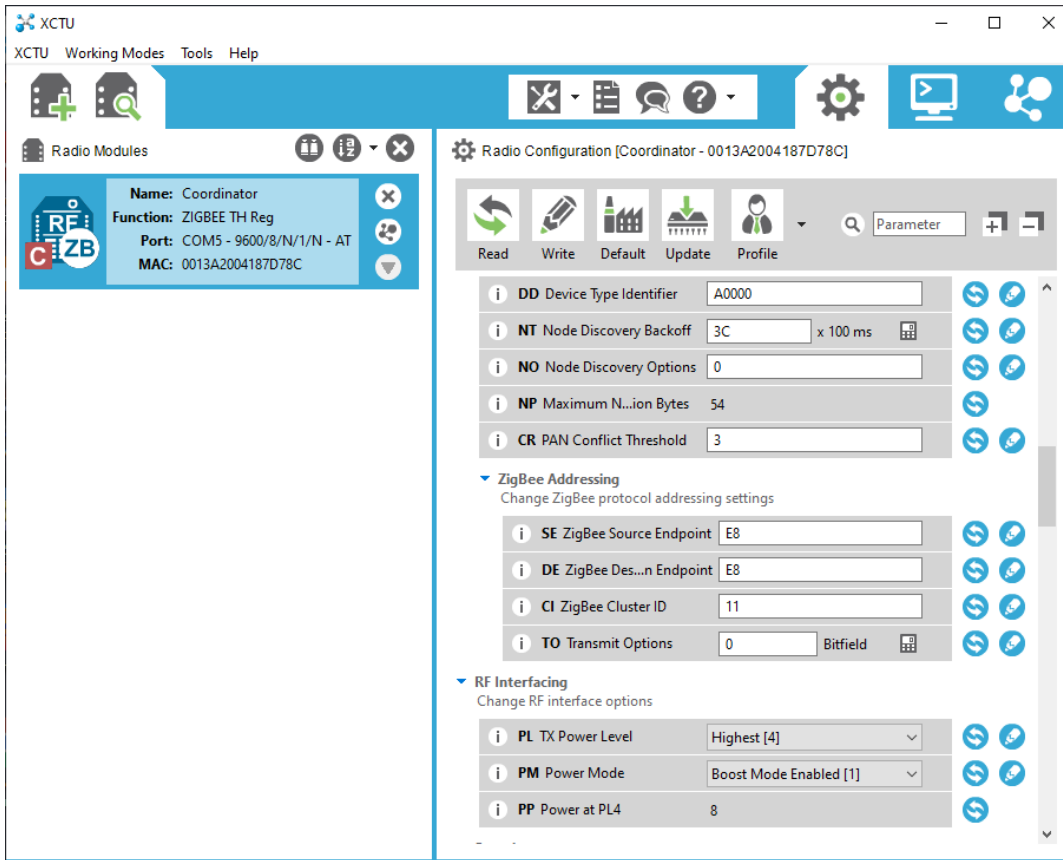
**Radio Configuration [Coordinator - 0013A2004187D78C]**

CE Coordinator Enable: Enabled [1]

**Addressing**  
 Change addressing settings

SH Serial Number High	13A200
SL Serial Number Low	4187D78C
MY 16-bit Network Address	0
MP 16-bit Parent Address	FFFE
DH Destination...dress High	0
DL Destination Address Low	FFFF
NI Node Identifier	Coordinator
NH Maximum Hops	1E
BH Broadcast Radius	0
AR Many-to-On...dcast Time	FF x 10 sec
DD Device Type Identifier	A0000

Annotations:  
 - Update DH to 0 (points to DH Destination...dress High)  
 - Update DL to 0 (points to DL Destination Address Low)  
 - Update Node Identifier to Coordinator (points to NI Node Identifier)



**XCTU** Working Modes Tools Help

Radio Modules

- Name: Coordinator
- Function: ZIGBEE TH Reg
- Port: COM5 - 9600/8/N/1/N - AT
- MAC: 0013A2004187D78C

Radio Configuration [Coordinator - 0013A2004187D78C]

Read Write Default Update Profile

Parameter

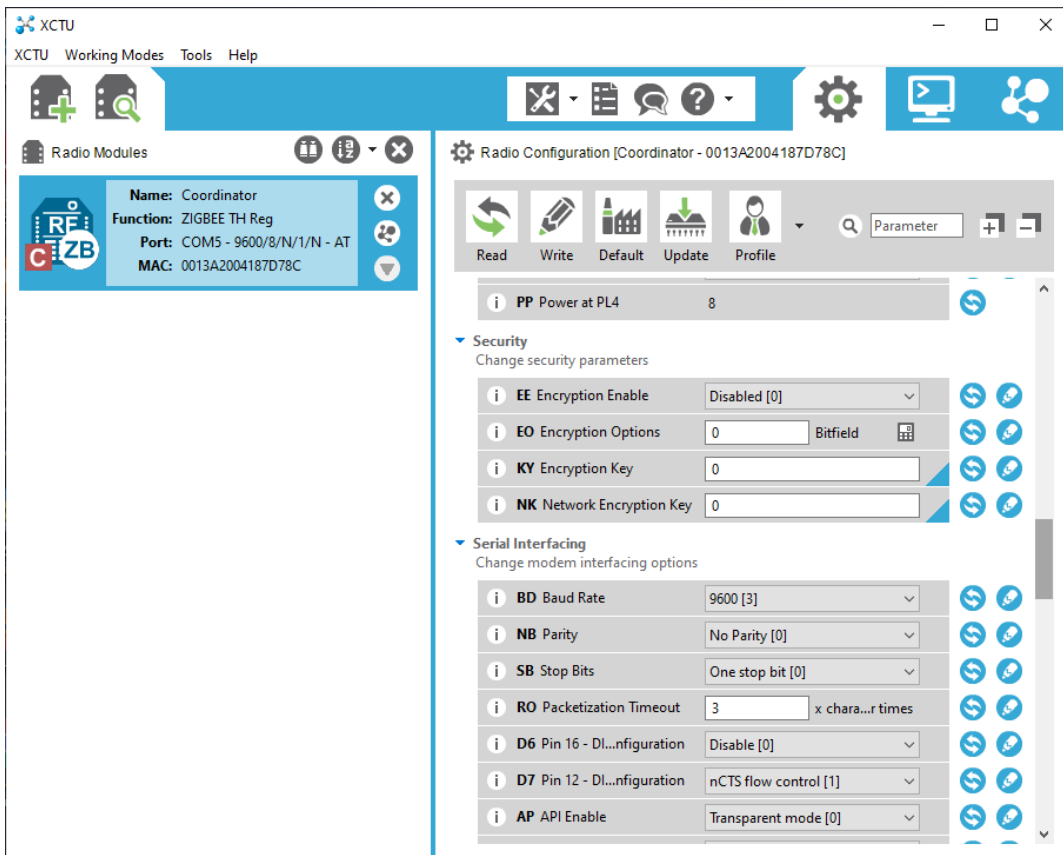
- DD Device Type Identifier: A0000
- NT Node Discovery Backoff: 3C x 100 ms
- NO Node Discovery Options: 0
- NP Maximum N...ion Bytes: 54
- CR PAN Conflict Threshold: 3

**ZigBee Addressing**  
Change ZigBee protocol addressing settings

- SE ZigBee Source Endpoint: E8
- DE ZigBee Des...n Endpoint: E8
- CI ZigBee Cluster ID: 11
- TO Transmit Options: 0 Bitfield

**RF Interfacing**  
Change RF interface options

- PL TX Power Level: Highest [4]
- PM Power Mode: Boost Mode Enabled [1]
- PP Power at PL4: 8



**XCTU** Working Modes Tools Help

Radio Modules

- Name: Coordinator
- Function: ZIGBEE TH Reg
- Port: COM5 - 9600/8/N/1/N - AT
- MAC: 0013A2004187D78C

Radio Configuration [Coordinator - 0013A2004187D78C]

Read Write Default Update Profile

Parameter

- PP Power at PL4: 8

**Security**  
Change security parameters

- EE Encryption Enable: Disabled [0]
- EO Encryption Options: 0 Bitfield
- KY Encryption Key: 0
- NK Network Encryption Key: 0

**Serial Interfacing**  
Change modem interfacing options

- BD Baud Rate: 9600 [3]
- NB Parity: No Parity [0]
- SB Stop Bits: One stop bit [0]
- RO Packetization Timeout: 3 x chara...r times
- D6 Pin 16 - DI...nfiguration: Disable [0]
- D7 Pin 12 - DI...nfiguration: nCTS flow control [1]
- AP API Enable: Transparent mode [0]



XCTU Working Modes Tools Help

Radio Modules

**Name:** Coordinator  
**Function:** ZIGBEE TH Reg  
**Port:** COM5 - 9600/8/N/1/N - AT  
**MAC:** 0013A2004187D78C

Radio Configuration [Coordinator - 0013A2004187D78C]

Read Write Default Update Profile

Parameter

**Serial Interfacing**  
 Change modem interfacing options

BD Baud Rate	9600 [3]	
NB Parity	No Parity [0]	
SB Stop Bits	One stop bit [0]	
RO Packetization Timeout	3 x character times	
D6 Pin 16 - D...nfiguration	Disable [0]	
D7 Pin 12 - D...nfiguration	nCTS flow control [1]	
AP API Enable	Transparent mode [0]	
AO API Output Mode	Native [0]	

**AT Command Options**  
 Change AT command mode behavior

CT AT Comman...e Timeout	64 x 100ms	
GT Guard Times	3E8 x 1ms	
CC Command Se... Character	2B Recomm...ASCII)	

**Sleep Modes**  
 Configure low power options to support end device children

XCTU Working Modes Tools Help

Radio Modules

**Name:** Coordinator  
**Function:** ZIGBEE TH Reg  
**Port:** COM5 - 9600/8/N/1/N - AT  
**MAC:** 0013A2004187D78C

Radio Configuration [Coordinator - 0013A2004187D78C]

Read Write Default Update Profile

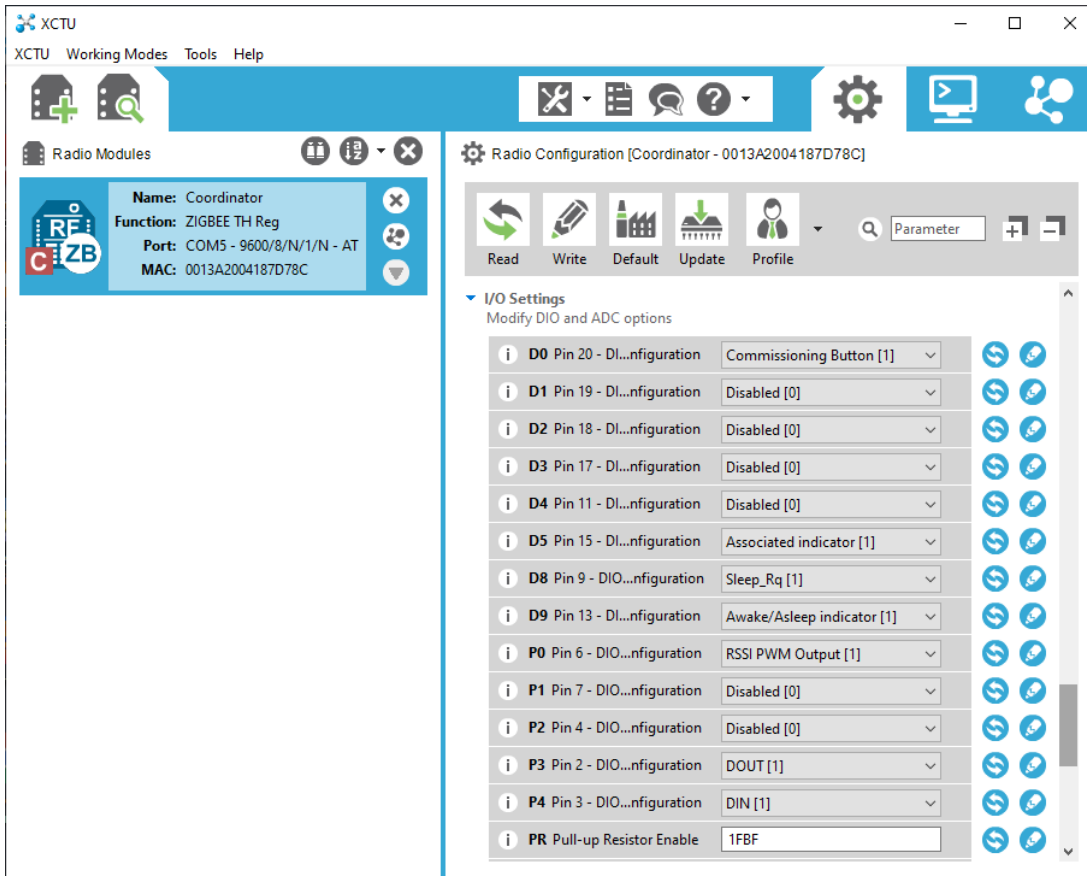
Parameter

**Sleep Modes**  
 Configure low power options to support end device children

SP Cyclic Sleep Period	20 x 10 ms	
SN Number of ...ep Periods	1	
SM Sleep Mode	No Sleep (Router) [0]	
ST Time before Sleep	1388 x 1 ms	
SO Sleep Options	0 Bitfield	
WH Wake Host	0 x 1 ms	
PO Poll Rate	0 x 100 ms	

**I/O Settings**  
 Modify DIO and ADC options

D0 Pin 20 - D...nfiguration	Commissioning Button [1]	
D1 Pin 19 - D...nfiguration	Disabled [0]	
D2 Pin 18 - D...nfiguration	Disabled [0]	
D3 Pin 17 - D...nfiguration	Disabled [0]	
D4 Pin 11 - D...nfiguration	Disabled [0]	

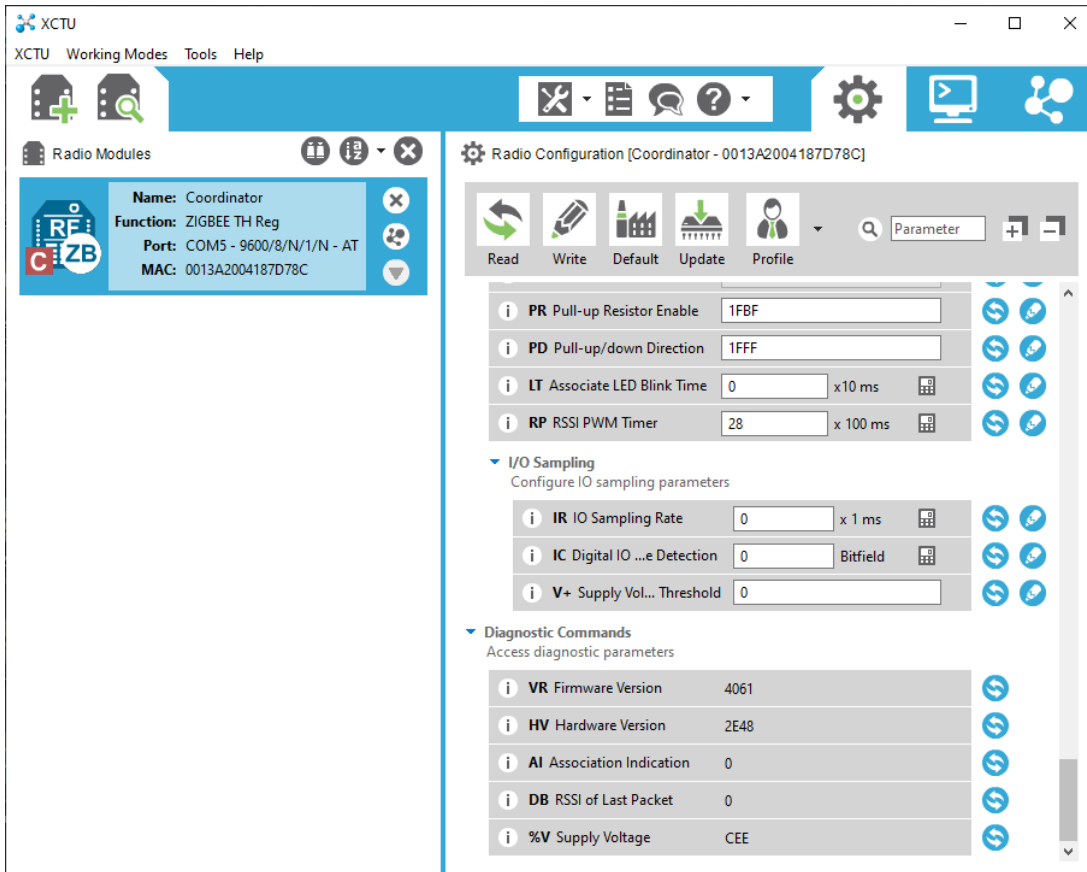


**Radio Configuration [Coordinator - 0013A2004187D78C]**

Read Write Default Update Profile

**I/O Settings**  
 Modify DIO and ADC options

D0 Pin 20 - DI...nfiguration	Commissioning Button [1]	
D1 Pin 19 - DI...nfiguration	Disabled [0]	
D2 Pin 18 - DI...nfiguration	Disabled [0]	
D3 Pin 17 - DI...nfiguration	Disabled [0]	
D4 Pin 11 - DI...nfiguration	Disabled [0]	
D5 Pin 15 - DI...nfiguration	Associated indicator [1]	
D8 Pin 9 - DIO...nfiguration	Sleep_Rq [1]	
D9 Pin 13 - DI...nfiguration	Awake/Asleep indicator [1]	
P0 Pin 6 - DIO...nfiguration	RSSI PWM Output [1]	
P1 Pin 7 - DIO...nfiguration	Disabled [0]	
P2 Pin 4 - DIO...nfiguration	Disabled [0]	
P3 Pin 2 - DIO...nfiguration	DOUT [1]	
P4 Pin 3 - DIO...nfiguration	DIN [1]	
PR Pull-up Resistor Enable	1FBF	



**Radio Configuration [Coordinator - 0013A2004187D78C]**

Read Write Default Update Profile

PR Pull-up Resistor Enable	1FBF	
PD Pull-up/down Direction	1FFF	
LT Associate LED Blink Time	0 x10 ms	
RP RSSI PWM Timer	28 x 100 ms	

**I/O Sampling**  
 Configure IO sampling parameters

IR IO Sampling Rate	0 x 1 ms	
IC Digital IO ...e Detection	0 Bitfield	
V+ Supply Vol... Threshold	0	

**Diagnostic Commands**  
 Access diagnostic parameters

VR Firmware Version	4061	
HV Hardware Version	2E48	
AI Association Indication	0	
DB RSSI of Last Packet	0	
%V Supply Voltage	CEE	

## Configuring the Xbee as End Device/Reveiver

*Update below fields*

1. **ID** PAN ID

PAN ID should be same for all Xbees communicating each other irrespective of Tx or Rx

Eg: 2019

2. **SC** Scan Channels

Scan channel should be same for all Xbee communicating each other irrespective of Tx and Rx

Eg: C

3. **JV** Channel Verification

Set it to **Enable [1]**

4. **CE** Coordinator Enable

Coordinator Enable should be Set to **Didable[0]**

5. **DH** Destination Address High

Set to **0**

6. **DL** Destination Address Low

Set to **0**

7. **NI** Node Identifier

Name of the device, it can be any name.

Eg: EndDevice

8. **BD** Baud Rate

Set to **9600 [3]**

9. **NB** Parity

Set it to **No Parity [0]**

10. **SB** Stop Bits

Set to **One stop bit [0]**

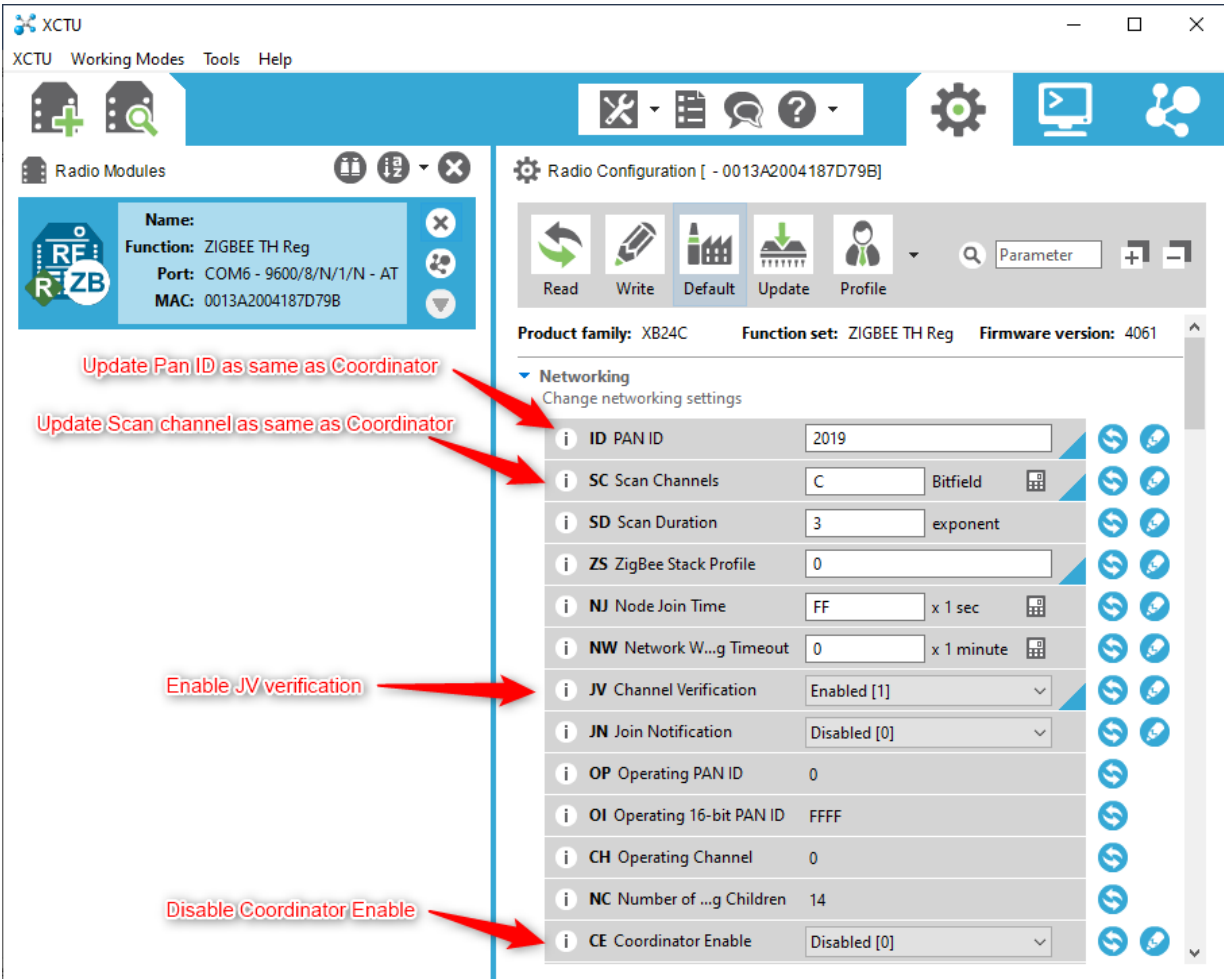
11. **D7** Pin 12 – DIO7/...Configuration

Set to **nCTS flow control [1]**

12. **AP** API Enable

Set to **Transparent mode [0]**

Below are the screenshots of XCTU software configuring Xbee as the receiver/end device



The screenshot shows the XCTU software interface for configuring a radio module. The main window is titled "Radio Configuration [- 0013A2004187D79B]". On the left, a sidebar shows the module details: Name, Function: ZIGBEE TH Reg, Port: COM6 - 9600/8/N/1/N - AT, and MAC: 0013A2004187D79B. The main area displays a list of networking settings for the XB24C module. The settings are as follows:

Parameter	Value
ID PAN ID	2019
SC Scan Channels	C Bitfield
SD Scan Duration	3 exponent
ZS ZigBee Stack Profile	0
NJ Node Join Time	FF x 1 sec
NW Network W...g Timeout	0 x 1 minute
JV Channel Verification	Enabled [1]
JN Join Notification	Disabled [0]
OP Operating PAN ID	0
OI Operating 16-bit PAN ID	FFFF
CH Operating Channel	0
NC Number of ...g Children	14
CE Coordinator Enable	Disabled [0]

Red arrows point to the following settings with labels:

- Update Pan ID as same as Coordinator (points to ID PAN ID)
- Update Scan channel as same as Coordinator (points to SC Scan Channels)
- Enable JV verification (points to JV Channel Verification)
- Disable Coordinator/Enable (points to CE Coordinator Enable)

**Radio Configuration [ Enddevice - 0013A2004187D79B ]**

Addressing  
 Change addressing settings

SH Serial Number High	13A200
SL Serial Number Low	4187D79B
MY 16-bit Network Address	FFFE
MP 16-bit Parent Address	FFFE
DH Destination...dress High	0
DL Destination Address Low	0
NI Node Identifier	Enddevice
NH Maximum Hops	1E
BH Broadcast Radius	0
AR Many-to-On...dcast Time	FF x 10 sec
DD Device Type Identifier	A0000
NO Node Discovery Options	0
NP Maximum N...ion Bytes	54

Update DH and DL to 0

Update Node Identifier to Enddevice

**Radio Configuration [ Enddevice - 0013A2004187D79B ]**

Serial Interfacing  
 Change modem interfacing options

BD Baud Rate	9600 [3]
NB Parity	No Parity [0]
SB Stop Bits	One stop bit [0]
RO Packetization Timeout	3 x chara...r times
D6 Pin 16 - DL...nfiguration	Disable [0]
D7 Pin 12 - DL...nfiguration	nCTS flow control [1]
AP API Enable	Transparent mode [0]
AO API Output Mode	Native [0]