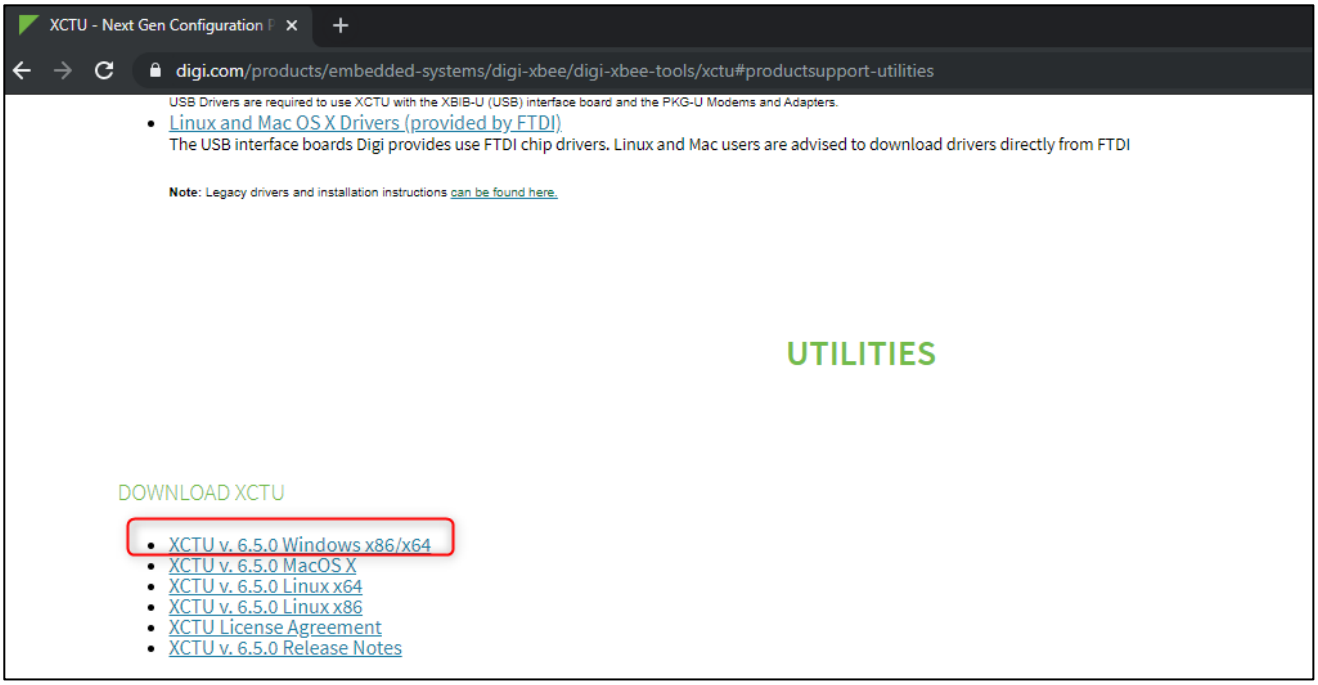
Note: This document is a pictorial guide to install XCTU software in windows up to configuring the Xbee modules accordingly. XCTU is a free software provided by Digi to configure and test Xbee modules.

Sections:

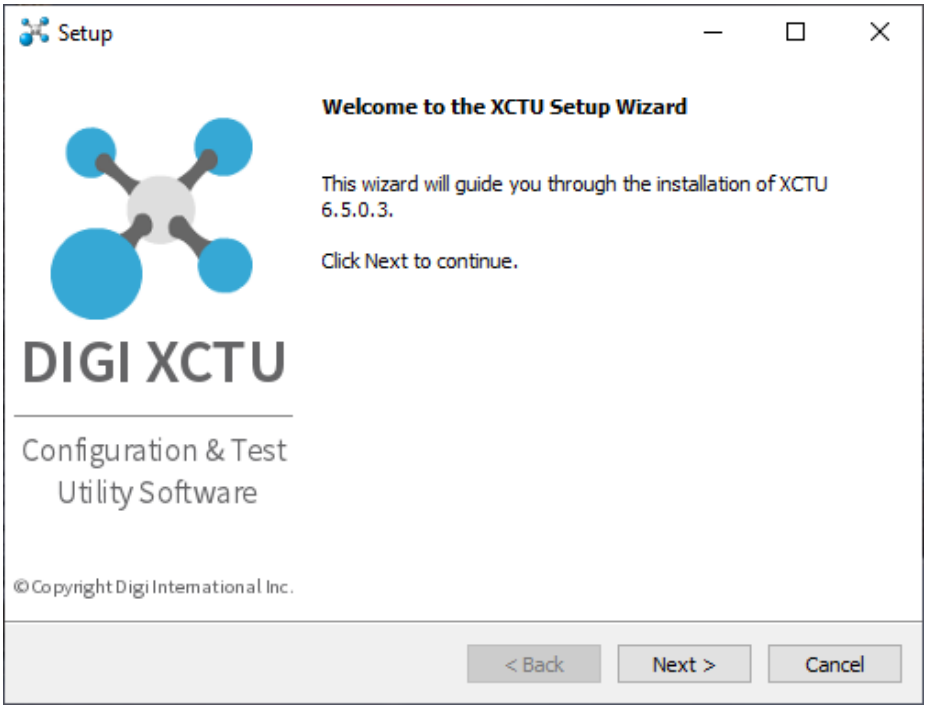
- Download XCTU software, Driver for Xbee and installing: steps 1 to 9
- Detecting the Xbee device in the XCTU software and updating the firmware of the Xbee: steps 10 to 22
- Configuring the Xbee as Transmitter
- Configuring the Xbee as Receiver

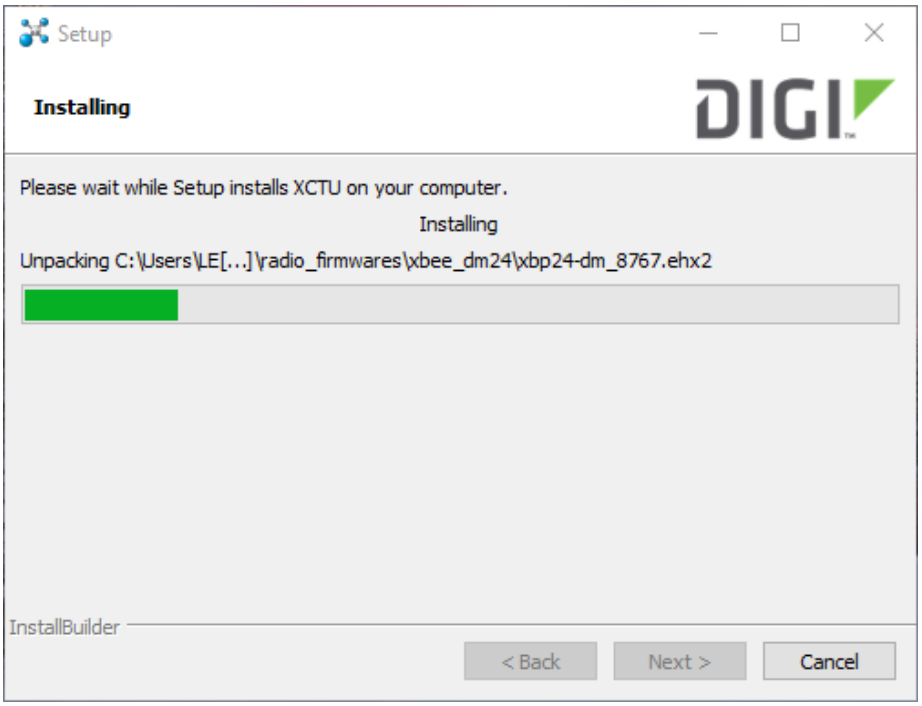
Contents:

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)

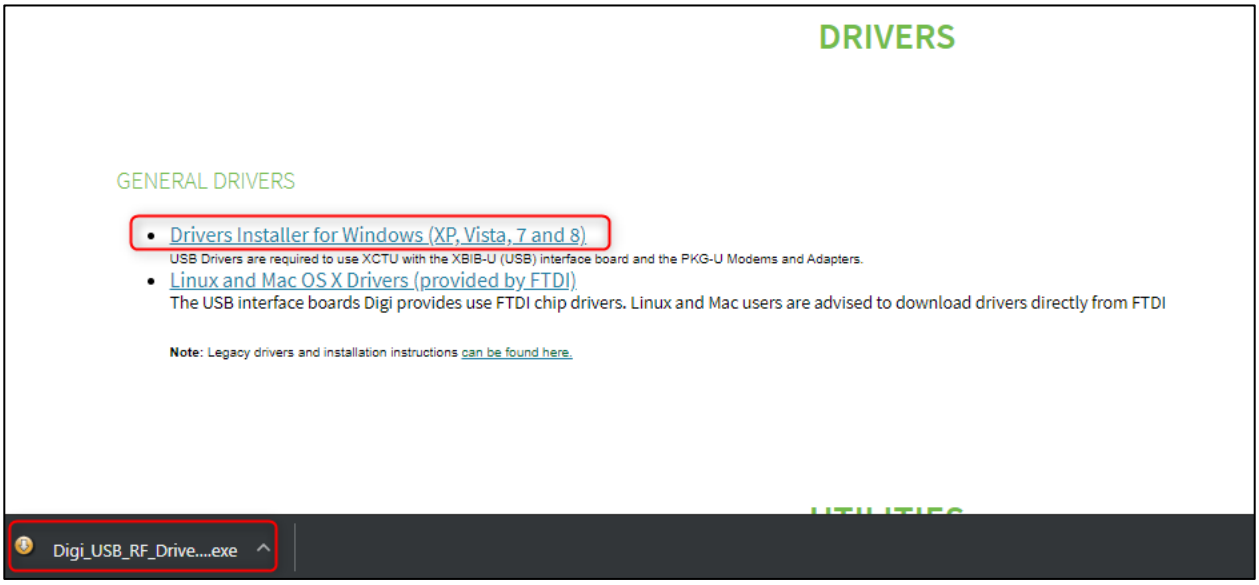


2. Install XCTU software

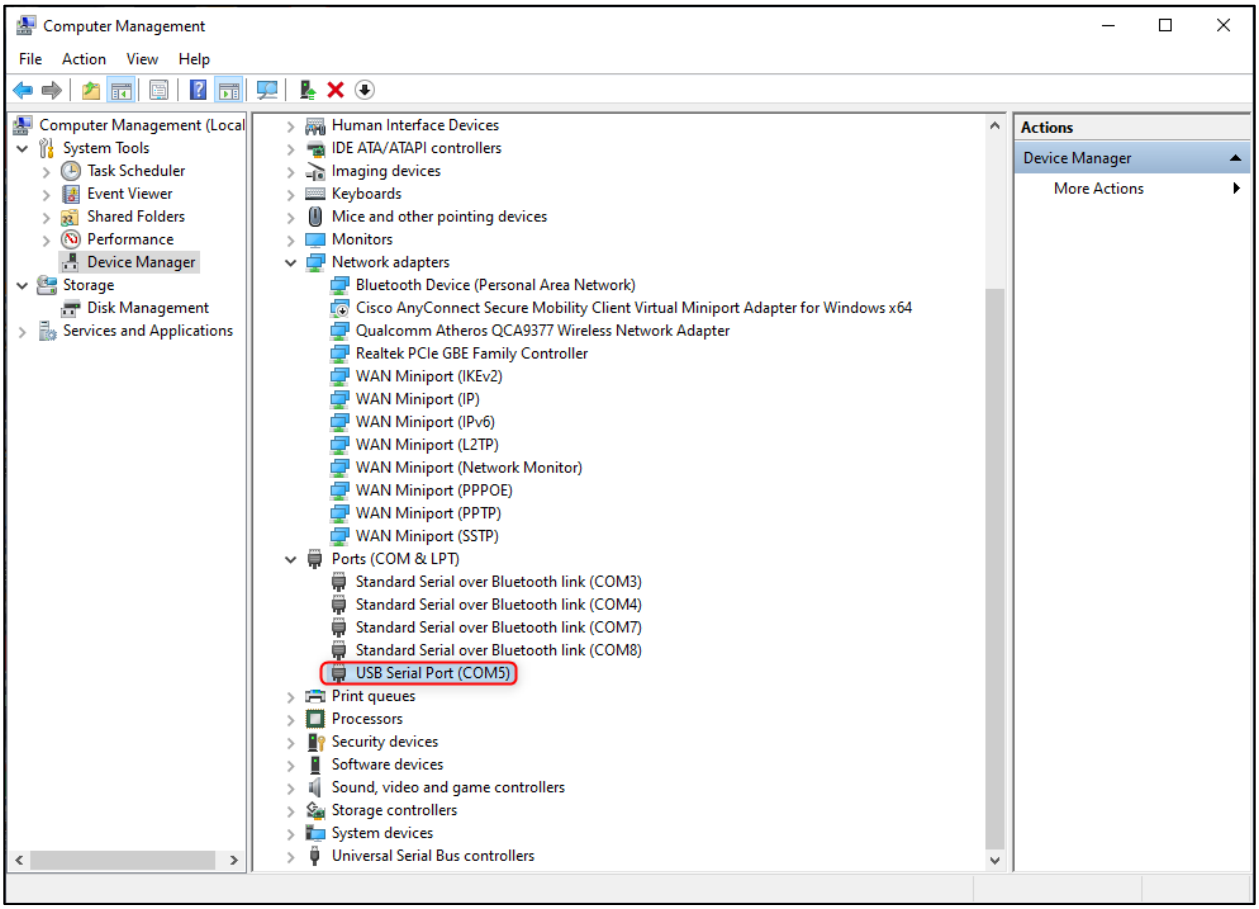




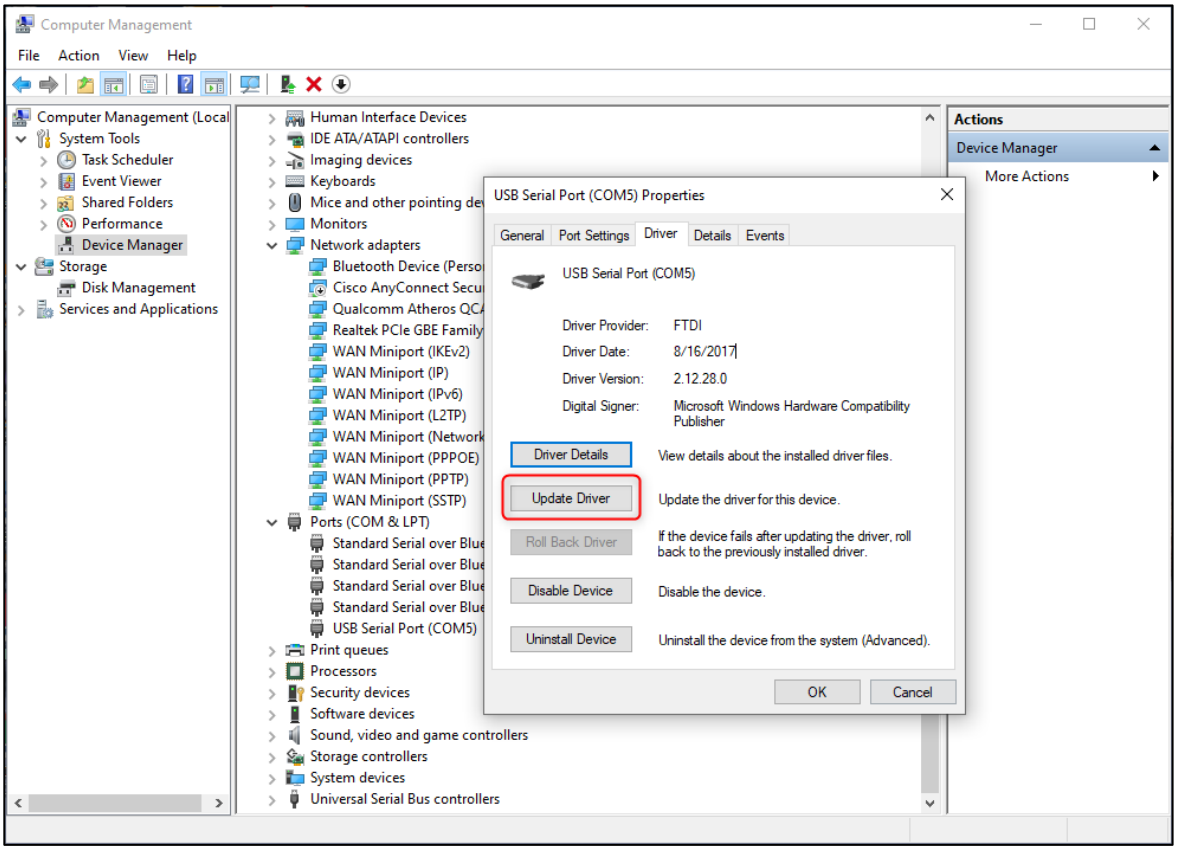
3. Download Driver from the same above link



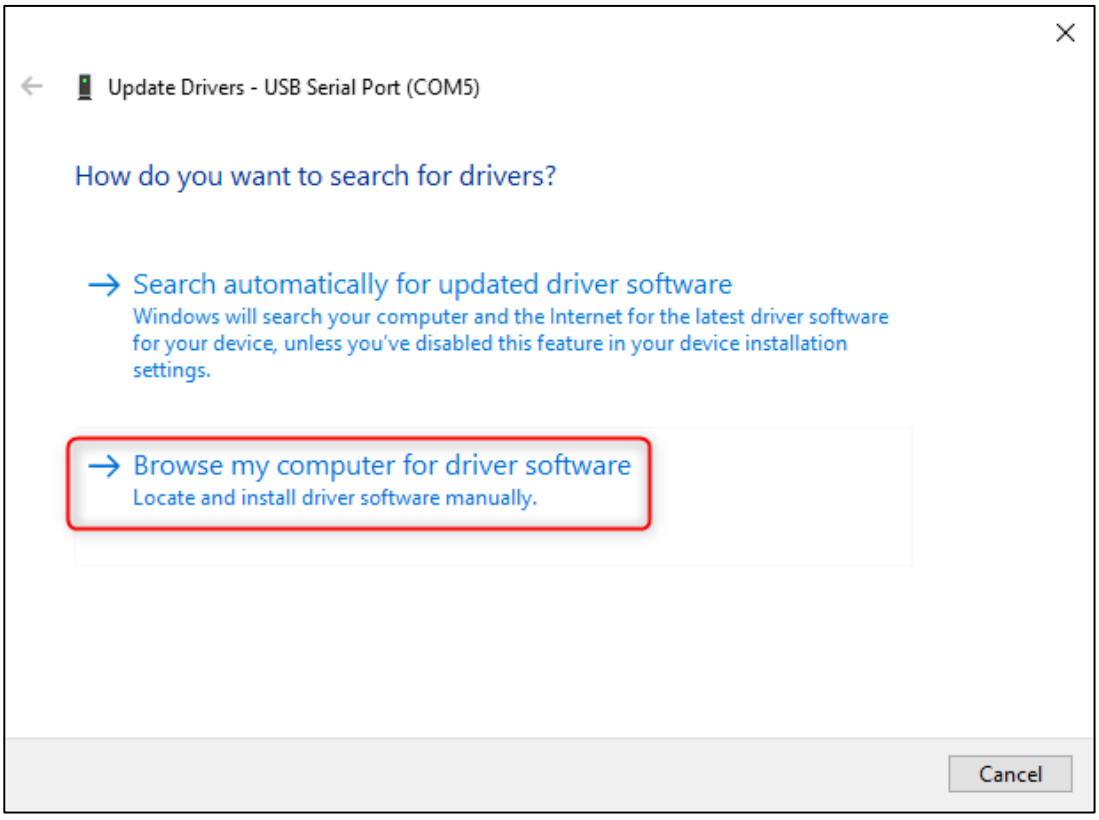
4. Connect XCTU to the PC then open device manager and open the serial port connected with the Xbee



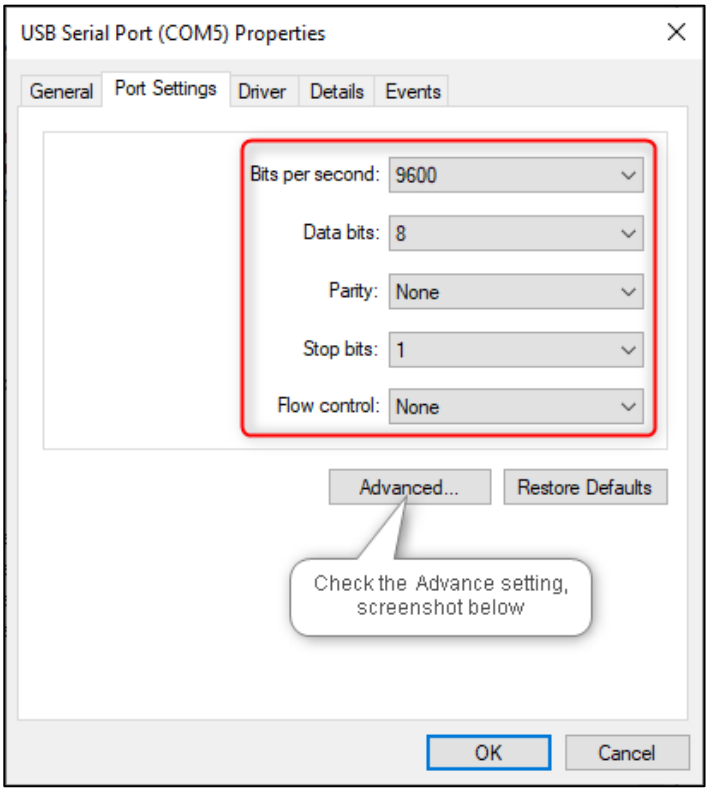
5. Update the driver



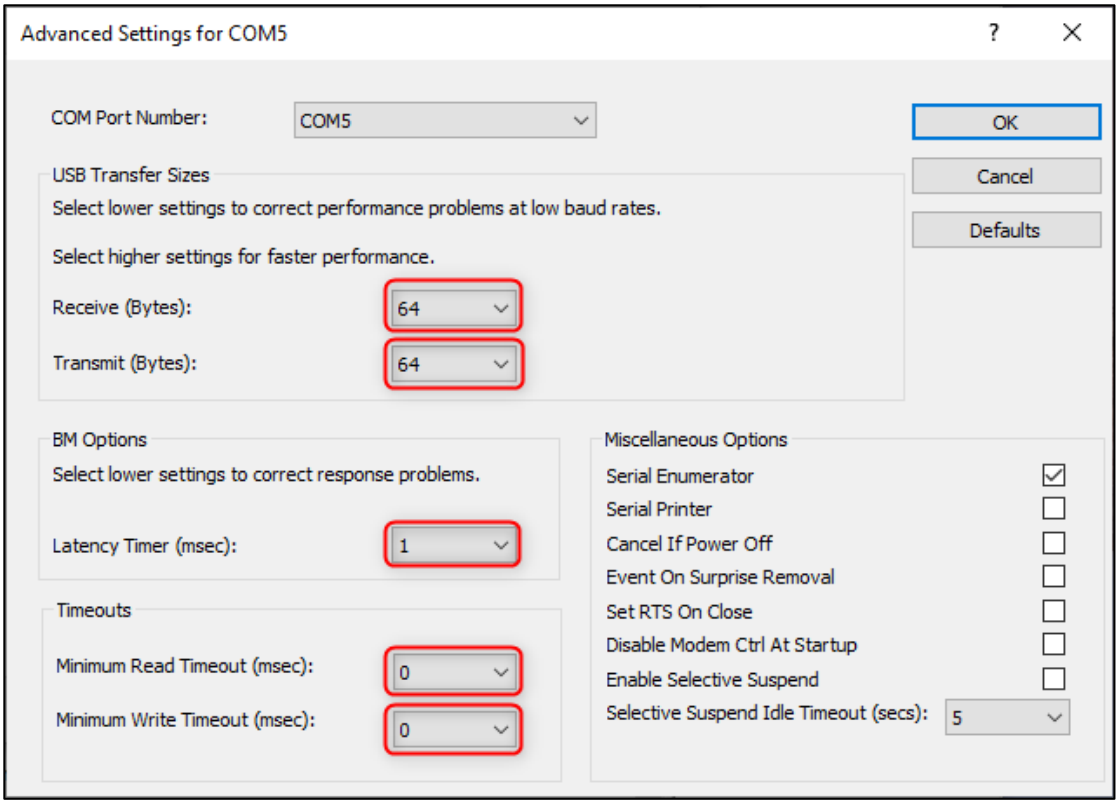
6. Browse the folder to select the driver downloaded above



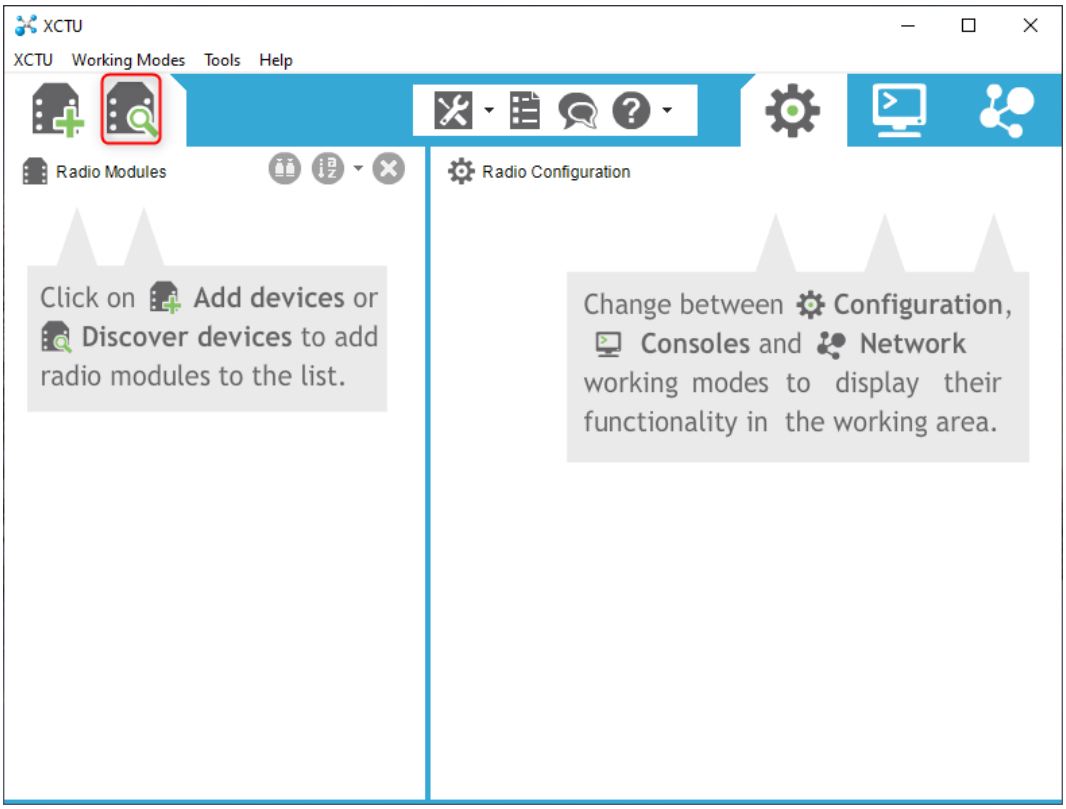
7. After updating the driver check the port setting



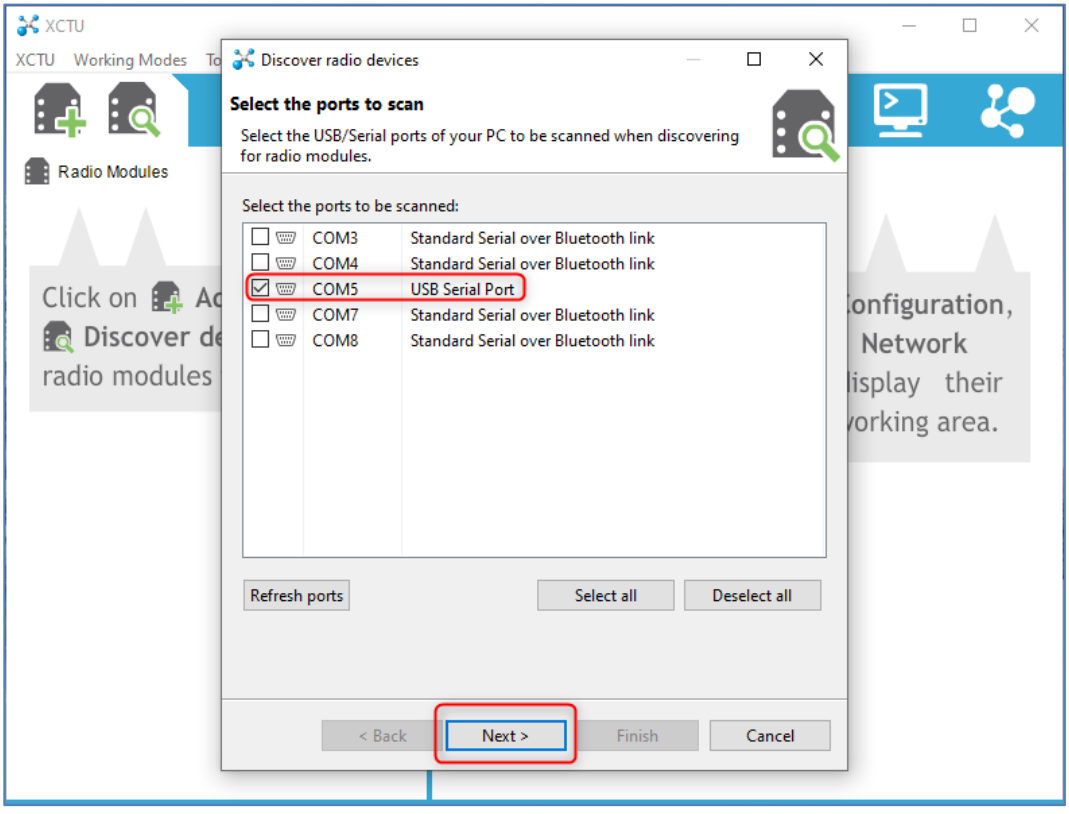
8. Then check the Advanced settings



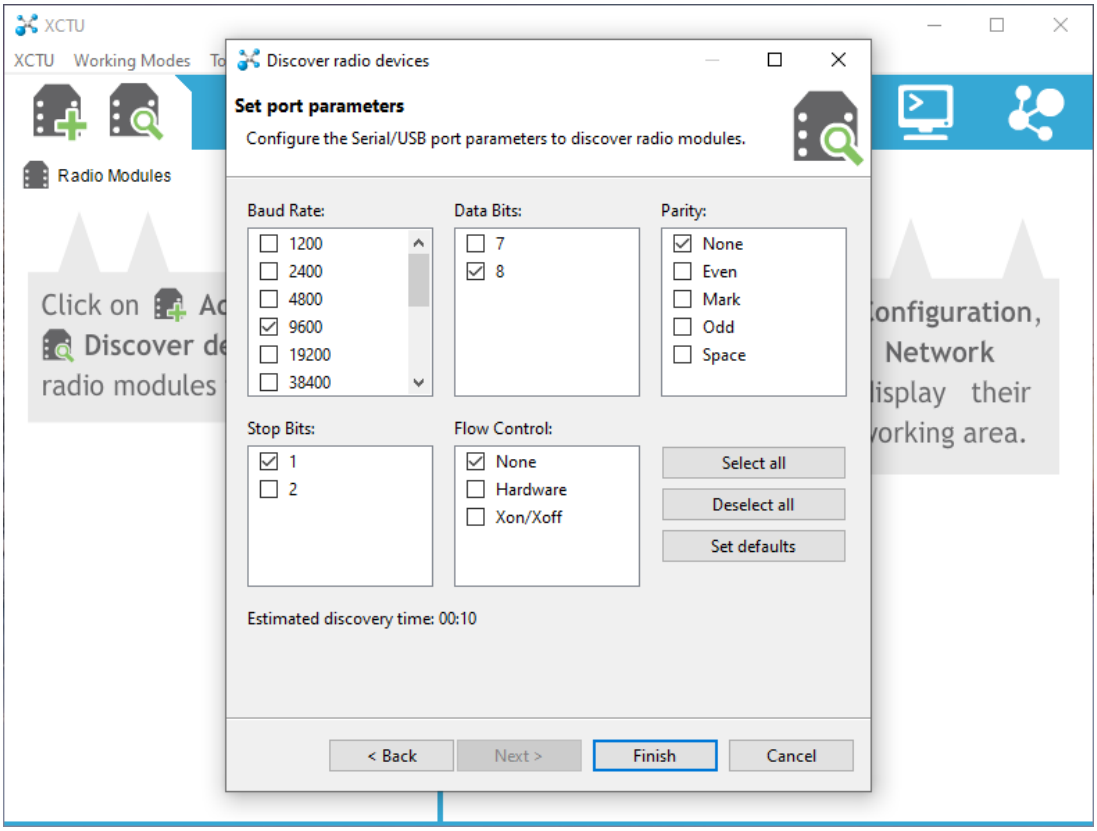
9. Now the software installation is complete. The Xbee module can be connected to the PC
10. Now let us see how to detect the device in XCTU. Open XCTU software and search for the device

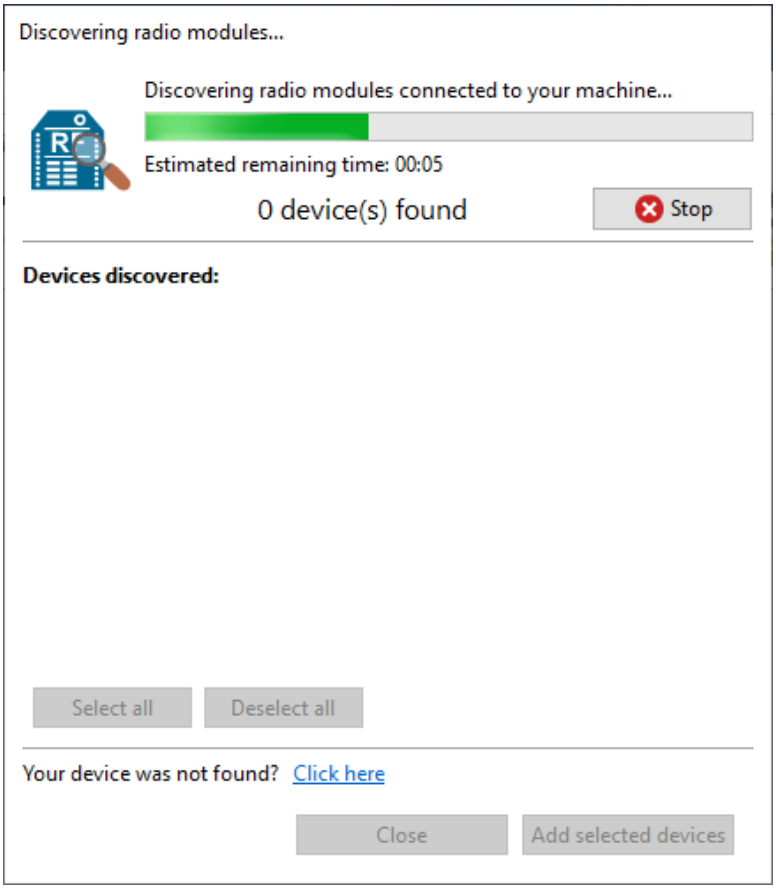


11. Select the serial port where Xbee is connected

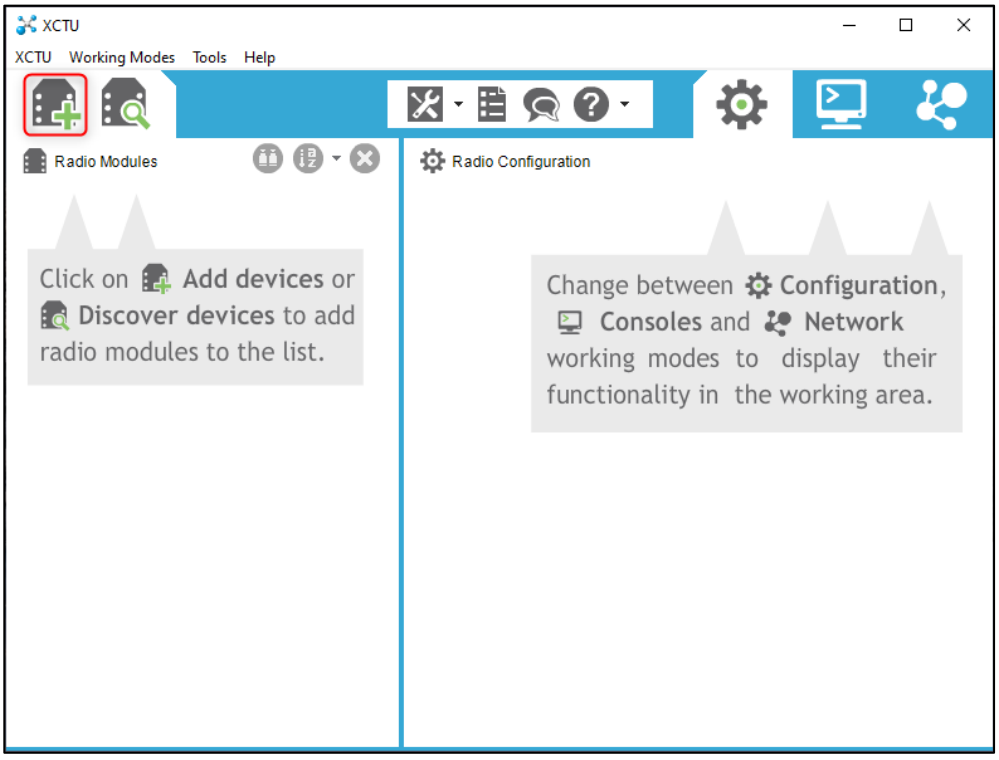


12. Click next and select below settings and then finish to find the device

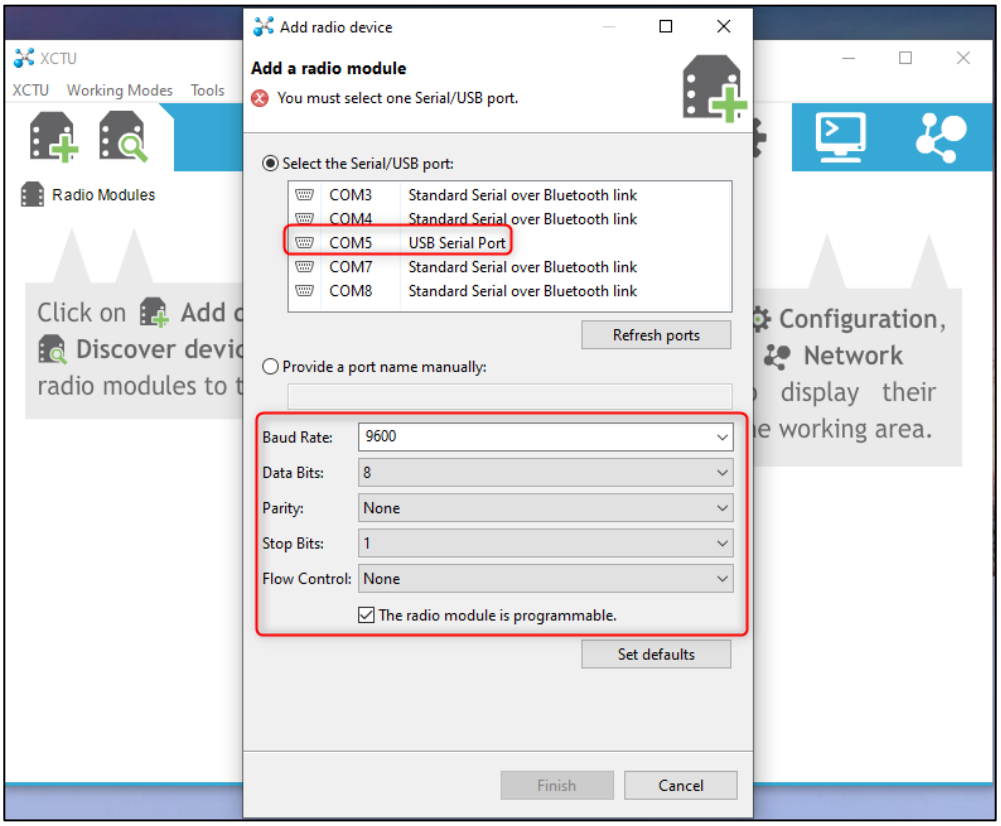




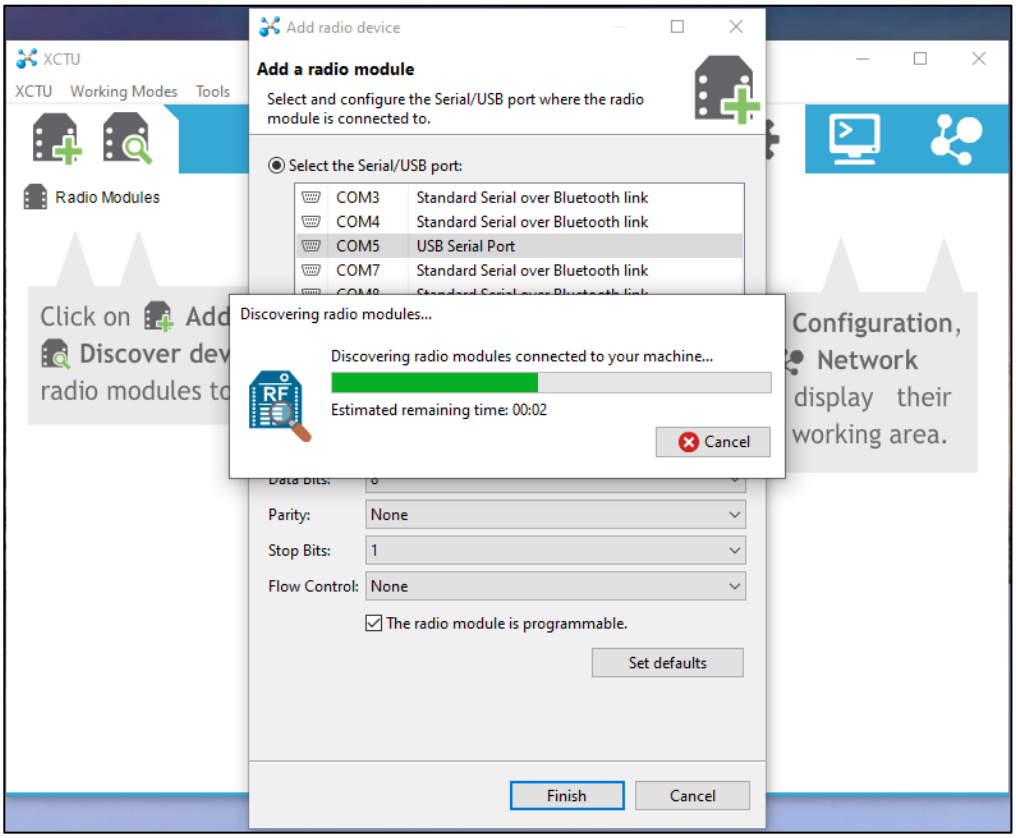
13. If not found try adding the device with the Add radio module option



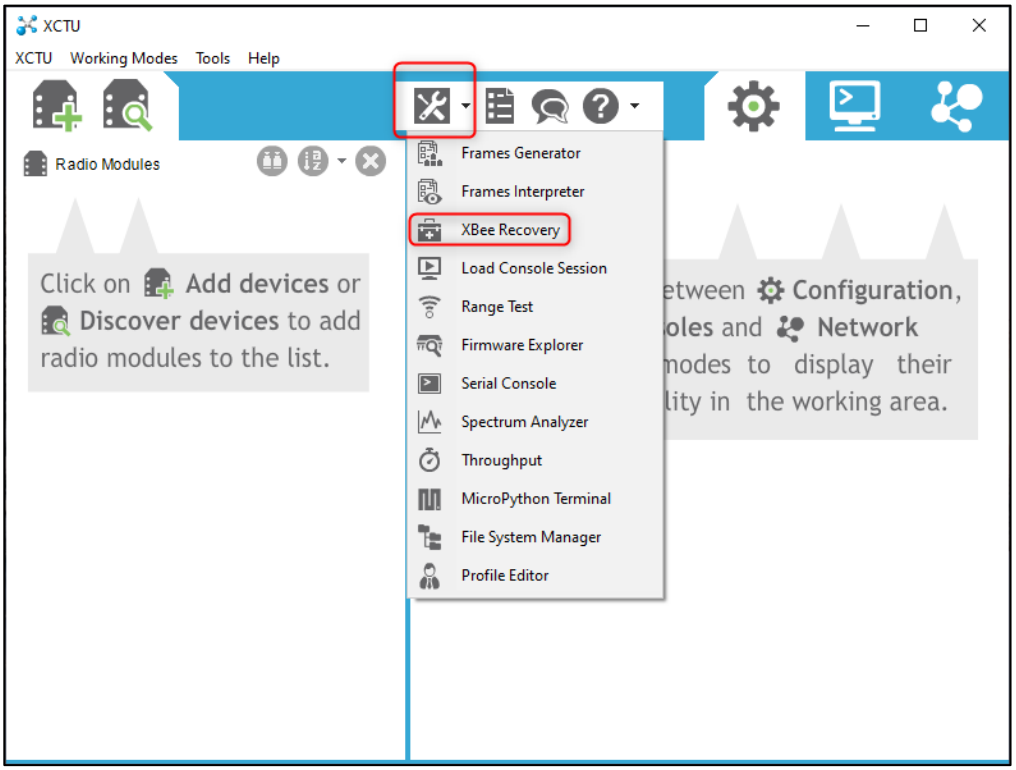
14. Select the corresponding Serial port and ensure the settings as in the screenshot, please make sure the box is ticked since the module is programmable



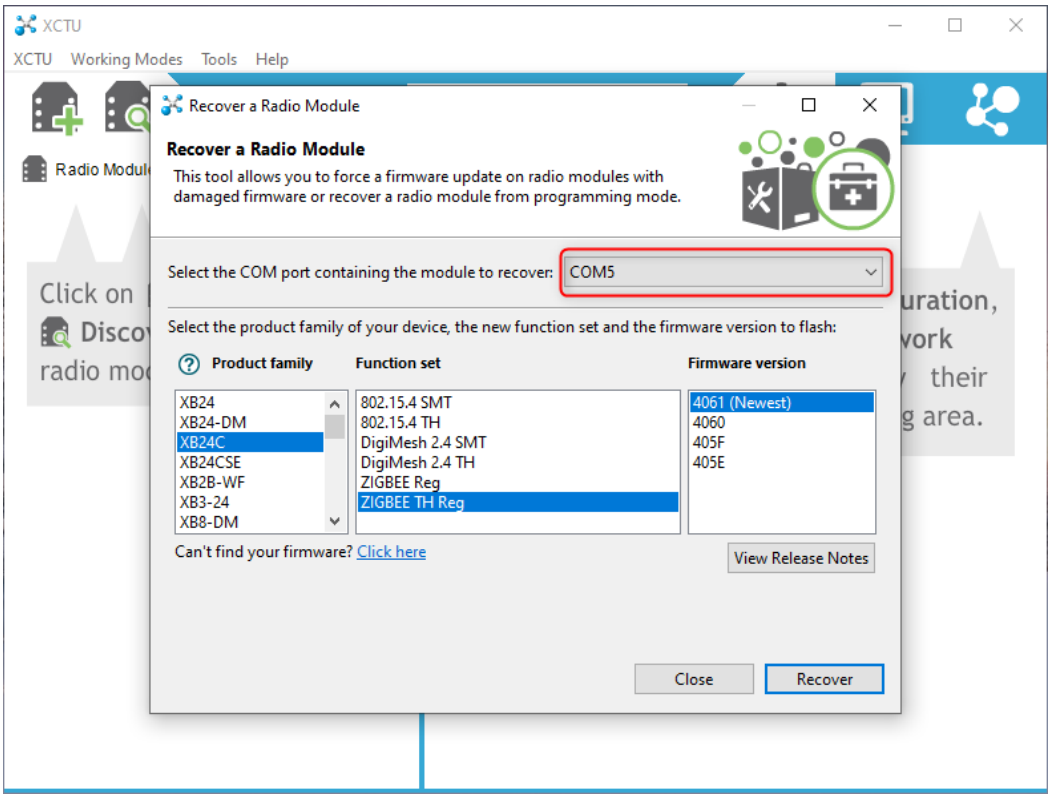
15. Click Finish and wait for the device to get connected



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)

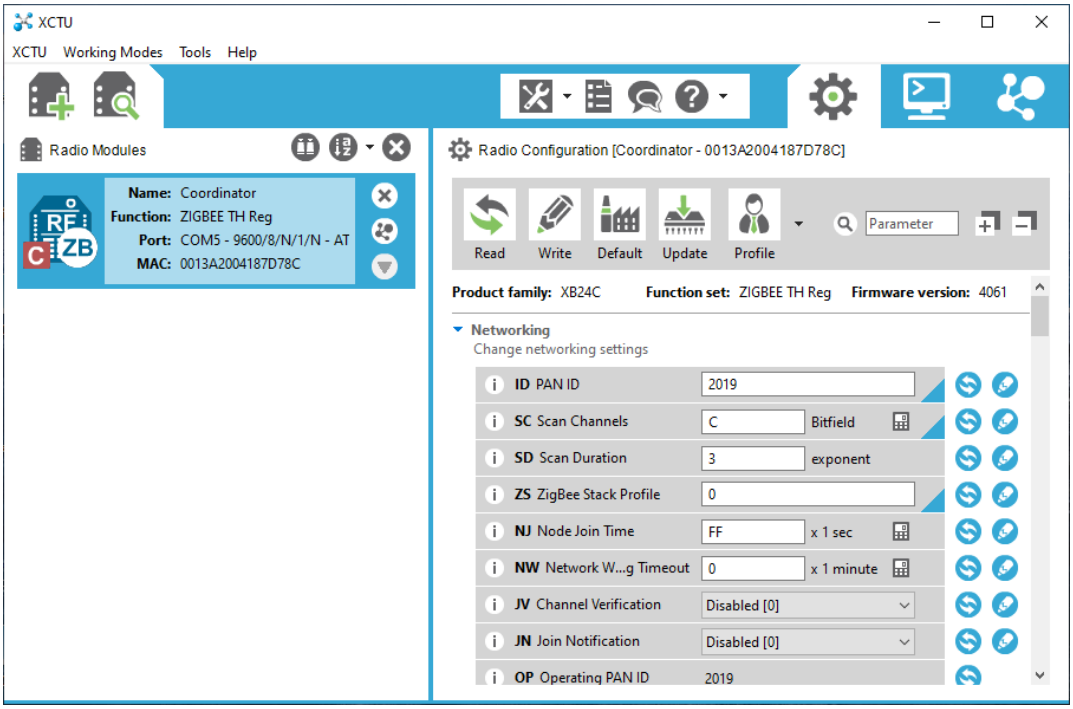


17. Then Choose the corresponding serial port with Xbee connected and select the firmware as in the screenshot

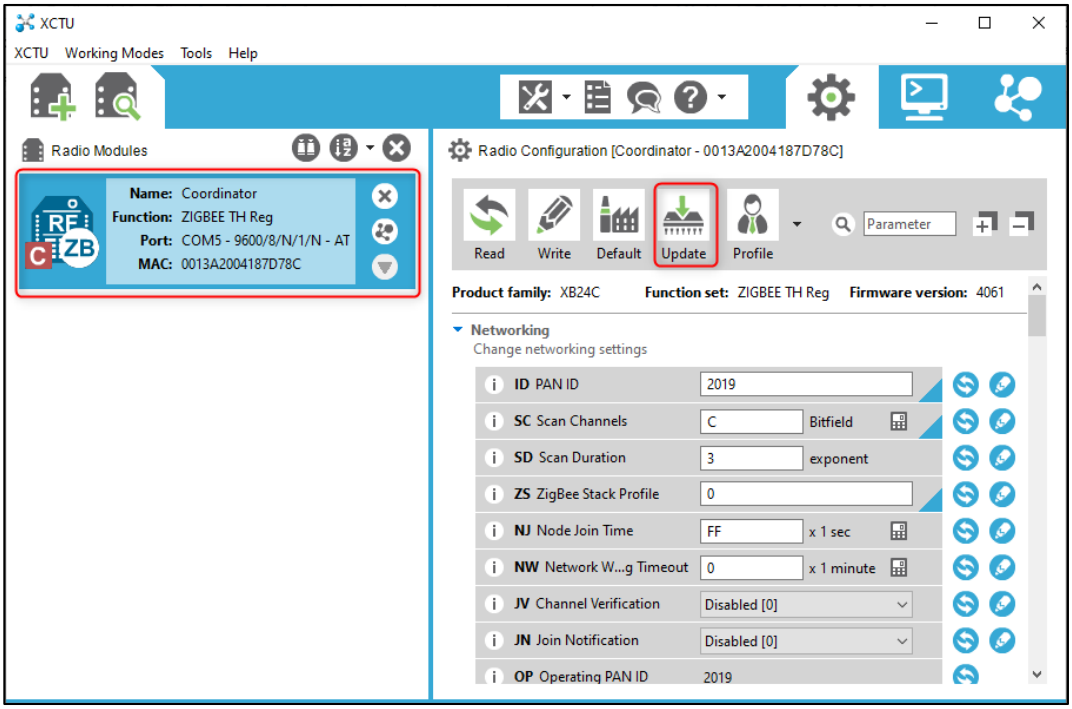


18. Wait for dialog box indicating successful update of firmware
19. Then repeat the steps 13 to 15 accordingly

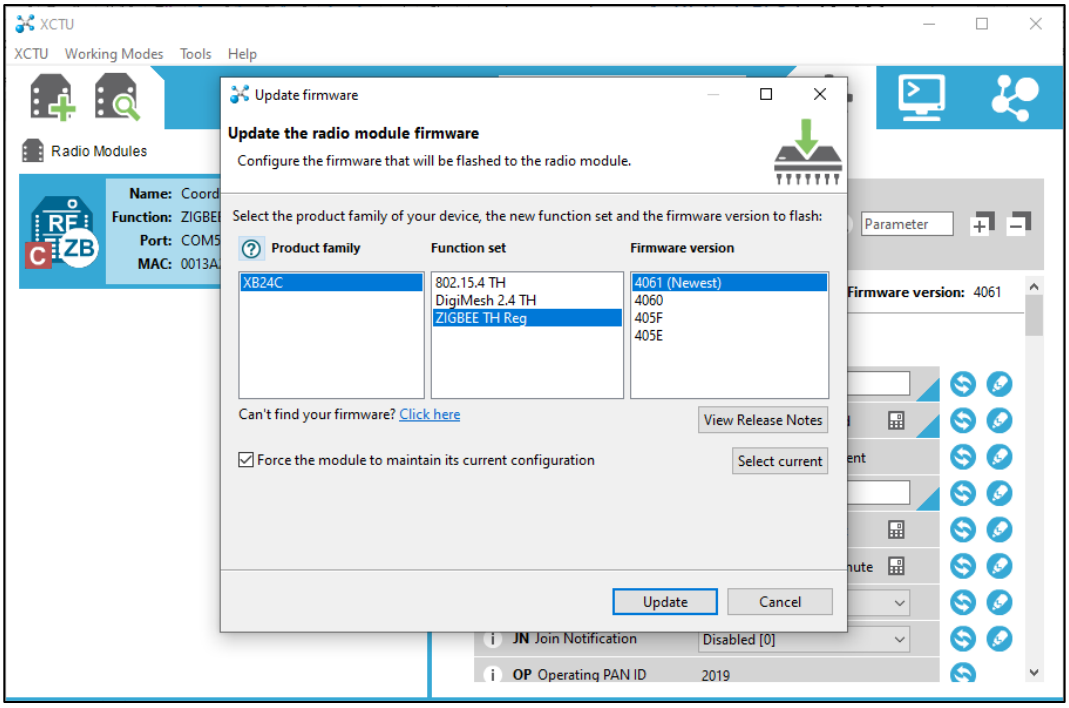
20. Once the device is recognized by XCTU then it will appear like in below screenshot



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]**

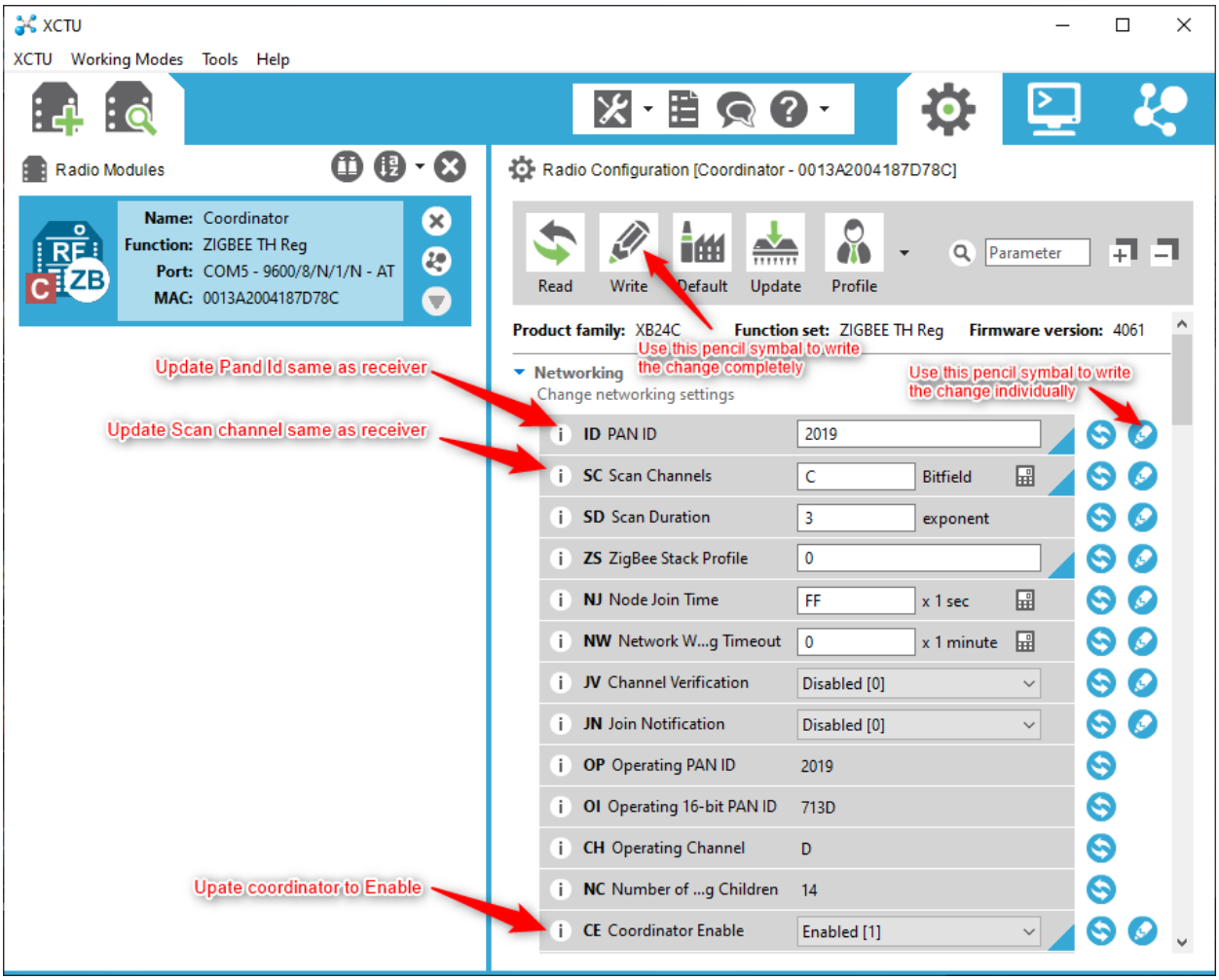
10. **D7** Pin 12 – DIO7/…Configuration

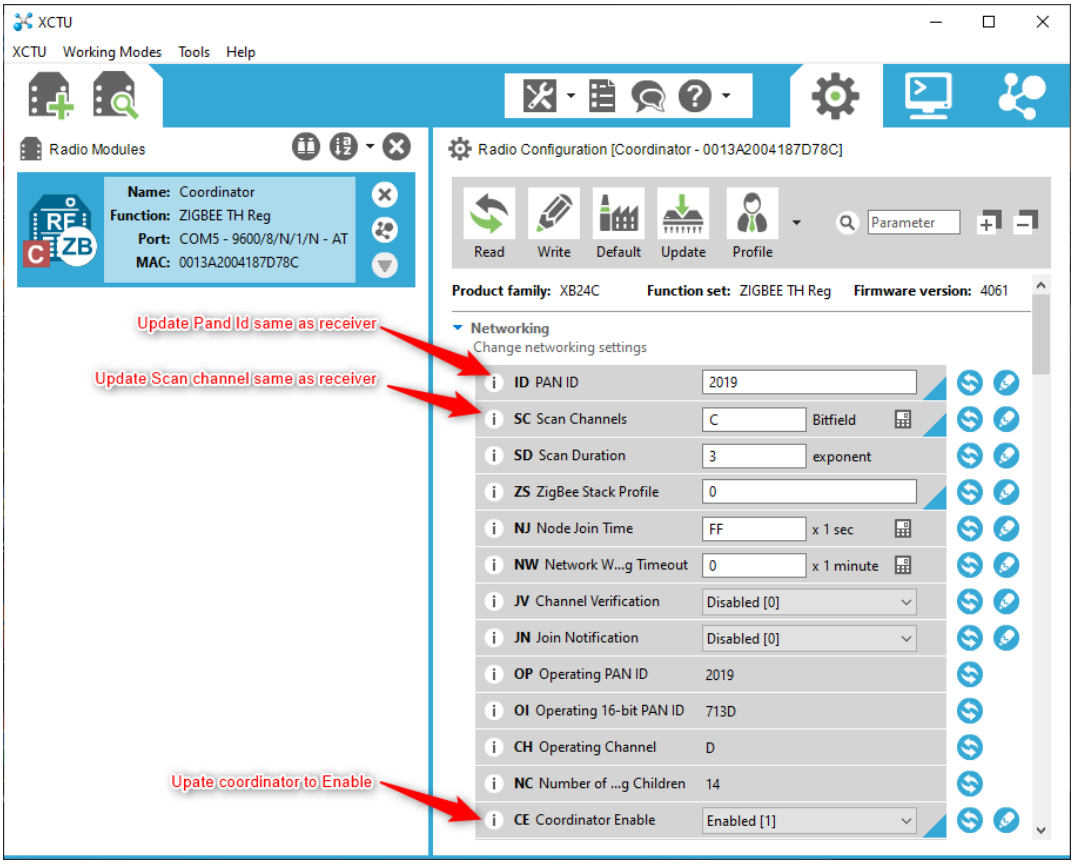
    Set to **nCTS flow control [1]**

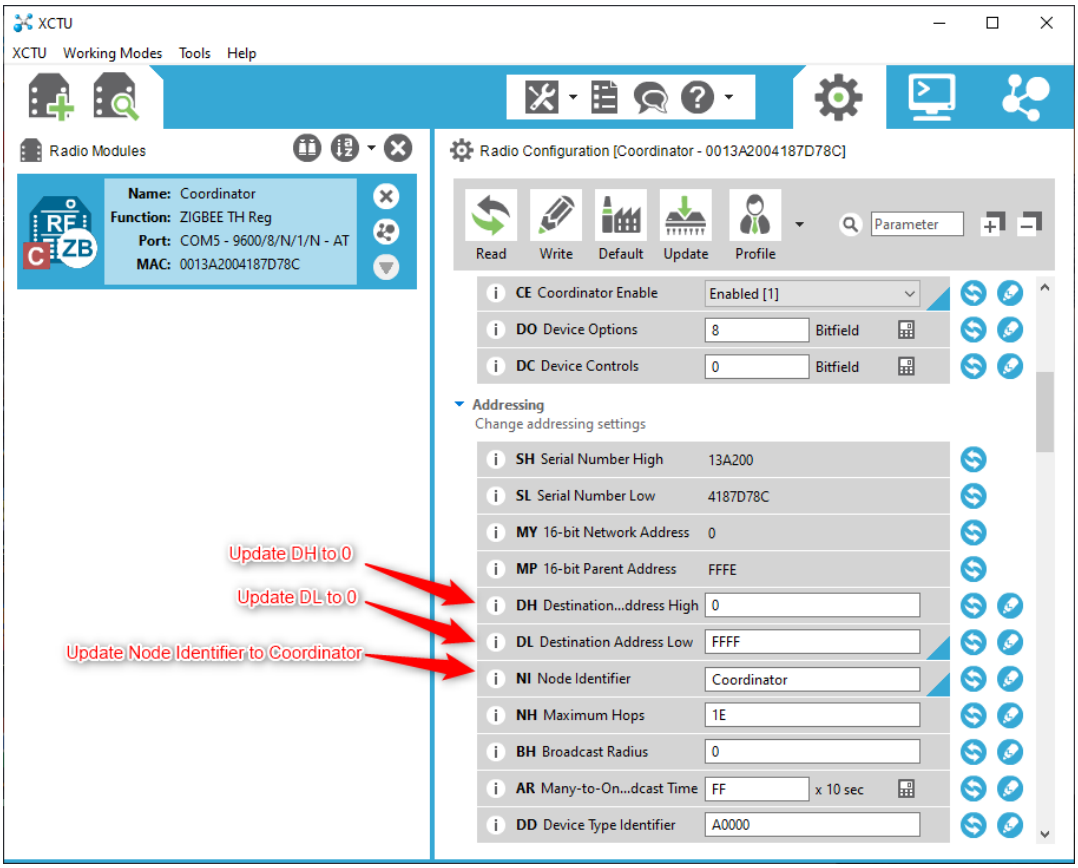
11. **AP** API Enable

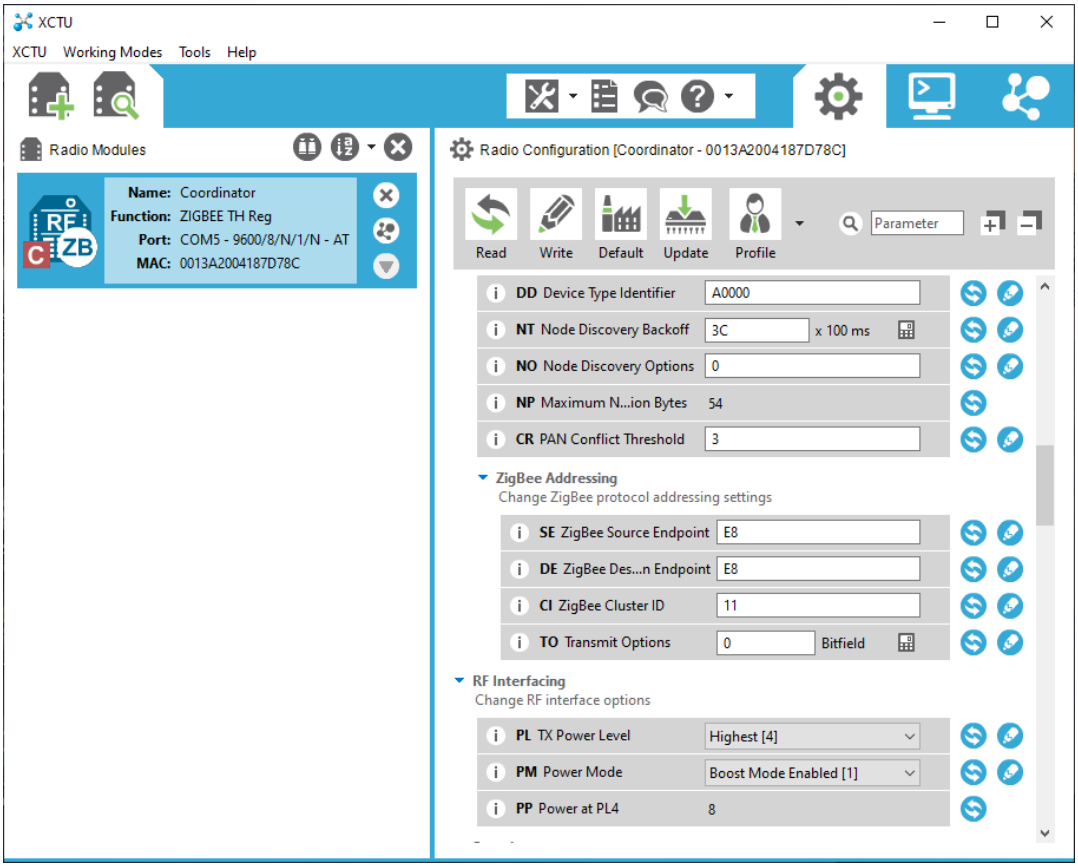
    Set to **Transparent mode [0]**

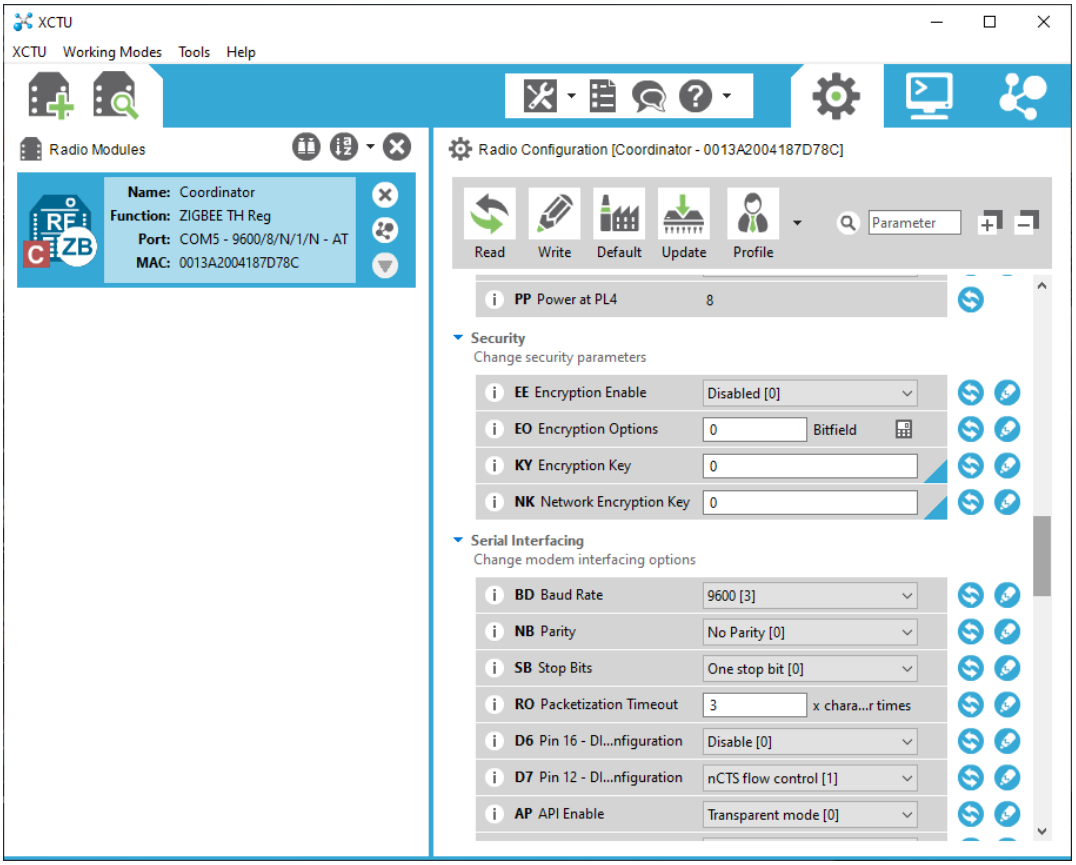
Below are the screenshots of XCTU software configuring Xbee as a transmitter/ coordinator




XCTU
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
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]
Update Pand Id same as receiver
Update Scan channel same as receiver
Upate coordinator to Enable


XCTU
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
CE Coordinator Enable Enabled [1]
DO Device Options 8 Bitfield
DC Device Controls 0 Bitfield
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...ddress 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
Update DH to 0
Update DL to 0
Update Node Identifier to Coordinator


XCTU
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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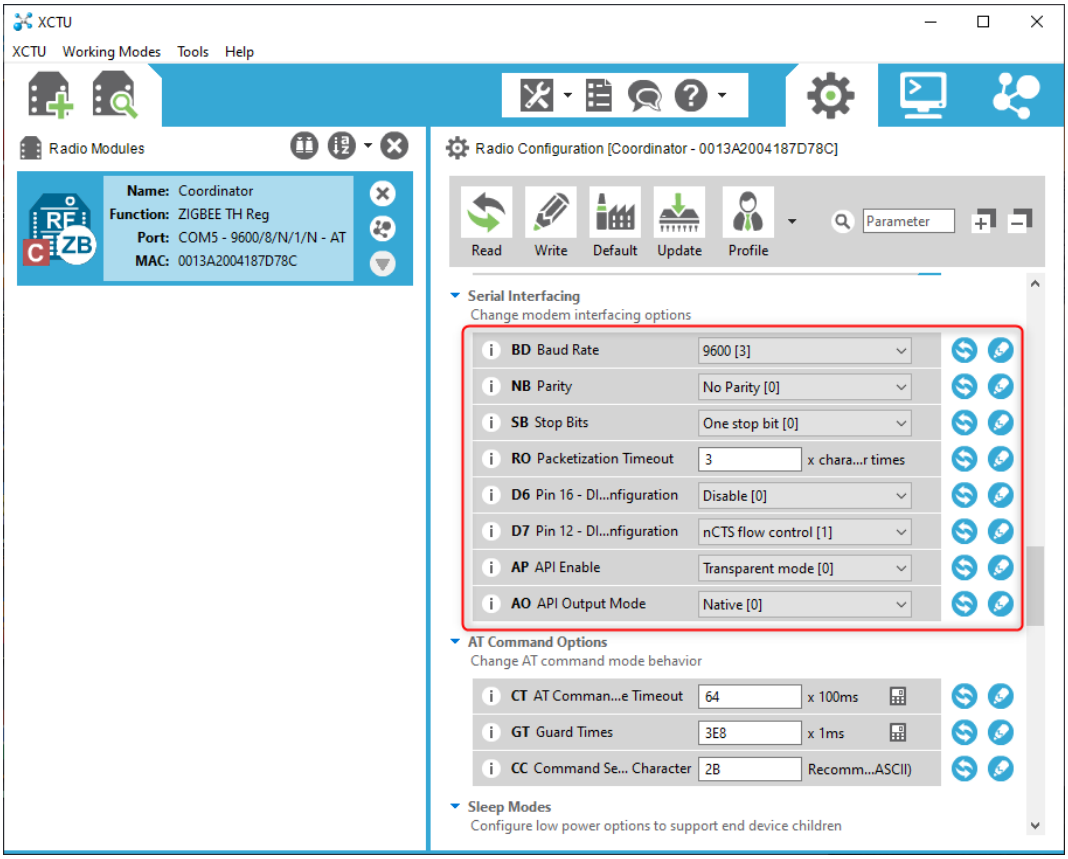
Function: ZIGBEE TH Reg
Port: COM5 - 9600/8/N/1/N - AT
MAC: 0013A2004187D78C
Radio Configuration [Coordinator - 0013A2004187D78C]
Read
Write
Default
Update
Profile
Parameter
PP Power at PL4 8
Security
Change security parameters
EE Encryption Enable Disabled [0]
EO Encryption Options 0 Bitfield
KY Encryption 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]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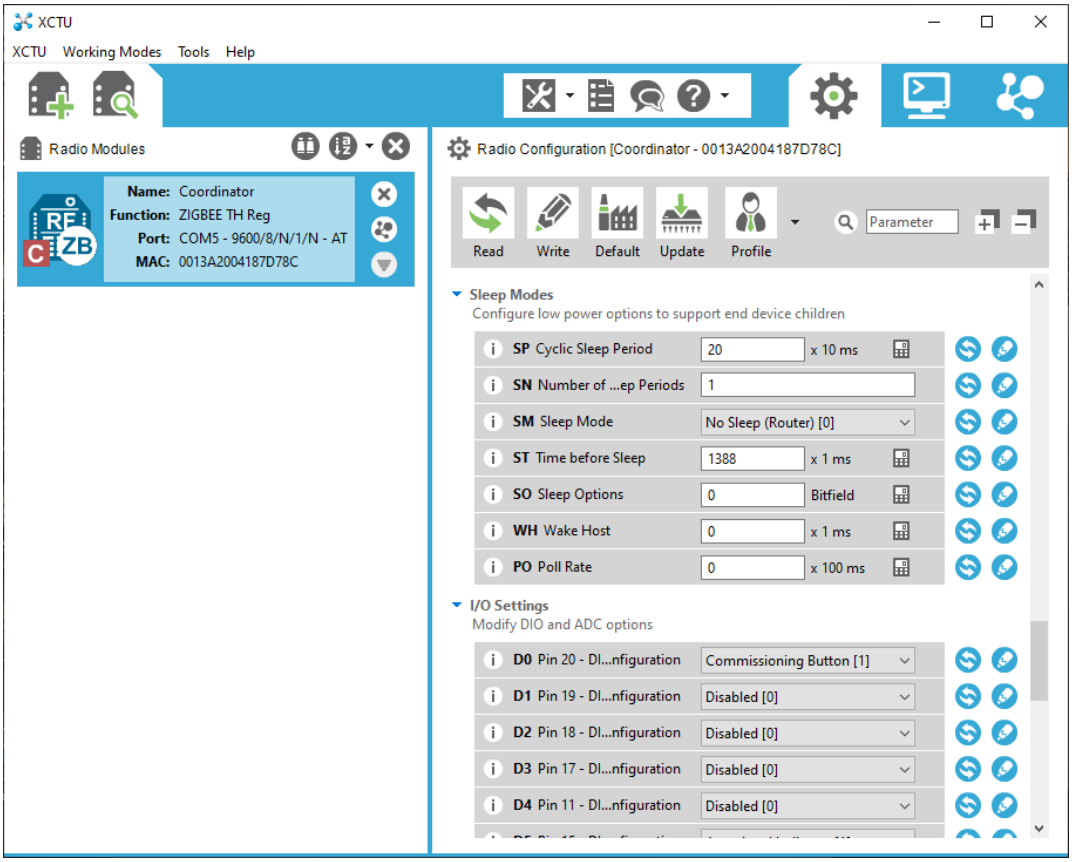
XCTU Working Modes Tools Help
Radio Modules
Name: Coordinator
Function: ZIGBEE TH Reg
Port: COM5 - 9600/8/N/1/N - AT
MAC: 0013A2004187D78C
Radio Configuration [Coordinator - 0013A2004187D78C]
Read
Write
Default
Update
Profile
Parameter
Serial Interfacing
Change modem interfacing options
BD Baud Rate 9600 [3]
NB Parity No Parity [0]
SB Stop Bits One stop bit [0]
RO Packetization Timeout 3 x 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]
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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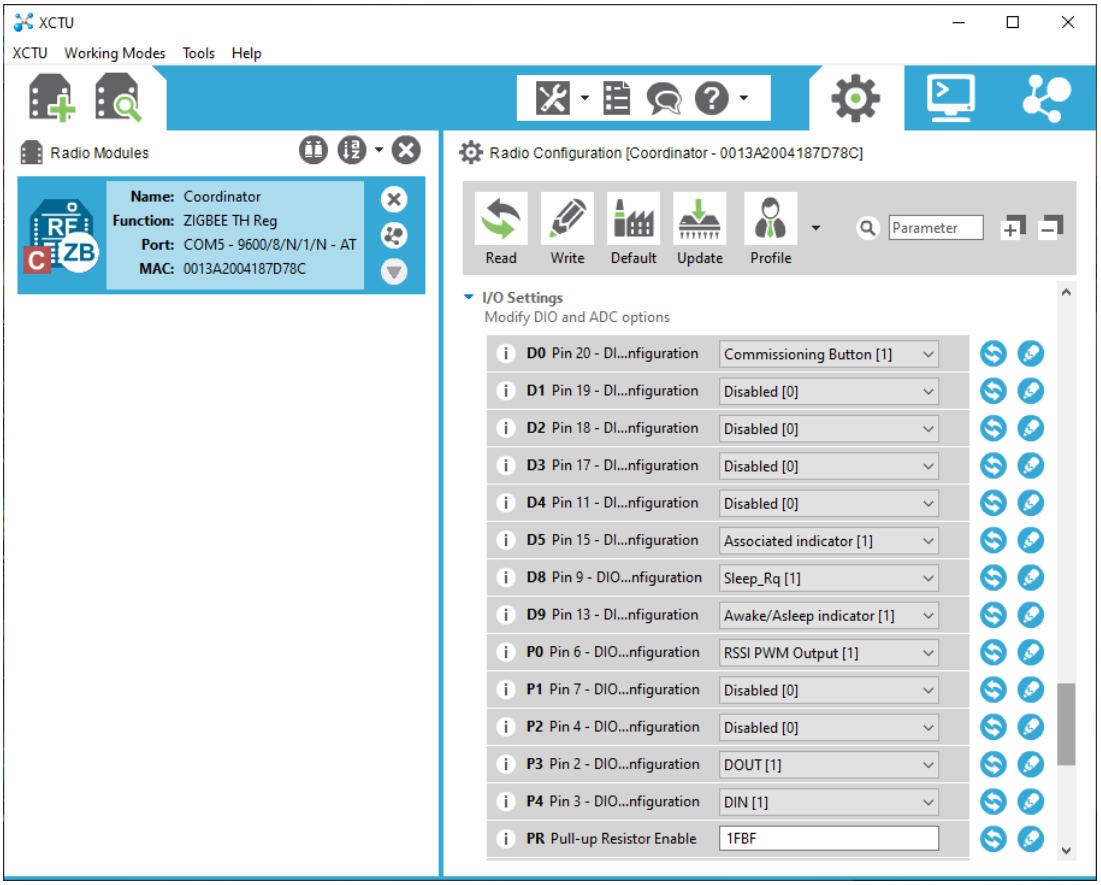
XCTU Working Modes Tools Help
Radio Modules
Name: Coordinator
Function: ZIGBEE TH Reg
Port: COM5 - 9600/8/N/1/N - AT
MAC: 0013A2004187D78C
Radio Configuration [Coordinator - 0013A2004187D78C]
Read
Write
Default
Update
Profile
Parameter
Sleep Modes
Configure low power options to support end device children
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 - 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]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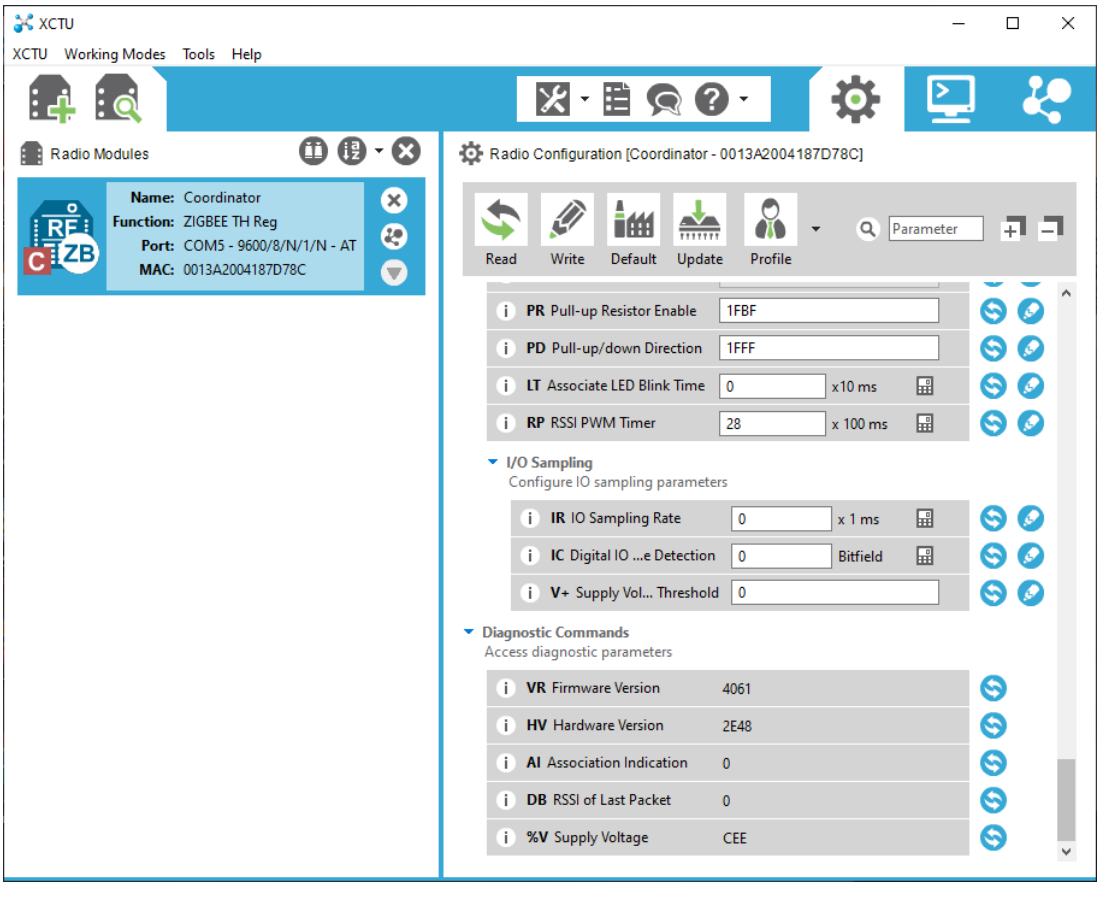
XCTU Working Modes Tools Help
Radio Modules
Name: Coordinator
Function: ZIGBEE TH Reg
Port: COM5 - 9600/8/N/1/N - AT
MAC: 0013A2004187D78C
Radio Configuration [Coordinator - 0013A2004187D78C]
Read
Write
Default
Update
Profile
Parameter
I/O Settings
Modify DIO and ADC options
D0 Pin 20 - DI...nfiguration 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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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
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]**

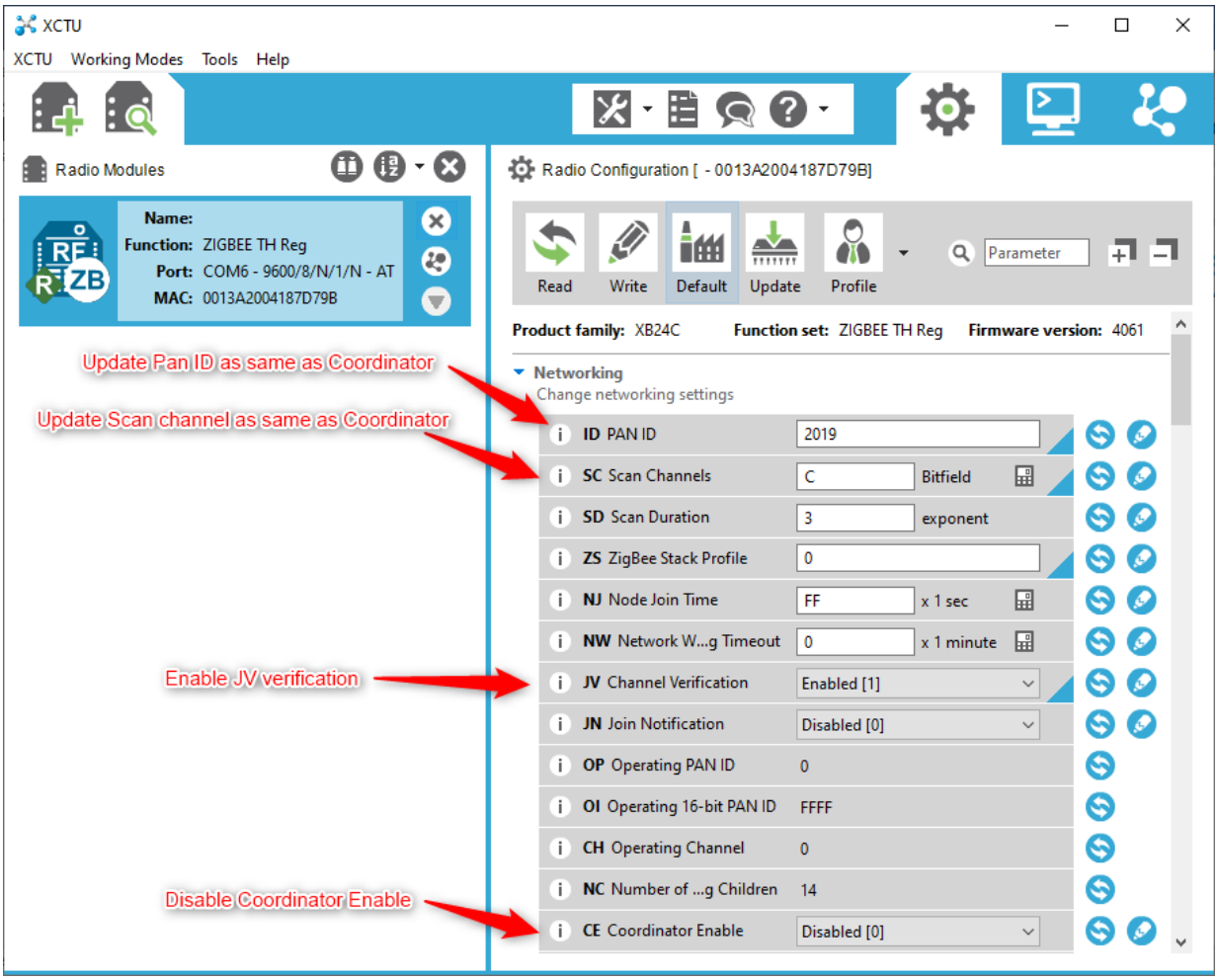
11. **D7** Pin 12 – DIO7/…Configuration

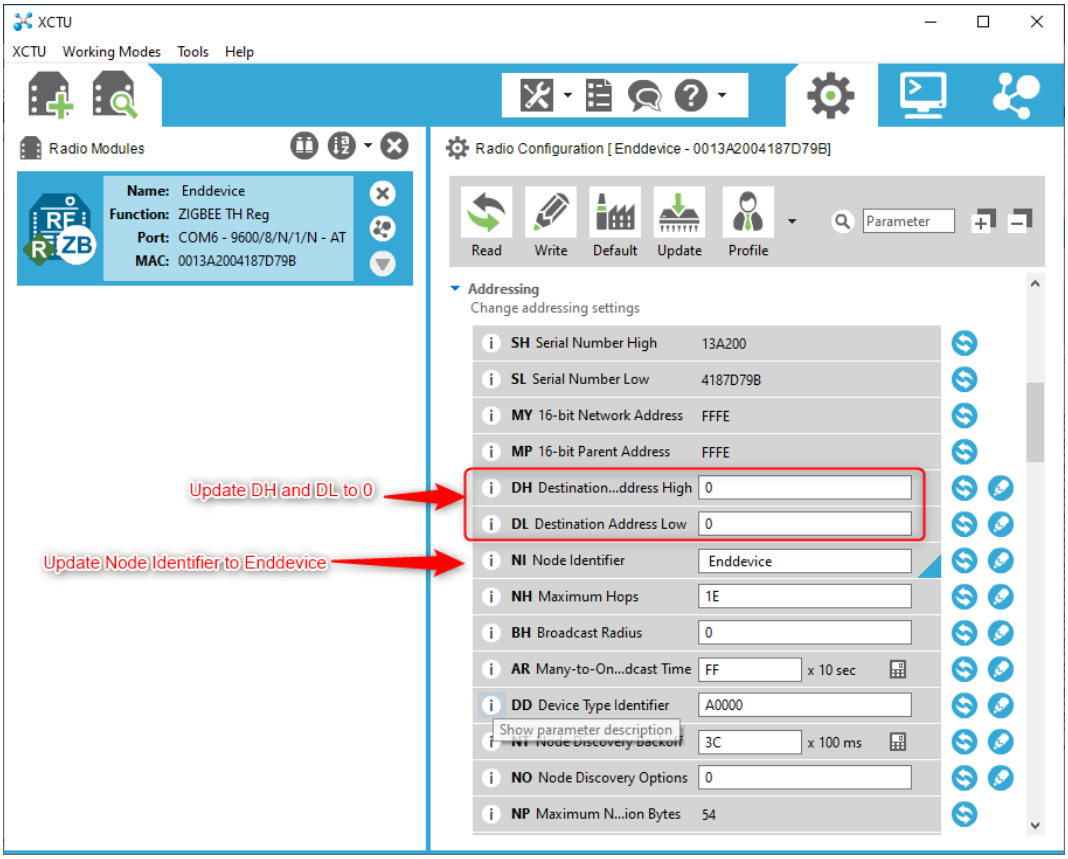
    Set to **nCTS flow control [1]**

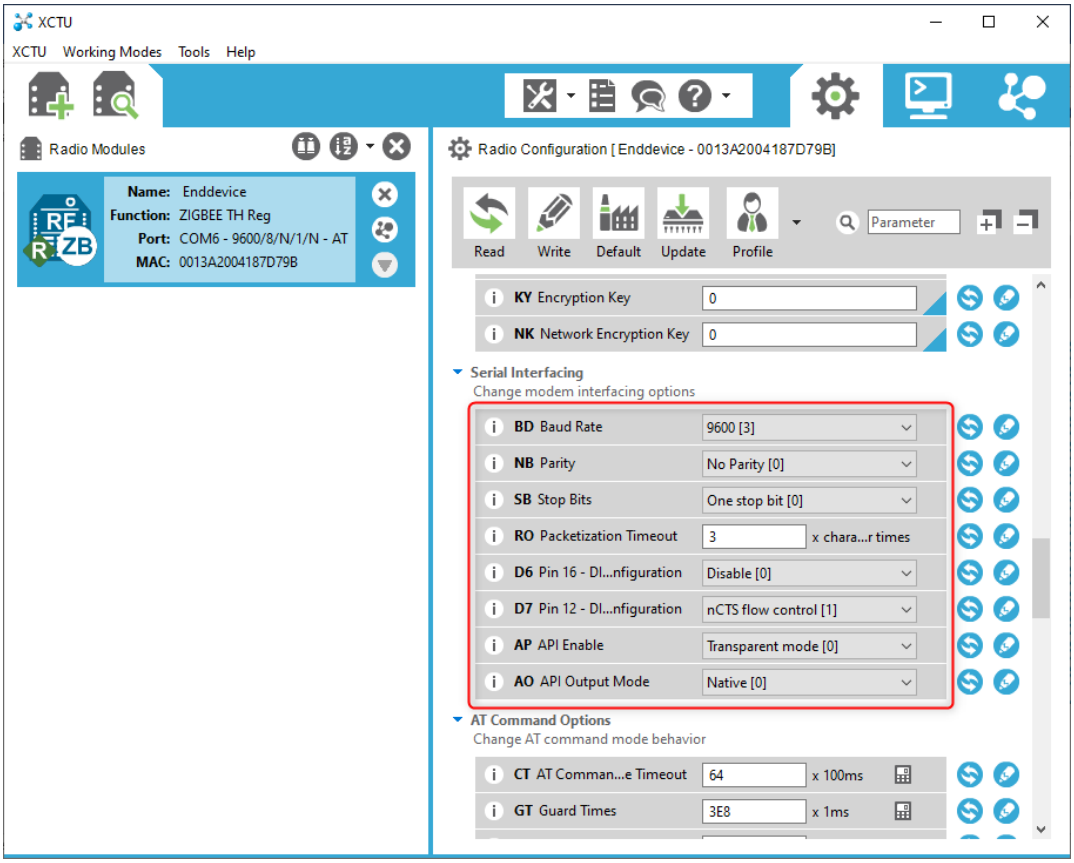
12. **AP** API Enable

    Set to **Transparent mode [0]**

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




XCTU
XCTU Working Modes Tools Help
Radio Modules
Name: Enddevice
Function: ZIGBEE TH Reg
Port: COM6 - 9600/8/N/1/N - AT
MAC: 0013A2004187D79B
Radio Configuration [Enddevice - 0013A2004187D79B]
Read Write Default Update Profile
Parameter
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...ddress 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
Show parameter description
3C x 100 ms
NO Node Discovery Options 0
NP Maximum N...ion Bytes 54
Update DH and DL to 0
Update Node Identifier to Enddevice


XCTU
XCTU Working Modes Tools Help
Radio Modules
Name: Enddevice
Function: ZIGBEE TH Reg
Port: COM6 - 9600/8/N/1/N - AT
MAC: 0013A2004187D79B
Radio Configuration [Enddevice - 0013A2004187D79B]
Read Write Default Update Profile
Parameter
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]
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