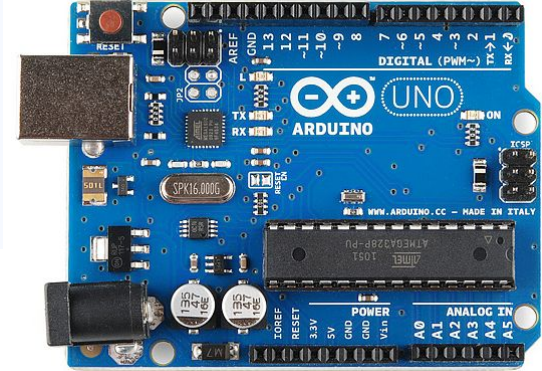


Programming the Arduino II



Quick Recap!

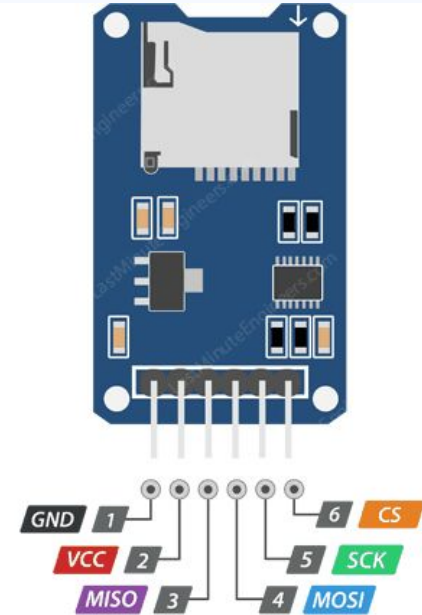
- Program to get pressure, temperature and altitude
- Store the data in SD card

Our mission?

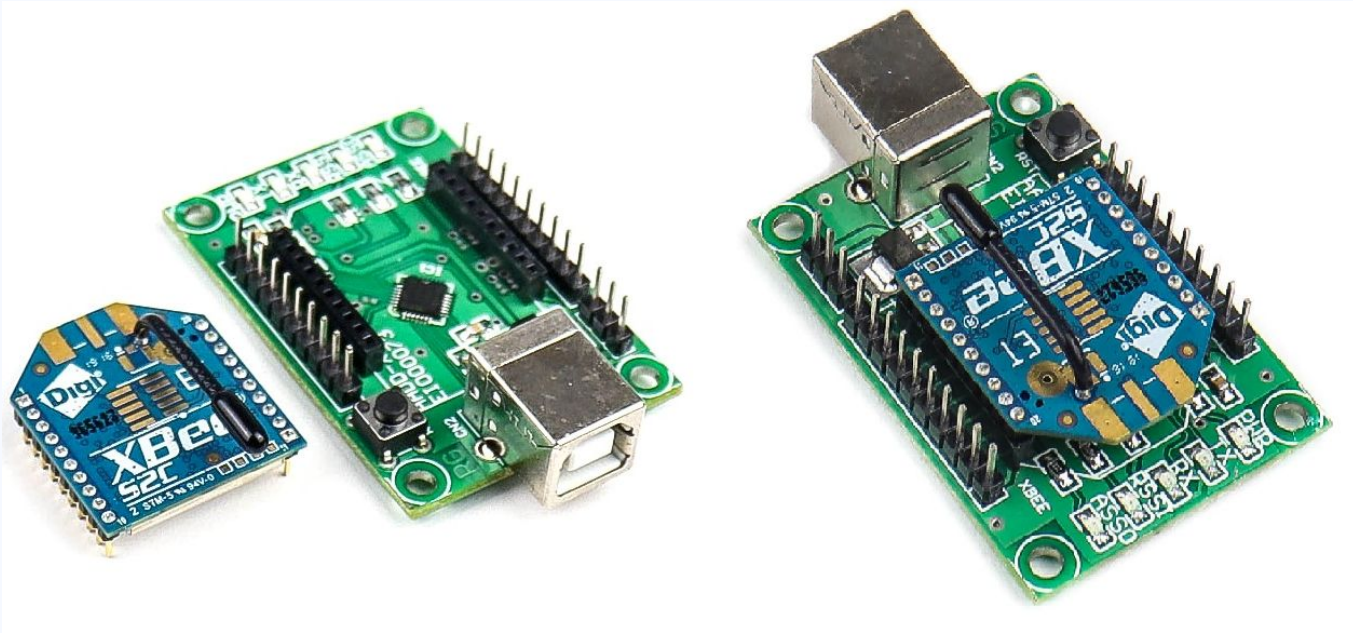
- Get weather data from sensor
- Store the data in SD card
- ***Send the data to ground station***

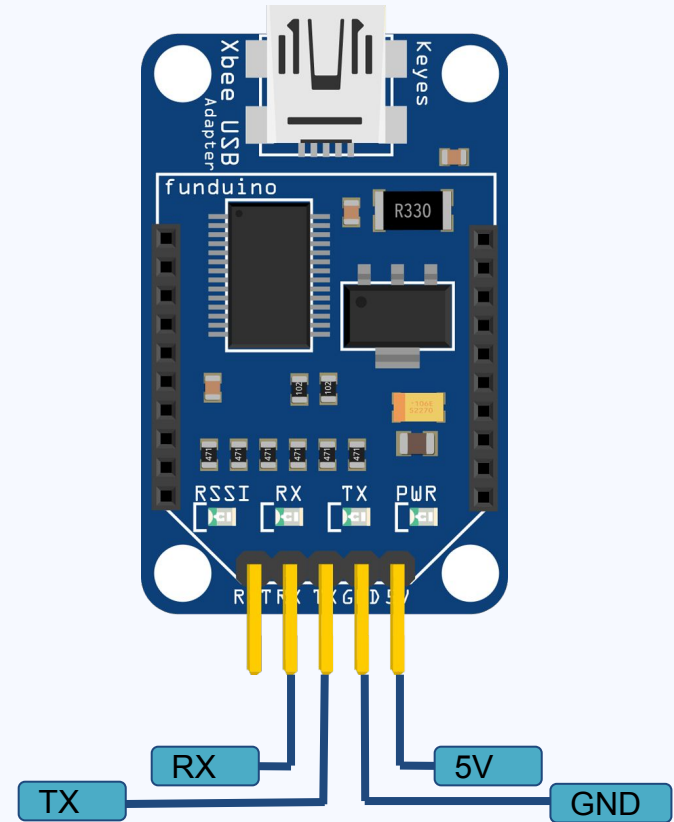


SD Card Module



XBee and XBee adapter





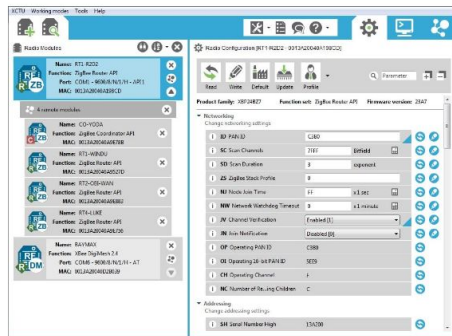
Configuring XBee using XCTU

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XCTU

Next Generation Configuration Platform for XBee/RF Solutions

- XCTU is a **free, multi-platform** application compatible with Windows, MacOS and Linux
- Graphical Network View** for simple wireless network configuration and architecture
- API Frame Builder** is a simple development tool for quickly building XBee API frames
- Firmware Release Notes Viewer** allows users to explore and read firmware release notes

[DOWNLOAD XCTU](#)

<https://www.digi.com/products/embedded-systems/digi-xbee/digi-xbee-tools/xctu>

Utilities

Download XCTU

- [XCTU v. 6.5.6 Windows x86/x64](#)
- [XCTU v. 6.5.6 MacOS X](#)
- [XCTU v. 6.5.6 Linux x64](#)
- [XCTU v. 6.5.6 Linux x86](#)
- [XCTU License Agreement](#)
- [XCTU v. 6.5.6 Release Notes](#)

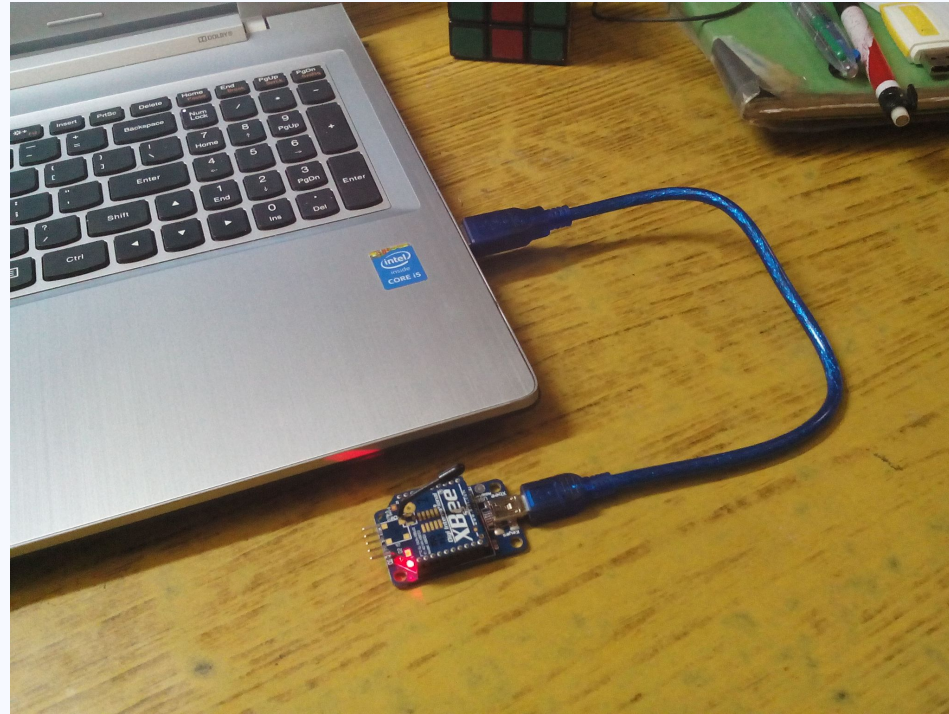
Download Legacy XCTU

- [XCTU ver. 5.2.8.6 installer](#)
- [XCTU 32-bit ver. 5.2.8.6 installer release notes](#)
- [XCTU ver. 5.1.0.0 installer](#)

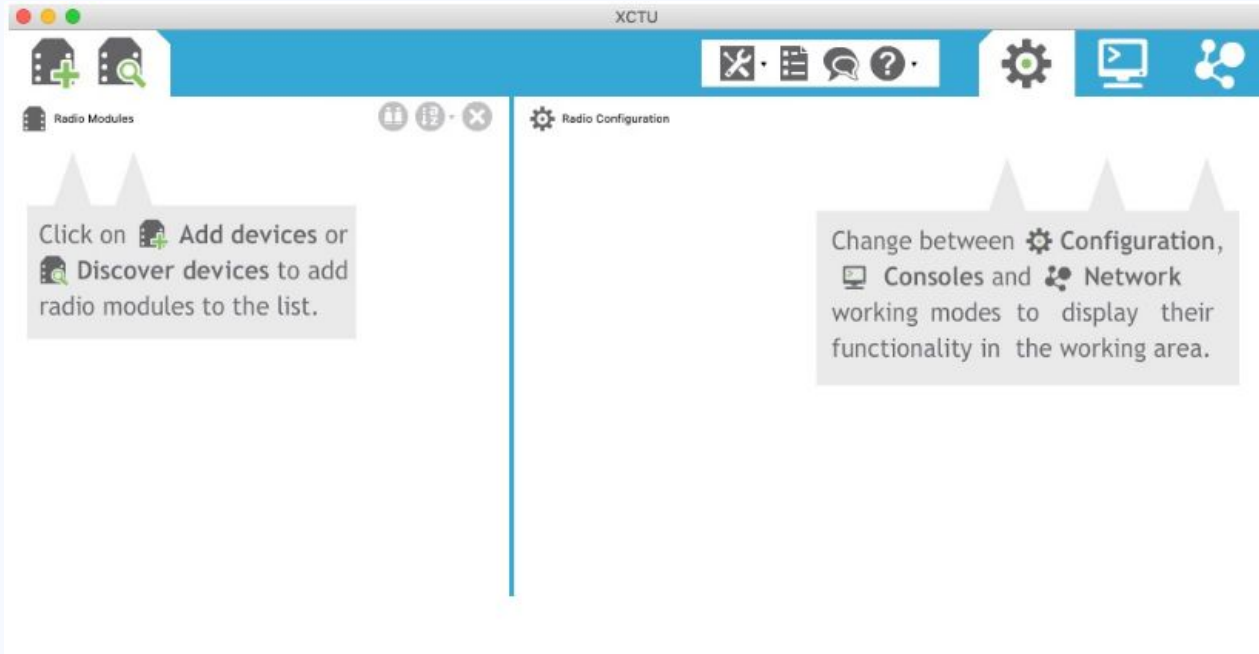
Last old-gen version of XCTU: Contains features from previous versions, plus adds support for XBee Wi-Fi modules, Compatible with Windows 2000, XP, 2003, Vista, 7. Does not support the Digi XLR PRO.

This older version of X-CTU is required for XStream Ethernet RF modems, as well as XCite RF modules and modems. X-CTU 5.1.0.0 is compatible with Windows 2000, XP, 2003 only.

Step 1: Connected XBee to Laptop using adapter and USB cable.



Step 2: Open XCTU and click on Discover devices button



Step 3: Click Finish button

Add radio device

Add a radio module

Select and configure the Serial/USB port where the radio module is connected to.

Select the Serial/USB port:

- Bluetooth-Incoming-Port
- usbserial-DN050RXA

Refresh ports

Provide a port name manually:

Baud Rate: 9600

Data Bits: 8

Parity: None

Stop Bits: 1

Flow Control: None

☐ The radio module is programmable.

Set defaults

Cancel Finish

Step 4: Configure the XBee and click Write button

Channel = C
PAN ID = 3332
DH = 0
DL = 0
MY = 0

The screenshot shows the XCTU software interface. On the left, the 'Radio Modules' pane displays a list of modules with details for the selected one: Name: XBEE 802.15.4, Port: usbserial-DN05.../N1/N - API 1, and MAC: 0013A200416AD892. The main window is titled 'Radio Configuration [- 0013A200416AD892]'. It features a toolbar with icons for Read, Write, Default, Update, and Profile. Below the toolbar, the configuration details are shown: Product family: XB24, Function set: XBEE 802.15.4, and Firmware version: 10ef. The 'Networking & Security' section is expanded, showing a table of settings to be configured. The settings include Channel (C), PAN ID (3332), Destination Address High (DH) (0), Destination Address Low (DL) (0), 16-bit Source Address (MY) (0), Serial Number High (SH) (13A200), Serial Number Low (SL) (416AD892), MAC Mode (MM) (802.15.4 + MaxStream header w/), XBee Retries (RR) (0), Random Delay Slots (RN) (0), and Node Discover Time (NT) (19 x 100 ms).

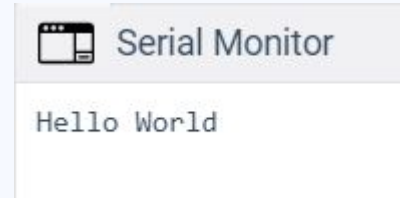
Parameter	Value
CH Channel	C
ID PAN ID	3332
DH Destination Address High	0
DL Destination Address Low	0
MY 16-bit Source Address	0
SH Serial Number High	13A200
SL Serial Number Low	416AD892
MM MAC Mode	802.15.4 + MaxStream header w/
RR XBee Retries	0
RN Random Delay Slots	0
NT Node Discover Time	19 x 100 ms

★ Very Important

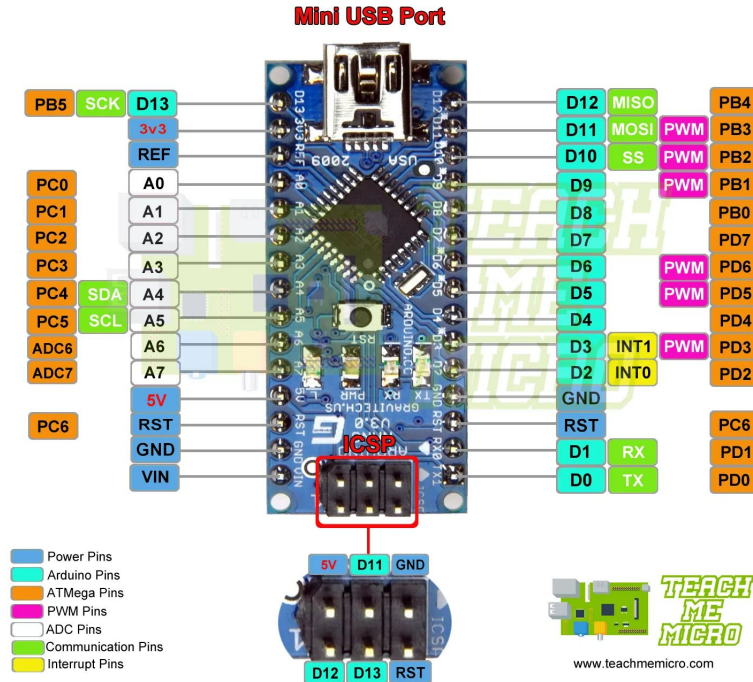
```
void setup()
{
  Serial.begin(9600);
  Serial.println("Hello World");
}
```

What does this code do?

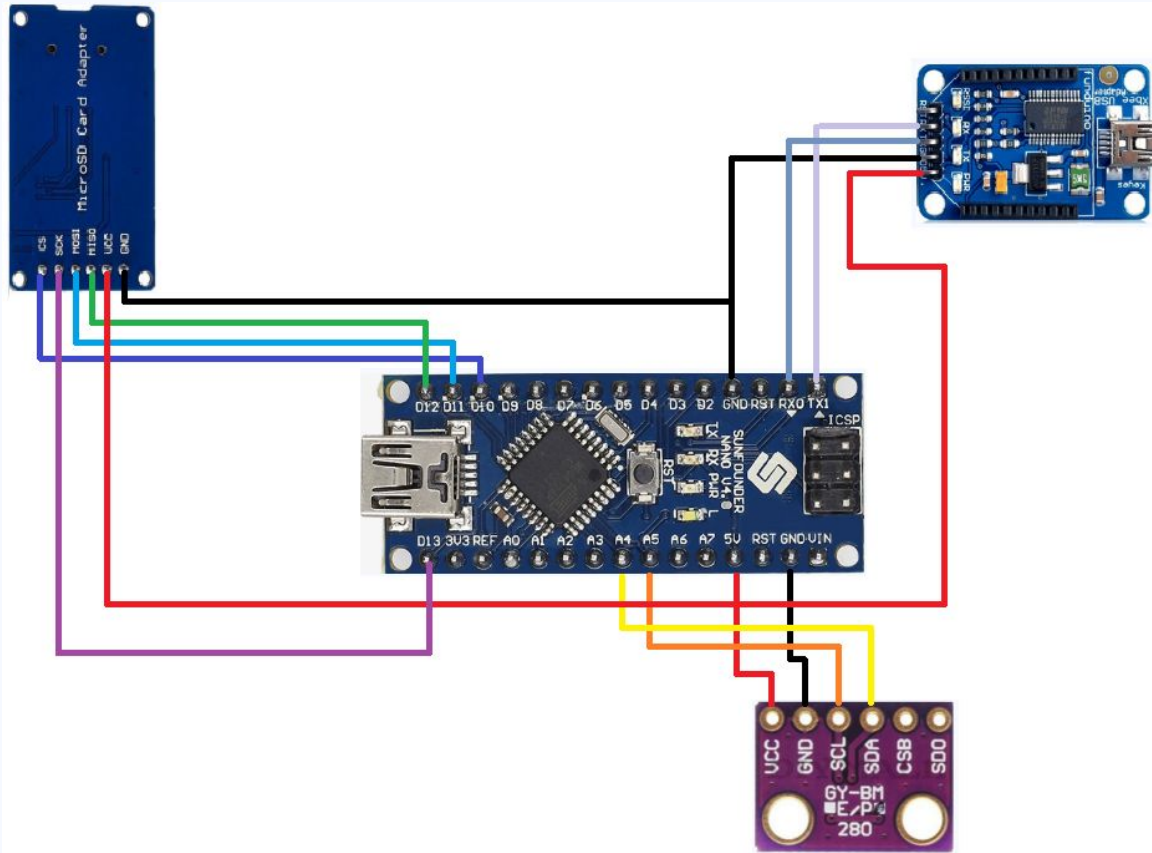
- It will show “Hello World” on serial monitor.
- Serial monitor is basically your computer/laptop to which arduino board is connected to.
- That code tells arduino to send the text “Hello World” to your laptop.
- Arduino uses UART protocol to communicate with laptop.
- Arduino uses pin 0 and 1 i.e RX and TX for UART
- If we connect XBee to RX and TX i.e UART pins of arduino, then can not communicate with serial monitor of computer/laptop.



ARDUINO NANO PINOUT



- ◆ **I2C**
 - A4 - SDA
 - A5 - SCL
- ◆ **SPI**
 - CS/SS - D10
 - MOSI - D11
 - MISO - D12
 - SCK - D13
- ◆ **UART**
 - TX - D0
 - RX - D1



RED - 5V
BLACK - Ground