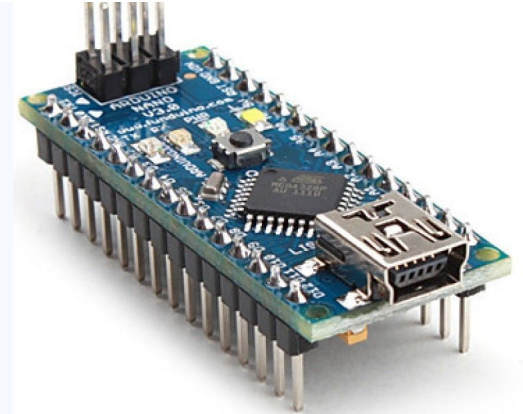


Introduction to Microcontrollers



Basic Electronics in our Satellite

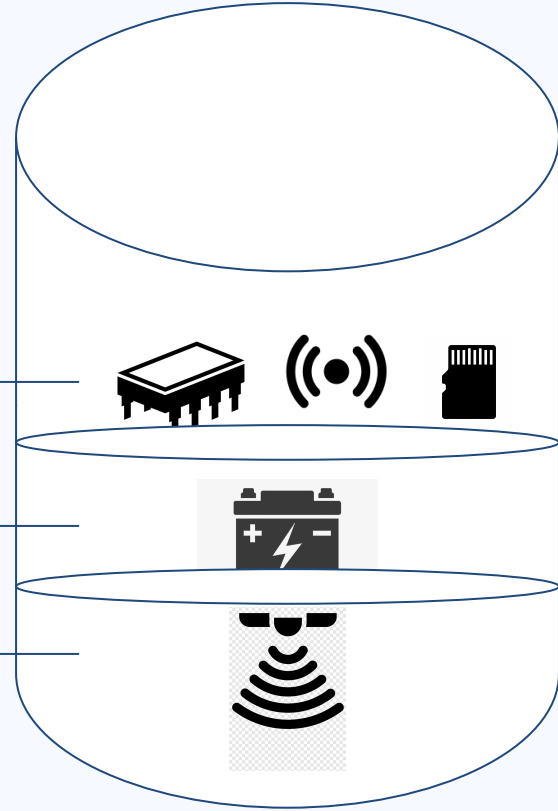
Mission

- Sense/measure weather data
- Process the data
- Store it
- Send it to ground station

Sensors and
Processors

Power
Source

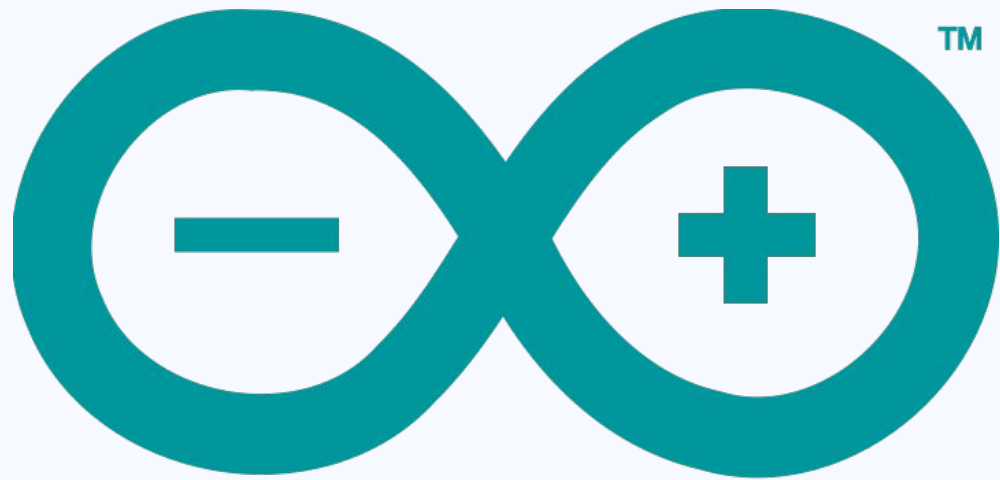
Telemetry
System



Microprocessor vs Microcontroller

- ★ Application: Your computer, phone, tablet etc
- ★ Example: Intel i3/i5/i7, AMD Ryzen
- ★ Complicated and costlier
- ★ High power, high speed - GHz
- ★ Only has CPU
- ★ General purpose
- ★ A microprocessor is the processor that performs arithmetic and logical operations

- ★ Application: Your washing machine, fridge, AC etc and our satellite
- ★ Example: Intel 8051, ATmega328P, STM32 series
- ★ Relatively simpler and much cheaper
- ★ Low power, low speed - MHz
- ★ Has CPU, memory (RAM, ROM, flash), I/O ports, other peripherals
- ★ Application specific
- ★ A microcontroller contains the processor along with other stuff meant for a specific application

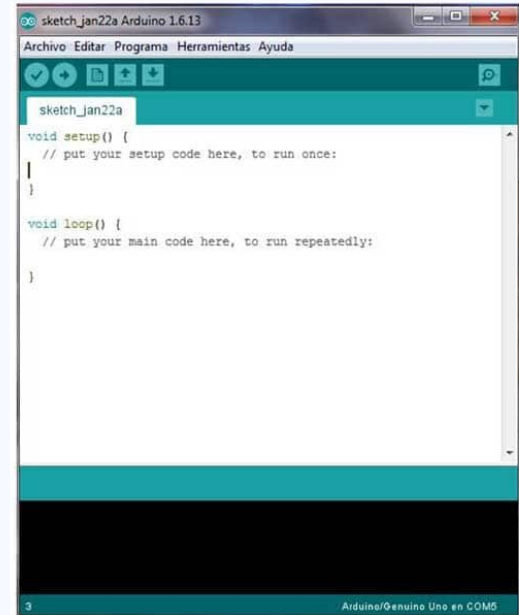
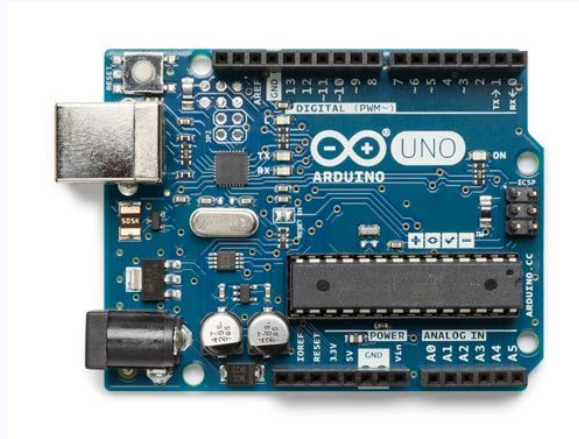


ARDUINO

What is Arduino?

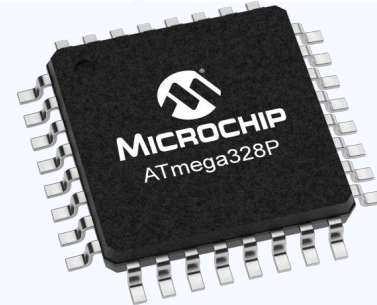
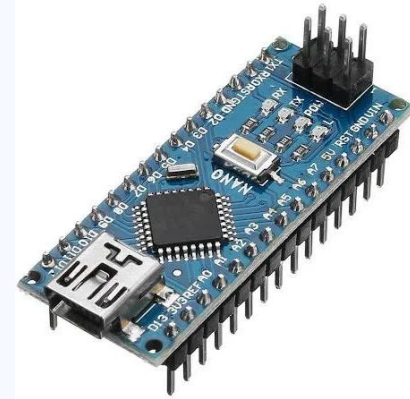
Arduino is an open source electronics platform.

- Hardware
- Software
- Community driven

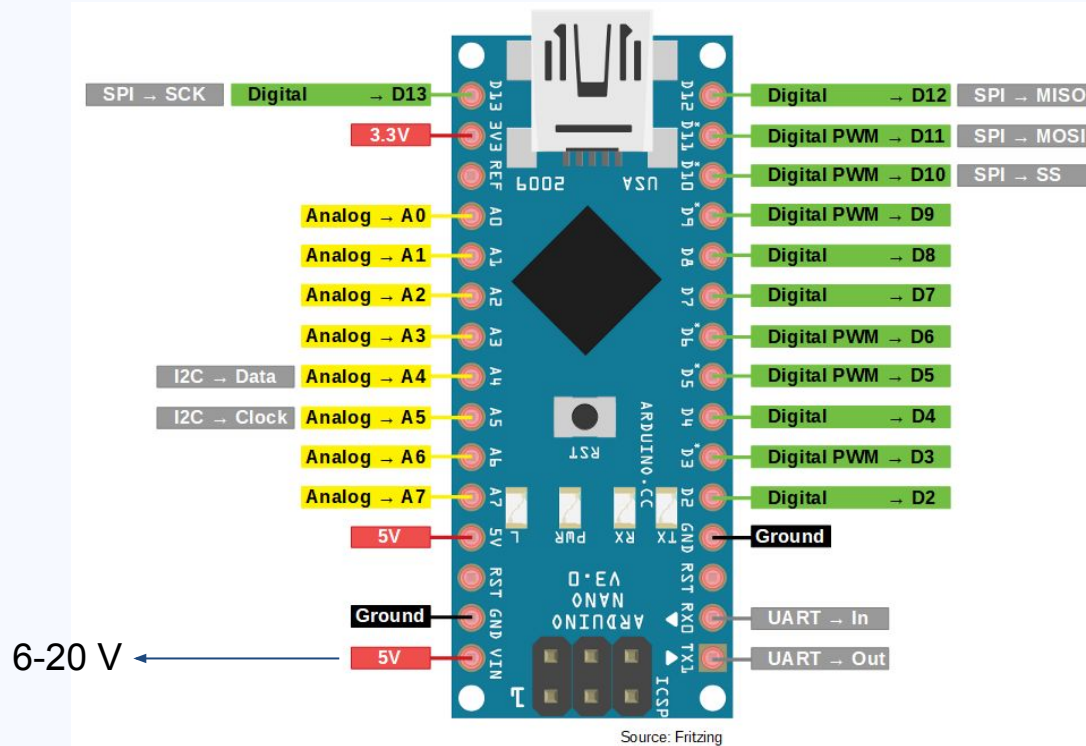


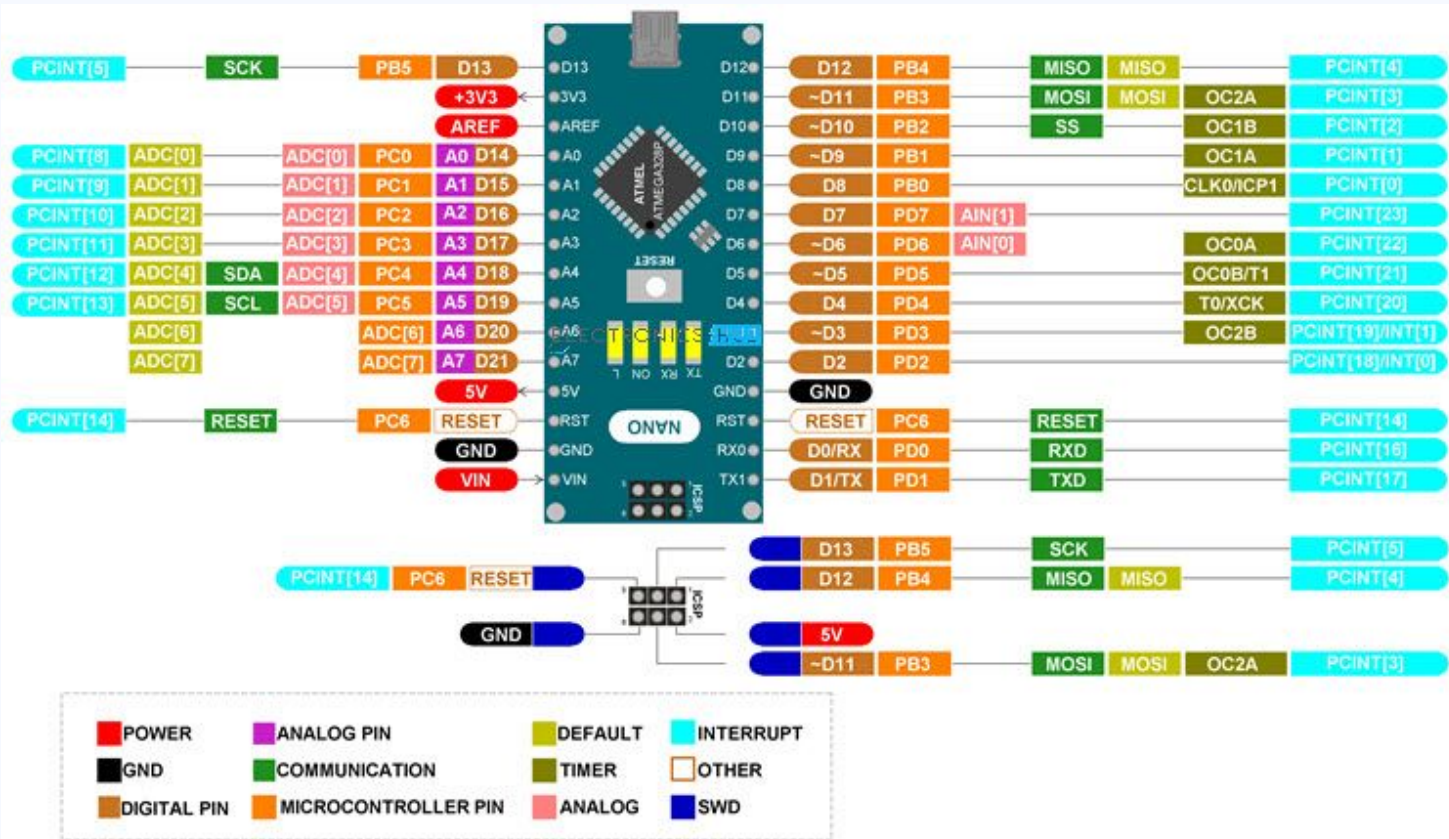
Arduino Nano Development Board

- ❖ Microcontroller: ATmega328P by Microchip
- ❖ Specifications
 - Clock Speed: 16 MHz
 - Flash Memory: 32 KB
 - SRAM: 2 KB
 - EEPROM: 1 KB
- ❖ Size: 18 x 45 mm
- ❖ Power: ≈ 0.3 Watts



Arduino Nano Pin Diagram





Arduino IDE

1. Go to <https://www.arduino.cc/en/software>
2. Under “Downloads” section, click on the appropriate link.
Ex: If you have Windows 10 then click the “Win 7 and newer” link
Note: Don’t download the Windows app
3. Click “Just Download” option.
4. Run the installer that you just downloaded and let it install everything.

 Arduino IDE 1.8.15

The open-source Arduino Software (IDE) makes it easy to write code and upload it to the board. This software can be used with any Arduino board.

Refer to the [Getting Started](#) page for installation instructions.

SOURCE CODE

Active development of the Arduino software is [hosted by GitHub](#). See the instructions for [building the code](#). Latest release source code archives are available [here](#). The archives are PGP-signed so they can be verified using [this](#) gpg key.

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Thank You