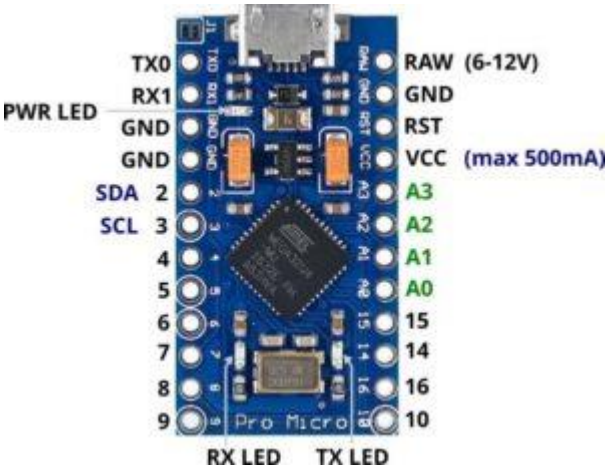
BMP vs MPU

	BMP	MPU
Full Form	Barometric Pressure Sensor	Magnetic Pickups
Use for	Barometric Pressure , Temperature and Altitude	3-Axis Gyroscope & 3-Axis Accelerometer
Types of	BMP581, BMP580, BMP390, BMP388, BMP384, BMP380, BMP280	MPU6050, MPU9250
BEST ACCORDING TO OUR PLANE	BMP390's relative accuracy of 3 Pascals, which translates to about ± 0.25 meter of altitude	MPU-6050
Weight		2.1g
Dimension	2 x 2 x 0.75	21.2 x 16.4 x 3.3
Best Price (in Rs)	Qty 1 – 396.71 Qty 10 – 318 per pcs	118 per pcs
Buy Link	https://bit.ly/3d4cYML	https://bit.ly/3QvIh0A

ShortListed Micro Controller

Arduino pro micro :



Specifications:

Microcontroller	ATmega32U4
Input Voltage(Recommended)	7-12V
Operating Voltage (VDC)	5
Input Voltage (limits)	6-20V
Analog I/O Pins	12
Digital I/O Pins	20
DC Current per I/O Pin (mA)	20
DC Current for 3.3V Pin (mA)	50
PWM Pins	7
Flash Memory	32 KB
EEPROM	2.5KB
SRAM (KB)	1
Clock Speed	16 MHz
Dimensions (mm) LxWxH	48x18x8

Price : 598

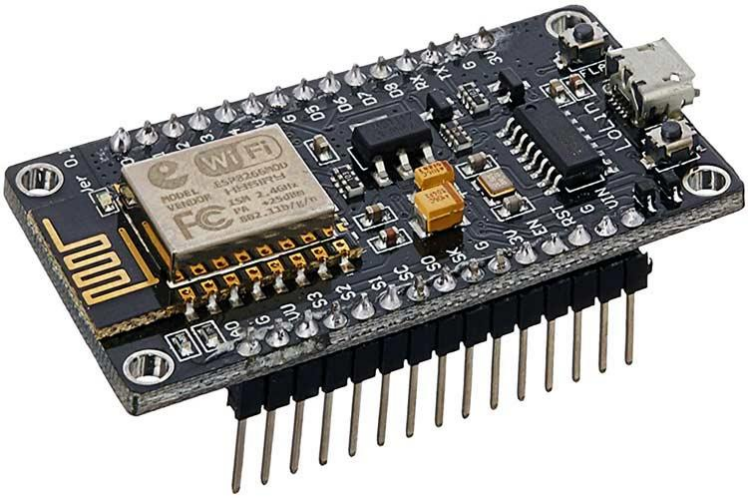
Teensey 3.1 :

Specifications:

- Processor : MK20DX256VLH7
- Core : Cortex-M4
- Rated Speed : 72 Mhz
- Overclockable : 96 Mhz
- Flash Memory : 256 Kb
- Bandwidth : 192 Mb/sec
- Cache : 256 b
- RAM : 64Kb
- EEPROM : 2 Kb
- Direct Memory Access : 16 Channels
- Digital I/O : 34 Pins
- Voltage Output : 3.3 V
- Voltage Input : 5V Tolerant
- Analog Input: 21 Pins
- Converters : 2
- Resolution :16 Bits
- Usable : 13 Bits
- Prog Gain Amp : 1
- Touch Sensing : 12 Pins
- Comparators : 3
- Analog Output : 1 Pin
- DAC Resolution : 12 Bits
- Timers : 12 Total
- FTM Type : 3
- PWM Outputs : 12 Pins
- PDB Type : 1
- CMT (infrared) Type : 1
- LPTMR Type : 1
- PIT (interval) Type : 4
- Systick : 1
- RTC (date/time) ** : 1
- USB : 1
- Serial : 3
- Serial With FIFOs : 2
- High Res Baud : 3
- Fast Clock : 2
- SPI : 1
- SPI With FIFOs : 1
- I2C : 2
- CAN Bus : 1
- I2S Audio : 1
- FIFO Size : 1

Price : 1,785

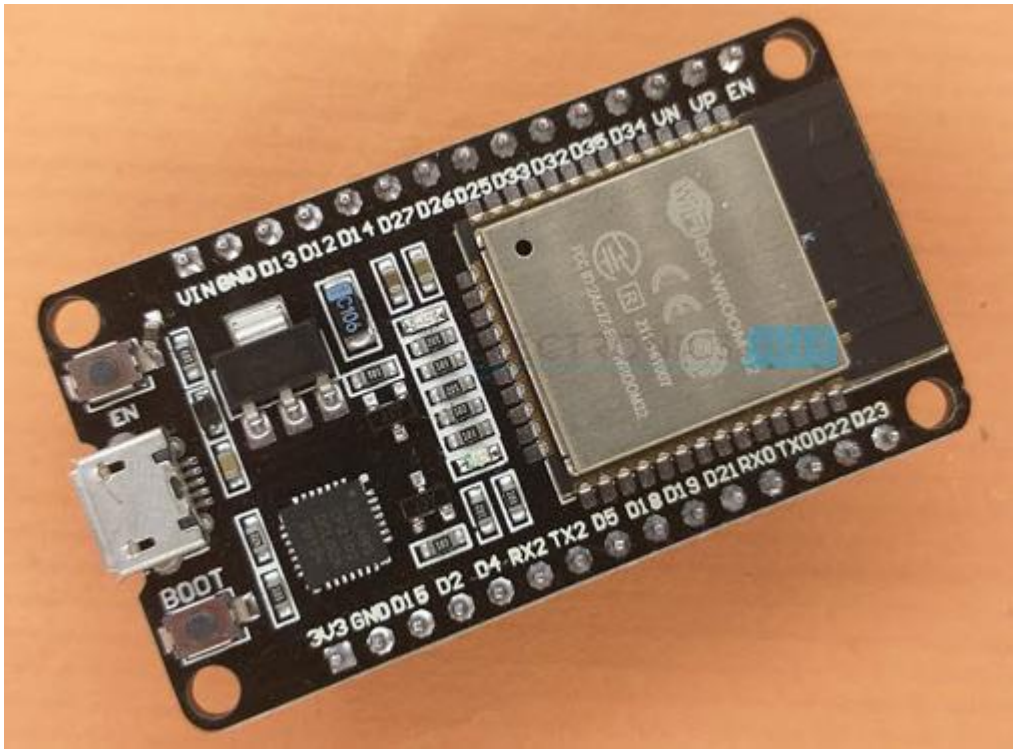
ESP8266



- Microcontroller: Tensilica 32-bit RISC CPU Xtensa LX106
- Operating Voltage: 3.3V
- Input Voltage: 7-12V
- Digital I/O Pins (DIO): 16
- Analog Input Pins (ADC): 1
- UARTs: 1
- SPIs: 1
- I2Cs: 1
- Flash Memory: 4 MB
- SRAM: 64 KB
- Clock Speed: 80 MHz
- USB-TTL based on CP2102 is included onboard, Enabling Plug n Play
- PCB Antenna
- Small Sized module to fit smartly inside your IoT projects

Price : 330

Esp32



- Single or Dual-Core 32-bit LX6 Microprocessor with clock frequency up to 240 MHz.
- 520 KB of SRAM, 448 KB of ROM and 16 KB of RTC SRAM.
- Supports 802.11 b/g/n Wi-Fi connectivity with speeds up to 150 Mbps.
- Support for both Classic Bluetooth v4.2 and BLE specifications.
- 34 Programmable GPIOs.
- Up to 18 channels of 12-bit SAR ADC and 2 channels of 8-bit DAC
- Serial Connectivity include 4 x SPI, 2 x I^2C, 2 x I^2S, 3 x UART.
- Ethernet MAC for physical LAN Communication (requires external PHY).
- 1 Host controller for SD/SDIO/MMC and 1 Slave controller for SDIO/SPI.
- Motor PWM and up to 16-channels of LED PWM.
- Secure Boot and Flash Encryption.
- Cryptographic Hardware Acceleration for AES, Hash (SHA-2), RSA, ECC and RNG.

Price : 330

Stm32 f3 Discovery kit:

- STM32F303VCT6 microcontroller featuring 256-Kbyte Flash memory and 48-Kbyte RAM in an LQFP100 package
- USB FS
- ST MEMS motion sensor, 3-axis digital output gyroscope
- ST MEMS system-in-package featuring a 3D digital linear acceleration sensor and a 3D digital magnetic sensor
- Ten LEDs:
  - LD1 (red) for 3.3 V power on
  - LD2 (red/green) for USB communication
  - Eight user LEDs: LD3/10 (red), LD4/9 (blue), LD5/8 (orange) and LD6/7 (green)
- 1 user and reset push-buttons
- Board connectors:
  - USB FS Mini-B connector
  - ST-LINK Mini-B USB connector
  - Extension header for all LQFP100 I/Os for quick connection to prototype board and easy probing
- Flexible power-supply options:
  - ST-LINK USB connector or USB FS connector
  - External 3 V or 5 V supply voltage
- On-board debugger/programmer ST-LINK/V2 for PCB version A or B, or ST-LINK/V2-B for PCB version C and newer:
  - Debug port
  - Mass storage and Virtual COM port with ST-LINK/V2-B only
- Support of a wide choice of Integrated Development Environments (IDEs) including IAR™, Keil®, and STM32CubeIDE

Price : 1252

I2C :

I2C stands for **Inter-**Integrated Circuit. It is a bus interface connection protocol incorporated into devices for serial communication. It was originally designed by Philips Semiconductor in 1982. Recently, it is a widely used protocol for short-distance communication. It is also known as Two Wired Interface(TWI).

Working of I2C Communication Protocol :
It uses only 2 bi-directional open-drain lines for data communication called SDA and SCL. Both these lines are pulled high.

Serial Data (SDA) – Transfer of data takes place through this pin.
Serial Clock (SCL) – It carries the clock signal.

I2C operates in 2 modes –

Master mode

Slave mode

SPI :

SPI is a common communication protocol used by many different devices. For example, SD card reader modules, RFID card reader modules, and 2.4 GHz wireless transmitter/receivers all use SPI to communicate with microcontrollers.
One unique benefit of SPI is the fact that data can be transferred without interruption. Any number of bits can be sent or received in a continuous stream. With I2C and UART, data is sent in packets, limited to a specific number of bits. Start and stop conditions define the beginning and end of each packet, so the data is interrupted during transmission.

Devices communicating via SPI are in a master-slave relationship. The master is the controlling device (usually a microcontroller), while the slave (usually a sensor, display, or memory chip) takes instruction from the master. The simplest configuration of SPI is a single master, single slave system, but one master can control more than one slave (more on this below).

UART :

UART, or universal asynchronous receiver-transmitter, is one of the most used device-to-device communication protocols. This article shows how to use UART as a hardware communication protocol by following the standard procedure.

When properly configured, UART can work with many different types of serial protocols that involve transmitting and receiving serial data. In serial communication, data is transferred bit by bit using a single line or wire. In two-way communication, we use two wires for successful serial data transfer. Depending on the application and system requirements, serial communications needs less circuitry and wires, which reduces the cost of implementation.