NodeMCU (ESP8266)

Wi-Fi Enabled Development Board



NodeMCU ESP8266 is a compact Wi-Fi development board based on the ESP8266 microcontroller. It is ideal for IoT, home automation, sensors and connected projects, offering Wi-Fi connectivity, GPIO, ADC, UART, SPI and I2C interfaces.

TOP USES

- IoT and Wi-Fi projects
- Home automation
- Wireless sensors
- Robotics and smart devices

KEY FEATURES

- ESP8266 Wi-Fi microcontroller
- Built-in 2.4 GHz Wi-Fi
- Digital GPIO pins
- 10-bit analog input
- USB programming interface
- Compact development board

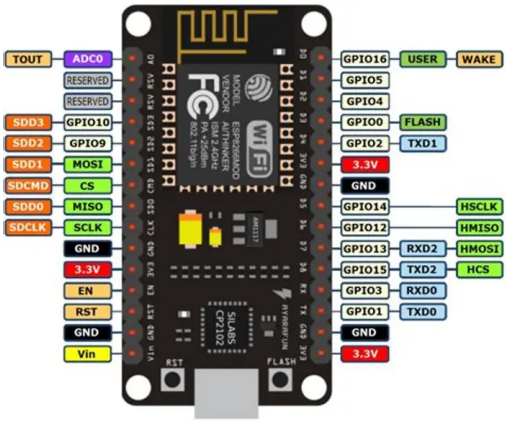
Technical Specifications

NodeMCU (ESP8266)

Parameter	Value
Microcontroller	ESP8266EX
Operating voltage	3.3 V
Input voltage	5 V via Micro-USB
Digital I/O	Up to 11 GPIO
Analog input	1 ADC (10-bit)
Wi-Fi	2.4 GHz 802.11 b/g/n
CPU frequency	80 MHz / 160 MHz
Flash memory	Typically 4 MB
Communication	UART / SPI / I2C
USB	Micro-USB
Logic level	3.3 V

Pinout

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PIN FUNCTIONS

Pin	Function	Notes
D0 - D8	GPIO	Digital input/output
D1 (GPIO5)	I2C SCL	Commonly used as I2C clock
D2 (GPIO4)	I2C SDA	Commonly used as I2C data
D5 - D7	SPI	SPI communication
D9 / D10	Flash	Connected to onboard flash; avoid using
A0	Analog	10-bit ADC input
TX / RX	UART	Serial communication
3V3	Power	3.3 V output
VIN	Power	Board input power
GND	Ground	Common ground

WIRING NOTES

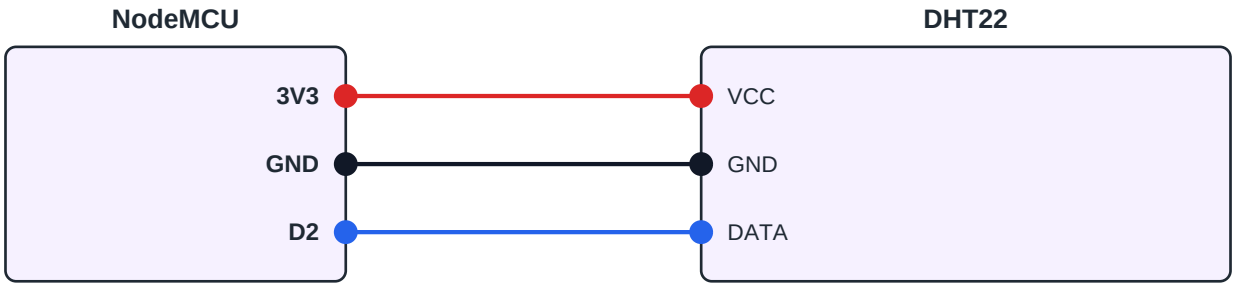
- ESP8266 GPIO uses 3.3 V logic.
- Do not apply 5 V directly to GPIO pins.
- D9 and D10 are normally connected to the ESP8266 flash memory.
- Use an external supply for motors and other high-current loads.

Example Project

Wi-Fi Temperature Monitor

Read temperature and humidity from a DHT22 sensor and display the values through the ESP8266 serial monitor.

CIRCUIT



EXAMPLE CODE

```
#include <DHT.h>

#define DHTPIN D2
#define DHTTYPE DHT22

DHT dht(DHTPIN, DHTTYPE);

void setup() {
  Serial.begin(115200);
  dht.begin();
}

void loop() {
  float temperature = dht.readTemperature();
  float humidity = dht.readHumidity();

  Serial.print("Temperature: ");
  Serial.print(temperature);
  Serial.println(" C");

  Serial.print("Humidity: ");
  Serial.print(humidity);
  Serial.println(" %");

  delay(2000);
}
```

EXPECTED RESULT

- The NodeMCU reads temperature and humidity from the DHT22.
- The measurements are displayed on the Serial Monitor.

Useful Links

NodeMCU (ESP8266)

Resource	Link
ESP8266 Documentation	https://arduino-esp8266.readthedocs.io/
ESP8266 Arduino Core	https://github.com/esp8266/Arduino
Arduino IDE	https://www.arduino.cc/en/software

COMPATIBLE COMPONENTS

- DHT22 Sensor
- HC-SR04 Ultrasonic Sensor
- MPU6050
- Relay Module
- OLED I2C Display
- SG90 Servo Motor

Need this component?

Buy NodeMCU ESP8266 >>

https://techzoneegypt.com/p/nodemcu-esp8266