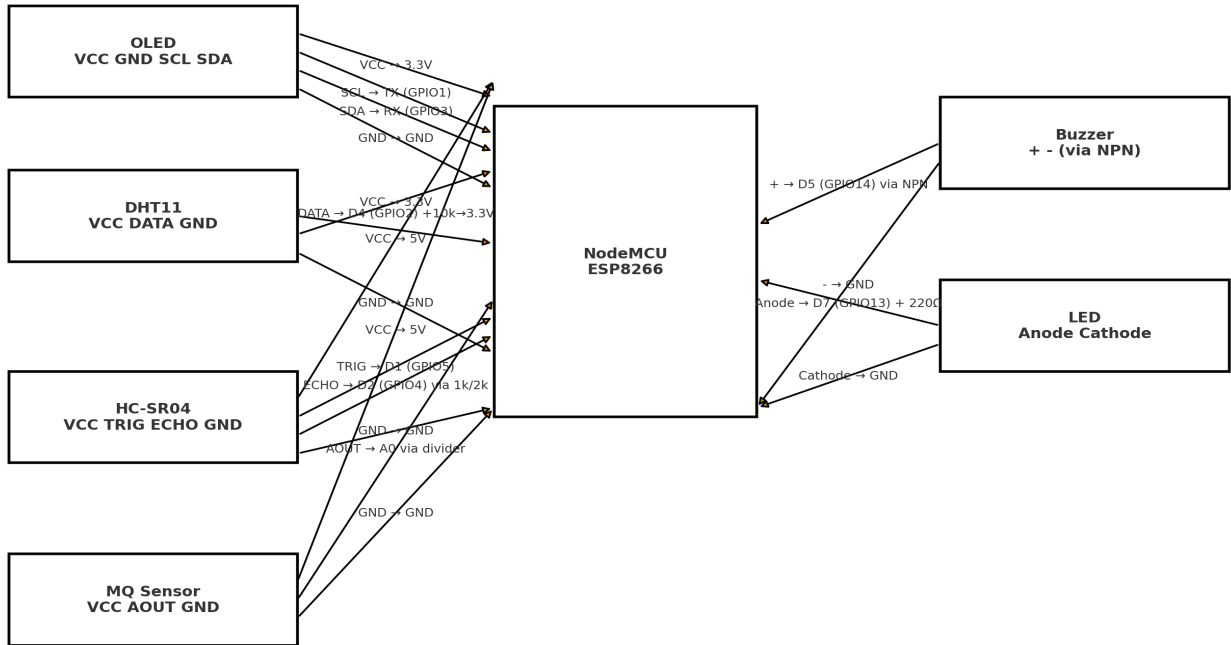# NodeMCU ESP8266 Project Wiring Guide

This document contains the wiring reference for your NodeMCU ESP8266 project with OLED, DHT11, HC-SR04, MQ Sensor, Buzzer, and LED.
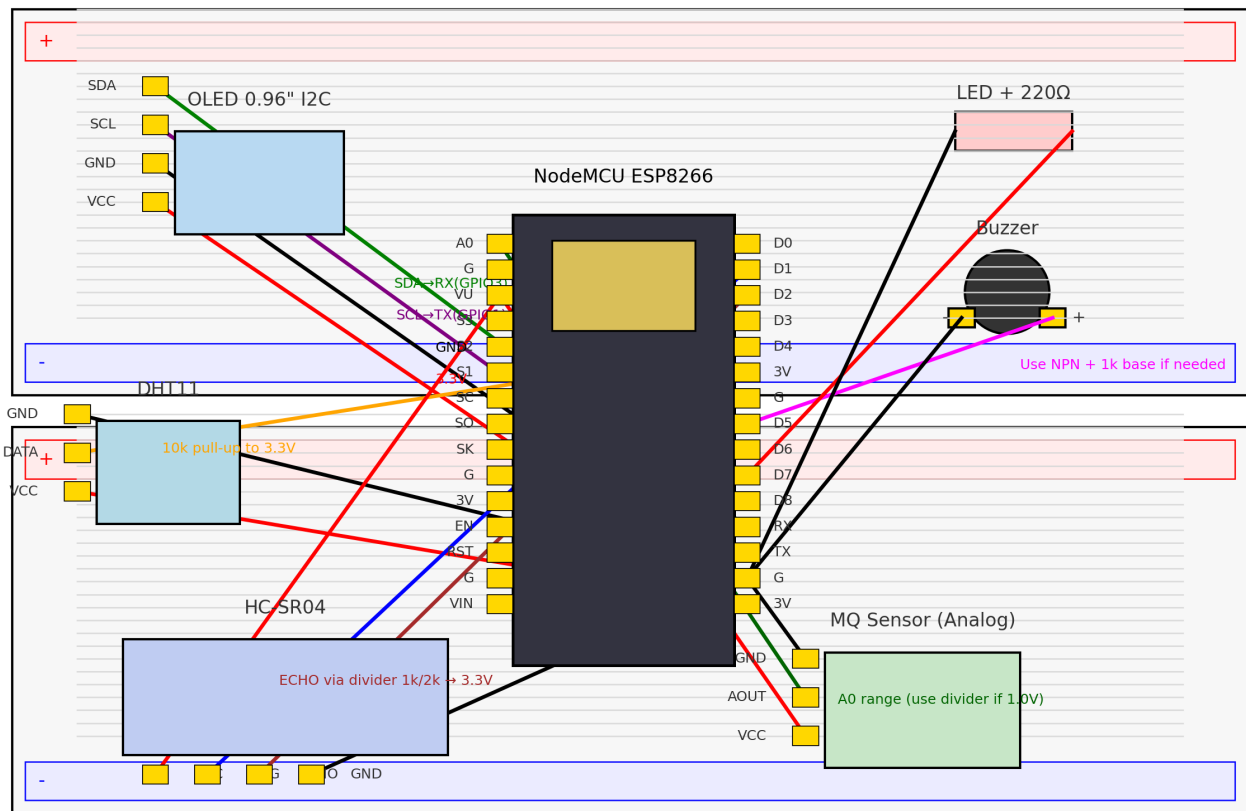
Wiring Table

Component	Pin	NodeMCU Pin	GPIO	Notes
OLED (SSD1306 I2C)	VCC	3.3V		Power
OLED (SSD1306 I2C)	GND	GND		Ground
OLED (SSD1306 I2C)	SCL	TX	GPIO1	I2C Clock (as per your table; typical is D1)
OLED (SSD1306 I2C)	SDA	RX	GPIO3	I2C Data (as per your table; typical is D2)
DHT11	VCC	3.3V		Power
DHT11	DATA	D4	GPIO2	Sensor data; add 10k pull-up to 3.3V if needed
DHT11	GND	GND		Ground
HC-SR04	VCC	5V		Power
HC-SR04	Trig	D1	GPIO5	Trigger
HC-SR04	Echo	D2	GPIO4	Echo via 1k/2k divider to 3.3V
HC-SR04	GND	GND		Ground
MQ Gas Sensor (Analog)	VCC	5V		Power
MQ Gas Sensor (Analog)	GND	GND		Ground
MQ Gas Sensor (Analog)	AOUT	A0	ADC0	Through divider to match A0 range (see note)
Buzzer (TMB12A12 active)	+	D5	GPIO14	Drive via NPN transistor + 1k base
Buzzer (TMB12A12 active)	-	GND		Ground
LED (external)	Anode +	D7	GPIO13	Series 220Ω resistor
LED (external)	Cathode -	GND		Ground

Schematic Diagram

OLED
VCC GND SCL SDA

DHT11
VCC DATA GND

HC-SR04
VCC TRIG ECHO GND

MQ Sensor
VCC AOUT GND

NodeMCU
ESP8266

Buzzer
+ - (via NPN)

LED
Anode Cathode

VCC → 3.3V

SCL → TX (GPIO1)

SDA → RX (GPIO3)

GND → GND

VCC → 3.3V

DATA → D4 (GPIO2) +10k→3.3V

VCC → 5V

GND → GND

VCC → 5V

TRIG → D1 (GPIO5)

ECHO → D2 (GPIO4) via 1k/2k

GND → GND

AOUT → A0 via divider

GND → GND

+ → D5 (GPIO14) via NPN

- → GND

Anode → D7 (GPIO13) + 220Ω

Cathode → GND

Breadboard Realistic Wiring (Prototype)

OLED 0.96" I2C
- SDA
- SCL
- GND
- VCC

NodeMCU ESP8266

LED + 220Ω

Buzzer

+

SDA→RX(GPIO3)
SCL→TX(GPIO1)

Use NPN + 1k base if needed

DHT11
- GND
- DATA +
- VCC

10k pull-up to 3.3V

A0
G
VU
GND
S1
SC
SO
SK
G
3V
EN
RST
G
VIN

D0
D1
D2
D3
D4
3V
G
D5
D6
D7
D8
RX
TX
G
3V

GND
AOUT
VCC

MQ Sensor (Analog)

A0 range (use divider if 1.0V)

HC-SR04

ECHO via divider 1k/2k → 3.3V

G   O   GND

-

Perfboard Soldering Layout (Permanent Assembly)

OLED

VCC GND SCL SDA →

DHT11

VCC DATA GND →

HC-SR04

VCC TRIG ECHO GND →

NodeMCU

V0
A0
3V

G

Echo Divider 1k/2k

TX
RX

D1
D2

D4
D5

D7

G2

Buzzer: NPN + 1k base if needed

Buzzer (+) (–)

LED Anode Cathode

LED: 220Ω series

MQ

VCC AOUT GND ←
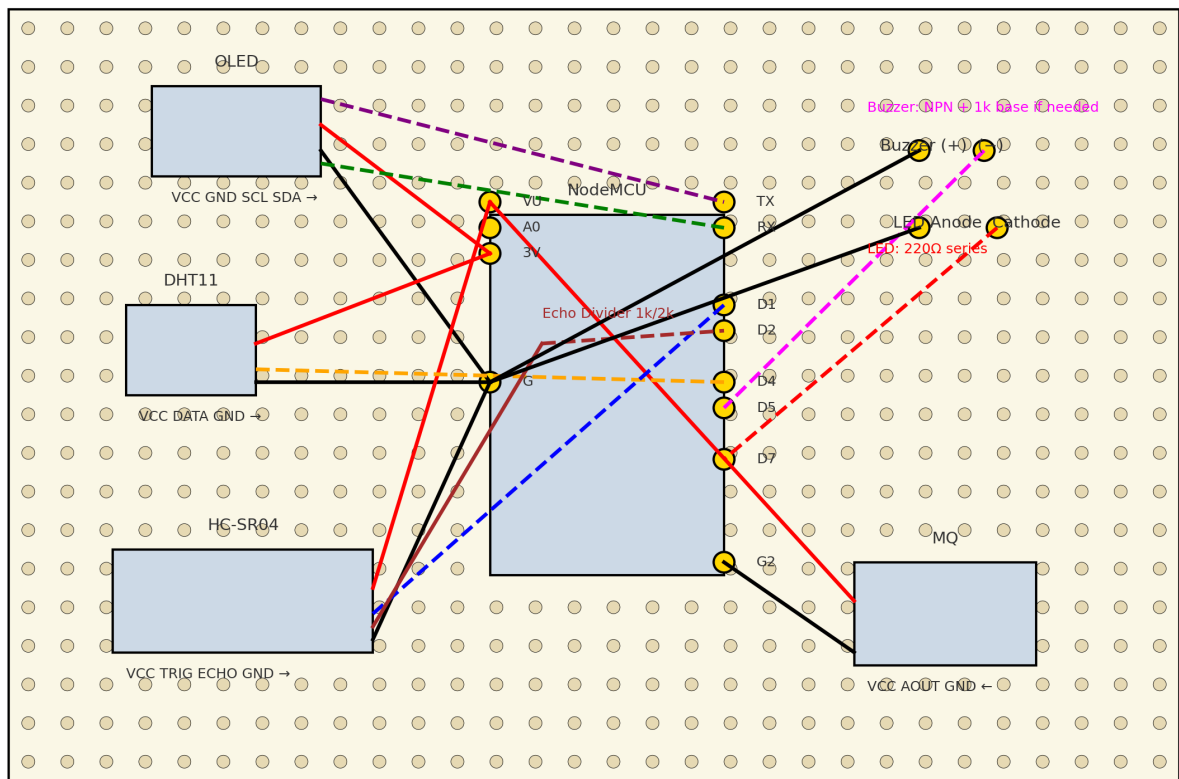
Power Distribution Diagram

NodeMCU USB (Powerbank 5V)

5V from USB

HC-SR04

VU (5V)

5V

5V

MQ Sensor

5V

OLED

3.3V

3.3V Regulated

3.3V

DHT11

Buzzer (via NPN)

3.3V

LED
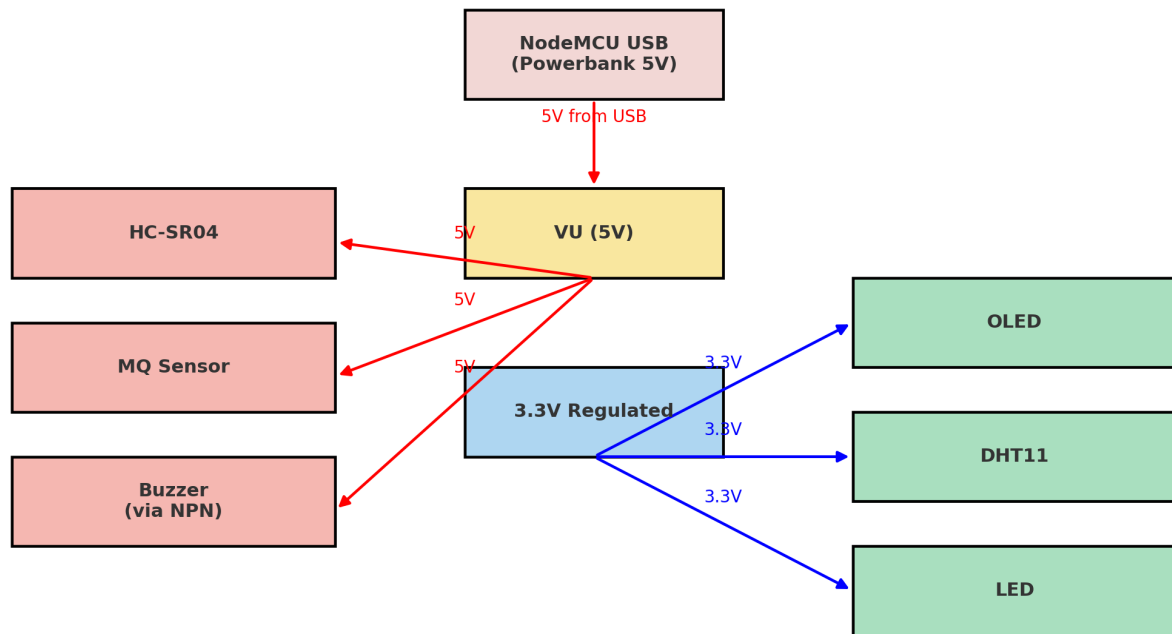
Note:
- MQ & HC-SR04 need 5V from VU (USB 5V)
- OLED & DHT11 use 3.3V regulator
- LED on 3.3V (with series resistor)
- Buzzer powered from 5V but driven via GPIO+transistor

Important Build Notes:
- OLED on TX/RX pins (GPIO1/GPIO3). Avoid Serial.print while OLED connected.
- HC-SR04 Echo requires a voltage divider (5V to 3.3V).
- MQ Sensor AOUT may require divider depending on NodeMCU version (1.0V vs 3.3V A0).
- Buzzer should be driven via NPN transistor + 1k base resistor, diode if coil type.
- LED should have 220Ω series resistor.
- Powerbank (≥1A) is recommended for stable operation.