QUIZ HUB   ESP32 Based   (3rd generation)

for power +.
programming

USB

ESP
Model MCU-ESP-32S

touch {
START   GPIO 4
STOP   GPIO 33
TEST   GPIO 15

LED's
RED   120Ω   GPIO 23
GREEN   82 Ω   GPIO 22
BLUE   22 Ω   GPIO 2

GND

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QUIZ NODE ESP 8266 based (3rd generation)

for programming
USB

VCC vcc 3/3

ESP8266

Node MCU 1.0
vs
(ESP-12E)

VCC

3V batt
(2x AA)

button

GPIO0 — D3

GPIO4 — D2

VCC

LED

I

R

BC167B

A0

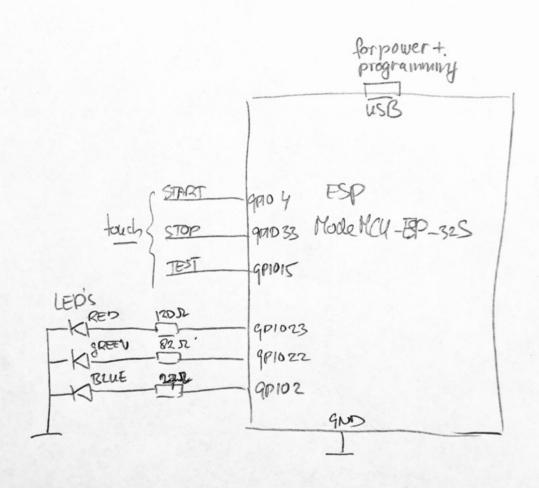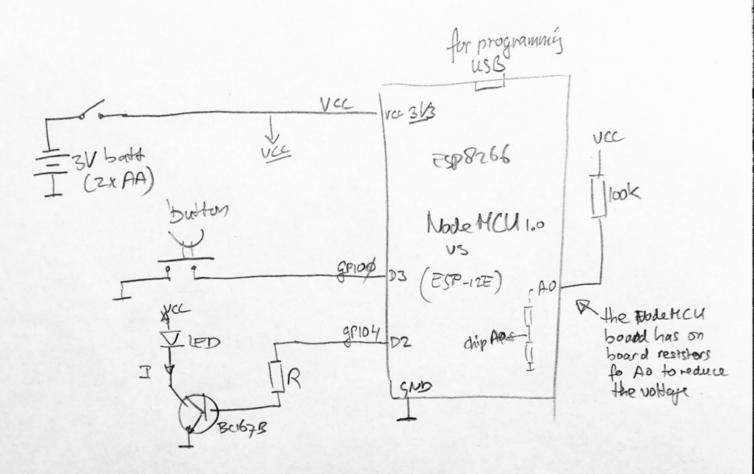chip A0

GND

VCC

100k

the NodeMCU board has on board resistors fo A0 to reduce the voltage.

Value of R depends on current gain and not based on color LED. Gain factor of transistor (hfe) can be measured or retrieved foum datasheet

If you want your LED to be on with a current of 15 mA,

then R is calculated as $\dfrac{2.3 \cdot hfe}{15}$ (in kΩ).

Example: I used an old BC167B with hfe of 225

$\Rightarrow \dfrac{2.3 \cdot 225}{15} = 34.5 \Rightarrow$ Round to 33k for R.

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