Fake TV v2

Circuits & Wiring

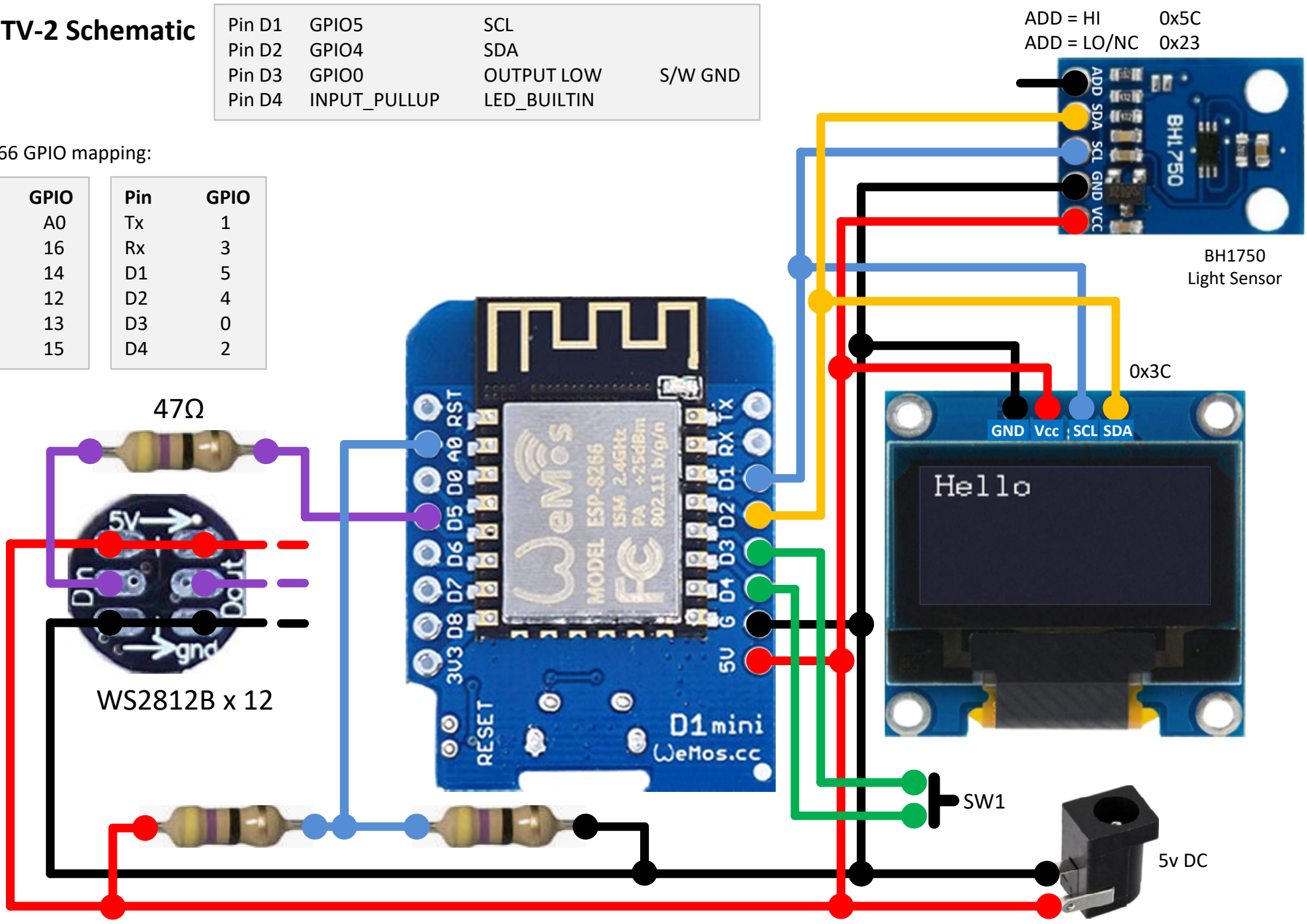
Fake TV-2 Schematic

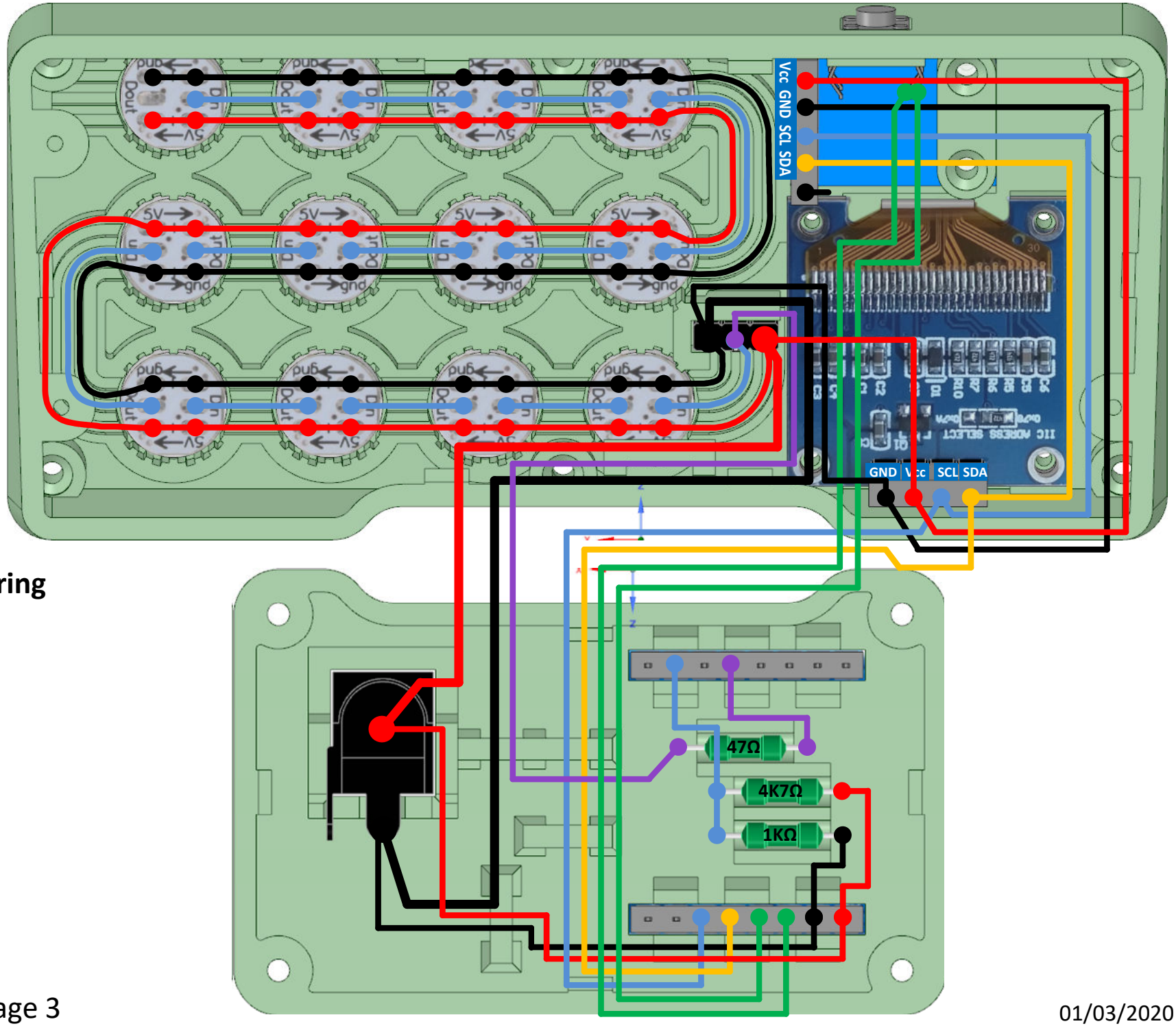
Pin D1	GPIO5	SCL	
Pin D2	GPIO4	SDA	
Pin D3	GPIO0	OUTPUT LOW	S/W GND
Pin D4	INPUT_PULLUP	LED_BUILTIN	

ESP8266 GPIO mapping:

Pin	GPIO
A0	A0
D0	16
D5	14
D6	12
D7	13
D8	15

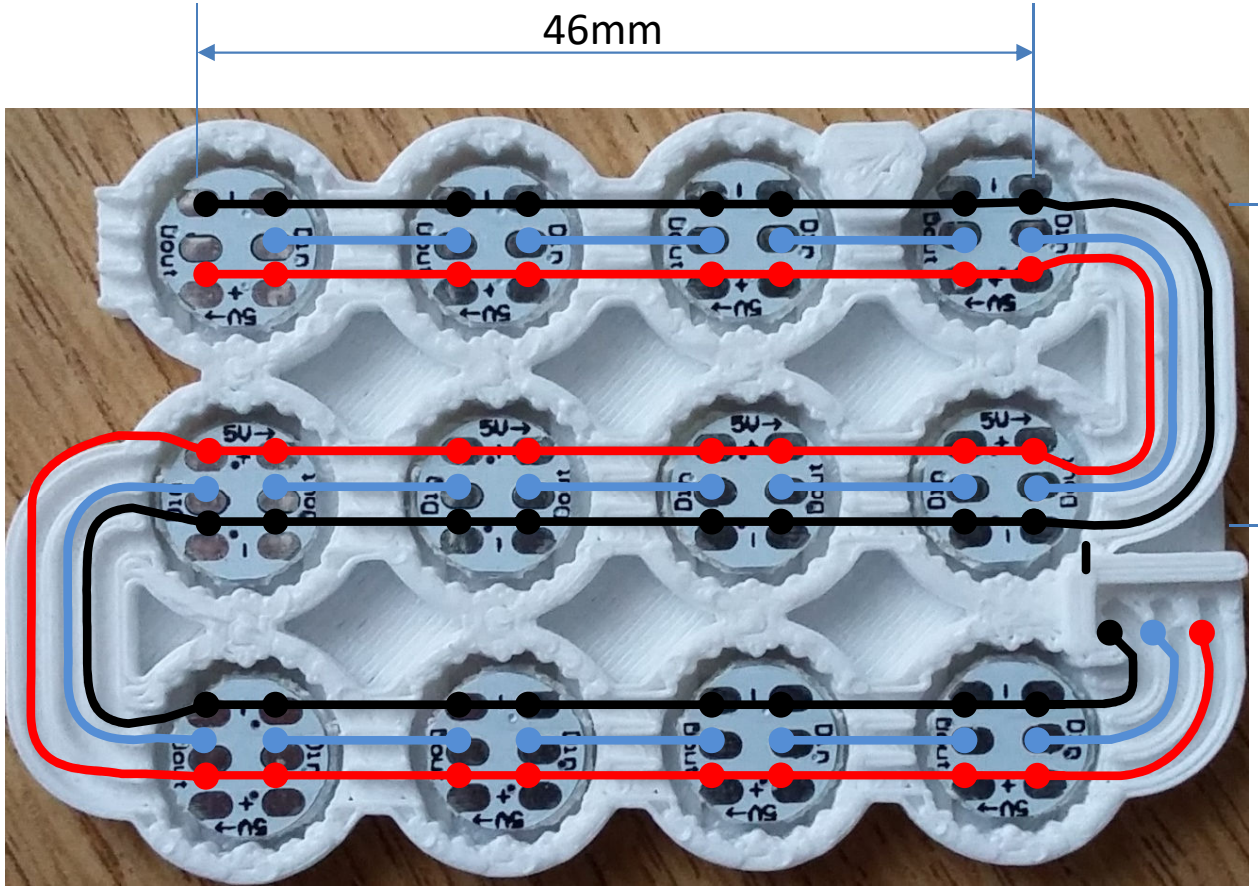
Pin	GPIO
Tx	1
Rx	3
D1	5
D2	4
D3	0
D4	2



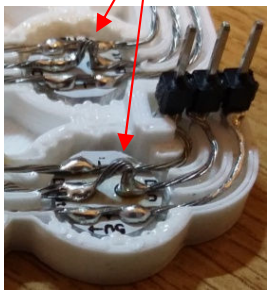


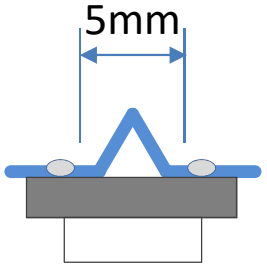
Fake TV-2 Wiring

Fake TV-2 LED Wiring



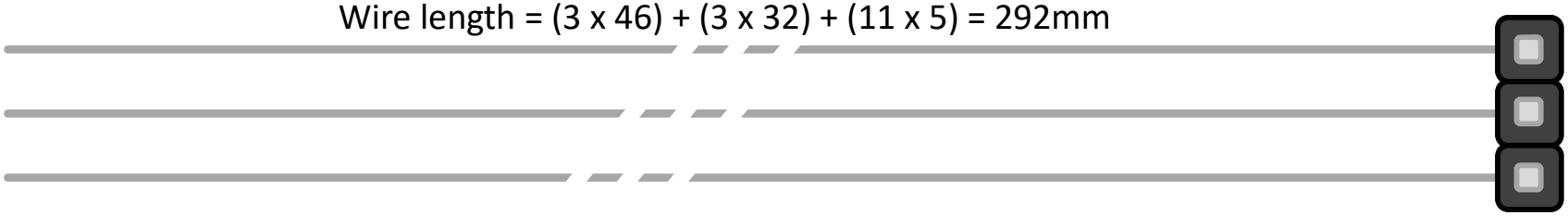
Kink centre data wire, then solder, then crop.





Data bridge

Wire length = (3 x 46) + (3 x 32) + (11 x 5) = 292mm



Use minimum 300 mm wire length

Fake TV-2 Protection Sensing

ESP8266 has a single ADC channel available to users. It may be used either to read voltage at ADC pin, or to read module supply voltage (VCC).

To read external voltage applied to ADC pin, use analogRead(A0). Input voltage range of bare ESP8266 is 0 — 1.0V, however some many boards may implement voltage dividers. To be on the safe side, <1.0V can be tested. If e.g. 0.5V delivers values around ~512, then maximum voltage is very likely to be 1.0V and 3.3V may harm the ESP8266. However values around ~150 indicates that the maximum voltage is likely to be 3.3V.

We will assume that the power socket is 5.5v max, hence R2 /R1 = 4.5 / 1.0

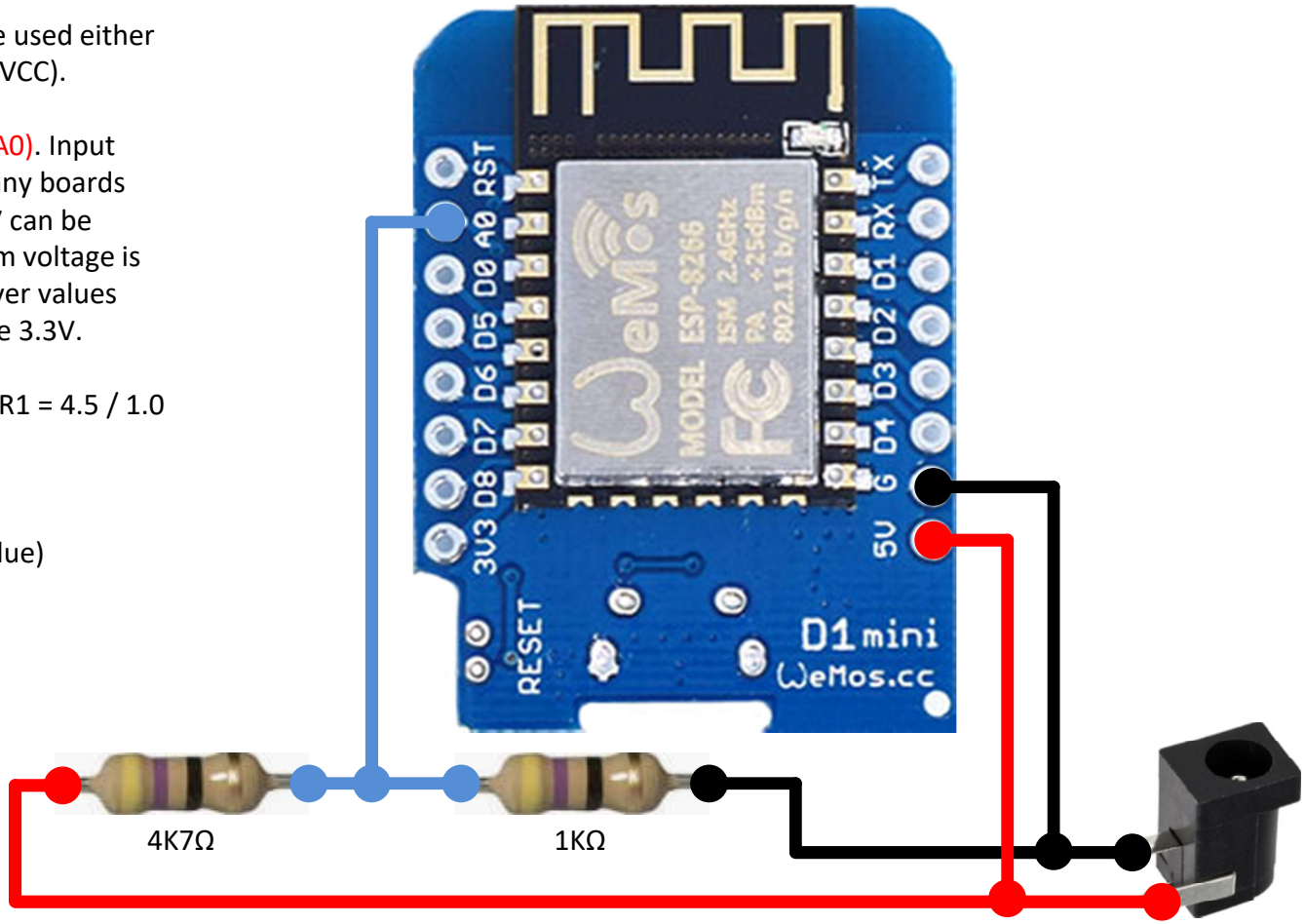
Based on standard values we will use R2 = 4k7 and R1 = 1k

For ADC, an input voltage of 1.0v == 1023 (analogRead(A0) value)

Hence:

VDC = 5.5v A0 = 987
VDC = 5.0 A0 = 897
USB = 5.0 A0 = 825 (assume 4.6v after Schottky diode)

So we can detect whether or not the board is running off the UDB input and reduce the LED brightness in this mode to safeguard the Schottky diode.



Note the above values may be different for your system, hence you should use the serial monitor to assess your values and set limits accordingly.