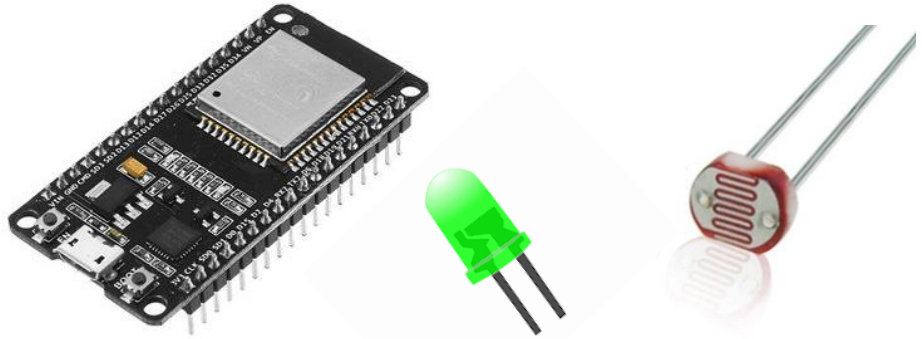
Smartphone-Experimente mit externen DIY-Messmodulen

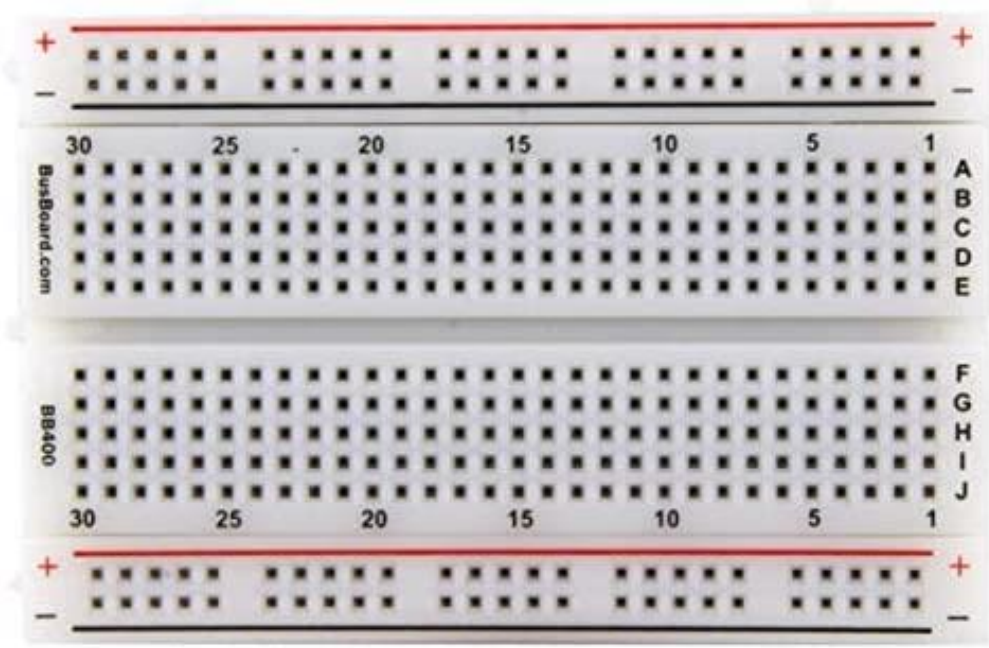
Übersicht

- Einführung zur verwendeten Hardware
- Bibliothek phyphoxBLE
- Spannungsteiler mit Fotowiderstand auslesen
- Übersicht über
  - Sensoren
  - Beispielprojekte
- Temperatur/Drucksensor auslesen

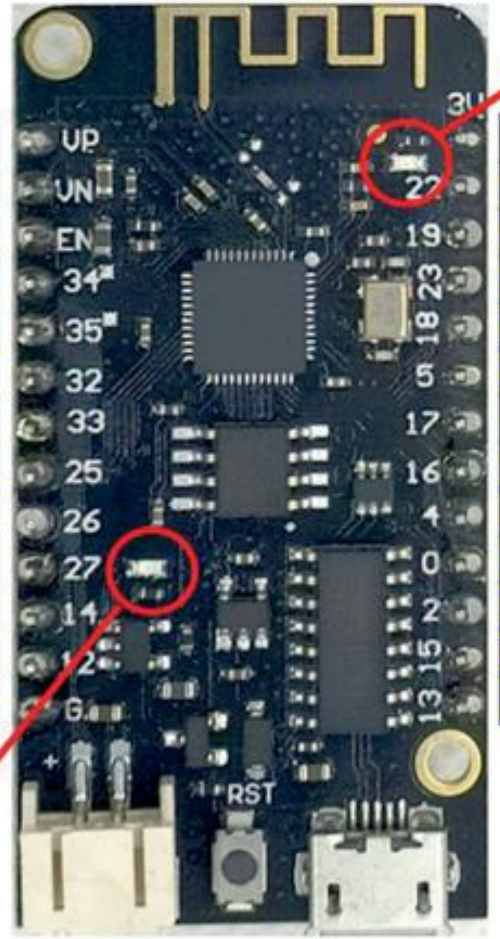
Verwendete Hardware

- Mikrocontroller ESP32
- Sensoren
  - Fotowiderstand
  - Temperatur/Druck Sensor BMP180
- Widerstände (10, 47, 2x 4.7k, 10k)
- RGB-LED





ESP32 Lolin32 Lite

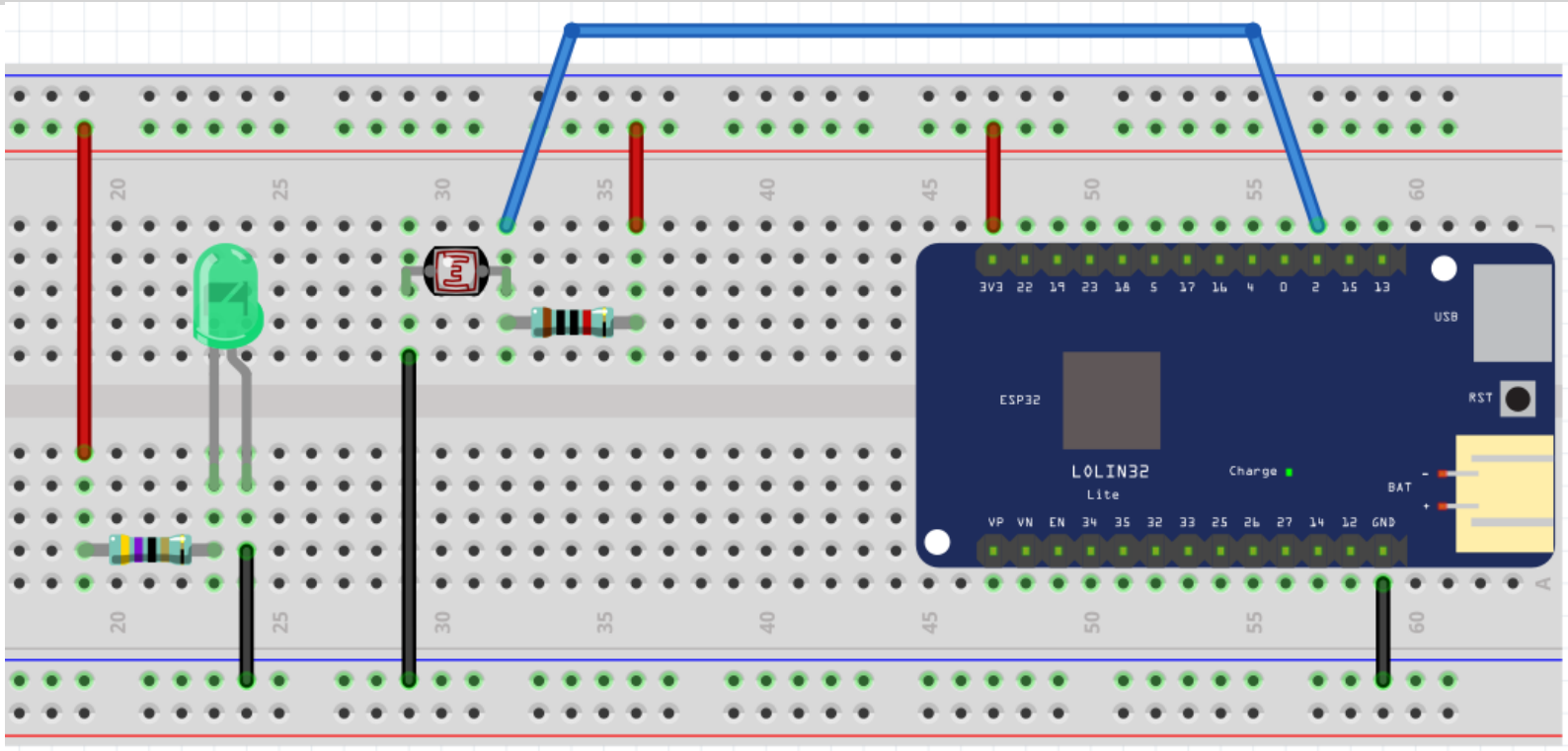


		RTC-0		ADC1-0	GPIO36							
		RTC-3		ADC1-3	GPIO39							
					RESET							
		RTC-4		ADC1-6	GPIO34							
		RTC-5		ADC1-5	GPIO35							
	RTC-9	Touch 9		ADC1-4	GPIO32							
	RTC-8	Touch 8		ADC1-5	GPIO33							
	RTC-6	DAC1		ADC2-8	GPIO25							
	RTC-7	DAC2		ADC2-9	GPIO26							
	RTC-17	Touch 7		ADC2-7	GPIO27							
HSPICL	SD CLK	RTC-16	Touch 6	ADC2-6	GPIO14							
HSPIQ	SD D2	RTC-15	Touch 5	ADC2-5	GPIO12							
					GND							

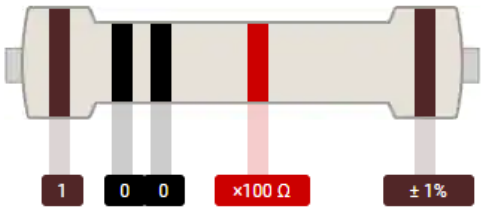
3.3V						
GPIO22	int.LED					
GPIO19	MISO	SDA				
GPIO23	MOSI	SCL				
GPIO18	CLK					
GPIO05	SS					
GPIO17	U2 TX					
GPIO16	U2 RX					
GPIO04	ADC2-0	Touch 0	RTC-10	I2C1 CL	SD D1	HSPIHD
GPIO00	ADC2-1	Touch 1	RTC-11	I2C1 DA		
GPIO02	ADC2-2	Touch 2	RTC-12	I2C2 CL	SD D0	HSPIWP
GPIO15	ADC2-3	Touch 3	RTC-13	I2C2 DA	SD CMD	HSPICS
GPIO13	ADC2-4	RTC-14	SD D3	HSPID		

Digitale Ein- Ausgänge
Analog Eingänge

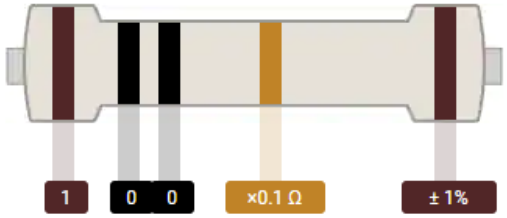
Spannungsteiler



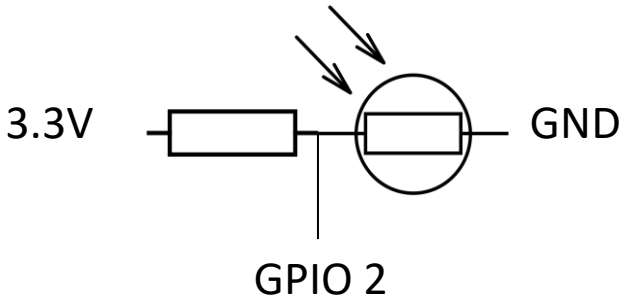
- ESP32
- Fotowiderstand
- 10kΩ Widerstand
- LED
- 10Ω Vorwiderstand



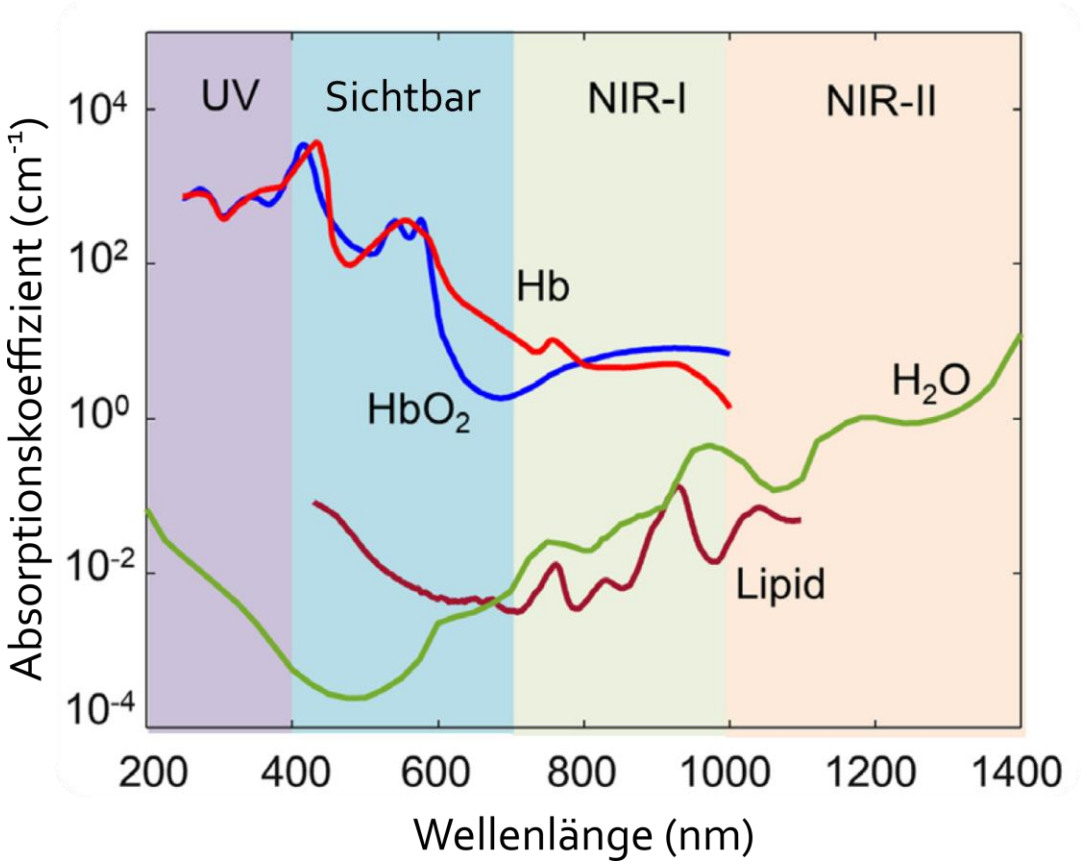
10kΩ

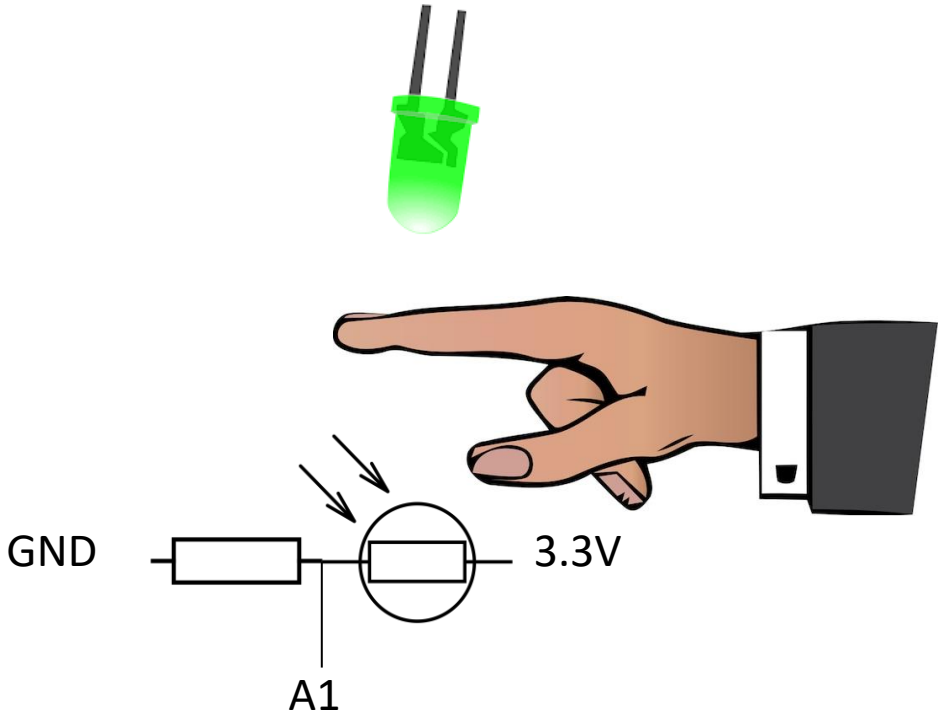


10Ω



Idee: Herzfrequenzsensor





CO_2 Monitor

https://phyphox.org/de/co2/

Lötkurs

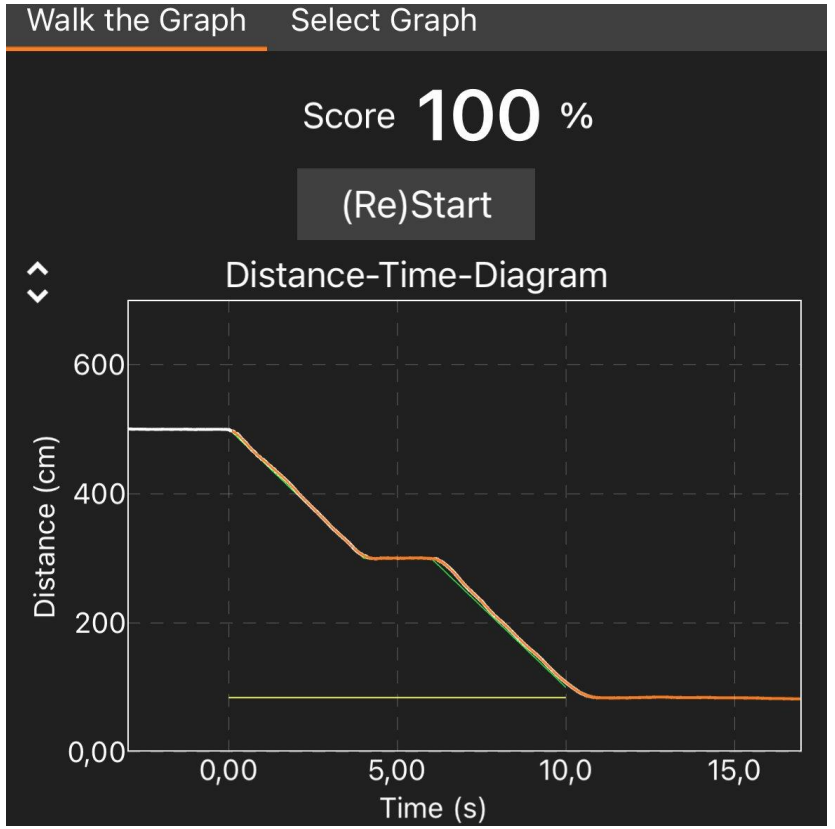
Schwierigkeit

1
2
3
4
5

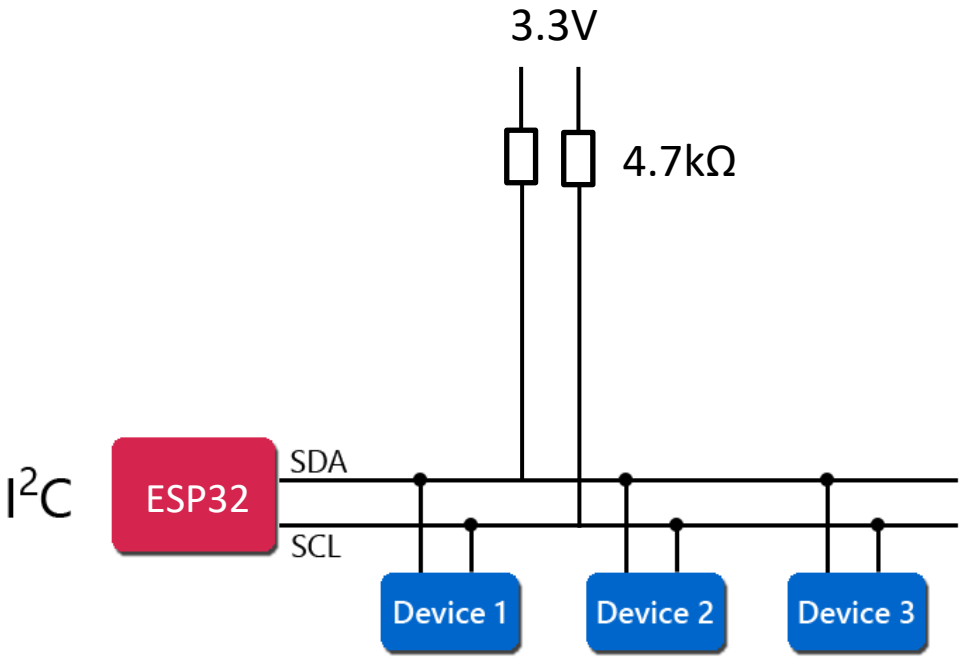
Testpunkte

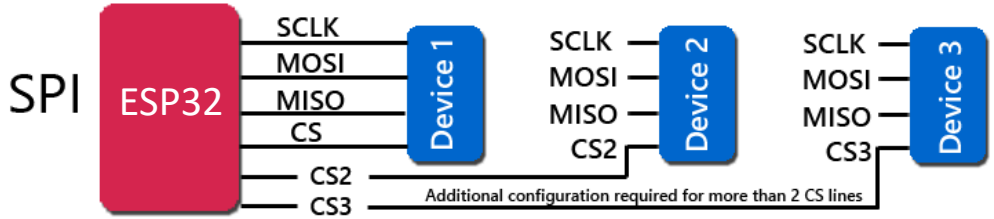
Weitere Projektbeispiele

- Push / Walk the Graph
- Bienenstock
- Sättigungsdampfdruckkurve
- Wärmekapazität
- Diodenkennlinie
- Freier Fall



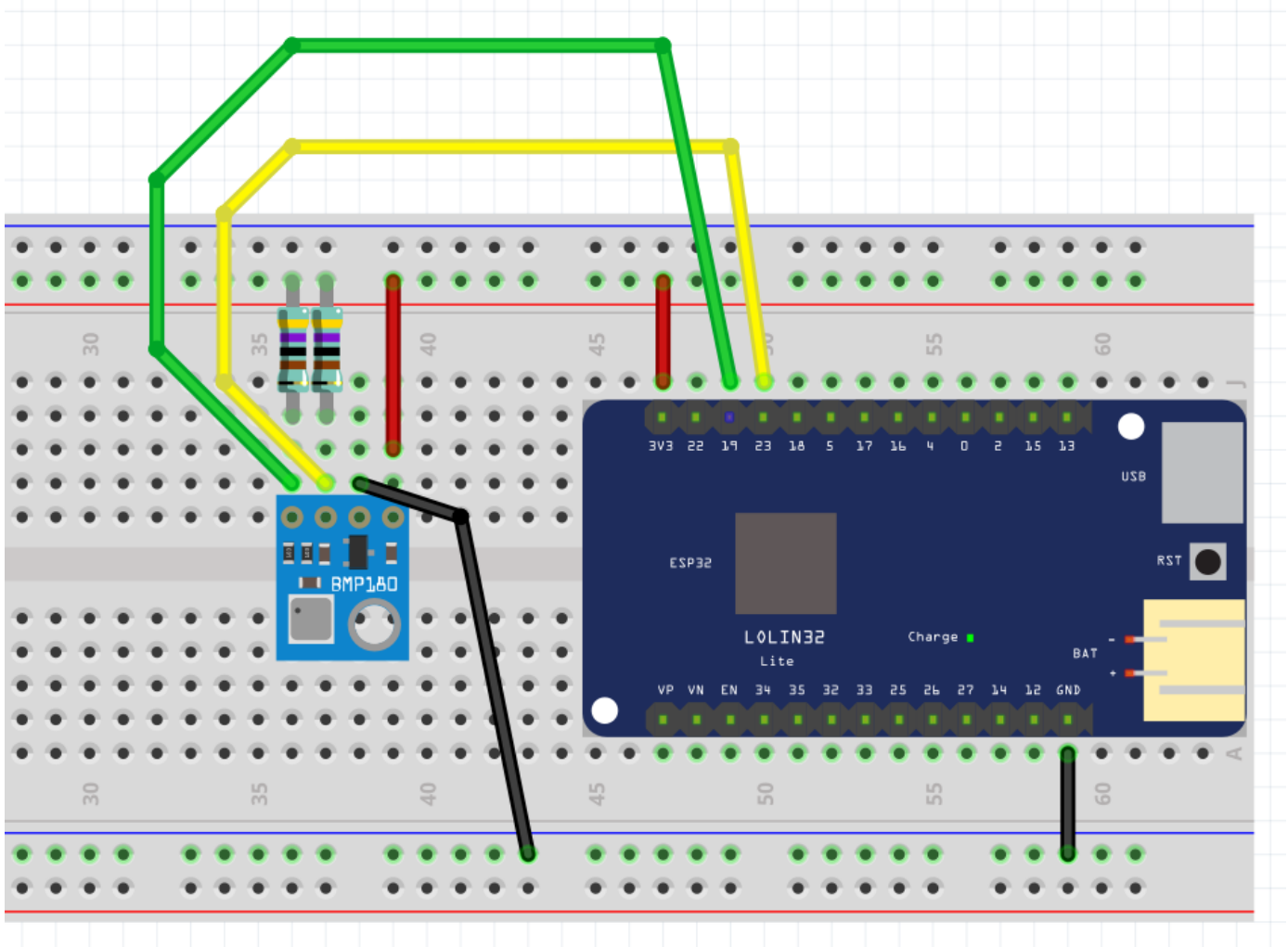
Schnittstellen





Pull-(Up) Widerstand benötigt!

BMP180 Auslesen



- ESP32
- BMP180
- 2x 4.7kΩ
- Jumperkabel

SDA: GPIO 19

SCL: GPIO 23

Wo finde ich Sensoren/Guides?

Informationen Guides

- https://www.adafruit.com/
- https://www.sparkfun.com/
- https://www.seeedstudio.com/

Shops

- https://www.az-delivery.de/
- https://eckstein-shop.de/
- https://www.exp-tech.de/
- https://www.dfrobot.com/
- https://electronics.semaf.at/

Vielen Dank für eure Aufmerksamkeit!