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**Erasmus+**

**„Strato-Ballon Measurement an Environmental  
Consciousness“**

**2024-1-DE02-KA210-VET-000243591**

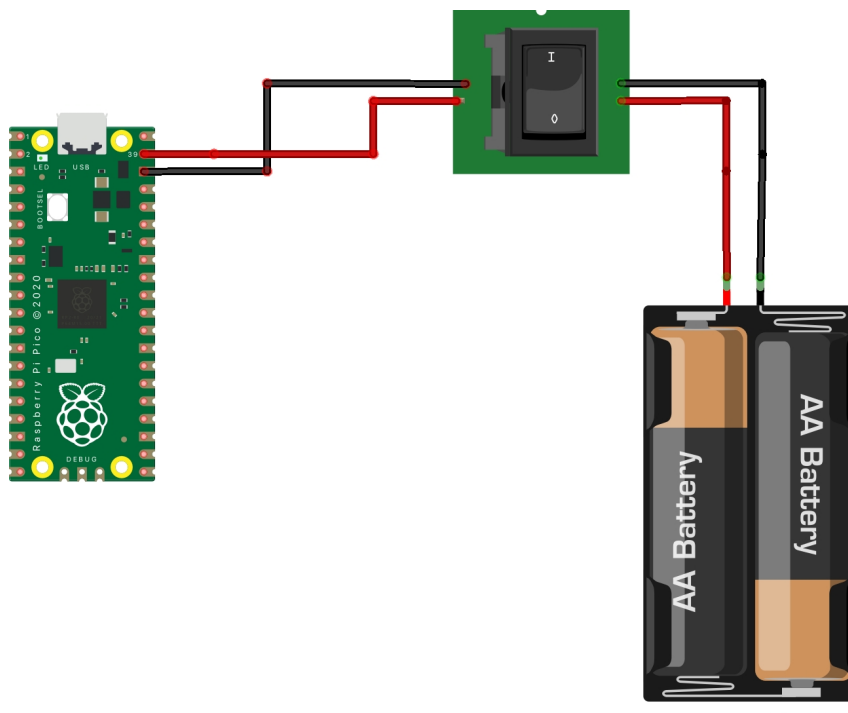
**<https://euballon.zslp.edu.pl/>**

Material for students and teachers allowing for the preparation of measuring equipment.  
Developed and used as part of the project implementation

**PICOBBOX**

**Information useful for constructing flight data recording devices (May be used in  
many other experiments, also in the field, including geospatial analysis)**

**Power switch/ battery schema**



Raspberry Pin	Battery wire	remarks
VSYS	red (+)	The minimum recommended voltage for the VSYS pin on the Raspberry Pi Pico is <b>1.8V</b> , and the maximum is 5.5V.
GND	black(ground)	You can select one from many pins with description "GND"

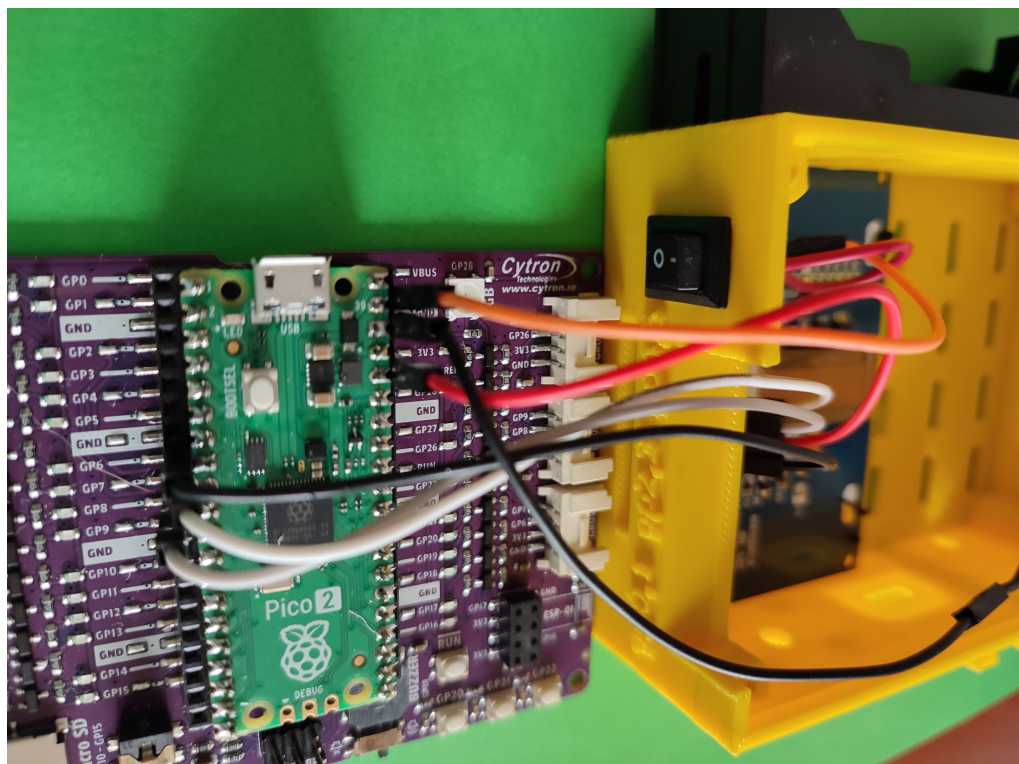
We use 1 accumulator/battery 18650 with single battery holder which offer from 3.7V to 4,2V (recommended). If you want to use a 18650 battery holder for 2 or more batteries, it can only be used battery holder with a parallel connection (then the voltage will not change). Battery holder with a series connection increase the voltage beyond the allowable norm (8.4V, 12.6V...).

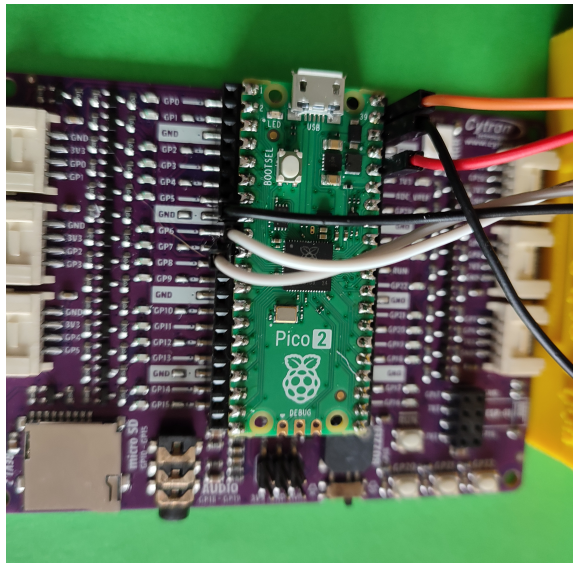
**Warning! Make sure the battery 18650 does not drop below 2.5V, otherwise it may not be possible to charge it again.**

This type of battery provides stable current for a long time. During our almost three-hour flight, 90% of the maximum charge remained

You can't connect the set of batteries which deliver max 5V.

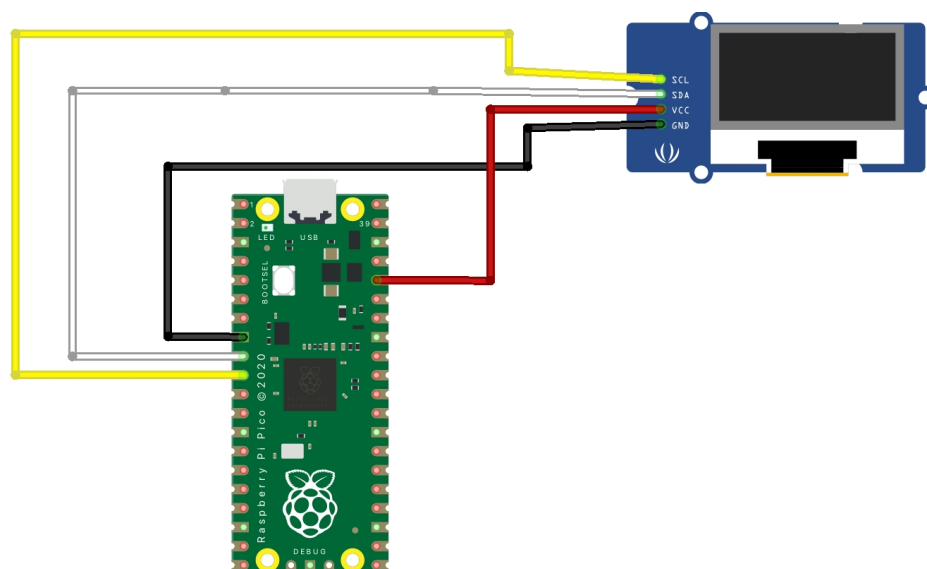
You must solder wires to power switch.





OLED screen SSD1306 I2C 2.4" connection

Raspberry Pico Pin	OLED SSD1306 PIN	wire color	remarks
3V3 Out	VCC	red	3.3 Volts (+)
GND	GND	black	You can select one from many pins with description "GND"
GP6	SDA	white	you can use different colour
GP7	SCK (SCL)	yellow	you can use different colour



fritzing

Colours: black, red, white and yellow is the standard for very popular Grove wires.

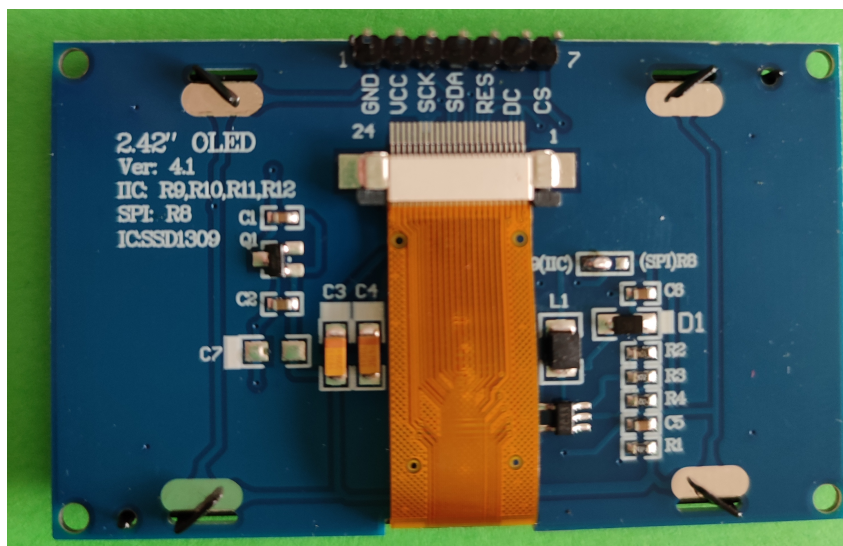
You can select different pins for I2C communication (GP6,GP7), but in this case You must modify our Python scripts.

See details: <https://pico2.pinout.xyz/>

In our case, we used RP2350 Pico 2 microcontrollers due to the space for recorded measurements and larger memory than Pico 1. Pico 1W and Pico 2W offer less space for saving data than Pico 2.

### **OLED SSD1306 2.4" screen**

For I2C communication it is necessary to properly solder jumpers R9, R10, R11 and R12. Pins RES, DC, CS not used if we have I2C communication (these pins are used for SPI communication).





## Parts:

### Raspberry Pi Pico 2

<https://botland.store/modules-and-kits-for-raspberry-pi-pico-2/25311-raspberry-pi-pico-2-rp2350-arm-cortex-m33-5056561803951.html>

Docking station for Pico/Pico2 (Cytron Maker Pi Pico)

<https://botland.store/raspberry-pi-pico-hat-extendings-findings/19297-maker-pi-pico-base-simplifying-pi-pico-for-beginners-5904422360917.html>

OLED SSD1306 2.4"

<https://sklep.msalamon.pl/produkt/wyswietlacz-oled-242-128x64px-bialy/>

Power switch (14x10 mm)

Battery holder for 18650 battery

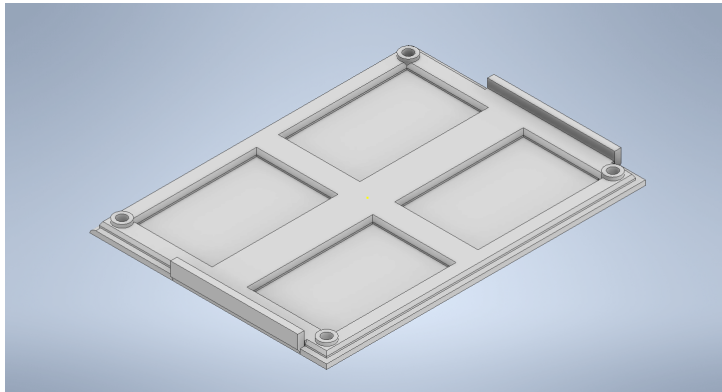
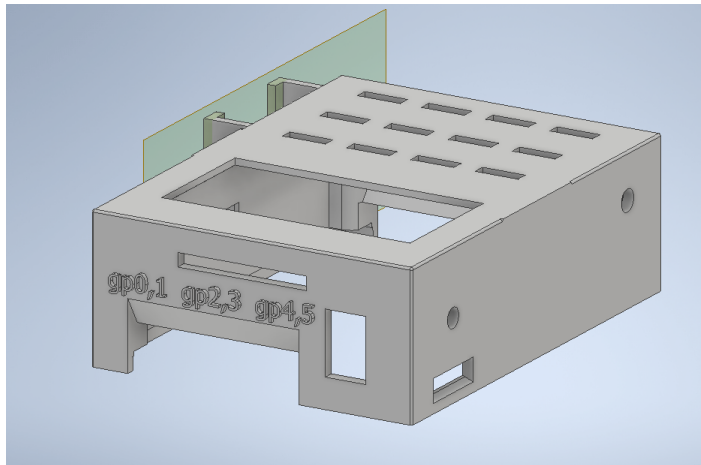
Battery 18650

Wires

<https://botland.store/female-to-male-connecting-cables/19949-connecting-cables-female-male-justpi-10cm-40pcs-5904422328696.html>

**Note:** instead of battery You can use PowerBank connected to USB socket, but many Powerbanks have low power consumption shutdown protection  
3D Models for self print Box

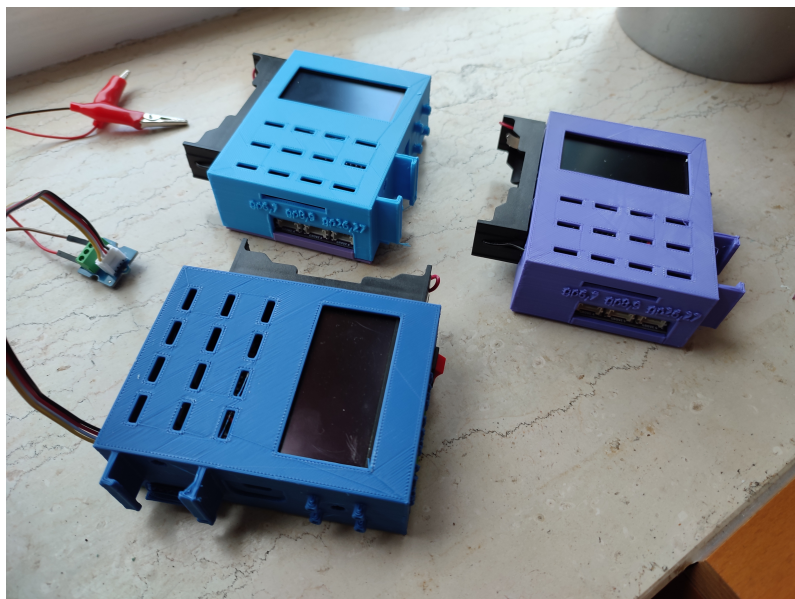
## PicoBox 3D Models



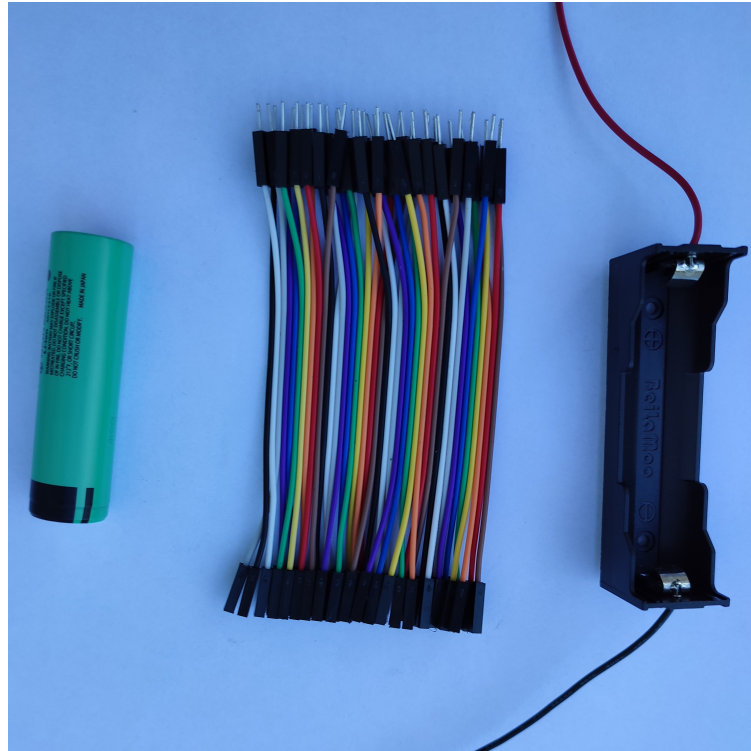
You can download our STL models from the website:

<https://euballon.zslp.edu.pl>

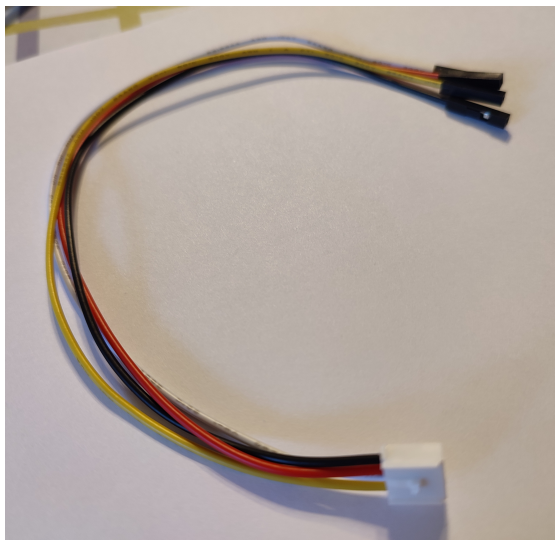
Our PicoBoxes after returning



Battery 18650 LI-Ion, Male -Female wires (10 cm), holder for 18650 battery



Grove to female cable for connection between PicoBox and sensors



Ready to start PicoBox powered by 18650 battery with switch



From the website <https://euballon.zslp.edu.pl/downloads/> You can download our MicroPython scripts for Raspberry Pi Pico, libraries, our Python tools for data analysis and other materials.

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