

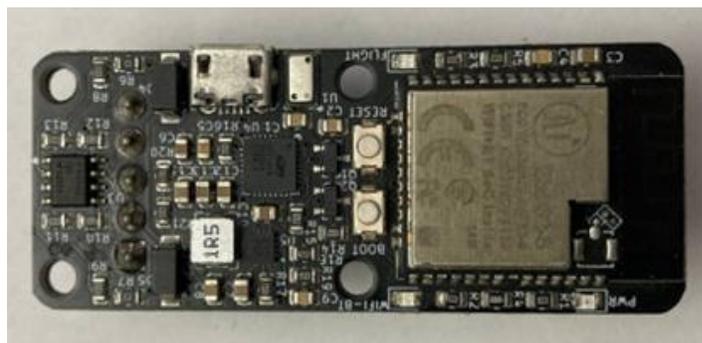
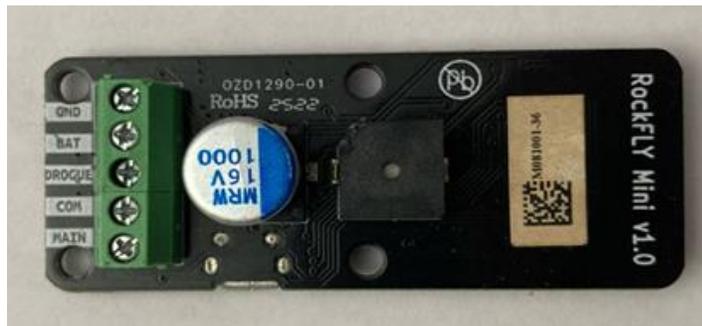
ROCKFLY-MINI

RockFLY Mini is an open source new generation user-friendly rocket card with Wifi/Bluetooth feature with two-stage recovery system in high-model rocketry.

Thanks to the RockFLY Mini Wifi/Bluetooth feature, it interfaces to the user. You can access the information of pre-flight sensor data, battery voltage, flash occupancy rate and whether e-matches are attached, and change the main parachute altitude, the metric/imperial measurement system and delete the flash memory. You can even test the card's e-match connected to the Drogue and Main line by firing them over the interface.

You can access the latest flight statistics data after the flight and download or delete the data recorded during the flight in .csv format.

RockFLY Mini Arduino appeals to a wide audience due to its programming through IDE. With its open source code, it allows users to access flight codes and make changes. Therefore, it supports users to develop different experiences on the card.



Basic Features

- Software : Open Source
- Weight :13 gr
- IDE : Arduino
- Platform : ESP32 WIFI/Bluetooth
- MCU : ESP32-S
- Flash : 16MB (3MB APP/12.9MB SPIFFS)
- Ram : 520 kB
- Operating Frequency : 80-240 Mhz
- Operating Voltage : 3.3 Volt
- Input Voltage : 2.7 (min) - 16 (max) Volt on Bat Terminal (Buck-Boost regulator with power good)
- Output current : Do not exceed 7 amper
- Sensor : MS5611 (pressure and temperature)
- Maximum altitude : 100.000 feet
- Altitude resolution : 10 cm
- Resolution temperature : 0.01 °C
- CPU Power Consumption (Idle) : ~70 mA
- Sample rate : 30 samples per second in flight mode

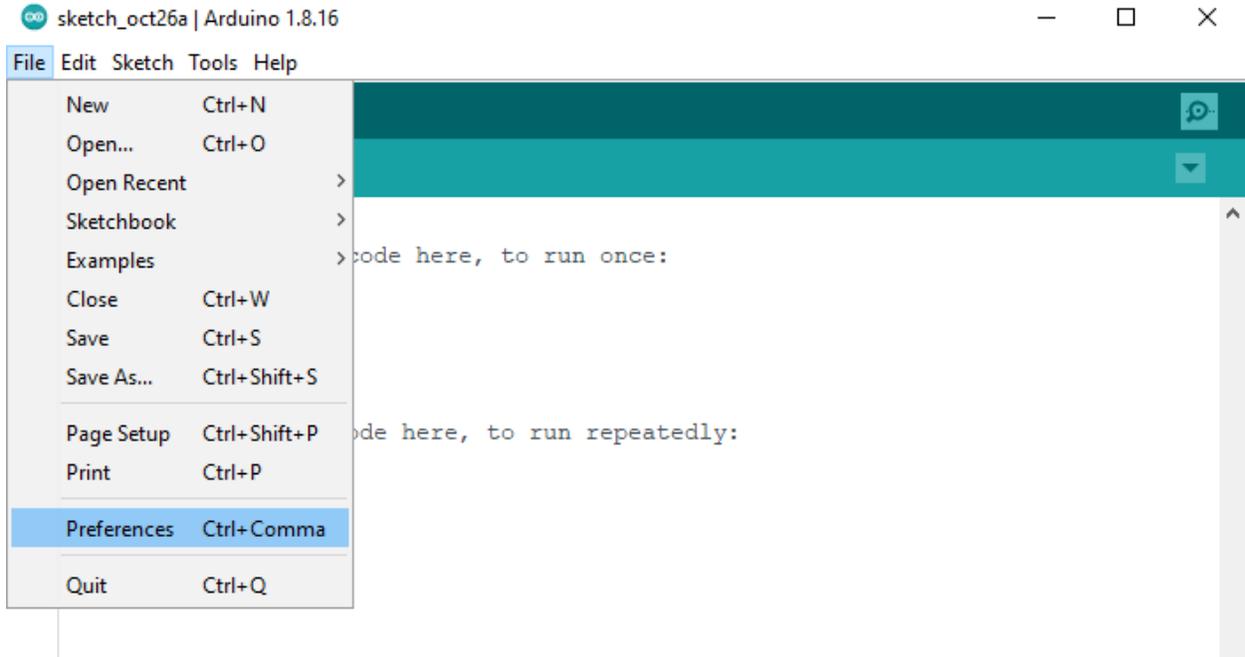
INSTALLATION

1. Install Arduino IDE

Download and install [Arduino IDE](#). If you have already installed Arduino, please check for updates. Its version should be at least v1.8.19 or newer.

2. Install ESP32

- Open the File > Preferences >... menu item as follows:

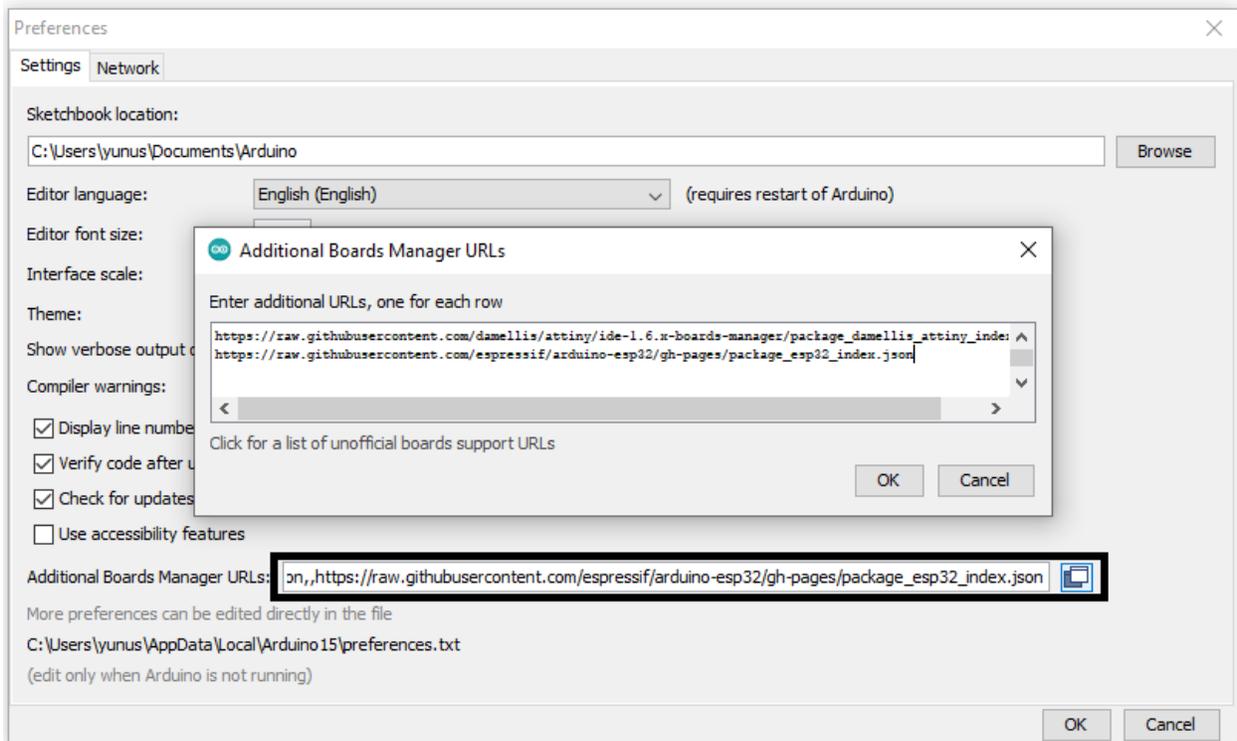


- Enter the following into the “Additional Board Manager URLs” field:

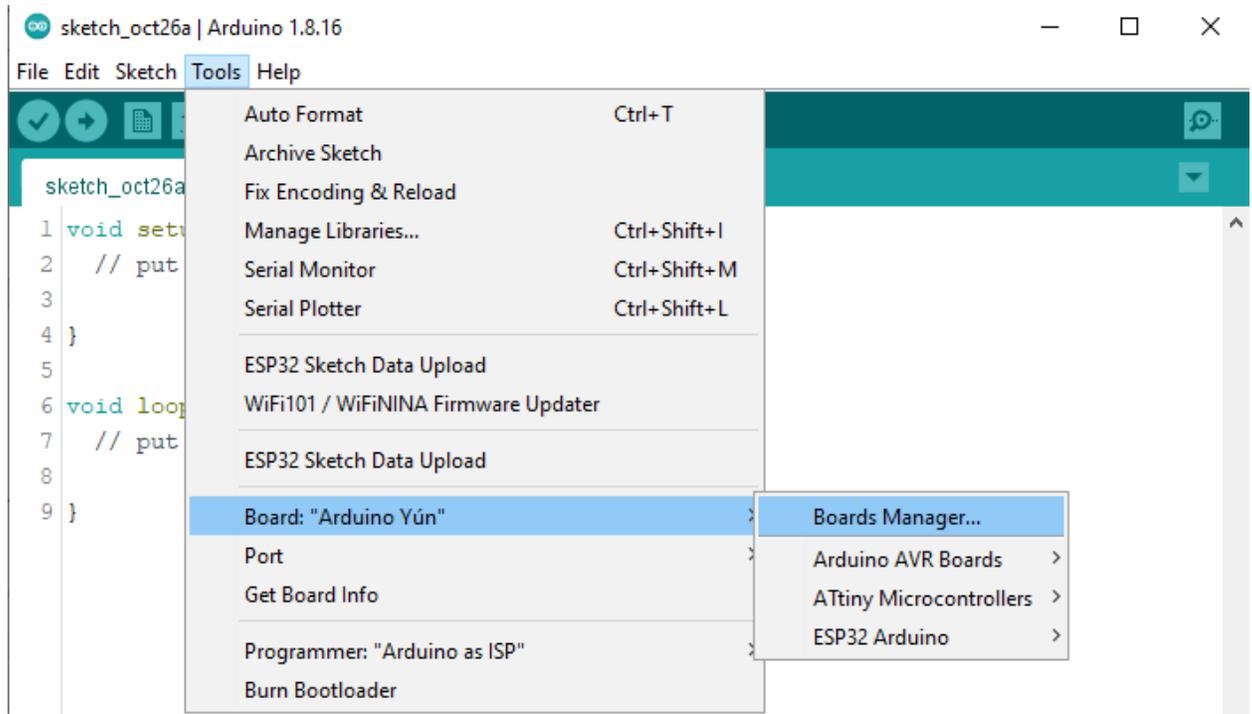
```
https://raw.githubusercontent.com/espressif/arduino-esp32/gh-pages/package_esp32_index.json
```

Note: if you already have the ESP8266 boards URL, you can separate the URLs with a comma as follows:

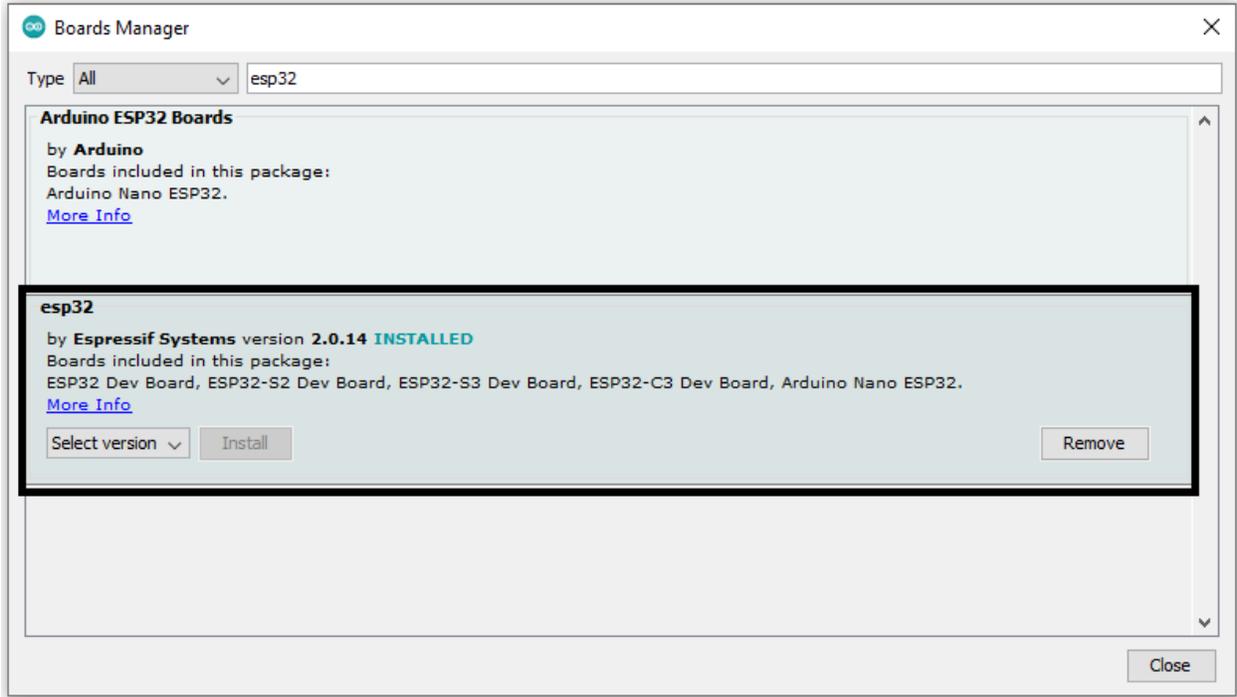
```
https://raw.githubusercontent.com/espressif/arduino-esp32/gh-pages/package_esp32_index.json,  
http://arduino.esp8266.com/stable/package_esp8266com_index.json
```



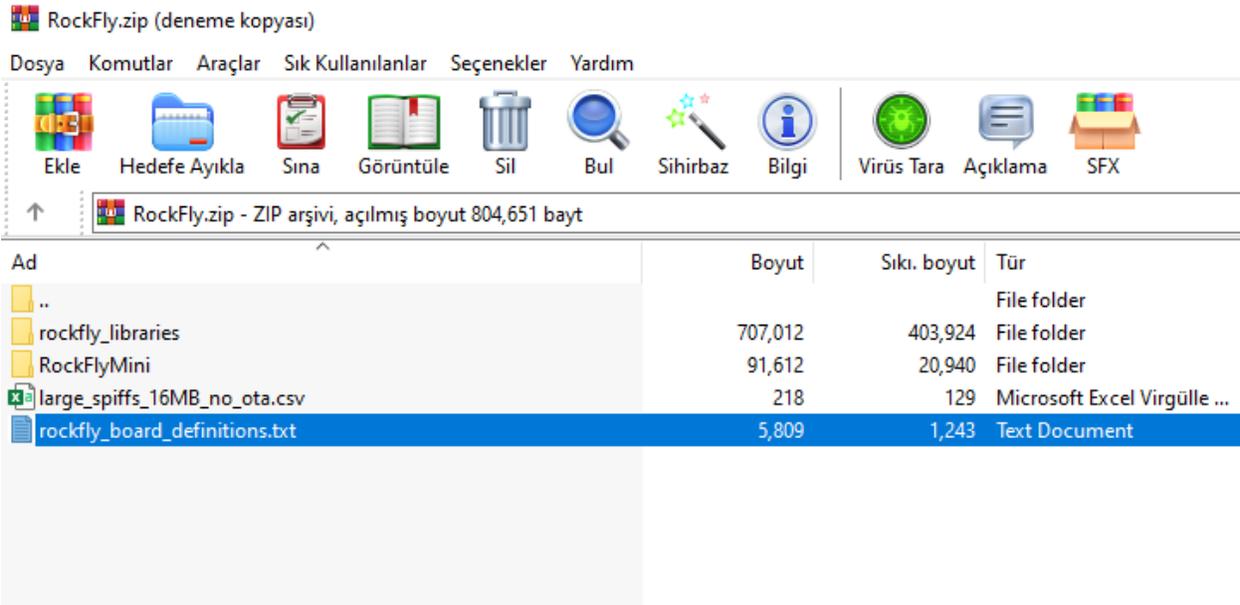
- Open the Boards Manager. Go to Tools > Board > Boards Manager...



- Search for ESP32 and press install button for the “ESP32 by Espressif Systems“:



- Open **RockFly zip** file and open **rockfly_board_definitions.txt** file and then copy the all texts.



RockFLY.menu.FlashSize.16M=16MB (128Mb)
RockFLY.menu.FlashSize.16M.build.flash_size=16MB

RockFLY.menu.UploadSpeed.921600=921600
RockFLY.menu.UploadSpeed.921600.upload.speed=921600
RockFLY.menu.UploadSpeed.115200=115200
RockFLY.menu.UploadSpeed.115200.upload.speed=115200

RockFLY.menu.Up1
RockFLY.menu.Up1
RockFLY.menu.Up1
RockFLY.menu.Up1
RockFLY.menu.Up1
RockFLY.menu.Up1
RockFLY.menu.Up1
RockFLY.menu.Up1
RockFLY.menu.Up1
RockFLY.menu.Up1

- Undo
- Cut
- Copy
- Paste
- Delete
- Select All
- Right to left Reading order
- Show Unicode control characters
- Insert Unicode control character >
- Open IME
- Reconversion
- Search with Bing...

RockFLY.menu.Loos
RockFLY.menu.Loos
RockFLY.menu.Loos
RockFLY.menu.Loos
RUNNING_CORE=1
RUNNING_CORE=0

RockFLY.menu.EventsCore.1.build.event_core=-DARDUINO_EVENT_RUNNING_CORE=1
RockFLY.menu.EventsCore.0=Core 0
RockFLY.menu.EventsCore.0.build.event_core=-DARDUINO_EVENT_RUNNING_CORE=0

RockFLY.menu.DebugLevel.none=None
RockFLY.menu.DebugLevel.none.build.code_debug=0
RockFLY.menu.DebugLevel.error=Error
RockFLY.menu.DebugLevel.error.build.code_debug=1
RockFLY.menu.DebugLevel.warn=Warn
RockFLY.menu.DebugLevel.warn.build.code_debug=2
RockFLY.menu.DebugLevel.info=Info
RockFLY.menu.DebugLevel.info.build.code_debug=3
RockFLY.menu.DebugLevel.debug=Debug
RockFLY.menu.DebugLevel.debug.build.code_debug=4
RockFLY.menu.DebugLevel.verbose=Verbose
RockFLY.menu.DebugLevel.verbose.build.code_debug=5

RockFLY.menu.EraseFlash.none=Disabled
RockFLY.menu.EraseFlash.none.upload.erase_cmd=
RockFLY.menu.EraseFlash.all=Enabled
RockFLY.menu.EraseFlash.all.upload.erase_cmd=-e

#####

- And then find the Esp32 boards file in your computer...

C:\Users\\AppData\Local\Arduino15\packages\esp32\hardware\esp32\2.0.14

cores	4.10.2023 20:31	Dosya klasörü	
libraries	4.10.2023 20:31	Dosya klasörü	
tools	4.10.2023 20:31	Dosya klasörü	
variants	4.10.2023 20:31	Dosya klasörü	
boards.txt	19.10.2023 18:14	Metin Belgesi	1.197 KB
package.json	4.10.2023 20:31	JSON Kaynak Dos...	1 KB
platform.txt	4.10.2023 20:31	Metin Belgesi	91 KB
programmers.txt	4.10.2023 20:31	Metin Belgesi	1 KB

- Open the boards file and paste the RockFly board definitions that you copied from the zip file to the bottom of the boards file.

```
atd147_s3.menu.DebugLevel.info=Info
atd147_s3.menu.DebugLevel.info.build.code_debug=3
atd147_s3.menu.DebugLevel.debug=Debug
atd147_s3.menu.DebugLevel.debug.build.code_debug=4
atd147_s3.menu.DebugLevel.verbose=Verbose
atd147_s3.menu.DebugLevel.verbose.build.code_debug=5

atd147_s3.menu.EraseFlash.none=Disabled
atd147_s3.menu.EraseFlash.none.upload.erase_cmd=
atd147_s3.menu.EraseFlash.all=Enabled
atd147_s3.menu.EraseFlash.all.upload.erase_cmd=-e

#####

RockFLY.name=RockFLY

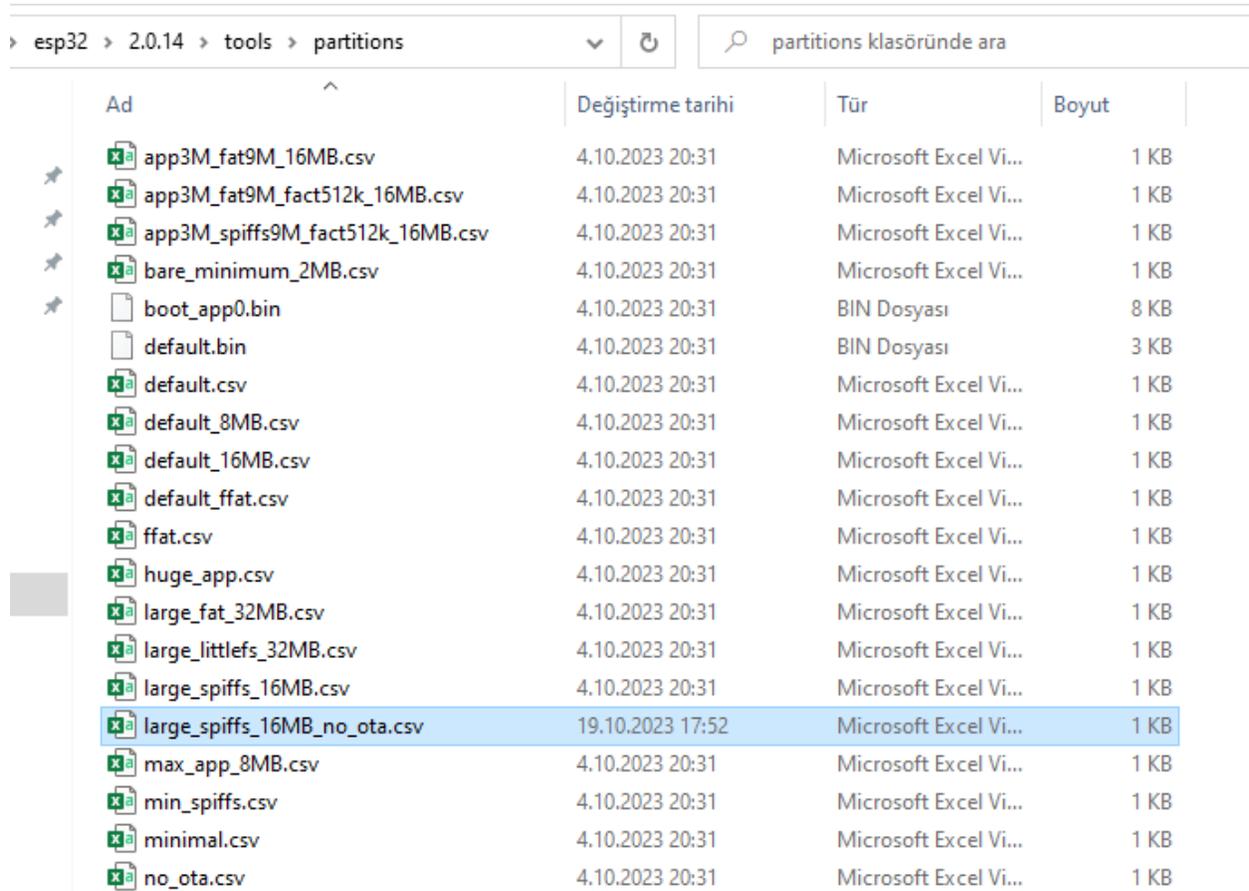
RockFLY.bootloader.tool=esptool_py
RockFLY.bootloader.tool.default=esptool_py

RockFLY.upload.tool=esptool_py
RockFLY.upload.tool.default=esptool_py
RockFLY.upload.tool.network=esp_ota

RockFLY.upload.maximum_size=1310720
RockFLY.upload.maximum_data_size=327680
RockFLY.upload.flags=
```

- After, in RockFly zip file copy the **large_spiffs_16MB_no_ota.csv** file and go to the **partitions** file and paste.

C:\Users\\AppData\Local\Arduino15\packages\esp32\hardware\esp32\2.0.14\tools\partitions



The screenshot shows a Windows File Explorer window with the address bar displaying the path: esp32 > 2.0.14 > tools > partitions. The search bar contains the text 'partitions klasöründe ara'. The main area displays a list of files and folders with columns for 'Ad', 'Değiştirme tarihi', 'Tür', and 'Boyut'. The file 'large_spiffs_16MB_no_ota.csv' is highlighted in blue.

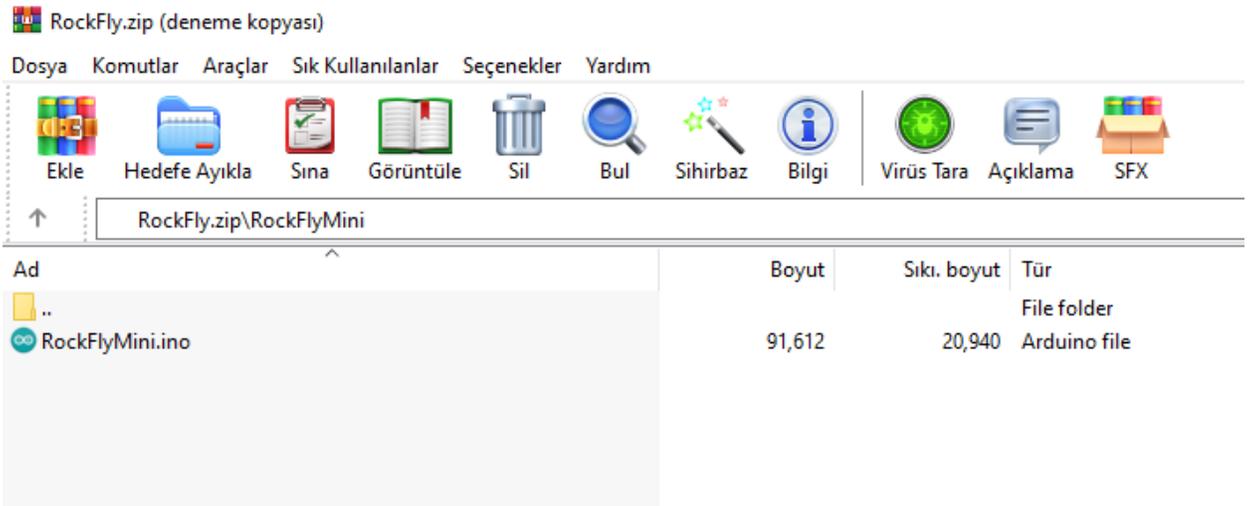
Ad	Değiştirme tarihi	Tür	Boyut
app3M_fat9M_16MB.csv	4.10.2023 20:31	Microsoft Excel Vi...	1 KB
app3M_fat9M_fact512k_16MB.csv	4.10.2023 20:31	Microsoft Excel Vi...	1 KB
app3M_spiffs9M_fact512k_16MB.csv	4.10.2023 20:31	Microsoft Excel Vi...	1 KB
bare_minimum_2MB.csv	4.10.2023 20:31	Microsoft Excel Vi...	1 KB
boot_app0.bin	4.10.2023 20:31	BIN Dosyası	8 KB
default.bin	4.10.2023 20:31	BIN Dosyası	3 KB
default.csv	4.10.2023 20:31	Microsoft Excel Vi...	1 KB
default_8MB.csv	4.10.2023 20:31	Microsoft Excel Vi...	1 KB
default_16MB.csv	4.10.2023 20:31	Microsoft Excel Vi...	1 KB
default_ffat.csv	4.10.2023 20:31	Microsoft Excel Vi...	1 KB
ffat.csv	4.10.2023 20:31	Microsoft Excel Vi...	1 KB
huge_app.csv	4.10.2023 20:31	Microsoft Excel Vi...	1 KB
large_fat_32MB.csv	4.10.2023 20:31	Microsoft Excel Vi...	1 KB
large_littlefs_32MB.csv	4.10.2023 20:31	Microsoft Excel Vi...	1 KB
large_spiffs_16MB.csv	4.10.2023 20:31	Microsoft Excel Vi...	1 KB
large_spiffs_16MB_no_ota.csv	19.10.2023 17:52	Microsoft Excel Vi...	1 KB
max_app_8MB.csv	4.10.2023 20:31	Microsoft Excel Vi...	1 KB
min_spiffs.csv	4.10.2023 20:31	Microsoft Excel Vi...	1 KB
minimal.csv	4.10.2023 20:31	Microsoft Excel Vi...	1 KB
no_ota.csv	4.10.2023 20:31	Microsoft Excel Vi...	1 KB

- Open **RockFly zip** file and open **rockfly_libraries** folder. Copy all files and go to **Arduino library** folder and paste.

C:\Users\

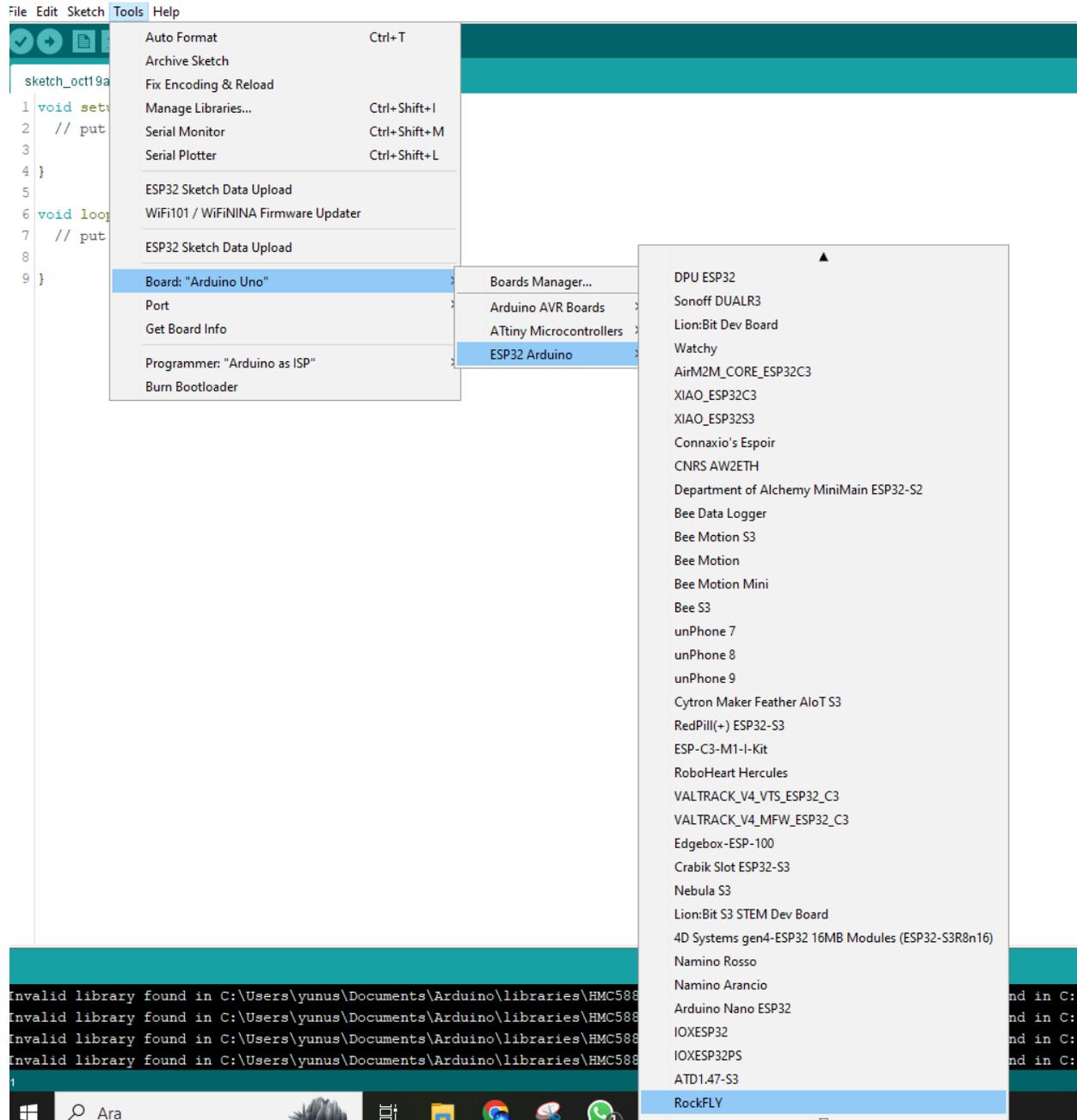
Name	Date modified	Type	Size
ESP32Time	10/26/2023 11:12 AM	File folder	
ESPAsyncWebServer-master	10/26/2023 11:22 AM	File folder	
ms5611_spi	10/26/2023 11:13 AM	File folder	
SimpleKalmanFilter	10/26/2023 11:14 AM	File folder	
Vector	10/26/2023 11:15 AM	File folder	

- Lastly restart the Arduino IDE.
- After in the RockFly zip file you can see **RockFlyMini** folder. It is RockFly code folder. You can open and compile it.

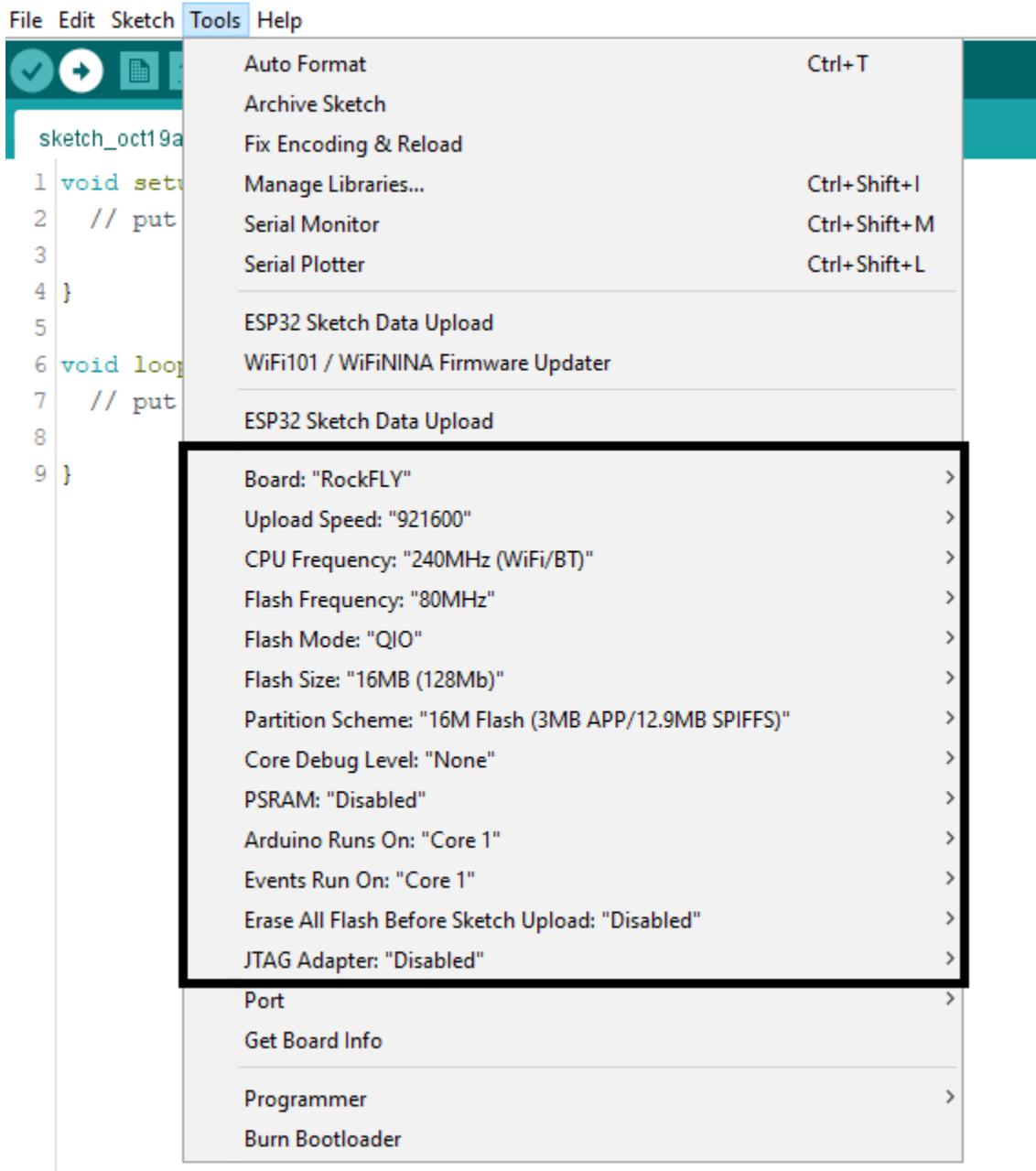


3. Configure ESP32

- Go to Tools > Board > Esp32 Arduino > RockFly



- Settings should be like this:



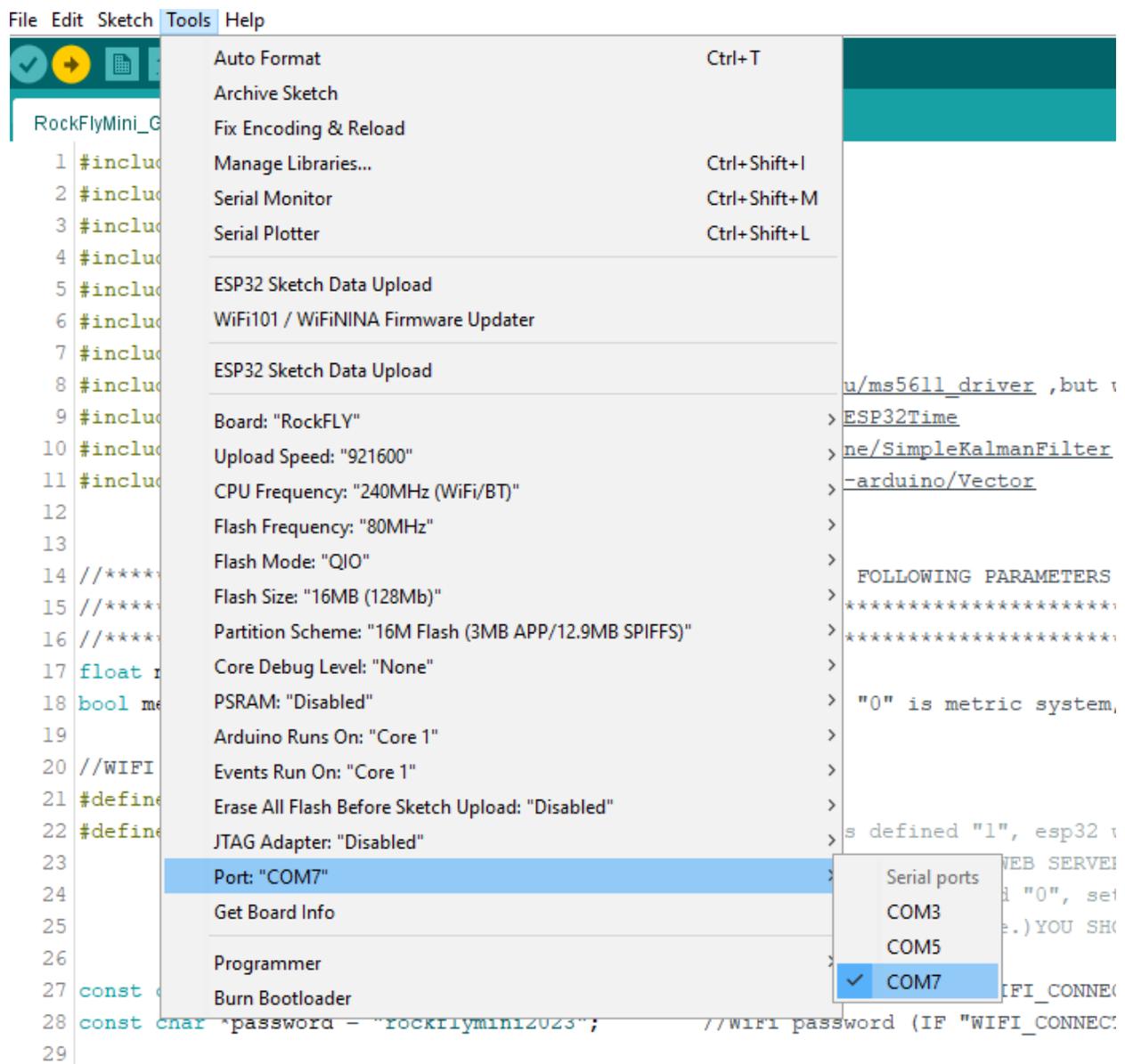
4. Copy Libraries & Compile Source Code

- In this link you can download files.

https://cdn.ozdisan.com/content/rockflymini/RockFly_Mini_v01.zip

5. UPLOAD

- After connecting the Rockfly board to the computer in the usb port, you can select the port in **Tools** menu.



ROCKFLY CONFIGURATION

In order for you to understand that the board is working correctly, it is activated at the beginning with the red power led and the buzzer. The red led lights continuously and the buzzer beeps 7 times, then it starts to read the data.

ROCKFLY-MINI -WiFi AND WEB SERVER:

With the RockFLY-Mini altimeter without any wiring, we press the reset button and pull the board after or before the flight. Then the buzzer beeps many times, and while the buzzer is beeping or within 2 seconds after the buzzer, we press and hold the boot button for 2 seconds. If there is a successful transition to WiFi mode, the blue LED will be active on the board. And we can connect to the board from any device that supports WiFi.

On the RockFLY-Mini Web Server: -You can see the current data:

- Altitude: It was obtained from the pressure value measured by the MS5611 pressure sensor. Altitude can be meters or feet.
- Speed: Calculated from differences in altitude. Speed can be meter/second(m/s) or mil per hour(mph).
- Temperature: Measured by the MS5611. Temperature can be Celsius(°C) or Fahrenheit (°F)
- E-match Short Circuit Information: on the web server you will see pyro1 and pyro2
 - pyro1: It is the e match of the Drogue parachute.
 - pyro2: It is the e match of the Main parachute.

if pyro1 or pyro2 is "0" e-matches not mounted to the terminal or mounted e-matches do not transmit the current. **ASSEMBLE NEW E-MATCH!!**

if pyro1 or pyro2 is "1" e-matches have been successfully mounted to the terminal and the mounted e-matches transmit the current. **SUCCESSFUL**

- Battery Voltage : The voltage divider is calculated with the circuit. Its unit is volts.
- You can change the main parachute altitude (minimum 1 meter maximum 30.000meter)
- You can change the metric or imperial measurement system.
- You can test apogee and main e-match before flight.
- You can see the flash memory fillrate before flight and clean it .
- You can download or delete the data of the last flight from the csv file registered with the flight id (It can store flights up to 13MB flash memory.)

-You can see the statistical data of the last flight:
max altitude : Highest altitude in the last flight
max speed: Highest speed in the last flight.
max acceleration :Highest acceleration in the last flight.
apogee time : From ground pad until apogee time.
descend time : From apogee until ground.
flight time : Total flight time from ground pad to.
pyroActivationTimeUs : From apogee until pyro burn time.
apogeeFallSpeed : Average speed from apogee to main.
mainFallSpeed : Average speed from main to ground.
riseaccel : Average rise acceleration until the apogee.
fallAccel : Average fall acceleration from apogee until ground.

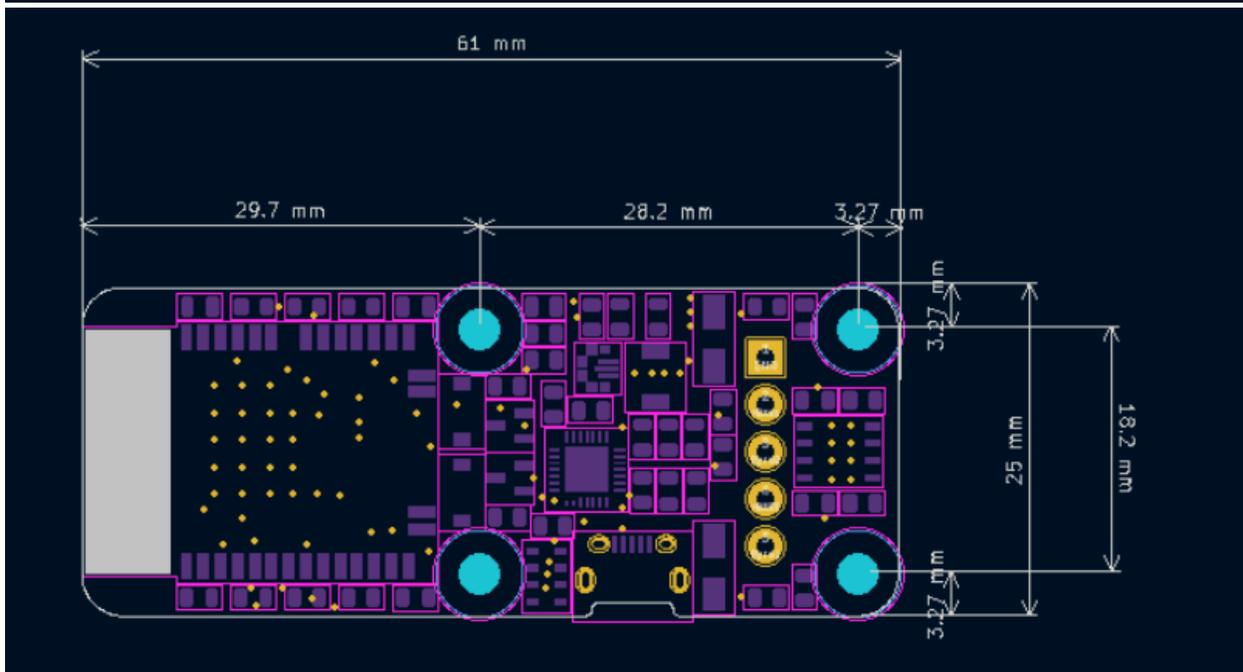
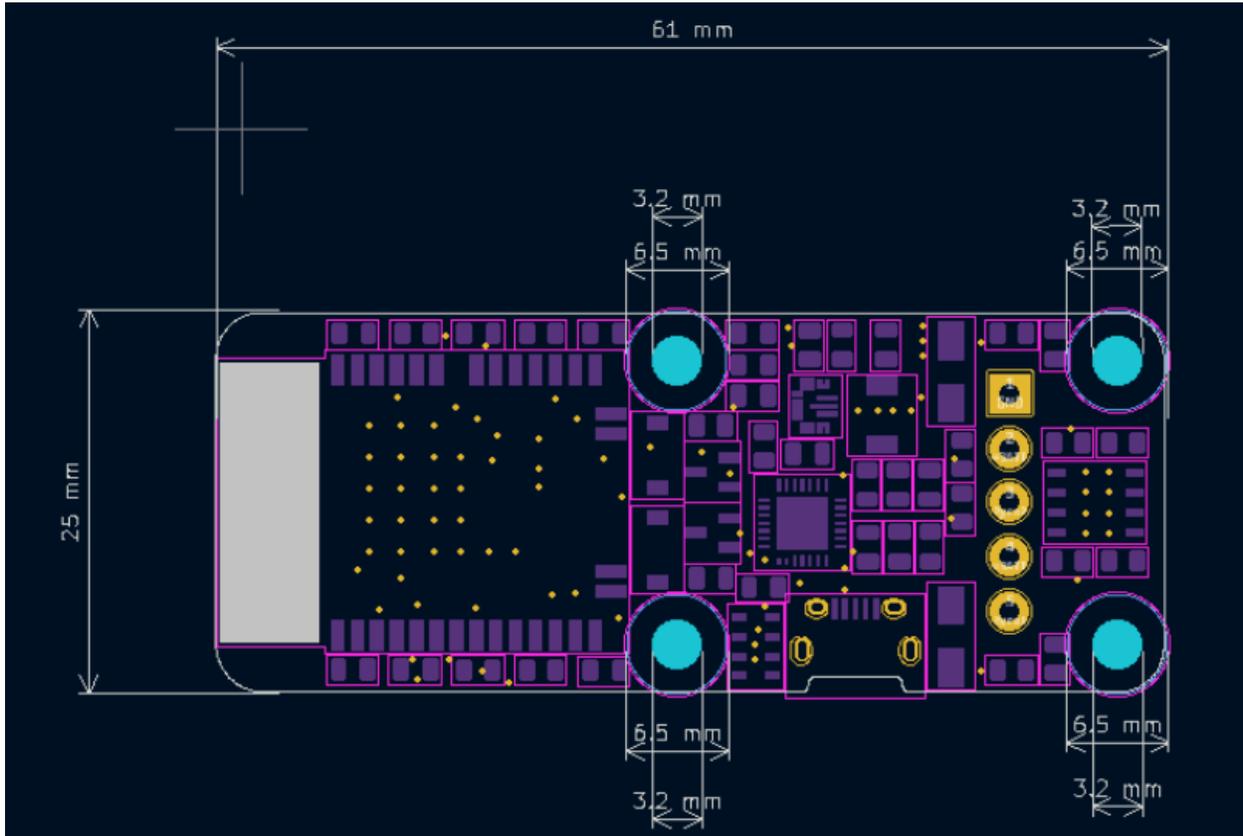
CAUTIONS

- -Do not touch the chips on the circuit board by hand. It can be damaged and inoperable due to static electricity
- -Do not let the chips on the circuit board come into contact with metal parts. It will cause a short circuit on the circuit and damage the board.
- Do not let the circuit board come into contact with liquid. Otherwise, it will cause short circuits and damage the board
- -Do not launch your rocket when the wind speed exceeds 20 MPH. If you must launch in high wind conditions, increase the Launch Detect Threshold as necessary to prevent accidental ejection caused by strong wind gusts.
- Take your safety precautions when testing with black powder. Especially do not work without wearing your safety glasses.
- -If the e-matches are connected on the circuit, do not energize the board without assembling the rocket. Unknown mistakes will cause e-matches to be active. E-matches that explode in your eyes or in your hand will harm you.
- Before each flight, start your flight by connecting to WiFi and checking the battery voltage and whether the e-matches are connected correctly
- Do not rupture pressure sensor diaphragm with excessive pressure or sharp object.
- Definitely follow the preflight checklist in the proper operational sequence before flying.

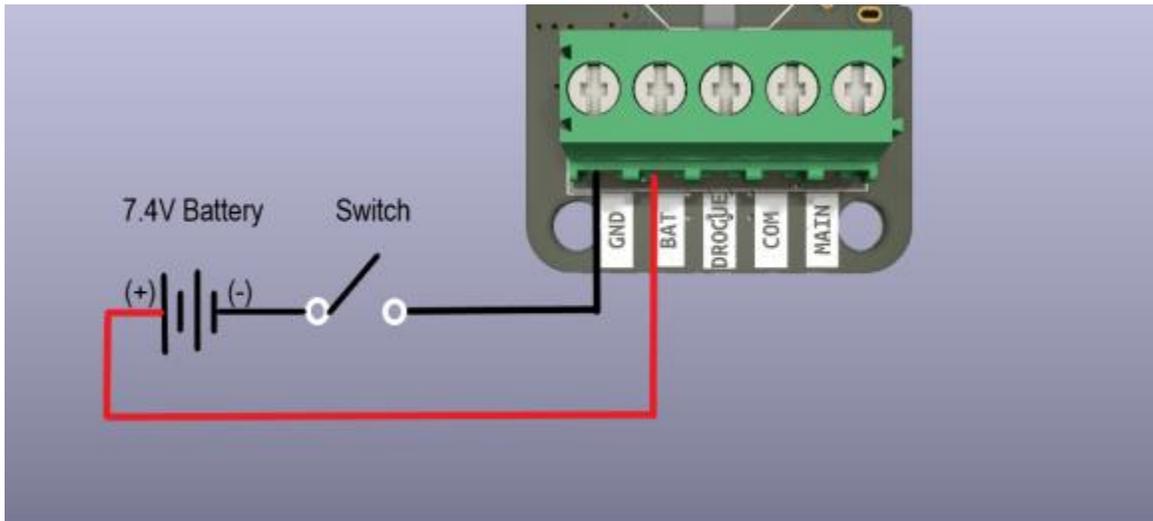
PREFLIGHT CHECKLIST

- Check all cable connections in order. Check with your hand or by pulling long pliers that the wires are tightly connected to the terminal blocks. Make sure the battery is securely mounted. Check all places connected with clips.
- Prep rocket, install engine, do not install engine igniter.
- Make sure the RockFLY-MiNi board's power switch is OFF.
- Connect e-matches. Make sure e-matches and battery cables are not short circuited. Since the circuit is not energized, there will be no problem. When you are sure that the cables are not short-circuited, proceed to the next step.
- Connect the e-matches to the black powder chamber. Then add the calculated amount of black powder and protect it so that it does not spill out of the black powder chamber. Make sure that all rescue apparatus are connected to the main and main parachutes, respectively, and docking.
- Turn ON the power switch of the RockFLY-MiNi board. You will see that the red led is active and you will hear the buzzer sound. If you cannot see this scenario, check your battery for the necessary energy by measuring it with a voltmeter. If the LED or buzzer is not active on the board, although the battery status is healthy, the previous error on the board may have caused a short circuit, replace it with a new board. If you hear the buzzer, switch to WiFi mode and make sure the battery status and e-matches are properly connected. By rechecking the battery or the e-match connection if there is a problem with the battery health and the connection of the e-matches. After making sure the battery voltage status and the connection of e-matches, proceed to the next step. If the problem persists, repeat the same step.
- Check the main parachute value. Does it match the altitude you preset? Is the selected metric or imperial measurement system set correctly? If you want to update again, you can update at this point.
- Turn OFF the power switch of the RockFLY-MiNi board again.
- Have your rocket inspected by RSO if applicable, install engine igniter, and place the rocket on the launch pad.
- Turn the RockFLY-MiNi board's power switch ON again. When the board works again, the red led will light and the buzzer will beep. If this situation has occurred, the board is now ready for flight.
- Ignite the engine starter. Have a nice flight.

ROCKFLY-MINI -SIZE AND DIMENSIONS



ROCKFLY-MINI -POWER SWITCH



- If you connect the cables in reverse, there will be no problem. RockFLY-Mini has protection to prevent reverse polarity on the circuit.