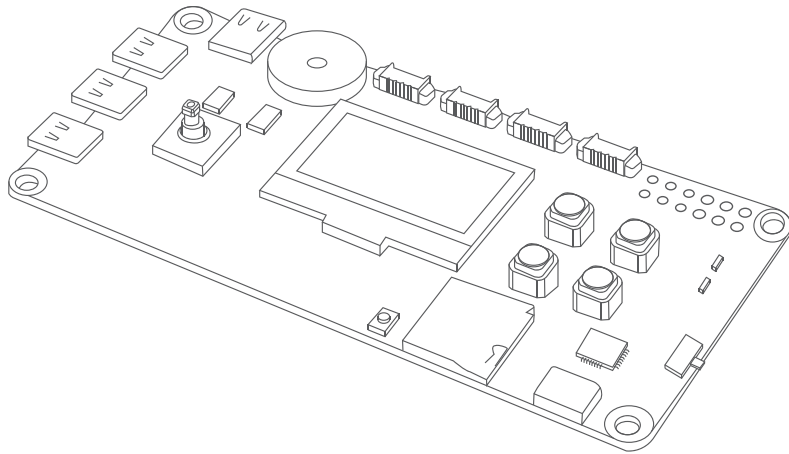


uArm Controller

User Manual



V1.0.1

2018-12-28



@Ufactory2013



@UFACTORY_UF



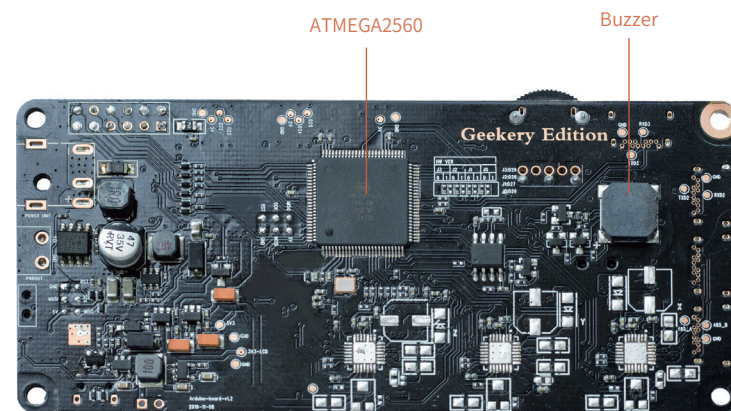
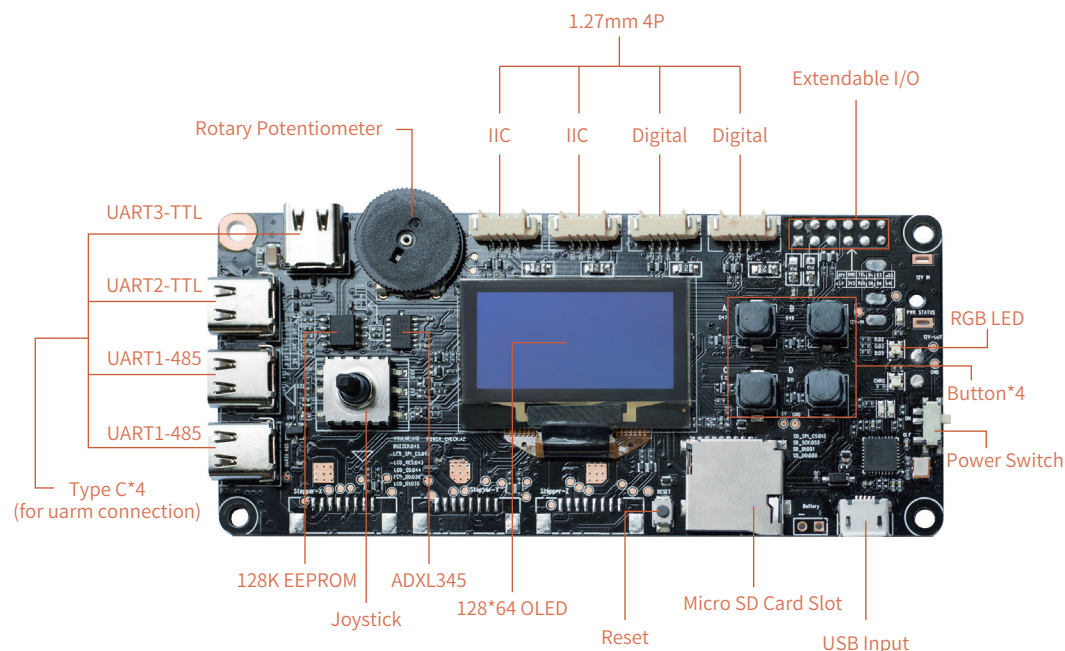
@UFACTORY

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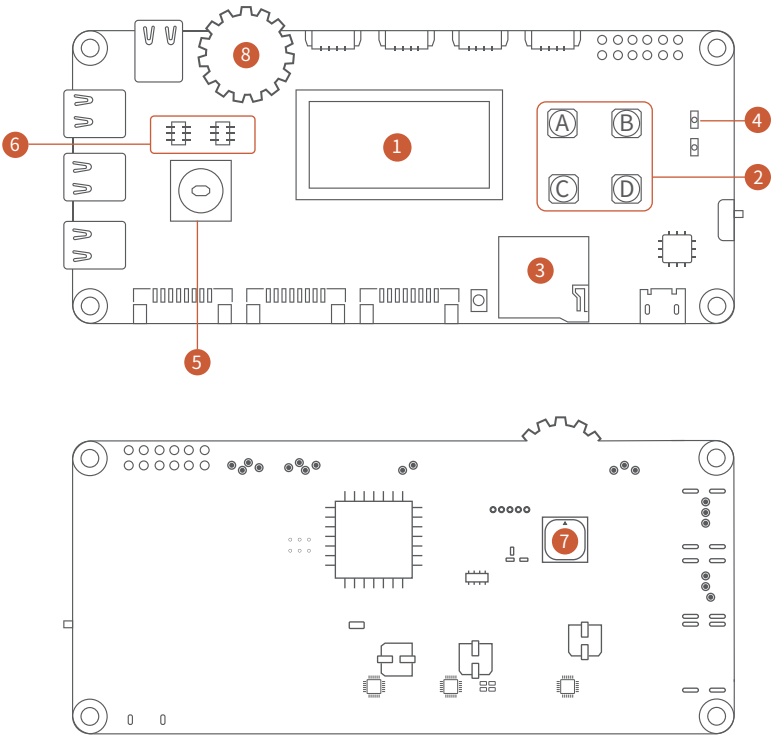
Product Introduction

uArm Controller is an open-source hardware based on Arduino MEGA 2560, and has a wide range of extendable functions. It's compatible with various peripherals and great for implementing your creative ideas.



Hardware Parameters

Specification	
Weight	0.15kg
Dimension(L*W*H)	150mm*132mm*281mm
Connection with PC	Micro USB
Input Voltage	USB 5V
Main Controller	ATMEGA2560 (Arduino compatible)
Display	128x64 OLED
Buttons	4
Rotary Potentionmeter	1
TypeC	4 (only for uarm connection)
RGB LED	1
Micro SD	1
4P Connector	2xDigital IOs / 2xIIC
Extendable I/O	6xdigital IOs
Operation Temperature & Humidity	0°C -35°C 30%RH-80%RH noncondensing
Storage Temperature & Humidity	-20°C -60°C 30%RH-80%RH noncondensing



1 128X64 Display Pin Description

LCD_CS	.....	D 4 2
LCD_RES	.....	D 4 3
LCD_CD	.....	D 4 4
LCD_SCK	.....	D 3 0
LCD_MOSI	.....	D 3 5

3 Micro SD Card Pin Description

TF_CS	.....	D 13
TF_SCK	.....	SCK(D53)
TF_MOSI	.....	MOSI(D51)
TF_MISO	.....	MISO(D50)

5 Joystick Pin Description

JOY_UP	.....	D 3 3
JOY_DOWN	.....	D 4 1
JOY_LEFT	.....	D 3 2
JOY_RIGHT	D 3 7
JOY_CENTRE	D 4 0

(Press Vil, Loosen Vih)

7 Buzzer Pin Description

BUZZER	D 4 5
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(Hardware PWM Control)

2 BUTTON Pin Description

BUTTON_A	D 4 7
BUTTON_B	D 4 9
BUTTON_C	D 1 2
BUTTON_D	.....	D 1 1

(Press Vil, Loosen Vih)

4 RGB LED Pin Description

RGB_LED_R	.....	D 2
RGB_LED_G	.....	D 3
RGB_LED_B	.....	D 5

(Vil On, Vih Off, Controlled by Hardware PWM)

6 IIC Device Address

EEPROM 24C128 Address	.....	D 13
ADXL345 Address	.....	SCK(D53)

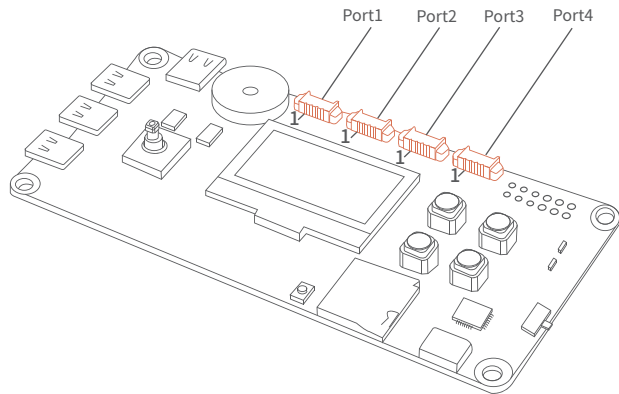
8 Rotary Potentiometer Pin Description

ROTARY	A 1 5
--------	-------	-------

(Measurement Analog)

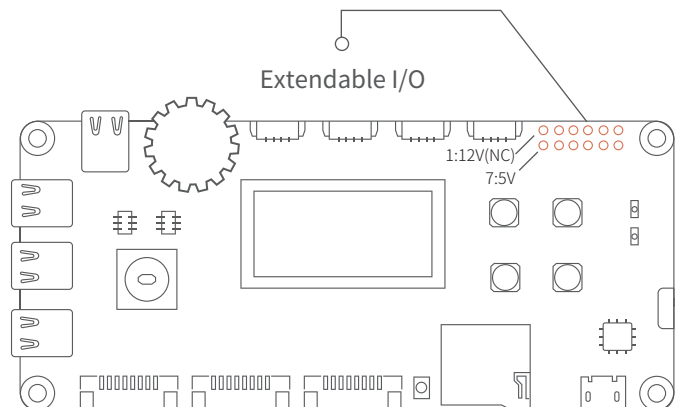
• Peripheral Port Pin Description (1.27mm 4P)

Port	1	2	3	4
Port1	SCL	SDA	5V	GND
Port 2	SCL	SDA	5V	GND
Port 3	D25	D24	5V	GND
Port 4	D23	D22	5V	GND



• IO Port Pin Description

1: 12V (NC)	2: GND	3: TXD0	4: D4	5: D8	6: D33
7: 5V	8: 3.3V	9: RXD0	10: D6	11: D9	12: D10

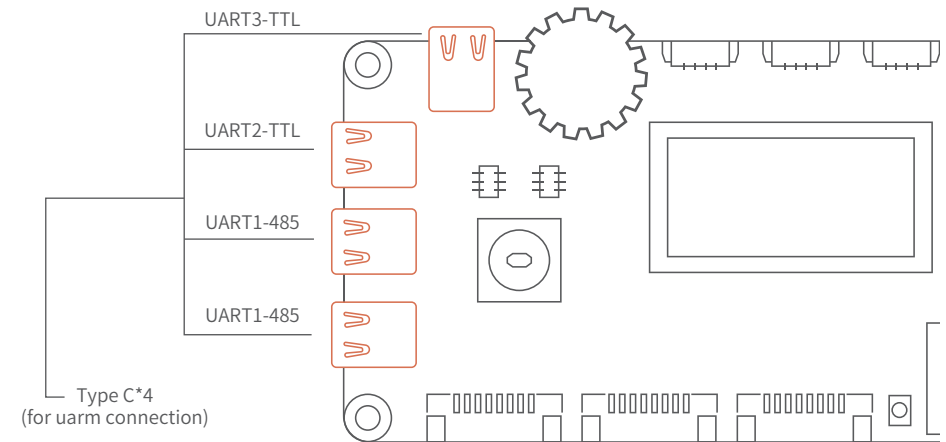


• TypeC Pin Description

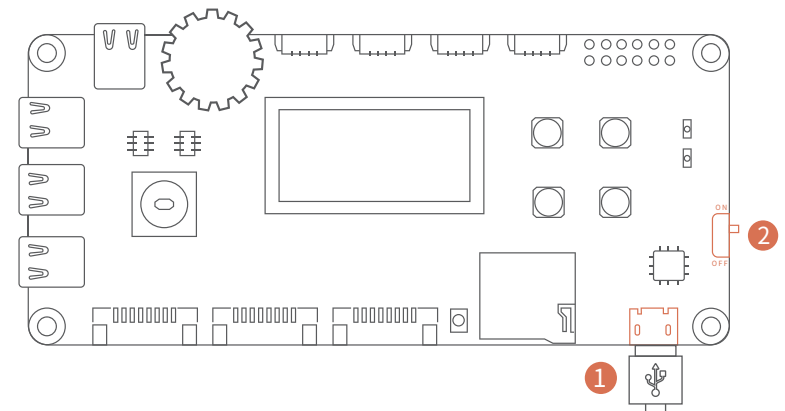
UART2 & UART3 → TTL Serial Port Communication

UART1 → RS485 Communication

Note: the four-core TypeC cable in the market is not supported for this port, please link it to the test point in the back.



■ Hardware Installation



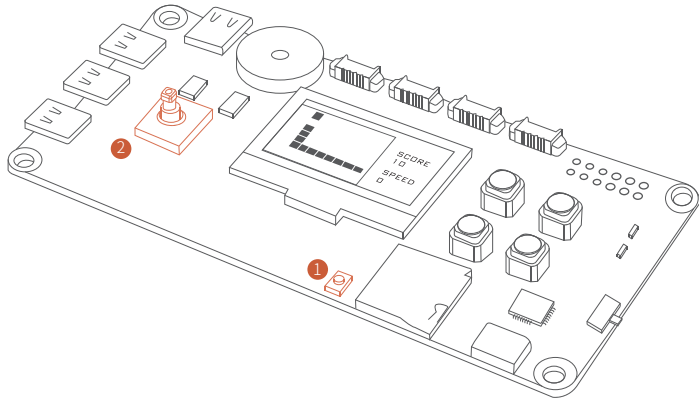
① Connect the uArm Controller to your computer using the Micro USB cable.

② Power on the uArm Controller (push up).

(For the Peripheral Port, a 1.27mm 4P cable should be purchased separately)

■ Preset Demo Tutorial

- 1 Press the "Reset" button, reset the system.
- 2 Use the Joystick to control the movement (e.g. move around, up and down) when playing the snake game.

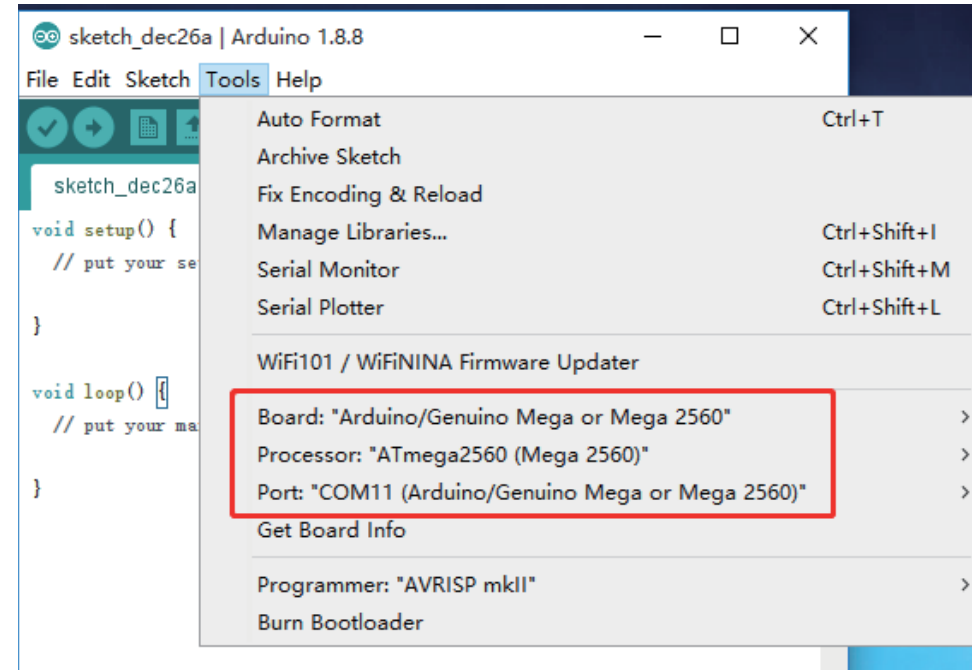


■ Software Installation

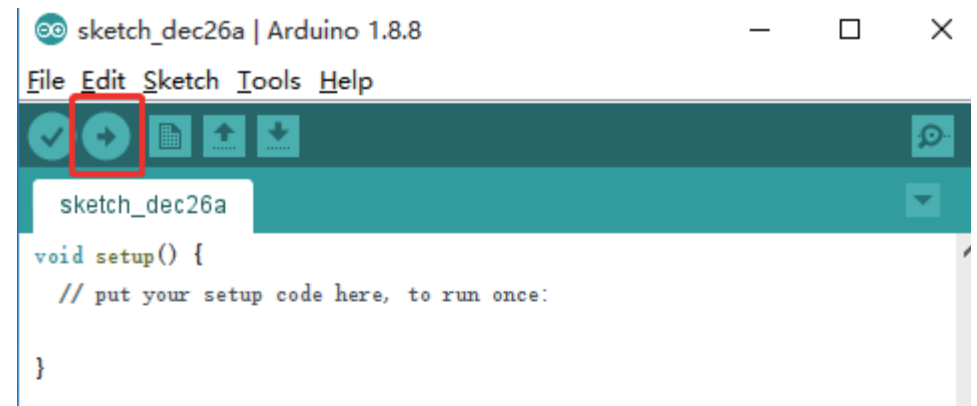
1. Download the Arduino IDE (www.arduino.cc)
2. GitHub: <https://github.com/uArm-Developer/Controller>
3. Arduino Port Reference: <https://www.arduino.cc/reference/en/>
4. Development Language: C/C++

Note: When uArm Controller is connected with a computer, please press the "Reset" button.

- When configure the Arduino IDE Hardware Platform and the COM Port (the COM Port is allocated randomly by your computer), please use IDE for code writing or use Github routine code to develop.



- As shown in the following picture, please press the "Upload" button to upload firmware.



Github Demo

Branch: master	New pull request	Create new file	Upload files	Find file	Clone or download
TopgunZh Add 2018-12-25 Latest commit 8963a4b Dec 25, 2018					
doc	Add 2018-12-25	Dec 25, 2018			
driver	Update 2018-12-25	Dec 25, 2018			
image	Update 2018-12-25	Dec 25, 2018			
scene_demo	Update 2018-12-25	Dec 25, 2018			
sch	Add 2018-12-25	Dec 25, 2018			
README.md	update	Nov 9, 2018			

doc→ User Manual

driver→ Peripheral Routine

image→ Product Image

scene_demo→ Scene Demo

sch→ Schematic Diagram of uArm Controller

• Peripheral driver

Branch: master	Controller / driver /	Create new file	Upload
TopgunZh Update 2018-12-25 Latest			
..			
button_driver	Update 2018-12-25		
joystick_driver	Update 2018-12-25		
led_RGB_driver	Update 2018-12-05		
oled_12864_driver	Update 2018-12-05		

At the moment, there are four routines under the "driver" folder
(we will keep updating the routine, please check our Github content).

• button_driver

For hardware connection, please refer to (Hardware Parameters→ Button Pin Description)

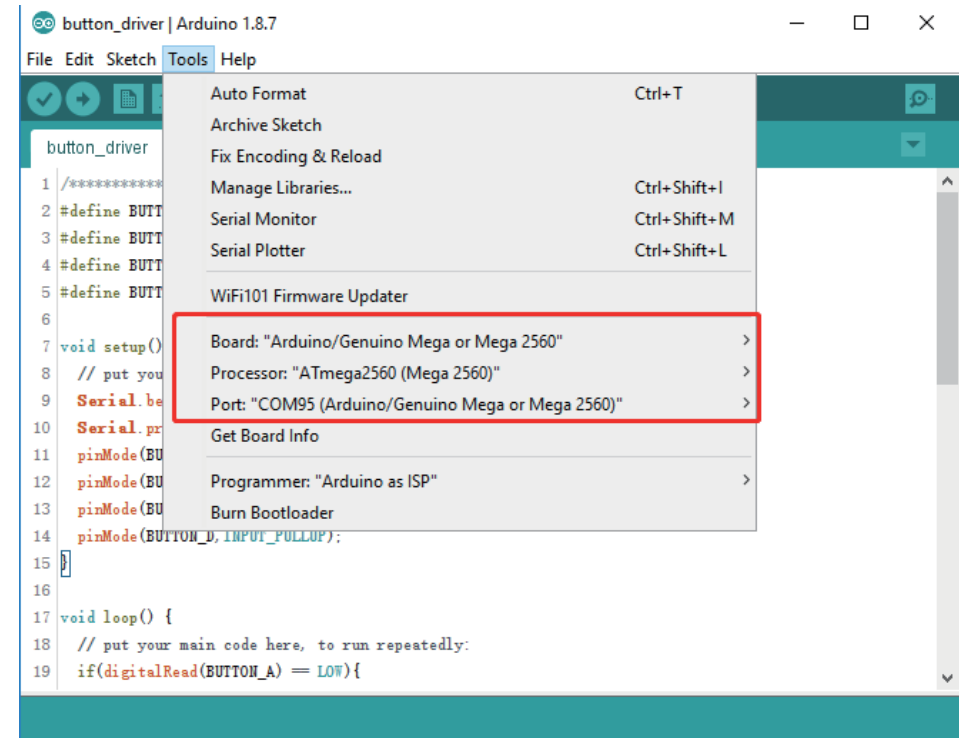
1.Download Project File: button_driver.ino

(https://github.com/uArm-Developer/Controller/tree/master/driver/button_driver)

About how to download a single file from Github, please refer to

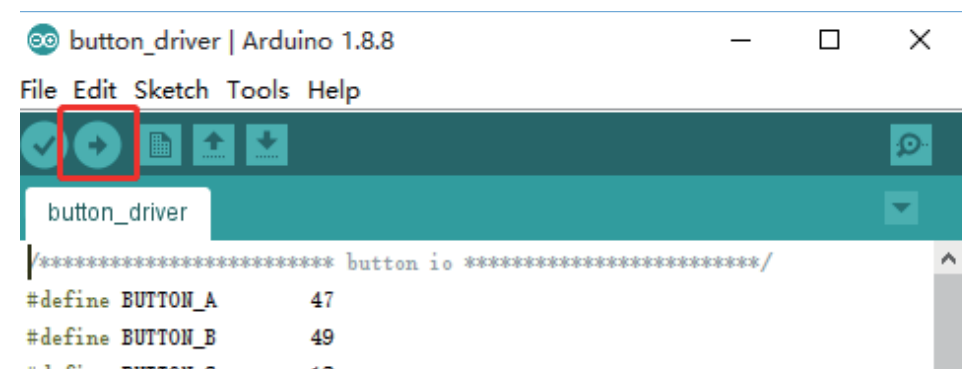
(<https://github.com/uArm-Developer/SwiftProForArduino/wiki/How-to-download-single-file-from-GitHub>)

2.Configure Arduino IDE, select the board as "Arduino/Genuino Mega or Mega 2560",
Select the COM that allocated randomly by your computer, please refer to the follow-
ing picture:

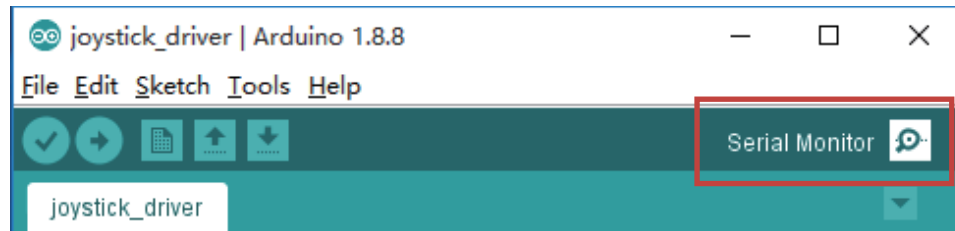


Note: When uArm Controller is connected with a computer, please press the "Reset" button.

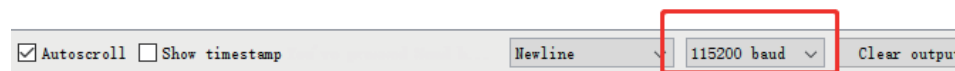
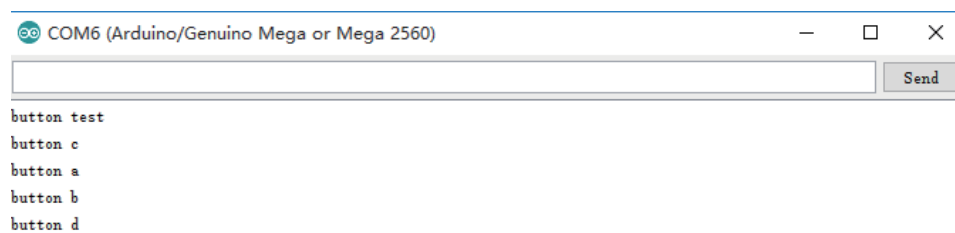
3.Press the "Upload" button to upload firmware.



4. Press the "Serial Monitor" button to open Port Assistant.



5. Press button A,B,C,D to check the log of terminal printing.



• joystick_driver

For hardware connection, please refer to (Hardware Parameters→ Joystick Pin Description).

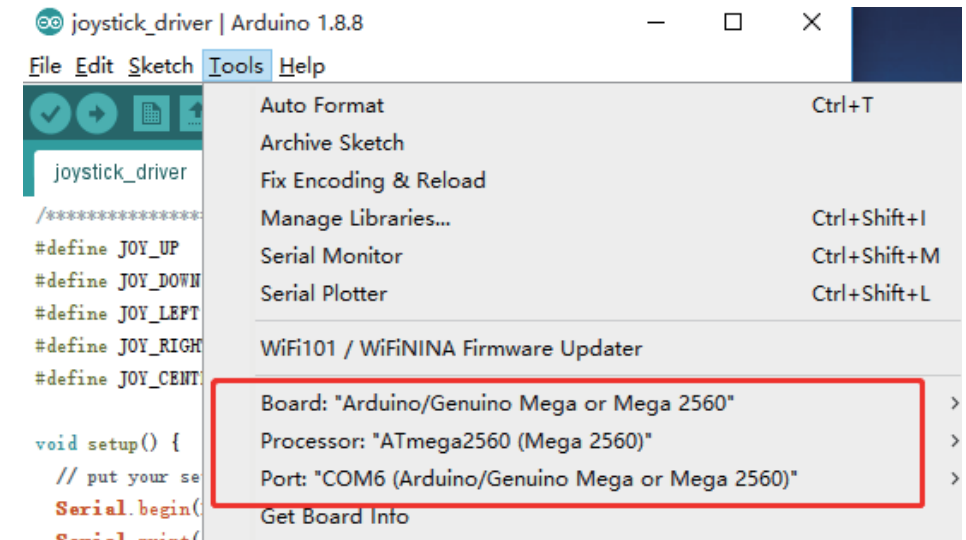
1. Download Project File: joystick_driver.ino

(https://github.com/uArm-Developer/Controller/tree/master/driver/joystick_driver)

About how to download a single file from Github, please refer to:

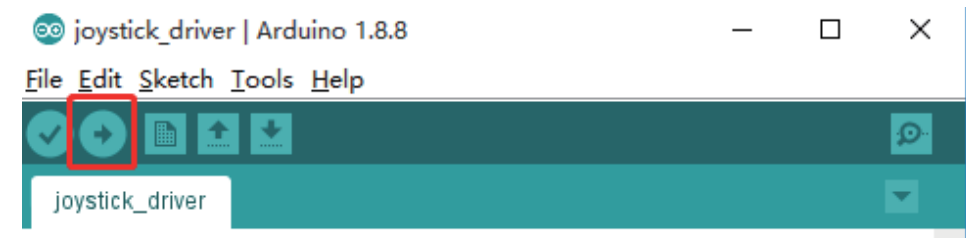
(<https://github.com/uArm-Developer/SwiftProForArduino/wiki/How-to-download-single-file-from-GitHub>)

2. Configure Arduino IDE, select the board as "Arduino/Genuino Mega or Mega 2560", Select the COM that allocated randomly by your computer, please refer to the following picture:

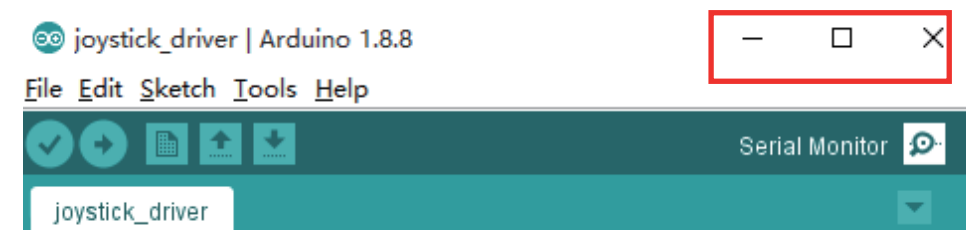


Note: When uArm Controller is connected with a computer, please press the "Reset" button.

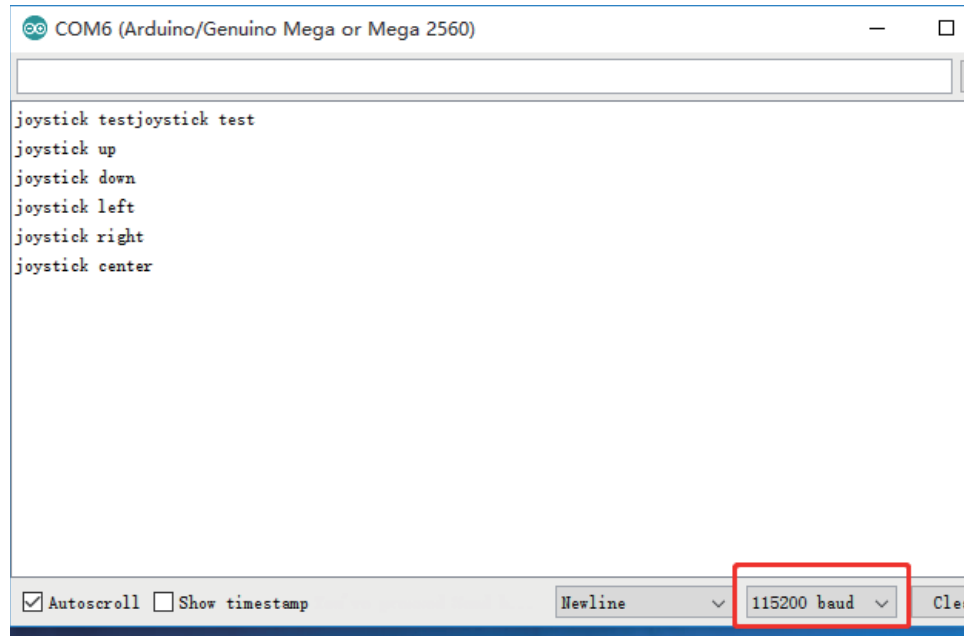
3. Press the "Upload" button to upload firmware.



4. Press the "Serial Monitor" button to open Port Assistant.



5.Push the Joystick to check the log of terminal printing.



• led_RGB_driver

For hardware connection, please refer to (Hardware Parameters→ RGB led Pin Description)

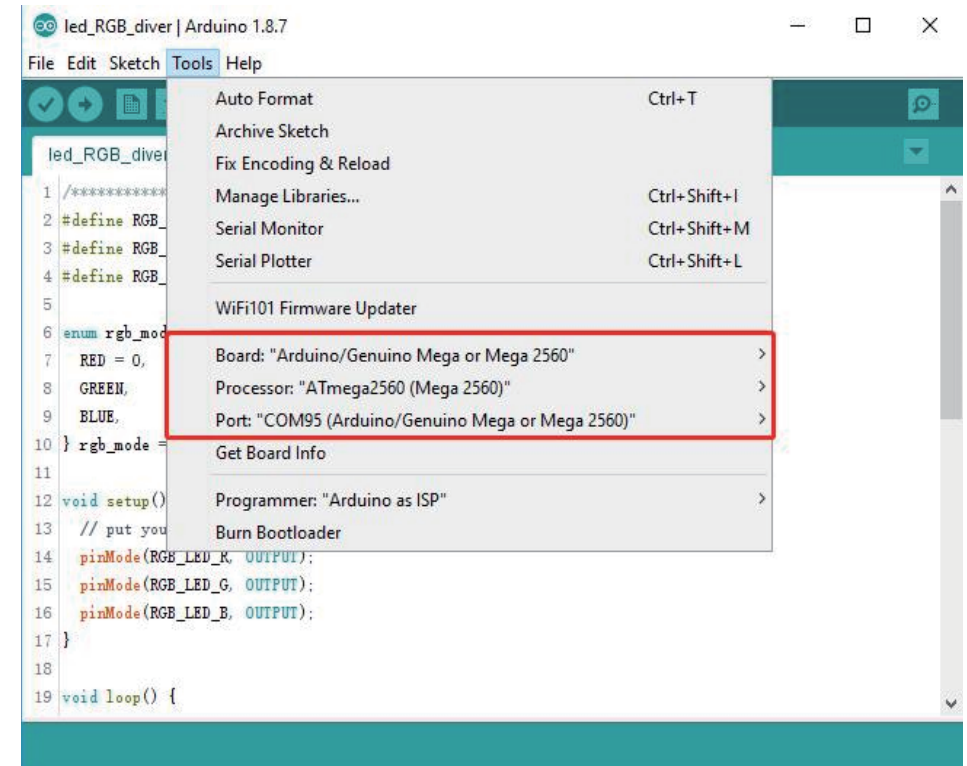
1.Download Project File: led_RGB_driver.ino

https://github.com/uArm-Developer/Controller/tree/master/driver/led_RGB_driver

About how to download a single file from Github, please refer to:

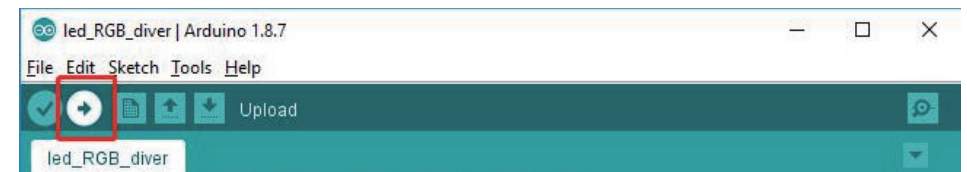
(<https://github.com/uArm-Developer/SwiftProForArduino/wiki/How-to-download-single-file-from-GitHub>)

2.Configure Arduino IDE, select the board as "Arduino/Genuino Mega or Mega 2560", Select the COM that allocated randomly by your computer, please refer to the following picture:



Note:When uArm Controller is connected with a computer, please press the "Reset" button.

3.Press the "Upload" button to upload firmware.



4.Test, and the RGB light will alternates with red, green and blue lights.

•oled_12864_driver

For hardware connection, please refer to (Hardware Parameters→128x64 Display Pin Description).

1.Download Project File: oled_12864_driver.ino

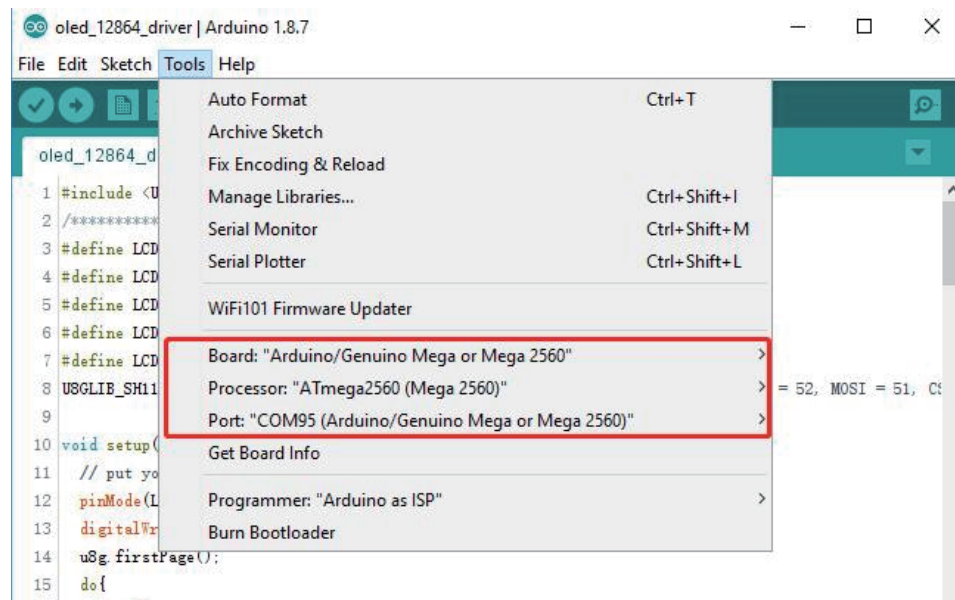
(https://github.com/uArm-Developer/Controller/tree/master/driver/oled_12864_driver)

About how to download a single file from Github, please refer to:

(<https://github.com/uArm-Developer/SwiftProForArduino/wiki/How-to-download-single-file-from-GitHub>)

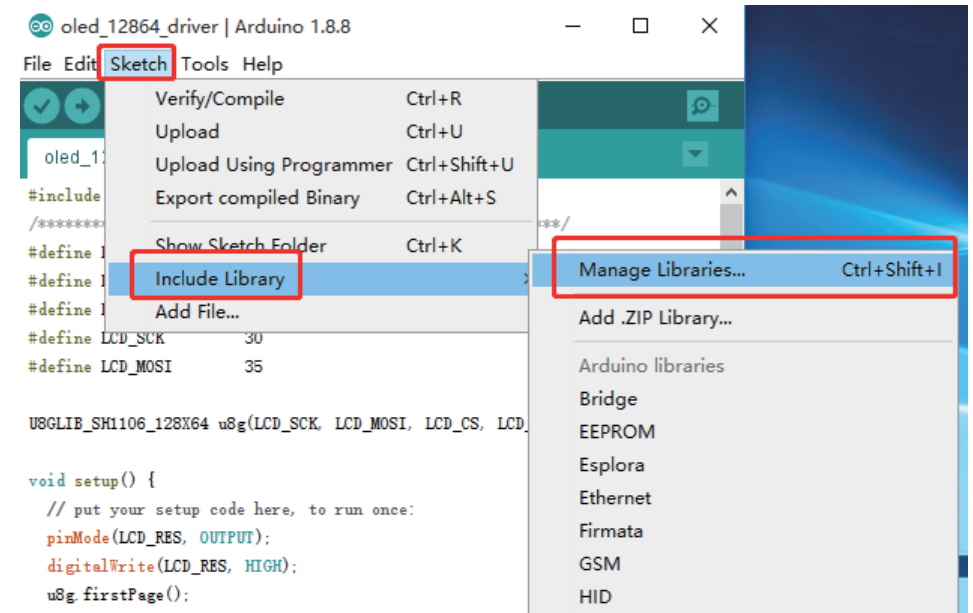
wiki/How-to-download-single-file-from-GitHub)

2.Configure Arduino IDE, select the board as "Arduino/Genuino Mega or Mega 2560", Select the COM that allocated randomly by your computer, please refer to the following picture:

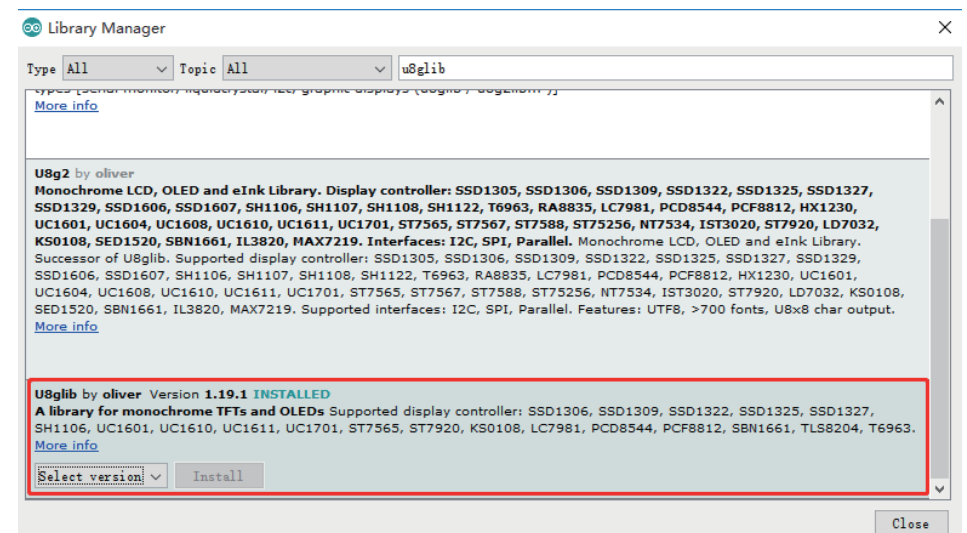


Note:When uArm Controller is connected with a computer, please press the "Reset" button.

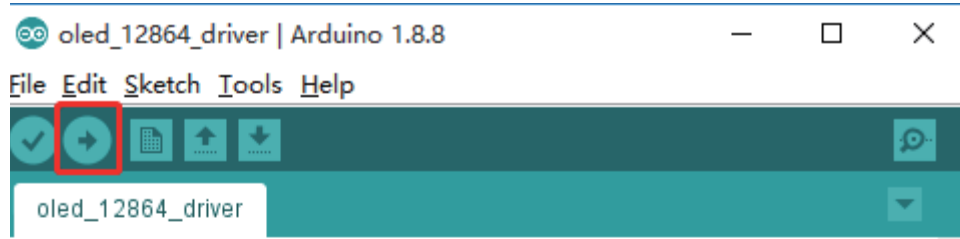
3.Open the "Manage Libraries".



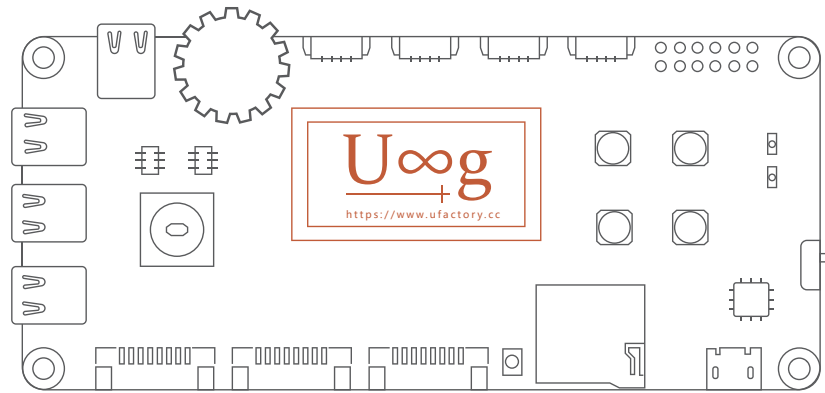
4.Install u8glib.



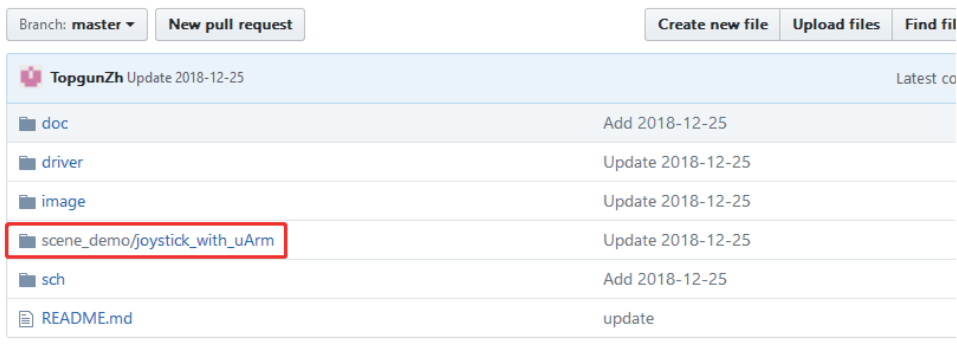
5. Press the "Upload" button to upload firmware.



6. Check the Display Screen.



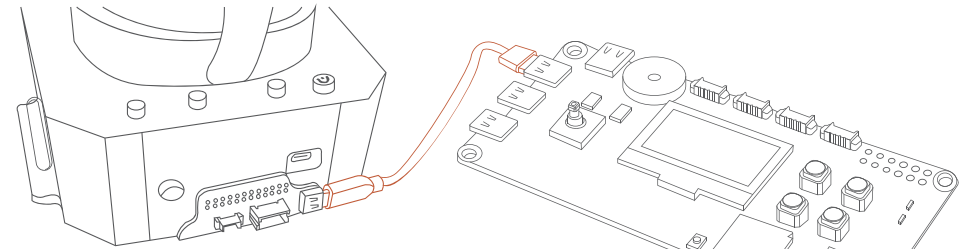
• Scene Demo



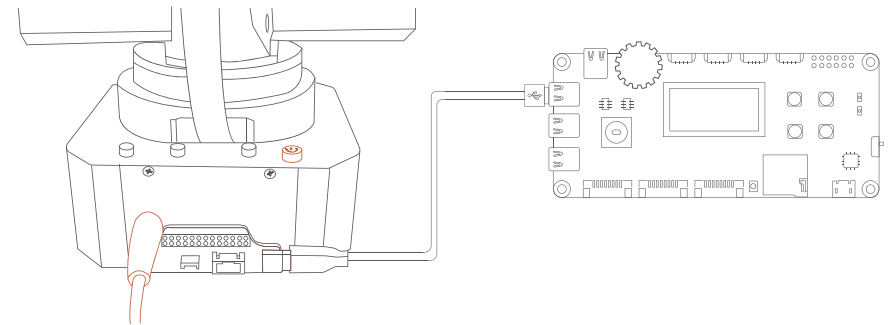
At the moment, there is one routine under the "scene_demo" folder (we will keep updating the routine, please check our Github content).

• joystick_with_uArm

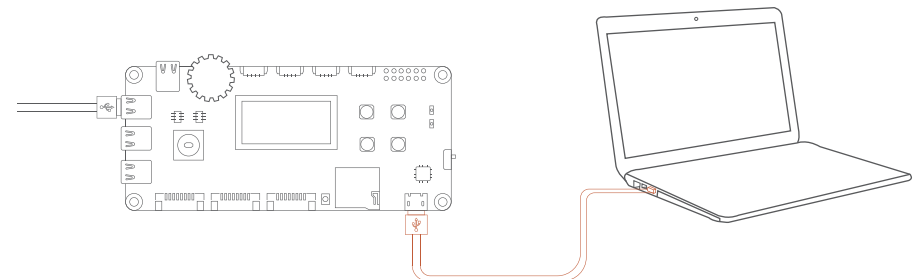
1. Connect the uArm Controller and uArm Swift Pro with Type-C.
(The program use the UART2-TTL interface)



2. Plug in the uArm Swift Pro.



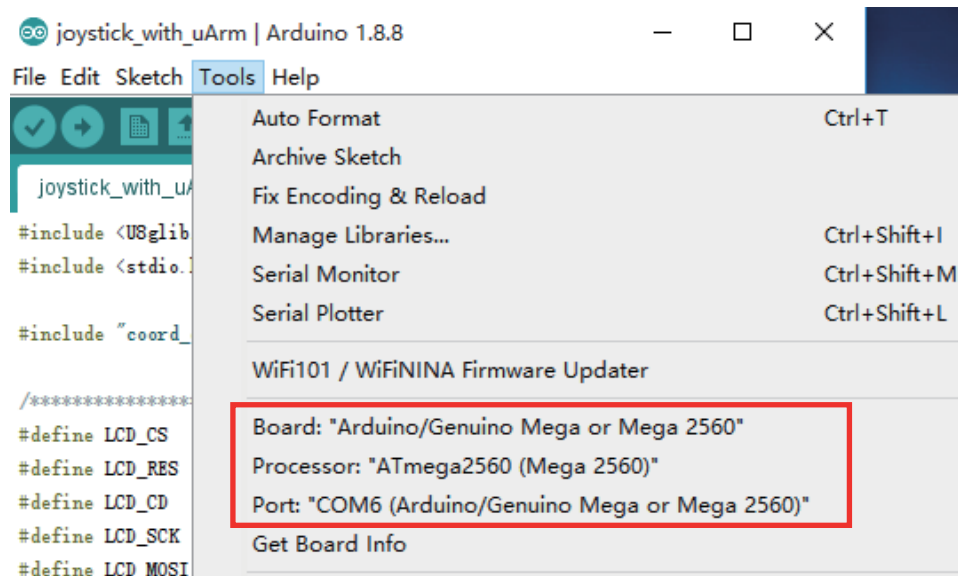
3. Connect the uArm Controller and Computer with USB.



4.Download Project File: joystick_with_uArm.ino
(https://github.com/uArm-Developer/Controller/tree/master/scene_demo/joystick_with_uArm)

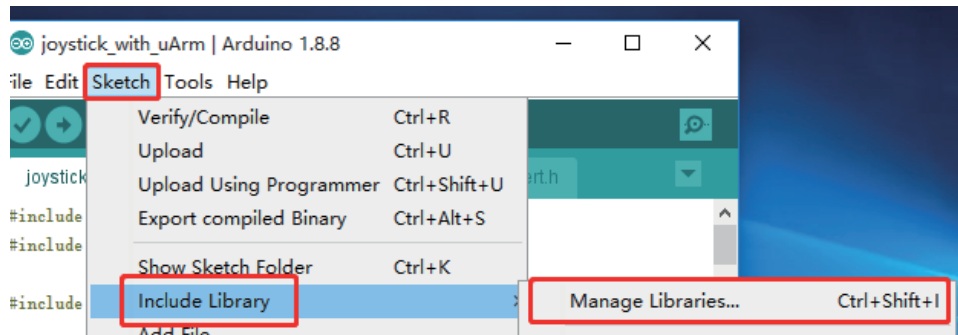
About how to download a single file from Github, please refer to:
(<https://github.com/uArm-Developer/SwiftProForArduino/wiki/How-to-download-single-file-from-GitHub>)

5.Configure Arduino IDE, select the board as "Arduino/Genuino Mega or Mega 2560", Select the COM that allocated randomly by your computer, please refer to the following picture:

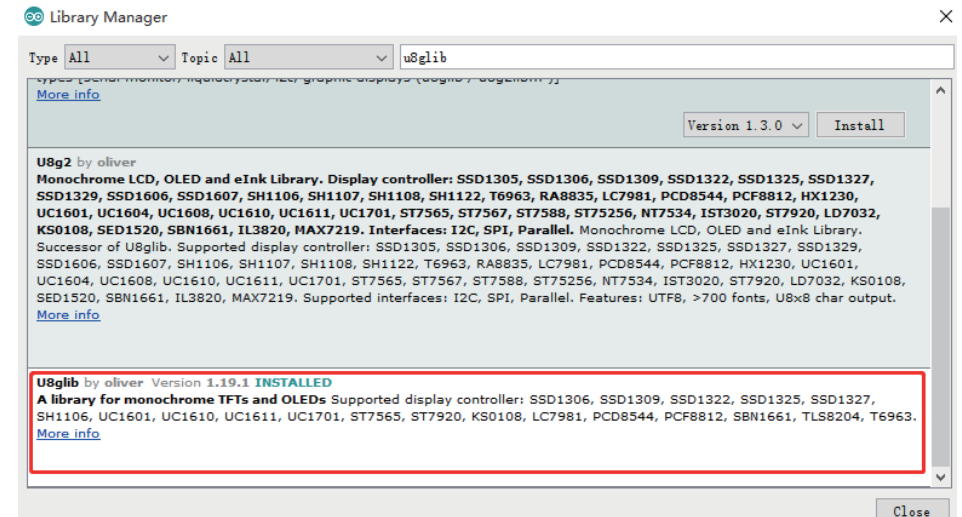


Note:When uArm Controller is connected with a computer, please press the "Reset" button.

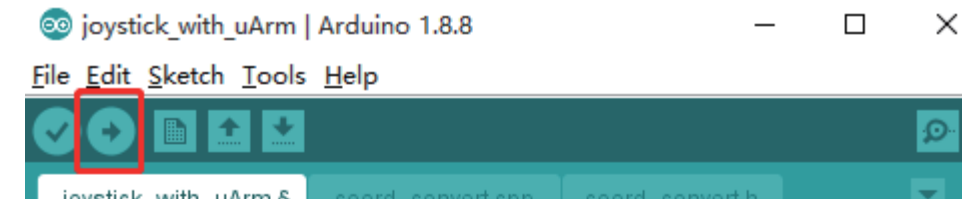
6.Open the "Manage Libraries".



7.Install u8glib.



8.Press the "Upload" button to upload firmware.



9.Test, and use the Joystick to control the movement of uArm (i.e. move around); use the rotary potentiometer to control the up-and-down motion of uArm; press button C to adjust the speed; press button D to open/close the gripper.

Release Note

Version	Description	
V1.0.0	Establish	Topgun
V1.0.1	Add Preset Demo Tutorial	Topgun