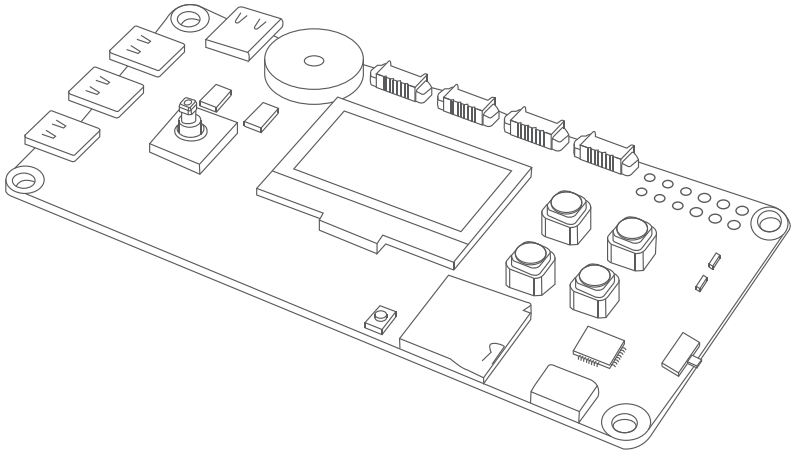
UFACTORY

uArm Controller

User Manual



V1.0.1

2018-12-28

@Ufactory2013

@UFACTORY_UF

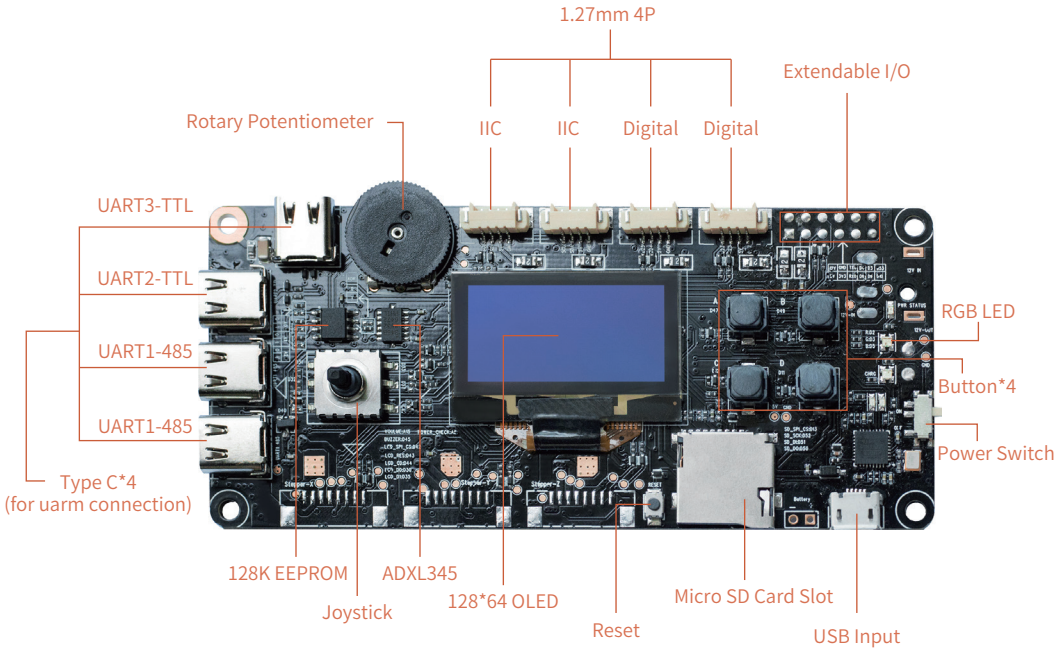
@UFACTORY

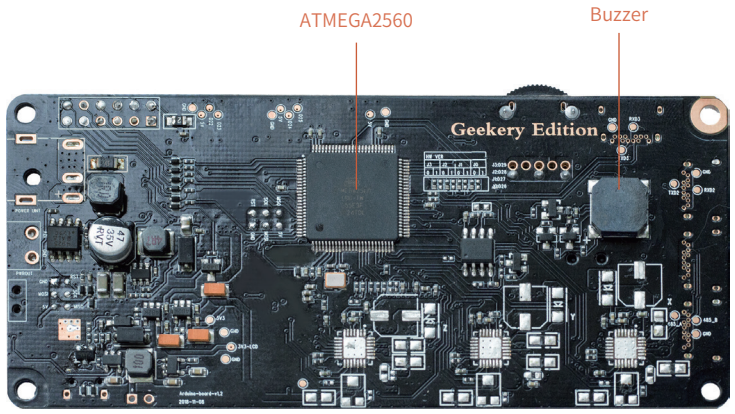
Website: www.ufactory.cc
Email: info@ufactory.cc

Table of Contents

Product Introduction

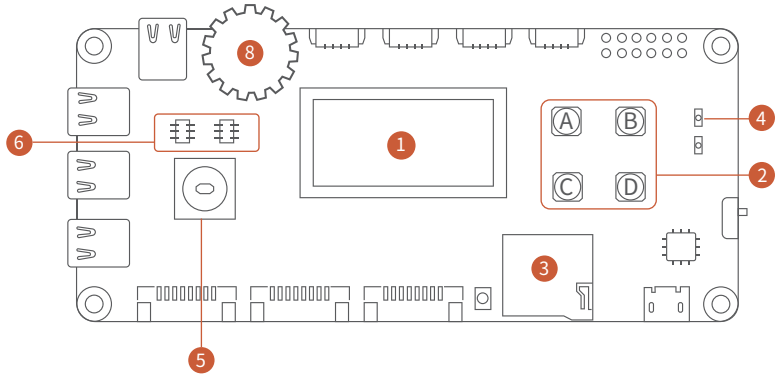
uArm Controller is an open-source hardware based on Arduino MEGA 2560, and has a wide range of extendable functions. It's compatible with various peripherals and great for implementing your creative ideas.

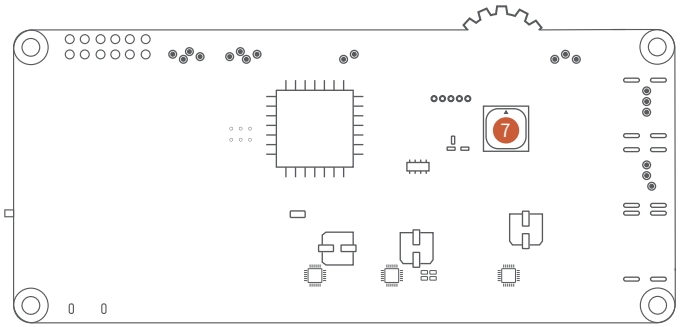




Hardware Parameters

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℃-35℃ 30%RH-80%RH noncondensing
Storage Temperature & Humidity	-20℃-60℃ 30%RH-80%RH noncondensing





1 128X64 Display Pin Description

LCD_CS	D42
LCD_RES	D43
LCD_CD	D44
LCD_SCK	D30
LCD_MOSI	D35

2 BUTTON Pin Description

BUTTON_A	D47
BUTTON_B	D49
BUTTON_C	D12
BUTTON_D	D11

(Press Vil, Loosen Vih)

3 Micro SD Card Pin Description

TF_CS	D13
TF_SCK	SCK(D53)
TF_MOSI	MOSI(D51)
TF_MISO	MISO(D50)

4 RGB LED Pin Description

RGB_LED_R	D2
RGB_LED_G	D3
RGB_LED_B	D5

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

5 Joystick Pin Description

JOY_UP	D33
JOY_DOWN	D41
JOY_LEFT	D32
JOY_RIGHT	D37
JOY_CENTRE	D40

(Press Vil, Loosen Vih)

6 IIC Device Address

EEPROM 24C128 Address	D13
ADXL345 Address	SCK(D53)

7 Buzzer Pin Description

BUZZER	D45

(Hardware PWM Control)

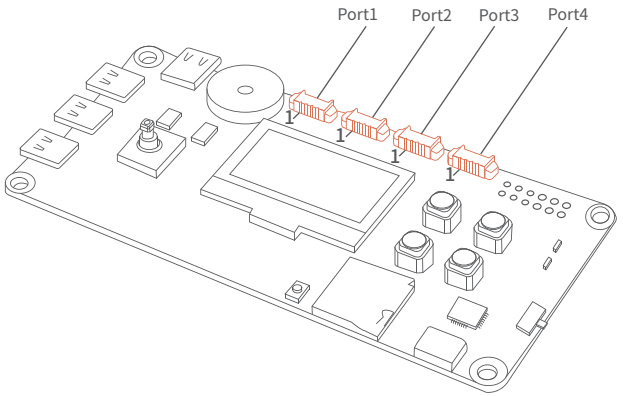
8 Rotary Potentiometer Pin Description

ROTARY	A15

(Measurement Analog)

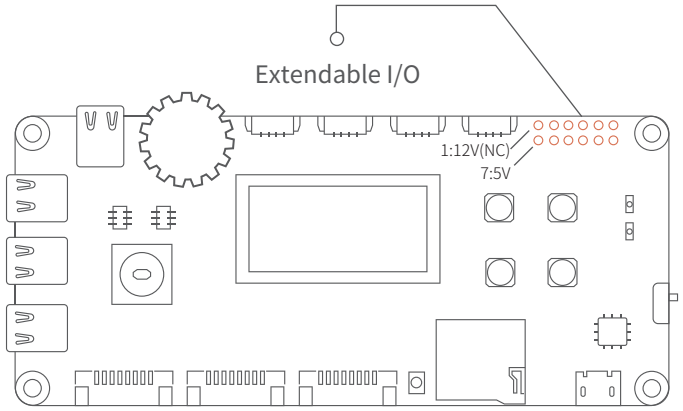
• Peripheral Port Pin Description (1.27mm 4P)

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

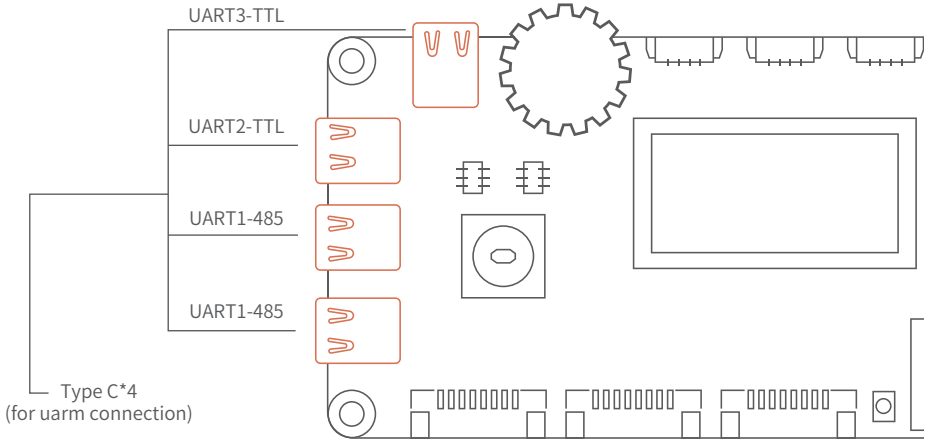
1：12V（NC）	**2：GND**	**3：TXD0**	**4：D4**	**5：D8**	**6：D53**
7：5V	**8：3.3V**	**9：RXD0**	**10：D6**	**11：D9**	**12：D10**



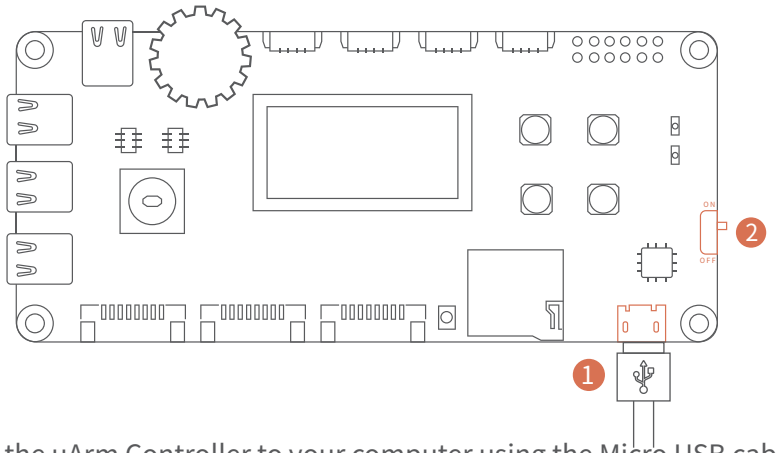
• TypeC Pin Description

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

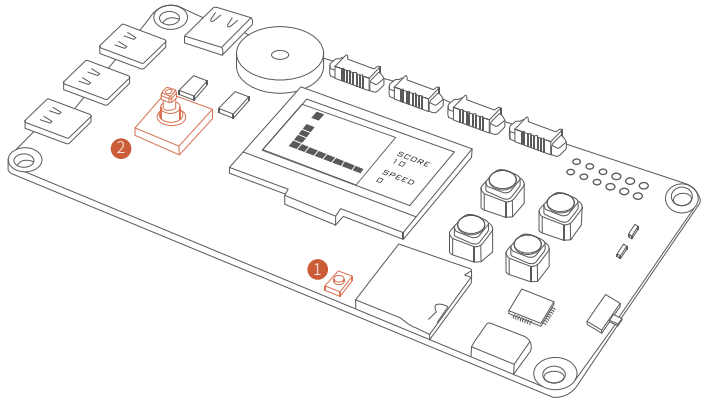


❶ Connect the uArm Controller to your computer using the Micro USB cable.
❷ Power on the uArm Controller (push up).

(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.

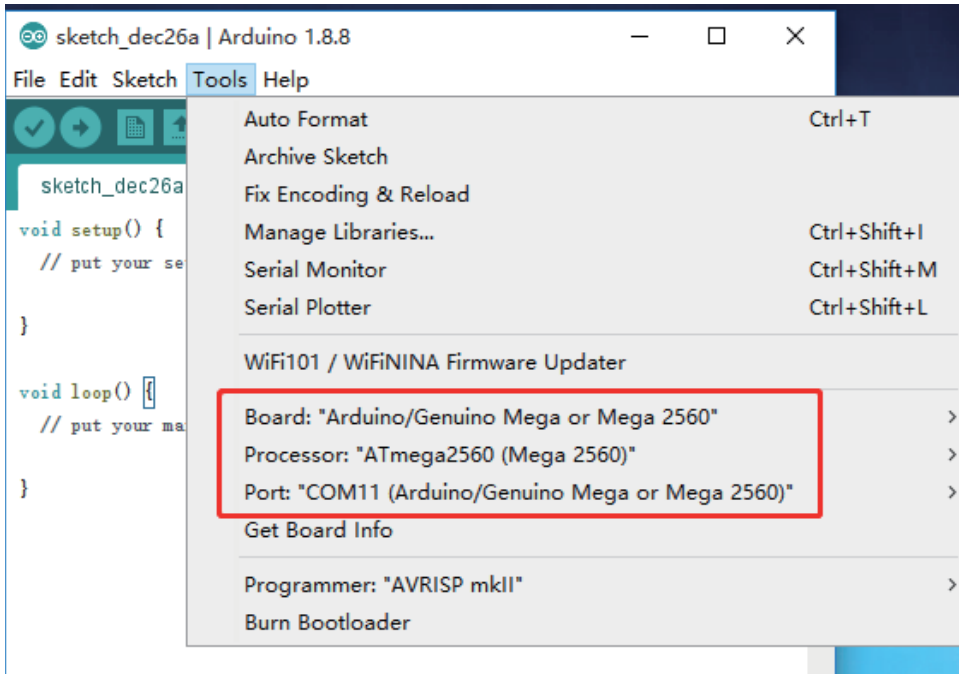


Software Installation

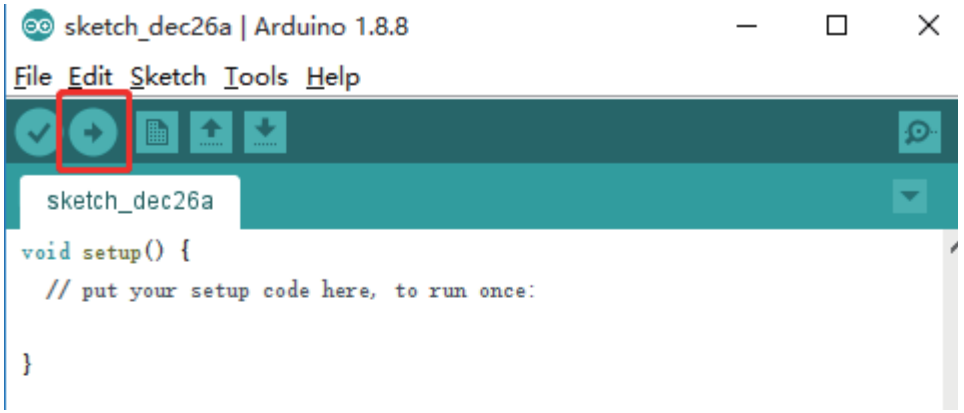
1.Download the Arduino IDE (www.arduino.cc)
2.GitHub: https://github.com/uArm-Developer/Controller
3.Arduino Port Reference: https://www.arduino.cc/reference/en/
4.Development Language: C/C++

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

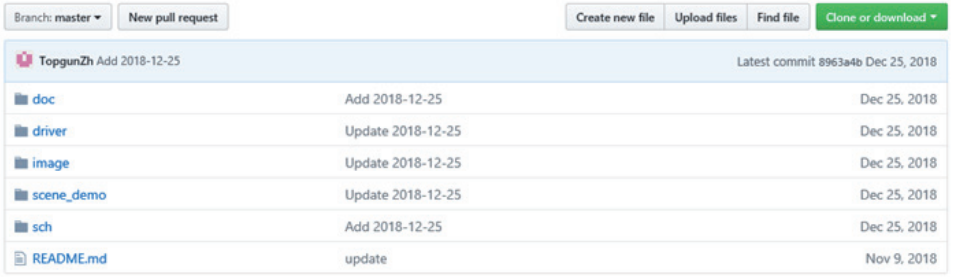
• When configure the Arduino IDE Hardware Platform and the COM Port (the COM Port is allocated randomly by your computer), please use IDE for code writing or use Github routine code to develop.



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

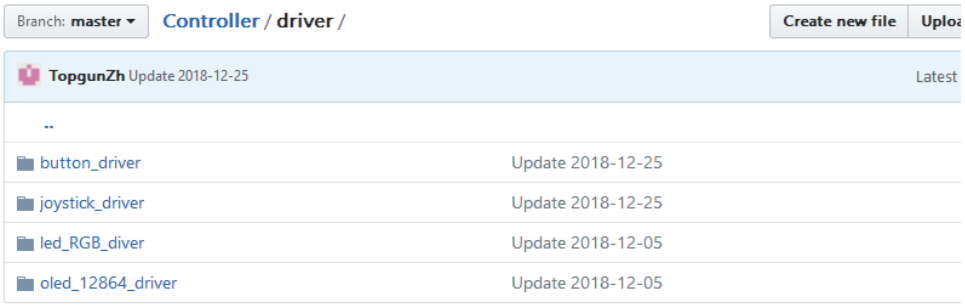


Github Demo



doc→ User Manual
driver→ Peripheral Routine
image→ Product Image
scene_demo→ Scene Demo
sch→ Schematic Diagram of uArm Controller

• Peripheral driver



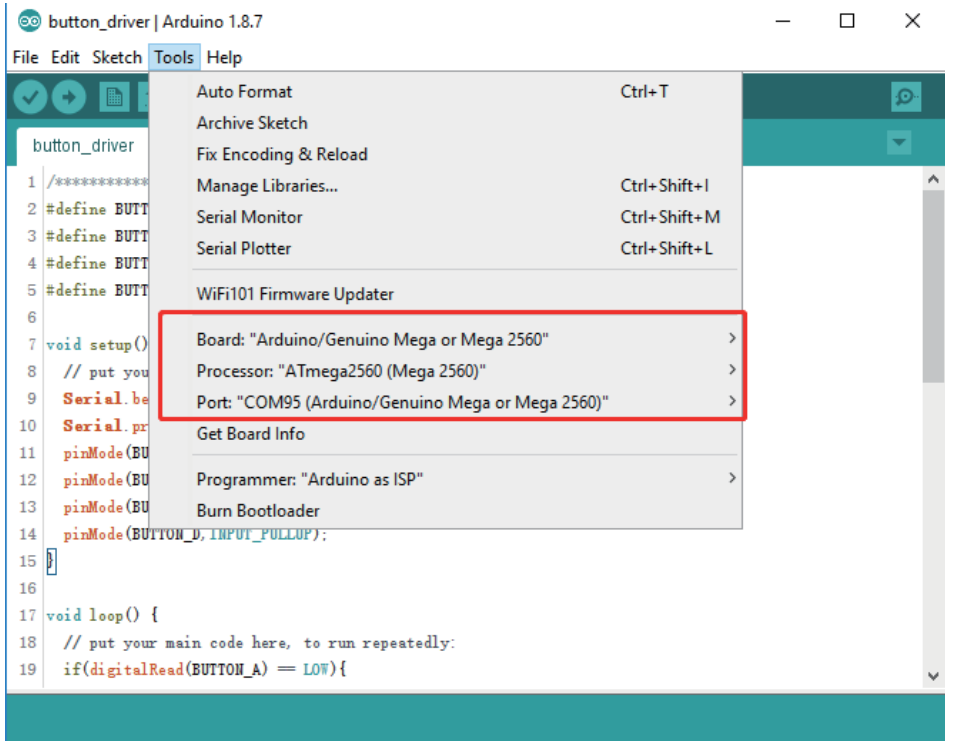
At the moment, there are four routines under the "driver" folder (we will keep updating the routine, please check our Github content).

• 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)

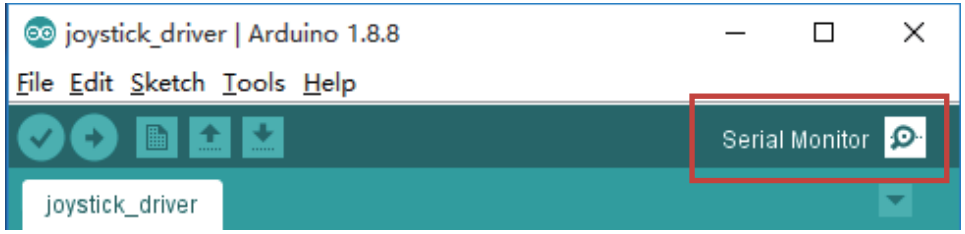
2.Configure Arduino IDE，select the board as "Arduino/Genuino Mega or Mega 2560", Select the COM that allocated randomly by your computer, please refer to the following picture:



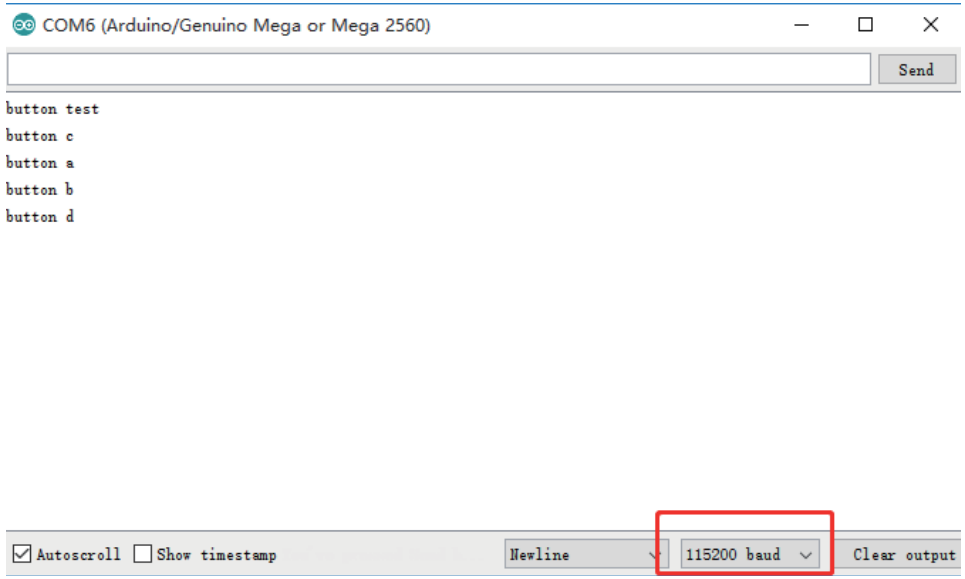
Note：When uArm Controller is connected with a computer, please press the “Reset” button.

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

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



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

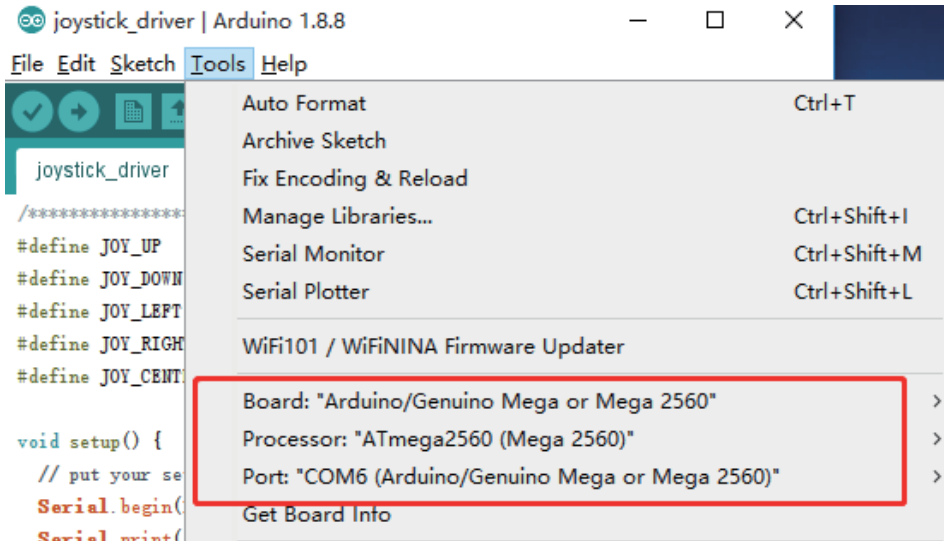


• joystick_driver

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

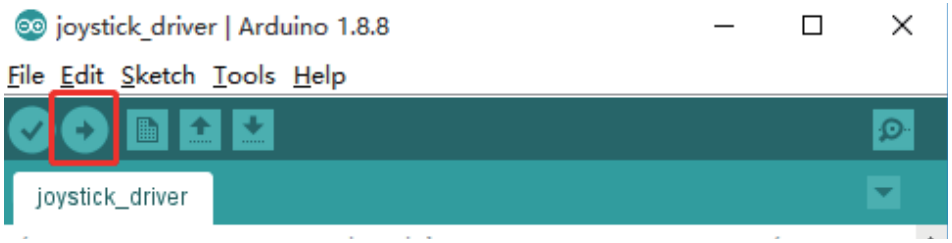
1.Download Project File: joystick_driver.ino
(https://github.com/uArm-Developer/Controller/tree/master/driver/joystick_driver)
About how to download a single file from Github, please refer to:
(https://github.com/uArm-Developer/SwiftProForArduino/wiki/How-to-download-single-file-from-GitHub)

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:

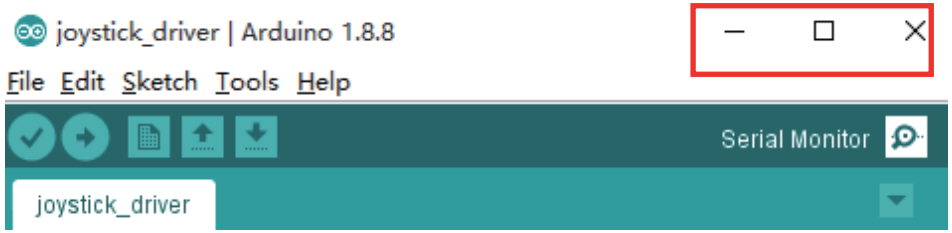


Note:When uArm Controller is connected with a computer, please press the "Reset" button.

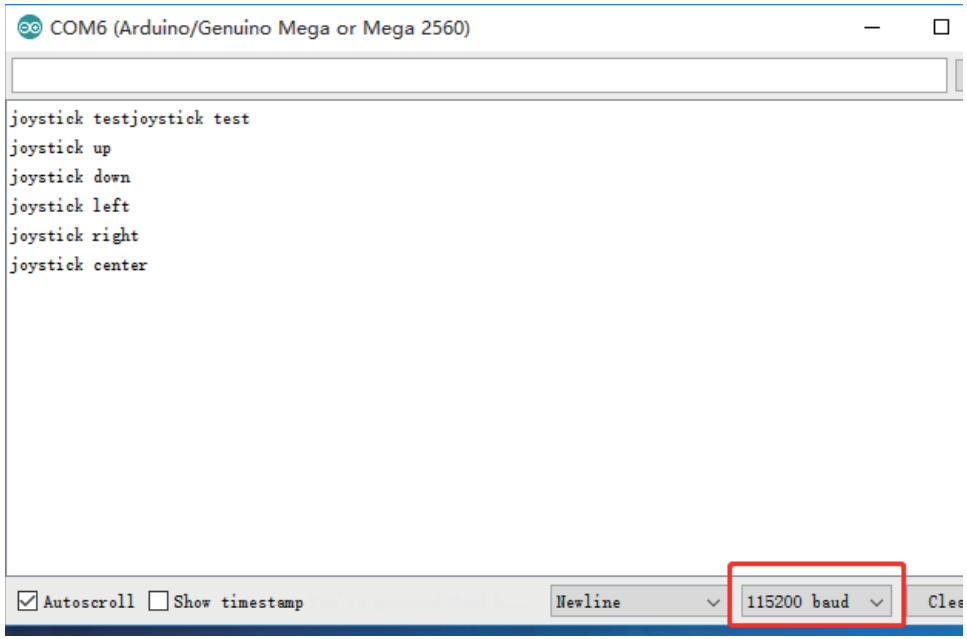
3.Press the "Upload" button to upload firmware.



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



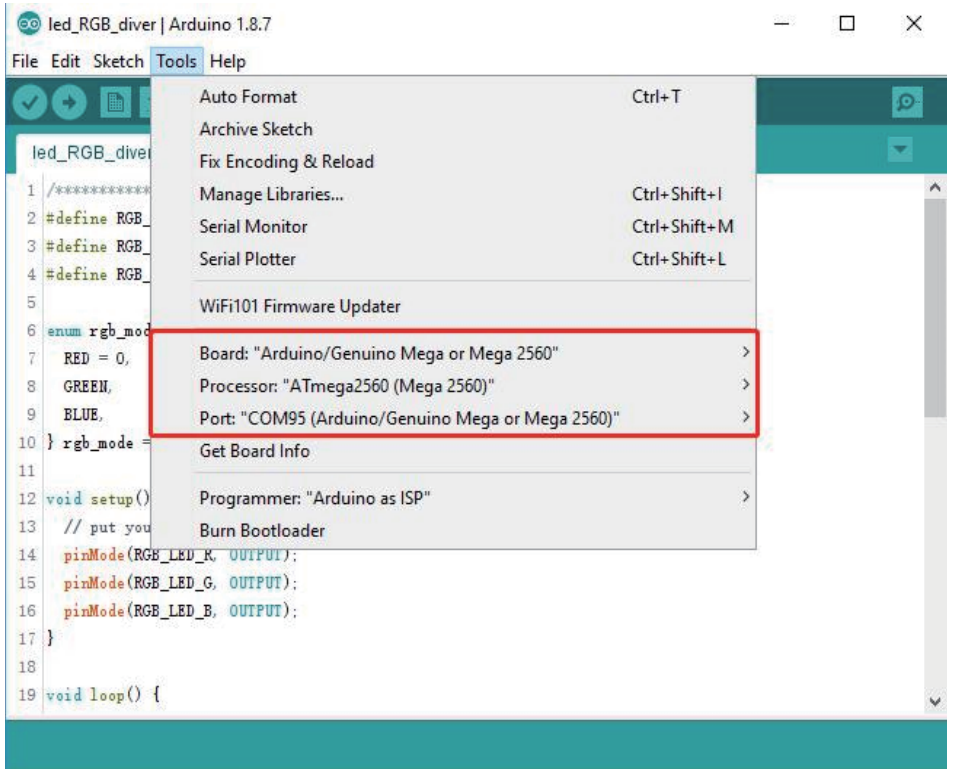
5.Push the Joystick to check the log of terminal printing.



- led_RGB_driver

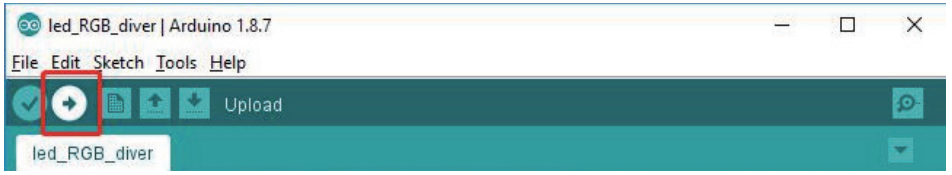
For hardware connection, please refer to (Hardware Parameters→ RGB led Pin Description)

1.Download Project File: led_RGB_diver.ino
https://github.com/uArm-Developer/Controller/tree/master/driver/led_RGB_diver
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.



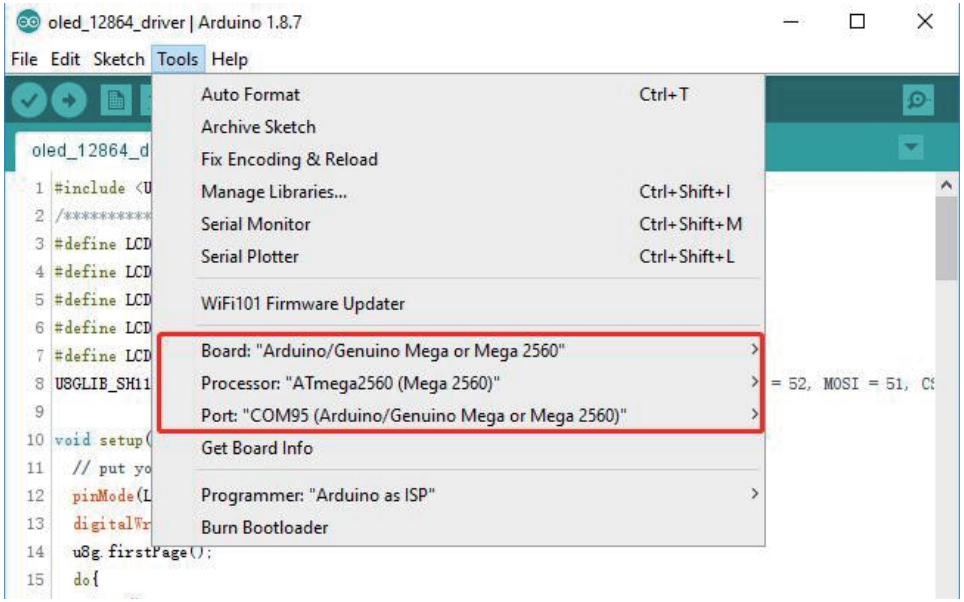
4.Test, and the RGB light will alternates with red, green and blue lights.

• oled_12864_driver

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

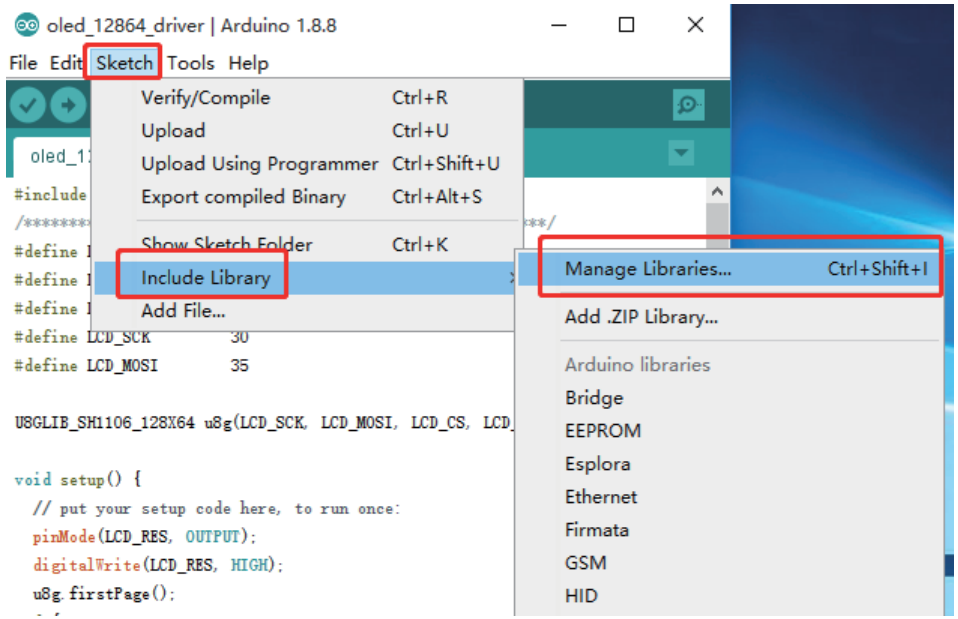
1.Download Project File: oled_12864_driver.ino
(https://github.com/uArm-Developer/Controller/tree/master/driver/oled_12864_driver)
About how to download a single file from Github, please refer to:
(https://github.com/uArm-Developer/SwiftProForArduino/
wiki/How-to-download-single-file-from-GitHub)

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:

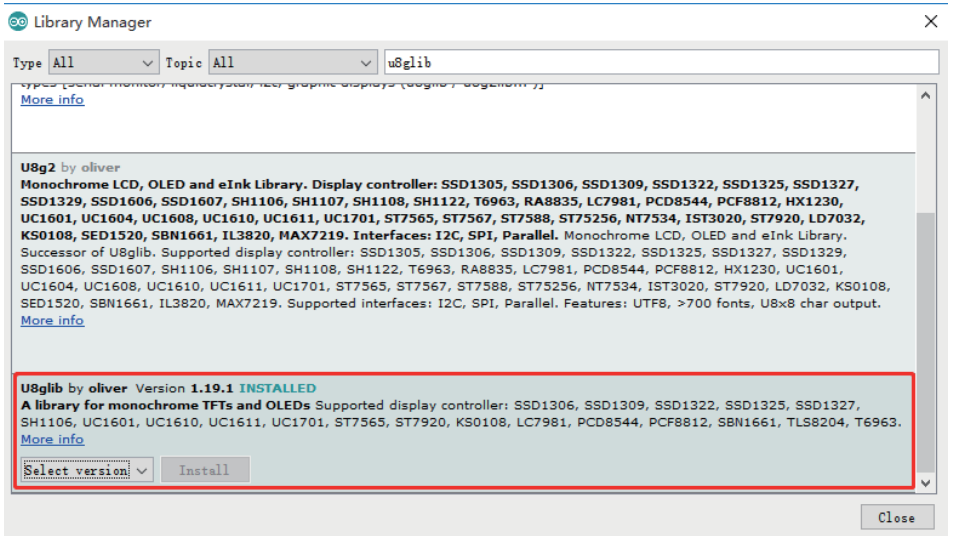


Note：When uArm Controller is connected with a computer, please press the "Reset" button.

3.Open the "Manage Libraries" .

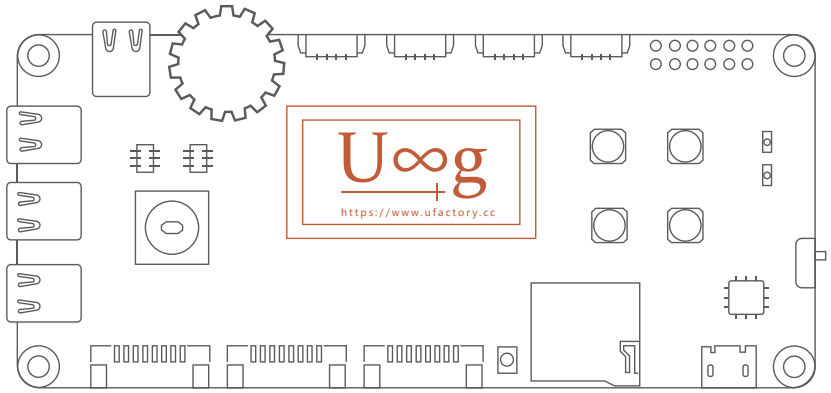


4.Install u8glib.

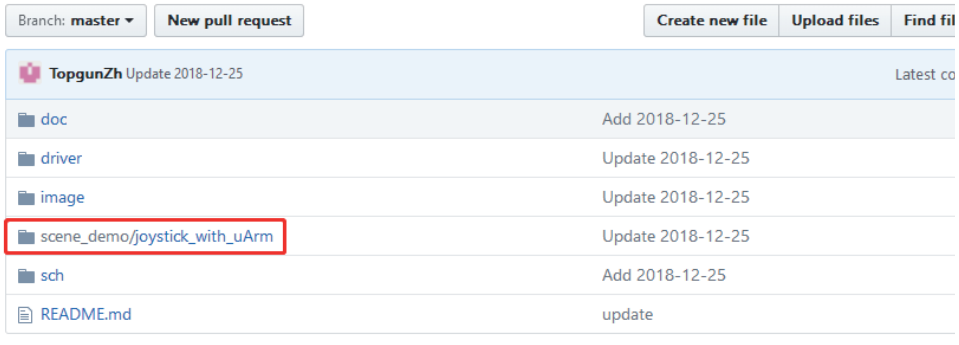


5.Press the "Upload" button to upload firmware.

6.Check the Display Screen.



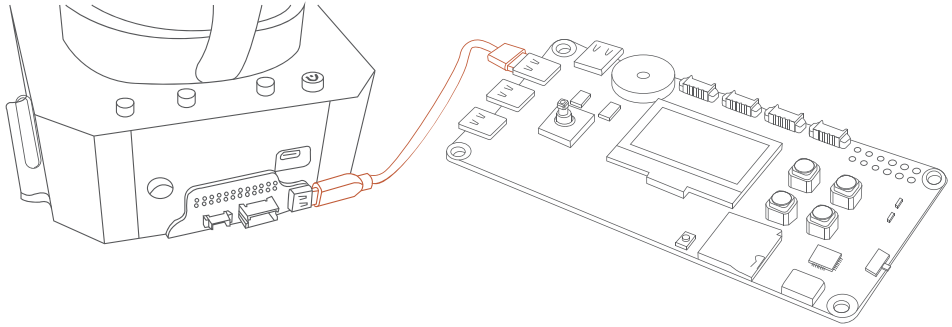
• Scene Demo



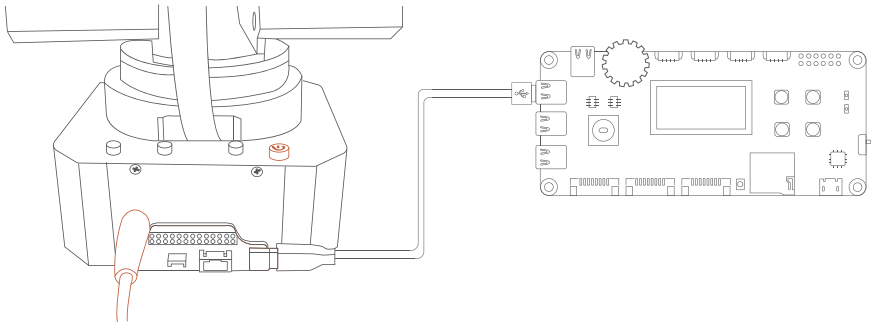
At the moment, there is one routine under the "scene_demo" folder (we will keep updating the routine, please check our Github content).

• joystick_with_uArm

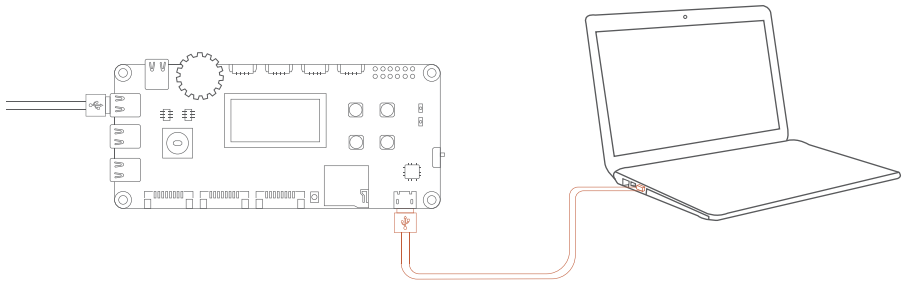
1.Connect the uArm Controller and uArm Swift Pro with Type-C.
(The program use the UART2-TTL interface)



2.Plug in the uArm Swift Pro.

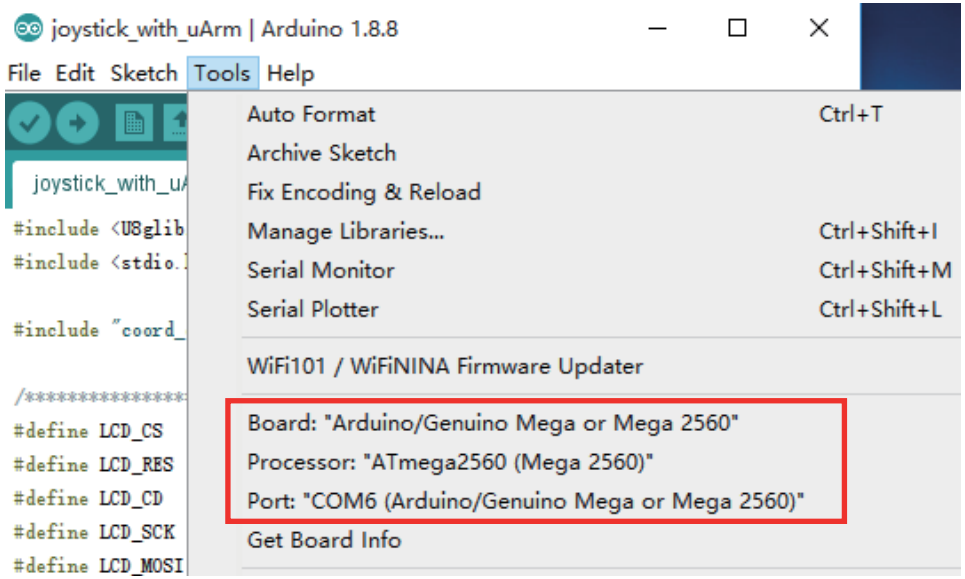


3.Connect the uArm Controller and Computer with USB.



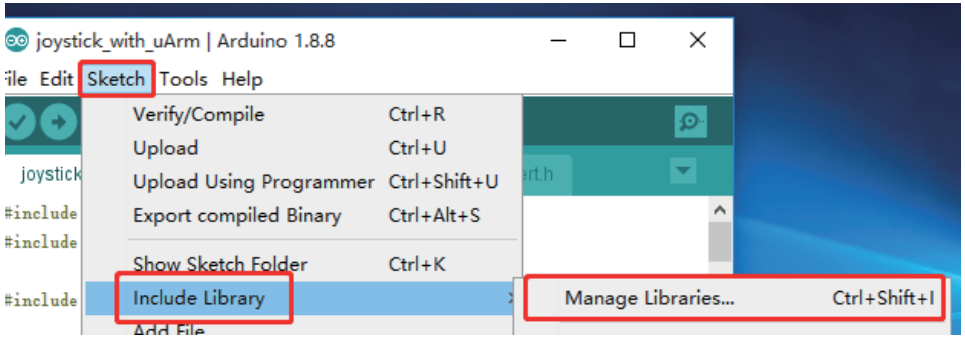
4.Download Project File: joystick_with_uArm.ino
(https://github.com/uArm-Developer/Controller/tree/master/scene_demo/joystick_with_uArm)
About how to download a single file from Github, please refer to:
(https://github.com/uArm-Developer/SwiftProForArduino/
wiki/How-to-download-single-file-from-GitHub)

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".



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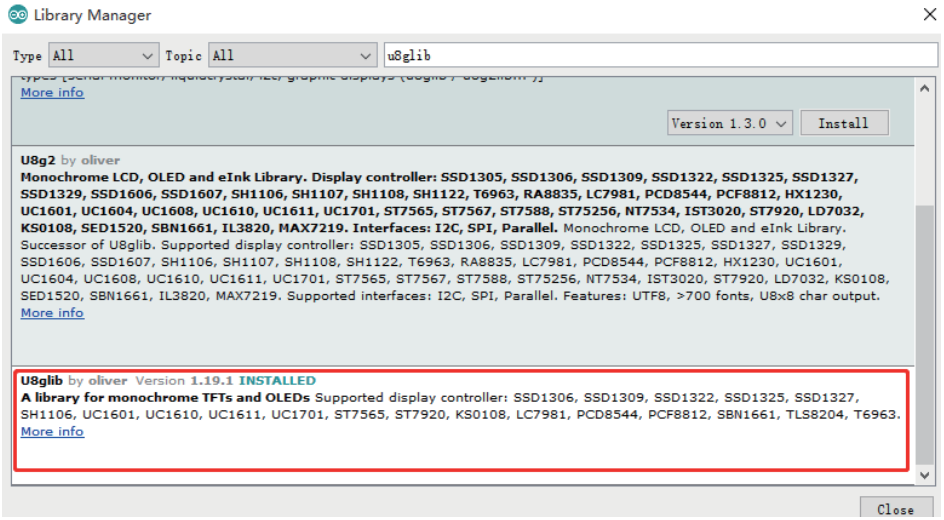

8.Press the "Upload" button to upload firmware.

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