SLIDER

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User Manual

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1.2 Software

1.Arduino IDE

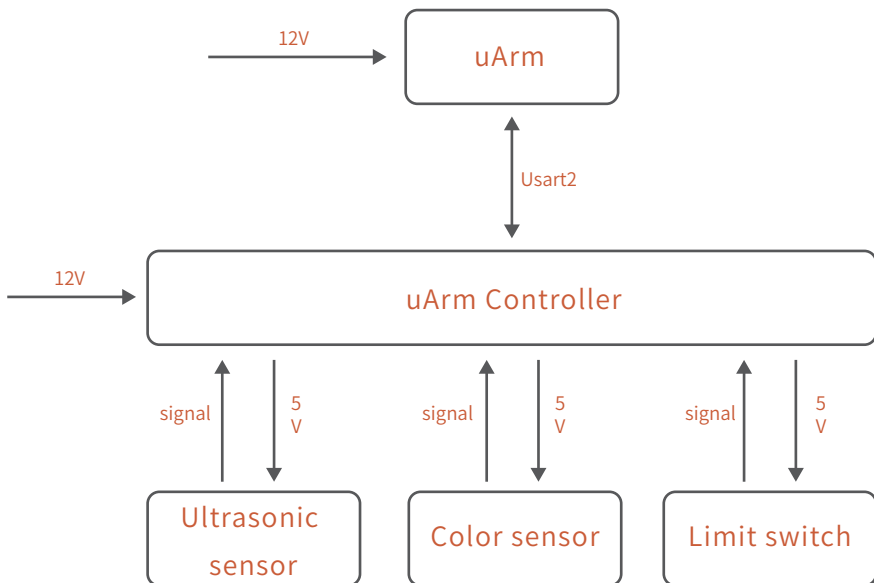http://www.arduino.cc

2.Slider.ino for Controller

https://bit.ly/2I8tvvP

3.uArmPro_V4.X.X.hex for uArm

https://github.com/uArm-Developer/SwiftProForArduino/tree/Version_V4.0/hex

2 System Structure

```
           12V ────────→  ┌──────────────┐
                          │     uArm     │
                          └──────────────┘
                                 ↕ Usart2

     12V ──────→  ┌─────────────────────────────────────────┐
                  │             uArm Controller              │
                  └─────────────────────────────────────────┘
              signal ↑ ↓ 5V      signal ↑ ↓ 5V      signal ↑ ↓ 5V
          ┌──────────────┐   ┌──────────────┐   ┌──────────────┐
          │  Ultrasonic  │   │ Color sensor │   │ Limit switch │
          │    sensor    │   │              │   │              │
          └──────────────┘   └──────────────┘   └──────────────┘
```
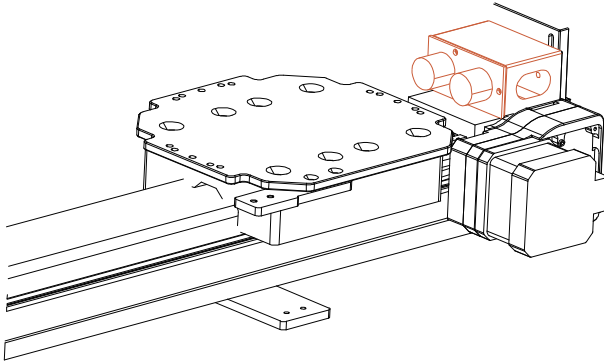
3 Installation Tutorial

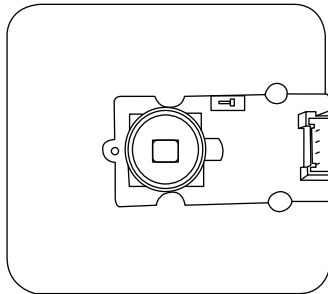## 3.1 Hardware installation tutorial

3.1.1 Suite Installation Tutorial

(1) Install the ultrasonic module
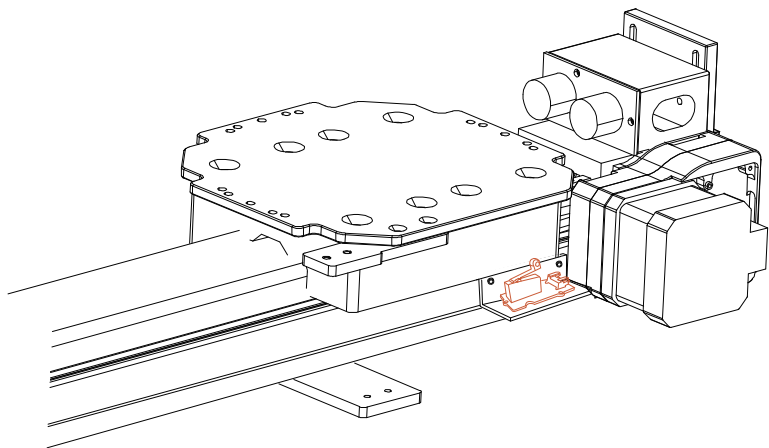
The mounting position for the Ultrasonic sensor

Put the ultrasonic sensor to the corresponding position of the slide rail.

(2) Color sensor

After locking in the position of the color sensor, users may run the system once to observe the gripping position of uArm, and then place the color sensor according to the grabbing position of the uArm.
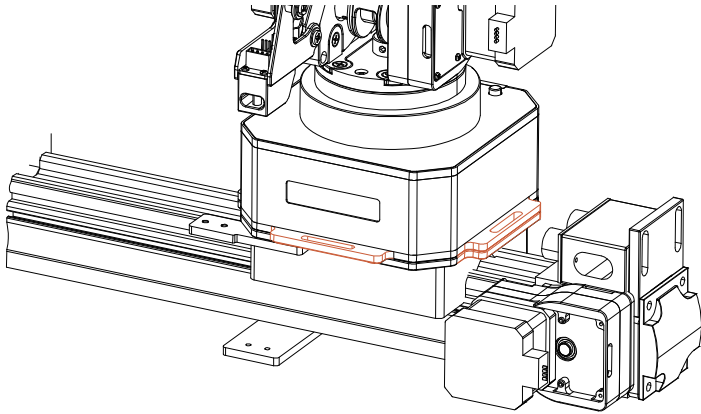
(3)Limit switch

The main function of the limit switch module is to establish the uArm starting point and assist the uArm to reset.

(5) Install uArm 30P extendable base.
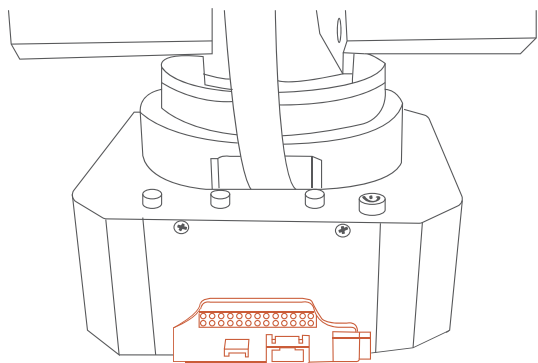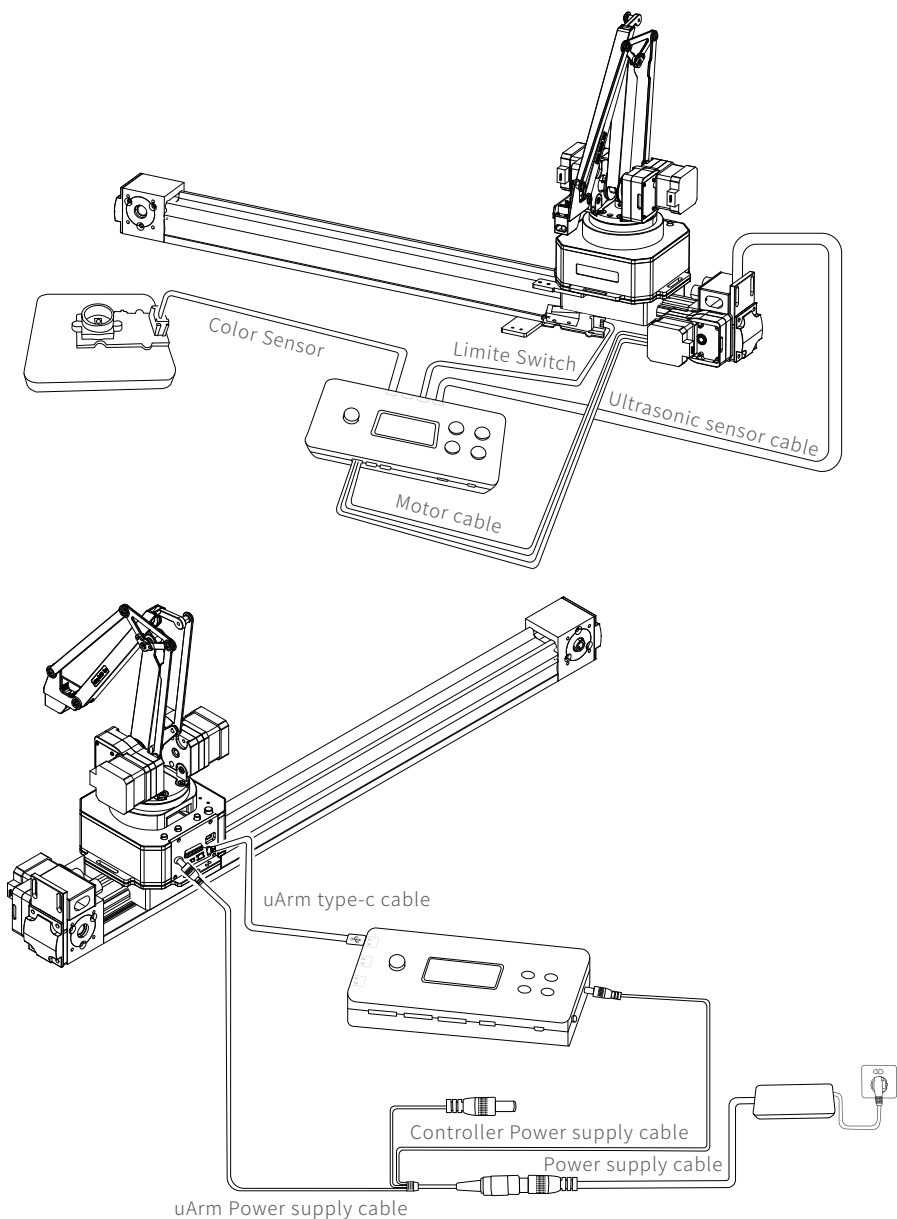
Install uArm 30P extendable base to the rear interface on uArm

(6)Fix the uArm

Put uArm on the fixing plate of the slider.
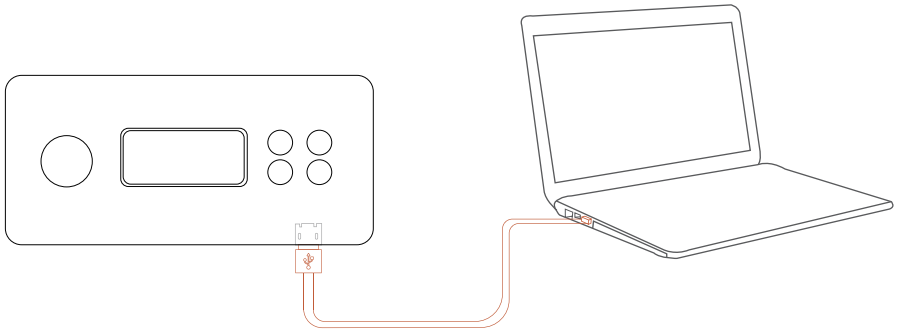
3.1.2 Wiring Tutorial

Connecting cables of each module.

Color Sensor

Limite Switch

Ultrasonic sensor cable

Motor cable

uArm type-c cable

Controller Power supply cable

Power supply cable

uArm Power supply cable

3.2 Software Installation Tutorial

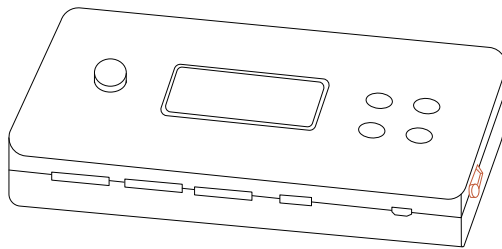## 3.2.1uArm controller & uArm Swift Pro Firmware Writing Tutorial

uArm Controller Firmware Writing

The firmware of uArm Controller has been written before leaving the factory. If you need to re-write the firmware, please refer to the following steps.

(1) Connect the uArm Controller to the computer with a USB cable

(2) Turn on the switch

(3) Download XLoader

https://drive.google.com/file/d/1doUByCPryPwEmDFmimSYODYo6s17S3rV/view?usp=sharing

(4) Download the hex(http://bit.ly/2Y36ggB),

click the link(http://bit.ly/32rA0mt)to learn how to download single

directory from GitHub.

(5) Open XLoader and select your controller's COM port from the drop down menu on the lower left.

(6) Select the appropriate device from the dropdown list titled "Device".

(7) Check that Xloader set the correct baud rate for the device: 115200 for Mega (ATMEGA2560).

(8) Now use the browse button on the top right of the form to browse to your hex file.

(9) Once your hex file is selected, click "Upload" The upload process general-ly takes about 3 seconds to finish. Once completed, a message will appear in the bottom left corner of XLoader telling you how many bytes were upload-ed. If there was an error, it would show instead of the total bytes uploaded. Steps should be similar and may be done through the command prompt.
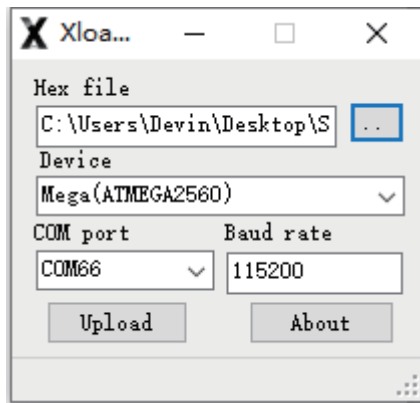

If you want to change the code in the firmware, you need to download the firmware in the following way:

(1)Download the project slider(http://bit.ly/2JMBM9i),
clickthe link(http://bit.ly/32rA0mt)to learn how to download single directory 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:

(3) Open the "Manage Libraries".
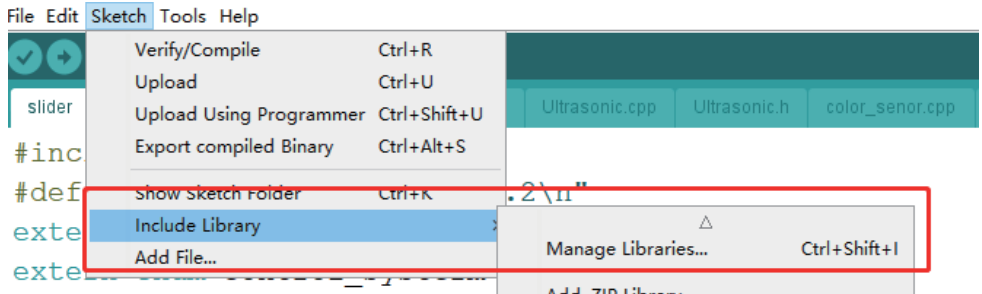
(4) Install u8glib.
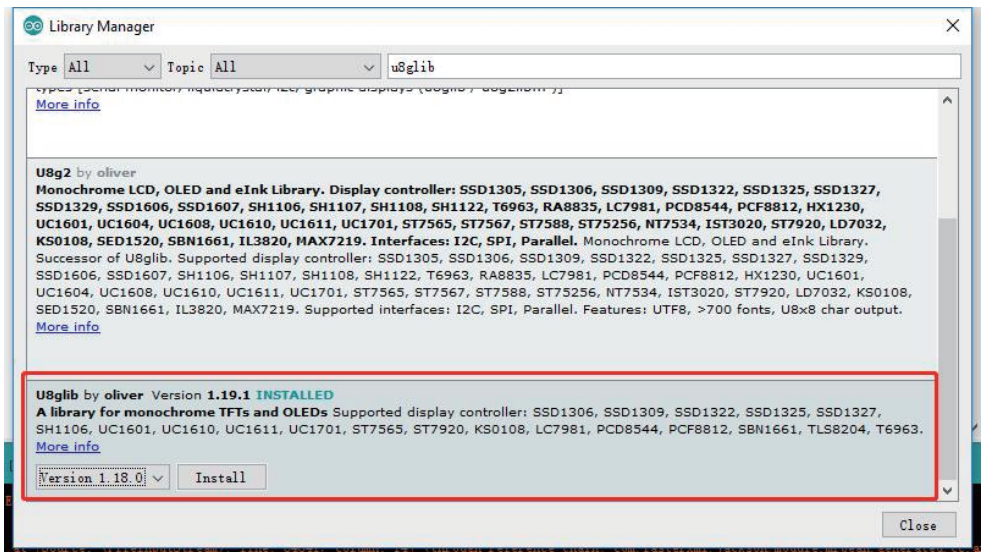
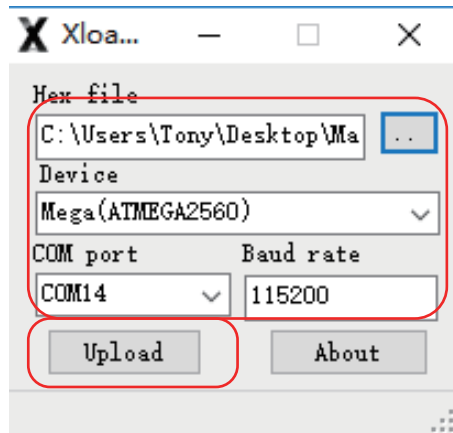(5) Press the "Upload" button to upload firmware.

uArm Swift Pro firmware Writing tutorial

Connect uArm Swift Pro to your computer. Open XLoader

and load uArmPro_V4.X.X.hex

download link：https://github.com/uArm-Developer/SwiftProForArduino/tree/Version_V4.0/hex

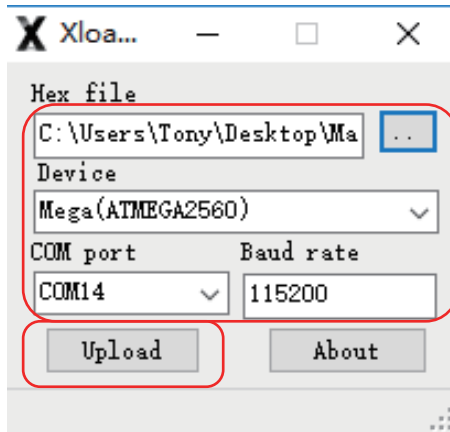Click the "Upload" button to upload the code to uArm Swift Pro.

3.2.2 uArm Swift Pro Firmware Recovery

A dedicated firmware has been flashed for uArm Swift Pro, such as firmware is not able to control the robotic arm with uArm Studio. To control the robotic arm with uArm Studio, please restore the firmware as follows:

Connect uArm Swift Pro to your computer, open XLoader

and load uArmPro_V4.X.X.hex

https://github.com/uArm-Developer/SwiftProForArduino/tree/Version_V4.0/hex

Click the "Upload" button to upload the code to uArm Swift Pro.

3.3 uArm Slider Demo

A dedicated firmware has been flashed for uArm Swift Pro, such as firmware is not able to control the robotic arm with uArm Studio. To control the robotic arm with uArm Studio, please restore the firmware as follows:

Connect uArm Swift Pro to your computer, open XLoader
xloader.russemotto.com/
and load uArmPro_V4.X.X.hex
https://github.com/uArm-Developer/SwiftProForArduino/tree/Version_V4.0/hex
Click the "Upload" button to upload the code to uArm Swift Pro.

Video Demo：
https://youtu.be/v8YozgnrShk

Note: If the cube is placed on the color sensor, and uArm is not able to grab, it is likely due to the value of the color sensor recognition is inconsistent with the preset color cube value, which makes it impossible to follow the default procedure. You can view the real-time values by uncommenting the following code and connecting the uArm Controller to your computer.

```
void get_color()
{
  r = tcs.read16(TCS34725_RDATAL) / 255;
  g = tcs.read16(TCS34725_GDATAL) / 255;
  b = tcs.read16(TCS34725_BDATAL) / 255;
  r = constrain(r, 0, 255);
  b = constrain(b, 0, 255);
  g = constrain(g, 0, 255);
//  Serial.print("r:"); Serial.println(r);
//  Serial.print("b:"); Serial.println(b);
//  Serial.print("g:"); Serial.println(g);
```

Taking a yellow cube as an example, r, b, and g are the three-color values of the yellow cube read.

```
r:255
b:96
g:255
Yellow
r:255
b:96
g:255
Yellow
r:255
b:96
g:255
Yellow
```

According to the real-time value of the color cube, the following values are changed, R corresponds to the red cube, Y corresponds to the yellow square, and G corresponds to the green cube.

RED, GREEN and BLUE are the three-color values.

```
void slider_rgb_r()
{
    R_RED       =   140;        Red Cube  r,g,b value
    R_GREEN     =    45;
    R_BLUE      =    37;
}
void slider_rgb_y()
{
    Y_RED       =   255;
    Y_GREEN     =   255;        Yellow Cube r,g,b value
    Y_BLUE      =   100;
}
void slider_rgb_g()
{
    G_RED       =   151;
    G_GREEN     =   218;        Green Cube    r,g,b value
    G_BLUE      =    89;
}
```

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