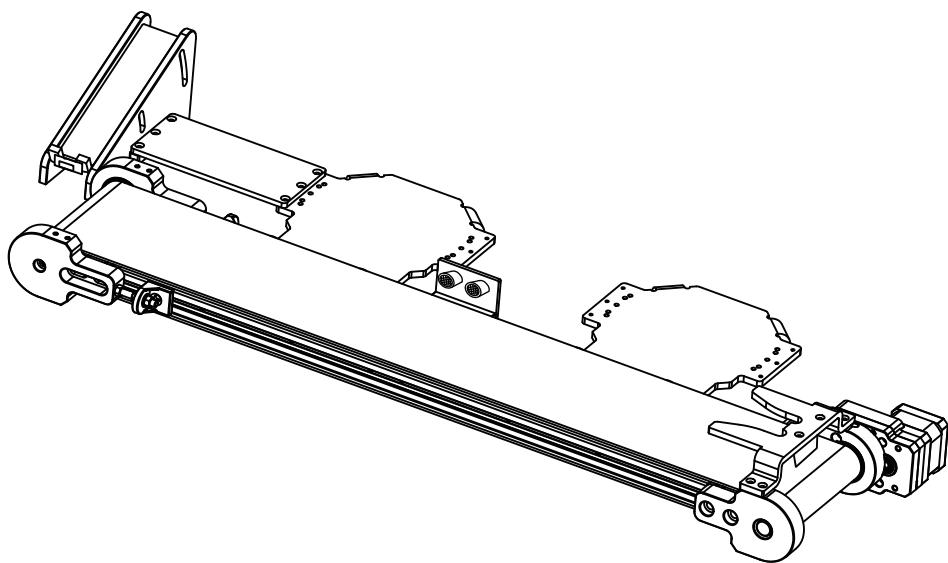


CONVEYOR BELT

User Manual



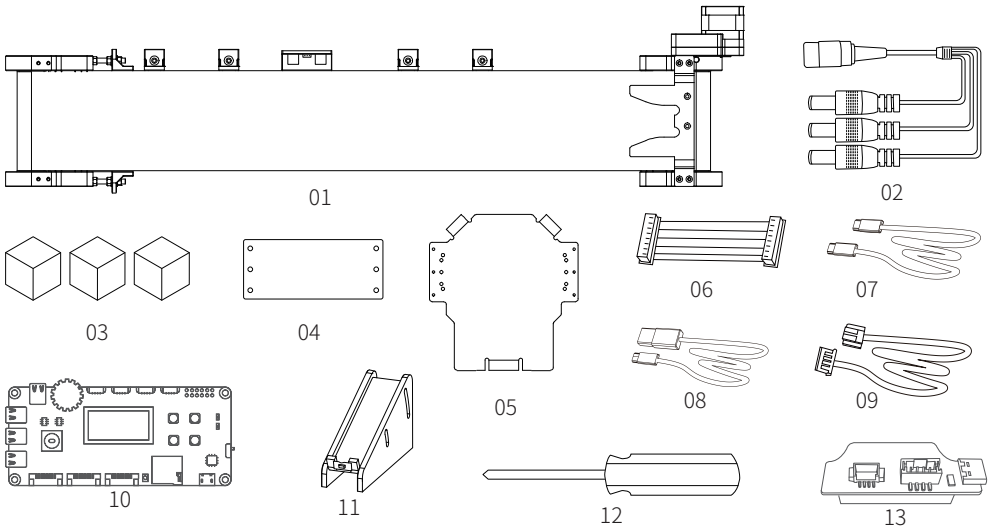
SHENZHEN UFACTORY CO.,LTD.

V 2 . 2

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1.Parts List



1.1 Hardware

- 01.Conveyor * 1
- 02.DC Power Supply 3-in-1 cable * 1
- 03.Target Object (Red & Green & Yellow Cube) 1
- 04.Connection Plate* 1
- 05.uArm Swift Pro stator *2
- 06.Slider Motor 8-Pin cable * 1
- 07.USB Type-C Cable * 2
- 08.USB Cable * 1
- 09.Seed Grove Sensor Cable * 3
- 10.Controller* 1
- 11.feeding Slide * 1
- 12.Screwdriver * 1
- 13.uArm 30P extendable base * 2

1.2 Software

01.Arduino IDE

<http://www.arduino.cc/>

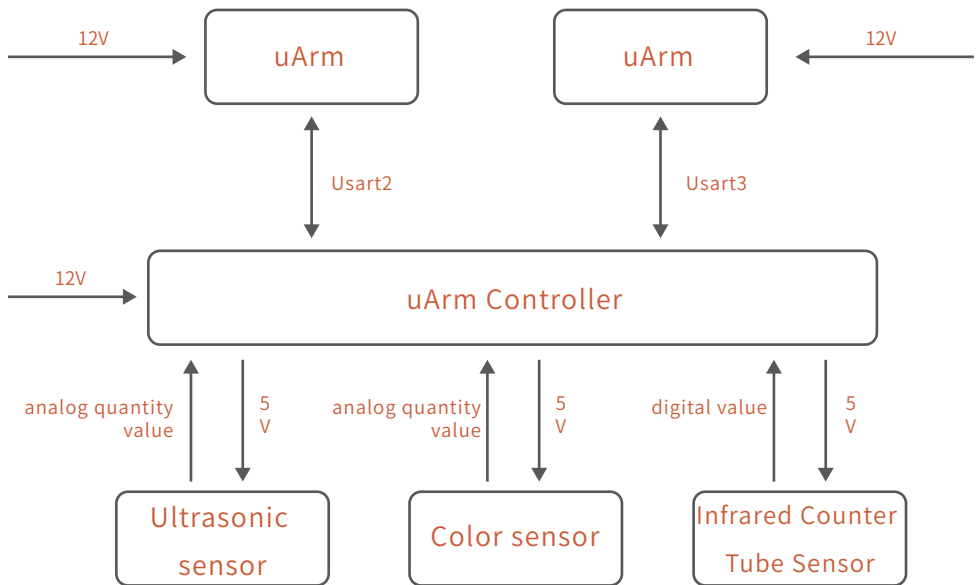
02.conveyor_belt.ino for Controller

<https://bit.ly/2YWITBZ>

03.uArmPro_V4.X.X.hex for uArm

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

2.System Structure

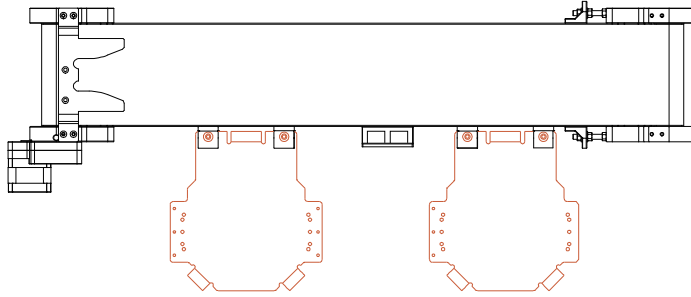


3 Installation Tutorial

3.1 Hardware installation tutorial

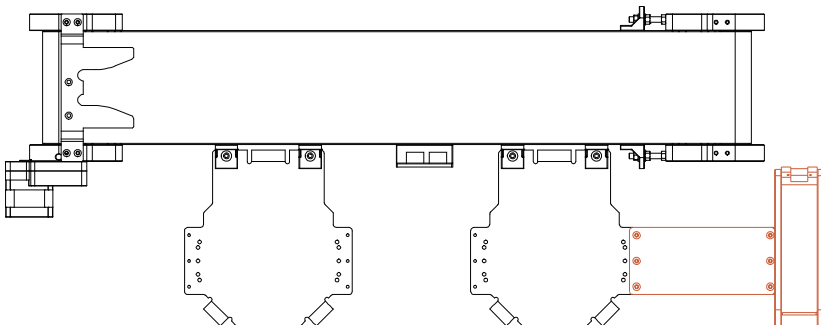
3.1.1 Kit Installation Tutorial

(1) Install the uArm stator



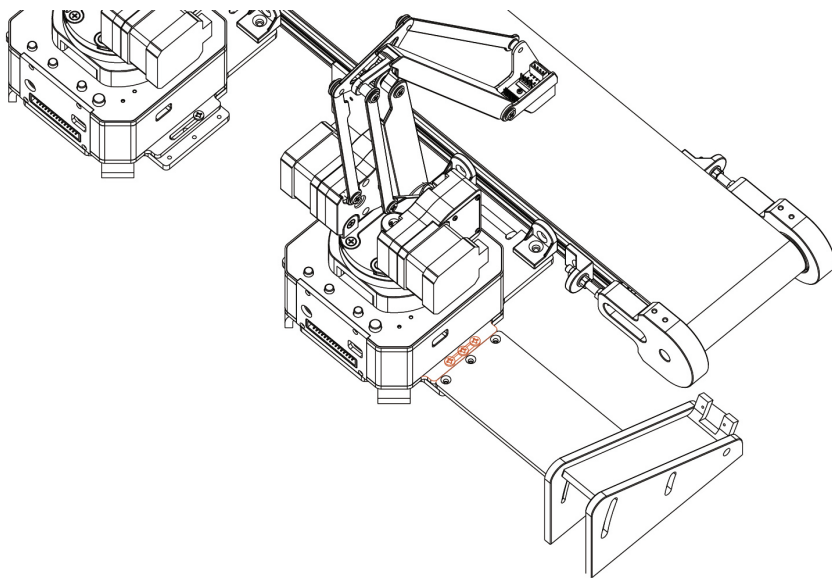
Fix the uArm stator on the conveyor belt.

(2) Install the feeding slide



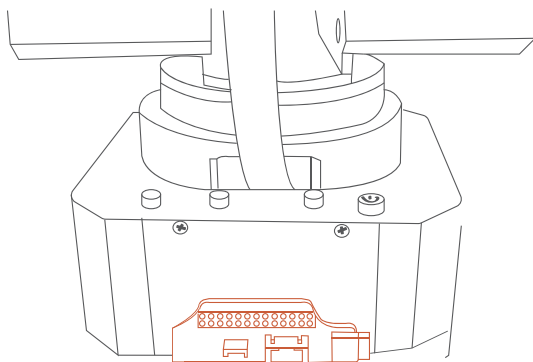
Connect the uArm Swift Pro stator to the material slide with the connection plate.

(3) Place the uArm Swift Pro



Place the Arm Swift Pro that with burnt firmware on the stator, it should stay close to the stator.

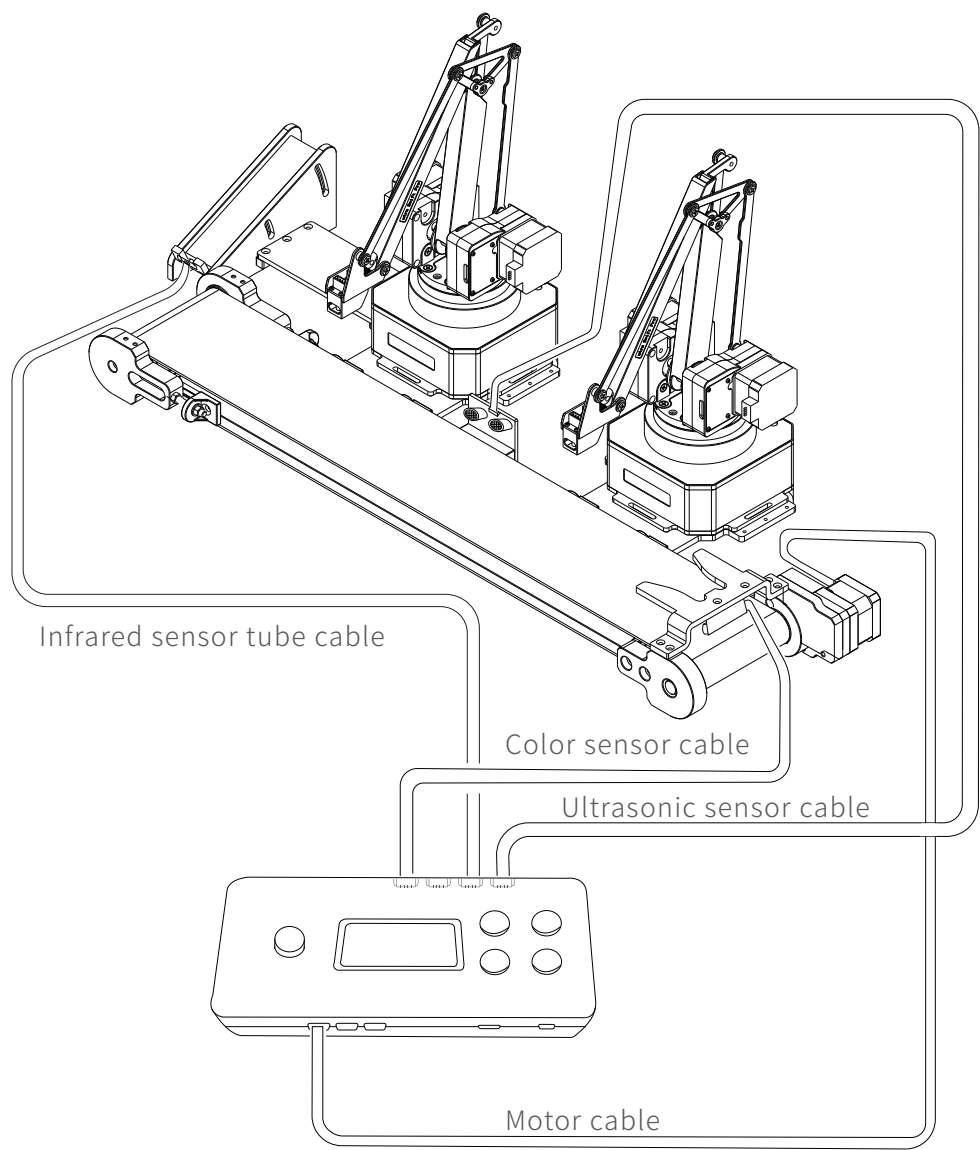
(4) Install uArm 30P extendable base.



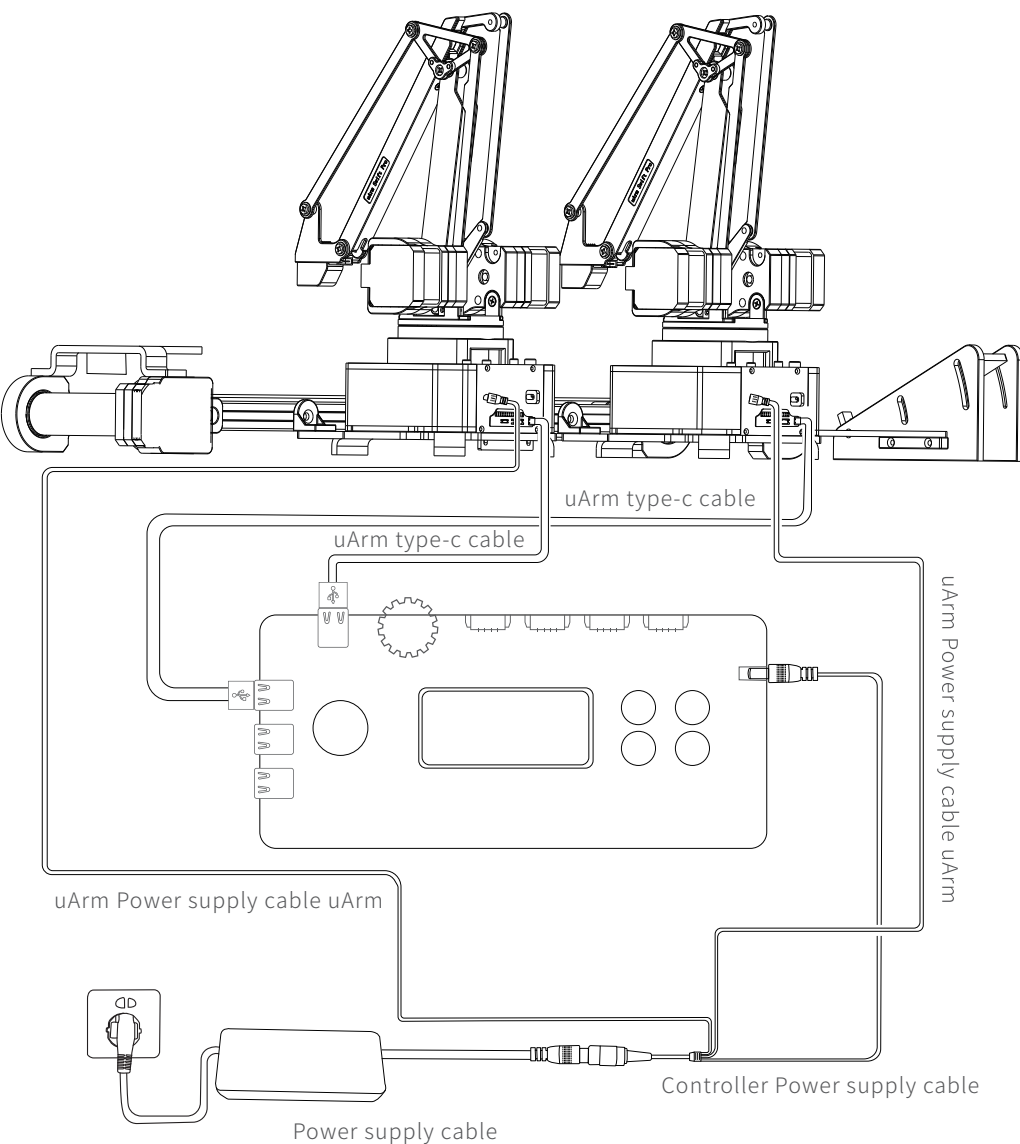
Install uArm 30P extendable base to the rear interface on uArm

3.1.2 Wiring Tutorial

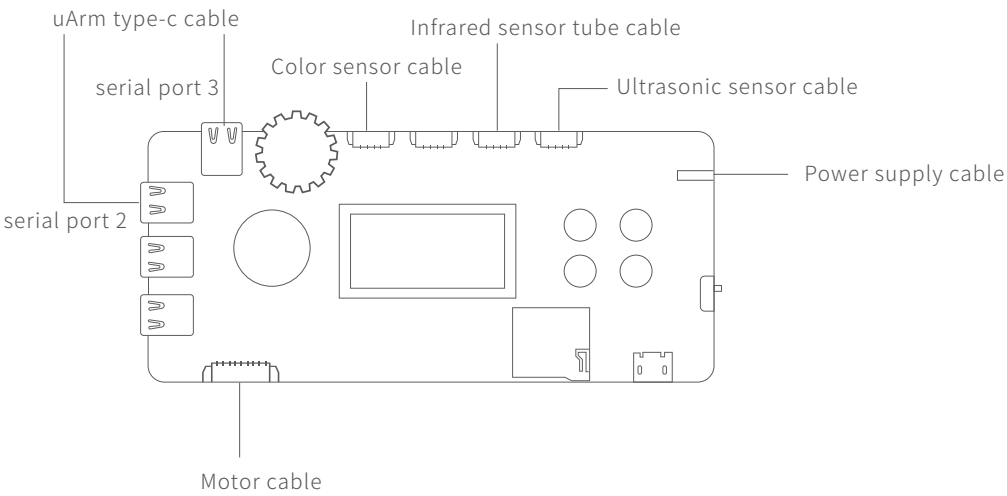
(1) Sensor cable connection



(2) Connect uArm Swift Pro Communication interface and the power supply cable



(3) uArm Controller wiring diagram



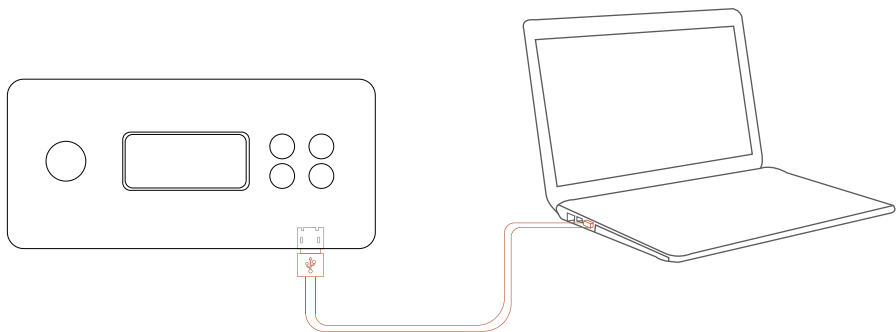
3.2 Software Installation Tutorial

3.2.1uarm controller & uArm swift pro Firmware Writing Tutorial

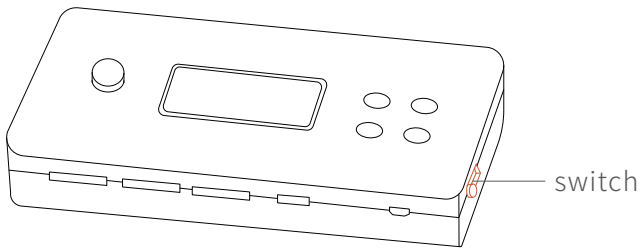
uArm Controller firmware writing

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/2GfpG7L>),click the link(<http://bit.ly/2XCfh0C>)to learn how to download single directory from GitHub.

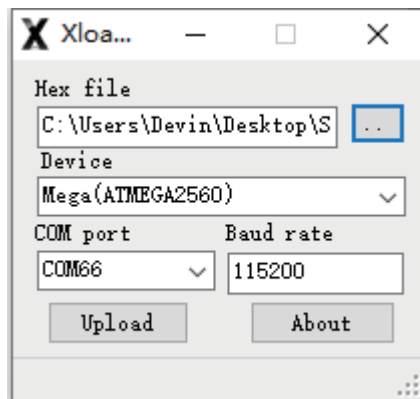
(5) Open XLoader and select your controller's COM port from the drop down menu on the lower left.

(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).

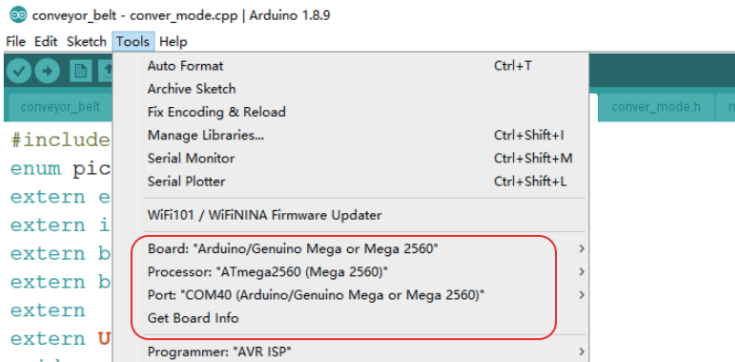
(8) Now use the browse button on the top right of the form to browse to your hex file.

(9) Once your hex file is selected, click "Upload" The upload process generally 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 uploaded. 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.

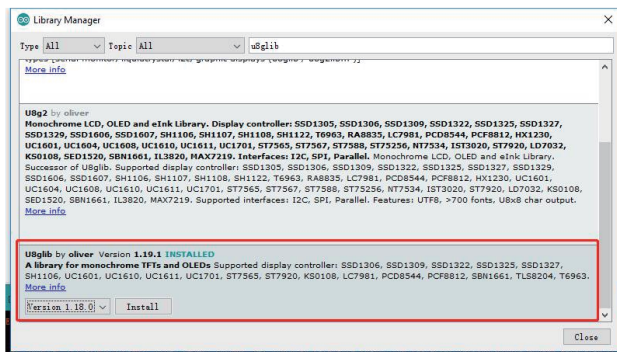


If you want to change the code in the firmware, you need to download the firmware in the following way:

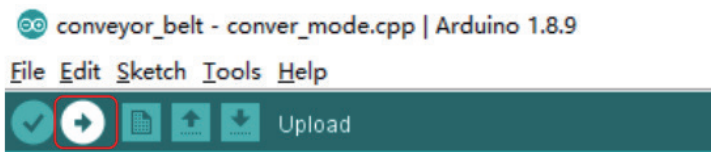
- (1)Download the project conveyor_belt(<http://bit.ly/32rzBA>),click the link (<http://bit.ly/32rA0mt>)to learn how to download single directory from GitHub.
- (2) Configure Arduino IDE, select the board as "Arduino/Genuino Mega or Mega 2560", Select the COM that allocated randomly by your computer, please refer to the following picture:



- (3) Install u8glib.



- (4) Press the "Upload" button to upload firmware.



uArm Swift Pro firmware Writing tutorial

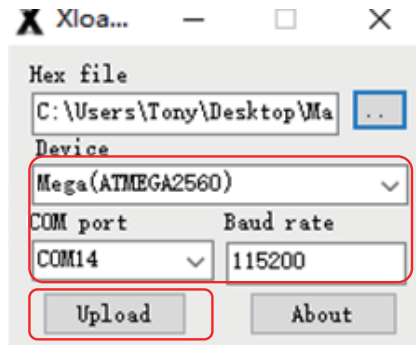
Connect uArm Swift Pro to your computer. Open XLoader

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

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.

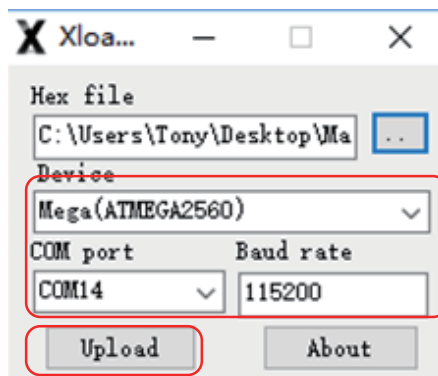


3.2.2 uArm swift pro Firmware Recovery

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 (xloader.russemotto.com/), and load SWIFTPRO3.2.0.hex (<http://download.ufactory.cc/firmware/SWIFTPRO3.2.0.hex?attname=>).

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



3.4 uArm Conveyor Belt Demo

When the infrared sensor detects the cube, the uArm grabs the cube according to the predetermined path and places the cube on the conveyor belt. The conveyor belt activates and accelerates when passing by the ultrasonic sensor, and the conveyor stops when the color cube reaches the end of the conveyor belt. uArm then grabs the color cube according to the color recognized by the sensor and place it in a different position.

Video Demo:

<https://youtu.be/xjtnRsCymzc>

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 three-color values.

```
void convert_rgb_r()  
{  
    R_RED    = 178;  
    R_GREEN  = 61;  
    R_BLUE   = 56;  
}  
void convert_rgb_y()  
{  
    Y_RED    = 255;  
    Y_GREEN  = 255;  
    Y_BLUE   = 120;  
}  
void convert_rgb_g()  
{  
    G_RED    = 157;  
    G_GREEN  = 233;  
    G_BLUE   = 108;  
}
```



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