The Guide Rail Manual

Part Lists:

Hardware

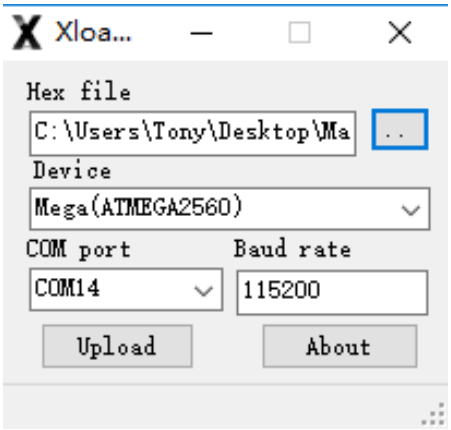
1. Guide Rail * 1
2. uArm Swift Pro* 1
3. Target Object（Red Block，Green Block，Yellow Block）* 1
4. USB Type C line & uArm 30P Bottom expansion plate * 1
5. LCD * 1
6. Color Sensor * 1
7. Ultrasonic Sensor * 1
8. Control Board * 1
9. Hidden trough * 1
10. Power Adapter * 1

Software

1. Arduino IDE
2. guide_rail.ino for Arduino Mega 2560
3. UArmSwiftPro_2ndUART.hex for uArm

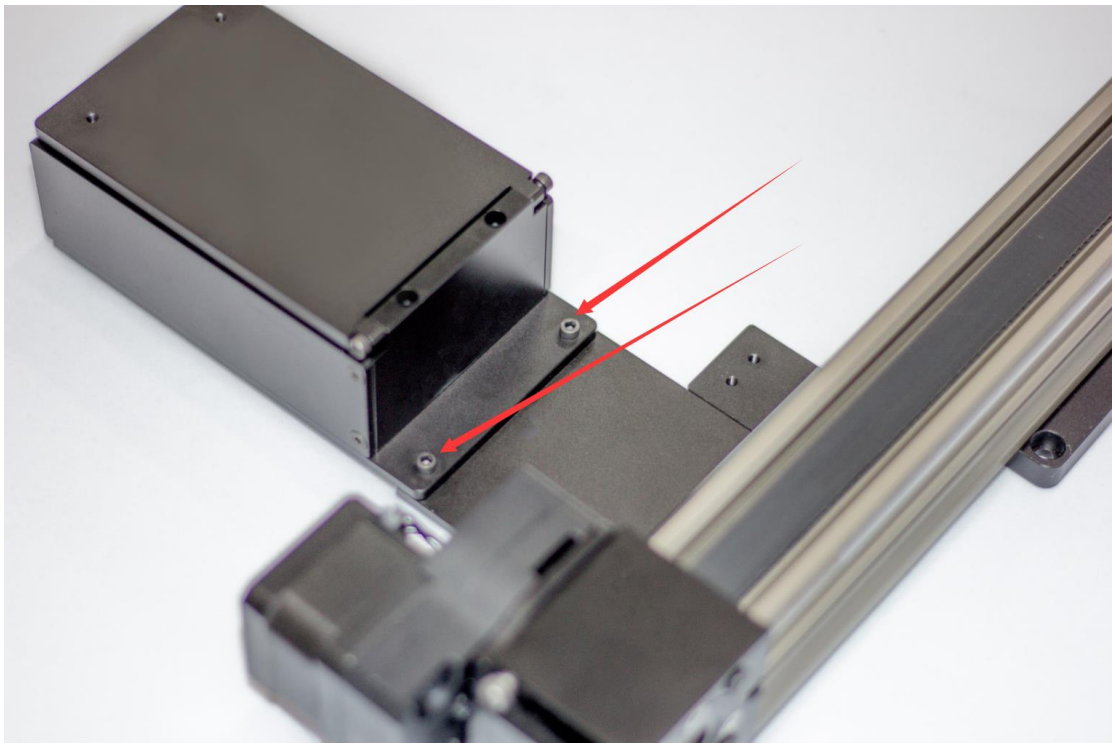
1. Software installation

1. Download the hex （GuideRailForControlBoard_Vx.x.x.hex）
2. Download and extract XLoader.
3. Open XLoader and select your uArm's COM port from the drop down menu on the lower left.
4. Select the appropriate device from the dropdown list titled "Device".
5. Check that Xloader set the correct baud rate for the device: 115200 for Mega (ATMEGA2560).
6. Now use the browse button on the top right of the form to browse to your hex file.
7. Once your hex file is selected, click "Upload" The upload process generally takes about 10 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.



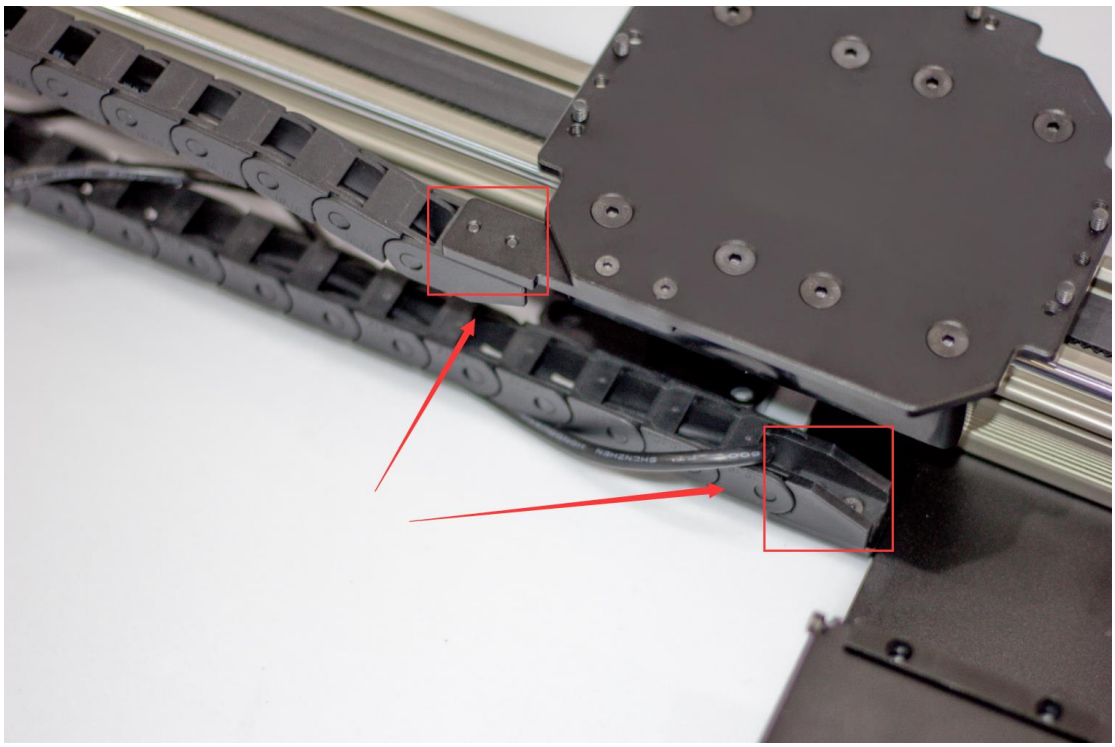
2. Hardware installation

1. **Install main control board**



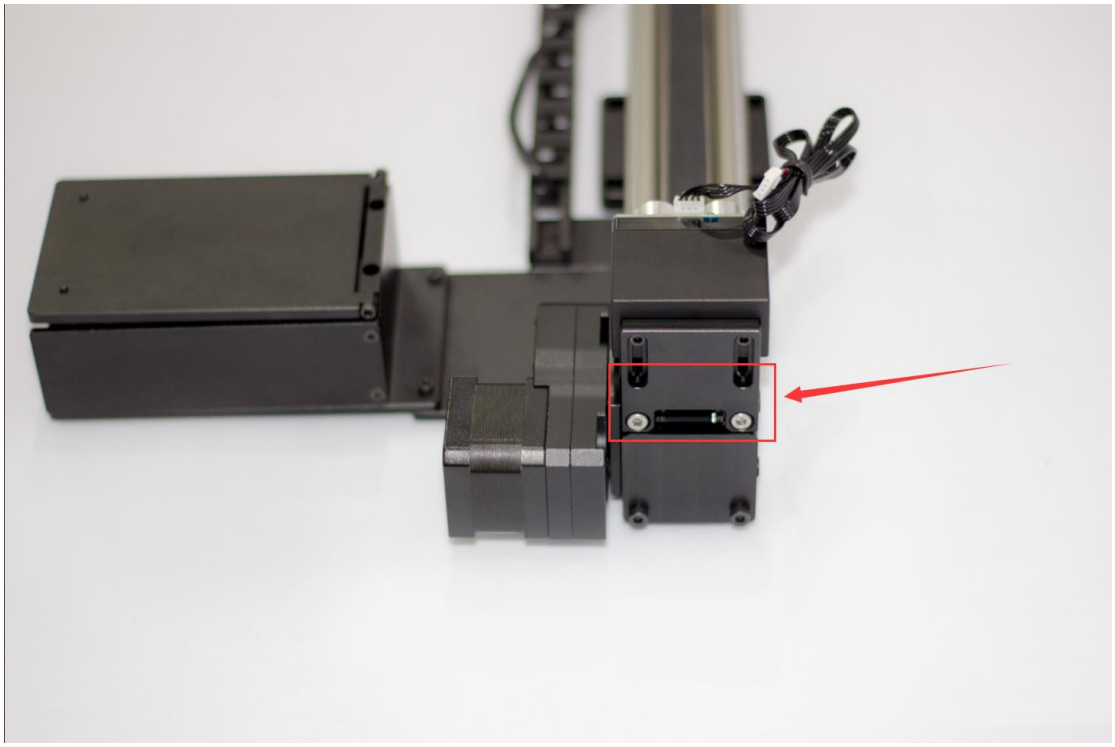
Put the main control board on the base of the guide rail.

2. Install slot

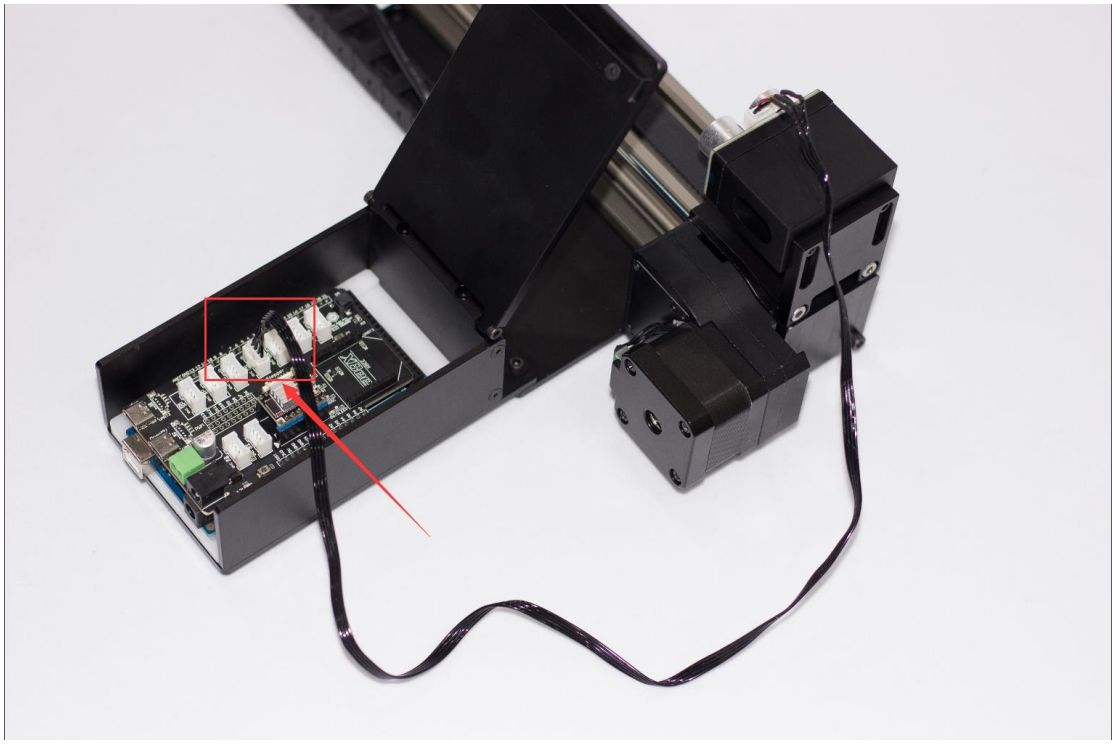


Put the slot on the corresponding position of the guide rail.

3. Install ultrasonic sensor

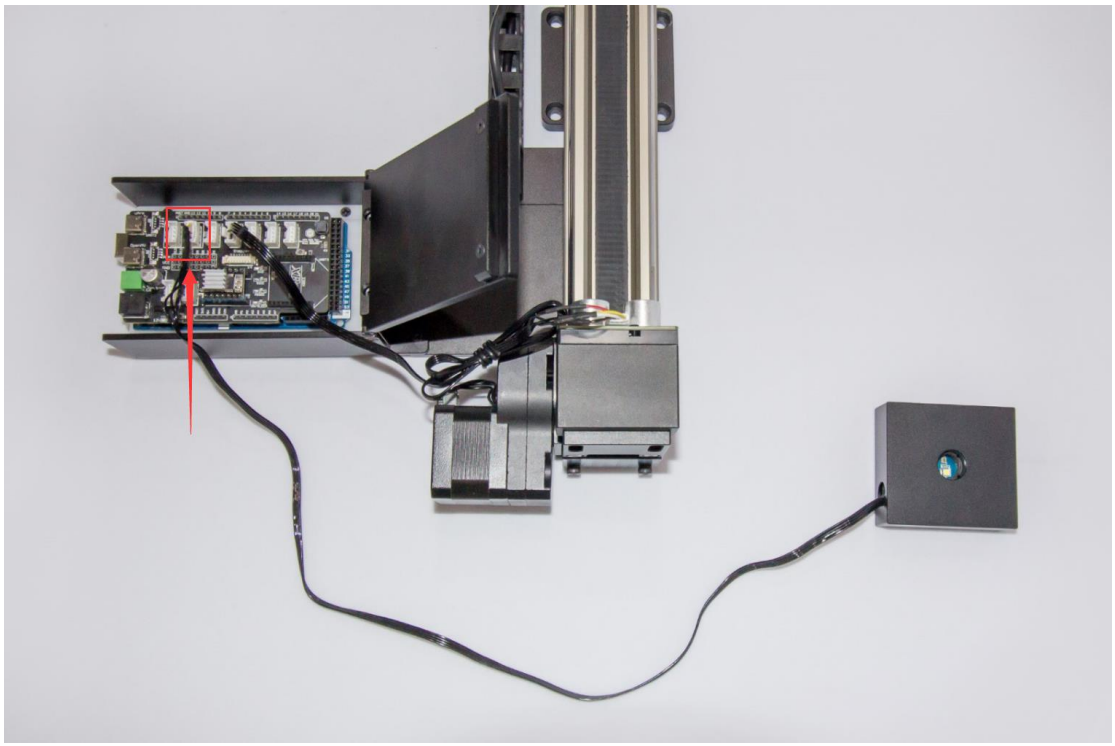


Put the ultrasonic sensor on the corresponding position of the guide rail.



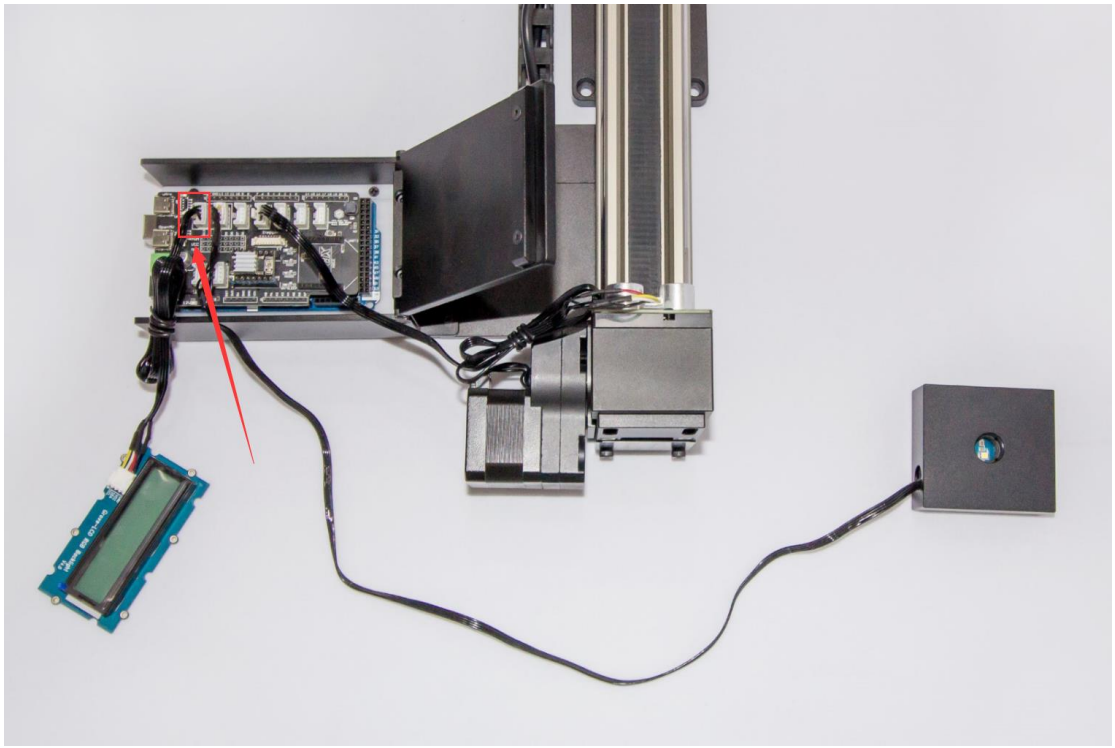
Connect the ultrasonic sensor to the D10-D11 port of the expansion board.

4. Install color sensor



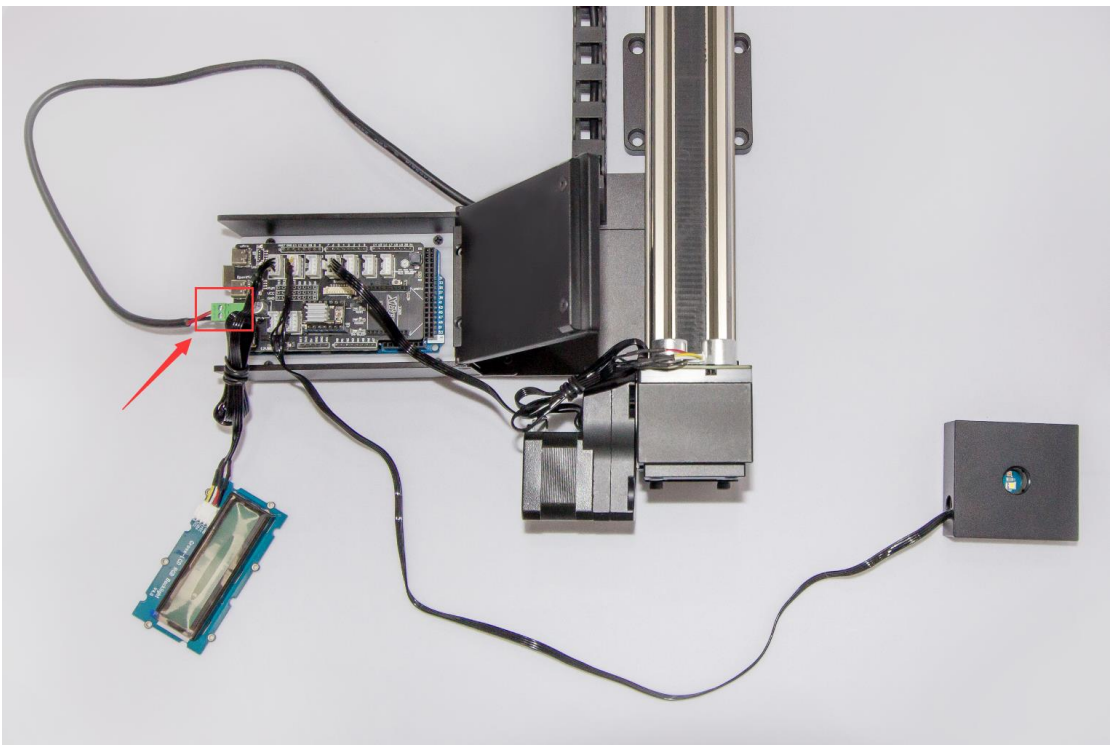
Connect the color sensor to the IIC port of the expansion board.

5. **Install LCD display**



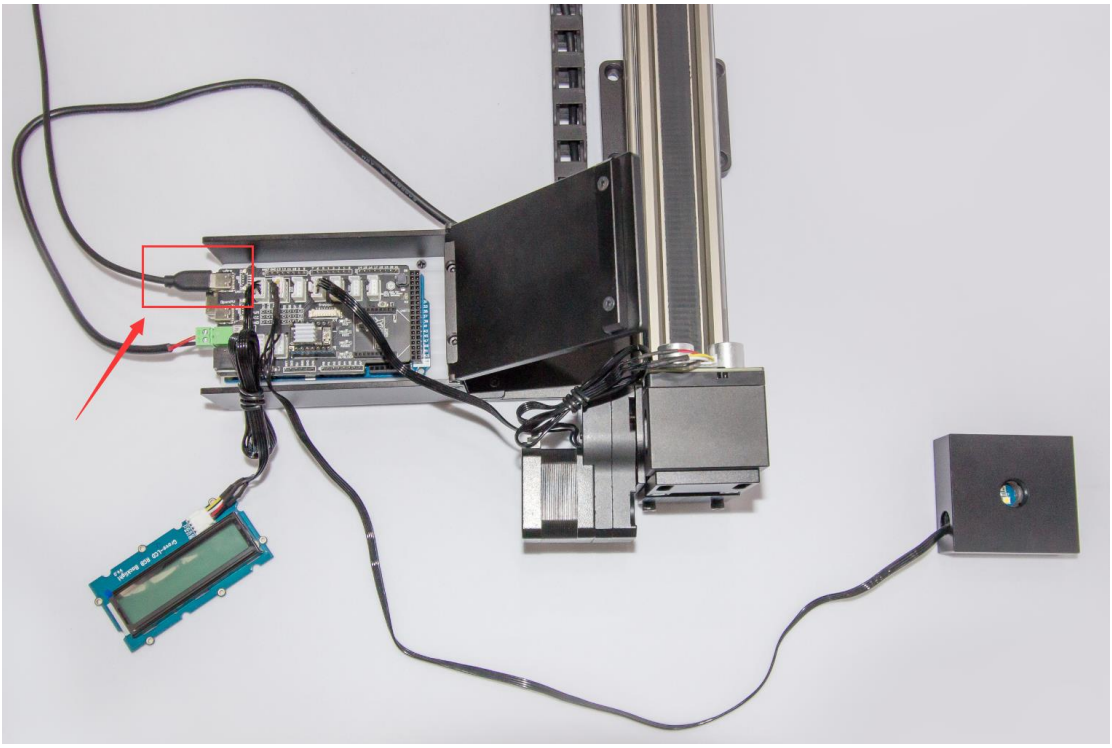
Connect the LCD display to the IIC port of the expansion board.

6. **Install uArm power terminal**



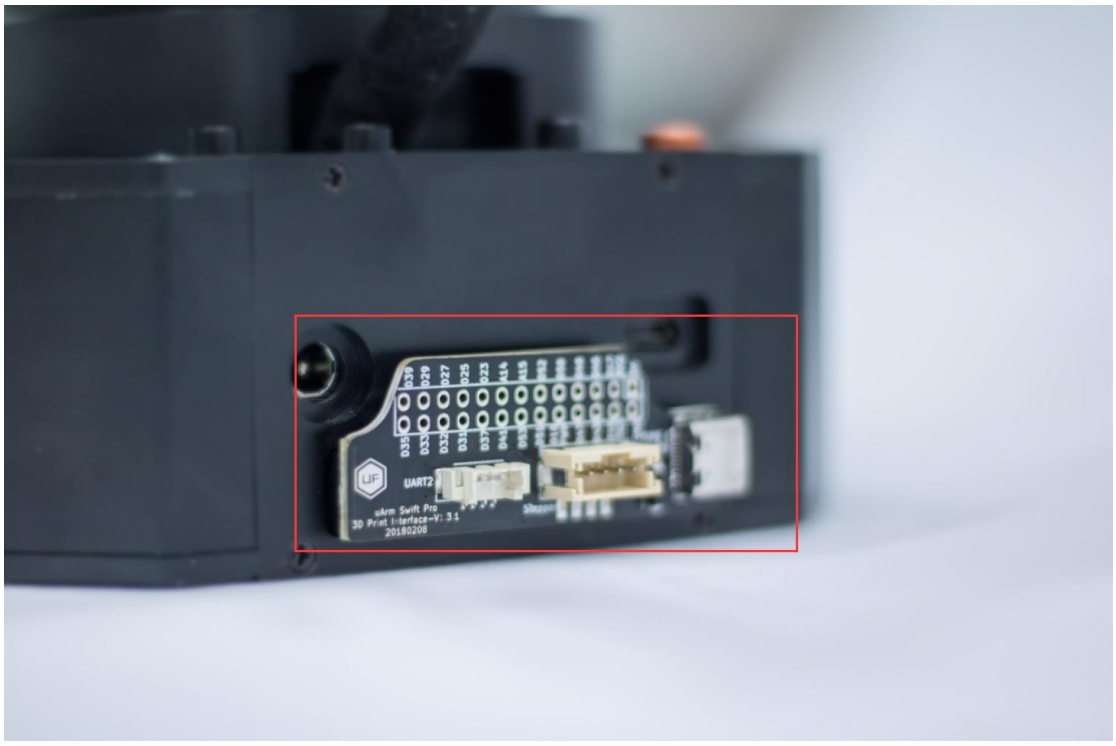
Connect the power line of the uArm to the main control board.

7. **Install USB Type C line**



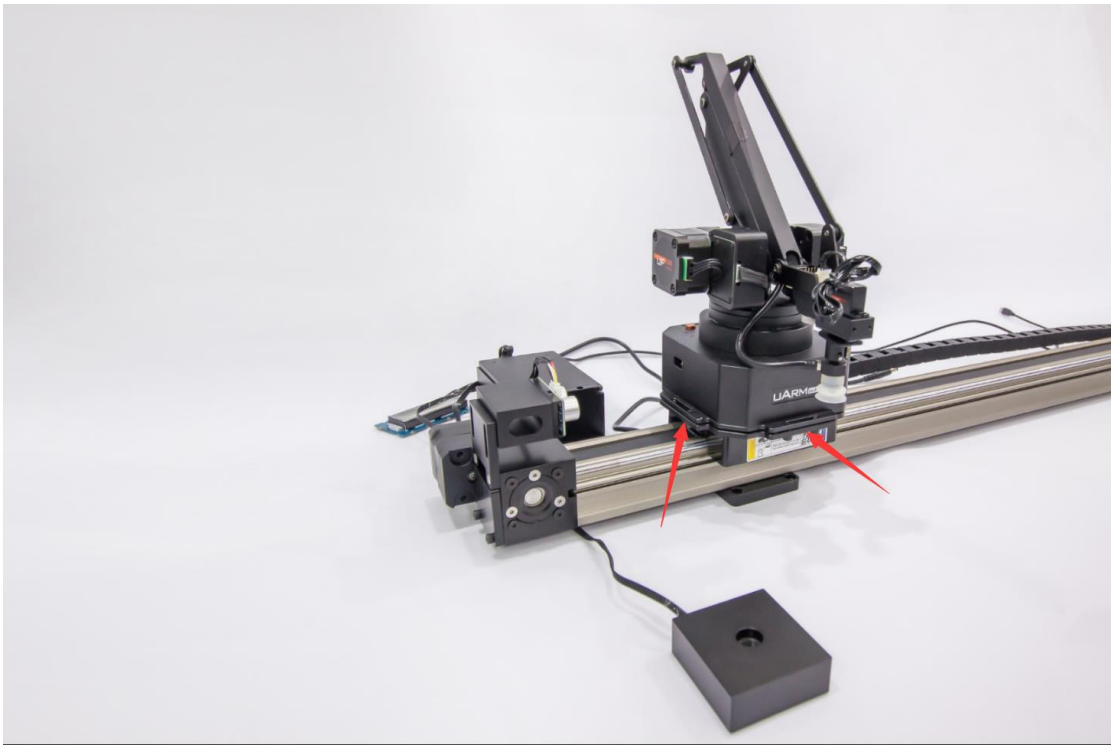
Connect the Type C line to the main control board.

8. **Install uArm 30P bottom expansion board**



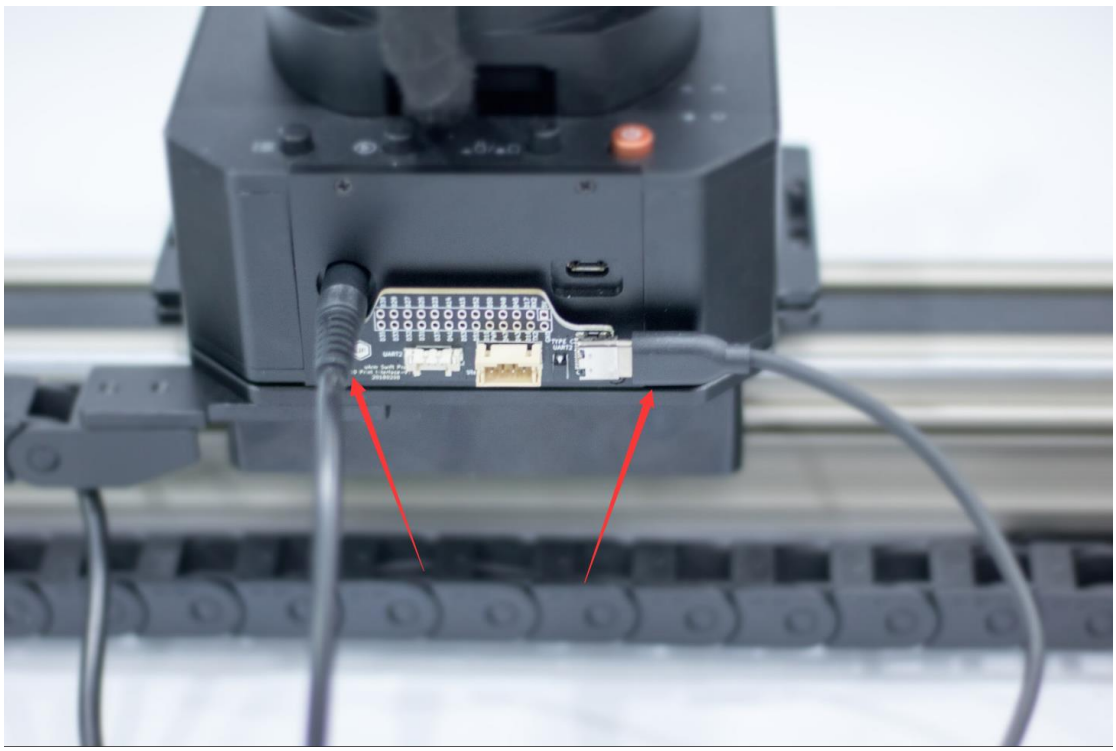
Install the uArm 30P bottom extension board to the back of uArm.

9. Fixed uArm



Attach the uArm to the guide rail mounting plate.

10. Plug in uArm power and USB cord

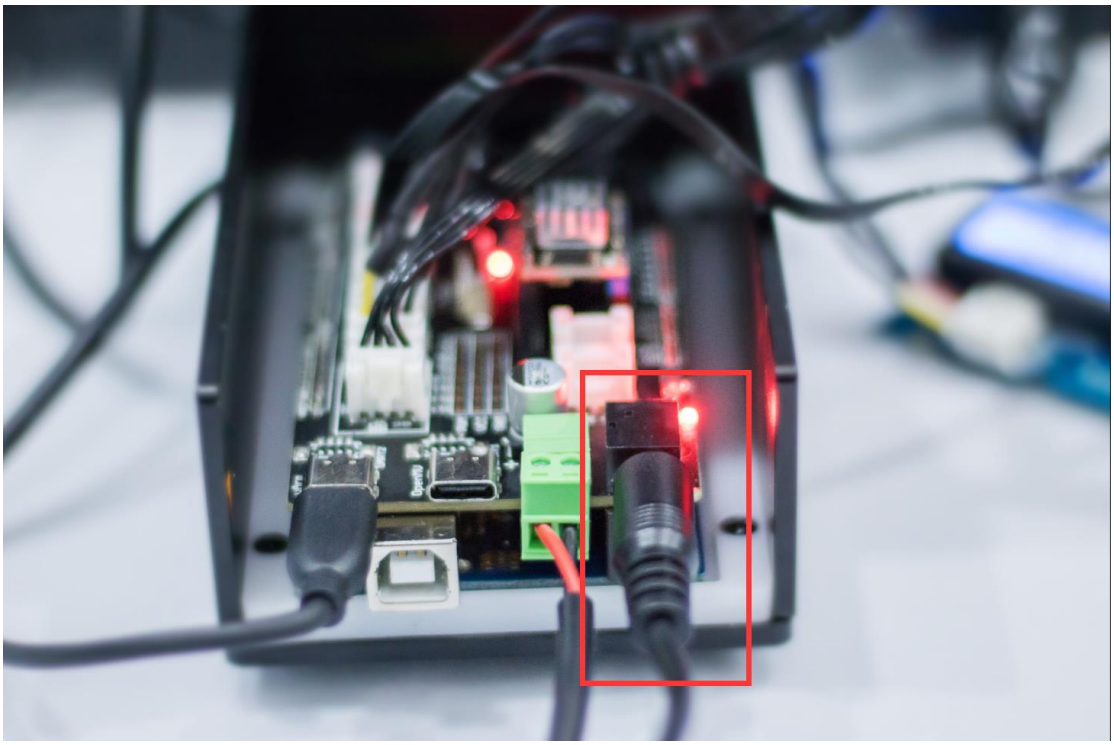


Connect uArm power line and Type C communication cord to uArm.

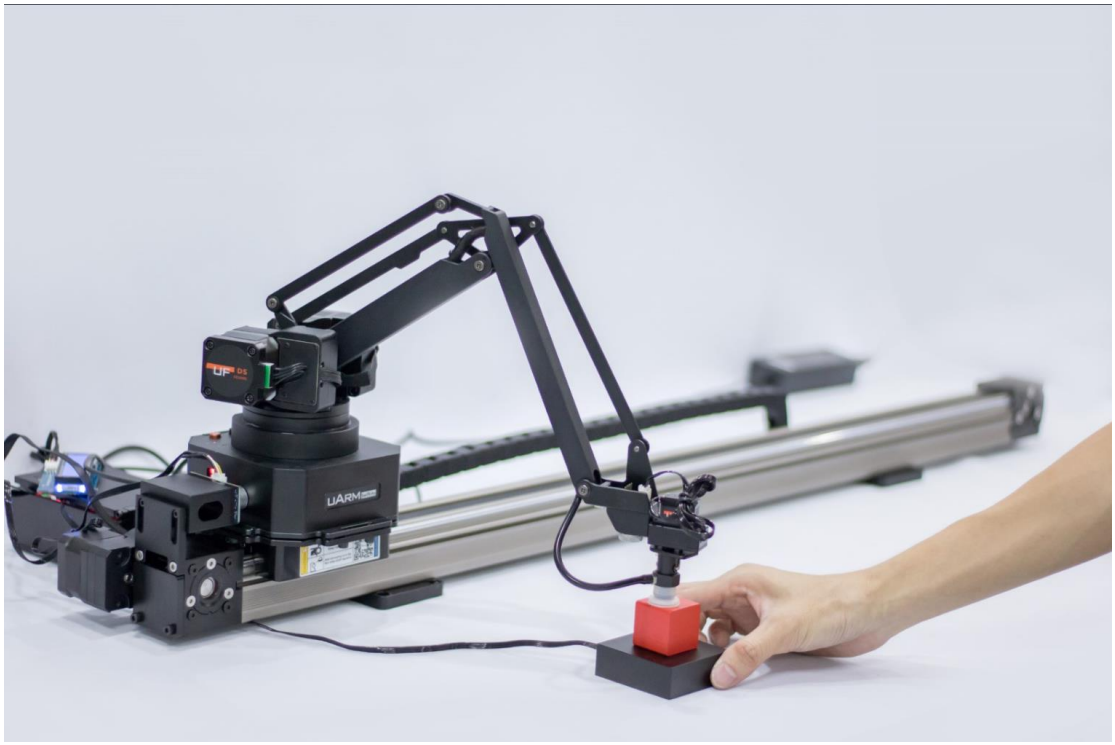
3. Operation

1、 Move uArm to the starting point (near the end of ultrasonic sensor, but remember to leave some space).

2、 Press the power button.



3、 Use 12V power adapter to power up the whole system, then uArm will reach an initial position.



4、 Put the color cube on the color sensor and wait for uArm to grab it. Adjust the position of the color sensor according to the position of uArm.

4. Video

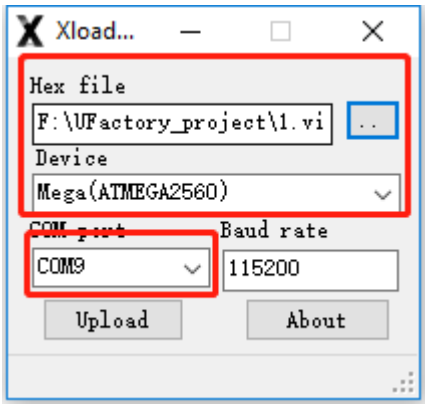
https://www.youtube.com/watch?v=3RFu6dOqdEw&feature=youtu.be

5. Firmware Reset

In the first step, a special firmware for the guide rail suite was added to the uArm Swift Pro. The firmware cannot control the uArm with uArm Studio. If you want to control the uArm with uArm Studio, please follow the following steps to restore the firmware:
Connect the 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 hex to uArm Swift Pro.



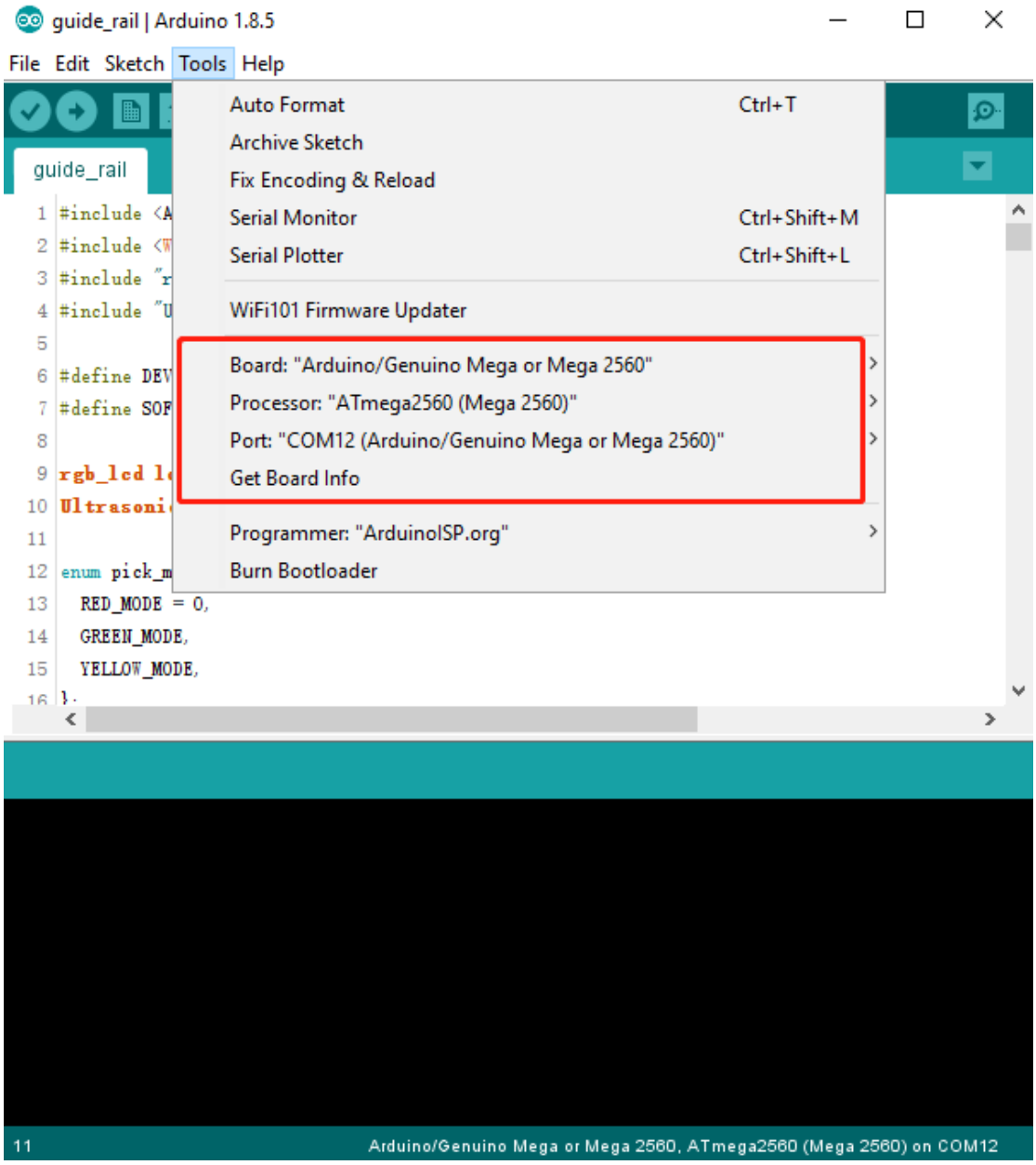
6. Note

The firmware Arduino Mega2560 has been set before it shipped. If the firmware need to be re-written, please refer to the following steps:

(1) Download firmware: guide_rail.ino for Arduino Mega 2560

(2) Connect Mega2560 to the computer via USB cable.

(3) Open firmware in the Arduino IDE and send the firmware to Arduino Mega2560 with the parameters shown below.


guide_rail | Arduino 1.8.5
File Edit Sketch Tools Help
Auto Format Ctrl+T
Archive Sketch
Fix Encoding & Reload
Serial Monitor Ctrl+Shift+M
Serial Plotter Ctrl+Shift+L
WiFi101 Firmware Updater
Board: "Arduino/Genuino Mega or Mega 2560"
Processor: "ATmega2560 (Mega 2560)"
Port: "COM12 (Arduino/Genuino Mega or Mega 2560)"
Get Board Info
Programmer: "ArduinoISP.org"
Burn Bootloader
guide_rail
enum pick_m
RED_MODE = 0,
GREEN_MODE,
YELLOW_MODE,
11
Arduino/Genuino Mega or Mega 2560, ATmega2560 (Mega 2560) on COM12


guide_rail | Arduino 1.8.5
File Edit Sketch Tools Help
guide_rail
#include <Adafruit_TCS34725.h>
#include <Wire.h>