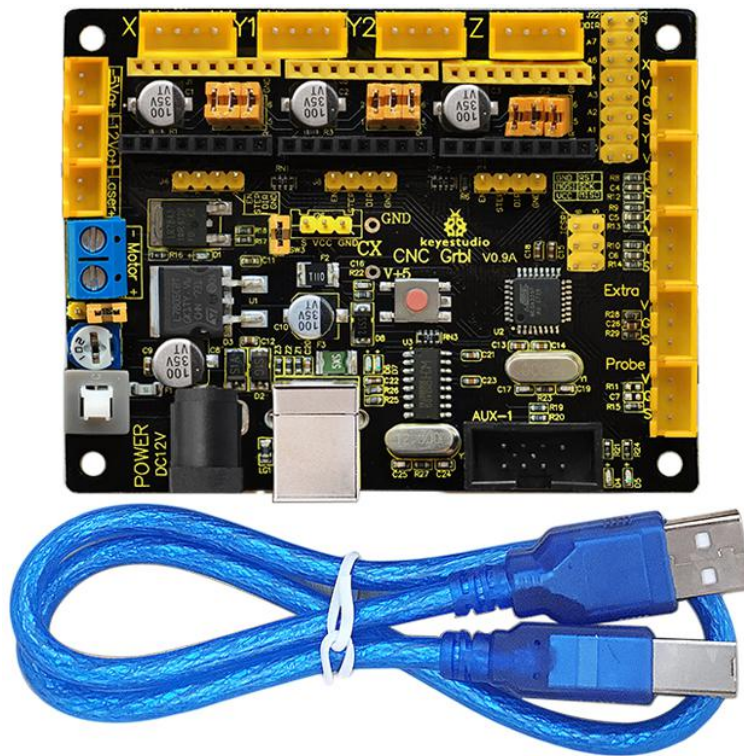


keyestudio

Keyestudio CNC GRBL V0.9



1. Introduction

Keyestudio CNC GRBL V0.9 is a motherboard developed for various robots such as laser engraving, CNC, writing robot and so on.

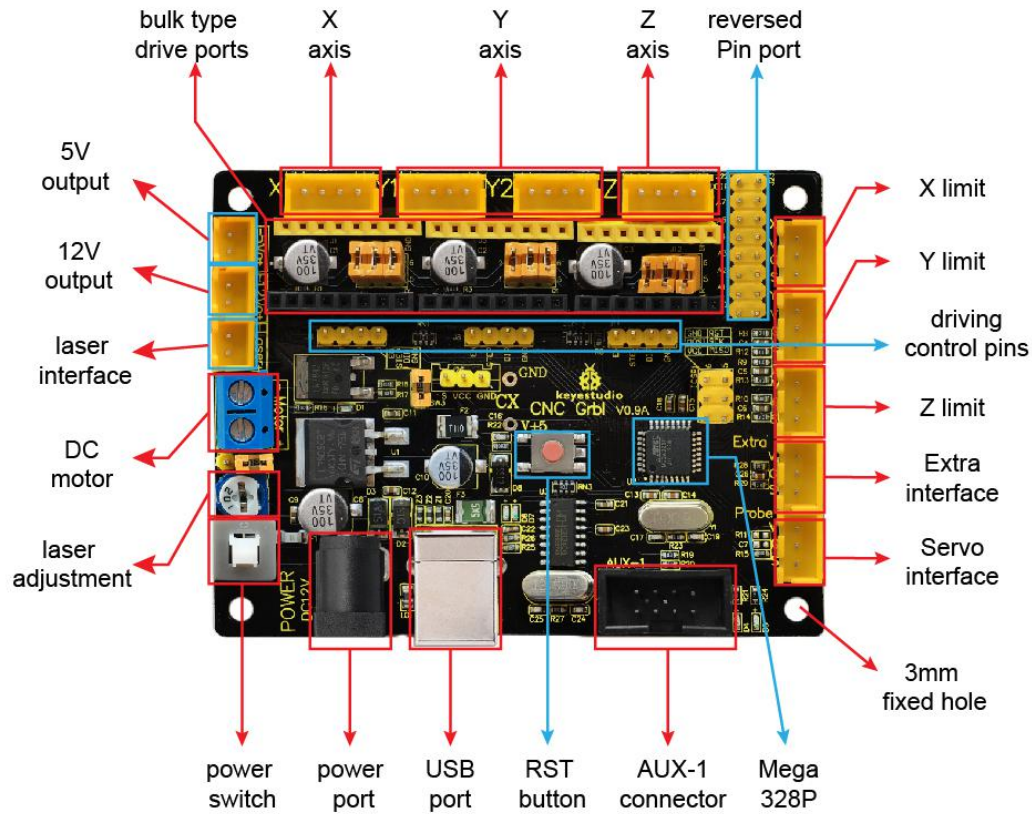
It has complete interfaces with cheap price, and can connect external drive, very suitable for DIY or factory use.

2. Specification

- 1) Microprocessor: MEGA328p
- 2) Input voltage: DC 12V
- 3) File supporting format: Gcode
- 4) Supporting machine structure: CNC, laser engraving, writing robot

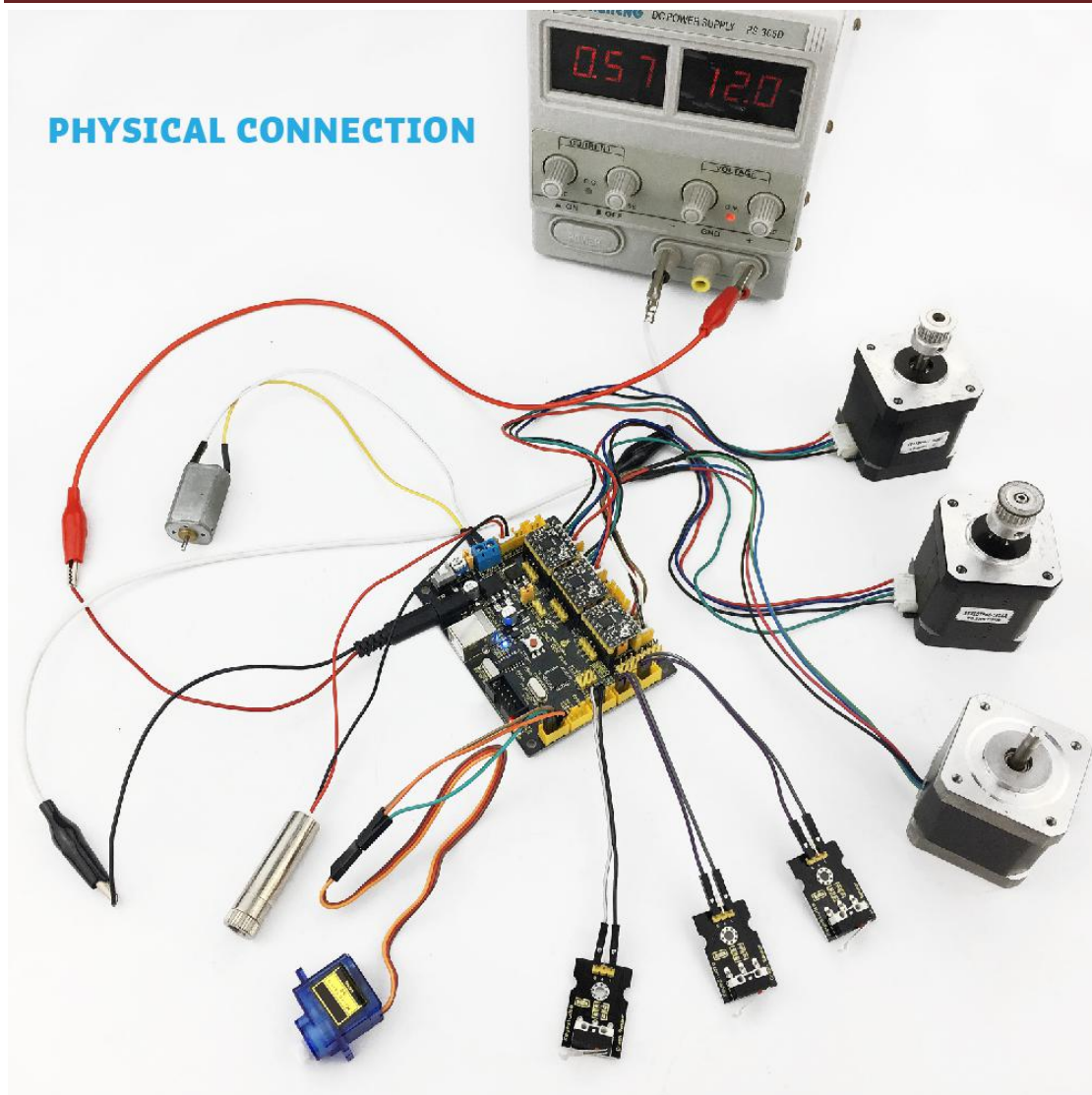
keyestudio

3. Pin Explanation



4. Wiring Diagram

keystudio



5. Install Driver Software and Development Environment Software IDE

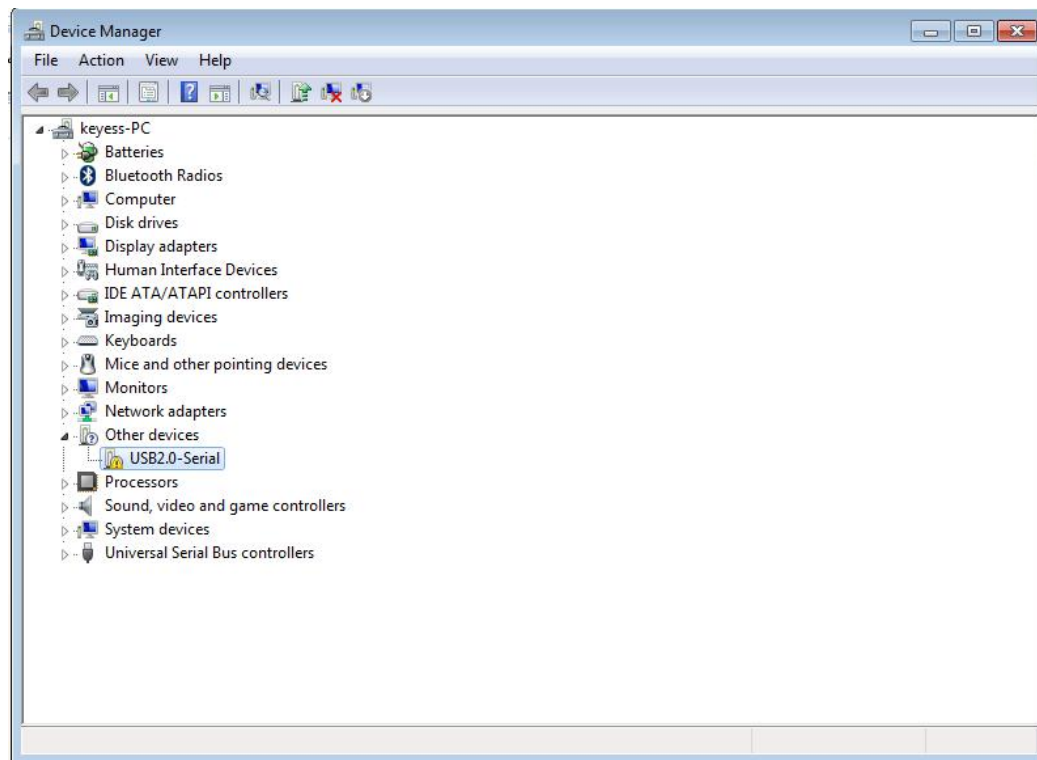
(1) Install Diver Software

For different operating system, there may be slight difference in installation method.

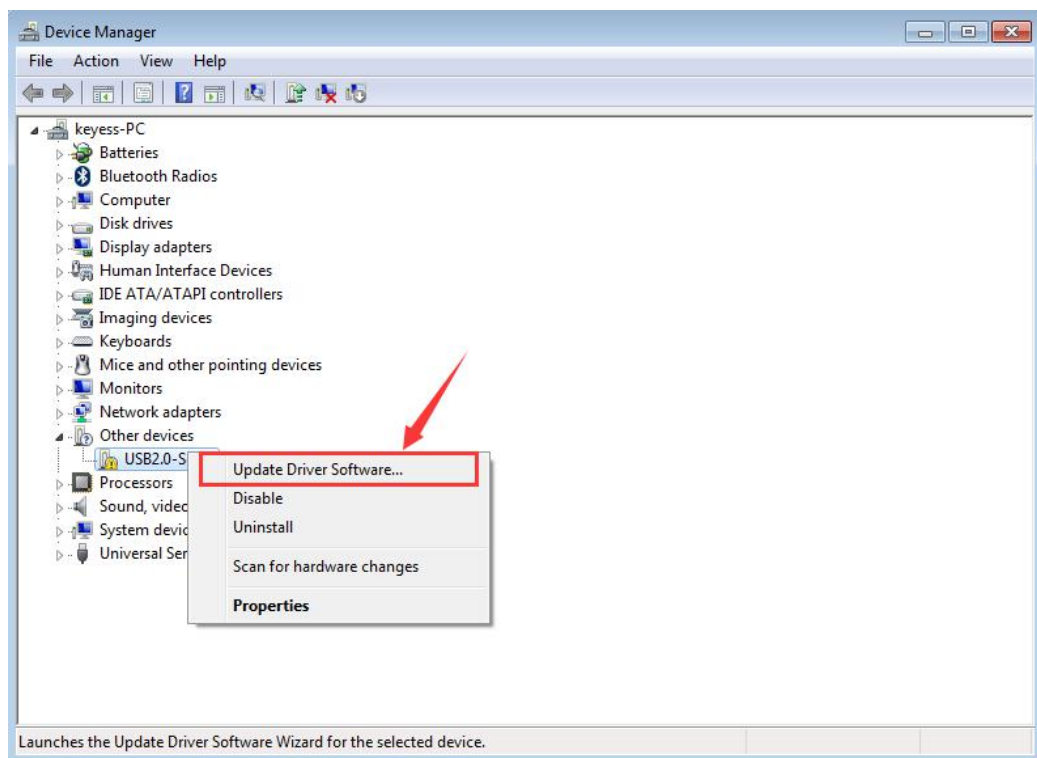
Below is an example in WIN 7.

- a. When you connect Keystudio CNC GRBL V0.9 to your computer at the first time, right click “Computer” —> “Properties” —> “Device manager”, you can see “USB2.0-Serial”. Shown below.

keystudio

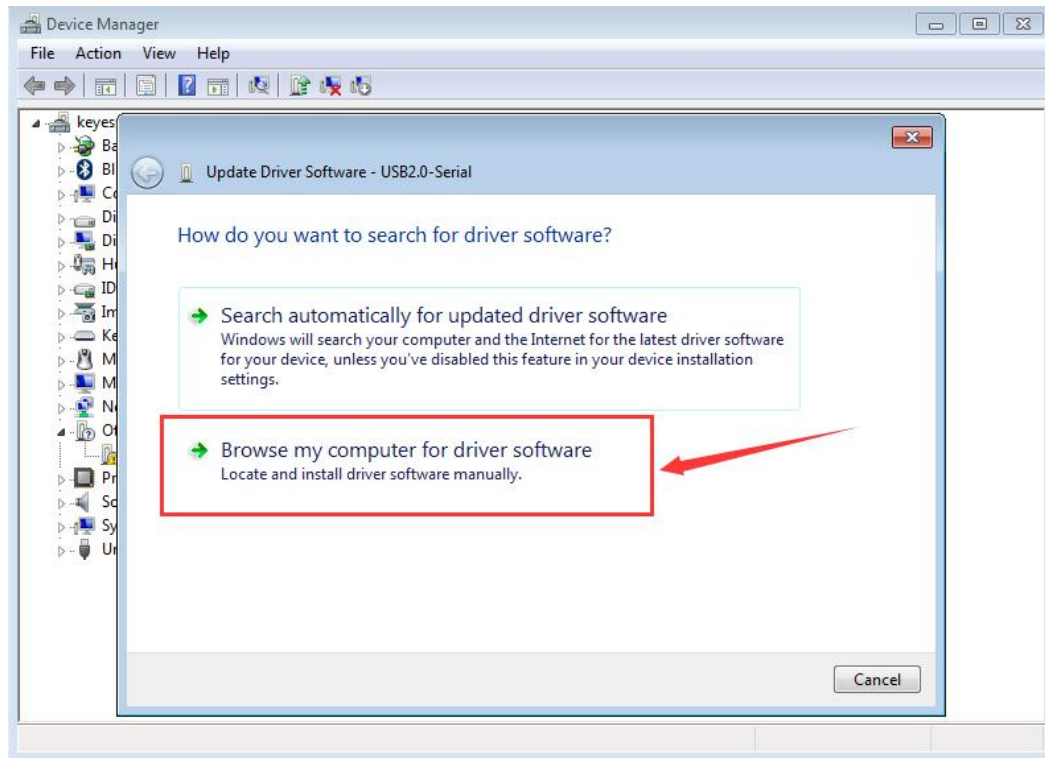


- b. Click “USB2.0-Serial”, select “Update Driver software”.

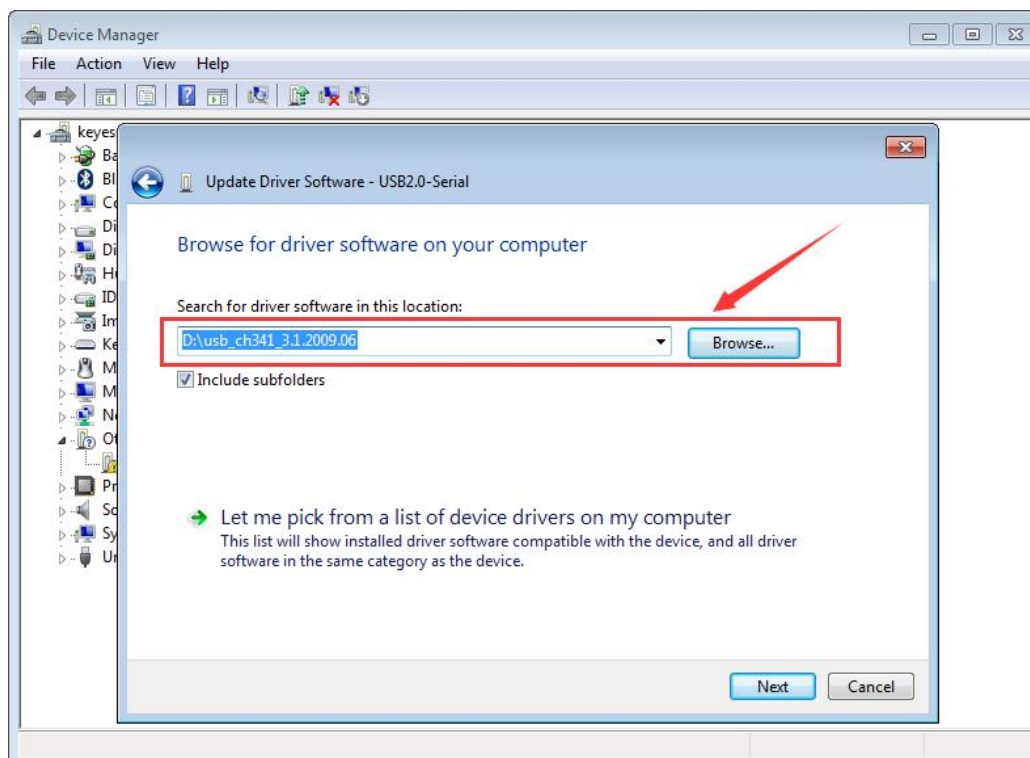


- c. Then, click “Browse my computer for driver software”.

keyestudio

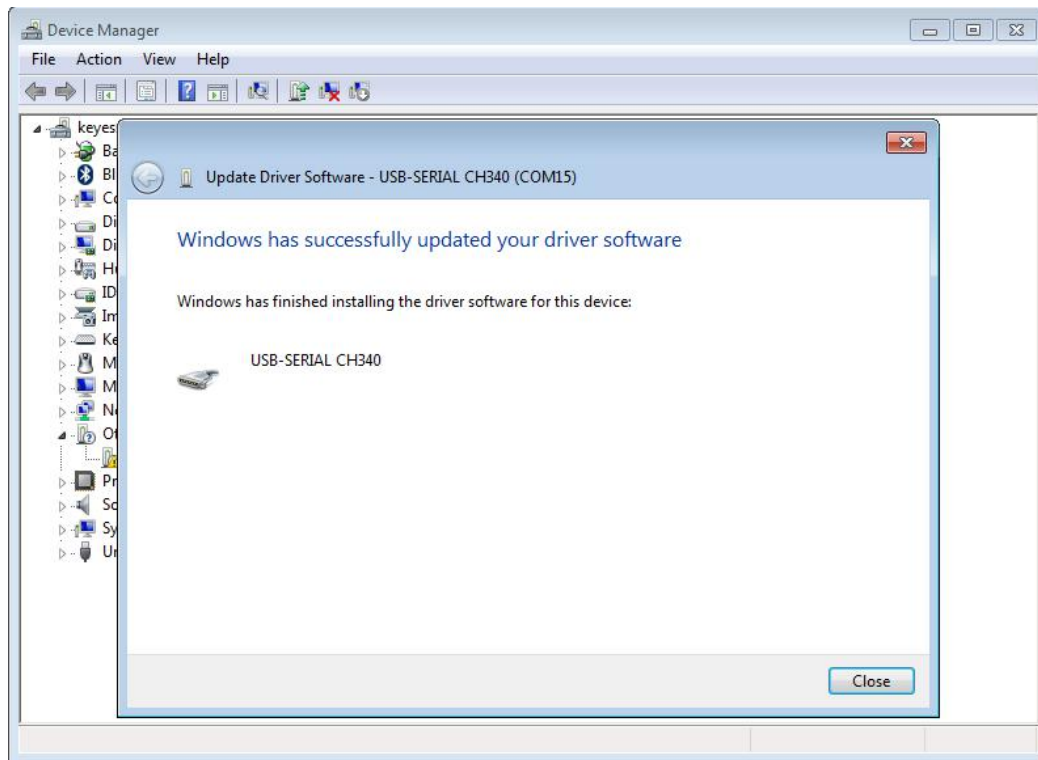


d. Find the “usb_ch341_3.1.2009.06” file.

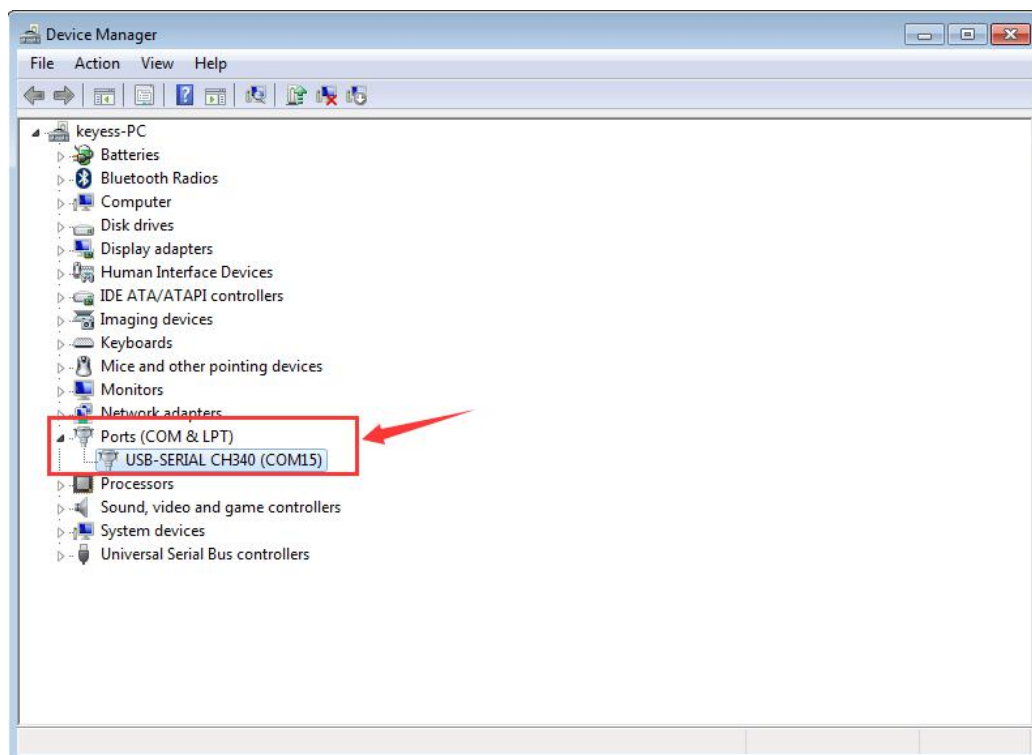


keystudio

- e. Click “Next”, Installation completed; click “Close”.



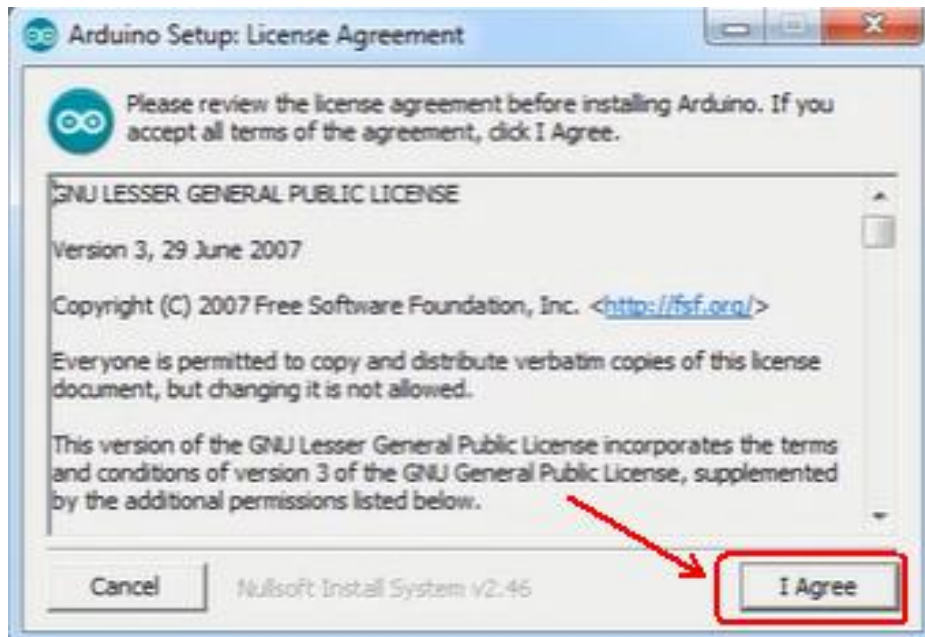
- f. After driver is installed, go to “Device manager” again. Right click “Computer” —> “Properties”—> “Device manager”, you can see the Board and Com port as below figure shown.



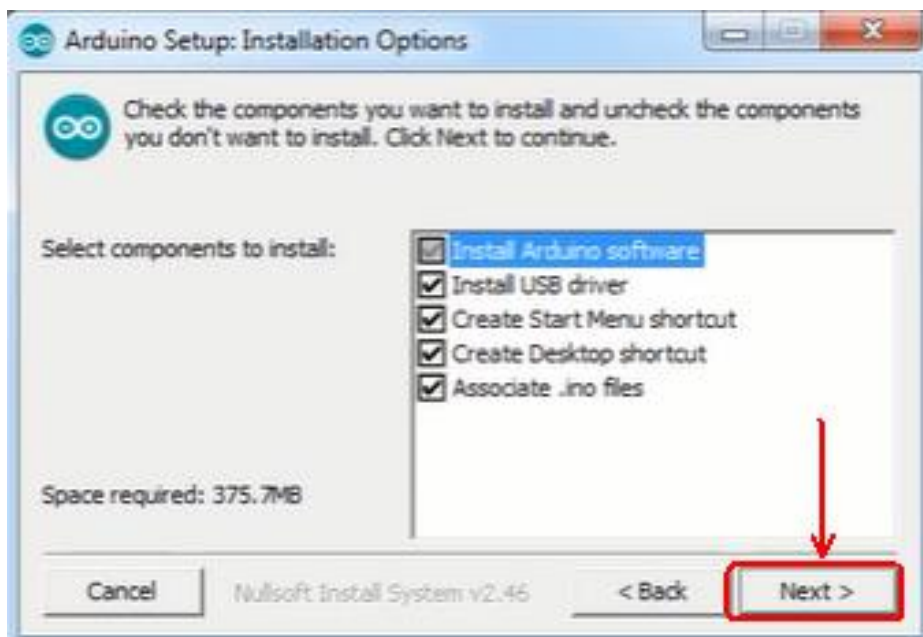
keyestudio

(2) Install Development Environment Software IDE

- a. Double click arduino-1.5.6-r2-windows to start.
Select “I Agree” to accept license agreement.

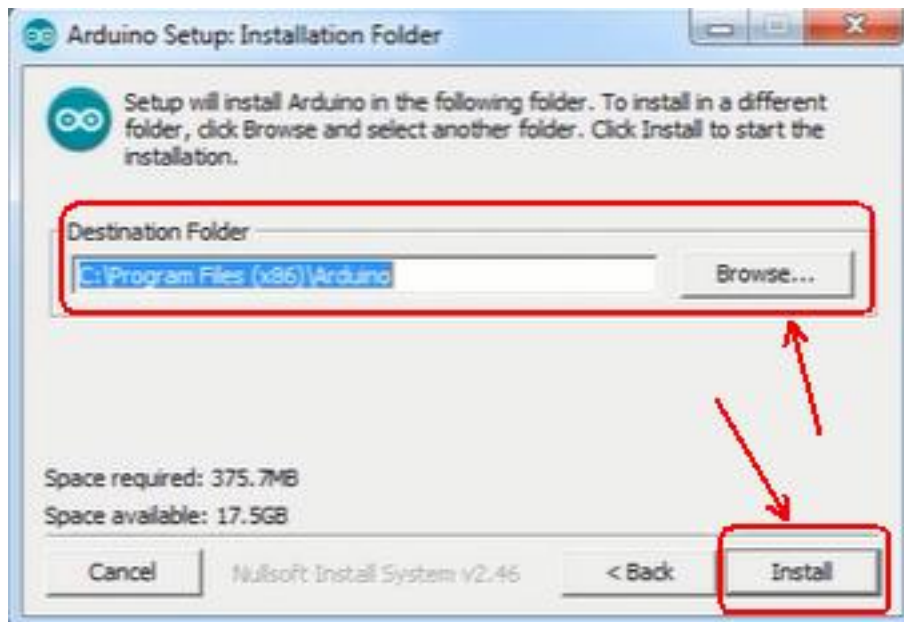


- b. Select components to install and click “Next”.

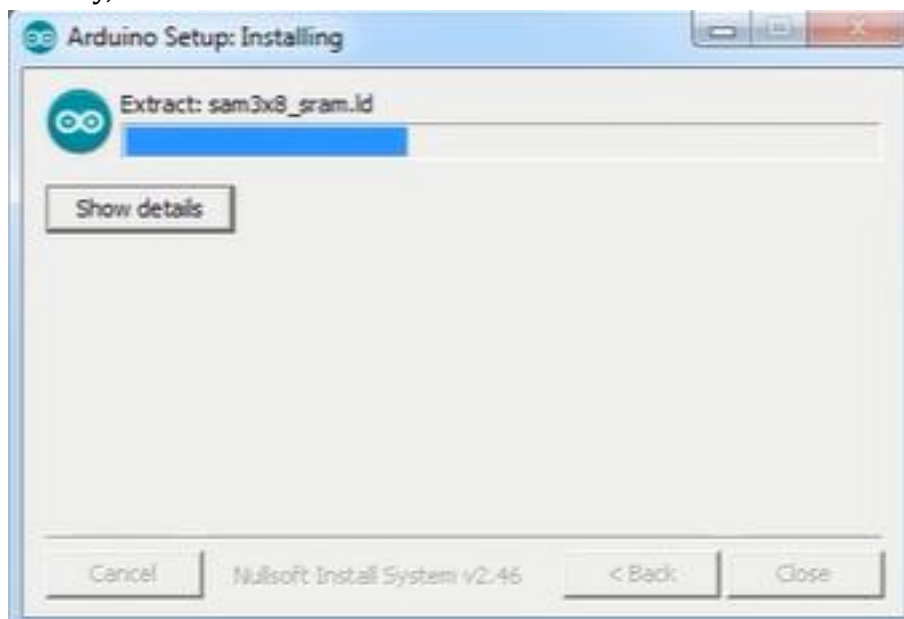


keyestudio

- c. Click “Browse” and select another folder. Click “Install” to start the installation.



- d. Finally, wait for a few minutes to finish.



keyestudio

6. Testing

Open Arduino IDE, compile and upload the below code to keyestudio CNC GRBL V0.9, then wire it up as above connection diagram, you can check every interface function.

Code:

```
*****
#define Light1  13
#define Light2  A1
#define Light3  A2
#define Light4  A3
#define Light5  A4
#define Light6  A5

#define EN1  8
#define X_DIR  5      //X axis   direction control of stepper motor
#define Y_DIR  6      //y axis   direction control of stepper motor
#define Z_DIR  7      //z axis   direction control of stepper motor
#define X_STP  2      //x axis   stepper control
#define Y_STP  3      //y axis   stepper control
#define Z_STP  4      //z axis   stepper control
#define X_LIMIT  9     //X limit
#define Y_LIMIT  10    //Y limit
#define Laser    11    //motor or laser controlling pin
#define Z_LIMIT  12    //Z limit
#define E_LIMIT  A0    //E limit
const int Button_A7 = A7;
const int Button_A6 = A6;
int Button_value_A7 = 0;
int Button_value_A6 = 0;
int Button_valueX = 0;
int Button_valueY = 0;
int Button_valueZ = 0;
int Button_valueE = 0;

void setup() {
    pinMode(Light1, OUTPUT);    pinMode(Light2, OUTPUT);
```

keyestudio

```
pinMode(Light3, OUTPUT);    pinMode(Light4, OUTPUT);
pinMode(Light5, OUTPUT);    pinMode(Light6, OUTPUT);

pinMode(EN1, OUTPUT);
pinMode(X_DIR, OUTPUT);
pinMode(Y_DIR, OUTPUT);
pinMode(Z_DIR, OUTPUT);
pinMode(X_STP, OUTPUT);
pinMode(Y_STP, OUTPUT);
pinMode(Z_STP, OUTPUT);
pinMode(Button_A7, INPUT);
pinMode(Button_A6, INPUT);
pinMode(E_LIMIT, INPUT);
pinMode(X_LIMIT, INPUT);
pinMode(Y_LIMIT, INPUT);
pinMode(Z_LIMIT, INPUT);
Serial.begin(9600);
}

void EN()
{
    digitalWrite(EN1, LOW);
}

//stepper motor turns and reverse
void turn(boolean dir, int steps)
{
    EN();
    digitalWrite(X_DIR, dir);
    digitalWrite(Y_DIR, dir);
    digitalWrite(Z_DIR, dir);
    delay(100);
    for(int i=0; i<steps; i++)
    {
        digitalWrite(X_STP, HIGH);
        digitalWrite(Y_STP, HIGH);
        digitalWrite(Z_STP, HIGH);
        delayMicroseconds(100);
    }
}
```

keyestudio

```
    digitalWrite(X_STP, LOW);
    digitalWrite(Y_STP, LOW);
    digitalWrite(Z_STP, LOW);
    delayMicroseconds(100);
  }
}

//laser is on
void Laser_ON()
{
    digitalWrite(Laser, HIGH);
    delay(500);
    //digitalWrite(Laser, LOW);
    //delay(500);
}

//laser is off
void Laser_OFF()
{
    digitalWrite(Laser, LOW);
    delay(500);
    //digitalWrite(Laser, LOW);
    //delay(500);
}

void loop()
{

    Button_valueX = digitalRead(X_LIMIT);
    if(Button_valueX == LOW)
    {
        digitalWrite(Light3, HIGH);
        turn(true, 4000);
    }
    else
    {
        digitalWrite(Light3, LOW);
    }
    Serial.print("Button_valueX = ");
```

keyestudio

```
Serial.println(Button_valueX);

Button_valueY = digitalRead(Y_LIMIT);
if(Button_valueY == LOW)
{
    digitalWrite(Light4, HIGH);
    turn(false, 4000);
}
else digitalWrite(Light4, LOW);
Serial.print("Button_valueY = ");
Serial.println(Button_valueY);

Button_valueZ = digitalRead(Z_LIMIT);
if(Button_valueZ == LOW)  digitalWrite(Light5, HIGH);
else digitalWrite(Light5, LOW);
Serial.print("Button_valueZ = ");
Serial.println(Button_valueZ);

Button_value_A7 = analogRead(Button_A7);
if(Button_value_A7 == 0)  digitalWrite(Light1, HIGH);
else digitalWrite(Light1, LOW);
Serial.print("Button_value_A7 = ");
Serial.println(Button_value_A7);

Button_value_A6 = analogRead(Button_A6);
if(Button_value_A6 == 0)  digitalWrite(Light2, HIGH);
else digitalWrite(Light2, LOW);
Serial.print("Button_value_A6 = ");
Serial.println(Button_value_A6);

Button_valueE = analogRead(E_LIMIT);
if(Button_valueE == 0)
{
    digitalWrite(Light6, HIGH);
    Laser_ON();
}
else
```

keyestudio

```
{  
    digitalWrite(Light6, LOW);  
    Laser_OFF();  
}  
Serial.print("Button_valueE = ");  
Serial.println(Button_valueE);  
}  
*****
```

7. Reference Download

https://drive.google.com/open?id=1UR3X9ZXmy_-bBTqhLOH1insBts5SyEsJ