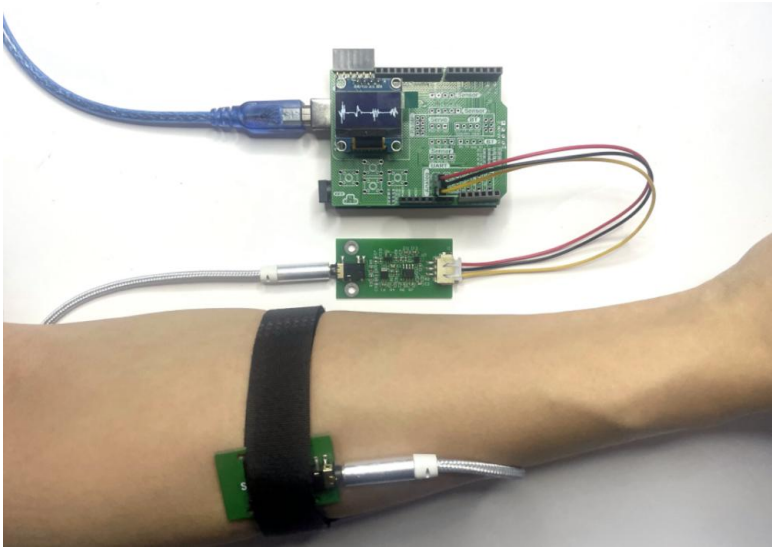
Dry Electrode Arduino OLED Display Kit



一、Bill of Materials

●dry Electrode muscle electrical module × 1;

●module audio cable × 1;

●strap × 1;

●Arduino UNO × 1;

●Arduino shield plate × 1;

●0.96OLED × 1;

●3p terminal line × 1;

●USB cable × 1;

二、Software configuration

1. Arduino IDE(recommend 1.8.2 and above)

（A file named How do I install Arduino IDE correctly.pdf can be found in the zip package）

2. Arduino driver

（A file named CH341SerSetup.rar can be found in the zip package）

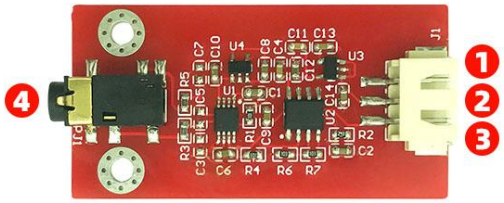
三、Wiring

1. Description

① Arduino the shield and the Arduino UNO are directly inserted

② the OLED display screen is inserted into the position of oled in the upper left corner of the Arduino shield

③ the EMG module and the Arduino Shield are connected through Dupont line.

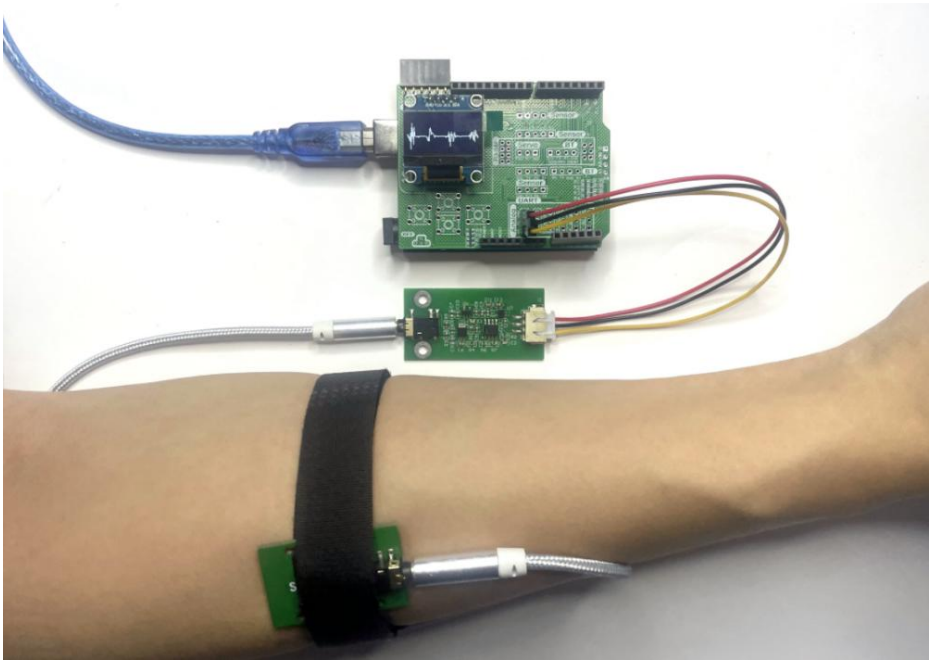


pin description and wiring:

myoelectric module Arduino shield

- 1 (power input negative pole) --> GND
- 2 (power input positive pole) --> 5V
- 3 （analog signal output 0~3.3V） --> A0
- 4 (PJ-342 Dry electrode interface)

2. Wiring diagram display



四、Burning code

1. Copy the code

copy the code below to the Arduino IDE.

```
/**************************************************************************
 * Wuxi Sichiray Co.,Ltd
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 * Shop website: https://sichiray.aliexpress.com/store/1100735731
 * Mailbox: sichiraywuxi@gmail.com
**************************************************************************/

#include <Arduino.h>
#include <Adafruit_SSD1306.h>

#define OLED_Address 0x3C
Adafruit_SSD1306 oled(128, 64);

// #define DEBUG  //Uncomment, display in the upper computer
```

```
typedef struct  // Curve parameter
{
  float Draw_Buf[128];  // Curve data cache
  float Draw_Min;       // The minimum value of the cached data is in percentage
  float Draw_Max;       // The maximum value of cached data
} _DrawCurve;           // Curve parameter

static _DrawCurve DrawCurve;

void PlotDataInput(_DrawCurve *Draw, float val) {
  uint8_t i;
  for (i = 1; i < 128; i++) {
    Draw->Draw_Buf[i - 1] = Draw->Draw_Buf[i];
  }
  Draw->Draw_Buf[127] = val;

  if (Draw->Draw_Buf[127] > 1)
    Draw->Draw_Buf[127] = 1;
  else if (Draw->Draw_Buf[127] < 0)
    Draw->Draw_Buf[127] = 0;
/*****************************************************************************
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 * Mailbox: sichiraywuxi@gmail.com
*****************************************************************************/
  Draw->Draw_Max = 0;
  Draw->Draw_Min = 1;
  for (i = 0; i < 128; i++)  // Gets the maximum and minimum range
  {
    if (Draw->Draw_Min > (Draw->Draw_Buf[i])) {
      Draw->Draw_Min = Draw->Draw_Buf[i];
      Draw->Draw_Min = (float)((uint8_t)(Draw->Draw_Min * 100) / 5) / 20;

      if (Draw->Draw_Min < 0)
```

```
        Draw->Draw_Min = 0;
      if ((Draw->Draw_Max - Draw->Draw_Min) < 0.05)
        Draw->Draw_Max = Draw->Draw_Min + 0.05;
    } else if (Draw->Draw_Max < Draw->Draw_Buf[i]) {
      Draw->Draw_Max = Draw->Draw_Buf[i];
      Draw->Draw_Max = (float)((uint8_t)(Draw->Draw_Max * 100) / 5 + 1) / 20;
      if (Draw->Draw_Max > 1.0)
        Draw->Draw_Max = 1.0;
      if ((Draw->Draw_Max - Draw->Draw_Min) < 0.05)
        Draw->Draw_Min = Draw->Draw_Max - 0.05;
    }
  }
}

void PlotDataPrint(_DrawCurve *Draw, int fllor, int upper, int lineColor) {

  for (int x = 1; x < 128; x++) {
    float k = (upper - fllor) / (Draw->Draw_Max - Draw->Draw_Min);  // Y-axis scaling
factor

    float last_y = upper - ((Draw->Draw_Buf[x - 1] - Draw->Draw_Min) * k);
    float now_y = upper - ((Draw->Draw_Buf[x] - Draw->Draw_Min) * k);

    oled.drawLine(x - 1, last_y, x, now_y, lineColor);
  }
}

void setup() {

#ifndef DEBUG
  oled.begin(SSD1306_SWITCHCAPVCC, OLED_Address);
  oled.clearDisplay();
#else
  Serial.begin(115200);

#endif
```

```
  delay(100);
}

void loop() {
  static uint16_t value = 0;
  value = analogRead(A0);

#ifndef DEBUG
  PlotDataInput(&DrawCurve, value / 1024.0);  // Incoming data
  oled.clearDisplay();
  PlotDataPrint(&DrawCurve, 10, 60, WHITE);  // Print curve
  oled.display();

#else
  Serial.println(value);
  delay(5);
#endif
}
/**************************************************************************
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 * Shop website: https://sichiray.aliexpress.com/store/1100735731
 * Mailbox: sichiraywuxi@gmail.com
**************************************************************************/
```
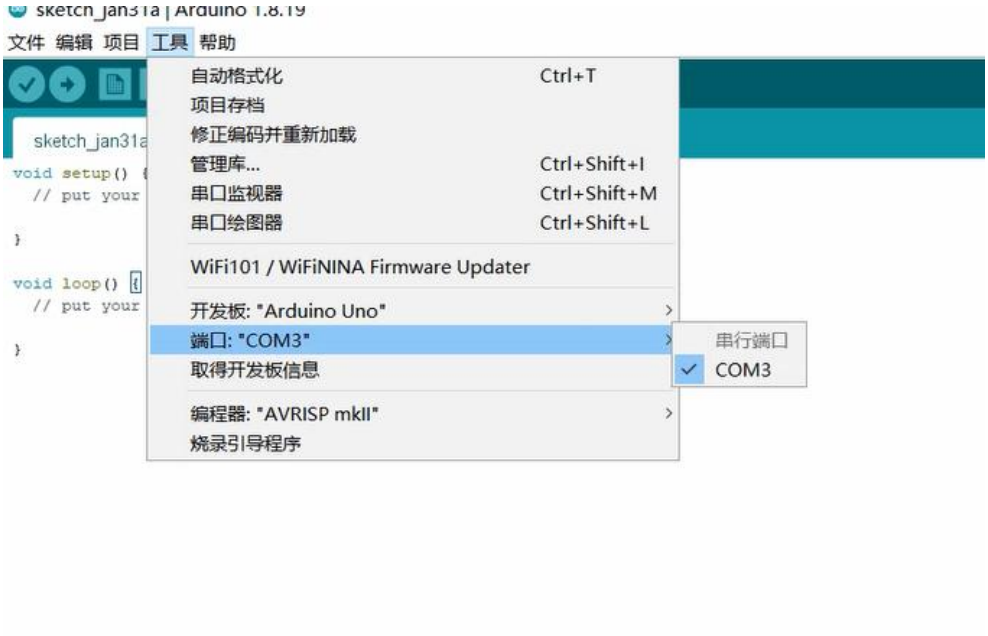

select SCM and port

find the port of CH340 from the Device Manager and select the corresponding serial port.

（A file named how do I view the serial port.pdf can be found in the zip package）



3. compile and upload.

After the code is uploaded successfully, wear the electrode correctly to display the waveform. Wipe the electrode and skin with water before wearing it.

Key point: when using it, you must disconnect the power supply of the notebook computer to produce the correct waveform.

6. Operate videos

（A file named video1.mp4 can be found in the zip package）

●place the sensor in the position where muscle activity needs to be detected, and then calibrate it to accurately count muscle activity, such as push-ups counting and dumbbell meter.

●it can also be used for human-computer interaction in several fitness occasions.

五、FAQ

1. where can dry electrodes be placed on the arm? Do you have any requirements?

> The three-metal dry electrode plate is adopted, which does not need to pay attention to the reference level, but only needs to keep the electrode plate consistent with the muscle direction.
>
> **For more information about the location, see the following figure:**
>
> 

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2. the serial port plotter has no waveform after burning the code.

> Set baud rate to 115200.

---

3. wiring is not based on the color of the wire, but in the order of the interface

> the order is gnd→5v→a0.

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4. waveform no response

in this case, check several solutions:

- ●whether it is attached to the position of muscle activity;
- ●whether it is tied tightly;
- ●whether the laptop power is unplugged;
- ●whether the connection interface is plugged tightly;
- ●wipe the electrode and skin with water.

5. can I connect the oscilloscope?

> No. The Oscilloscope has power interference.