About keyestudio

Keyestudio is a best-selling brand owned by KEYES Corporation. Our product lines range from controller boards, shields and sensor modules to smart car and complete starter kits for Arduino, Raspberry Pi and BBC micro:bit, which can help customers at any level learn electronics and programming knowledge. Likewise, all of our products comply with international quality standards and are greatly appreciated in a variety of different markets throughout the world.

You can obtain the details and the latest information through visiting the following web sites: http://www.keyestudio.com

*References and After-sales Service

1. Download Profile：https://fs.keyestudio.com/KS0507

2. Feel free to contact us please, if there is missing part or you encounter some troubles. Welcome to send email to us：**service@keyestudio.com.** We will update projects and products continuously from your sincere advice.

*Warning

1. This product contains tiny parts(screws, copper pillars), keep it out of reach of children under 7 years old please.

2. This product contains conductive parts (control board and electronic

module). Please operate according to the requirements of tutorial. Improper operation may cause parts to overheat damage. Do not touch and immediately disconnect the circuit power.

*Copyright

Content

Smart Motorhome Kit


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1. Description:

When it comes to programming, many think it difficult. However, KEYES group issues a smart motorhome kit to cope with this problem.

This is a low-cost, easy-to-build and open source programming kit.

In fact, it integrates a smart home and a robot car. You can absorb the knowledge of programming like electronics, control logic, computing and science from practical installation.

In compliance with the tutorial, you can create your own robot by boards, slot connection and wiring.

It also has a temperature humidity sensor and an LCD display except LED, line tracking sensor, ultrasonic sensor, Bluetooth module and motor d riving modules. Furthermore, the detailed projects will guide you to learn the working principle of sensors and modules.

If interested in STEM and code programming, you can customize your smart motorhome by altering code and adding extra modules.

That sounds entertaining, right? Let’ s get started!

2. Features:

- Multi-purpose function： obstacle avoidance, line tracking, Bluetooth control, ultrasonic follow, smart sensation and so on.
- Easy to build：Slot connection and without soldering circuit
- Novel style：Adopt strong wood board, acrylic board, RGB and lcd1602

modules.

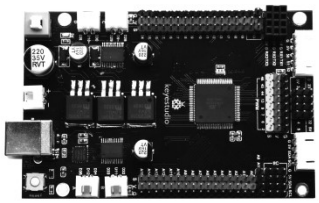
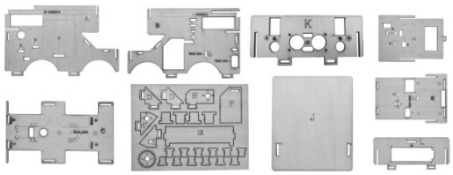
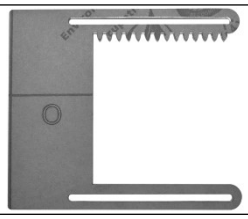
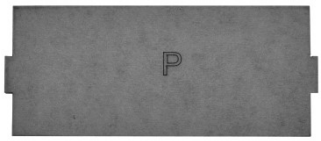
- High extension： configure motor driving chip, preserve IIC, UART and SPI port and expand other sensor and module.
- Basic programming learning： use C language and code

3. Specification：

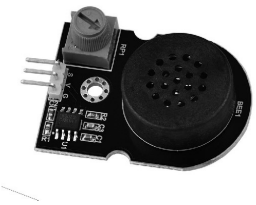
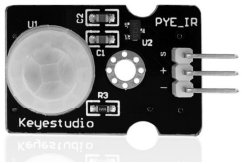
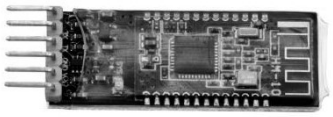
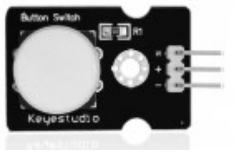
- Working voltage: 5v
- Input voltage: 7-12V
- Maximum output current: 3A
- Maximum power dissipation: 15W
- Motor speed: 200 rpm (4.5V)
- Motor driving form: TB6612 chip drive
- Ultrasonic sensing angle: <15 degrees
- Ultrasonic detection distance: 2cm-400cm
- Bluetooth remote control distance: 50 meters (measured)
- Bluetooth APP control: support Android and iOS system

4. Kit：

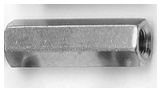
Remember to check if the components received are in line with the following product list when you getting this kit.

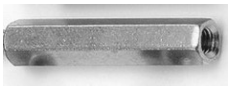
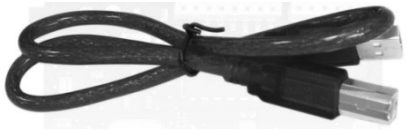
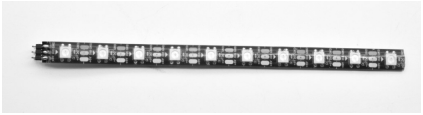
#	Picture	Model	QTY
1		Keyestudio MEGA 2560 Smart Development Board	1
2		9 Pcs Wooden Boards	1
3		Acrylic Board O	1
4		Acrylic Board P	1
5		Keyestudio 9G 180°Servo	3
6		6-Slot AA Battery Holder	1

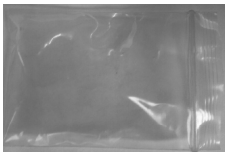
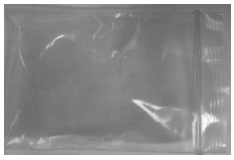
7		4*4 Matrix Array Membrane Keypad	1
8		Keyestudio I2C1602 LCD Display Module	1
9		HC-SR04 Ultrasonic Sensor	1
10		Keyestudio Quick Connectors Line Tracking Sensor	1
11		Keyestudio TEMT6000 Ambient Light Sensor	1
12		Keyestudio Steam Sensor	1
13		Keyestudio DHT11 Temperature and Humidity Sensor	1

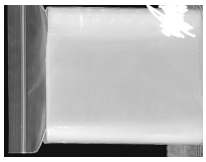
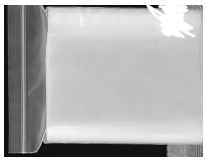
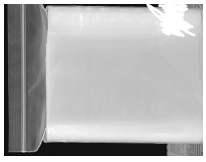
14		Keyestudio Analog Gas Sensor	1
15		Keyestudio Power Amplifier Module	1
16		Keyestudio PIR Motion Sensor	1
17		Keyestudio Full Color LED	2
18		Keyestudio HM-10 Bluetooth Module	1
19		Keyestudio Digital Push Button	1
20		4.5V 200r Motor	4
21		Car Wheels	4

22		Keyestudio White LED Module	1
23		Keyestudio Analog Rotation Sensor	1
24		ABS White Insulation Column	14
25		Aluminum Mounts	4
26		M3*8MM Round Head Screws	32
27		M3*10MM Round Head Screws	6
28		M3*12MM Round Head Screws	5
29		M3*20MM Round Head Screws	2
30		M3*30MM Round Head Screws	10

31		M3 Nickel Plated Nuts	35
32		M3 Self-locking Nuts	6
33		M2*10MM Round Head Screws	3
34		M2*16MM Round Head Screws	5
35		M2 Nickel Plated Nuts	8
36		M1.4*8MM Round Head Screws	6
37		M1.4 Nickel Plated Nuts	6
38		M1.2*4MM Round Head Self-tapping Screws	14
39		M3*12MM Flat Head Screws	3
40		M3*10MM Copper Pillar	3

41		M3*20MM Copper Pillar	3
42		3.0*40MM Screwdriver	1
43		2.0*40MM Screwdriver	1
43		Cross Wrench	1
44		AM/BM USB Cable	1
45		Winding Pipe	1
46		3*100MM Black Ties	4
47		Full Color WS2812B LED Light Strip with 5V 5050 Light Beads	2
48		15cm 3pin F-F 26AWG Dupont Line	2
49		20cm 3pin F-F 26AWG Dupont Line	6

50		15cm 8pin M-F 26AWG Dupont Line	1
51		35cm 4pin F-F 26AWG Dupont Line	2
52		35cm 4pin F-F 26AWG Dupont Line	1
53		20cm 4pin F-F 26AWG Dupont Line	2
54		40cm 5pin XH2.54 to PH2.0 26AWG Dupont Line	1
55		15cm 3pin F-F 26AWG Dupont Line	2
56		50*82*0.2MM Plastic Bag	15
57		63*106*0.2MM Plastic Bag	1

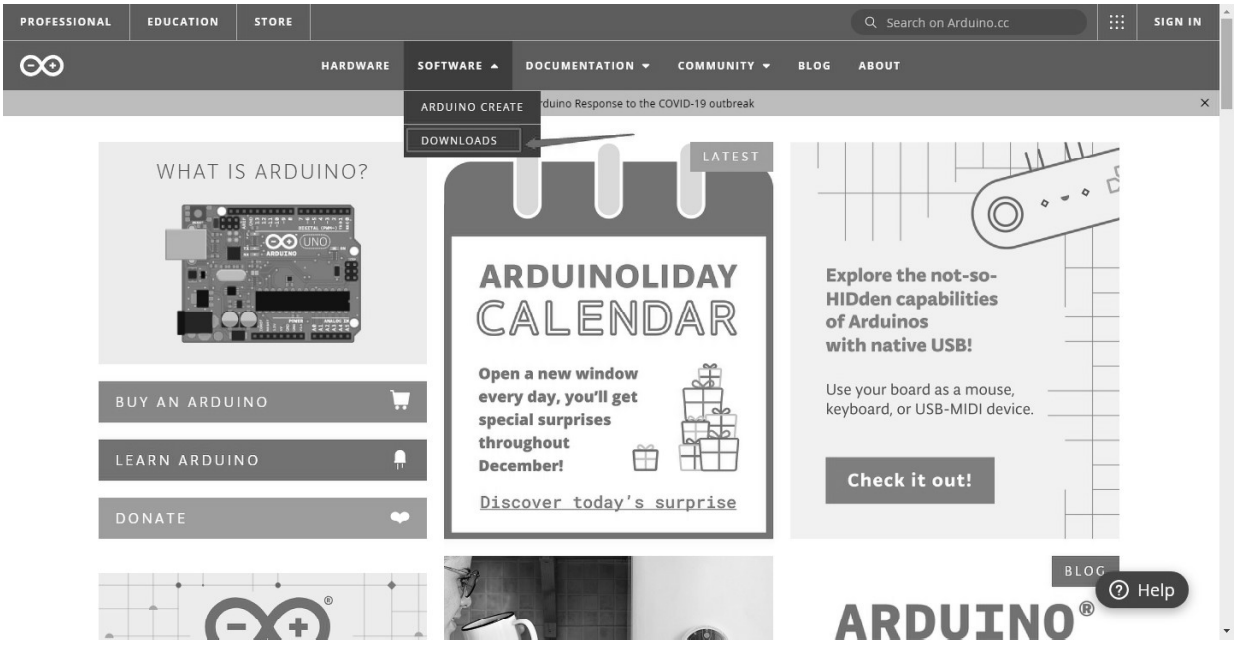
58		4*6CM Plastic Bag	17
59		6*9CM Plastic Bag	2
60		10*15CM Plastic Bag	2

5. Getting Started with Arduino

(1) Installing Arduino IDE

When we get control board, we need to download Arduino IDE and driver firstly.

You could download Arduino IDE from the official website: https://www.arduino.cc/, click the **SOFTWARE** on the browse bar, click "DOWNLOADS" to enter download page, as shown below:

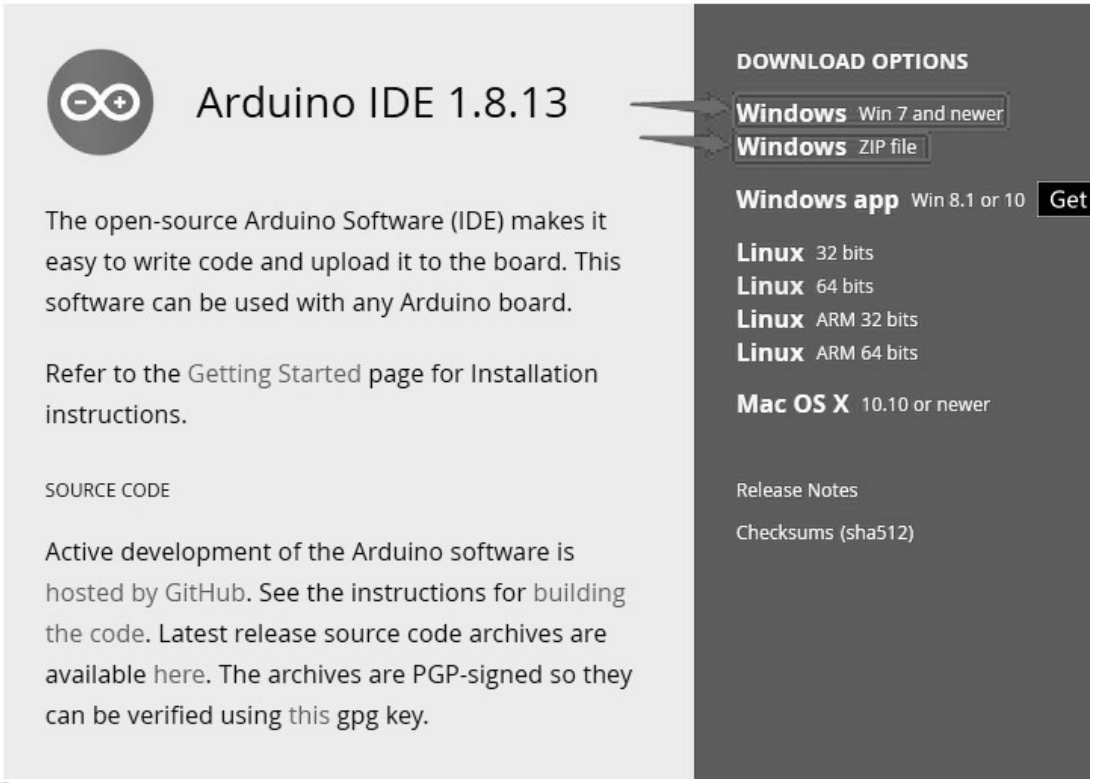


You can download either Windows win7 and newer or Windows ZIP file. The first one doesn’ t require

There are two versions of IDE for WINDOWS system, you can choose from the Installer (.exe) and the Zip packages. We suggest you use the first one that installs directly everything you need to use the Arduino Software (IDE), including the drivers.

With the Zip package you need to install the drivers manually. The Zip file is also useful if you want to create a portable installation.

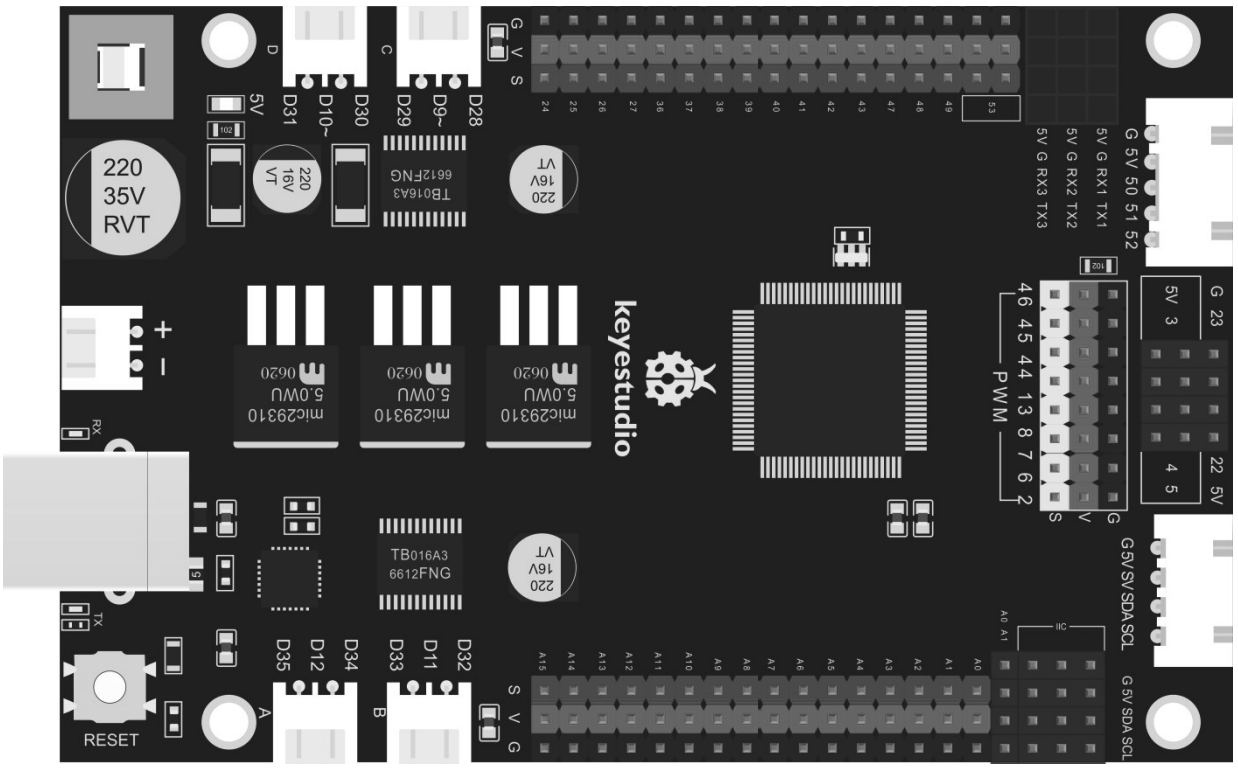
Downloads



You just need to click JUST DOWNLOAD.

(2) Keyestudio MEGA 2560 Smart Development Board

We need to know keyestudio MEGA 2560 development board, as a core of this smart car.



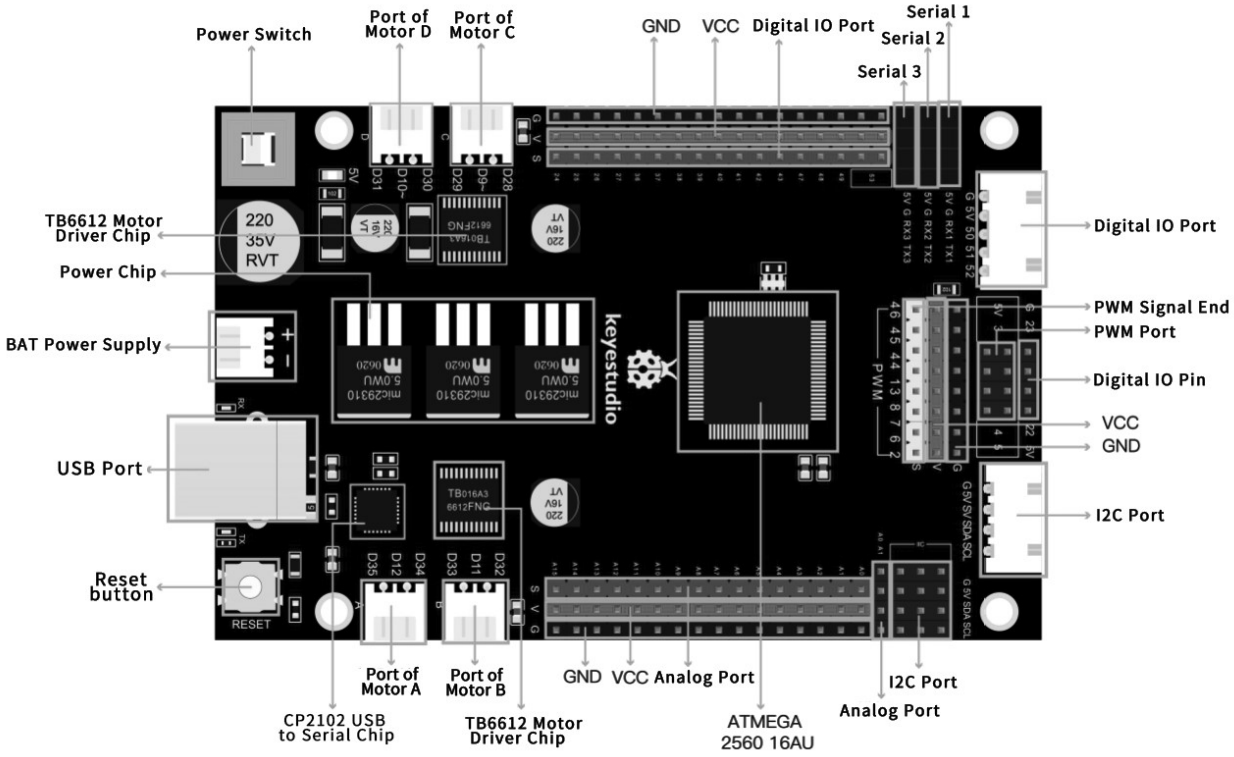
The processor core of MEGA 2560 board is ATMEGA2560-16AU, with the cp2102 chip.

It has 54 digital input/output pins (of which 15 can be used as PWM outputs), 16 analog inputs, 4 UARTs (hardware serial ports), a 16 MHz crystal oscillator, a USB connection, a power jack, 1 ICSP header, and a reset button.

It can be interfaced computer with external power with a USB cable.

Microcontroller	ATMEGA2560-16AU
Working Voltage	5V
Input Voltage	DC7-12V
Digital I/O Pins	54个 (D0-D53) (pin D9,D10,D11 and D12 control speed of motor , D28,D29,D30,D31,D32,D33,D34 and D35 control rotation direction of motor
PWM IO Pins	15 (D2-D13, D44-D46)
Analog Input Pins	16 (A0-A15)
DC Current per I/O Pin	20 mA
DC Current for 3.3V Pin	50 mA
Flash Memory	256 KB (ATMEGA2560-16AU) of which 8 KB used by boot loader
SRAM	8 KB (ATMEGA2560-16AU)
EEPROM	4 KB (ATMEGA2560-16AU)

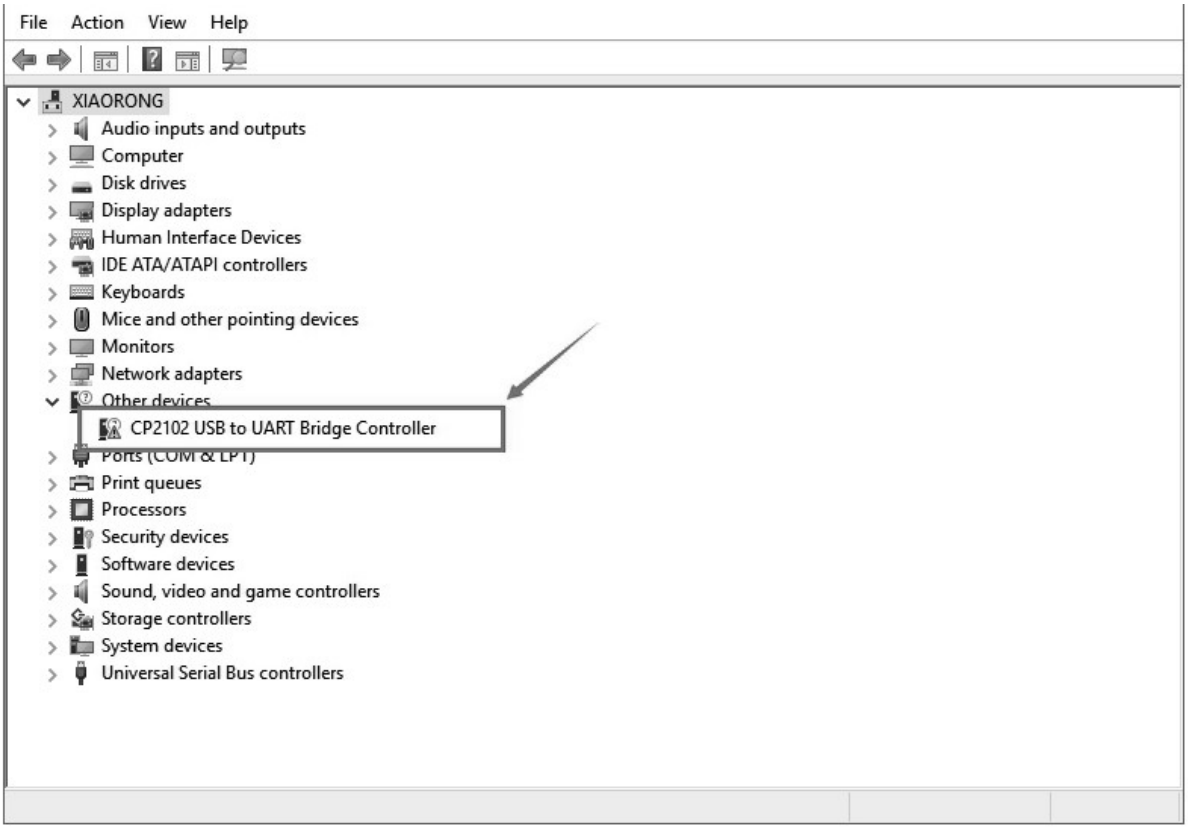
Clock Speed	16 MHz



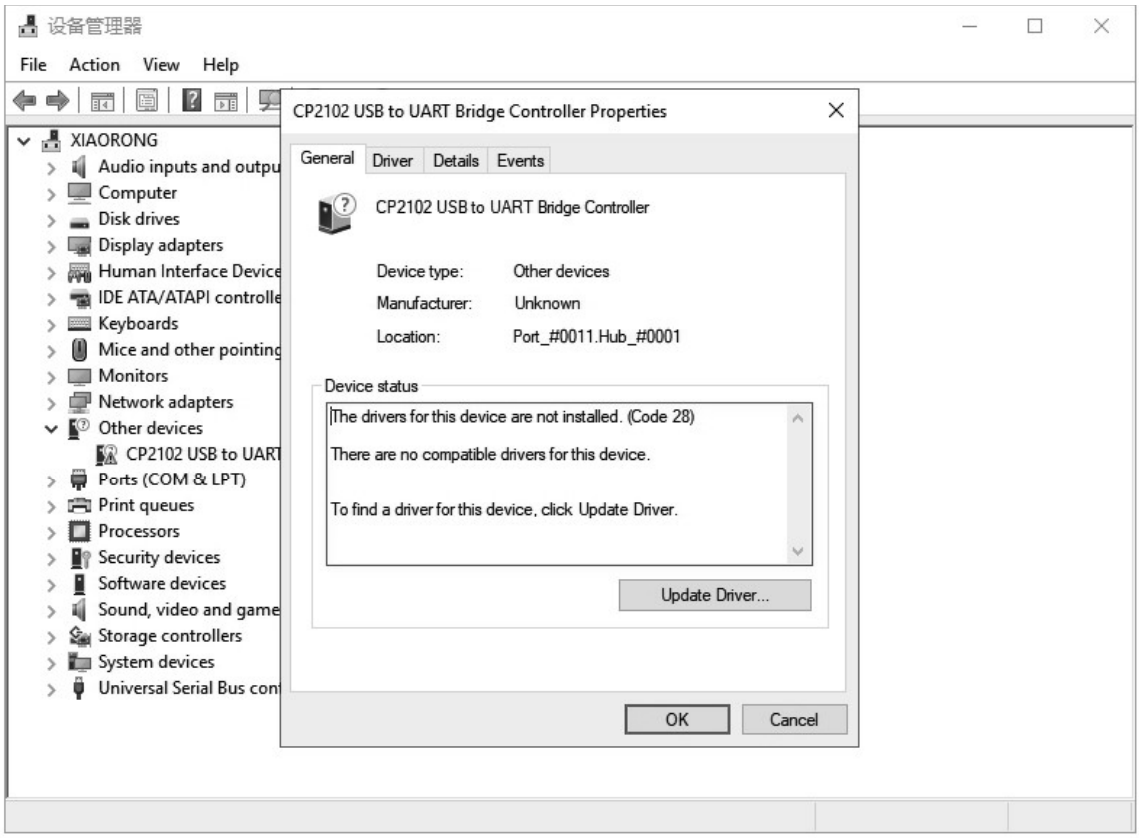
(3) Install Driver on Windows System

Let’s install the driver of keyestudio MEGA 2560 smart development board. The USB-TTL chip on this board adopts CP2102 serial chip. The driver program of this chip is included in Arduino 1.8 version and above, which is convenient. Plugged in USB port, the computer can recognize the hardware and automatically install the driver of CP2102.

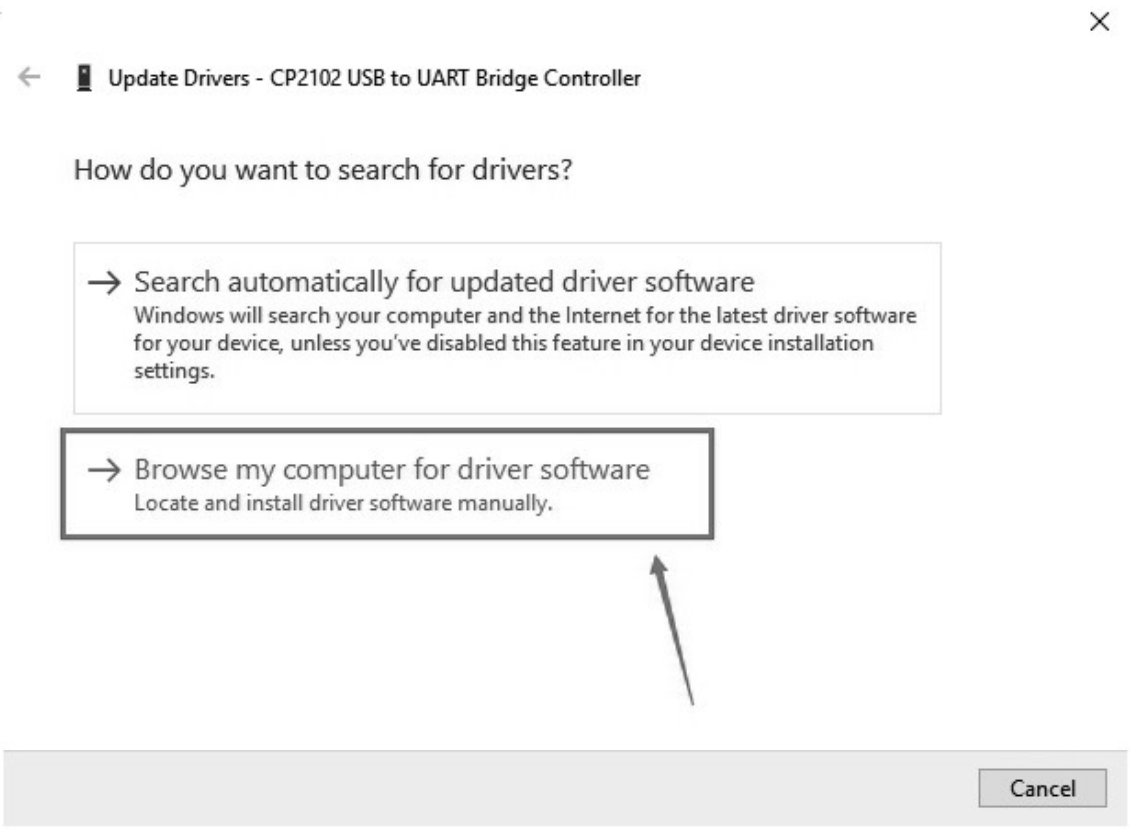
If install unsuccessfully, or you intend to install manually, open the device manager of computer. Right click Computer----- Properties----- Device Manager.



There is a yellow exclamation mark on the page, which implies installing unsuccessfully. Then we double click the hardware and update the driver.

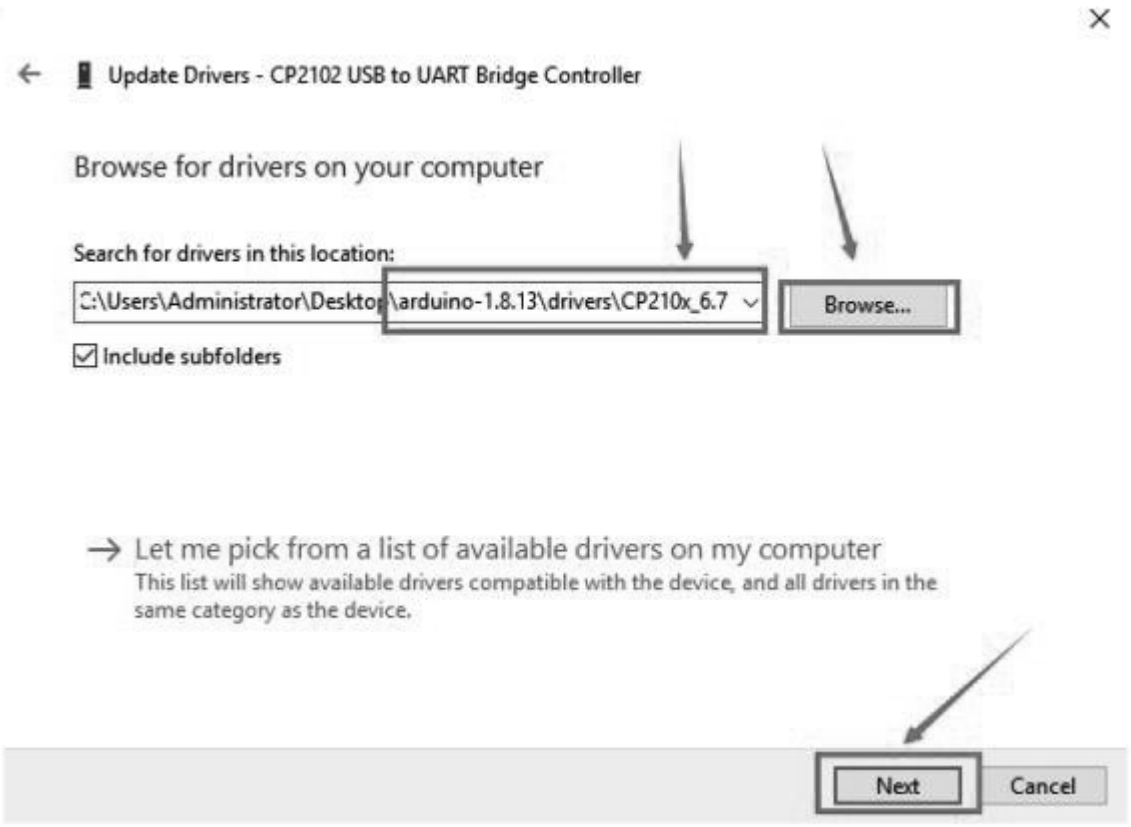


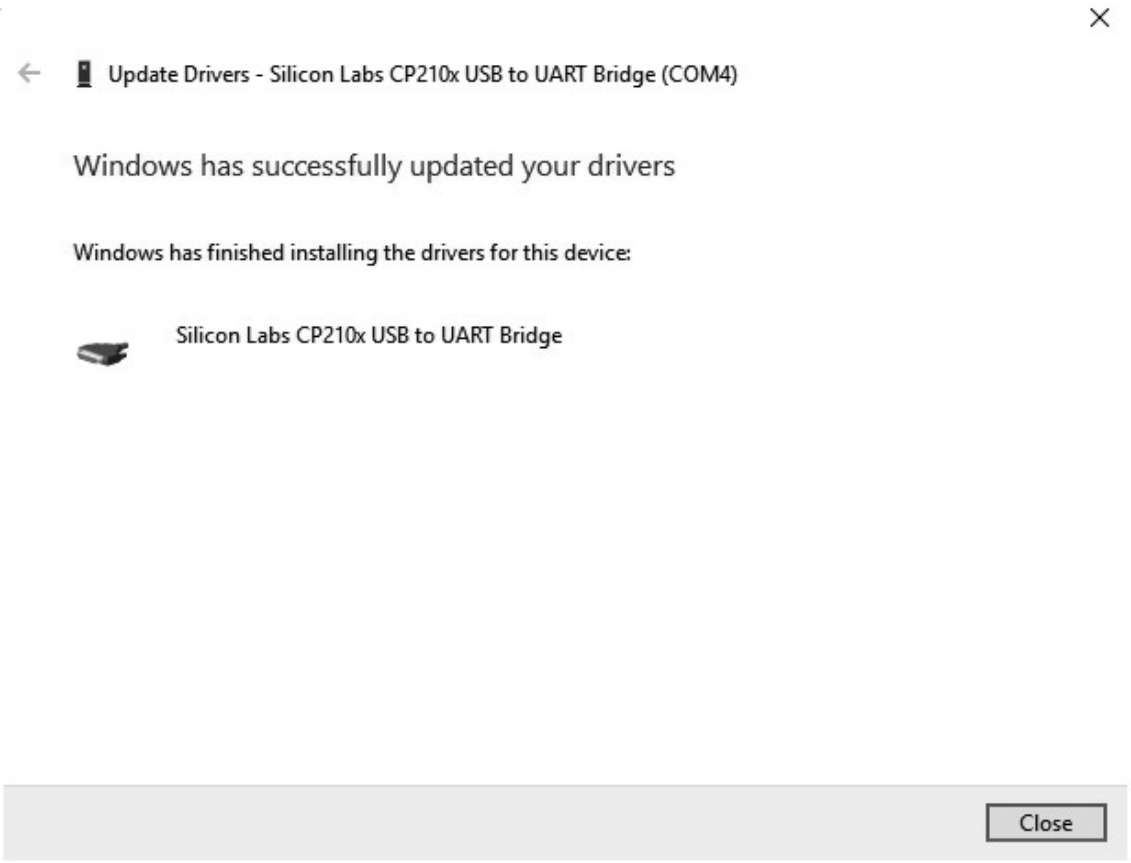
Click“OK”to enter the following page, click“browse my computer for updated driver software”, find out the installed or downloaded ARDUINO software. As shown below:



There is a DRIVERS folder in Arduino software installed package. Just open driver folder and you can see the driver of CP210X series chips.

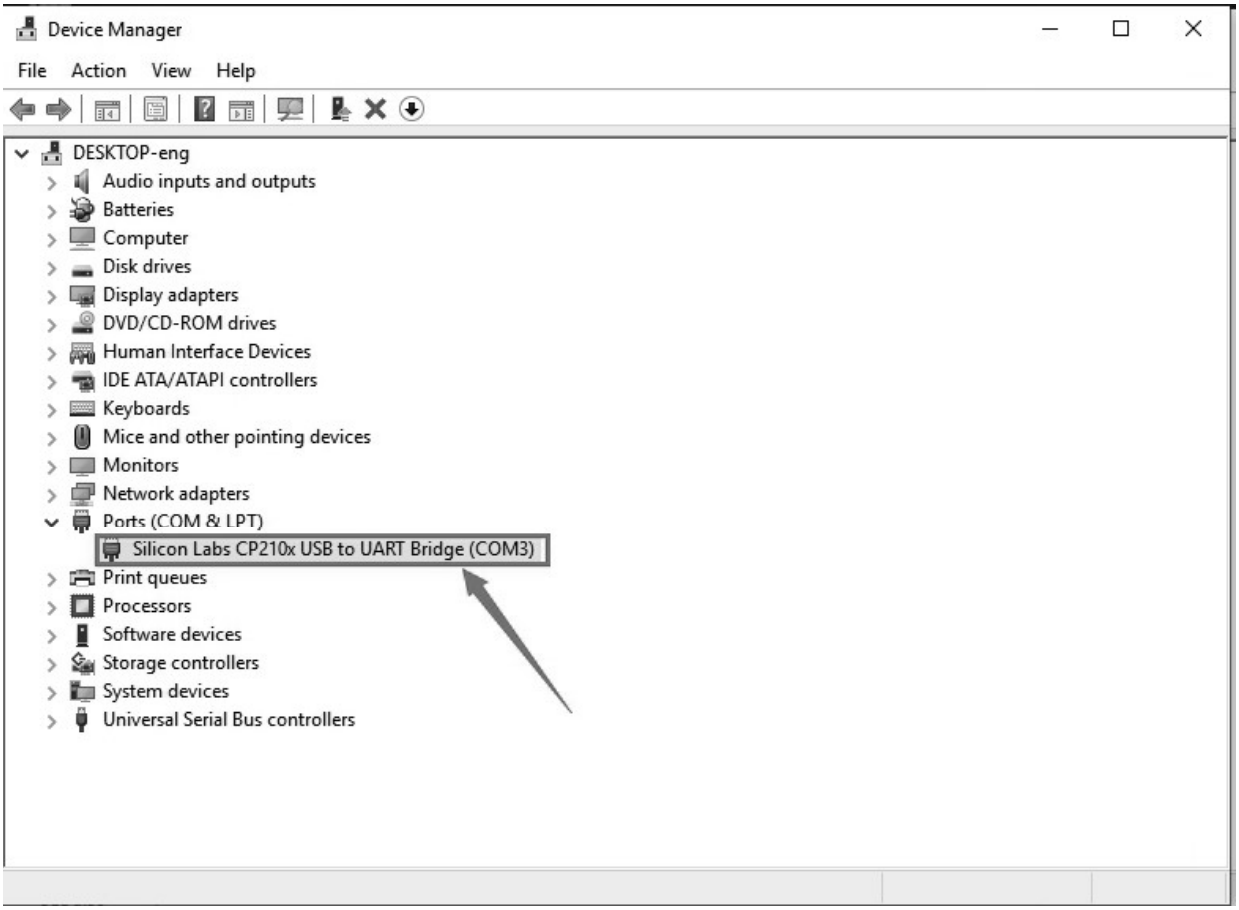
We click "Browse", then find out the driver folder, or you could enter "driver" to search in rectangular box, then click "next", the driver will be installed successfully. (I place Arduino software folder on the desktop, you can follow my way)


Update Drivers - CP2102 USB to UART Bridge Controller
Browse for drivers on your computer
Search for drivers in this location:
C:\Users\Administrator\Desktop\arduino-1.8.13\drivers\CP210x_6.7
Browse...
Include subfolders
Let me pick from a list of available drivers on my computer
This list will show available drivers compatible with the device, and all drivers in the same category as the device.
Next
Cancel



Open device manager, we will find the yellow exclamation mark disappear.

The driver of CP2102 is installed successfully.



(4) Install Driver on MAC System

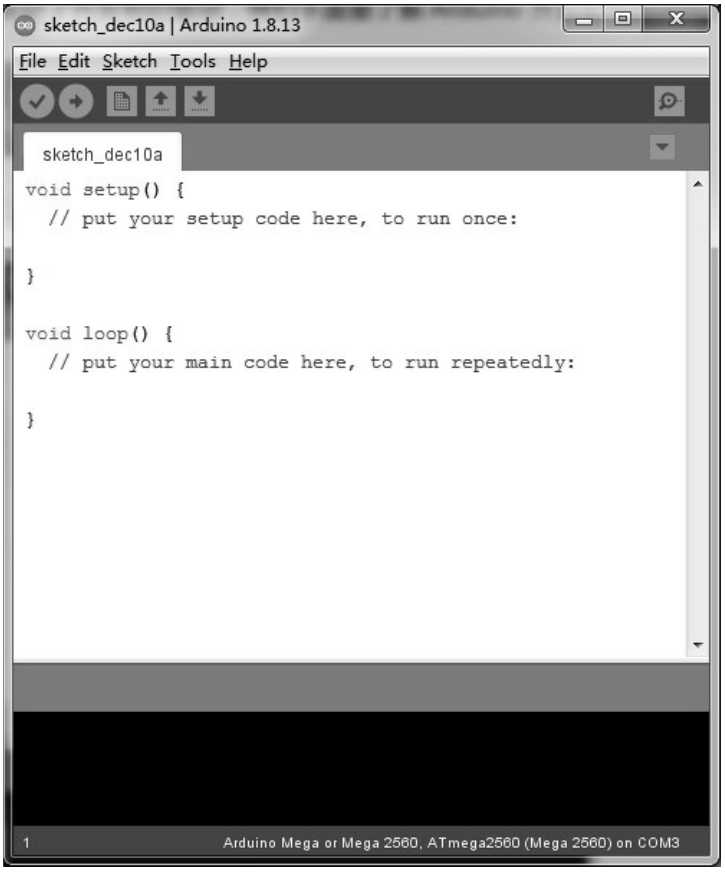
The USB to serial chip of control board is CP2102. We install driver on MAC as follows:

https://wiki.keyestudio.com/How_to_Install_the_Driver_of_CP2102_on_MAC_System

(5) Arduino IDE Setting

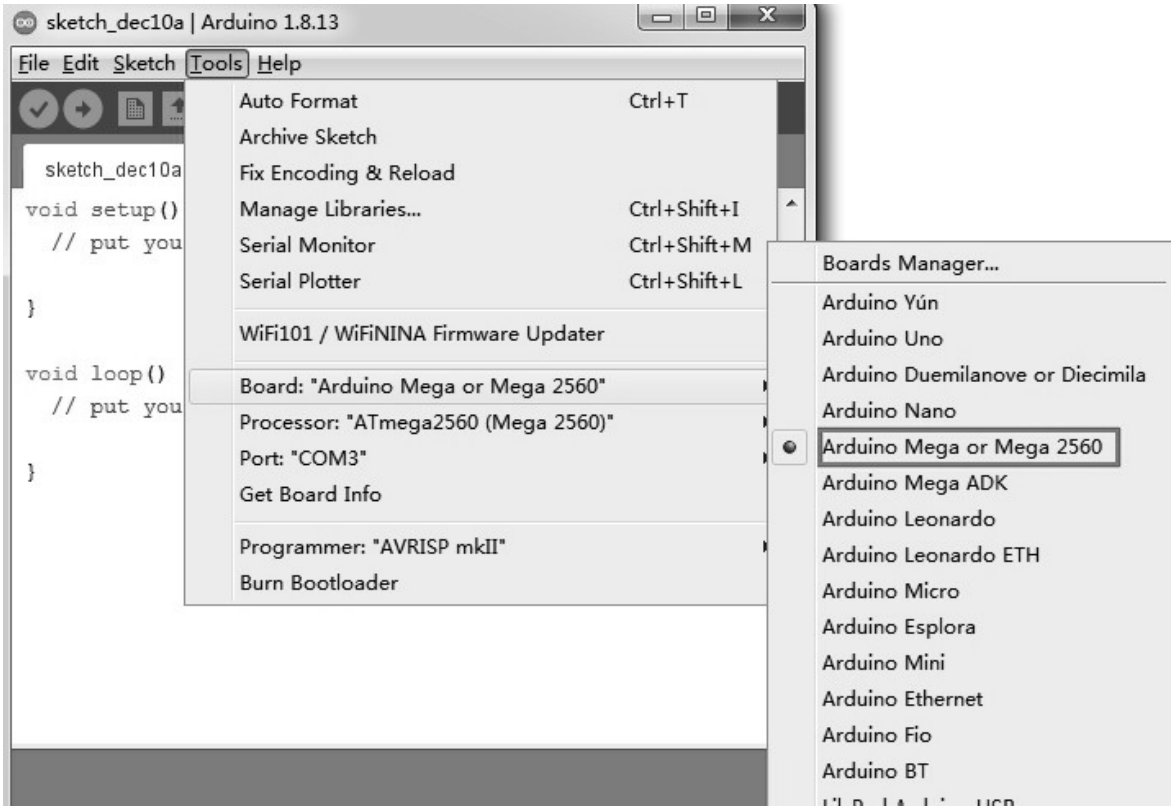
Click 

icon，open Arduino IDE.

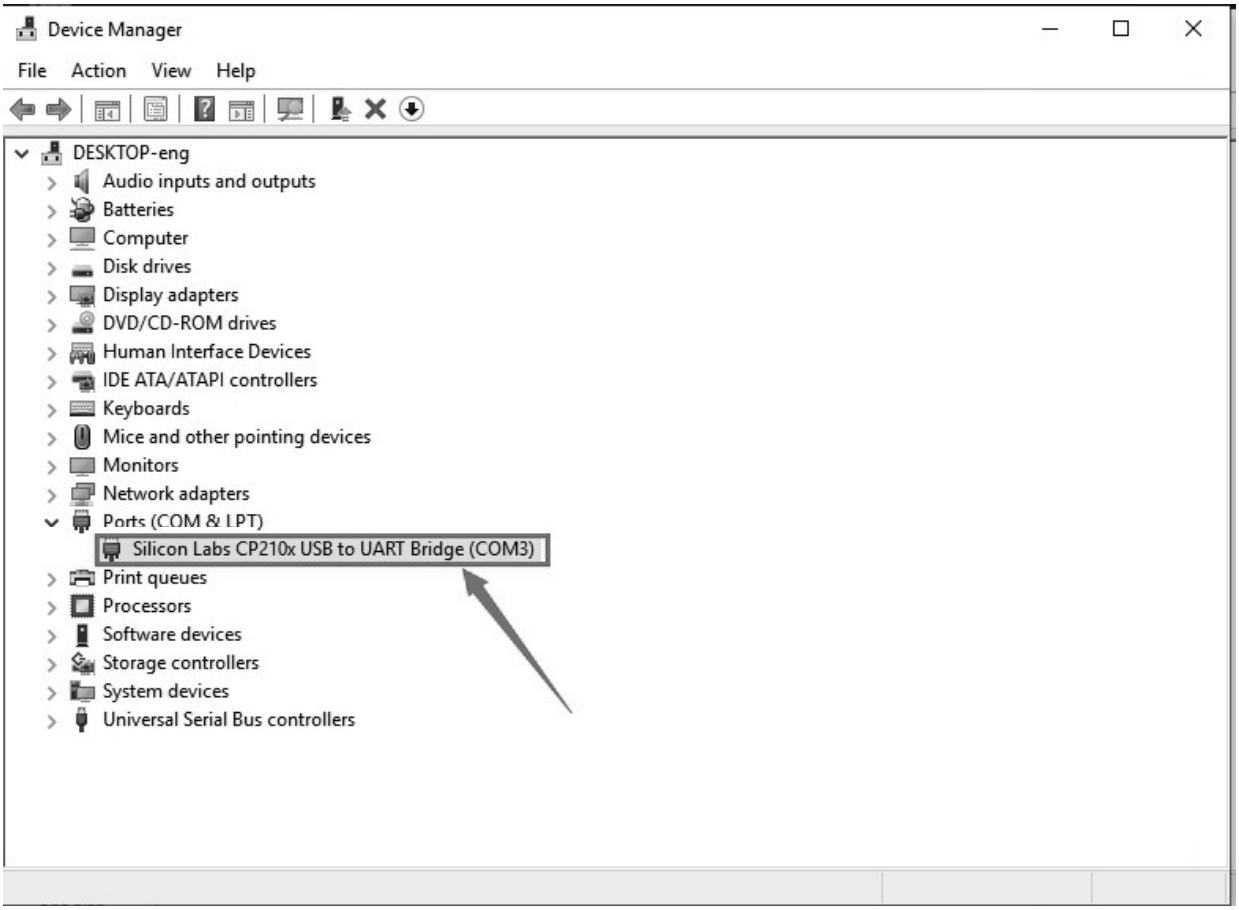


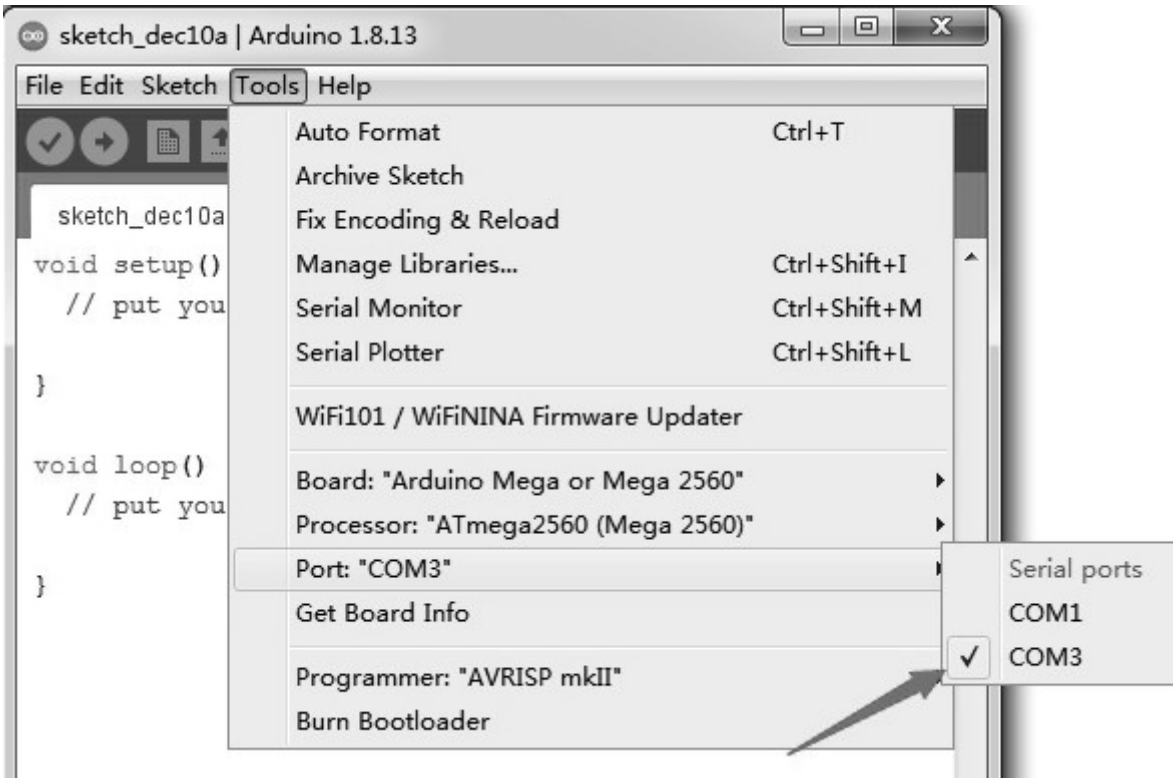
To avoid the errors when uploading the program to the board, you need to select the correct Arduino board that matches the board connected to your computer.

Then come back to the Arduino software, you should click Tools→Board, select the board. (as shown below)



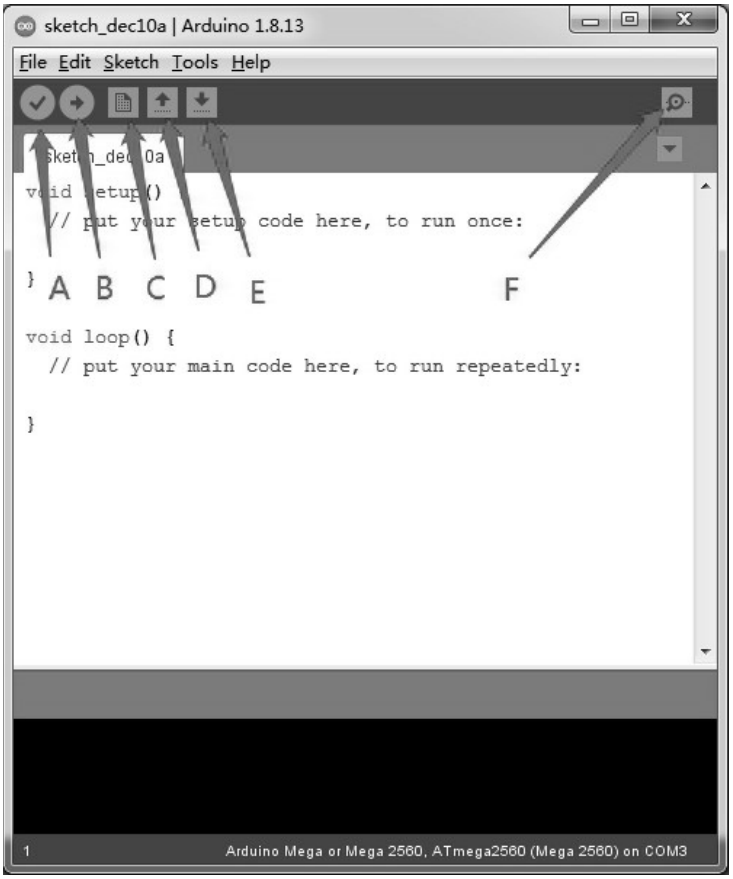
Then select the correct COM port (you can see the corresponding COM port after the driver is successfully installed)





Before uploading the program to the board, let’ s demonstrate the

function of each symbol in the Arduino IDE toolbar.



A- Used to verify whether there is any compiling mistakes or not.

B- Used to upload the sketch to your Arduino board.

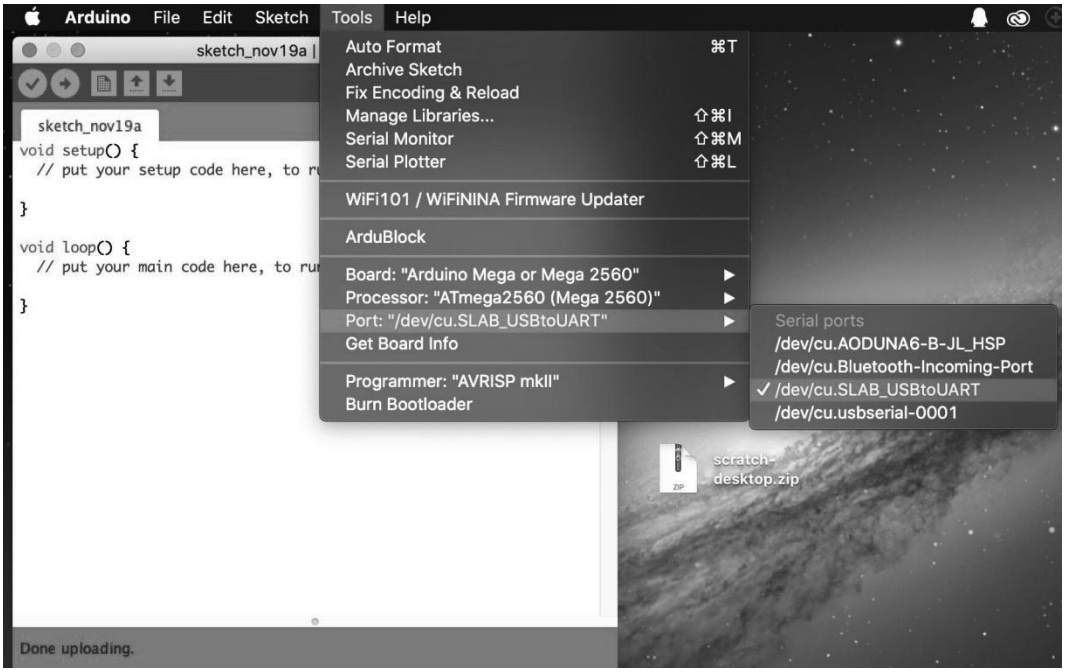
C- Used to create shortcut window of a new sketch.

D- Used to directly open an example sketch.

E- Used to save the sketch.

F- Used to send the serial data received from board to the serial monitor.

Note: the setting method on Mac system is same as on Windows system except different COM port, as shown below:



(6) Start First Program

We’ ve known how to download and install the driver of development board , next, we will burn a code to show “Hello World！” in the monitor.

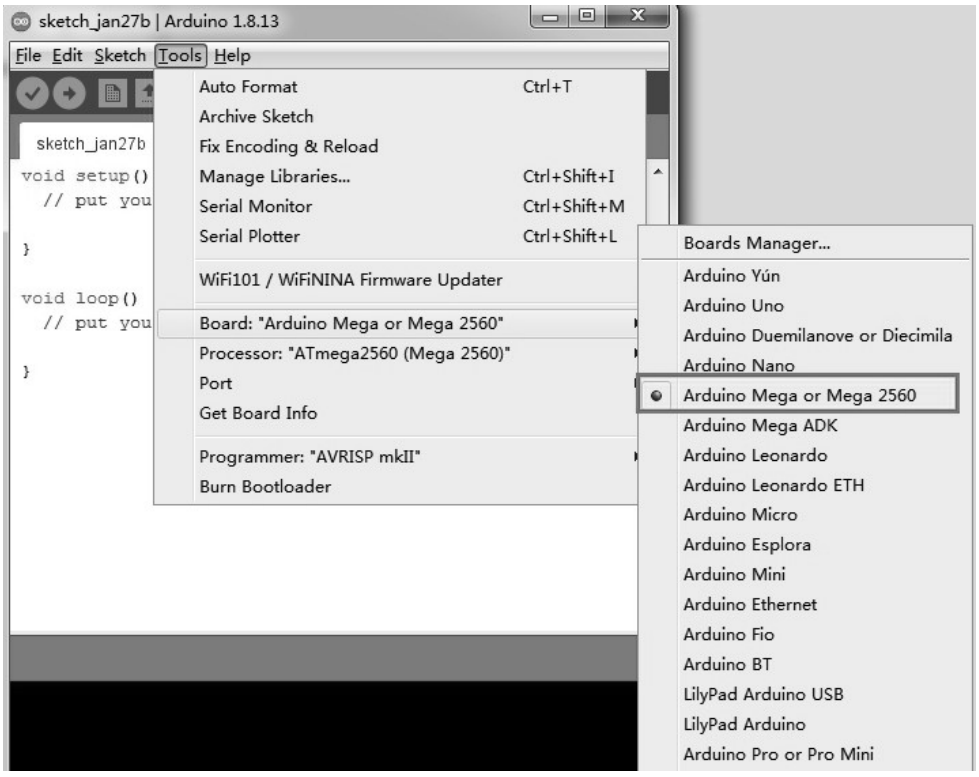
Test Code

```
void setup() {
```

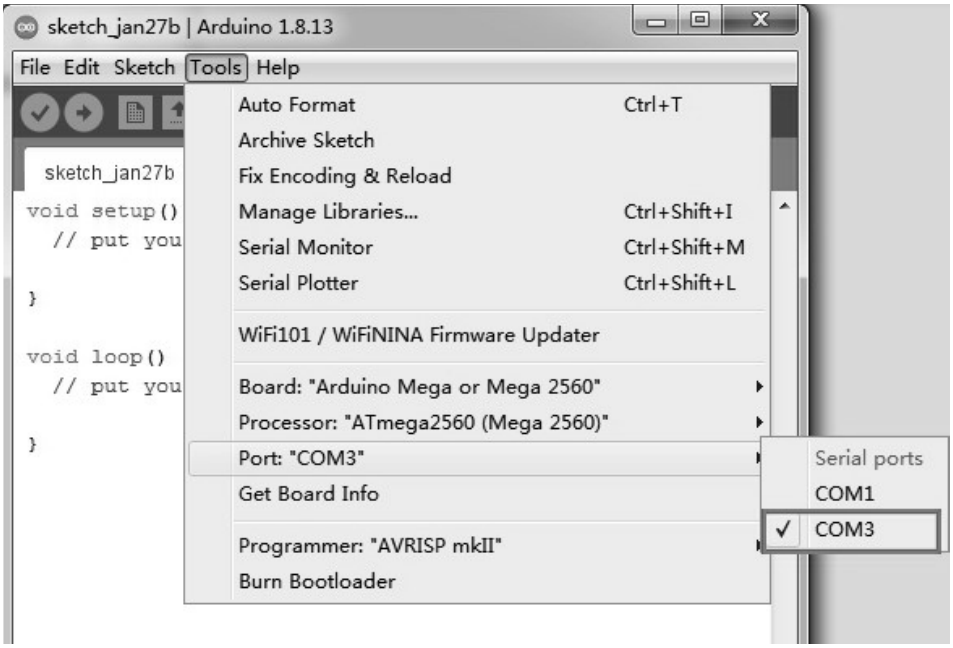
```
    // initialize serial communication at 9600 bits per second:
    Serial.begin(9600);
}

void loop() {
    // print out "Hello world!"
    Serial.println("Hello world!");
    delay(1000);// delay 1 second
}
```

Open Arduino IDE, and set board as follows:

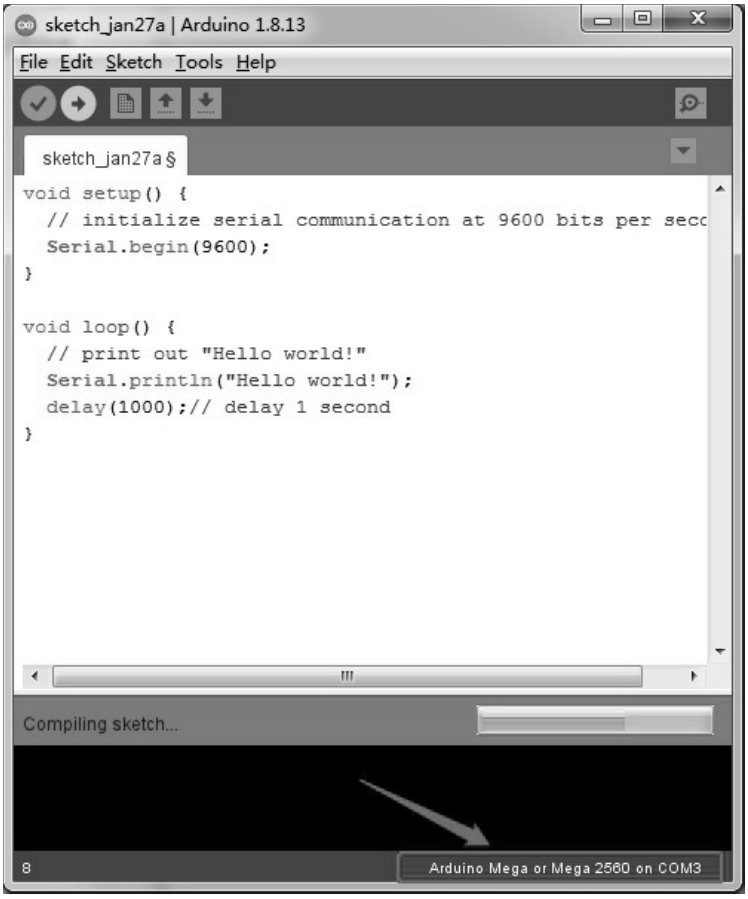


Set COM port, as shown below:



Click to start compiling the program, and check errors.

Click to upload the program, upload successfully.



Upload the program successfully, open serial monitor and set baud rate to 9600. Monitor will print "Hello World!" each 1s.

Congratulation, you finish the first program.

7. Projects

The whole project begins with basic program. Starting from simple to complex, the lessons will guide you to assemble smart motorhome and absorb the knowledge of electronic and machinery step by step. I reckon that you might hardly sit still and itch to have a go, let’ s get started.

Note: (G), marked on each sensor and module, is negative pole and connected to “G”, “-” or “GND” on the sensor shield or control board ; (V) is positive pole and interfaced with “V”, “VCC”, “+” or “5V” on the sensor shield or control board.