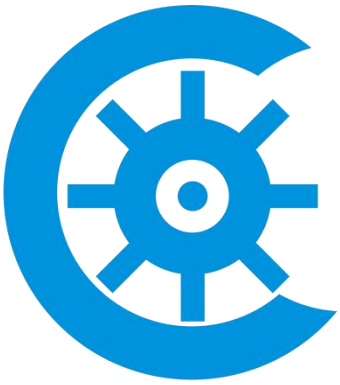


Adeept

www.adeept.com

Indoor Environment Monitoring Kit

Warning

Please pay attention to the following issues when purchasing or using the product:

- There are small components included in this kit. Swallowing mistakenly or misoperation can cause serious infection and be even fatal. When an accident occurs, please seek medical assistance immediately.
- Please place the product in a safe place where an under-6-year-old cannot touch, who should not use or approach the product.
- Juveniles should use the product with their parents.
- Do not place the product or the components near any AC socket or other circuits, in case of potential risks of electric shock.
- Do not use the product near any liquid or flame.
- Do not use or store the product in an extreme environment such as extremely cold or hot and heavily humid.
- Do not connect the positive and negative poles of the power inversely, or the devices in the circuit may be damaged.
- Please place and put the product gently. Do not smash or shock it.
- The acrylic plate used in this kit is fragile and please gently install in case of breaking.

About

Adeept is a technical service team of open source software and hardware. Dedicated to applying the Internet and the latest industrial technology in open source area, we strive to provide best hardware support and software service for general makers and electronic enthusiasts around the world. We aim to create infinite possibilities with sharing. No matter what field you are in, we can lead you into the electronic world and bring your ideas into reality.

The code and circuits of our product are open source. You can check on our website:

www.adeept.com

If you have any problems, please feel free to send an email for technical support and assistance:

support@adeept.com

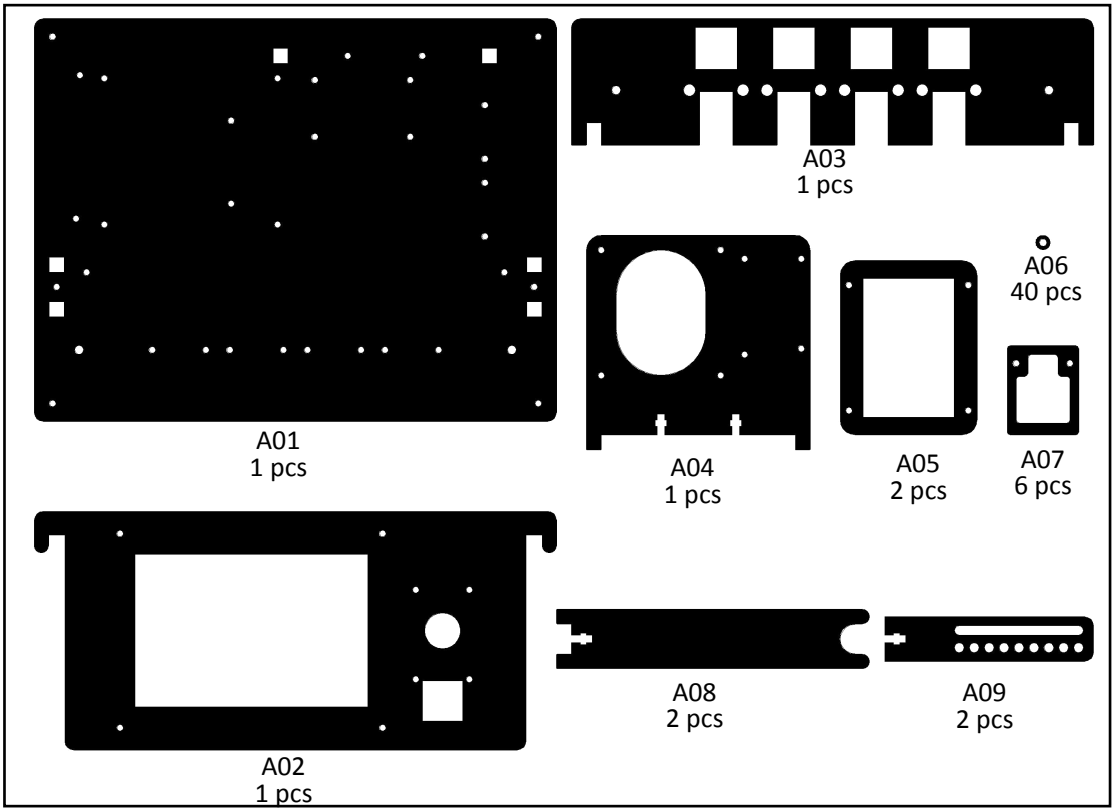
On weekdays, we usually will reply within 24 hours. Also welcome to post forums on our website.

Copyright

Contents

Components List

Acrylic Sheets

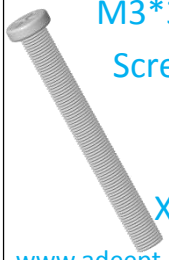


The acrylic sheet is covered with a layer of protective film. You need to remove it first.

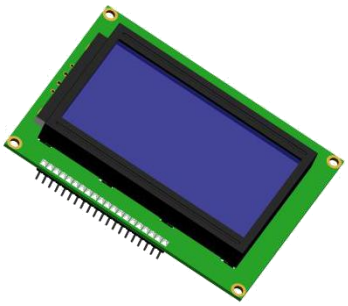
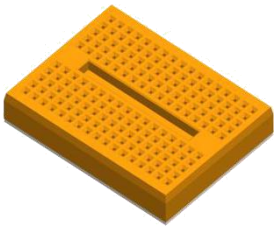
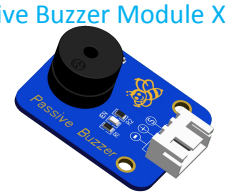
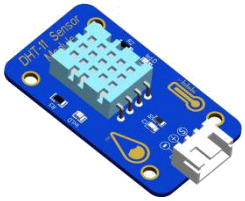
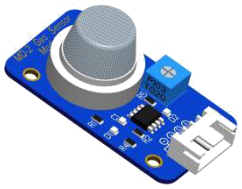
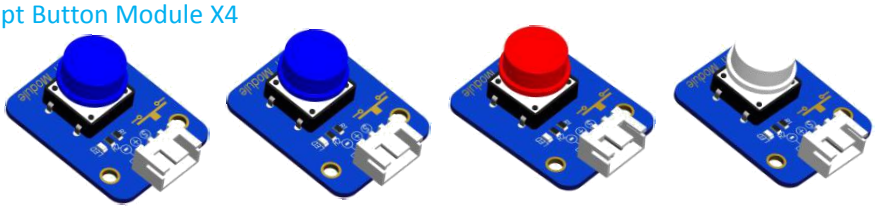
Some holes in the acrylic sheets may have residues,so you need to clean them before using it.

Kindly reminder: The acrylic plate used in this kit is fragile and please gently install in case of breaking.

Machinery Parts

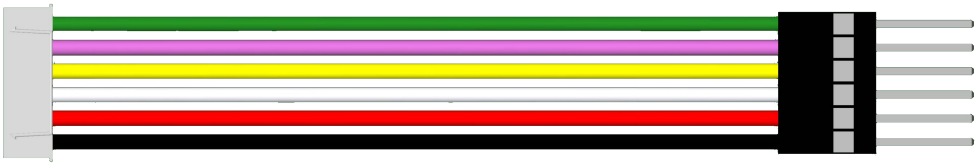
M2 Nut  X46 www.adeept.com	M3 Nut  X8 www.adeept.com	M2*10 Screw  X12 www.adeept.com	M2*14 Screw  X34 www.adeept.com	M3*8 Screw  X4 www.adeept.com
M3*30 Screw  X2 www.adeept.com	M3*8 Copper Standoff  X2 www.adeept.com			

Electronic Parts

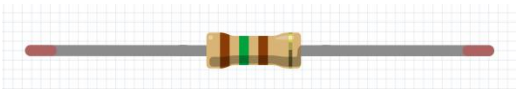
Adeept UNO R3 Board X1 	LCD12864 Module X1 
Dust Module X1 	Mini Breadboard X1 
Adeept Passive Buzzer Module X1 	Adeept RGB LED Module X1 
Adeept Photoresistor Module X1 	Adeept Barometer Sensor Module X1 
Adeept DHT-11 Sensor Module X1 	Adeept MQ-2 Gas Sensor Module X1 
Adeept Button Module X4 	
3-Pin Wires X7 	

4-Pin Wires X3

6-Pin Wires X1



Resistor (150Ω) X5

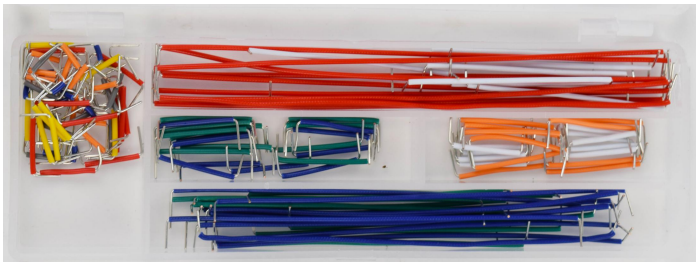


Capacitor (220uF) X2

USB CableX1

Male to Female Jumper Wires X20

Breadboard Jumper Wires X1



Tools

Cross Screwdriver X1 	Slotted Screwdriver X1 
Cross Socket Wrench X1 	Wingding pipe X1 

Power

Adeept Power Supply X1

Introduction

We live in an environment amid air under a certain temperature and humidity. When the temperature is between 18 and 23 degrees Celsius and humidity is about 45-65%RH, we feel comfortable, while plants live well under 22-32℃ and 60-80%RH. It is important to keep a good environment for human and other creatures. Therefore, every government on the earth invests great quantity of manpower and financial resources in detecting and studying the environment. An effective method is to build a weather station. It can be a portal one, high-precision station, or one on the highway, in the forest and on the campus.

This Adeept weather box kit, or indoor environment monitoring kit, is suitable for beginners for Arduino, environment enthusiasts and geeks. It can not only detect basic values like temperature and humidity, but also air pressure, air pollution index, smog, flammable gas, and light existence. A large screen LCD12864 is included to print data, more modules like button, RGB LED, and buzzer added too. A variety of tutorials are provided for you to easily learn about Arduino. Software and hardware are both involved in this kit, which features:

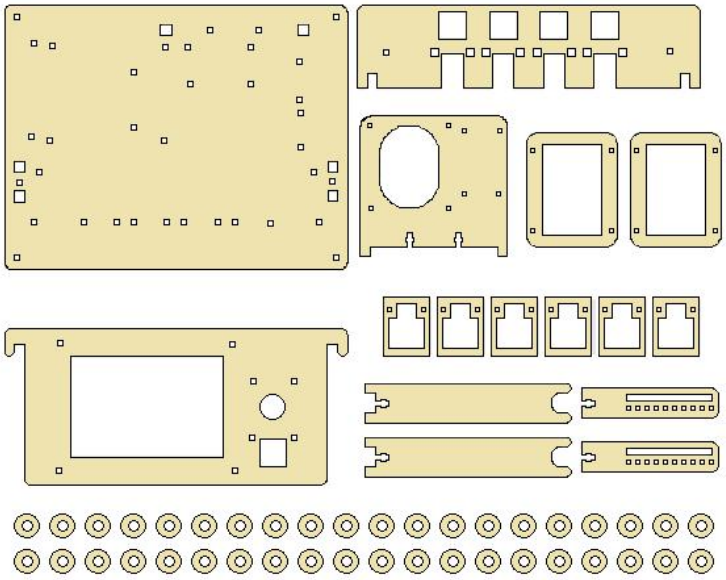
1. Detection of ambient temperature: 0-50 ℃ (±2)
2. Detection of ambient humidity: 20-90%RH (±5%RH)
3. Detection of liquefied gas, butane, propane, methane, alcohol, hydrogen, smog, etc.
4. Detection of light existence
5. Alarm with buzzer
6. Alert by RGB LED
7. Detection of dust concentration
8. Detection of air pressure (300-1100hPa)
9. Button control of data display by LCD12864

Assembly

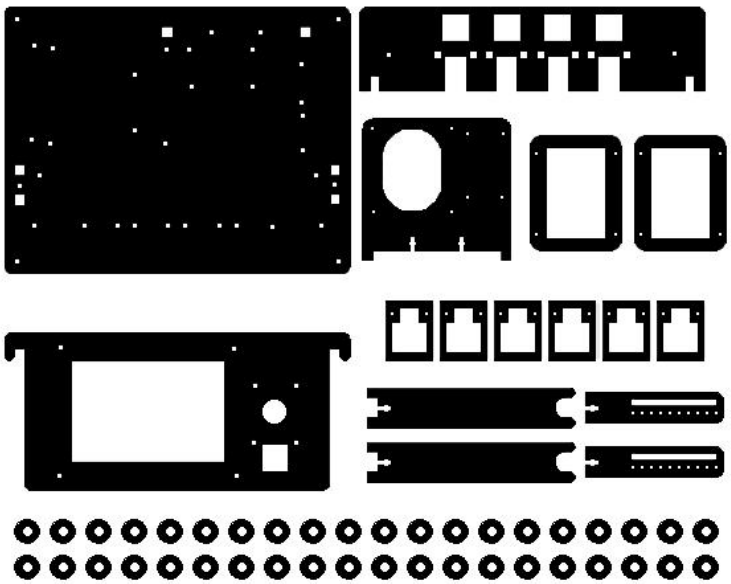
Preparations

a. Remove the protective sticker on the acrylic plates

Before removing

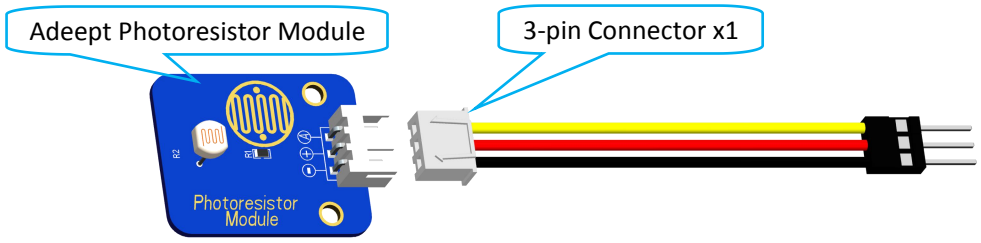


After removing



b. Connect the corresponding wires to all the modules:

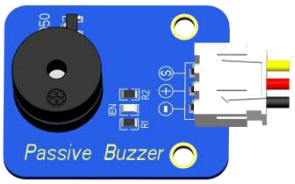
Assemble the following components



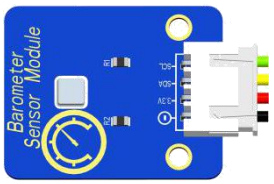
Effect diagram after assembling

For convenient demonstration, hereafter only the connecting end (white part) will be shown in the figure:

Wiring of the rest modules:

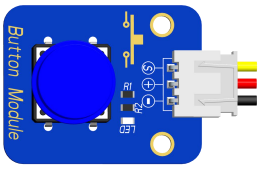


Adeept Passive Buzzer Module
+ 3-pin Connector

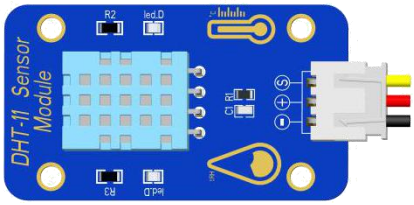


Adeept Barometer Sensor Module
+ 4-pin Connector

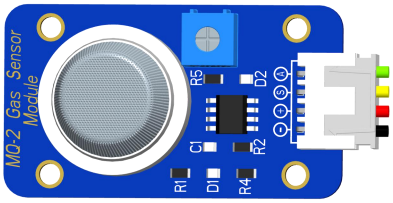
Adeept RGB LED Module
+ 4-pin Connector



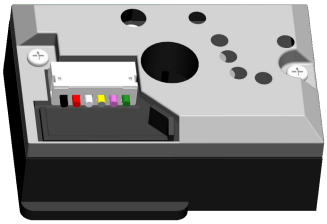
Adeept Button Module
+ 3-pin Connector



Adeept DHT-11 Sensor Module
+ 3-pin Connector



Adeept MQ-2 Gas Sensor Module
+ 4-pin Connector



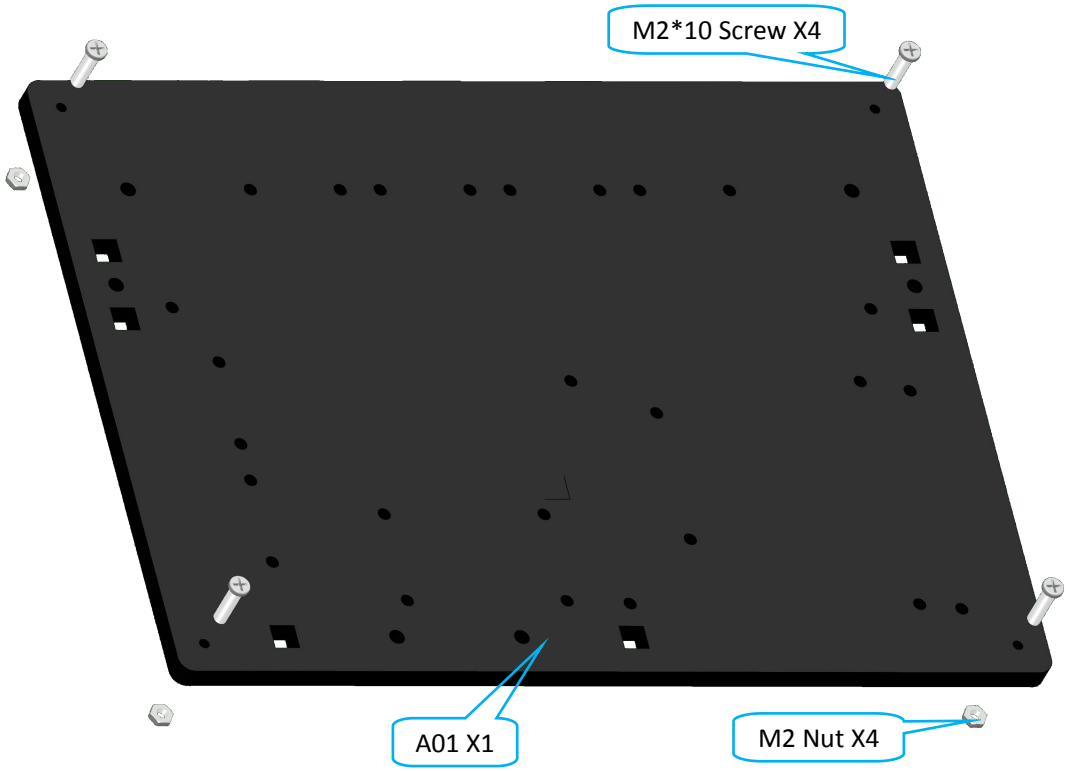
Dust Module
+ 6-pin Connector

Note: After the assembly is done, if you need to remove the connectors, please dismantle all the electronic modules on the acrylics before remove the connectors, in case of breaking acrylics nearby when removing.

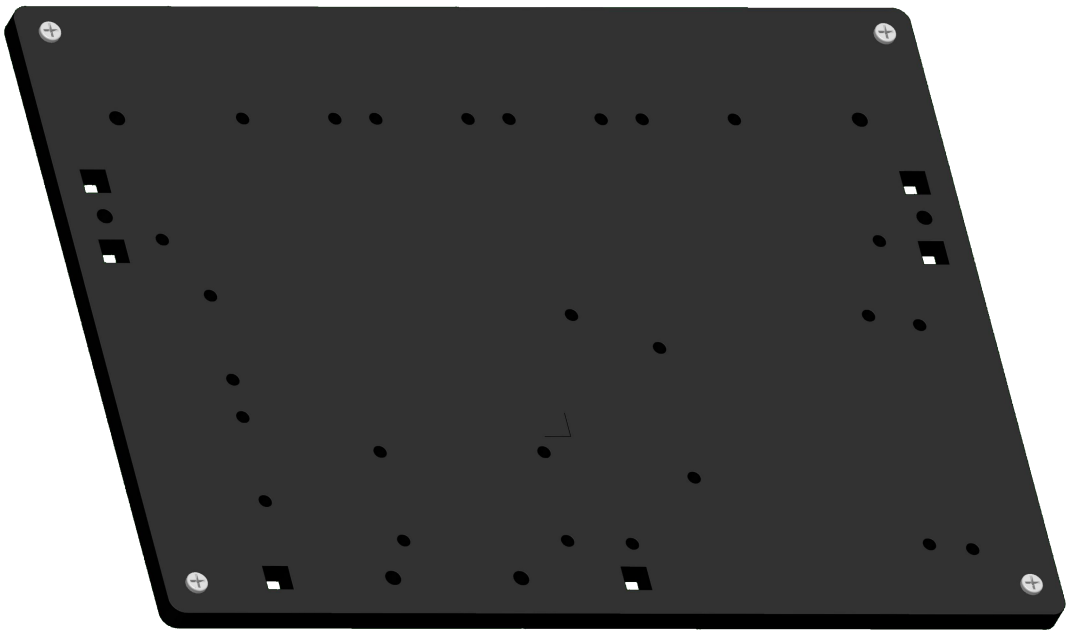
Fix Modules

a.First four M2*10 Screw fixed on the A01. The following figure is accurate.

Assemble the following components

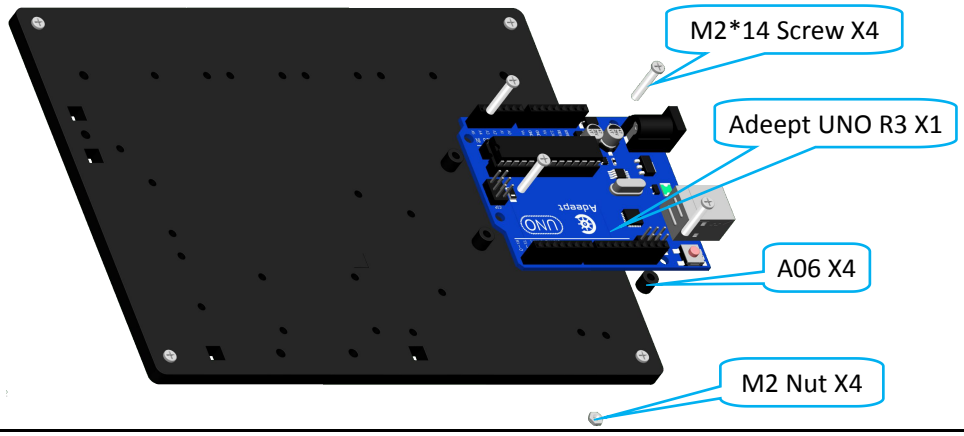


Effect diagram after assembling

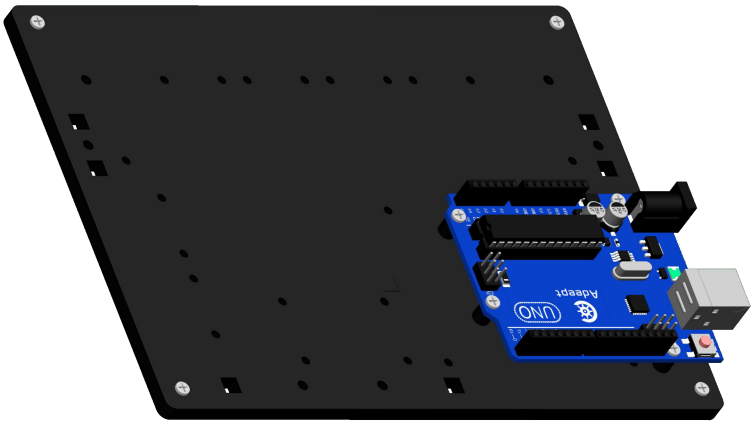


b. Mount the Adeept UNO R3 onto the acrylic A01.

Assemble the following components

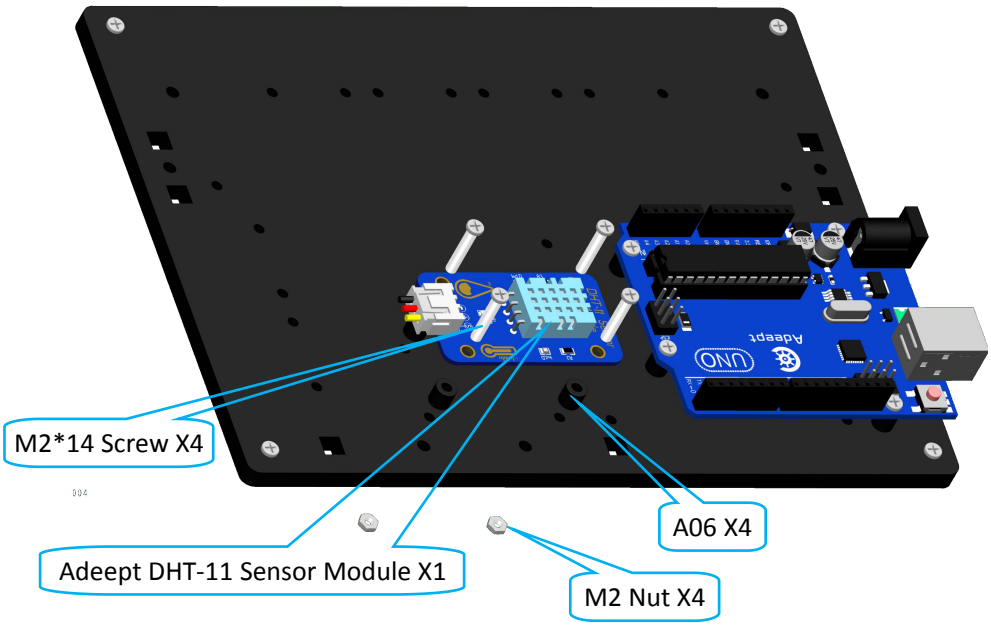


Effect diagram after assembling

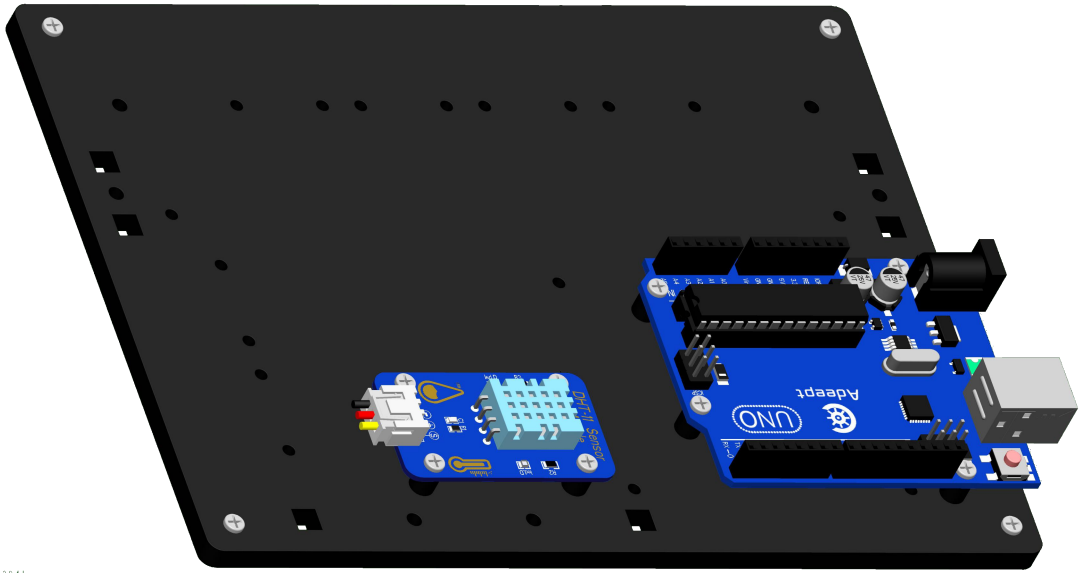


c. Mount the Adeept DHT-11 Sensor Module onto A01.

Assemble the following components

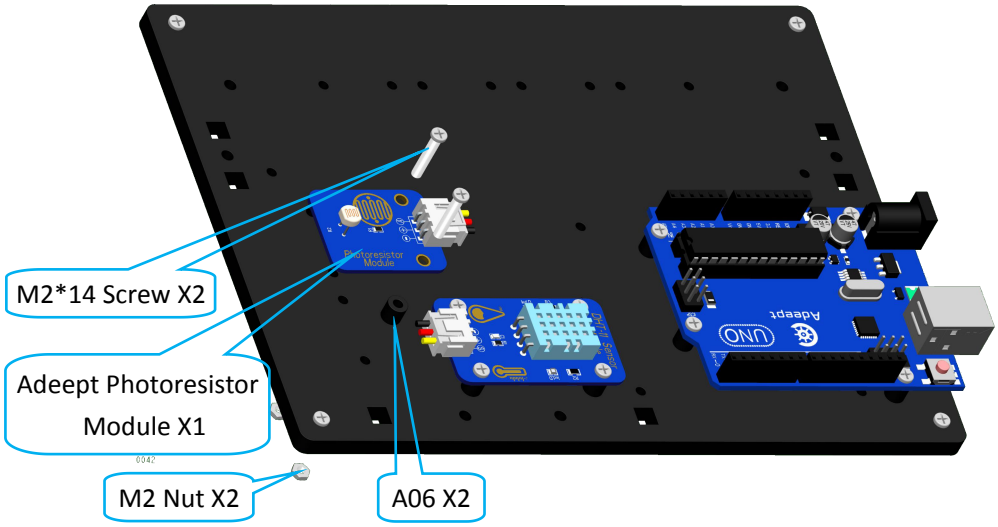


Effect diagram after assembling

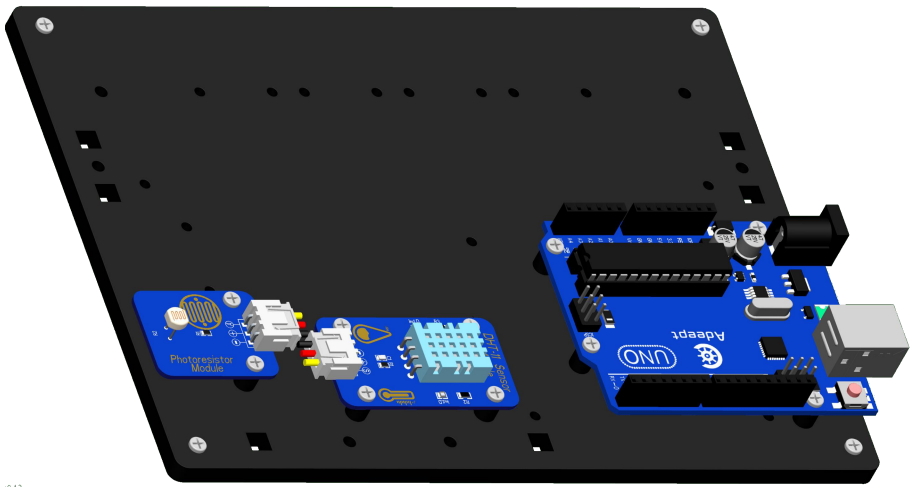


d. Fix the Adeept Photoresistor Module onto A01.

Assemble the following components

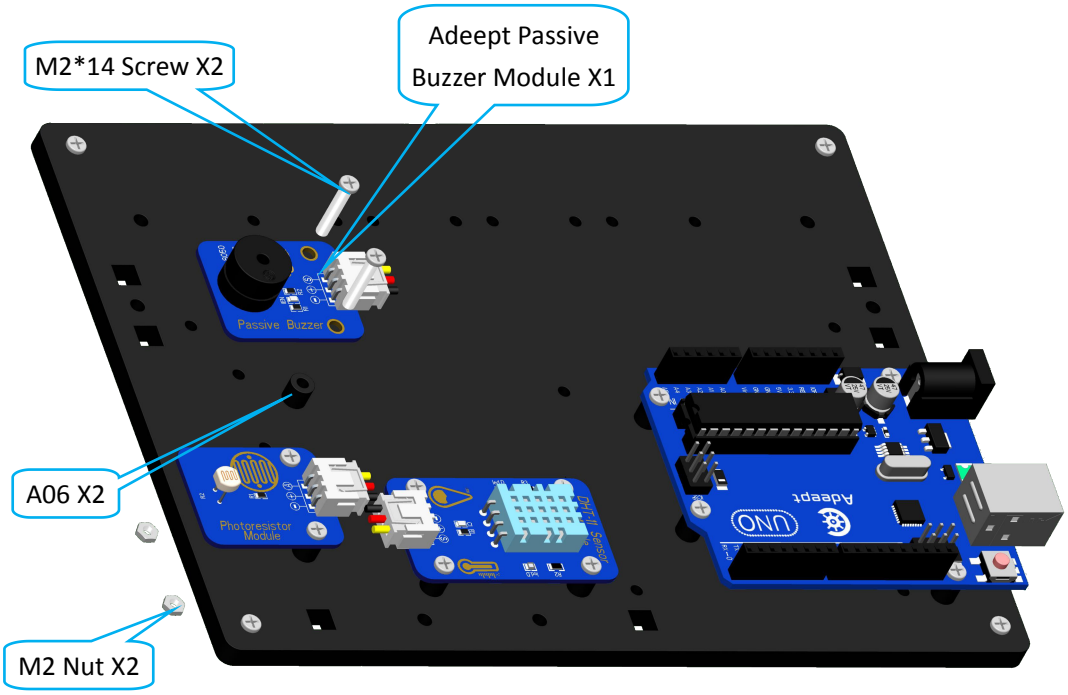


Effect diagram after assembling

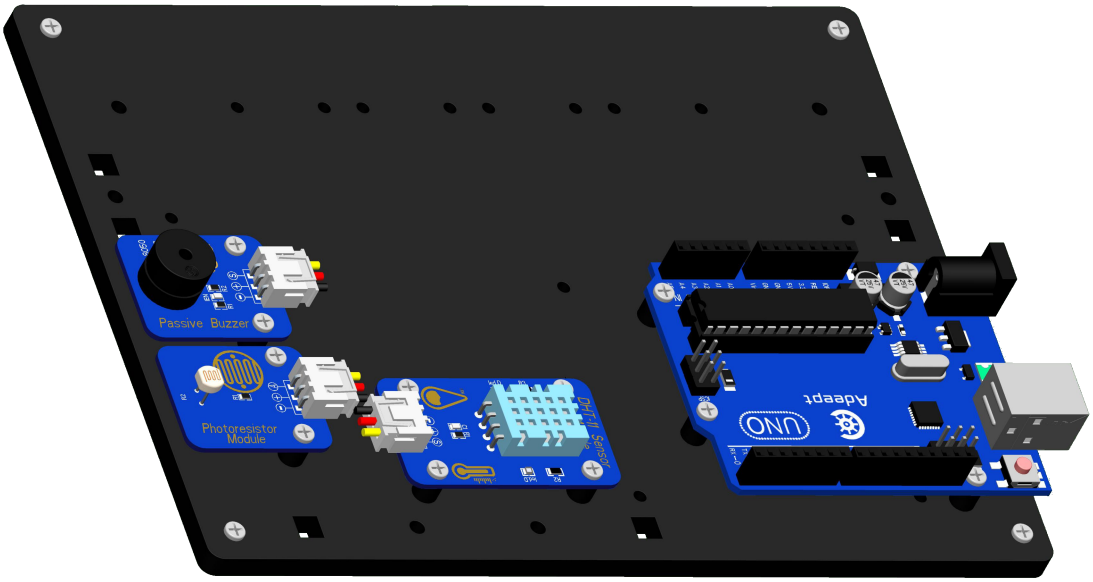


e. Mount the Adeept Passive Buzzer Module onto A01.

Assemble the following components

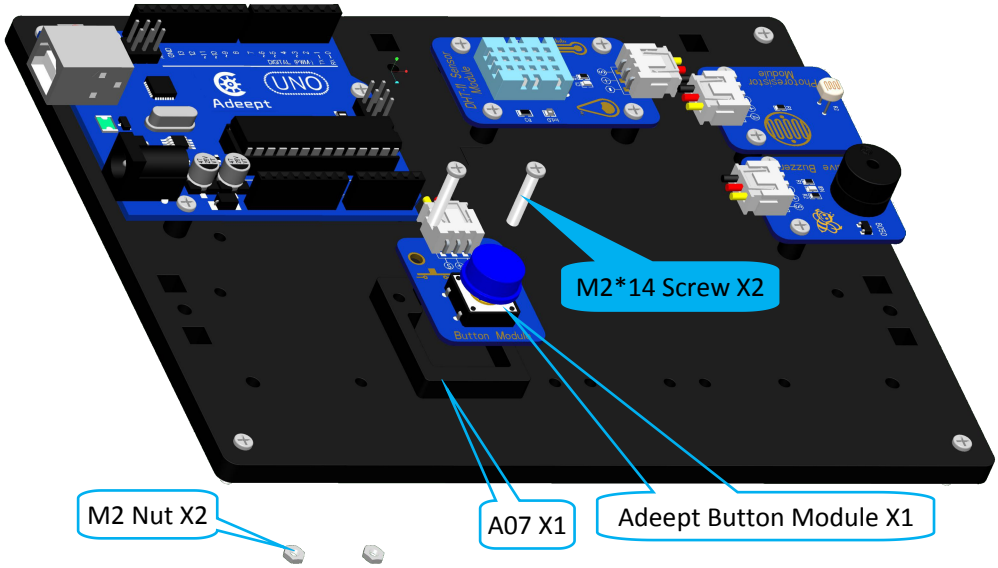


Effect diagram after assembling

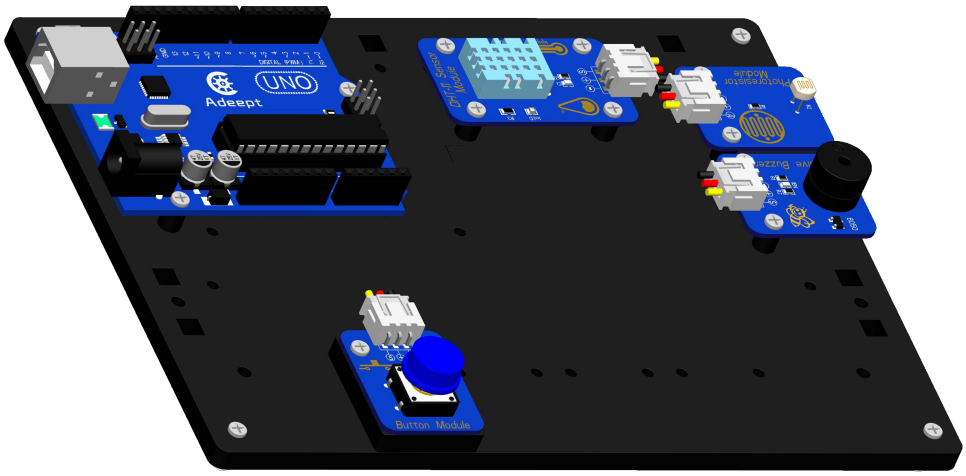


f. Fix the Adeept Button Module.

Assemble the following components

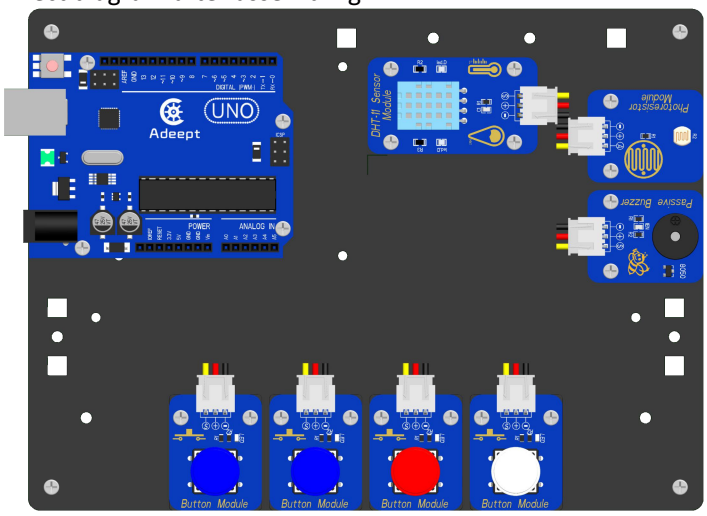


Effect diagram after assembling



Mount the rest three Adeept Button Modules onto the A01.

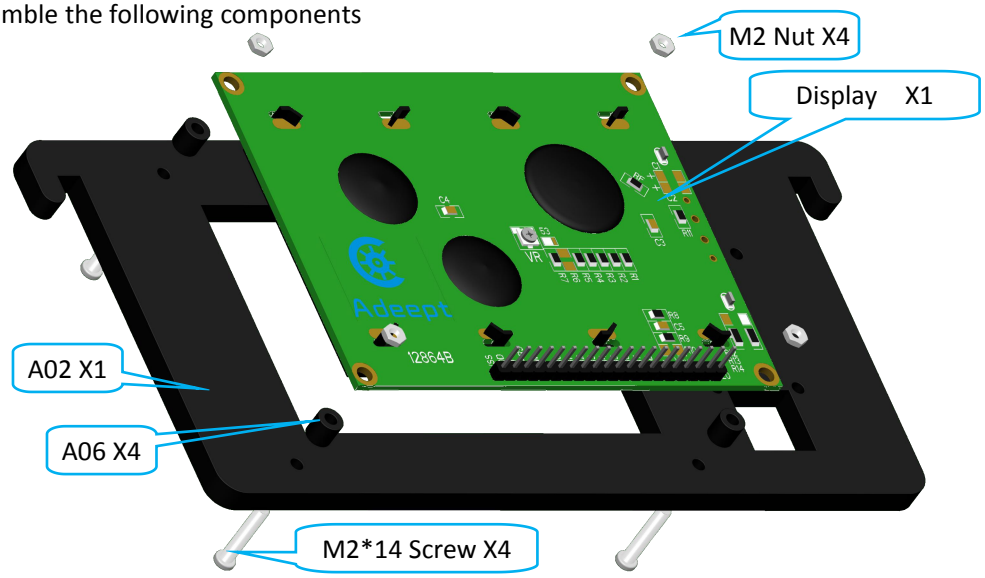
Effect diagram after assembling



Fasteners needed:
M2*14 Screw X6
A07 X3
M2 Nut X6

g. Fix the screen display onto A02.

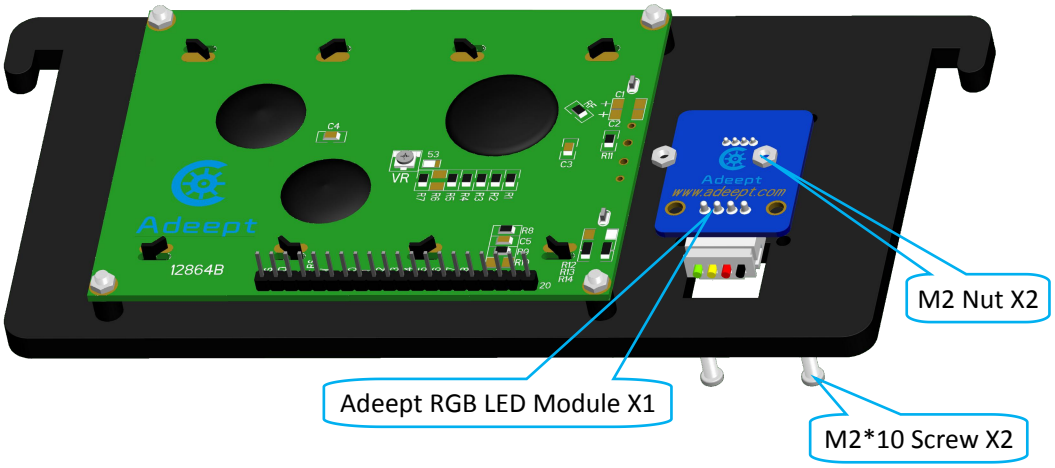
Assemble the following components



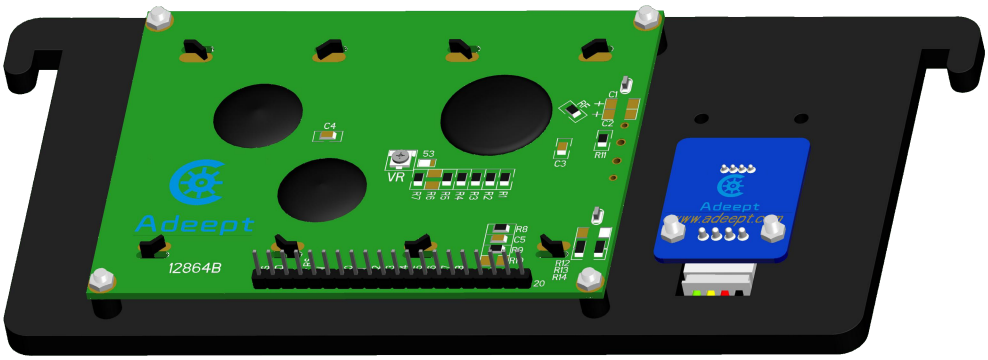
Effect diagram after assembling

h. Mount the Adeept RGB LED Module onto the plate

Assemble the following components

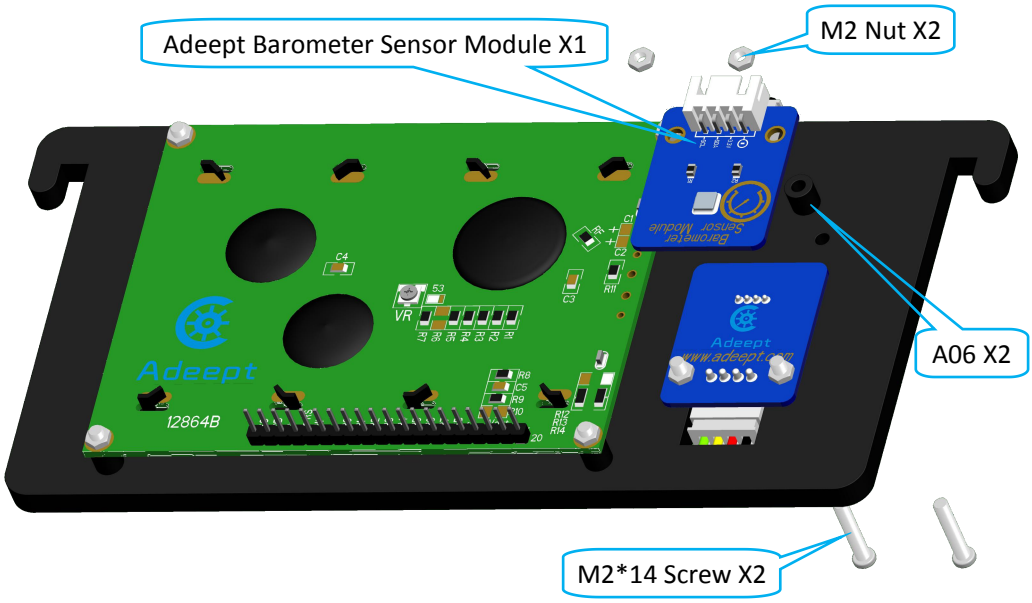


Effect diagram after assembling

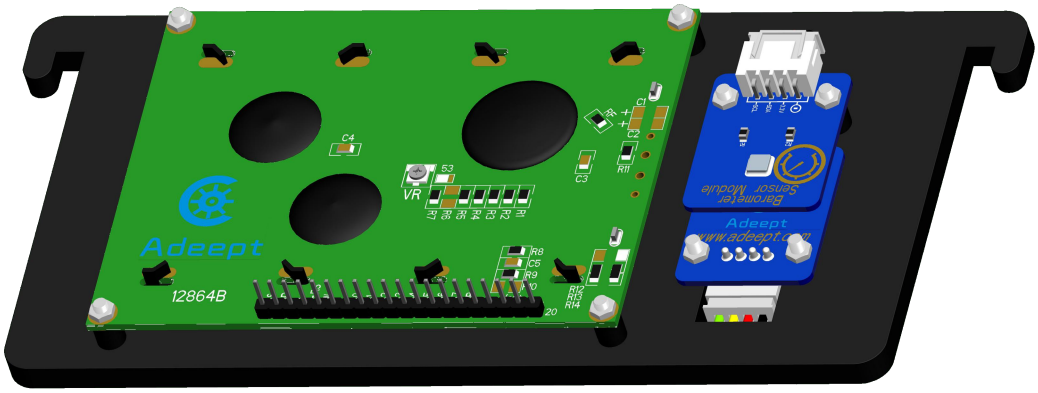


i. Fix the Adeept Barometer Sensor Module.

Assemble the following components

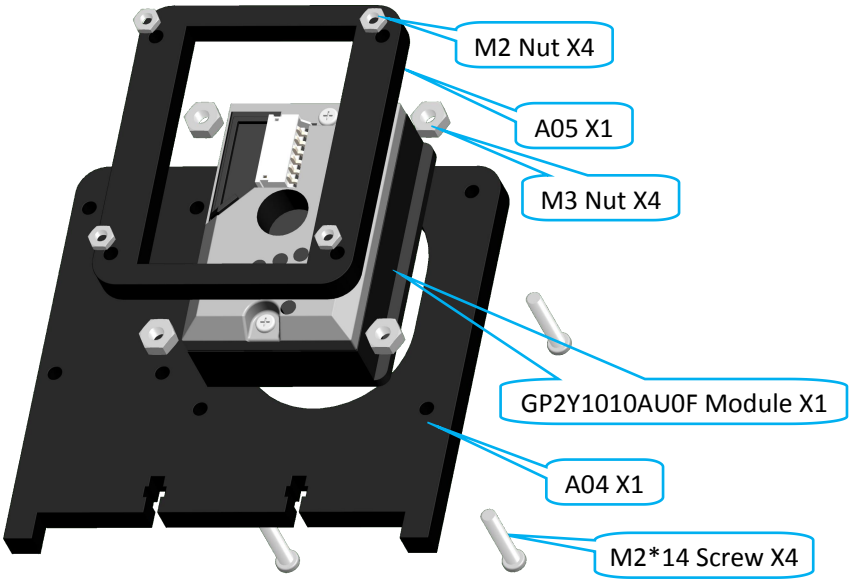


Effect diagram after assembling

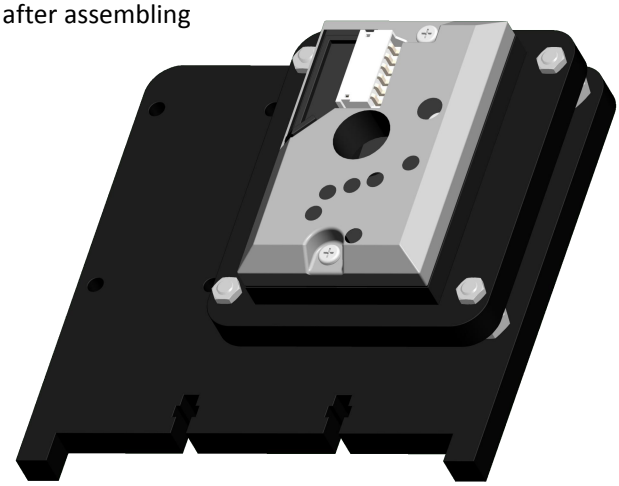


j.Mount the dust sensor.

Assemble the following components

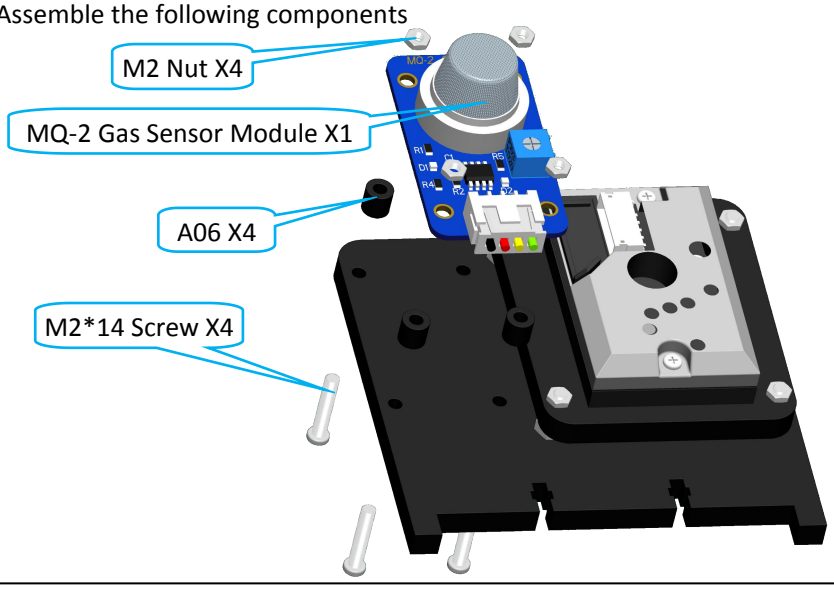


Effect diagram after assembling



k.Assemble the MQ-2 Gas Sensor Module.

Assemble the following components

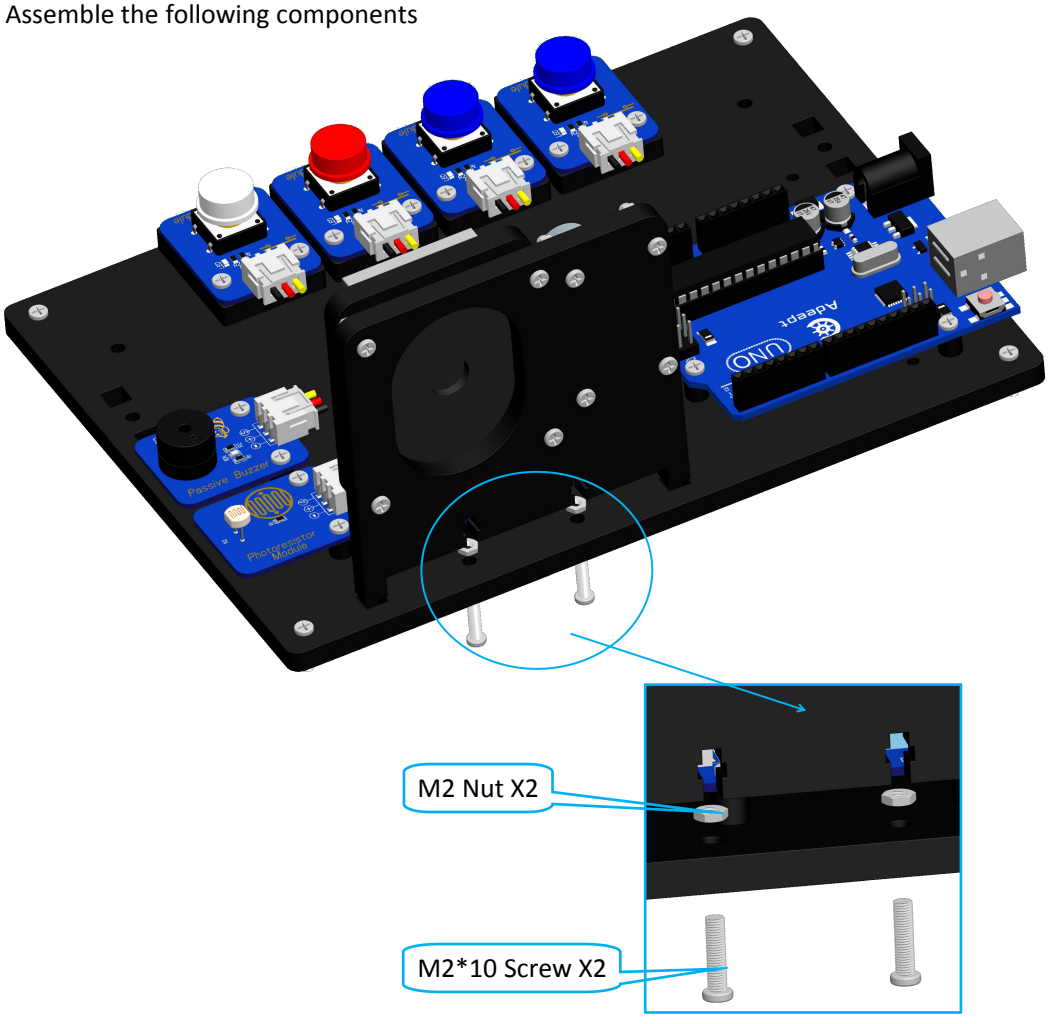


Effect diagram after assembling

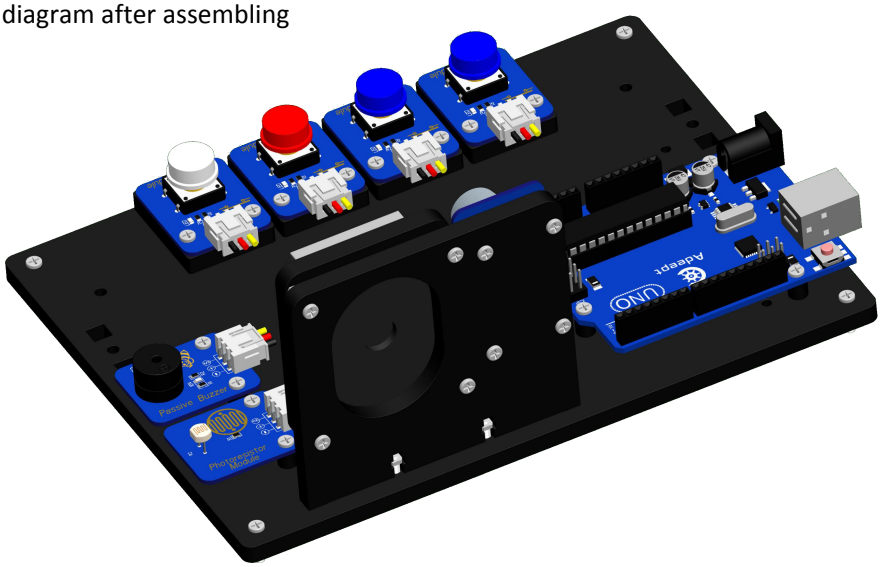
Assemble Acrylics

a. Assemble A04 plates onto the A01.

Assemble the following components

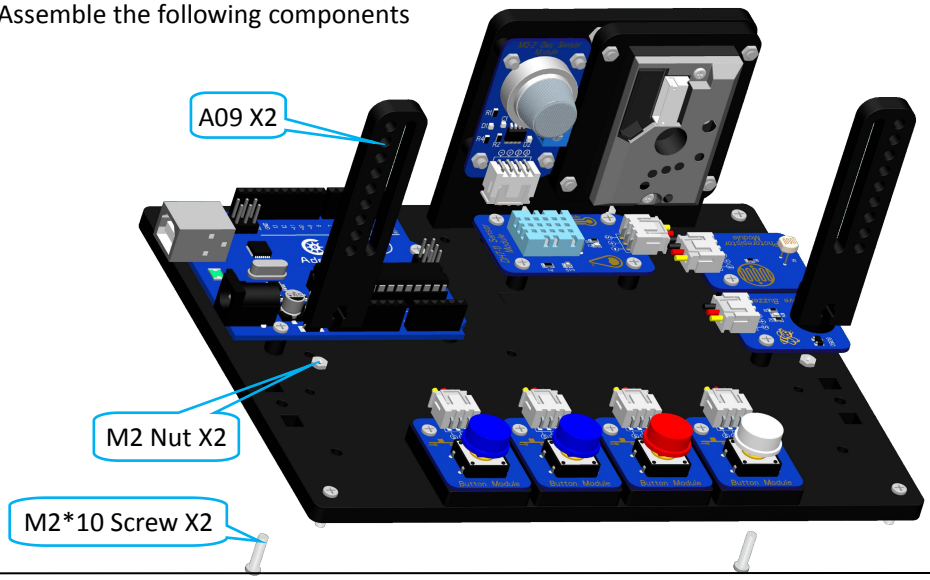


Effect diagram after assembling

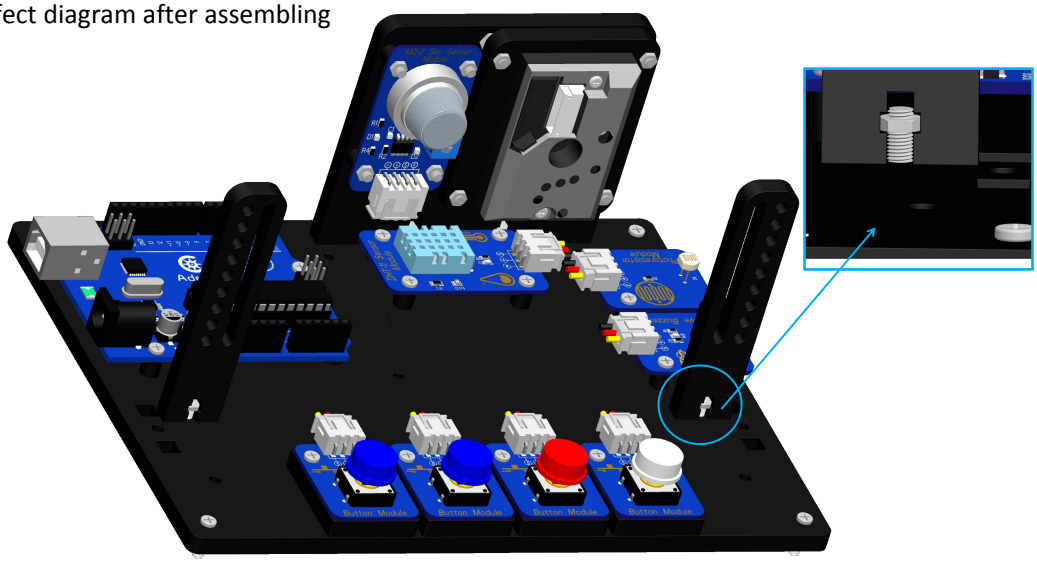


b. Assemble two A09 plates onto the A01.

Assemble the following components

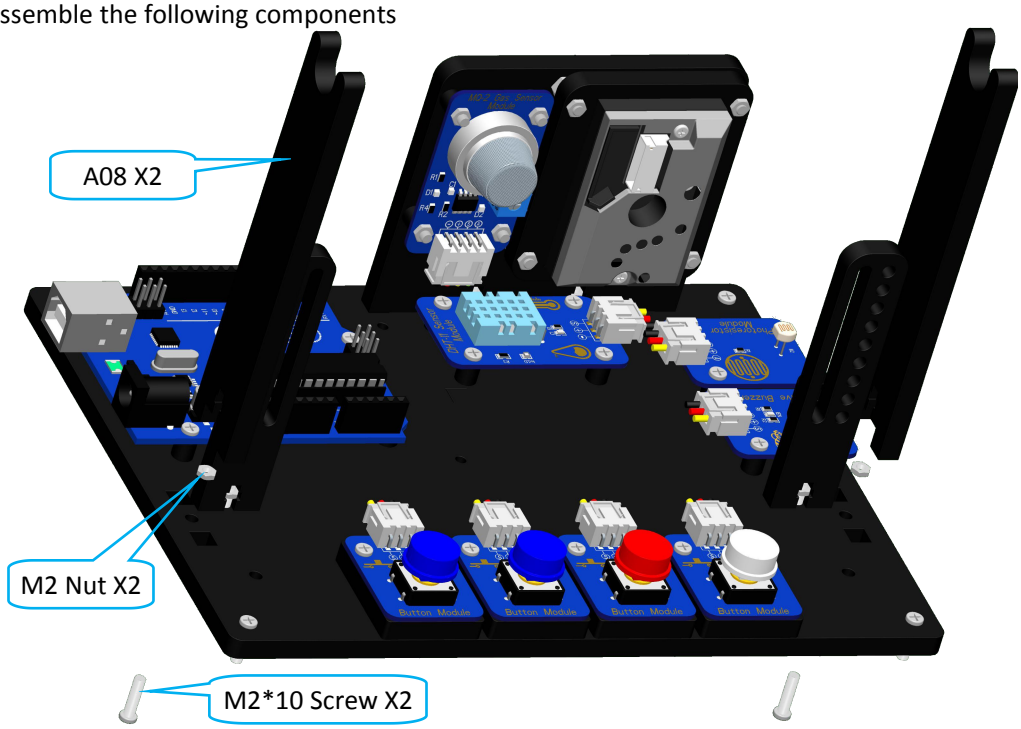


Effect diagram after assembling

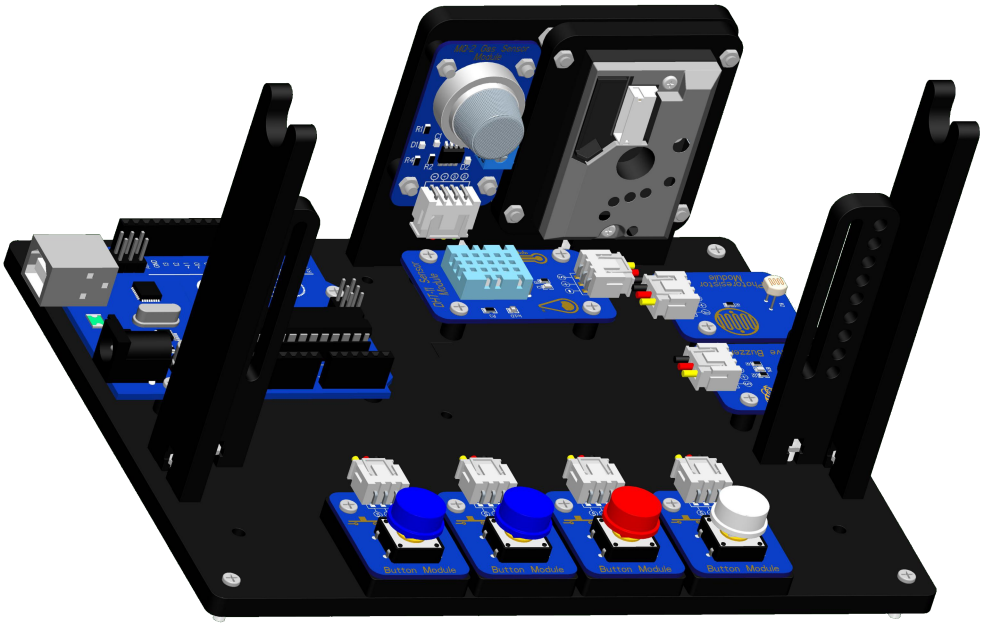


c. Assemble two A08 plates onto the A01.

Assemble the following components

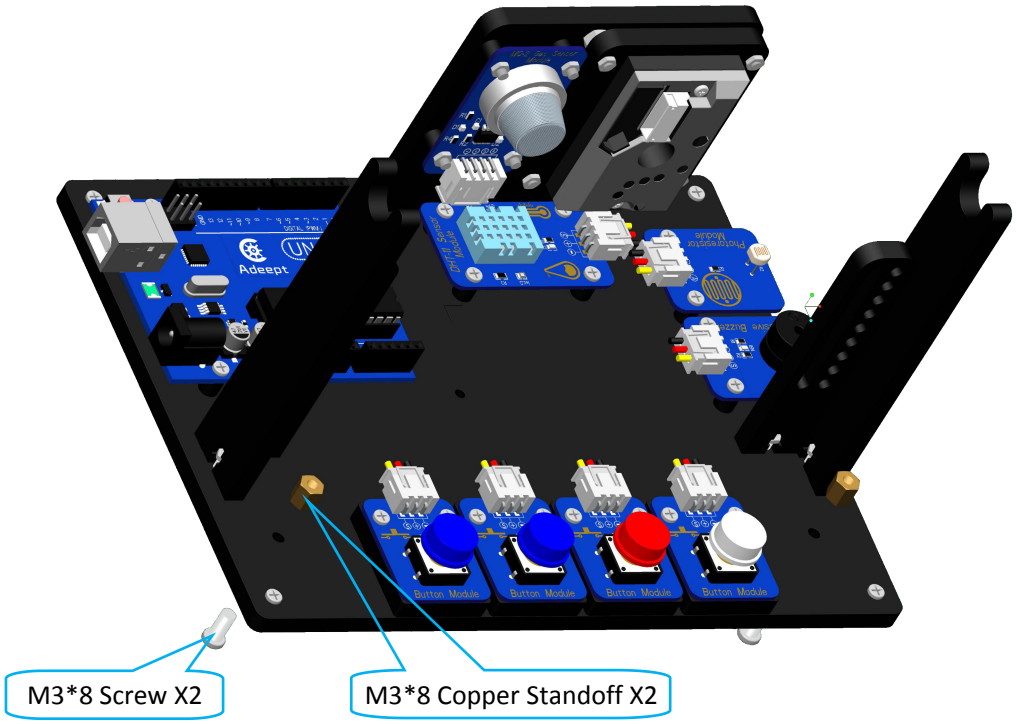


Effect diagram after assembling

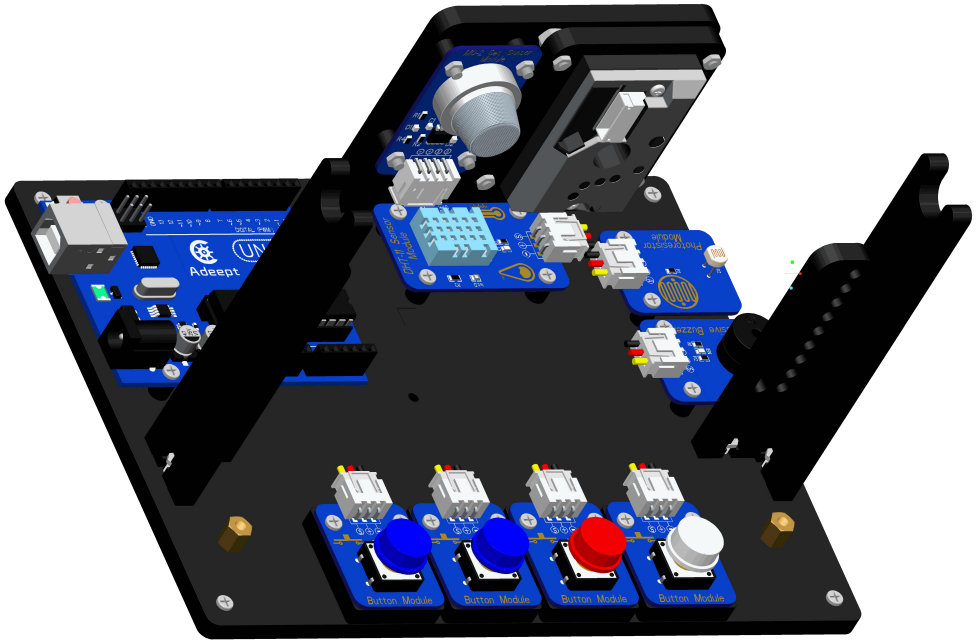


d. Mount the M3*8 Copper Standoff onto the acrylic A01.

Assemble the following components

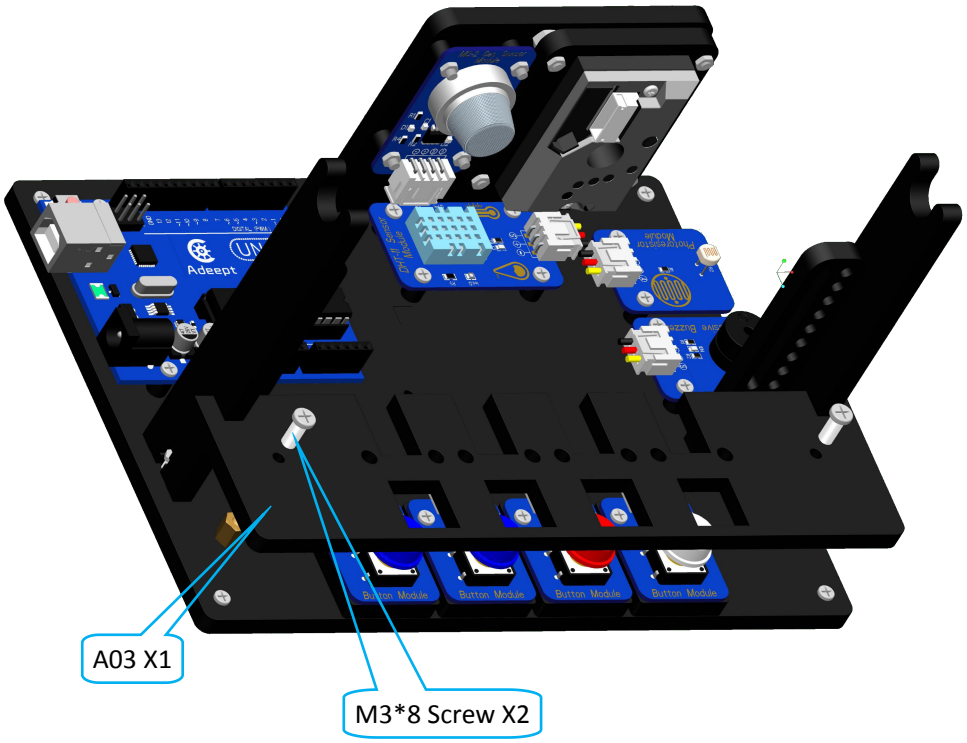


Effect diagram after assembling

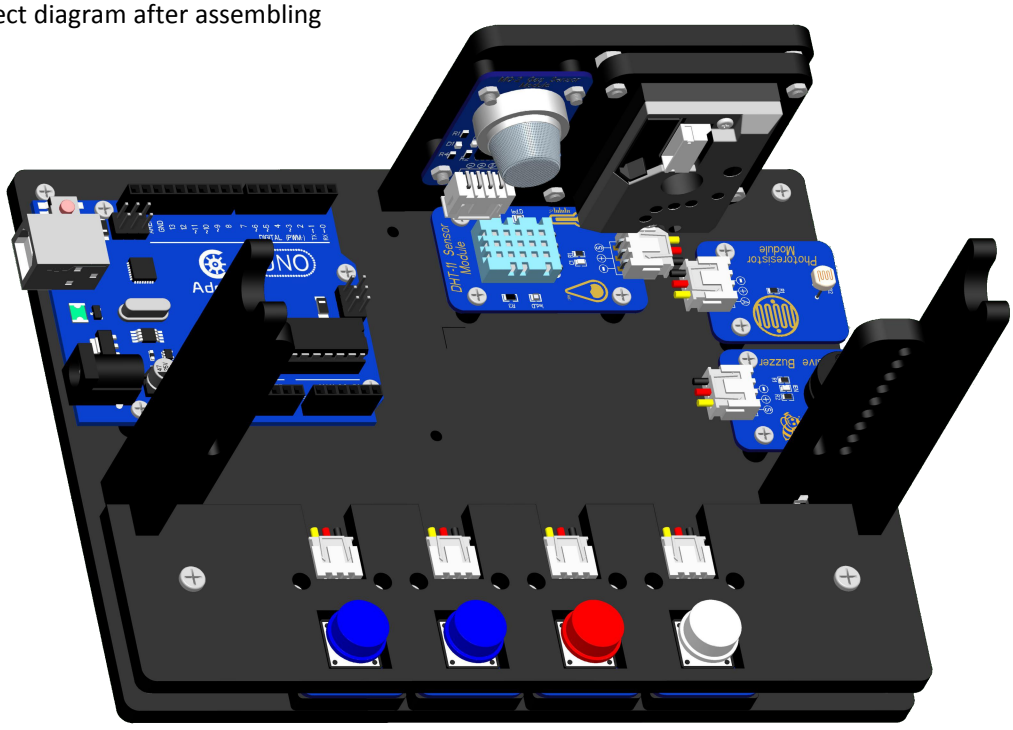


e. Assemble A03 plates onto the A01.

Assemble the following components

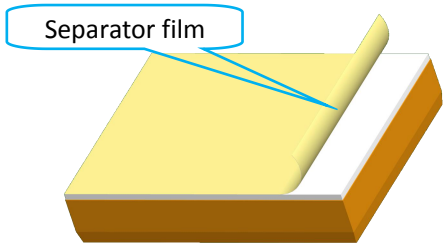


Effect diagram after assembling

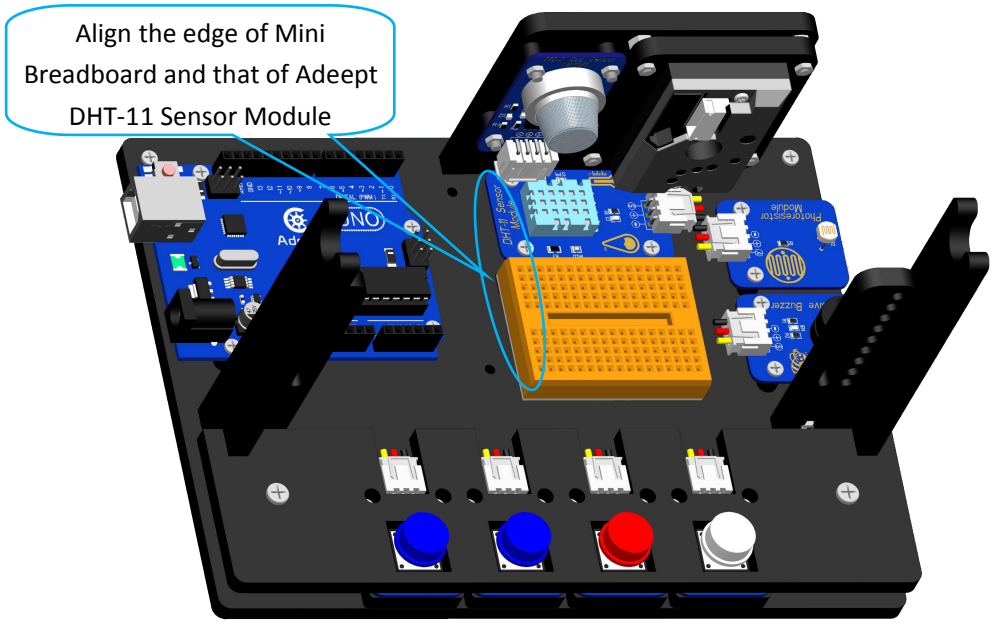


f. Stick the Mini Breadboard onto the plate

Remove the separator film on the back of Mini Breadboard



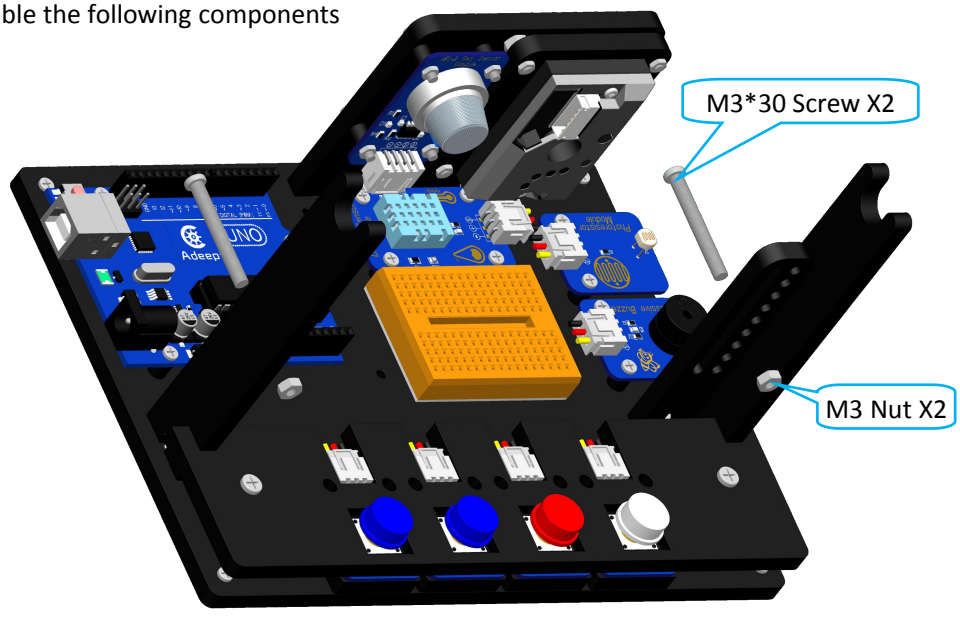
Stick the Mini Breadboard onto the plate as shown below:



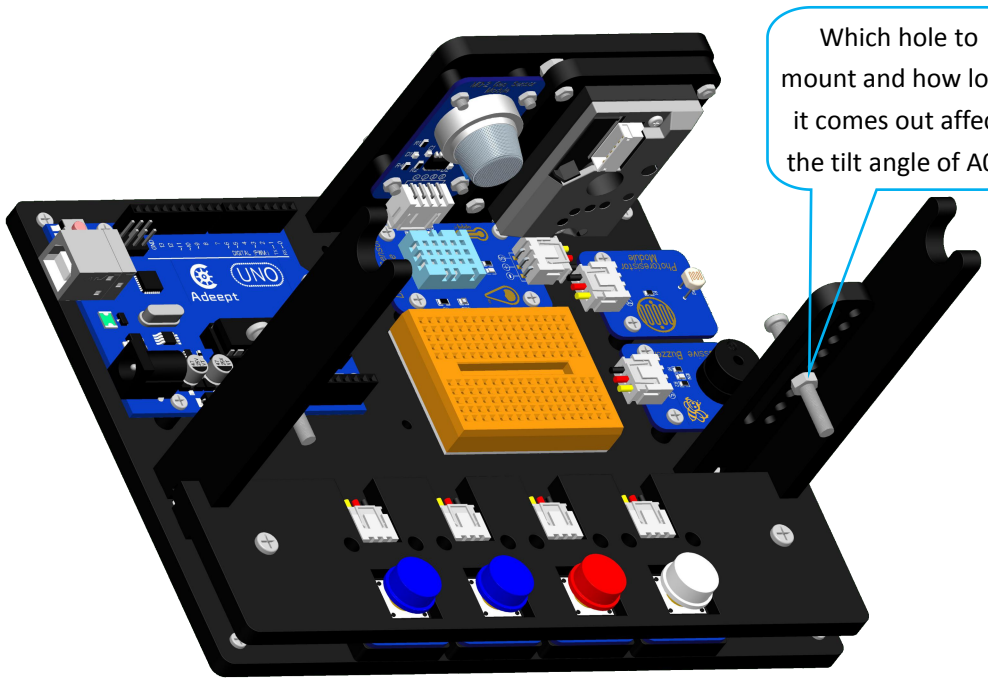
Adjust the Angle of Display Assembly

a. Mount the adjustment screws on the A09 plate.

Assemble the following components

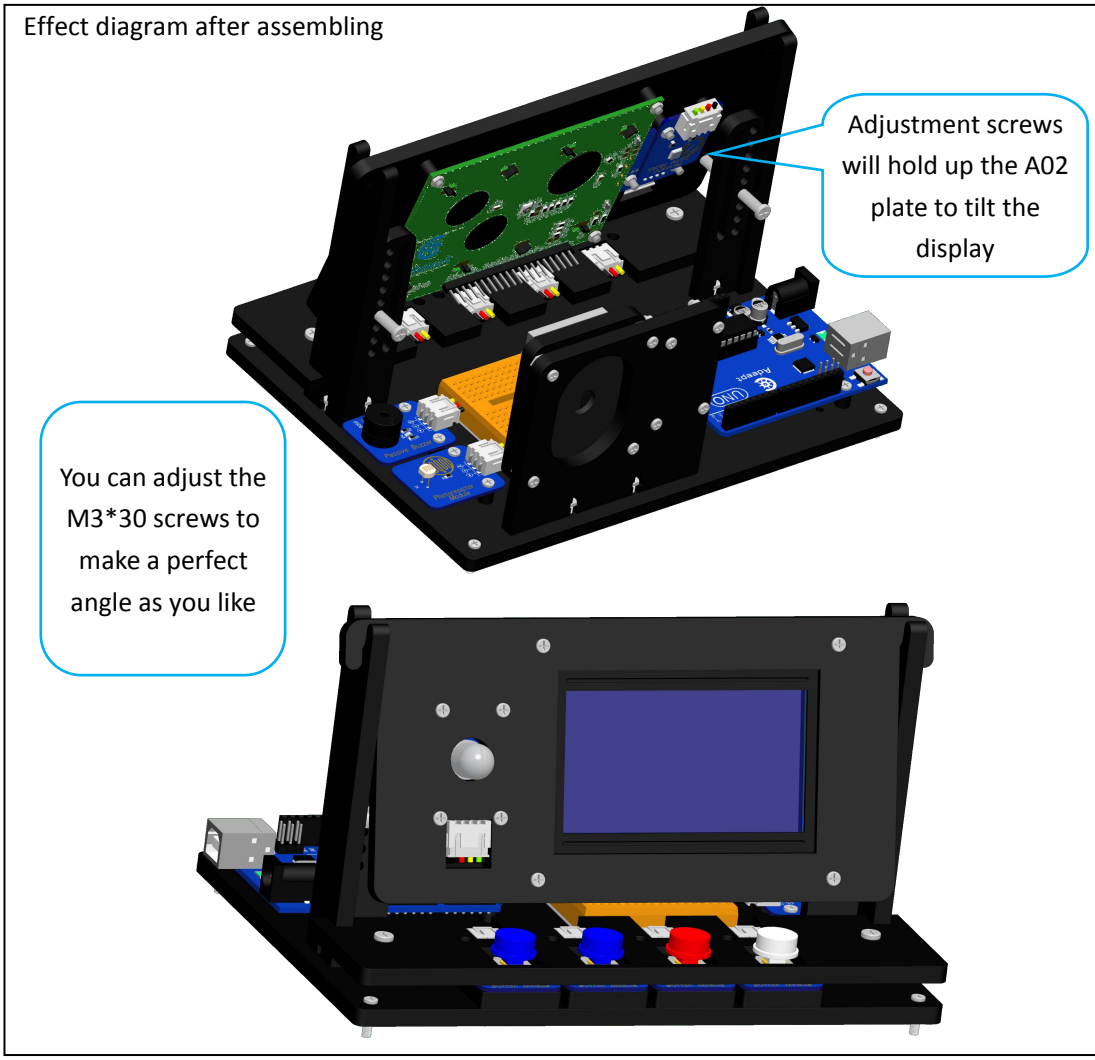


Effect diagram after assembling



b. Assemble the A02 on A09

Effect diagram after assembling



What is Arduino?

Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online. You can tell your board what to do by sending a set of instructions to the microcontroller on the board. To do so you use the Arduino programming language (based on Wiring), and the Arduino Software (IDE), based on Processing.

Over the years Arduino has been the brain of thousands of projects, from everyday objects to complex scientific instruments. A worldwide community of makers - students, hobbyists, artists, programmers, and professionals - has gathered around this open-source platform, their contributions have added up to an incredible amount of accessible knowledge that can be of great help to novices and experts alike.

Arduino was born at the Ivrea Interaction Design Institute as an easy tool for fast prototyping, aimed at students without a background in electronics and programming. As soon as it reached a wider community, the Arduino board started changing to adapt to new needs and challenges, differentiating its offer from simple 8-bit boards to products for IoT applications, wearable, 3D printing, and embedded environments. All Arduino boards are completely open-source, empowering users to build them independently and eventually adapt them to their particular needs. The software, too, is open-source, and it is growing through the contributions of users worldwide.

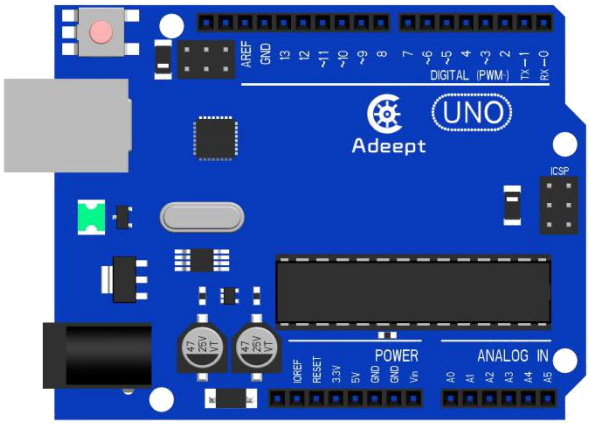
Why Arduino?

Thanks to its simple and accessible user experience, Arduino has been used in thousands of different projects and applications. The Arduino software is easy-to-use for beginners, yet flexible enough for advanced users. It runs on Mac, Windows, and Linux. Teachers and students use it to build low cost scientific instruments, to prove chemistry and physics principles, or to get started with programming and robotics. Designers and architects build interactive prototypes, musicians and artists use it for installations and to experiment with new musical instruments. Makers, of course, use it to build many of the projects exhibited at the Maker Faire, for example. Arduino is a key tool to learn new things. Anyone - children, hobbyists, artists, programmers - can start tinkering just following the step by step instructions of a kit, or sharing ideas online with other members of the Arduino community.

How Should I Use Arduino?

If you are a beginner with Arduino, Arduino learning kits on our website www.adeept.com would be a prefect step into this fantastic field!

Adeept UNO R3 Board V1.0



Power

The Adeept Uno board can be powered via the USB connection or with an external power supply. The power source is selected automatically.

External (non-USB) power can come either from an AC-to-DC adapter (wall-wart) or battery. The adapter can be connected by plugging a 2.1mm center-positive plug into the board's power jack. Leads from a battery can be inserted in the GND and Vin pin headers of the POWER connector.

The board can operate on an external supply from 6 to 20 volts. If supplied with less than 7V, however, the 5V pin may supply less than five volts and the board may become unstable. If using more than 12V, the voltage regulator may overheat and damage the board. The recommended range is 7 to 12 volts.

The power pins are as follows:

Vin. The input voltage to the Adeept board when it's using an external power source (as opposed to 5 volts from the USB connection or other regulated power source). You can supply voltage through this pin, or, if supplying voltage via the power jack, access it through this pin.

5V.This pin outputs a regulated 5V from the regulator on the board. The board can be supplied with power either from the DC power jack (7 - 12V), the USB connector (5V), or the VIN pin of the board (7-12V). Supplying voltage via the 5V or 3.3V pins bypasses the regulator, and can damage your board. We don't advise it.

3V3. A 3.3 volt supply generated by the on-board regulator. Maximum current draw is 50 mA.

GND. Ground pins.

IOREF. This pin on the Adeept board provides the voltage reference with which the microcontroller operates. A properly configured shield can read the IOREF pin voltage and select the appropriate power source or enable voltage translators on the outputs to work with the 5V or 3.3V.

Input and Output

Each of the 14 digital pins on the Uno can be used as an input or output, using pinMode(), digitalWrite(), and digitalRead() functions. They operate at 5 volts. Each pin can provide or

receive 20 mA as recommended operating condition and has an internal pull-up resistor (disconnected by default) of 20-50k ohm. A maximum of 40mA is the value that must not be exceeded on any I/O pin to avoid permanent damage to the microcontroller.

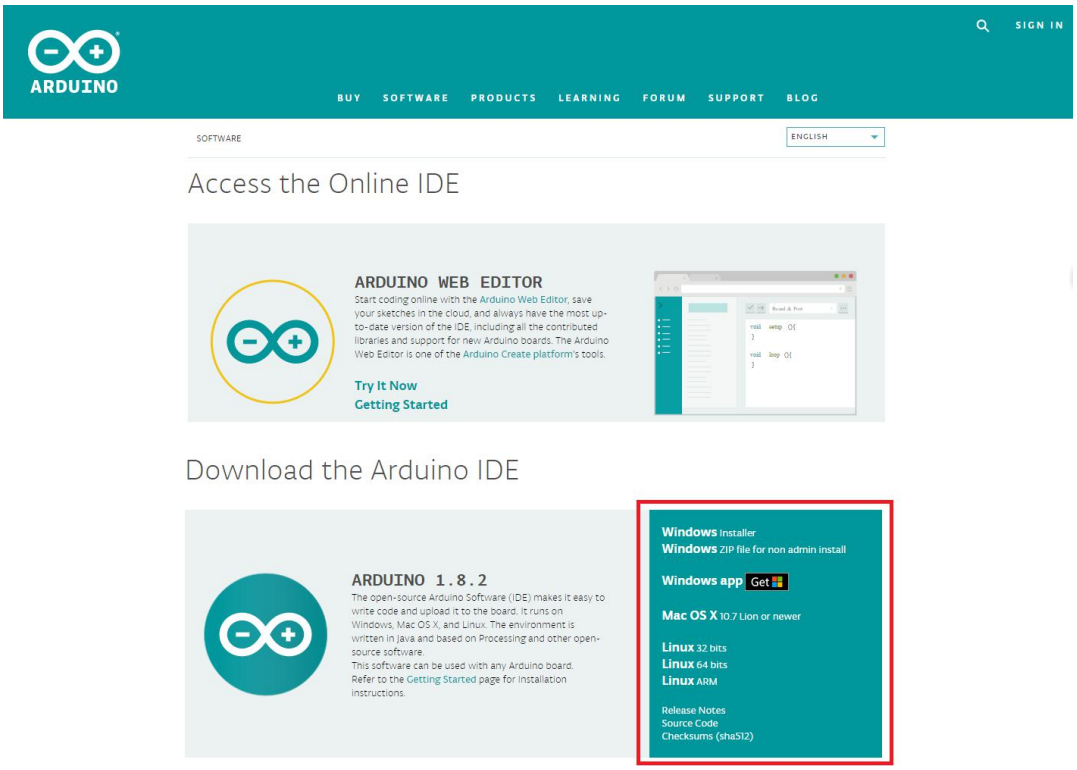
In addition, some pins have specialized functions:
Serial:0 (RX) and 1 (TX). Used to receive (RX) and transmit (TX) TTL serial data. These pins are connected to the corresponding pins of the ATmega8U2 USB-to-TTL Serial chip.
External Interrupts: 2 and 3. These pins can be configured to trigger an interrupt on a low value, a rising or falling edge, or a change in value. See the attachInterrupt() function for details.
PWM: 3, 5, 6, 9, 10, and 11. Provide 8-bit PWM output with the analogWrite() function.
SPI: 10 (SS), 11 (MOSI), 12 (MISO), 13 (SCK). These pins support SPI communication using the SPI library.
LED: 13. There is a built-in LED driven by digital pin 13. When the pin is HIGH value, the LED is on, when the pin is LOW, it's off.
TWI: A4 or SDA pin and A5 or SCL pin. Support TWI communication using the Wire library.

The Uno has 6 analog inputs, labeled A0 through A5, each of which provide 10 bits of resolution (i.e. 1024 different values). By default they measure from ground to 5 volts, though is it possible to change the upper end of their range using the AREF pin and the analogReference() function.

There are a couple of other pins on the board:
AREF. Reference voltage for the analog inputs. Used with analogReference().
Reset. Bring this line LOW to reset the microcontroller. Typically used to add a reset button to shields which block the one on the board.

Arduino Software (IDE)

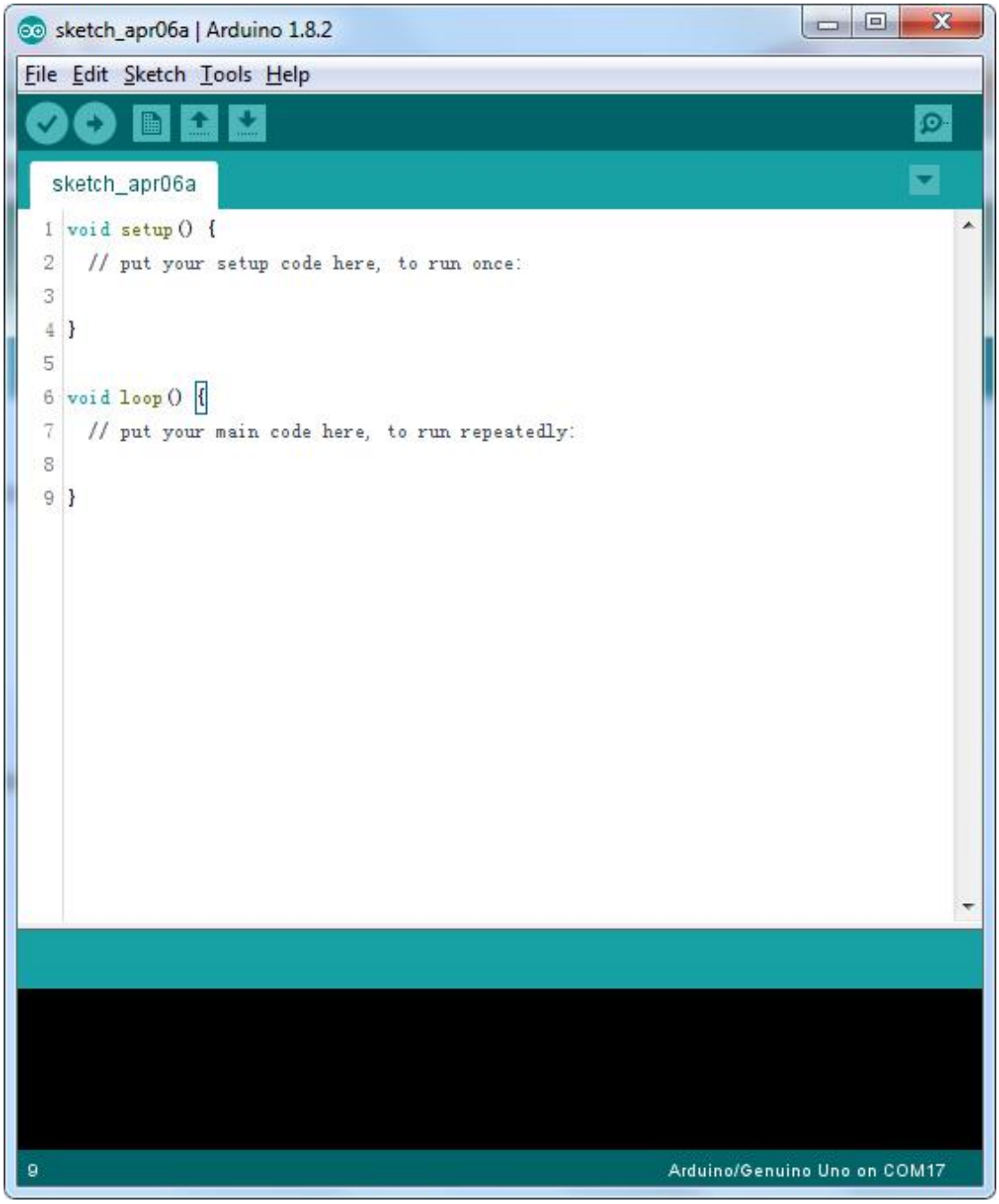
Arduino Software (IDE) is used to write and upload the code for Arduino Board. First, install Arduino software (IDE): visit https://www.arduino.cc/en/Main/Software. Download the corresponding installation program according to your operating system. If you are aWindows user, please select the “Windows Intaller” to download and install the driver correctly.



After the download completes, run the installer. For Windows users, there may pop up an installation dialog box of the driver during the installation . Please agree the installation when it appears.

After installation is completed, an Arduino software shortcut will be generated on the desktop. Run the ide.

The interface of Arduino software is as follows:



The Arduino Integrated Development Environment - or Arduino Software (IDE) - contains a text editor for writing code, a message area, a text console, a toolbar with buttons for common functions and a series of menus. It connects to the Arduino and Genuino hardware to upload programs and communicate with them.

Verify : Checks your code for errors when compiling it.

Upload : Compiles your code and uploads it to the configured board.

Before uploading your sketch, you need to select the correct items from the **Tools > Board** and **Tools > Port** menus. The boards are described below. On the Mac OS X, the serial port is probably

something like **/dev/tty.usbmodem241** (for an Uno or Mega2560 or Leonardo) or **/dev/tty.usbserial-1B1** (for a Duemilanove or earlier USB board), or **/dev/tty.USA19QW1b1P1.1** (for a serial board connected with a Keyspan USB-to-Serial adapter). On Windows, it's probably **COM1** or **COM2** (for a serial board) or **COM4,COM5**, **COM7**, or higher (for a USB board) - to find out, you look for USB serial device in the ports section of the Windows **Device Manager**. On Linux, it should be **/dev/ttyACMx , /dev/ttyUSBx** or similar.

Once you've selected the correct serial port and board, press the upload button in the toolbar or select the **Upload** item from the **Sketch** menu. Current Arduino boards will reset automatically and begin the upload. With older boards (pre-Diecimila) that lack auto-reset, you'll need to press the reset button on the board just before starting the upload. On most boards, you'll see the RX and TX LEDs blink as the sketch is uploaded. The Arduino Software (IDE) will display a message when the upload is completed, or show an error.

When you upload a sketch, you're using the Arduino bootloader, a small program that has been loaded on to the microcontroller on your board. It allows you to upload code without using any additional hardware. The bootloader is active for a few seconds when the board resets; then it starts whichever sketch was most recently uploaded to the microcontroller. The bootloader will blink the on-board (pin 13) LED when it starts (i.e. when the board resets).

Note:If you are using an external programmer with your board, you can hold down the "shift" key on your computer when using this icon. The text will change to "Upload using Programmer"

 New: Creates a new sketch.

 Open: Presents a menu of all the sketches in your sketchbook. Clicking one will open it within the current window overwriting its content.
Note:Due to a bug in Java, this menu doesn't scroll; if you need to open a sketch late in the list, use the File | Sketchbook menu instead.

 Save: Saves your sketch.

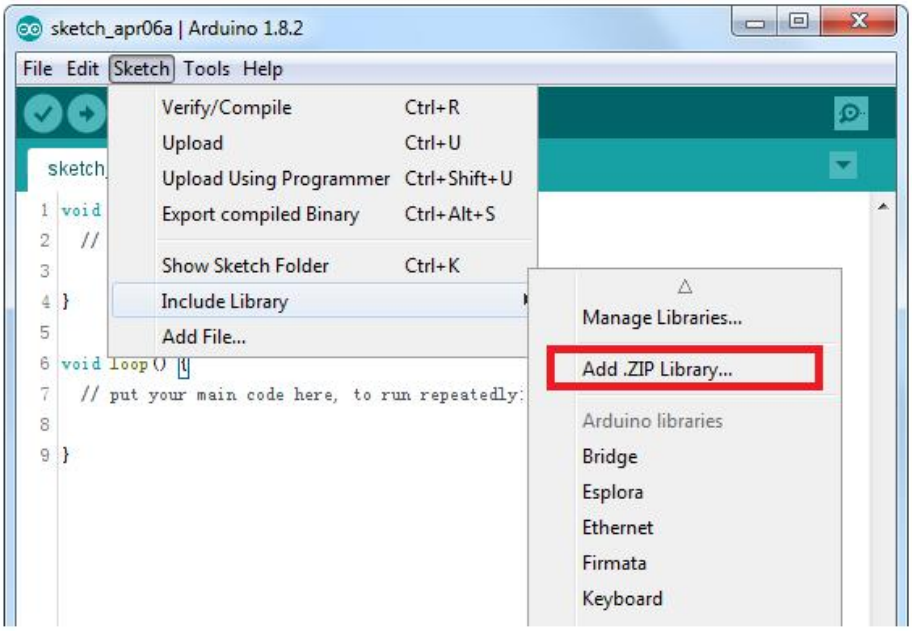
 Serial Monitor: Opens the serial monitor.

Additional commands are found within the five menus: **File**, **Edit**, **Sketch**, **Tools**, and **Help**. The menus are context sensitive, which means only those items relevant to the work currently being carried out are available.

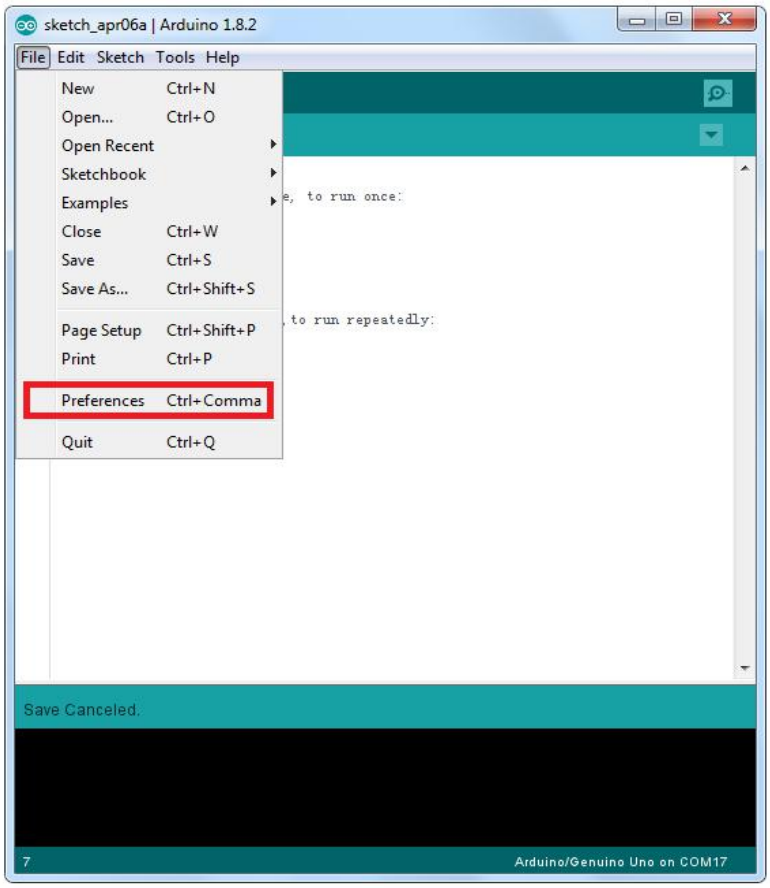
Since version 1.0, files are saved with an **.ino** file extension. Previous versions use the **.pde** extension. You may still open **.pde** named files in version 1.0 and later, and the software will automatically rename the extension to **.ino.**

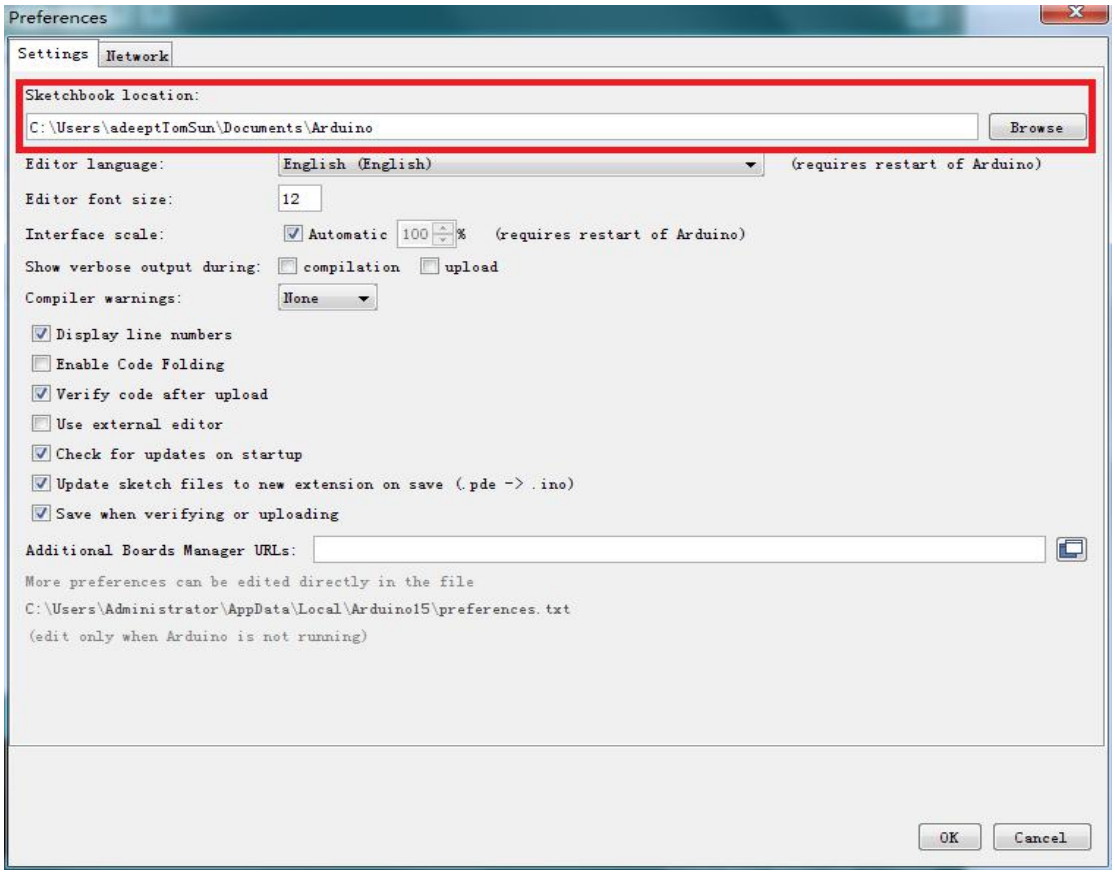
Install Library

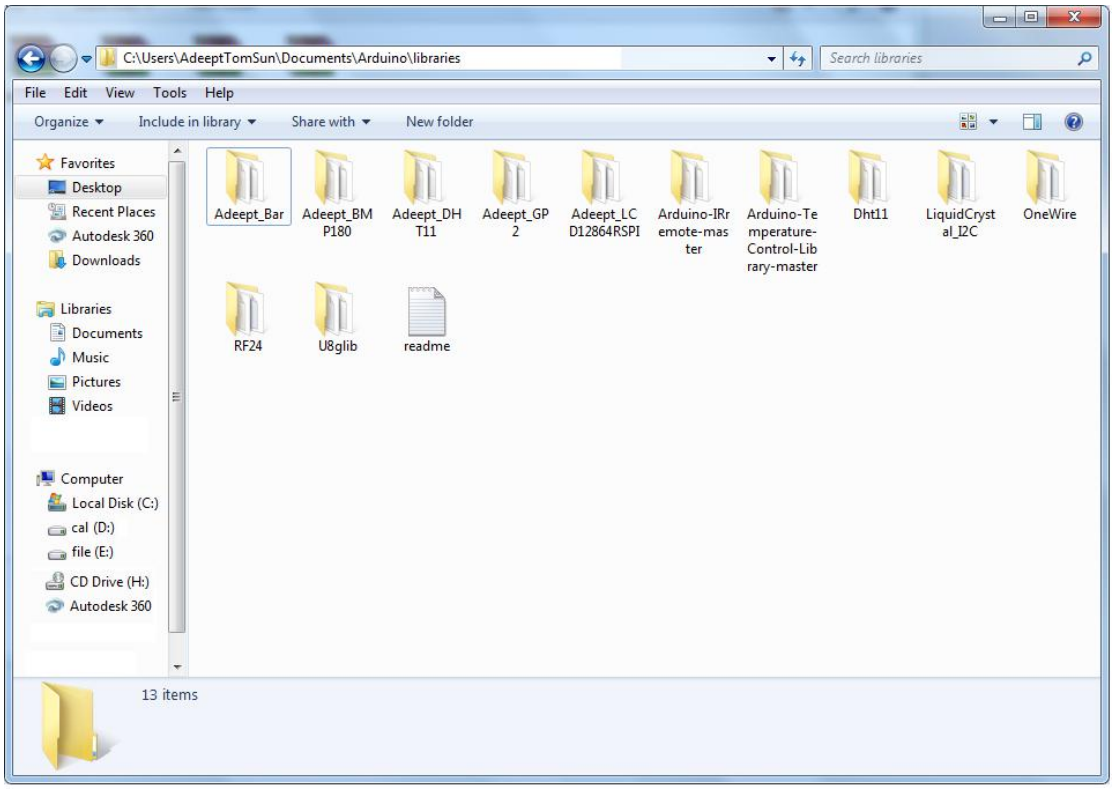
The example sketches provided use the *Adeept_BMP180.ZIP* library, Adeept_DHT11.*ZIP* library, Adeept_GP2.*ZIP* library, Adeept_LCD12864RSPI.*ZIP* library, U8glib.ZIP, so you need to install it before compiling. Click **Add.ZIP Library...** to add the*Adeept_BMP180.ZIP*, Adeept_DHT11.*ZIP*, Adeept_GP2.*ZIP*, Adeept_LCD12864RSPI.*ZIP*, U8glib.ZIP,to the *libraries* folder.



After the library is installed successfully, you can find the *Adeept_BMP180* library, Adeept_DHT11 library,Adeept_GP2 library, Adeept_LCD12864RSPI library, U8glib library, under **Sketchbook location:** on the window popped up by clicking Preferences.


sketch_apr06a | Arduino 1.8.2
File Edit Sketch Tools Help
New Ctrl+N
Open... Ctrl+O
Open Recent
Sketchbook
Examples
Close Ctrl+W
Save Ctrl+S
Save As... Ctrl+Shift+S
Page Setup Ctrl+Shift+P
Print Ctrl+P
Preferences Ctrl+Comma
Quit Ctrl+Q
e, to run once:
to run repeatedly:
Save Canceled.
7
Arduino/Genuino Uno on COM17

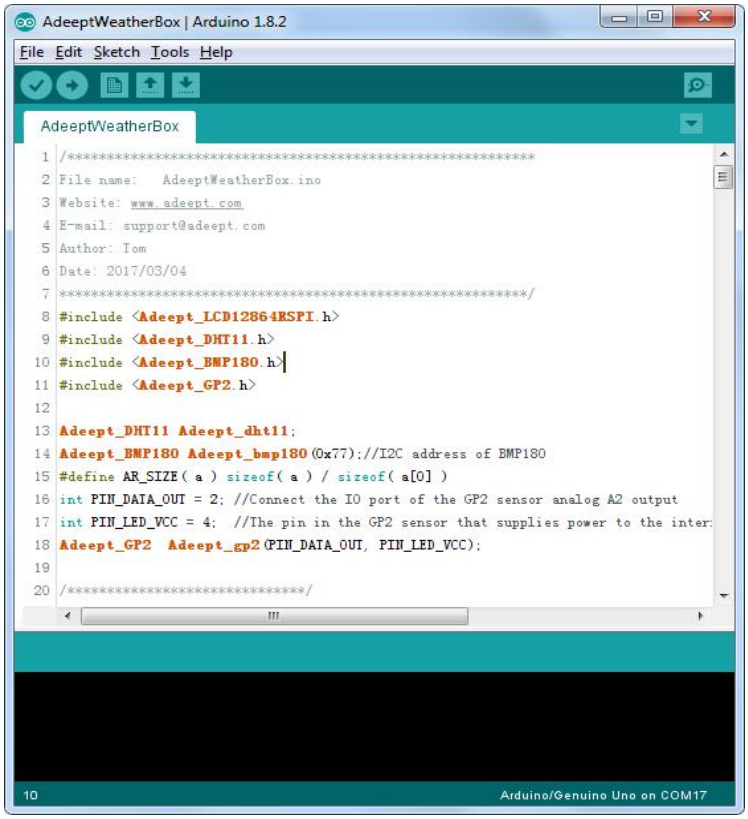

Preferences
Settings Network
Sketchbook location:
C:\Users\adeeptTomSun\Documents\Arduino
Browse
Editor language:
English (English)
(requires restart of Arduino)
Editor font size:
12
Interface scale:
Automatic 100 %
(requires restart of Arduino)
Show verbose output during:
compilation
upload
Compiler warnings:
None
Display line numbers
Enable Code Folding
Verify code after upload
Use external editor
Check for updates on startup
Update sketch files to new extension on save (.pde -> .ino)
Save when verifying or uploading
Additional Boards Manager URLs:
More preferences can be edited directly in the file
C:\Users\Administrator\AppData\Local\Arduino15\preferences.txt
(edit only when Arduino is not running)
OK
Cancel



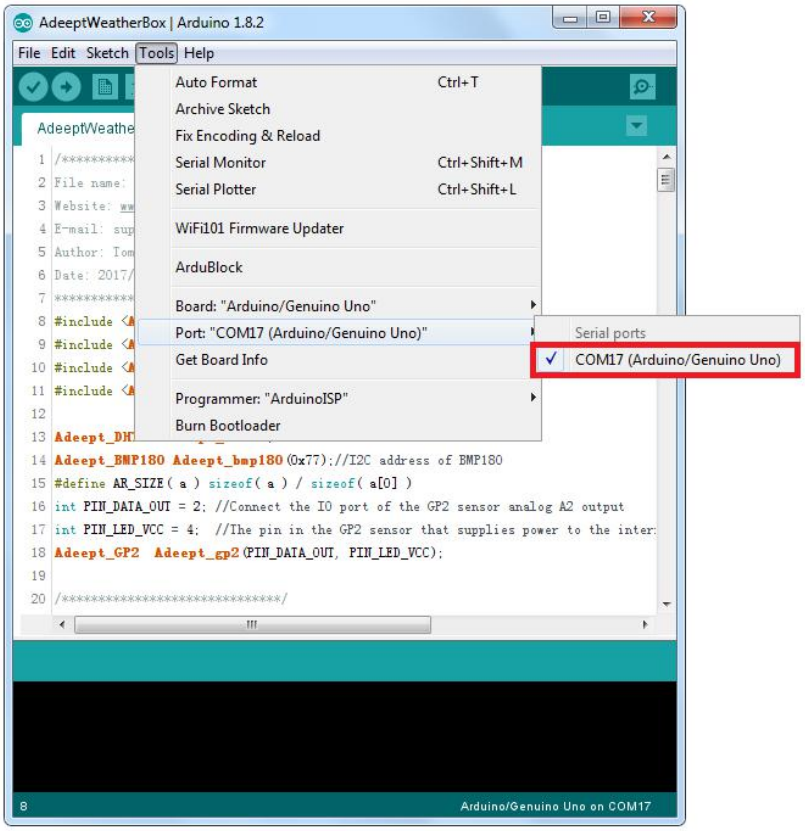
Upload Program

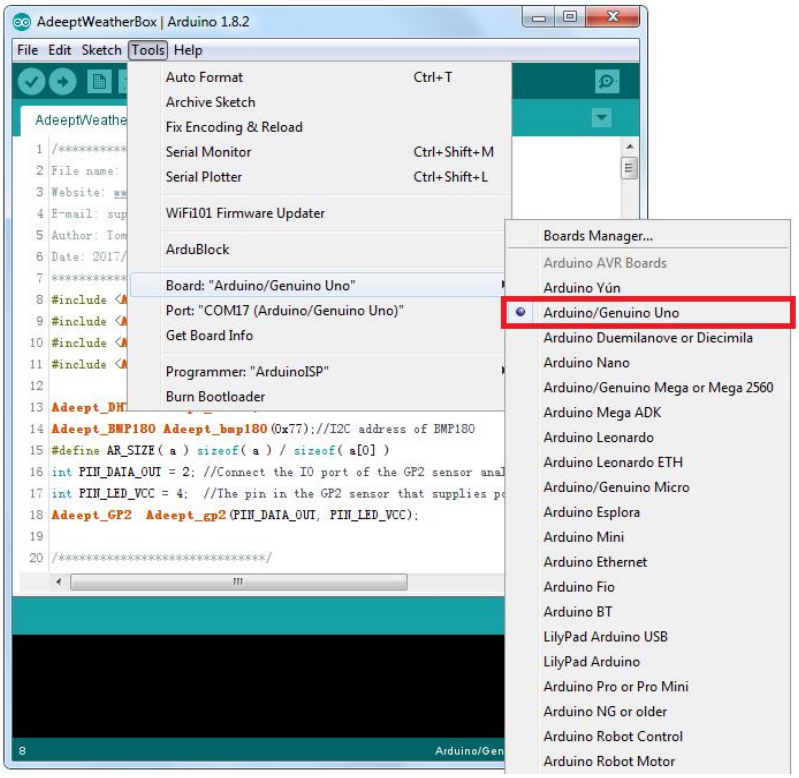
After the preparations above, next we will upload the program (example sketches provided) to the Adeept UNO R3 boards.

First, upload sketch to the Adeept UNO R3. Open the program provided for the control board, the file "*AdeeptWeatherBox.ino*".



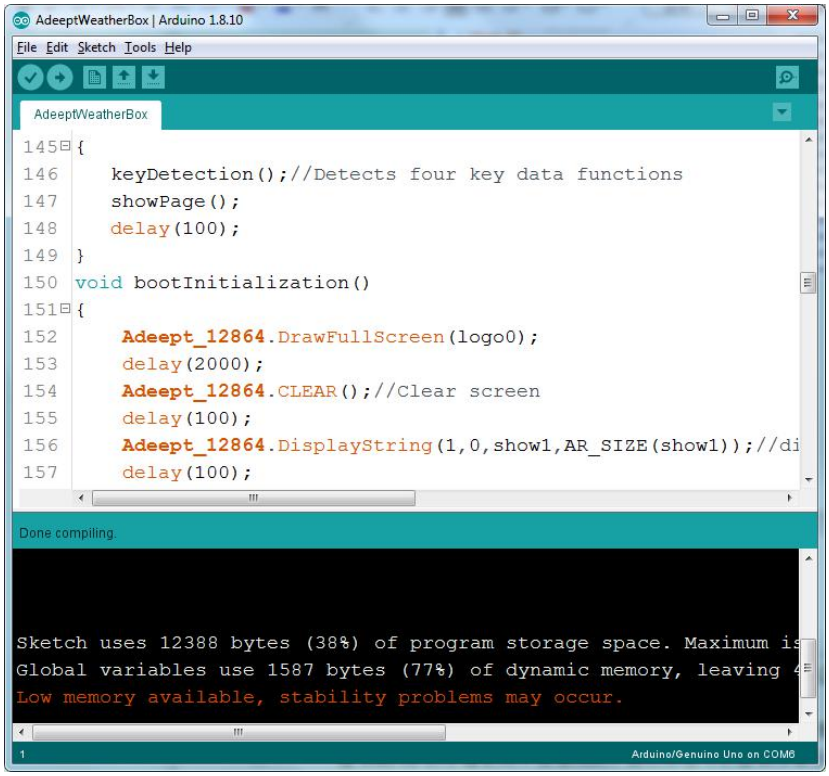
Connect the Arduino UNO R3 board to the PC. Select **Tool** ->**Board "Arduino/Genuino Uno"**, and **Port** - >**COM17**. Also here is COM17, assigned to the Uno, but it can be COM1, COM2, COM3...



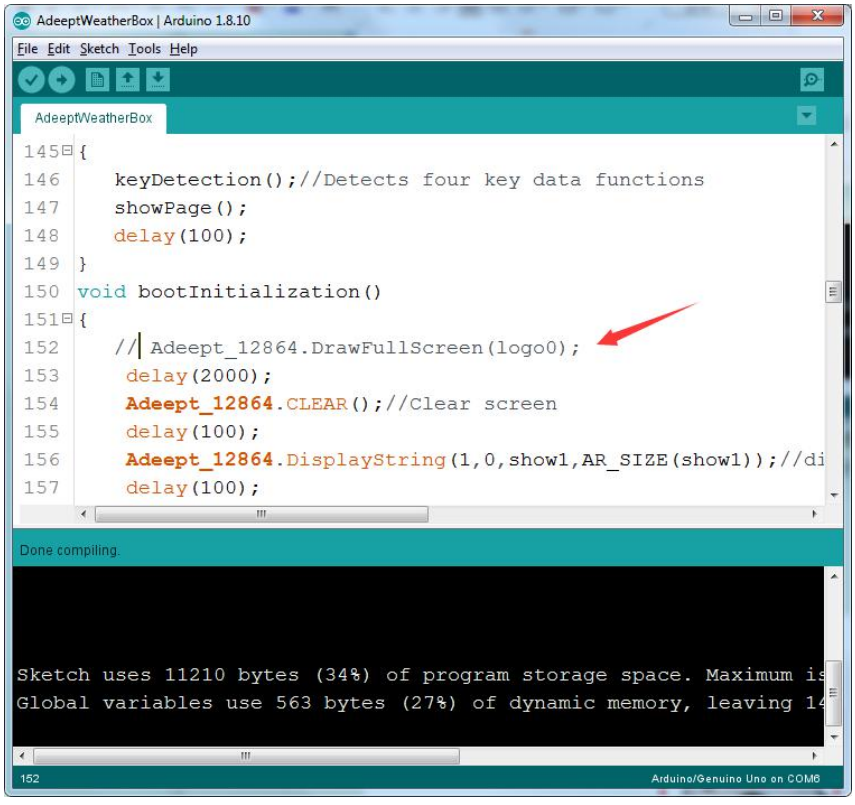


Click the button  to upload the sketch to the board.

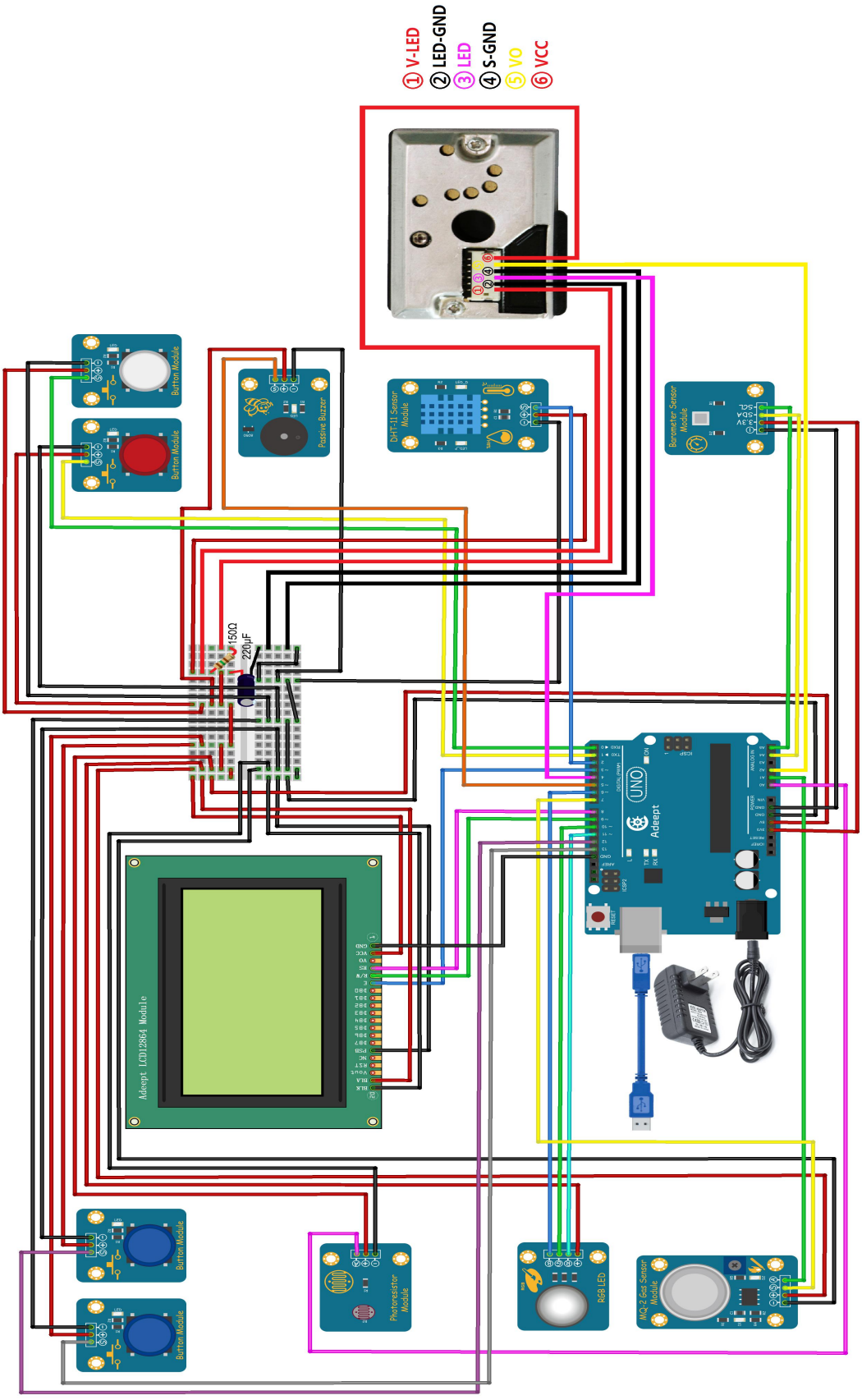
The prompt about insufficient memory during code compilation can be ignored and does not affect normal use.



If you want to modify it, you can try to block the code of the LOGO display part and it will not report an error. The reason for this warning is that UNO R3 has insufficient storage space.



Circuit Connection



The four buttons can be used to control the weather box to page up, page down, turn on and off. This weather box can be used to monitor temperature, humidity, combustible gases, atmospheric pressure, light intensity and dust concentration, and has alarm function based on the light and sound.

Note: here you need to use a black power cord for power supply, otherwise the LCD12864 will not work because of insufficient power supply.

Afterword

Thanks for purchasing our product and reading the manual! If you spot any errors or have any ideas or questions for the product and this guide, welcome to contact us! We will correct them if any as quickly as possible.

For more information about Arduino, Raspberry Pi, smart car robot, or robotics, etc., please follow our website www.adeept.com. We will introduce more cost-effective, innovative and intriguing products!

Thanks again for choose Adeept product!