

Keyestudio ESP8266 WI-FI Module (Black and Eco-friendly)





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Description:

This keyestudio ESP8266 WI-FI development board is based on the ESP8266-12FWIFI module developed by Ai-Thinker.

The processor ESP8266 integrates the industry-leading Tensilica L106 ultra-low-power 32-bit micro MCU in a smaller package, with 16-bit Lite mode. The main frequency supports 80MHz and 160 MHz.

It supports RTOS, integrated with Wi-Fi MAC/BB/RF/PA/LNA. Onboard comes with curved antenna.

This development board is a standalone network controller, which can add networking function to those existing devices.

When using, power the board and upload the program via a Micro USB port, and the current supply should be 2A.





Technical Details:

- Microcontroller: ESP8266-12F WIFI Module
- USB to Serial Chip: CP2102-GMR
- Operating Voltage: DC5V
- Input Current: 2A
- Main frequency supports 80 MHz and 160 MHz
- Analog Input Pins: 1(A0)
- Micro USB cable: 1m
- Dimensions: 49mm*26mm*12mm





Element and Interfaces:

Here is an explanation of what every element and interface of the board has:





Specialized Functions of Some Pins:

- Serial communication pins: RX and TX
- SPI communication pins: CLK(CLK); SD0(MIS0); CMD(MOSI); SD1(INT).
- SD Card communication pins: D3(SD3); D2(SD2); D1(SD1); CMD(CMD); D0(SD0); CLK(CLK).
- Analog output pin: A0
- GPIO pins: D0(GPIO16); D1(GPIO5); D2(GPIO4); D3(GPIO0); D4(GPIO2); D5(GPIO14); D6(GPIO12); D7(GPIO13); D8(GPIO15); RX(GPIO3); TX(GPIO1); SD3(GPIO10); SD2(GPIO9)



Detailed Using Method as follows:

Step1 | Install the Arduino IDE

When programming the control board, first you should install the Arduino software and driver.

You can download the different versions for different systems from the link below:

https://www.arduino.cc/en/Main/OldSoftwareReleases#1.5.x

NOTE: this control board is only compatible with Arduino 1.6.5 version or latest. In the following, we will download the Arduino 1.6.5 version.

HOME BUY	SOFTWARE PRODUCTS	EDU RESOURCES	COMMUNITY HELP	
	windows installer		Linux ARM	OFGILITAD
1.6.10	Windows Windows Installer	MAC OS X	Linux 32 Bit Linux 64 Bit Linux ARM	Source code on Github
1.6.9	Windows Windows Installer	MAC OS X	Linux 32 Bit Linux 64 Bit Linux ARM	Source code on Github
1.6.8	Windows Windows Installer	MAC OS X	Linux 32 Bit Linux 64 Bit	Source code on Github
1.6.7	Windows Windows Installer	MAC OS X	Linux 32 Bit Linux 64 Bit	Source code on Cithub
1.6.6	Windows Windows Installer	MAC OS X	Linux 32 Bit Linux 64 Bit	Source code on Github
1.6.5	Windows Windows Installer	MAC OS X	Linux 32 Bit Linux 64 Bit	Source code on Github
1.6.4	Windows Windows Installer	MAC OS X	Linux 32 Bit Linux 64 Bit	Source code on Github
1.6.3	Windows Windows Installer	MAC OS X	Linux 32 Bit Linux 64 Bit	Source code on Github



In this Windows system page, there are two options. One is Windows version, the other is Windows Installer.

For Windows Installer, you can download the installation file, this way you need to install the arduino IDE.

165	Windows	1	MACOSY	Linux 32 Bit	Source code	
1.0.5	Windows Installer	*	MACOSX	Linux 64 Bit	on Github	

For simple Windows version, you can download the software directly, do not need to install, just directly use the software after unzip the file.

NAC OS X Linux 32 Bit Source code Unidows Installer MAC OS X Linux 64 Bit on Github

Next, we click the Windows, pop up the interface as below.





Click JUST DOWNLOAD.

When the ZIP file is downloaded well to your computer, you can directly unzip the file. Open the Arduino-1.6.5-r5 folder, you should get it as follows.

luino-1.6.5-r5-			
windows			
C. STREET CONTRACTOR OFFICE	and Description Report.	Ann 1 2 4 10 10	A DESCRIPTION OF TAXABLE
I Disk (F:) 🕨 arduino-1.6.5-r5-win	dows → arduino-1.6.5-r5 →		
Share with 🔻 New folde	r		
ame	Date modified	Туре	Size
📙 dist	2015/8/28 9:32	File folder	
drivers	2015/8/28 9:32	File folder	
examples	2015/8/28 9:32	File folder	
hardware	2015/8/28 9:32	File folder	
java	2015/8/28 9:32	File folder	
📙 lib	2015/8/28 9:32	File folder	
libraries	2015/8/28 9:32	File folder	
reference	2015/8/28 9:32	File folder	
tools	2015/8/28 9:32	File folder	
🧿 arduino	2015/8/28 9:32	Application	393 KB
] arduino.l4j	2015/8/28 9:32	Configuration settings	1 KB
🧿 arduino_debug	2015/8/28 9:32	Application	390 KB
🗋 arduino_debug.l4j	2015/8/28 9:32	Configuration settings	1 KB
libusb0.dll	2015/8/28 9:32	Application extension	43 KB
\delta msvcp100.dll	2015/8/28 9:32	Application extension	412 KB
🗟 msvcr100.dll	2015/8/28 9:32	Application extension	753 KB
revisions	2015/8/28 9:32	Text Document	67 KB



Click the icon of ARDUINO software to open it. This is your Arduino.





Step2 | Install the Driver

The USB to serial port chip of this control board is **CP2102-GMR**. So you need to install the driver for the chip.

You can click the driver package download link here.

https://www.silabs.com/products/development-tools/software/usb-to-uart-bridg e-vcp-drivers

You can download the driver software for different systems.

Download Software

The CP210x Manufacturing DLL and Runtime DLL have been updated and must be used with v6.0 and later of the CP210x Windows VCP Driver. Application Note Software downloads affected are AN144SW.zip, AN205SW.zip and AN223SW.zip. If you are using a 5.x driver and need support you can download archived Application Note Software.

Legacy OS software and driver package download links and support information >

Download for Windows 10 Universal (v10.1.4)

Platform	Software	Release Notes
🙀 Windows 10 Universal	Download VCP (2.3 MB)	Download VCI2 Revision History

Download for Windows 7/8/8.1 (v6.7.6)

Platform	Software	Release Notes
🙀 Windows //8/8.1	Download VCP (5.3 MB) (Default)	Download VCP Revision History
🙀 Windows //8/8.1	Download VCP with Serial Enumeration (5:3 MB) Learn More »	Download VCI ² Revision History

For example, download for Windows 7, you can get the driver package **CP210x_Windows_Drivers**.



Unzip the package to install the driver.



ganize 👻 🖬 Open	Share with 👻 New folder				= •	-
5	Name	Data modified	Turne	Cine		
Favorites	Name	Date modified	Type	5126		
🧮 Desktop	\mu x64	2018/6/15 23:13	File folder			
🔛 Recent Places	🍌 x86	2018/6/15 23:13	File folder			
🐌 Downloads	CP210xVCPInstaller_x64	2017/9/28 1:58	Application	1,026 KB		
🎉 2345Downloads	CP210xVCPInstaller_x86	2017/9/28 1:58	Application	903 KB		
	👚 dpinst	2017/9/28 1:45	XML Document	12 KB		
🚽 Libraries	SLAB_License_Agreement_VCP_Windows	2017/9/28 1:46	Text Document	9 KB		
Documents	slabvcp	2018/6/2 4:35	Security Catalog	11 KB		
J Music	🗿 slabvcp	2018/6/2 4:35	Setup Information	8 KB		
Pictures	v6-7-6-driver-release-notes	2018/6/16 2:51	Text Document	16 KB		
Videos						
2						
📮 Computer						
📮 Network						

Then double click **CP210xVCPInstaller_x64** to install the driver. Shown below.

CP210x USB to UART Bridge D	river Installer
	Welcome to the CP210x USB to UART Bridge Driver Installer This wizard will help you install the drivers for your CP210x USB to UART Bridge device.
	To continue, click Next. < Back Next > Cancel



To continue, accept the following license agreement. To read the entire agreement, use the scroll bar or press the Page Down key. LICENSE AGREEMENT SILICON LABS VCP DRIVER IMPORTANT: READ CAREFULLY BEFORE AGREEING TO TERMS This PRODUCT CONTAINS THE SILICON LABS VCP DRIVER AND INSTALLER PROGRAMS AND OTHER THIRD PARTY SOFTWARE TOGETHER THESE PRODUCTS ARE REFERRED TO AS THE "LICENSED SOFTWARE". USE OF THE LICENSED SOFTWARE IS SUBJECT TO THE TERMS OF THIS LICENSE I accept this agreement I accept this agreement I don't accept Installer Ox USB to UART Bridge Driver Installer The drivers are now installing	ucense Ag	greement	EV.
LICENSE AGREEMENT SILICON LABS VCP DRIVER IMPORTANT: READ CAREFULLY BEFORE AGREEING TO TERMS THIS PRODUCT CONTAINS THE SILICON LABS VCP DRIVER AND INSTALLER PROGRAMS AND OTHER THIRD PARTY SOFTWARE. TOGETHER THESE PRODUCTS ARE REFEREND TO AS THE "LICENSED SOFTWARE". USE OF THE LICENSED SOFTWARE IS SUBJECT TO THE TERMS OF THIS LICENSE I accept this agreement Back Next > Cancer OX USB to UART Bridge Driver Installer The drivers are now installing	Ń	To continue, accept the following license agreement. To read the entire agreement, use the scroll bar or press the Page Down key.	
THIS PRODUCT CONTAINS THE SILICON LABS VCP DRIVER AND INSTALLER PROGRAMS AND OTHER THIRD PARTY SOFTWARE.TOGETHER THESE PRODUCTS ARE REFERRED TO AS THE "LICENSED SOFTWARE IS SUBJECT TO THE TERMS OF THIS LICENSE I accept this agreement Save As I don't accept this agreement Image: Cancer I don't accept Installer Image: Cancer Ox USB to UART Bridge Driver Installer Image: Cancer		LICENSE AGREEMENT SILICON LABS VCP DRIVER IMPORTANT: READ CAREFULLY BEFORE AGREEING TO TERMS	^
I accept this agreement I don't accept this agreement I don't accept this agreement<		THIS PRODUCT CONTAINS THE SILICON LABS VCP DRIVER AND INSTALLER PROGRAMS AND OTHER THIRD PARTY SOFTWARE.TOGETHER THESE PRODUCTS ARE REFERRED TO AS THE "LICENSED SOFTWARE". USE OF THE LICENSED SOFTWARE IS SUBJECT TO THE TERMS OF THIS LICENSE	Ŧ
I don't accept this agreement < Back		I accept this agreement Save As Print	
< Back		I don't accept this agreement	
he drivers are now installing	Dx USB to I	< Back Next >	Cancel
Please wait while the drivers install. This may take some time to complete.	he drivers	s are now installing	EU.



e Driver Installer	
Completing the In CP210x USB to U/	stallation of the ART Bridge Driver
The drivers were successfully i	nstalled on this computer.
You can now connect your dev	vice to this computer. If your device
	na yaya kuna za Mingina t
Driver Name	Status
Driver Name	Status Ready to use
Driver Name Silicon Laboratories Inc	Status Ready to use
Driver Name Silicon Laboratories Inc	Status Ready to use



Step3 | Install the ESP8266 with Arduino

Double-click the icon of Arduino 1.6.5 downloaded well, you will get the interface shown below.



(Note: if the Arduino software loads in the wrong language, you can change it in

the preferences dialog. See the environment page for details.)





The functions of each button on the Toolbar are listed below:



Verify/Compile	Check the code for errors
Upload	Upload the current Sketch to the Arduino
New	Create a new blank Sketch
Open	Show a list of Sketches
Save	Save the current Sketch
Serial Monitor	Display the serial data being sent from the Arduino



Firstly, plug one end of your USB cable into the Keyestudio ESP8266 WI-FI module and the other into a USB socket on your computer.



Then open the Arduino IDE, click the "File" to select the "Preferences".





The pop-up interface is shown below.

See the "Additional Boards Manager URLs", copy and paste the link below: http://arduino.esp8266.com/stable/package_esp8266com_index.json

and then click OK.

references		×
Sketchbook location:		
D: \Administrator \Documents \Arduino		Browse
Editor language: English (English)	(requires restart of Arduino)	
Editor font size: 12		
Show verbose output during: 🕅 compilation 📗 upload		
Compiler warnings: None 🔻		
🕅 Display line numbers		
Thable Code Folding		
Verify code after upload		
Use external editor	1	
Check for updates on startup		
✓ Update sketch files to new extension on save (.pde -> .ino)		
V Save when verifying or uploading		
Addıtional Boards Manager URLs: http://arduino.esp8266.com/stable/packa	ge_esp8266com_index.json	
More preferences can be edited directly in the file		
C:\Users\Administrator\AppData\Roaming\Arduino15\preferences.txt		
(edit only when Arduino is not running)	OK	Cancel

After that, click "Tools", for "Board", enter the Boards Manager, it will automatically download the relevant file. Shown below.



e Edit Sketch To	ols Help		
sketch_aug13; oid setup () {	Auto Format Ctrl+T Archive Sketch Fix Encoding & Reload Serial Monitor Ctrl+Shift+M	Q •	-
// put your s	Board: "Arduino/Genuino Uno"		Boards Manager
	Port	1	Arduino AVR Boards
oid loop() { // put your m	Programmer: "AVRISP mkII" Burn Bootloader	•	Arduino Yún Arduino/Genuino Uno Arduino Duemilanove or Diecimila
			Arduino Nano Arduino/Genuino Mega or Mega 2560 Arduino Mega ADK Arduino Leonardo Arduino/Genuino Micro Arduino Esplora Arduino Mini Arduino Ethernet Arduino Fio Arduino BT LilyPad Arduino USB
	Arduino/Genuino Uno on	c	LilyPad Arduino Arduino Pro or Pro Mini Arduino NG or older Arduino Robot Control Arduino Robot Motor

Pop up the following window:

) Boards Manager	x
Type All * Filter your search	
Arduino AVR Boards Built-In by Arduino version 1.6.8 INSTALLED Boards included in this package: Arduino Yún, Arduino/Genuino Uno, Arduino Uno WiFi, Arduino Diecimila, Arduino Nano, Arduino/Genuino Mega, Arduino MegaADK, Arduino Leonardo, Arduino Leonardo Ethernet, Arduino/Genuino Micro, Arduino Esplora, Arduino Mini, Arduino Ethernet, Arduino Fio, Arduino BT, Arduino LilyPadUSB, Arduino Lilypad, Arduino Pro, Arduino ATMegaNG, Arduino Robot Control, Arduino Robot Motor, Arduino Gemma, Adafruit Circuit Playground, Arduino Yún Mini, Arduino Industrial 101, Linino One. <u>Online help</u> <u>More info</u>	* H
Arduino megaAVR Boards by Arduino Boards included in this package: Arduino Uno WiFi Rev2. Online help More info	_
Arduino SAM Boards (32-bits ARM Cortex-M3) by Arduino Boards included in this package: Arduino Due. Online help More info	-
Downlog ding platforms index Downloaded 23kb of 69kb.	el



Done downloading the relevant file, it will pop up the window below. Then enter the 8266 on the blank bar and click Install.

💿 Boards Manager	x			
Type All - 8266				
esp8266 by ESP8266 Community Boards included in this package: Generic ESP8266 Module, Generic ESP8285 Module, ESPDuino (ESP-13 Module XinaBox CW01, ESPresso Lite 1.0, ESPresso Lite 2.0, Phoenix 1.0, Phoenix 2 (ESP-12E Module), Olimex MOD-WIFI-ESP8266(-DEV), SparkFun ESP8266 Thi ESP-210, LOLIN(WEMOS) D1 R2 & mini, LOLIN(WEMOS) D1 mini Pro, LOLIN(V Module), ThaiEasyElec's ESPino, WifInfo, Arduino, 4D Systems gen4 IoD Rans Seeed Wio Link, ESPectro Core. Online help More info	 Adafruit Feather HUZZAH ESP8266, Invent One, NodeMCU 0.9 (ESP-12 Module), NodeMCU 1.0 SparkFun ESP8266 Thing Dev, SweetPea VEMOS) D1 mini Lite, WeMos D1 R1, ESPino (ESP-12 Digistump Oak, WiFiduino, Amperka WiFi Slot, 			
	2.4.2 2.5.0-beta2 2.5.0-beta1 2.4.2 2.4.1 2.4.0 2.4.0-rc2 2.4.0-rc1 2.3.0			
	Close			
Deards Manager	X			
Iype AII 0200 esp8266 by ESP8266 Community Boards included in this package: Generic ESP8266 Module, Generic ESP8285 Module, ESPDuino (ESP-13 Module), Adafruit Feather HUZZAH ESP8266, XinaBox CW01, ESPresso Lite 1.0, ESPresso Lite 2.0, Phoenix 1.0, Phoenix 2.0, NodeMCU 0.9 (ESP-12 Module), NodeMCU 1.0 (ESP-12E Module), Olimex MOD-WIFI-ESP8266(-DEV), SparkFun ESP8266 Thing, SparkFun ESP8266 Thing Dev, SweetPea ESP-210, LOLIN(WEMOS) D1 R2 & mini, LOLIN(WEMOS) D1 mini Pro, LOLIN(WEMOS) D1 mini Lite, WeMos D1 R1, ESPino (ESP-12 Module), ThaiEasyElec's ESPino, WifInfo, Arduino, 4D Systems gen4 IoD Range, Digistump Oak, WiFiduino, Amperka WiFi Slot, Seeed Wio Link. Online help More info				
	Installing			
Installation completed	Cancel			



Installation completed, click Close, then click "Tools", for "Board", you should see

the NodeMCU 1.0 (ESP-12E Module). Shown below.





Step4 | Add the Libraries

Before upload the code to test your board, you should first add the library ESP8266WiFi into the libraries folder of Arduino-1.6.5-r5.

You can click the link to download the library needed.

https://drive.google.com/open?id=1_Y5IKCrDgY3AeovXZKorQ8FVk2olUOOL

Edit View Tools H	lelp			
rganize 🔻 🛛 🔭 Open	Include in library * Share with *	New folder		III - 🔟
7 Favorites	Name	Date modified	Туре	Size
📃 Desktop	鷆 dist	2015/8/28 9:32	File folder	
🖳 Recent Places	🍌 drivers	2015/8/28 9:32	File folder	
🐌 Downloads	🌛 examples	2015/8/28 9:32	File folder	
) 2345Downloads	🌗 hardware 📝	2015/8/28 9:32	File folder	
	🔰 java	2015/8/28 9:32	File folder	
Libraries	퉬 lib 📂	2015/8/28 9:32	File folder	
Documents	🍺 libraries	2015/8/28 9:32	File folder	
J Music	🎍 reference	2015/8/28 9:32	File folder	
Pictures	🍌 tools	2015/8/28 9:32	File folder	
Videos	🥺 arduino	2015/8/28 9:32	Application	393 KB
	arduino.l4j	2015/8/28 9:32	Configuration settings	1 KB
b	🥺 arduino_debug	2015/8/28 9:32	Application	390 KB
	🗿 arduino_debug.l4j	2015/8/28 9:32	Configuration settings	1 KB
Computer	🔊 libusb0.dll	2015/8/28 9:32	Application extension	43 KB
	S msvcp100.dll	2015/8/28 9:32	Application extension	412 KB
📭 Network	svcr100.dll	2015/8/28 9:32	Application extension	753 KB
	revisions	2015/8/28 9:32	Text Document	67 KB

Note:

Before adding the library, you have opened the Arduino IDE. After add the library successfully, must restart the IDE, so the library can work.



Step5 | Select the Board and Serial Port

Open the Arduino IDE, you'll need to click the "Tools", then select the Board and the Serial Port.



You can check out the Serial Port on your computer's Device Manager. Select your proper COM Port.



Bevice Manager	
File Action View Help	
 XIAORONG Computer Disklays adapters Displays adapters Displays adapters Displays adapters Displays adapters Destand ther pointing devices Keyboards Monitors Network adapters Ports (COM & LPT) Communications Port (COM3) Silicon Labs CP210x USB to UART Bridge (COM25) Silicon Labs CP210x USB to UART Bridge (COM25) System devices System devices Universal Serial Bus controllers 	







Step6 | Upload the Code

Add well the libraries mentioned above, and select the proper Board and Port, you should upload the code to test the module.

Below is an example code, you can copy and paste it on Arduino IDE.

```
******
/*
*
   This sketch demonstrates how to scan WiFi networks.
   The API is almost the same as with the WiFi Shield library,
*
*
   the most obvious difference being the different file you need to include:
*/
#include "ESP8266WiFi.h"
void setup() {
 Serial.begin(115200);
 // Set WiFi to station mode and disconnect from an AP if it was previously connected
 WiFi.mode(WIFI_STA);
 WiFi.disconnect();
 delay(100);
 Serial.println("Setup done");
}
void loop() {
 Serial.println("scan start");
```

// WiFi.scanNetworks will return the number of networks found int n = WiFi.scanNetworks(); Serial.println("scan done"); if (n == 0)

Serial.println("no networks found");

else

}

```
{
  Serial.print(n);
  Serial.println(" networks found");
  for (int i = 0; i < n; ++i)
  {
    // Print SSID and RSSI for each network found
    Serial.print(i + 1);
    Serial.print(": ");
    Serial.print(WiFi.SSID(i));
    Serial.print(" (");
    Serial.print(WiFi.RSSI(i));
    Serial.print(")");
    Serial.println((WiFi.encryptionType(i) == ENC_TYPE_NONE)?" ":"*");
    delay(10);
  }
}
Serial.println("");
// Wait a bit before scanning again
delay(5000);
```



After copy and paste the code on IDE, click the compile button, if compiling successfully, the message "Done compiling." will appear in the status bar.









Then click the "Upload" button, if the upload is successful, the message "Done uploading." will appear in the status bar.









Step7 | What Should You See

Done uploading the code, open the serial monitor and set the baud rate to 115200, you should see all the WIFI information.

sketch_dec26a Arduino 1.6.5			
File Edit Sketch Tools Help			
	Serial Monitor 🦻		
sketch_dec26a §	© COM25		
{ // Print SSID and RSSI for each			Send
Serial. print (i + 1);	Setup done		<u>^</u>
Serial. print (": ");	scan start		
Serial. print (WiFi. SSID (i));	scan done		
Serial. print (" (");	8 networks found		
Serial. print (WiFi. RSSI (i));	1: yihongfushi (-61)*		
Serial. print (")");	2: ZHENDEMAN (-77)*		
Serial. println ((WiFi. encrypti	3: HUAWEI-3L9MLS (-69)*		
del ay (10);	4: ChinaNet-ixRU (-72)*		
}	5: Chinalet-kzIn (-79)*		
}	6: jclax8888 (~/8)*		
Serial. println ("");	(: 50 (-75)*		
	0. 300 I (10)*		
<pre>// #ait a bit before scanning again delege/E000).</pre>	scan start		
aeray (5000).	scan done		
	8 networks found		
	1: yihongfushi (-69)*		
Done uploading.	2: ZHENDEMAN (-83)*		
	3: jekx8888 (-84)*		
Sketch uses 252,608 bytes (24%) of pro	4: HUAWEI-3L9ML8 (-75)*		
	5: ChinaNet-ixRU (-76)*		/
* III	6: ChinaNet-kzTn (-82)*		-
MBz, Flash, 4M (1M SPIFFS), v2 Lower Memory	V Autoscroll	No line ending 💌	115200 baud 👻



Package Includes:

- Keyestudio ESP8266 WI-FI module* 1
- USB cable * 1





More Resources:

You can download the PDF file from the link: https://drive.google.com/open?id=1Wfgqrcm-TgBC5frC303jiErqVrZ678J8

Driver Software Download: https://www.silabs.com/products/development-tools/software/usb-to-uart-bridg e-vcp-drivers

Download the Libraries:

https://drive.google.com/open?id=1_Y5lKCrDgY3AeovXZKorQ8FVk2olUOOL

Download the Code:

https://drive.google.com/open?id=101IQF4so7e2buAN3GT9OhJaw7BvE6zvG

ARDUINO Software:

https://www.arduino.cc/en/Main/OldSoftwareReleases#1.5.x