

Arduino Beginners Course 21-Feb-2018

MOZMB

Arduino Software Setup Arduino Software Famili

Agenda

- Arduino Software Familiarisation
- Adding the NodeMCU Board
- Connecting UP
- Writing and uploading your first Sketch
- Modify Sketches
- Adding Libraries
- Running up the WiFi





Arduino Software Setup

20/02/2018

Arduino Software Setup 1/3



Double-click the Arduino installer



arduino-1.8.5-windows.exe Type: Application

Accept any software warning

Date modified: 29/12/2017 17:01 Size: 90.3 MB



Arduino Software Setup 2/3

1	💿 Arduino Setup: License Agreement — 🗌 🗙	2	💿 Arduino Setup: Installation Options 🛛 — 🗌 🗙
1.	Please review the license agreement before installing Arduino. If you accept all terms of the agreement, click I Agree.	۷.	Check the components you want to install and uncheck the components you don't want to install. Click Next to continue.
	SNU LESSER GENERAL PUBLIC LICENSE		
	Version 3, 29 June 2007 Copyright (C) 2007 Free Software Foundation, Inc. < <u>http://fsf.org/</u> >		Select components to install:
	Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.		Create Desktop shortcut Associate .ino files
	This version of the GNU Lesser General Public License incorporates the terms and conditions of version 3 of the GNU General Public License, supplemented by the additional permissions listed below.		Space required: 420.6MB
	Cancel Nullsoft Install System v3.0 I Agree		Cancel Nullsoft Install System v3.0 < Back Next >
3.	Arduino Setup: Installation Folder - X Setup will install Arduino in the following folder. To install in a different folder, did Beruna and extent the	4.	Arduino Setup: Installing - ×
	installation.		Show details
	Destination Folder		
	C:\Program Files (x86)\Arduino\ Browse		
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	Space available: 821.6GB		
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Thornbury & South Gloucestershire Amateur Radio Club



Arduino software setup 3/3

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New Shortcut

Double Click to run



Arduino Software Familiarisation

Arduino Software Familiarisation







Adding Boards

Adding Boards 1/3



Menu: Tools/Board.../Boards Manager...

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<pre>void loop() { // put your }</pre>	Board: "Arduino/Genuino Un Porte "COMS" Get Board Info	o"		A Boards Manager Auduino AVR Boards Arduino Yún	þ			
	Programmer: "AVRISP mkll" Burn Bootloader		•	Arduino/Genuino Uno Arduino Duemilanove or Diecimila Arduino Nano				
				Arduino/Genuino Mega or Mega 2560 Arduino Mega ADK Arduino Leonardo Arduino Leonardo ETH				
				Arduino/Genuino Micro Arduino Esplora Arduino Mini				~
				Arduino Ethernet Arduino Fio Arduino BT				
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Adding Boards 2/3

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esp8266 by ESP8266 Community version 2.3.0 Boards included in this package: Generic ESP8266 Module, Olimex MOD-WIFI-ESP8266(-DEV), NodeMCU 0.9 (ESP-12 Module), NodeMCU 1.0 (ESP-12E Module), Adafruit HUZZAH ESP8266 (ESP-12), ESPresso Lite 1.0, ESPresso Lite 2.0, Phoenix 1.0, Phoenix 2.0, SparkFun Thing, SweetPea ESP-210, WeMos D1, WeMos D1 mini, ESPino (ESP-12 Module), ESPino (WROOM-02 Module), WifInfo, ESPDuino. Online help More info	^
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Adding Boards 3/3



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esp8266 by ESP8266 Community version 2.3. INSTALLED Boards included in this package: Generic ESP8266 Module, Olimex MOD-WIFI-ESP8266(-DEV), NodeMCU 0.9 (ESP-12 Module), NodeMCU 1.0 (ESP-12E Module), Adafruit HUZZAH ESP8266 (ESP-12), ESPresso Lite 1.0, ESPresso Lite 2.0, Phoenix 1.0, Phoenix 2.0, SparkFun Thing, SweetPea ESP-210, WeMos D1, WeMos D1 mini, ESPino (ESP-12 Module), ESPino (WROOM-02 Module), WifInfo, ESPDuino. Online help More info	^
Clos	e



Connecting Up

Connecting Up 1/4

• Plug your NodeMCU into the base and then a spare USB port on your Laptop/PC.





Connecting Up 2/4

Menu: Tools/Board.../NodeMCU 1.0 (ESP-12E Module)



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<pre>sketch_dec31 void setup() // put your } void loop() { // put yous }</pre>	Adto Format Ctrl+ Archive Sketch Fix Encoding & Reload Serial Monitor Ctrl+ Serial Plotter Ctrl+ WiFi101 Firmware Updater Board: "Arduino/Genuino Uno" Put: "COME" Get Board Info Programmer: "AVRISP mkll" Burn Bootloader	T ESPresso Lite 2.0 Phoenix 1.0 Phoenix 2.0 Shift+M NodeMCU 1.0 (ESP-12-Module) Shift+L NodeMCU 1.0 (ESP-12E Module) Simex MOD WITH ESP0200(DEV) SparkFun ESP8266 Thing SparkFun ESP8266 Thing Dev SweetPea ESP-210 WeMos D1 R2 & mini WeMos D1 R2 & mini WeMos D1 R2 & mini WeMos D1 (Retired) ESPino (ESP-12 Module) ThaiEasyElec's ESPino WifInfo Core Development Module ⊽		
				 ,

Arduino/Genuino Uno on COM6

Connecting Up 3/4

- Open Device Manager (Windows Key + X or via Control Panel)
- Expand Ports (COM & LPT
- Note the serial port for the USB-SERIAL CH340 interface





Connecting Up 4/4



Menu: Tools/Port.../COMx (select you NodeMCU serial port)

Sketch_dec31h	LArduino 1.8.5			-		×
sketch_dec31	Achive Sketch Fix Encoding & Reload	Ctrl+T				₽ ▼
void setup() // put your	Serial Monitor Serial Plotter	Ctrl+Shift+M Ctrl+Shift+L				^
void loop() { // put you	ViFi101 Firmware Updater	, ,	Serial ports			
}	Programmer: "AVRISP mkll" Burn Bootloader		COM1 COM2 COM6			
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			Arduino/	Genuino	Uno on C	OM6



Writing and uploading your first Sketch

Writing and uploading your first Sketch 1/4



- 1. Setup Output pin
- 2. Turn our LED On
- 3. Delay for 1 second
- 4. Turn our LED off
- 5. Delay for 2 seconds

sketch_dec31b | Arduino 1.8.5 \times File Edit Sketch Tools Help + Ø + sketch_dec31b § 1 * ESP8266 Blink by Simon Peter Modified by Paul Smart MOZMB Blink the blue LED on the ESP-12E module The blue LED on the ESP-12E module is connected to GPIO2 labelled D4 */ int ESP12E_LED = 2; void setup() { // put your setup code here, to run once: pinMode(ESP12E_LED, OUTPUT); // Initialize the LED_BUILTIN pin as an output } void loop() { // put your main code here, to run repeatedly: digitalWrite(ESP12E LED, LOW); // Turn the Builtin LED on (Note that LOW is the voltage level // but actually the LED is on; this is because // it is acive low on the ESP-12-E) delay(1000); // Wait for a second digitalWrite (ESP12E_LED, HIGH); // Turn the LED off by making the voltage LOW delay(2000); // Wait for two seconds }

When ready select Verify or Upload if you are brave



NodeMCU 1.0 (ESP-12E Module). 80 MHz, 115200, 4M (3M SPIFFS) on COM8 Thornbury & South Gloucestershire Amateur Radio Club http://tsgarc.uk

Writing and uploading your first Sketch 4/4



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File Edit Sketch Tools Help				
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Blink				
/*				^
ESP8266 Blink by Simon Peter Modific Blink the blue LED on the ESP-12E m	ed by Paul Smart MOZMB odule			
The blue LED on the ESP-12E module :	is connected to GPIO2 labelled D4			
*/				
<pre>int ESP12E_LED = 2;</pre>	// Create and set the Integer variable to 2			
<pre>void setup() { // put your setup code here, to ru: pinMode(ESP12E_LED, OUTPUT); } }</pre>	n once: // Initialize the pin as an output			
<pre>void loop() { // put your main code here, to run digitalWrite(ESP12E_LED, LOW); </pre>	repeatedly: // Turn the Builtin LED on (Note that LOW is the voltage level // but actually the LED is on; this is because // it is actual on the FSP-12-F)			
delay(1000);	// Wait for a second			
<pre>digitalWrite(ESP12E_LED, HIGH); delay(2000); }</pre>	// Turn the Builtin LED off by making the voltage LOW // Wait for two seconds			
				~
Uploading				
Sketch uses 222237 bytes (21%) of pro Global variables use 31580 bytes (38% Uploading 226384 bytes from C:\Users\	<pre>sgram storage space. Maximum is 1044464 bytes. b) of dynamic memory, leaving 50340 bytes for local variables. Maximum is 81920 byte Paul\AppData\Local\Temp\arduino_build_996904/Blink.ino.bin to flash at 0x00000000 [36%] [72%]</pre>	:5.		
14	NodeMCU 1.0 (ESP-12E Module), 80 MHz, 115200, 4M	(3M SPI	FFS) on (оме



Connecting an LED





Modify

20/02/2018

Modify 1/3





Connecting a Speaker







	🥺 Switch Arduino 1.8.5		↔ – □ ×
	File Edit Sketch Tools Help		
			₽
Modify	Switch		
IVIUUITY	/*		
	ESP8266 Blink by Simon Peter Modif	fied by Paul Smart MOZMB	
ン / ン	and play a two tone controlled by	a switch.	
5/5	The blue LED on the ESP-12E modul(e is connected to GPIO2 labelled D4	
- / -	+/		
	*/		
	<pre>int ESP12E_LED = 2; int Speaker = 14;</pre>	<pre>// Create and set the Integer variable to 2 or pin D4 // Create and set the Integer variable to 14 or pin D5</pre>	
int Switch = 16;	int Switch = 16;	<pre>// Create and set the Integer variable to 16 or pin D0</pre>	l i i i i i i i i i i i i i i i i i i i
	<pre>void setup() {</pre>		
	<pre>// put your setup code here, to p pipMode(ESP12E_LED, OUTPUT);</pre>	run once: // Initialize the pin as an output	
ninMade (Switch INDUT)	pinMode (Speaker, OUTPUT);	<pre>// Initialize the pin as an output</pre>	
pinMode(Switch, INPOI);	<pre>pinMode(Switch, INPUT);</pre>	<pre>// Initialise the pin as an input</pre>	
	}		
	<pre>void loop() {</pre>		
	<pre>// put your main code here, to ru digitalWrite(ESP12E_LED, LOW);</pre>	un repeatedly: // Turn the Builtin LED on (Note that LOW is the volta	ge level
		<pre>// but actually the LED is on; this is because // it is acive low on the ESP-12-E)</pre>	
if(digitalRead(Switch) == HIGH){			
	<pre>tone(Speaker, 1500, 1000);</pre>	<pre>// If the switch is not pushed play the tone // Play a tone for 1 second</pre>	
}	} else {		
else {	noTone(Speaker);	// Turn all tones off	
noTone(Speaker);	,		
1	delay(1000);	// Wait for a second	
1	<pre>digitalWrite(ESP12E_LED, HIGH);</pre>	// Turn the Builtin LED off by making the voltage $\ensuremath{\texttt{LOW}}$	
if(digitalRead(Switch) == HIGH){	if(digitalRead(Switch) == HIGH){		
1	tone(Speaker, 1200, 2000);	<pre>// Play a tone for 2 seconds</pre>	
}	1-1	// Tale for the second	
	delay(2000); }	// Walt for two seconds	
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20/02/2010		[72%]	
20/02/2018		[100%]	
	16	NodeMCU 1.0 (ESP-12E Modula	e), 80 MHz, 115200, 4M (3M SPIFFS) on COM7



Connecting a Switch





Adding Libraries



Adding Libraries 1/3



Adding Libraries 2/3



Library Mai	nager					
/pe All	~	Topic	All 🗸	adafruit gfx		
Adafruit GF2 Adafruit GF2 addition to ti More info Select vers	X Library X graphics he display	by Ad s core y libra	afruit Version 1.2.3 I library, this is the 'co ry for your hardware.	INSTALLED ore' class that	all our other graphics libraries derive from. Install this library in	
dafruit Neo dafruit_GF lore info	oMatrix b X-compa	y Ada tible l	fruit ibrary for NeoPixel gr	rids Adafruit_G	FX-compatible library for NeoPixel grids	
oakOLED by In Adafruit Iore info	/ Brian Ta GFX drive	ylor er for	the Oak OLED (an SS	D1306 with no	reset line) Install this as the display library for Adafruit_GFX	
PL_microEP A Hardware he appeara <u>fore info</u>	D by Rob Library fo nce of na	ert Po or 1.1 tural p	iser " E-Paper display (EP paper and is capable	D) from Plasti of holding text	c Logic for Adafruits GFX Library. The eInk-based display mimics and images indefinitely, even without electricity.	
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Adding Libraries 3/3



🥺 Library Manager	×
Type All V Topic All adafruit ssd1306	
Adafruit SSD1306 by Adafruit Version 1.1.2 INSTALLED SSD1306 oled driver library for 'monochrome' 128x64 and 128x32 OLEDs! SSD1306 oled driver library for 'monochrome' 128x64 and 128x32 OLEDs! More info Select vers V Install	4
OakOLED by Brian Taylor An Adafruit GFX driver for the Oak OLED (an SSD1306 with no reset line) Install this as the display library for Adafruit_GFX More info	
	_
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Running up the WiFi

South Gloucestershire Amarcur Radio Club

Running up the WiFi



Running up the WiFi





References & Links



[ARDU] - Arduino : <u>https://www.arduino.cc/</u>



The End

Thank you