Handson Technology

Datasheet

WeMOS D1 R32 ESP32 Wi-Fi and Bluetooth Board

This is the Wemos D1 R32, an ESP32 development board in Arduino Uno form factor. It is running on clock speed up to 240MHz and one core is dedicated to wireless functions, another core reserved for user application. This is much faster than its predecessor, ESP8266. Although it is a 3.3V system, with it in Arduino UNO form factor, you should be able to utilize most of the shields out there.

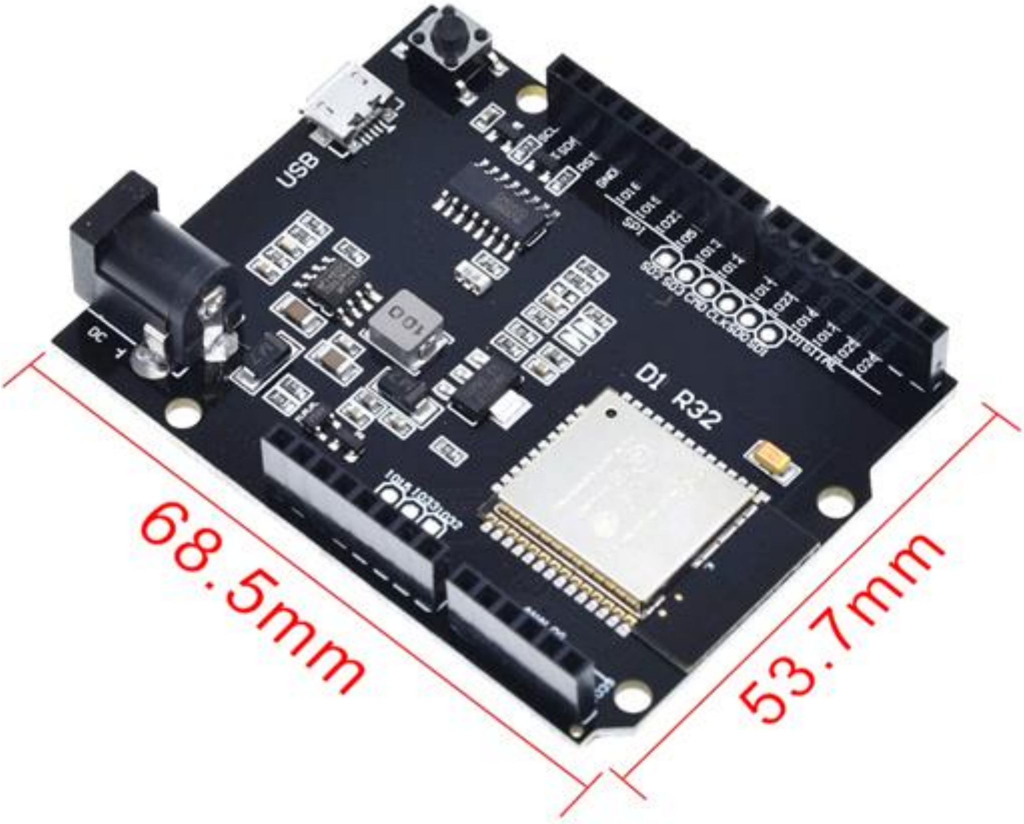
SKU: MDU1143

Brief Data:

- Form Factor: Arduino UNO and headers.
- CPU and Memory: Xtensa® 32-bit LX6 Dua-core processor, up to 600 DMIPS.
- Operating Voltage: (5~12)Vdc.
- I/O pins Voltage: 3.3V.
- 4-MByte SPI Flash, 448-KByte ROM, 520-KByte SRAM.
- WiFi: 802.11 b/g/n/e/i.
- Bluetooth V4.2 BR/EDR and BLE specification.
- Flash: 4-Mbytes.
- Interface: Micro USB connection.
- USB Bridge IC: CH340G.
- Board Dimension: (68x53x3.1) mm.

Mechanical Dimension:

Unit: mm



Tutorial:

This is a short tutorial on how to have a simple ESP32 project running with Arduino IDE.

In order to start this tutorial, we need the following:

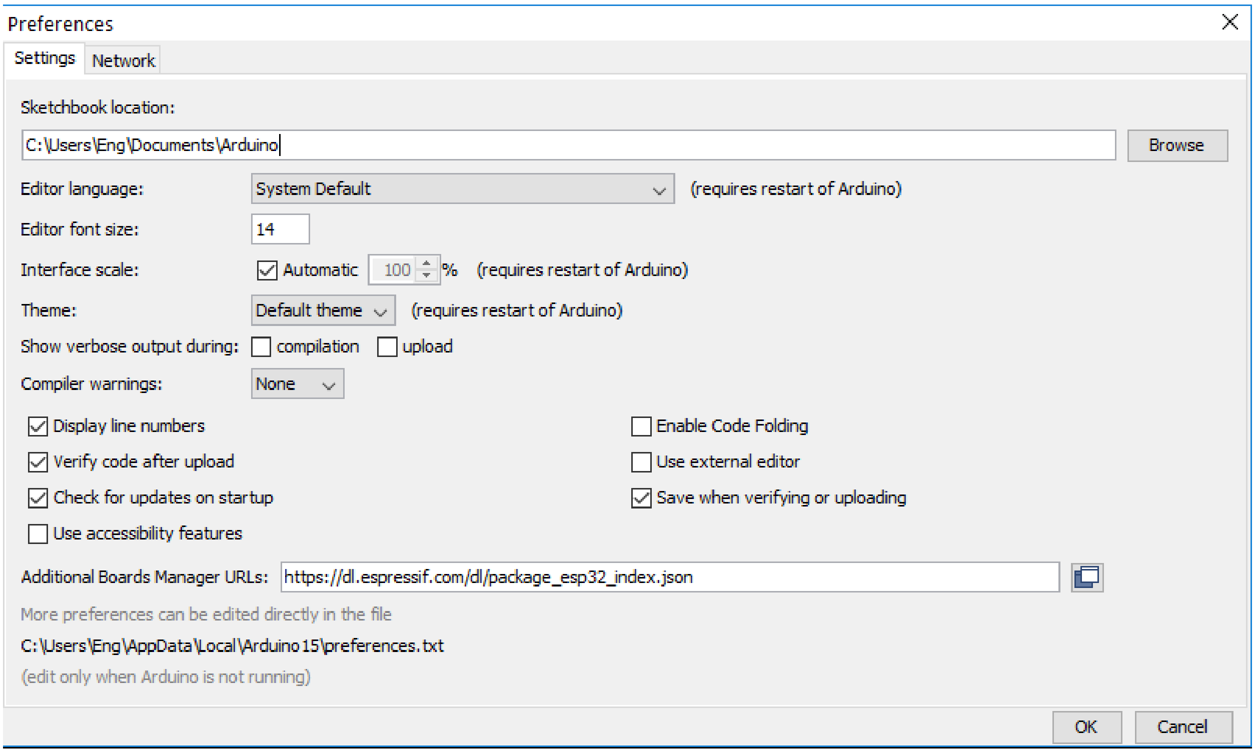
1. Wemos R32 development board.
2. Arduino IDE.

Procedure:

1. Before we plug into the Wemos R32 board, we need to install Arduino IDE first. Get the Arduino from this link: https://www.arduino.cc/en/Guide/HomePage
2. Afterwards, open the Arduino and obtain the ESP32 support first:

   Select **File**>**Preferences**, and then copy this link: https://dl.espressif.com/dl/package_esp32_index.json into the

   “Additional Boards Manager URLs” and click OK.



Preferences

Settings | Network

Sketchbook location:

C:\Users\Eng\Documents\Arduino

Editor language: System Default (requires restart of Arduino)

Editor font size: 14

Interface scale: ☑ Automatic 100 % (requires restart of Arduino)

Theme: Default theme (requires restart of Arduino)

Show verbose output during: □ compilation □ upload

Compiler warnings: None

☑ Display line numbers

☑ Verify code after upload

☑ Check for updates on startup

□ Use accessibility features

□ Enable Code Folding

□ Use external editor

☑ Save when verifying or uploading

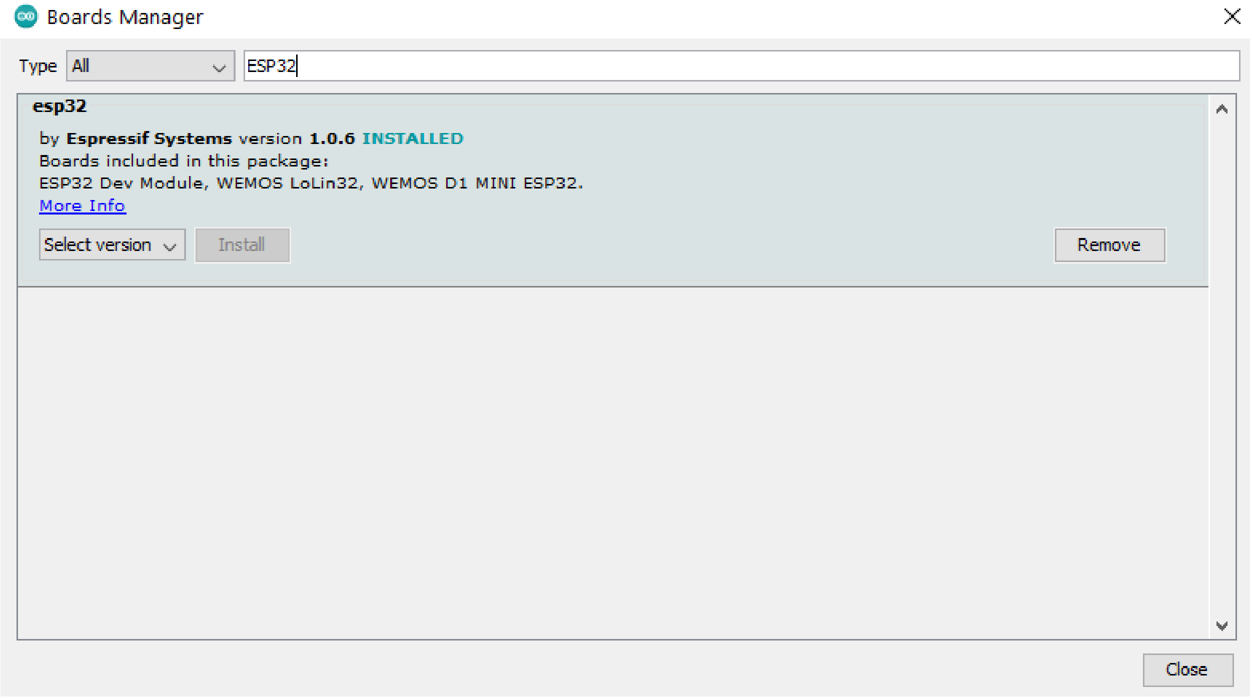
Additional Boards Manager URLs: https://dl.espressif.com/dl/package_esp32_index.json

More preferences can be edited directly in the file

C:\Users\Eng\AppData\Local\Arduino15\preferences.txt

(edit only when Arduino is not running)

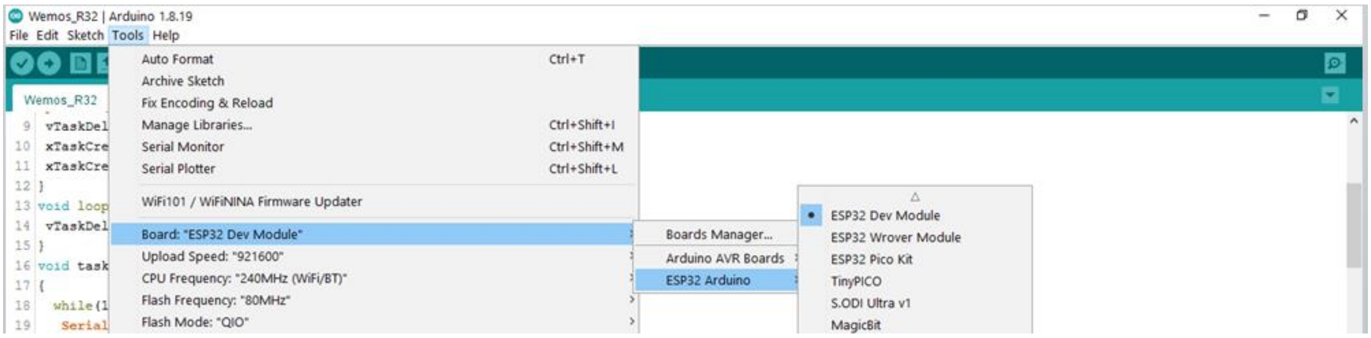
3. Go to **Tools**>**Board**>**Boards Manager**, then type in "ESP32". When you see this, press **Install**:



esp32

by **Espressif Systems** version **1.0.6** **INSTALLED**
Boards included in this package:
ESP32 Dev Module, WEMOS LoLin32, WEMOS D1 MINI ESP32.
More Info

4. Once it's all done, go to **Tools>Board>Boards Manager**, and then select "**ESP32 Dev Module**":



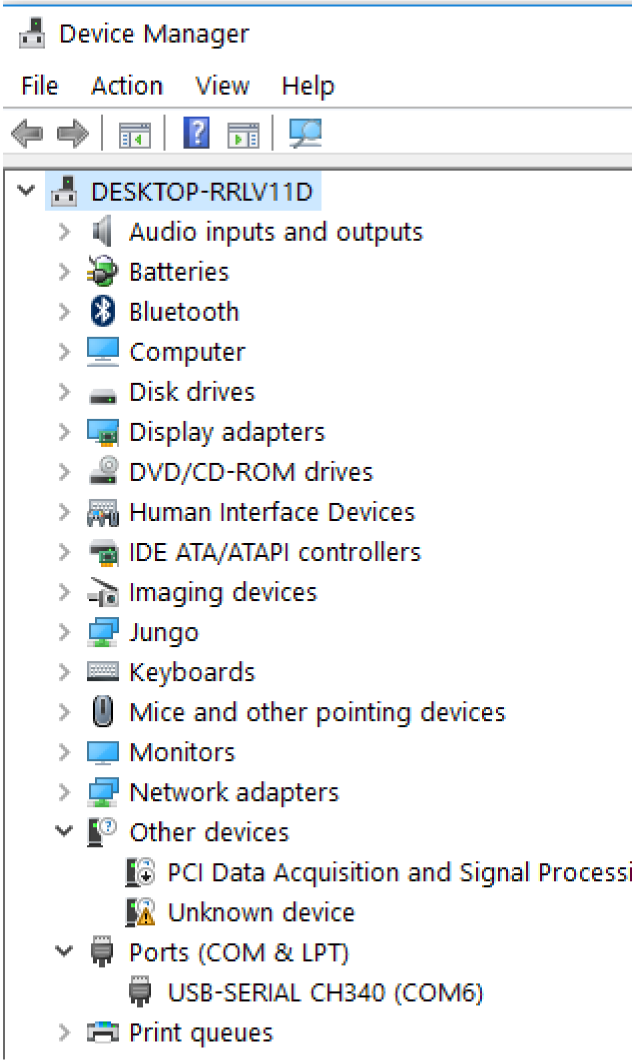
```
vTaskDel
xTaskCre
xTaskCre
}
void loop
vTaskDel
}
void task
{
  while(1
   Serial
```

5. Create a new project! Type in the sketch below:

```
void setup() {
  Serial.begin(112500);
  pinMode(2, OUTPUT);
  vTaskDelay(1000 / portTICK_PERIOD_MS);
  xTaskCreate(task1,"task1", 2048, NULL,1,NULL);
  xTaskCreate(task2,"task2", 2048, NULL,1,NULL);
}
void loop() {
 vTaskDelay(1000 / portTICK_PERIOD_MS);
}
```

```
void task1( void * parameter )
{
    while(1) {
     Serial.println("Hello Handsontec!");
     vTaskDelay(1000 / portTICK_PERIOD_MS);
  }
}
void task2( void * parameter)
{
  while(1) {
     digitalWrite(2, HIGH);
     vTaskDelay(1000 / portTICK_PERIOD_MS);
     digitalWrite(2, LOW);
     vTaskDelay(1000 / portTICK_PERIOD_MS);
  }
}
```

6. Save the project.
7. Before you upload, connect the R32 board to your PC. Find the COM port that is with the R32 board through Device Manager. The board is equipped with the CH340 USB bridge IC, so take note of the COM number:



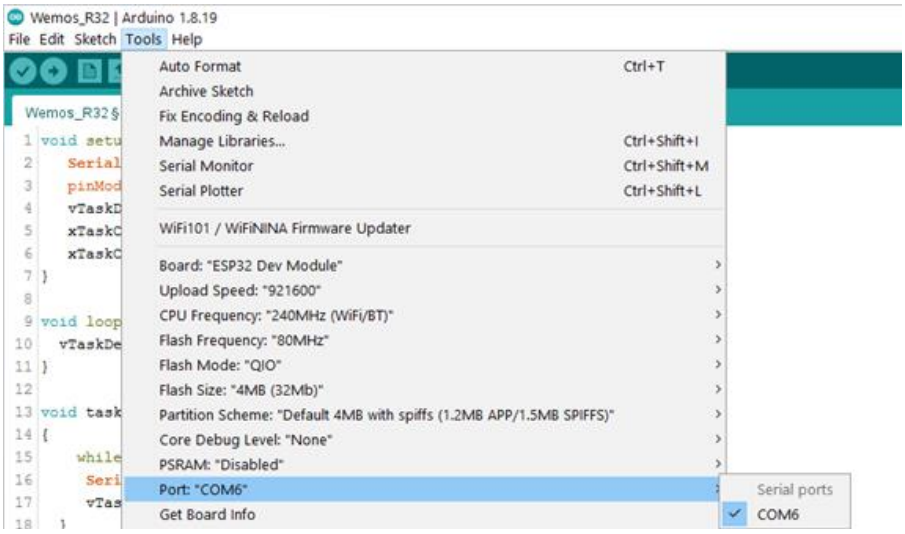
Device Manager

File Action View Help

- DESKTOP-RRLV11D
  - Audio inputs and outputs
  - Batteries
  - Bluetooth
  - Computer
  - Disk drives
  - Display adapters
  - DVD/CD-ROM drives
  - Human Interface Devices
  - IDE ATA/ATAPI controllers
  - Imaging devices
  - Jungo
  - Keyboards
  - Mice and other pointing devices
  - Monitors
  - Network adapters
  - Other devices
    - PCI Data Acquisition and Signal Processi
    - Unknown device
  - Ports (COM & LPT)
    - USB-SERIAL CH340 (COM6)
  - Print queues

In this example it's COM6, so it will be different on your PC. Note: If you couldn't find this "USB-SERIAL CH340", the drivers are probably not installed. You can refer to the CH340 drivers installation guide there: https://sparks.gogo.co.nz/ch340.html

8. Back to your Arduino IDE, select your COM port that is connected to the board:



Wemos_R32 | Arduino 1.8.19

File Edit Sketch Tools Help

Wemos_R32 §

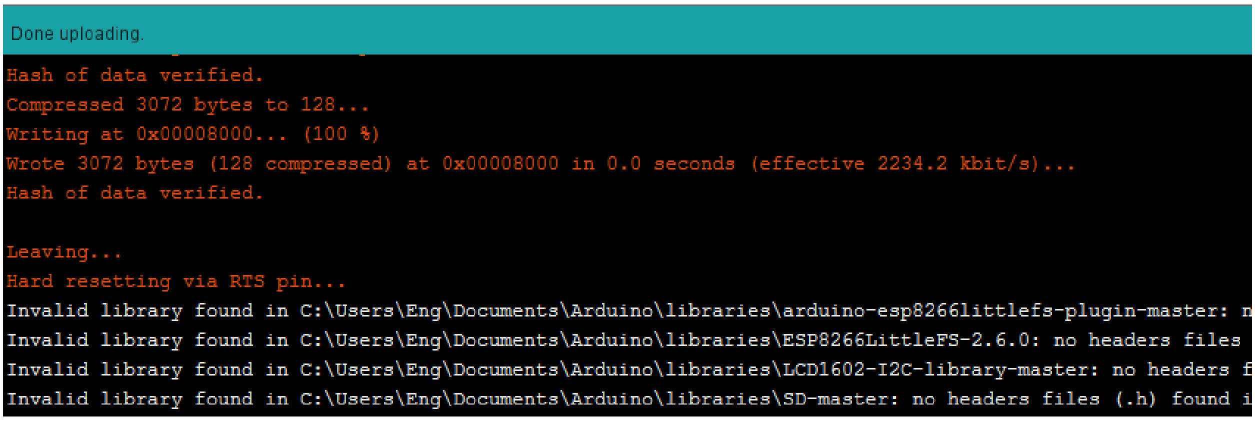
```
void setu
   Serial
   pinMod
   vTaskD
   xTaskC
   xTaskC
}

void loop
  vTaskDe
}

void task
{
    while
     Seri
     vTas
   }
```

Auto Format	Ctrl+T
Archive Sketch	
Fix Encoding & Reload	
Manage Libraries...	Ctrl+Shift+I
Serial Monitor	Ctrl+Shift+M
Serial Plotter	Ctrl+Shift+L
WiFi101 / WiFiNINA Firmware Updater	
Board: "ESP32 Dev Module"	›
Upload Speed: "921600"	›
CPU Frequency: "240MHz (WiFi/BT)"	›
Flash Frequency: "80MHz"	›
Flash Mode: "QIO"	›
Flash Size: "4MB (32Mb)"	›
Partition Scheme: "Default 4MB with spiffs (1.2MB APP/1.5MB SPIFFS)"	›
Core Debug Level: "None"	›
PSRAM: "Disabled"	›
Port: "COM6"	›
Get Board Info	

Serial ports

✓ COM6

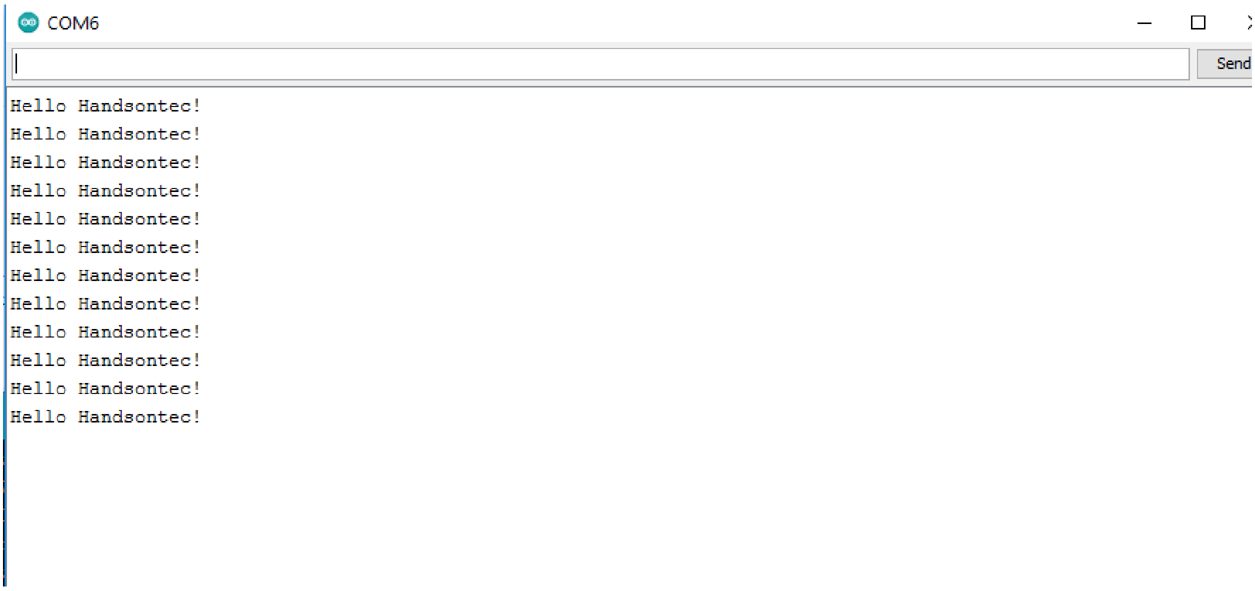
9. Press "Upload". You will see a lot of messages scrolling downwards. It is in the process of uploading the binary to the ESP32 module on the board.



```
Done uploading.
Hash of data verified.
Compressed 3072 bytes to 128...
Writing at 0x00008000... (100 %)
Wrote 3072 bytes (128 compressed) at 0x00008000 in 0.0 seconds (effective 2234.2 kbit/s)...
Hash of data verified.

Leaving...
Hard resetting via RTS pin...
Invalid library found in C:\Users\Eng\Documents\Arduino\libraries\arduino-esp8266littlefs-plugin-master: n
Invalid library found in C:\Users\Eng\Documents\Arduino\libraries\ESP8266LittleFS-2.6.0: no headers files
Invalid library found in C:\Users\Eng\Documents\Arduino\libraries\LCD1602-I2C-library-master: no headers f
Invalid library found in C:\Users\Eng\Documents\Arduino\libraries\SD-master: no headers files (.h) found i
```

The upload is successful when it says : "**Hash of data verified. Leaving...**" at the end of the process.

10. Open a terminal program and you will see "Hello World!" printed on it each second, and the LED on the board toggles at the rate of 500ms:



```
Hello Handsontec!
Hello Handsontec!
Hello Handsontec!
Hello Handsontec!
Hello Handsontec!
Hello Handsontec!
Hello Handsontec!
Hello Handsontec!
Hello Handsontec!
Hello Handsontec!
Hello Handsontec!
Hello Handsontec!
```

You are done here! Congratulation, the ESP board is working.

Web Resources:

- https://www.hackster.io/NYH-workshop/wemos-r32-with-arduino-startup-guide-7bc841

HT

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