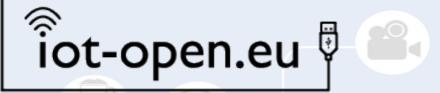






This project has been funded with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.







What we will talk about.

- Laboratory development boars
- Software examples



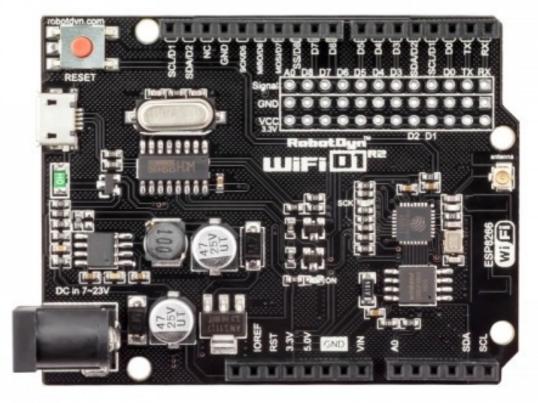






Laboratory development boards

- ESP8266 based
- WeMos D1R2
- Size compatible with Arduino UNO







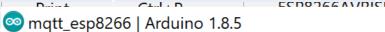




Ctrl+Shift+M Ctrl+Shift+L



Board selection



File Edit Sketch Tools Help



Auto Format Ctrl+T

Archive Sketch

Fix Encoding & Reload

Serial Monitor
Serial Plotter

WiFi101 Firmware Updater

ArduBlock

void se

delay

// We

Seria

Seria

Board: "WeMos D1 R2 & mini"

Flash Size: "4M (1M SPIFFS)"

Debug port: "Disabled"

Debug Level: "None"

lwIP Variant: "v2 Prebuilt (MSS=536)"

CPU Frequency: "80 MHz"

SparkFun ESP8266 Thing Dev

SweetPea ESP-210

WeMos D1 R2 & mini

WeMos D1 mini Pro

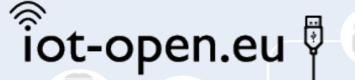
Wemos D1 mini Lite

Makas D1 D1



Project Reference Number: 2016-1-PL01-

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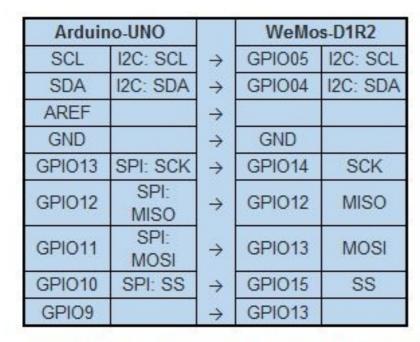








Arduino vs WeMos D1R2 pinout



Arduino-UNO		WeMos-D1R2	
GPIO8	→	GPIO12	
GPI07	→	GPI014	
GPIO6	→	GPI02	
GPI05	\rightarrow	GPI00	
GPIO4	→	GPIO04	
GPIO3	\rightarrow	GPIO05	
GPIO2	→	GPIO16	
GPIO1 TX	→	GPIO01	TX0
GPIO0 RX	→	GPI003	RX0

Difference in pin assignments between Arduino UNO and Wemos-D1R2









AnalogReadSerial

DigitalReadSerial

ReadAnalogVoltage

BareMinimum

Blink

Fade



Blink example

File Edit Sketch Tools Help

New Ctrl+N Open... Ctrl+O

Open Recent

Sketchbook

Examples

Close Ctrl+W

Save

Save As... Ctrl+Shift+S

Ctrl+S

Ctrl+P

Page Setup Ctrl+Shift+P

Print

Preferences Ctrl+Comma

Ouit Ctrl+O

> teReceiver.h>

Δ

Built-in Examples
01.Basics

02 Digital

02.Digital

03.Analog

04.Communication

05.Control

06.Sensors 07.Display

OR String OT-OPEN.EU

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PIN used by built-in LED





Board	PIN
Arduino	13
WeMos D1R2	14
ESP8266-12	2









Settings for WeMos D1R2 #define LED_BUILTIN 14

```
void setup() {
  // initialize digital pin LED_BUILTIN as an output.
  pinMode(LED_BUILTIN, OUTPUT);
```







Laboratory development boards

- LCD Keypad shield
- HD44780
- Analog input keyboard



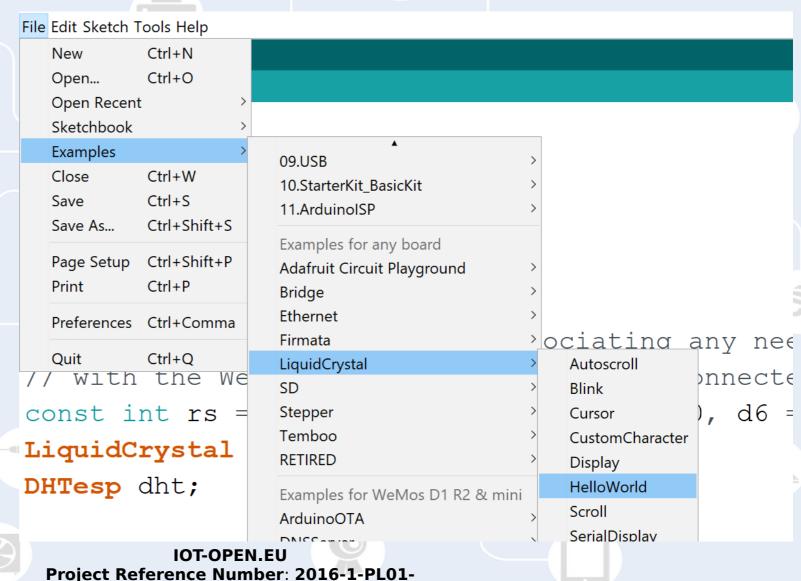




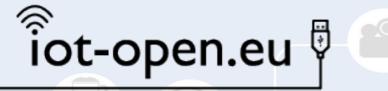


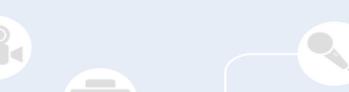


Hello world on LCD example



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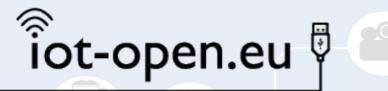


PINs used by LCD Keypad shield

Name	Arduino number	ESP number
EN	9	13
RS	8	12
DB7	7	14
DB6	6	2
DB5	5	0
DB4	4	4
W	GND	









Settings for WeMos R1D2

```
#include <LiquidCrystal.h>
const int rs = 8, en = 9, d4 = 4, d5 = 5, d6 = 6, d7 = 7;
LiquidCrystal lcd(rs, en, d4, d5, d6, d7);
```

```
const int rs = 12, en = 13, d4 = 4, d5 = 0, d6 = 2, d7 = 14;
```

LiquidCrystal lcd(rs, en, d4, d5, d6, d7);





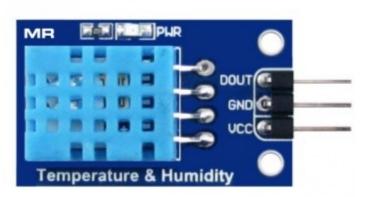






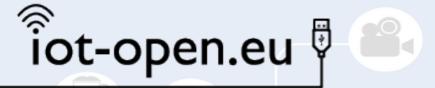
Laboratory development boards

- DHT11 sensor
- Temperature
- Humidity





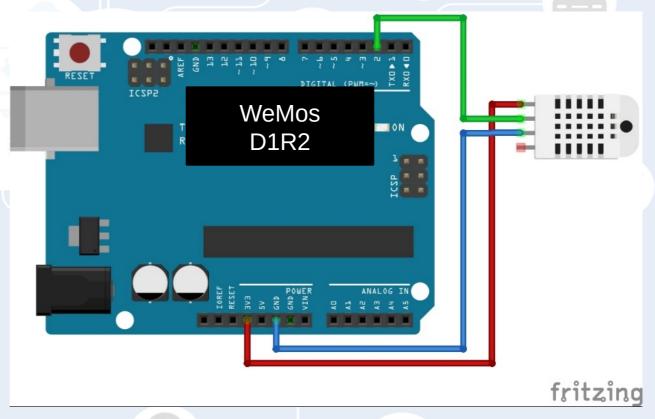






DHT11 connection

- Connect GND to GND
- Connect Vcc to 3V3!
- Connect Dout to D16 (Arduino PIN D2)













DHT11 library

Blink | Arduino 1.8.5

File Edit Sketch Tools Help



oile Ctrl+R Ctrl+U

Upload Using Programmer Ctrl+Shift+U

Export compiled Binary

Ctrl+Alt+S

Show Sketch Folder

Ctrl+K

Include Library

Add File...

Turns an LED on for

Contributed libraries

Adafruit ST7735 Library

ArduinoOTA

DHT sensor library for ESPx

DNSServer

DallasTemperature

Most Arduinos have an

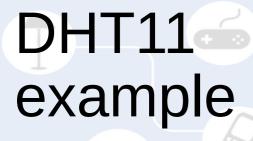


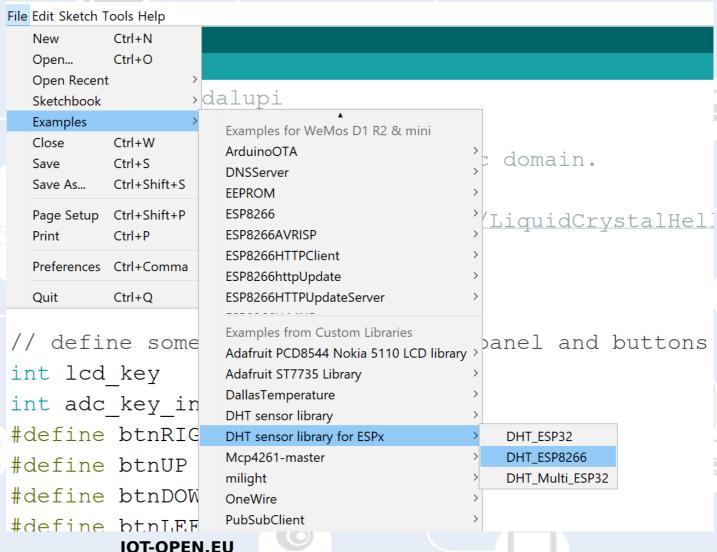
В





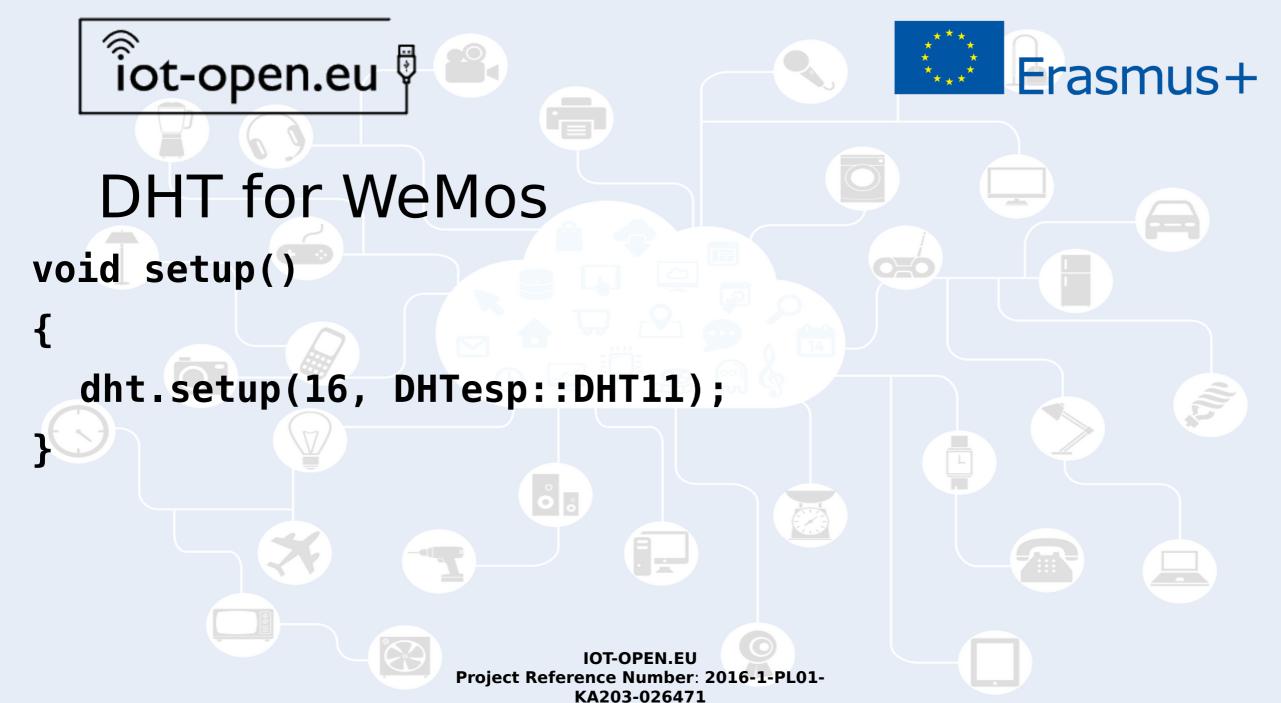








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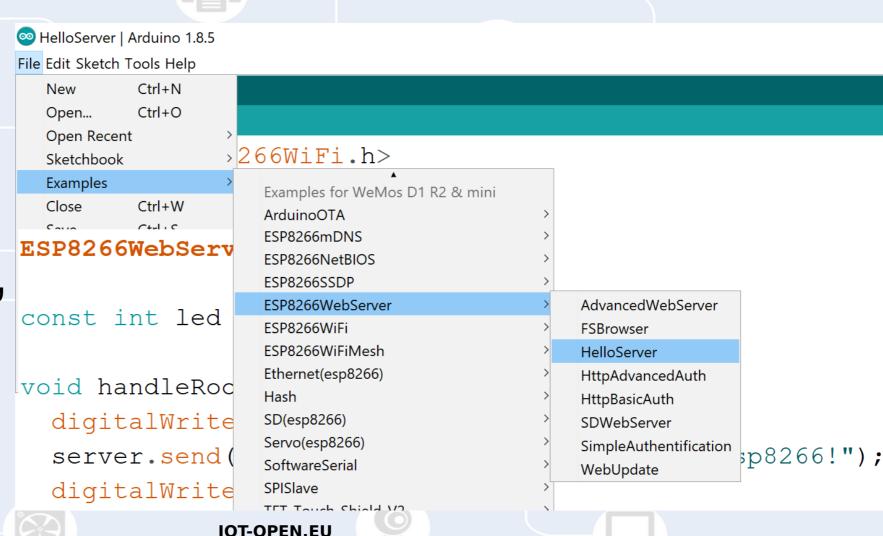












Project Reference Number: 2016-1-PL01-KA203-026471





Web Server

const char* ssid = "internal.IOT";
const char* password = "IoTlab32768";













library PubSubClient

Examples from Custom Libraries ard manager under Adafruit PCD8544 Nokia 5110 LCD library > >stable/package es Adafruit ST7735 Library **DallasTemperature** ard Manager" and **DHT** sensor library >>> Board" DHT sensor library for ESPx Mcp4261-master milight OneWire **PubSubClient** mqtt_auth rc-switch mqtt_basic RemoteSwitch-master mqtt_esp8266 mqtt_publish_in_callback TFT_ILI9163C **INCOMPATIBLE** mqtt_reconnect_nonblocking mqtt_stream







MQTT publish/subscribe

// Update these with values suitable for your network.





MQTT publish/subscribe

MQTT server login credentials

Username: vrel

Password: vrel2018

// Attempt to connect if

(client.connect("ESP8266Client", "vrel", "vrel2018"))



