



Home Assistant

Introduction and my initial experience

- Who am I
- Conflict of interests - none
- What is home assistant
- How to get it
- How to use it
- My experience and impressions

What's home assistant

If you don't know yet, this month is Home Assistant's birthday!



- On September 17th, 2013 [Paulus Schoutsen](#) made the first commit for Home Assistant that started a snowball of Home Automation enthusiasts willing to contribute to the open-source project.
- 9 Years later, Home Assistant is actively used by more than 500,000 people and growing every day.
- Nabu Casa also turns 4 this month. Turning 4 years old ...
(from home assistant website.)

What's home assistant

It is a free and Open source program that runs on **your home network**.
-It is well maintained. Updates appear on a weekly/daily basis

It enables you to easily set up automation to control things in your home. Examples to be given later.

It can easily be used via the user interface but there are options to use YAML code (easily accessible from within the program)
- more about YAML later

The underlying workhorse is Python

Operating system is Linux

What's home assistant

It uses a web-based user interface That enables you to control everything.

(my home assistant resides on a Raspberry Pi)

- But I access it mostly via my Mac or through the app)

Browser - use Google Chrome.

Companion app.

Free

Mirrors what you see using
web based interface

- can get notifications from HA to your phone via app
(500/day **for free!!!**. - this happens via google firebase)

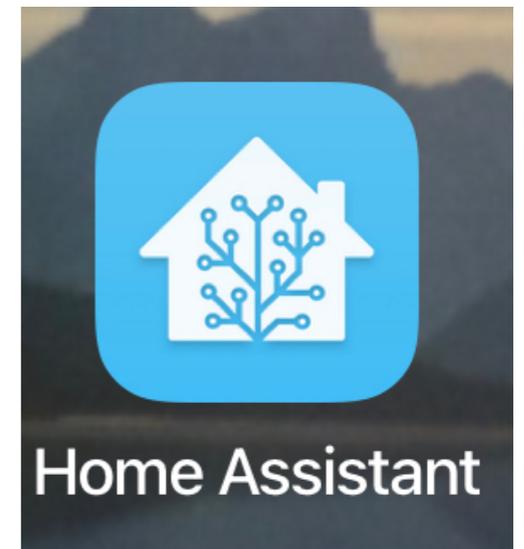


What's home assistant

App cannot access home assistant when you are away from you home network, unless you subscribe to their paid cloud based service

- I do not use their cloud based service
- I think the fee is about \$5.00/month

Nabu Casa was set up to facilitate this



Getting going with Home assistant

The way I use it : download raspberry pi operating system

- there is a other section where HA is an image option
- works on raspberry Pi 3 and Pi 4
- I use a 64G mem stick

Power up the pi connected to
Internet via **Ethernet**

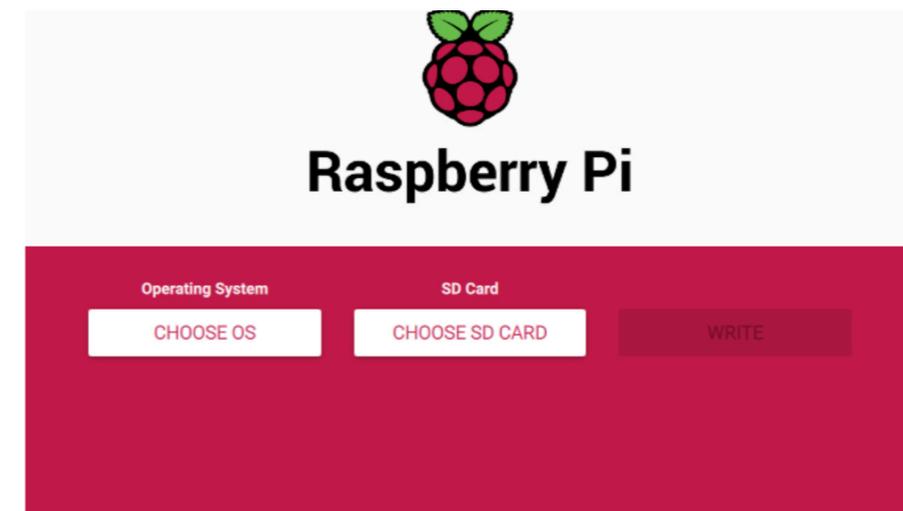
Connect chrome to:

homeassistant.local:8123

Create account. (**remember username and password...!!!**)

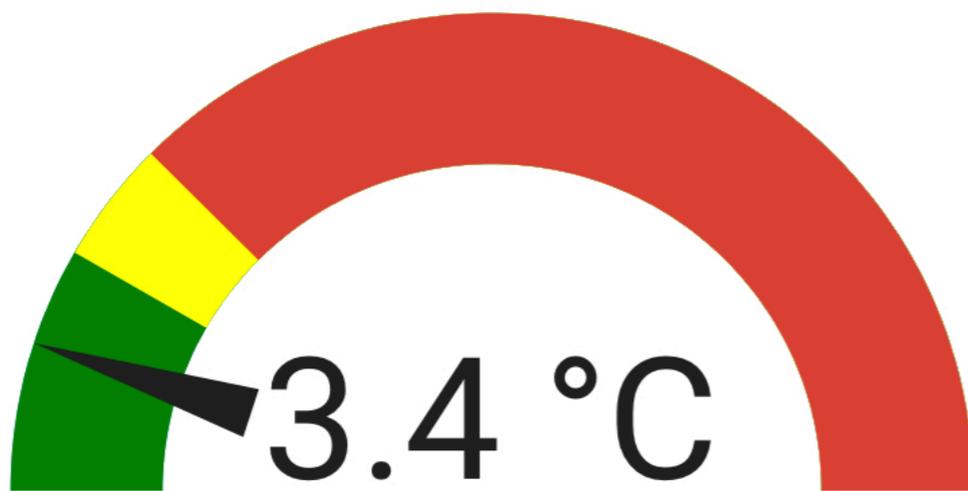
You are asked for location units etc

- Works on Mac, windows and linux



Getting going with Home assistant

There is an easily configurable dashboard. (Lovelace)
- you add "cards " to this. Two I made up



Fridge 140



Milliliters of water in Pepper's dish

Some configurations are very impressive

Home assistant - dashboards

Home Assistant

ARS Home [by Arsaboo](#) [NEXT DEMO](#)

Lights

- Kitchen Lights
- Living Room Lights
- Porch Lights
- Garage Lights

Energy distribution today

Non-fossil: 0.6 kWh
Solar: 1 kWh
Gas: 1.4 m³
Grid: ←0.1 kWh, →2.6 kWh
Home: 3.5 kWh

[GO TO THE ENERGY DASHBOARD](#)

22 °C
20.0 - 24.0
Auto - Away

Upstairs

21 °C
23 °C

Family Room

easy rider
MUSIC FROM AND INSPIRED BY
PETER FONDA
DENNIS HOPPER
JACK NICHOLSON

I Wasn't Born To Follow
The Byrds

Information

- Morning Commute: 37 min
- Commute to Home: 41 min
- PlexSpy: 0 Watching
- USDINR: 71.25 INR

Security Disarmed

[ARM HOME](#) [ARM AWAY](#)

Home Assistant - side bars

Most useful are:

- esp home
- developers tools and settings
- studio code server
- file editor

Home Assistant



Overview



Energy



Map



Logbook



History



ESPHome



File editor



Node-RED



Studio Code Server



Terminal



Media



Developer Tools



Settings

Home Assistant - settings

Integrations - with a LOT of stuff already in your network
- google home, Moen flo, iPhone, environment Canada,
chrome cast, music (I do not really use this one) , and more

Automations : **my favorite section.** Where things happen..!!!
- like IFTTT on steroids.

Triggers, conditions, and actions.
Will show actually examples later

Uses a user interface and/or YAML

Home Assistant - automation

How do you want to create your new automation? ×

Use a blueprint

Select a Blueprint ▼

Start with an empty automation >
Create a new automation from scratch

← New Automation

Triggers

+ ADD TRIGGER

Conditions

+ ADD CONDITION

Actions

+ ADD ACTION

Automation

← fridge 140 too hot alert. ⋮

send google tts announcements and also push notification to app that fridge is too hot (has to be out of range for 5 minutes)

Triggers ?

^ Time pattern trigger ⋮

Hours

Minutes
30

Seconds

Automation

Conditions

Confirm Kitchen 140 Temperature
(temperature4) is above 6

Entity*
Kitchen 140 Temperature (temperature4)

Attribute

Above
6

Below

Actions

Text-to-Speech (TTS): Say an TTS message
with google_translate

Service
Text-to-Speech (TTS): Say an TTS message

Say something using text-to-speech on a
media player with google_translate.

Entity
Name(s) of media player entities.

Entity*
Den speaker

Message
Text to speak on devices.

The fridge at 140 is above 6 degrees celsius

YAML

alias: "fridge 140 too hot alert. "

description: >-

send google tts announcements and also push notification to app that fridge is too hot (has to be out of range for 5 minutes)

trigger:

- platform: time_pattern
- minutes: "30"

condition:

- condition: numeric_state
- entity_id: sensor.living_room_temperature_temperature4
- above: "6"

action:

- service: tts.google_translate_say

data:

entity_id: media_player.den_speaker

message: "The fridge at 140 is above 6 degrees Celsius " message: "The fridge at 140 is above 6 degrees celsius "

YAML

Yet Another Markup Language, Initial release 2001

But From yaml.org :

`%YAML 1.2`

`---`

`YAML: YAML Ain't Markup Language™`

`What It Is:`

`YAML is a human-friendly data serialization language for all programming languages.`

`Some important points: I am not an expert, BUT`

YAML

Spacing must be correct - like python.

Tabs are not allowed (use spaces instead)

(studio code server automatically disables the tab key)

YAML tips

Using the value of a state.:

Lightning strike of a thunderstorm has been detected of magnitude `{{states('sensor.lightning_energy')}}`

Using value of an attribute:

```
- condition: template
  value_template: >-
    {{ states('sensor.weather_calgary_olympic_park_high_temperature' )|
float |
    round(2) >state_attr('weather.calgary','temperature') | float| round(2)}}}
```

So this can get complicated: => use developer tools , =>templates

Templates are rendered using the Jinja2 template engine- **test here**

Example to be shown later.

Helper functions

Can be used to enhance your automations
-Long list of handy useful functions

Create helper



Button



Change device type of a switch



Counter



Date and/or time



Derivative sensor



Dropdown

Helper functions



Group



Integration - Riemann sum integral sensor



Min / max / mean / median sensor



Number



Schedule



Text



Threshold Sensor

Helper functions



Timer



Times of the Day Sensor



Toggle



Utility Meter

ESPHOME- very useful addon

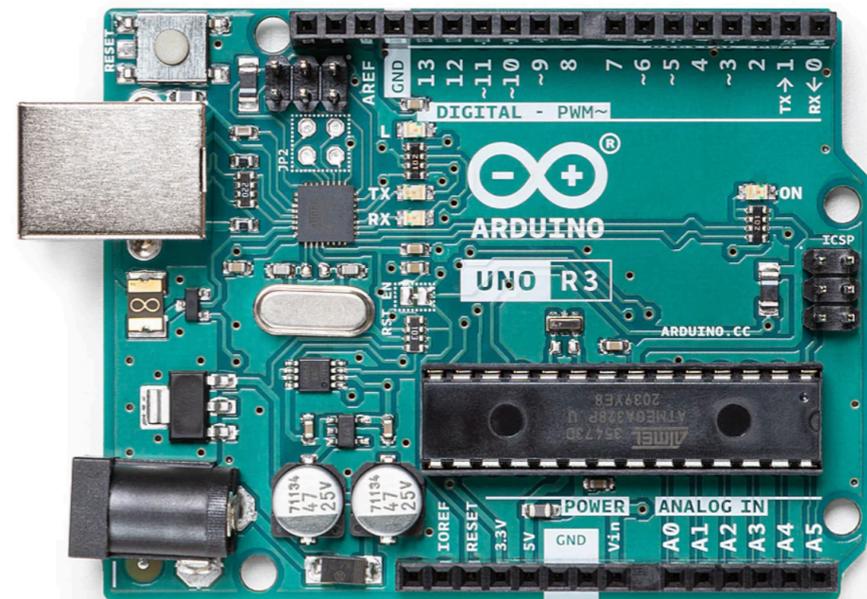
- Will give ESP home live demo later
 - It uses single board computers - **ESP8266**, ESP32
- Like a more powerful Arduino with onboard WIFI

- short history

Arduino first launched 2005 - tool for students

- picture from [arduino.cc](https://www.arduino.cc) =>
- programmed in C via
Arduino IDE (Integrated
Development Environment)
compiler

Arduino IDE used for
programming ESP32
and ESP8266



ESPHOME- ESP8266

Programming with Arduino IDE is ok but prone to errors.

- le Node red
- MQTT** lightweight method - but not always easy

Better:

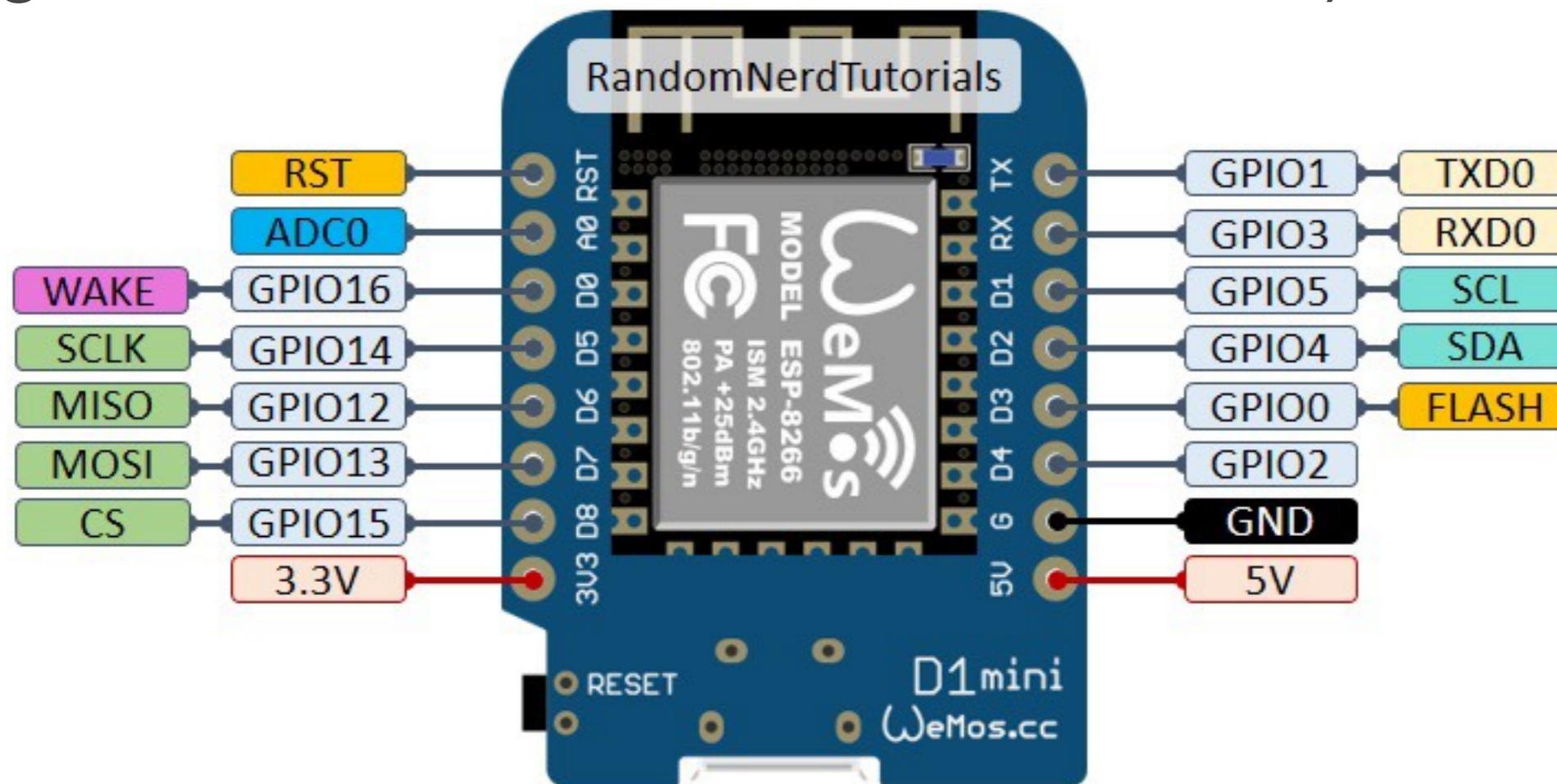
- use esp8266 easily with ESPHOME
(it is done within home assistant - huge step forward)

— —

The random nerd tutorials are very good for ESP8266

ESPHOME- ESP8266

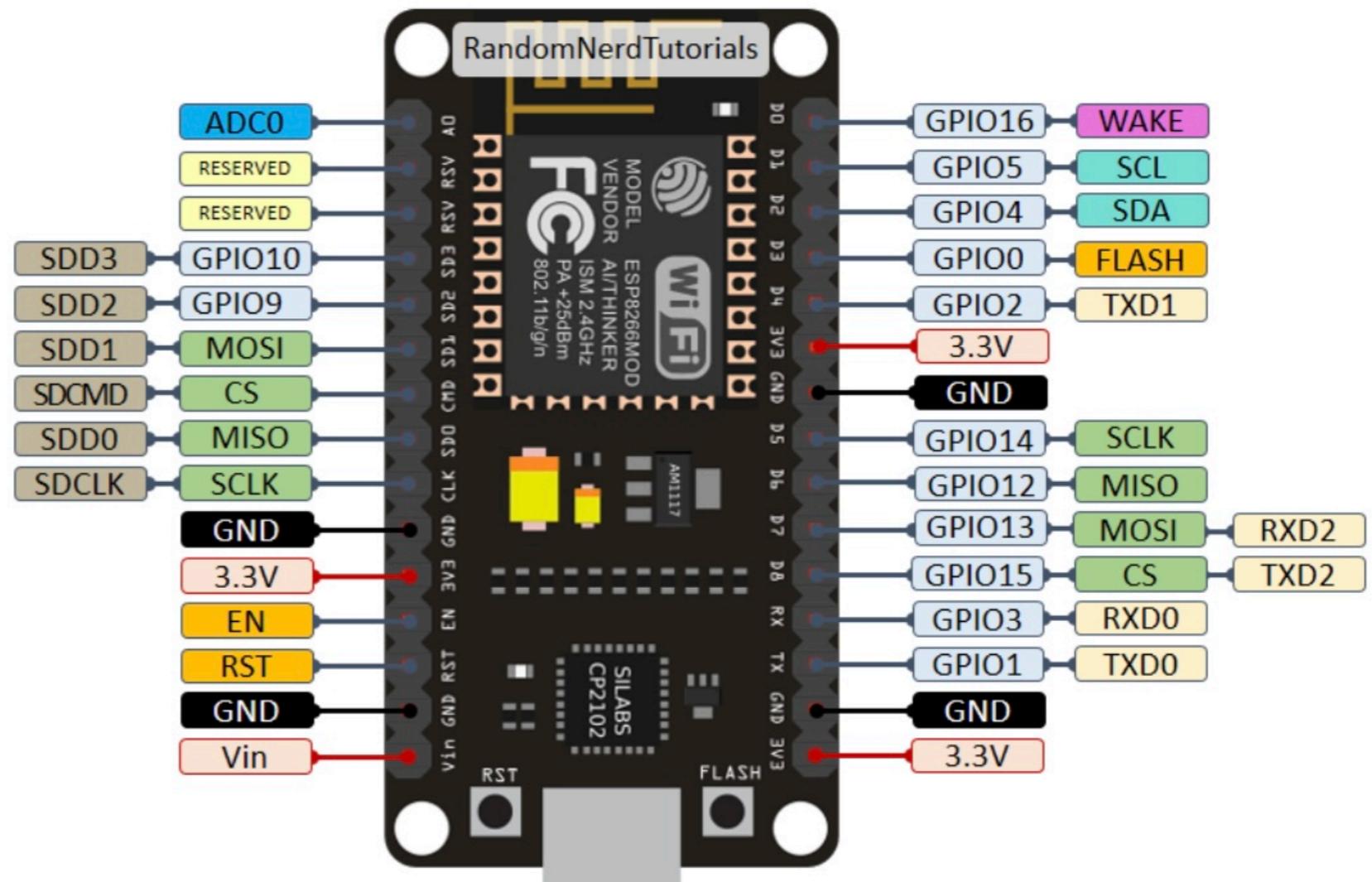
D1 mini - use d2 or d1. (which frequently has to be programmed as GPIO4 and GPIO5...!!!!)



ESPHOME- ESP8266

- Same as before
bigger format
- upload initial Program via **Usb micro port**
 - after this it is done:
 - Use over wifi (**OTA updates**)

Here's a quick overview of the ESP-12E NodeMCU Kit pinout:



ESPHOME- MANY sensors

Just a few examples

Air Quality

		
AirThings BLE Radon	CCS811 CO2 & Volatile organics	HM3301 Particulate
		
MH-Z19 CO2 & Temperature	PM1006 Sensor Particulate	PMSA003I Particulate
		
PMSX003 Particulate	RadonEye BLE Radon	SDS011 Sensor Particulate
		
SEN5x Temperature & Humidity	SenseAir CO2	SCD30 CO2 & Temperature & Humidity

- [Dallas Temperature Sensor](#)
- [Daly BMS Sensor](#)
- [DHT Temperature+Humidity Sensor](#)
- [DHT12 Temperature+Humidity Sensor](#)
- [DPS310 Atmospheric Pressure Sensor](#)
- [DSMR Component](#)
- [Duty Cycle Sensor](#)
- [ENS210 Temperature+Humidity Sensor](#)
- [ESP32 Hall Sensor](#)
- [EZO sensor circuits](#)
- [Growatt Solar](#)
- [Havells Solar](#)
- [HDC1080 Temperature+Humidity Sensor](#)
- [HLW8012 Power Sensor](#)
- [The Grove - Laser PM2.5 Sensor \(HM3301\)](#)
- [HMC5883L Magnetometer](#)
- [Home Assistant Sensor](#)
- [Honeywell ABP Pressure Sensors](#)
- [HRXL MaxSonar WR Series](#)
- [HTU21D | Si7021 | SHT21 Temperature & Humidity Sensor](#)
- [HX711 Load Cell Amplifier](#)
- [Hydreon Rain Sensor](#)
- [INA219 DC Current Sensor](#)
- [INA226 DC current and power sensor](#)
- [INA260 DC Current and Power sensor](#)
- [INA3221 3-Channel DC Current Sensor](#)
- [Inkbird IBS-TH1, IBS-TH1 Mini, and IBS-TH2 BLE Sensor](#)
- [Integration Sensor](#)
- [Kalman filter-based sensor fusion](#)
- [LTR390 UV and Ambient Light Sensor](#)
- [MAX31855 K-Type Thermocouple Temperature Sensor](#)
- [MAX31856 Thermocouple Temperature Sensor](#)
- [MAX31865 Platinum RTD Temperature Sensor](#)
- [MAX44009 Ambient Light Sensor](#)
- [Dallas Temperature Sensor](#)
- [Daly BMS Sensor](#)
- [DHT Temperature+Humidity Sensor](#)
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- [MAX31865 Platinum RTD Temperature Sensor](#)
- [MAX44009 Ambient Light Sensor](#)

ESPHOME-HA integration DEMO

Select add new device:

Select continue in dialog

Name you device

Select: you microprocessor board

Select connect to this computer

- allow raspberry pi to compile file

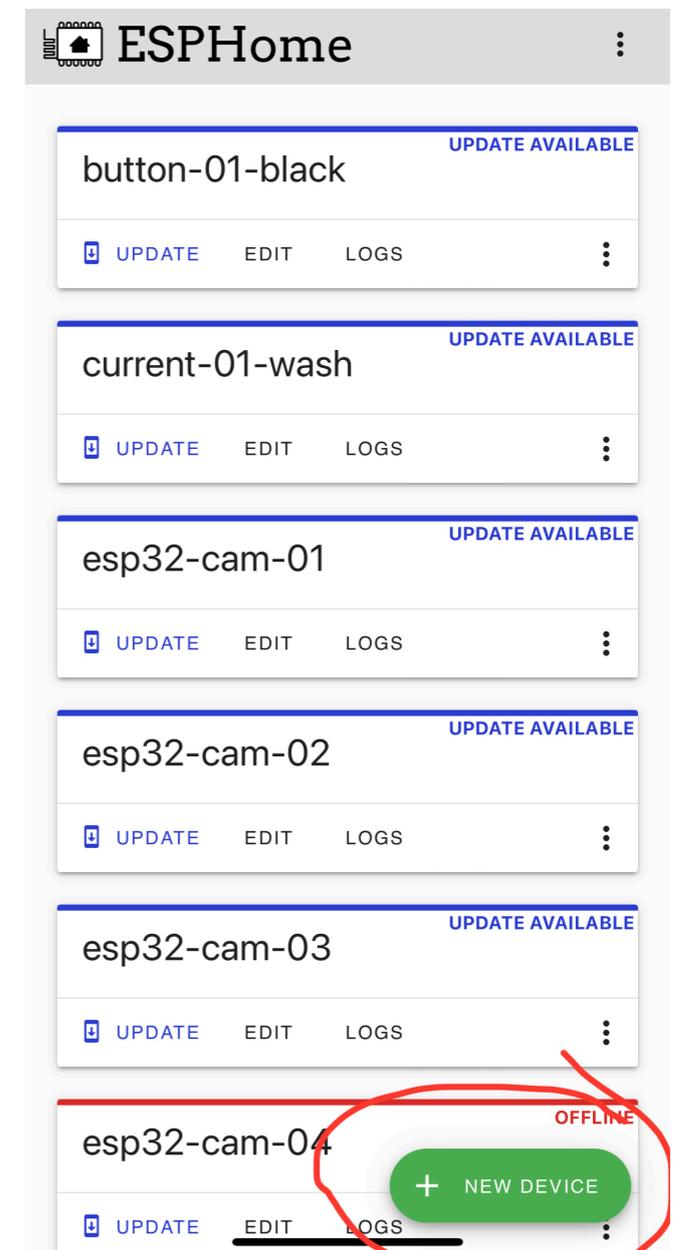
- download file

Open web programming interface

-connect to usb connected board

-upload downloaded file to board

Done: everything else happens by wifi



ESPHOME-HA integration DEMO

Now microprocessor board as been prepared with

- Password for future OTA programming
- Password for it to act as its own hotspot so you can log into it even if no home wifi network is available.

It cannot do anything else.

- it needs functionality- *a purpose in life !!!*

Add the few lines of YAML code , and update (OTA)

Once done. Copy password => to HA integration

- and now device is available to home assistant