

Automate your home

with **Home Assistant**



Alternatives

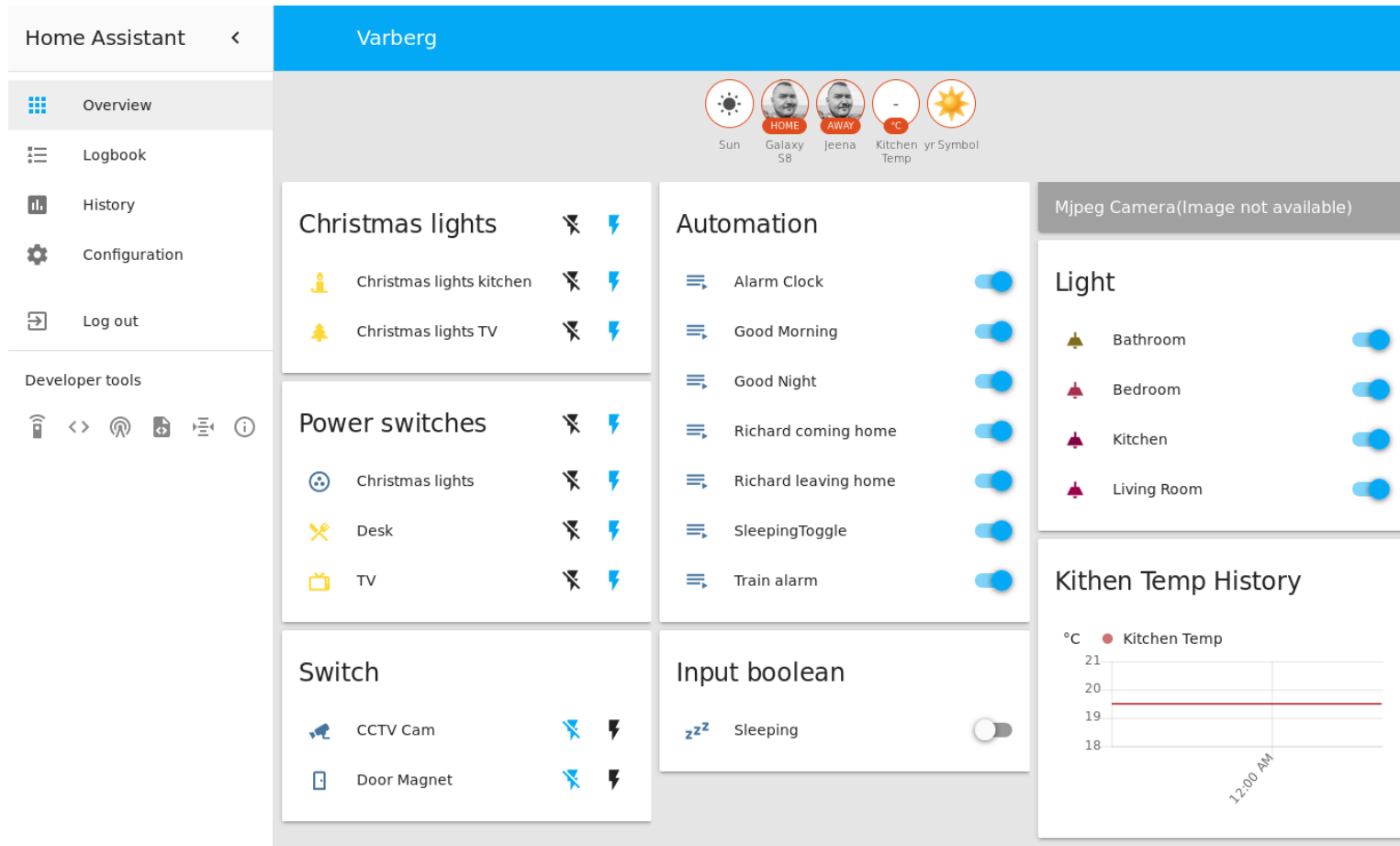


- Very convenient
- Everything happens in the Cloud
- Nice looking bricks without internet connection
- Always listening and sending home data about you
- No incentive to integrate with other brand's hardware

What is Home Assistant?

- A central software which can listen to events which are happening in connected hardware, trigger automations and log what is happening
- Frontend written with Polymer and WebComponents
- Backend written in Python
- Over 1000 integrations to hardware and software
- Can be run everywhere where Python runs, Raspberry Pi, NUC, Laptop, Desktop, Server
- Really big community

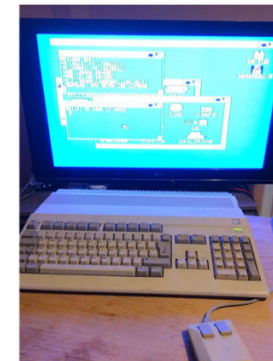
UI example



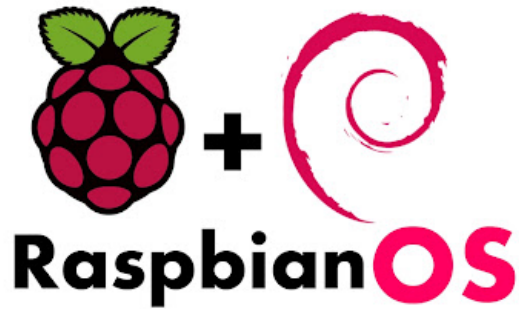
Hass.io

- Super easy to set up:
 - Image to flash on your Raspberry Pi
- Extensible with from the UI available extensions (implemented as Docker images)
- Automatic updates
- Not as much control over the software

My (small) hardware setup



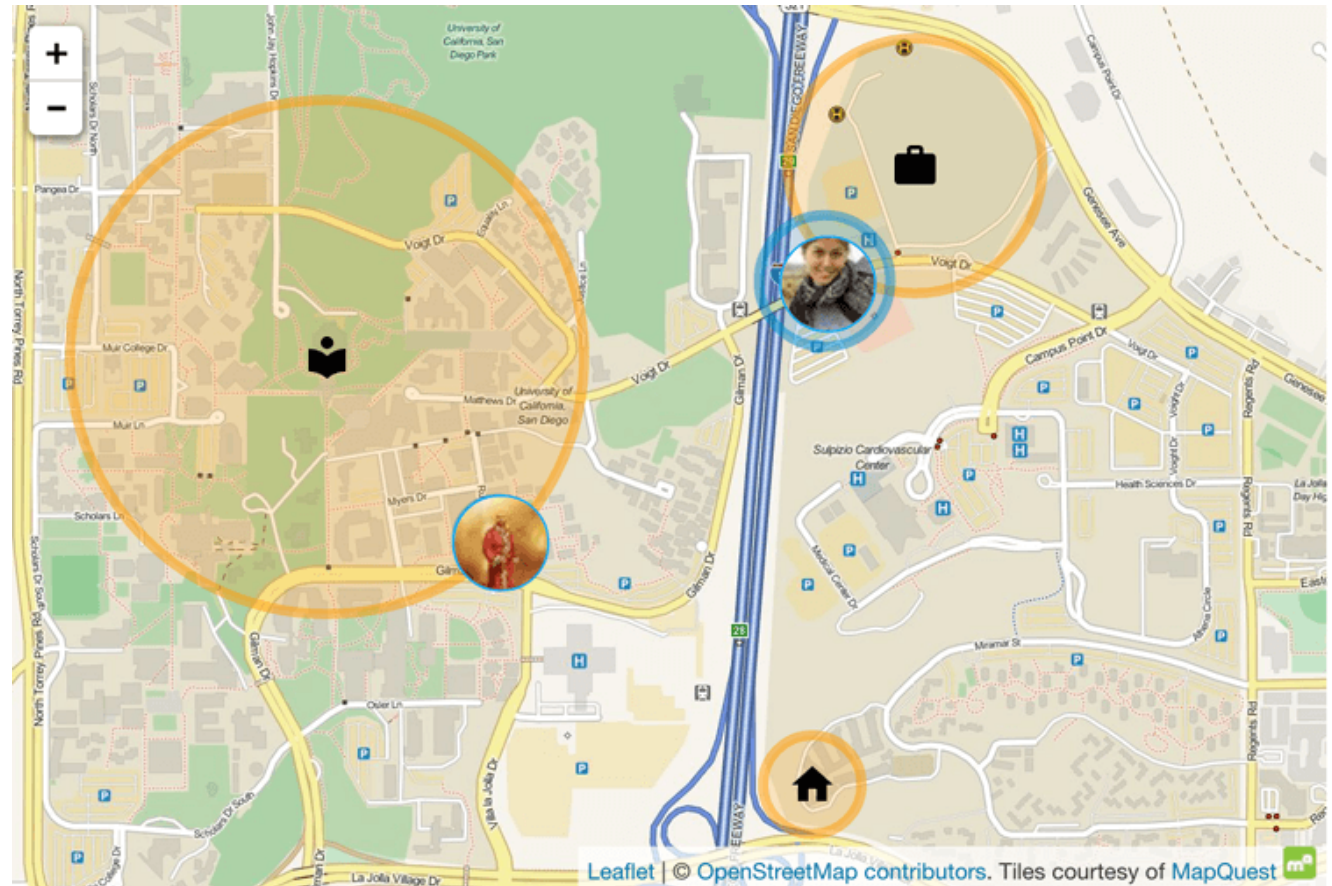
Software setup



My way of setting it up

1. Install Raspbian on Raspberry Pi
2. Compile + install telldus-core
3. Configure TellstickDuo
4. Install and configure BlueZ
5. Configure Home Assistant for hardware
6. Write automations
7. Build WiFi thermometer and button
8. Configure them to be useful in HA

Presence detection



Presence detection technology



Google Maps location sharing



Automating lights

- The easiest use case to come up with
- The easiest to set up
- Fairly expensive to replace all lights, especially to make it user friendly
- Cool show off effects
- Grouped in logical groups
- My setup are wifi bulbs with a open protocol
- Problematic when people use the switches
- Better, but more expensive, to replace the light switches.

More wireless technologies

LPD433

- Low power device 433 MHz
- UHF band in which licence free communication devices
- No mesh networking functionality
- No common protocol
- Used for Citizens band radio
- Many have Nexa switches



- Open protocol
- Defined by ZigBee Alliance
- Mesh networking technology
- Philips Hue uses it



- Closed protocol
- Only available to their customers
- Mesh networking technology
- Simple protocol

Saving energy

- Automation to cut the power when I leave:
 - TV
 - Music amps / subwoofer
 - WiFi Access Point
 - Computer
 - Screen
 - Christmas lights
 - Ethernet switches
- Might want to add in the future:
 - Kitchen stove
 - Iron
 - Microwave



Automations

- The heart of the system
- I don't have many yet but they're fun

Pick automation to edit

Alarm Clock >

Good Morning >

Good Night >

Jeena coming home >

Jeena leaving home >

SleepingToggle >

Train alarm >

Automation UI

Trigger type

State

Entity

device_tracker.galaxy_s8

From

home

To

not_home

Action type

Call service

Service

homeassistant.turn_off

Service data

{
 "entity_id": "group.power_switches"
}

Action type

Call service

Service

light.turn_off

Service data

{}

Action type

Call service

Service

switch.turn_on

Service data

{
 "entity_id": "switch.cctv_cam"
}

Automation UI 2

Condition type

State

Entity

device_tracker.galaxy_s8

State

home

Condition type

State

Entity

input_boolean.sleeping

State

off

Condition type

Time

After

06:00:00

Before

11:00:00

Action type

Call service

Service

tts.picotts_say

Service data

{
 "message": "Jeena, the train goes in 7 minutes, if you don't go now you'll be late!"
}

Configuration

- Many things possible in UI
- Everything else in yaml config files
- Hardware configuration like normally on Linux in /etc

device_tracker:

- platform: bluetooth_tracker
- track_new_devices: no

mqtt:

broker: localhost
port: 1883
client_id: home-assistant
username: !secret mqtt_user
password: !secret mqtt_password

light:

- platform: yeelight
- devices:
 - 192.168.1.182:
 - name: Bathroom
 - transition: 1000
 - 192.168.1.122:
 - name: Living Room
 - transition: 1000

CCTV

- Only has power when I'm away
- Remote control via open ONVIF protocol
- left, right, up, down
- MJPEG stream directly to the browser or HA UI
- Movement detection + notification on phone

Dual Antenna

Dual antenna designed, WIFI connection is more stable and powerful.

ESCAM®

ESCAM G02



States in my flat

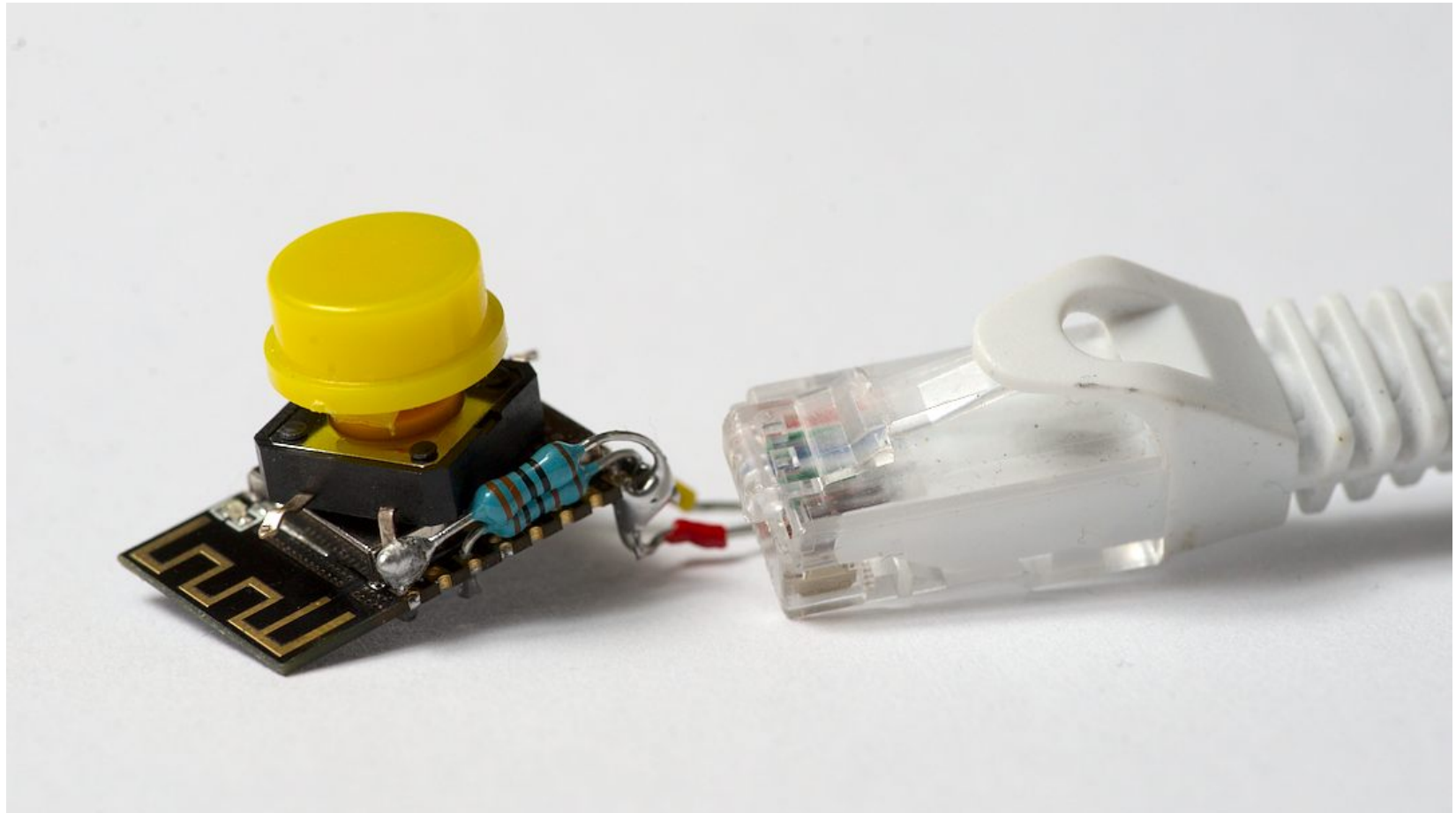


- **Am I present?**
- Bluetooth
- If my mobile phones Bluetooth is visible to the Rpi3's Bluetooth chip, doesn't need to be paired

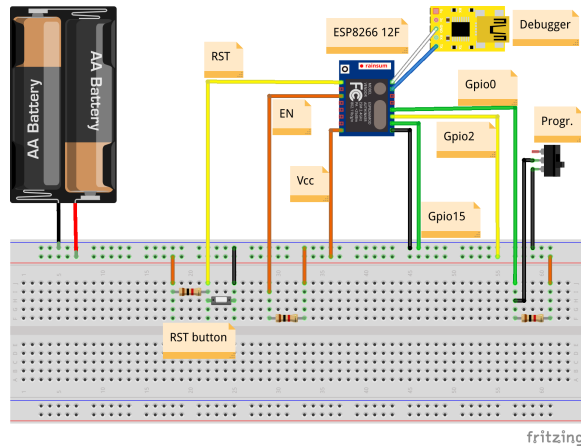


- **Am I sleeping?**
- ESP8266 Button
- Sends MQTT message to HA on boot
- I press the button when I go to sleep and when I wake up

ESP8266-Button



Open Source Hard- & Software



Setup:

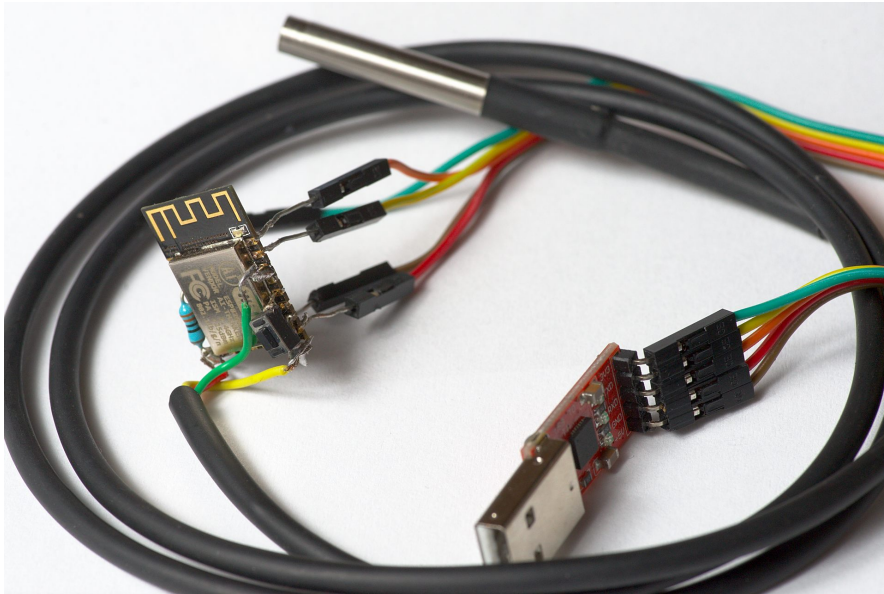
```
#define ssid "myssid"
#define password "mypass"
#define mqtt_server "example.com"
#define mqtt_port 1883
#define mqtt_user "user"
#define mqtt_password "passwd"
#define topic "sensor/sleeping"
#define topic_content "toggle"
```

- My first Open Source Hardware project
- Schema designed with fritzing
- Software is GPLv3
- Documentation on how to flash with Arduino IDE
- Consumes minimal amount of energy because it only runs for 2 seconds after pressing the button then goes to deep sleep
- Low lag, about 1s to boot, send MQTT message and HA switching on/off lamps

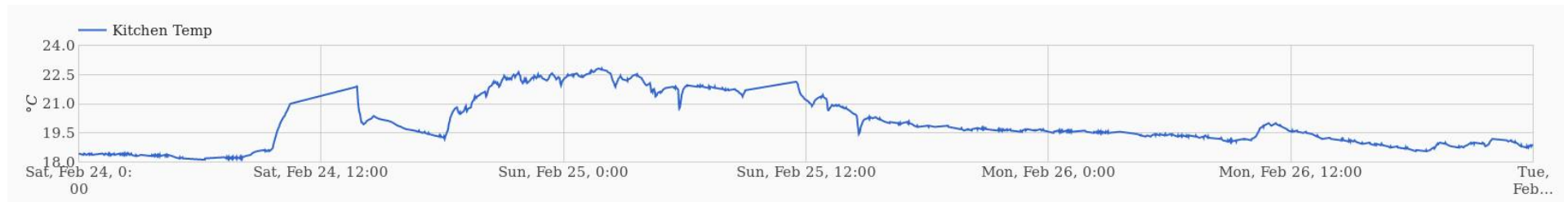
Let's look at the code

<https://github.com/jeena/esp8266-button/blob/master/espbutton/espbutton.ino>

Kitchen Temperature

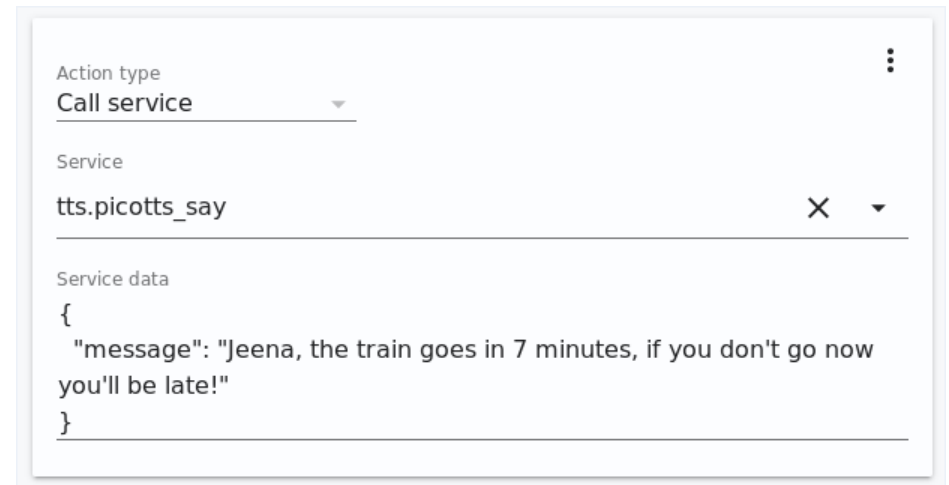


- It's cold in my flat but I need data on how cold it is
- ESP8266 (24 SEK) + DS18B20 (17 SEK) + old USB changer (0 SEK)
- Built in HTTP server responds to GET requests with a plaintext floating number like: 19.03
- <https://github.com/jeena/esp8266-temperature>
- Still need to document the hardware
- HA calls it periodically and saves the temperature in it's database
- Interesting party weekend graph



Train alarm

- I always missed the train to work in the morning because I didn't look at the clock often enough
- Now HA reminds me that the train leaves really soon
- Speech is done locally by libttspico-utils, not in the cloud
- Might want to turn it off when in recorded telco with 100 people, otherwise it interrupts you several time



The image shows a screenshot of a Home Assistant configuration interface for a service call. It has a light gray background with a white content area. At the top right, there is a vertical ellipsis menu icon. The interface is divided into sections by horizontal lines. The first section is labeled 'Action type' and contains a dropdown menu with 'Call service' selected. The second section is labeled 'Service' and contains a dropdown menu with 'tts.picotts_say' selected, accompanied by a close button (X) and a dropdown arrow. The third section is labeled 'Service data' and contains a JSON object: { "message": "Jeena, the train goes in 7 minutes, if you don't go now you'll be late!" }.

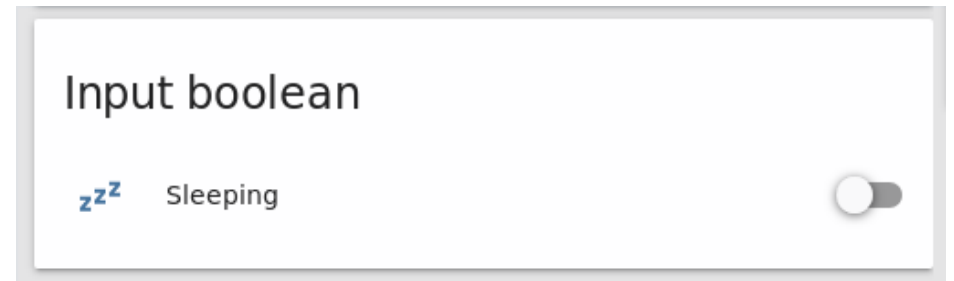
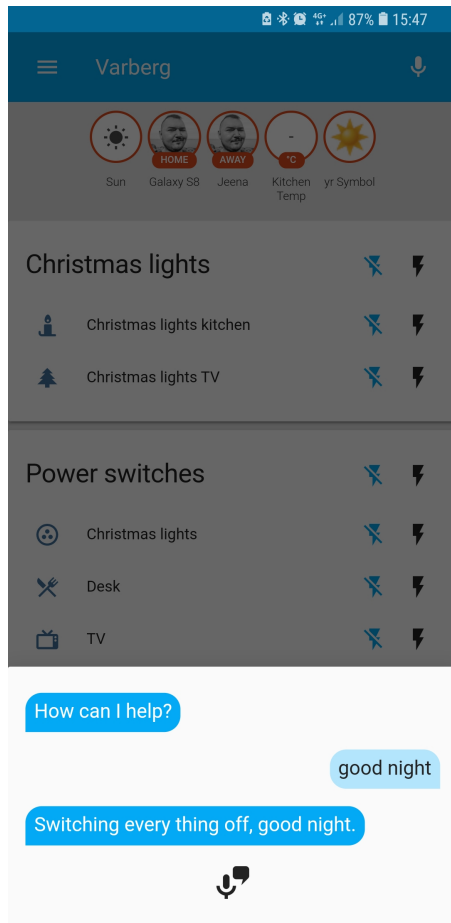
```

Action type
Call service

Service
tts.picotts_say

Service data
{
  "message": "Jeena, the train goes in 7 minutes, if you don't go now
you'll be late!"
}
```


Different ways to trigger



Speaking with your HA and intents

Allows you to issue voice commands from the frontend in enabled browsers

conversation:

intents:

TellTime:

- What time is it

GoodNight:

- Good night

GoodMorning:

- Good morning

intent_script:

TellTime:

speech:

text: "Current local time is {{now().hour}}: {{now().minute}}"

action:

service: tts.picotts_say

data_template:

message: "Current local time is {{now().hour}}: {{now().minute}}"

cache: false

GoodNight:

speech:

text: "Switching every thing off, good night."

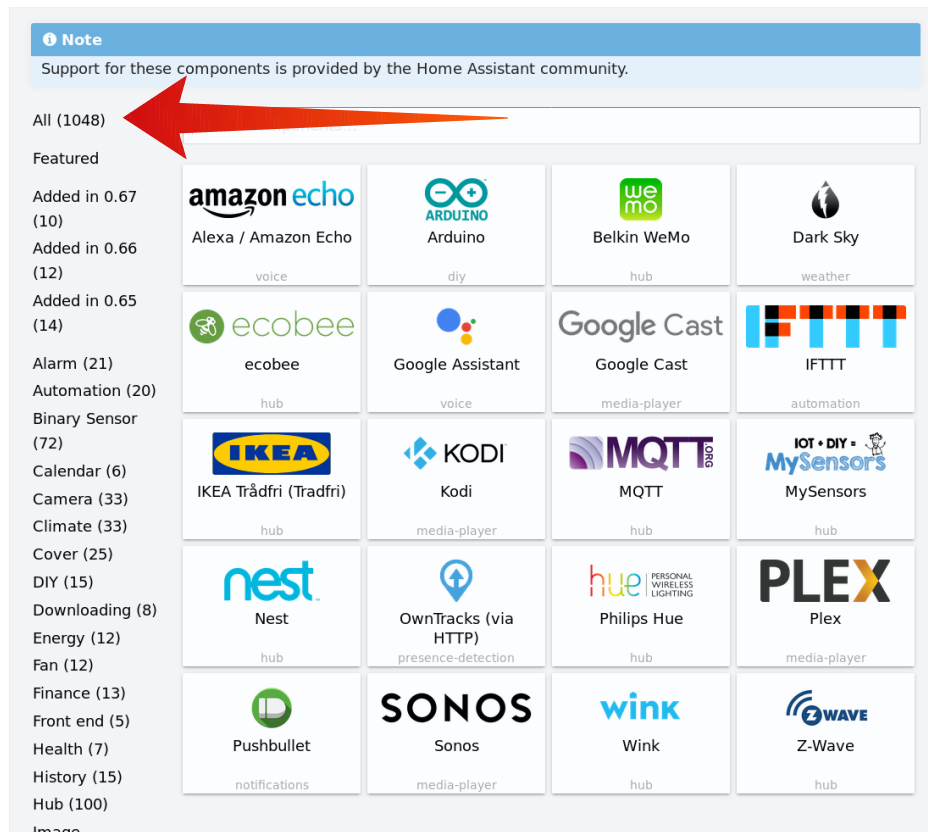
action:

service: input_boolean.turn_on

data:

entity_id: input_boolean.sleeping

HA has over 1000 integrations



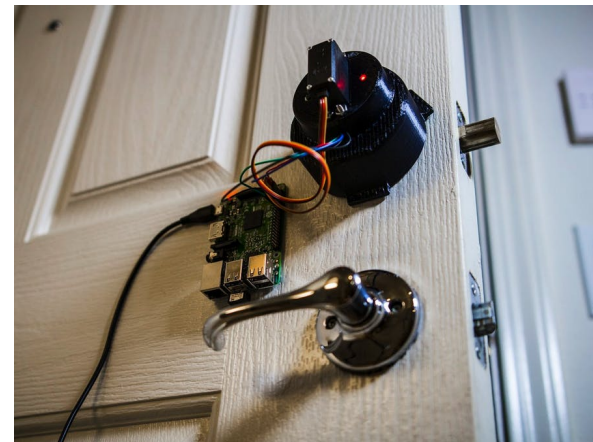
- About 10 commits per day
- Over 100 contributors
- Apache 2.0 license
- Forum
- Chat

Helper software I use

- DuckDNS for access dynamic IP via subdomain
- Letsencrypt for HTTPS
- ZoneMinder for motion detection at other places where I only have a CCTV video stream

My future plans

- Motion sensor at the toilet to switch the light on during the night
- Moving to a more powerful machine, a NUC
- Voice recognition without cloud via snips, very difficult
- Unlocking the front door when I'm close by and automatically lock it afterwards



Questions / Discussion

