

Domotica

donderdag 6 februari 2020

5th GroSkills edition

9:00 - 10:00 & 11:00 - 12:00

th edition

Wat is Domotica of Home Automation

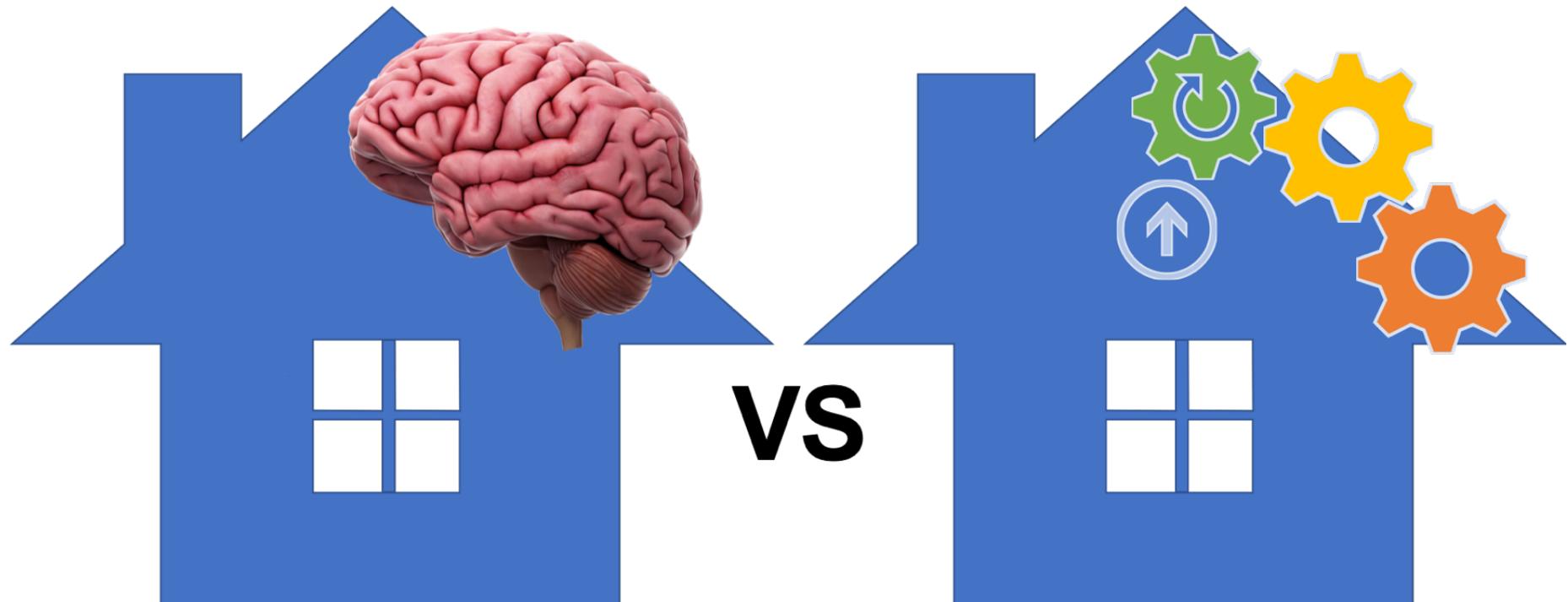
- Wat kun je ermee?
- Hoe begin je met het 'slimmer' maken van je huis.

Home + Automation

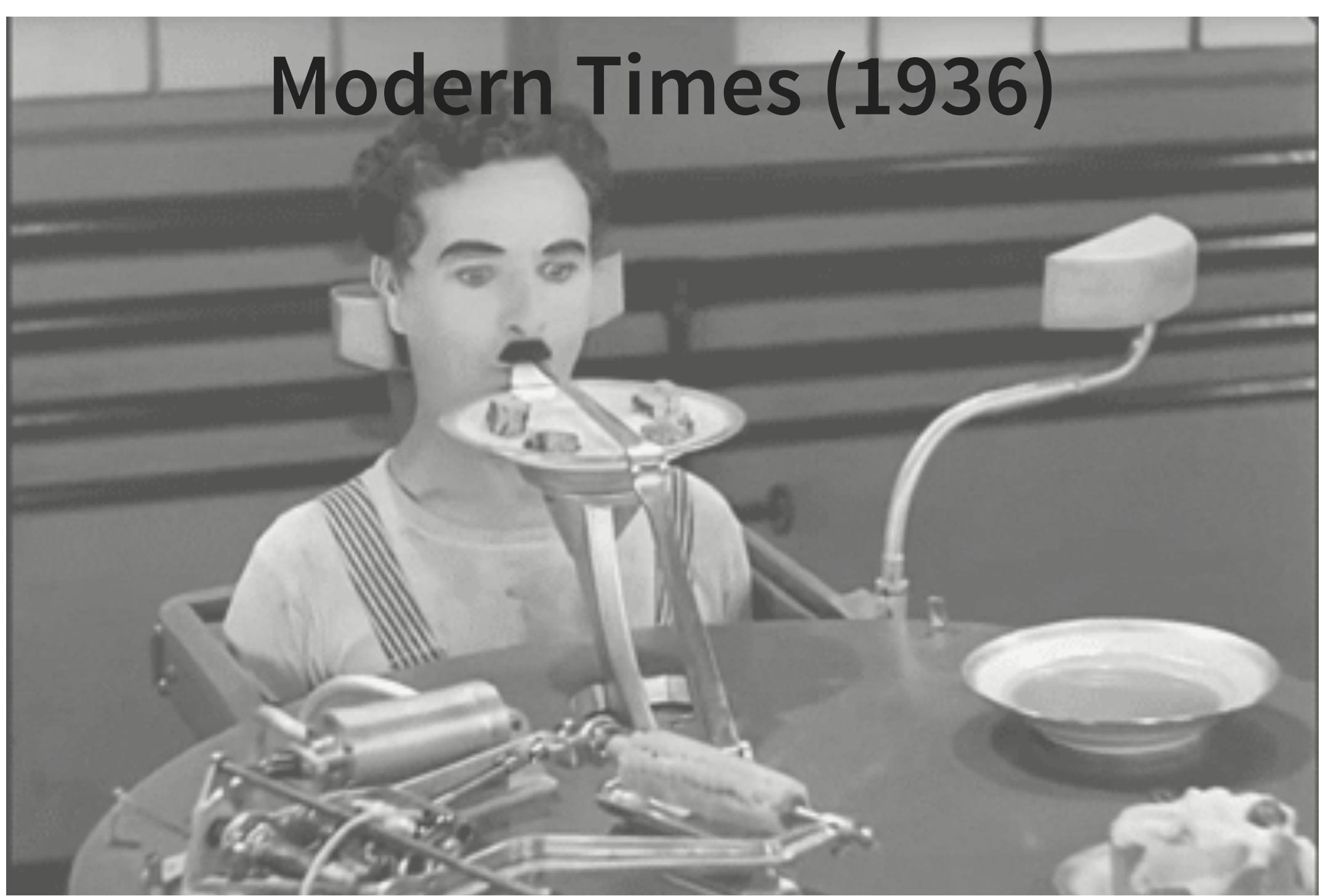
Domus Robotica



Smart vs Automated



Modern Times (1936)



Het Huis van de Toekomst (1989)



Definities

Het toepassen van elektronica en huisnetwerken ten behoeve van de automatisering van processen in en om een woning.

De integratie van technologie en diensten, ten behoeve van een betere kwaliteit van wonen en leven.

Waarom niet?

- Ingewikkeld
- Techniek is niet volwassen (geen standaardisatie)
- Het is duur
- Niet veilig
- Je wordt er lui van
- Je wordt er afhankelijk van
- Het kost te veel tijd

Security

- Waar gaat jouw data naar toe?
- Wat kan iemand met jouw data?
- Je huis in gijzeling? Ransomware?
- etc.
- etc.
- etc.



Waarom wel?

- Gebruiksgemak
- Wooncomfort
- Veiligheid
- Efficient energie gebruik
- Leuk
- Leerzaam

Automatiseren?

A black and white photograph showing a person from the side, wearing a light-colored t-shirt and dark trousers. They are sitting at a desk, looking down at a laptop computer. The background is out of focus, showing what appears to be a workshop or laboratory environment with various equipment and shelving.

Wat wil jij automatiseren?



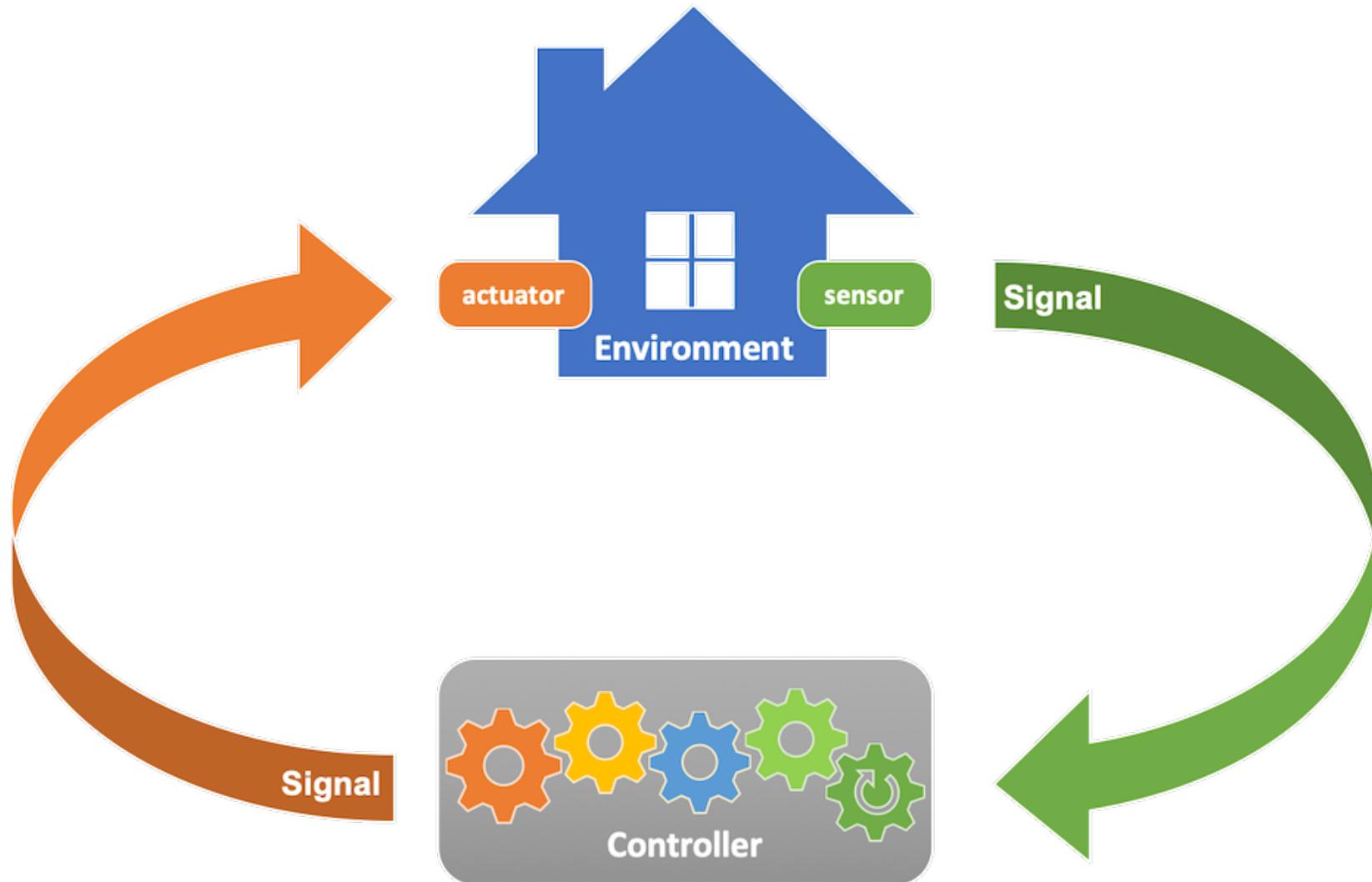
Wat wil jij automatiseren?



Mijn praktijk voorbeelden

- Verwarming uit en aan o.b.v. aanwezigheid
- Verlichtings scenes
- Kerstverlichting uit en aan met timer
- Bewegingsdetectie en notificatie
- Licht automatisch aan bij thuiskomst van de eerste persoon na zonsondergang
- Slimme meter uitlezen
- Opbrengst Zonnepanelen (Fronius)
- Temperatuur, vochtigheid en luchtdruk metingen
- etc.

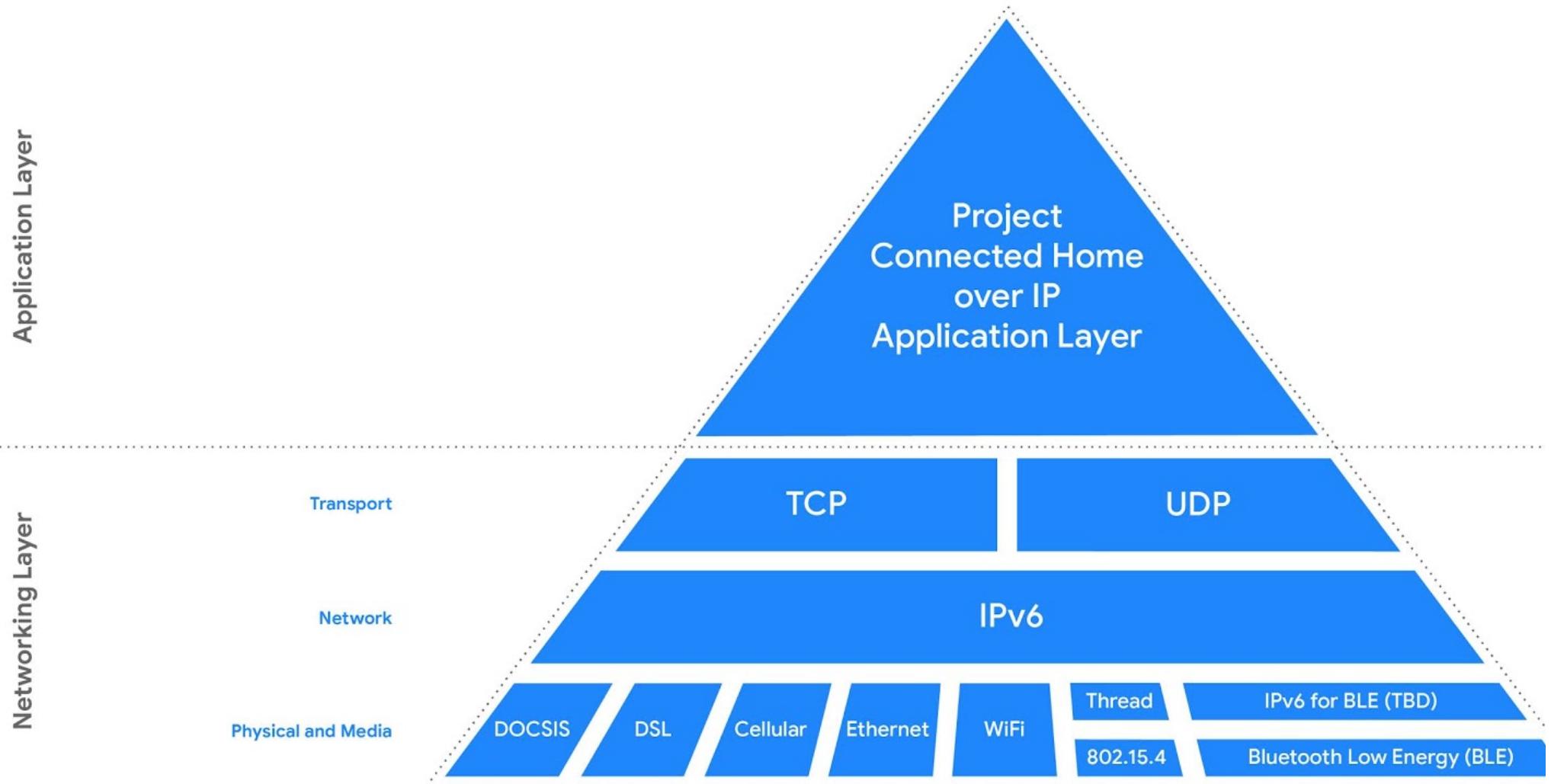
Hoe werkt het?



Signalen - Protocollen

- WiFi, 2,4 GHz
- Zigbee
- 6LoWPAN
- Zwave
- RF, X10 afgeleide
- X10
- CHIP, Connected Home over IP(v6)
 - protocol in ontwikkeling
- MQTT, pub-sub messaging

Project CHIP





*MQTT is a machine-to-machine
(M2M)/IoT connectivity protocol. It was
designed as an extremely lightweight
publish/subscribe messaging
transport.*

Wat is er op de markt?

en wat kun je zelf?



Zigbee

WiFi

	Zigbee	WiFi
Manufacturer	Philps Hue, Ikea TRÅDFRI, Xiaomi	Sonoff, Shelly, Tuya, Espressif
Controller	on premise, cloud	app, cloud based
Modification	DeConz/Conbee, Zigbee2MQTT, Tasmota	Tasmota, ESPHome

KlikAanKlikUit set



KlikAanKlikUit



Stopcontact

Bediening

Control
Station

App

KlikAanKlikUit kenmerken

- Protocol: RF (433 en 868 MHz)
- Groeiend assortiment
- Integratie met Philips Hue via gateway
- Geen API's, gesloten eco-systeem
- RF technologie, "fire-and-forget"

KlikAanKlikUit integratie met RFLink

- How to connect Home Assistant & KlikAanKlikuit
- RFLink Gateway

Philips Hue



Lamp



Bridge



App

Philips Hue kenmerken

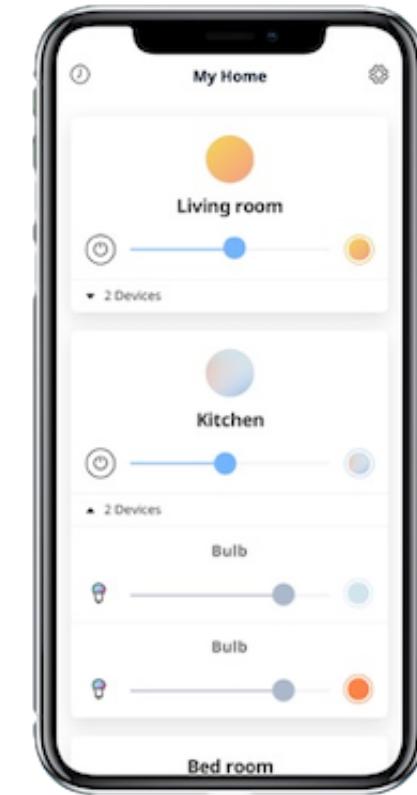
- Protocol: Zigbee
- Integraties met HomeKit, Alexa en Google Assistant
- Groeiend "exclusief" assortiment
- Eigen gateway
- Alternatieve Zigbee gateways mogelijk
 - Deconz/Cponbee, Tasmota of Zigbee2MQTT

Philips Hue LivingColors

- 2.4 Ghz device in RFLink device list
- LivingColors 1st generation



Ikea TRÅDFRI



Lamp

Gateway

App

Ikea TRÅDFRI kenmerken

- Protocol: Zigbee
- Integraties met HomeKit, Alexa en Google Assistant
- Groeiend "betaalbaar" assortiment
- Eigen gateway
- Alternatieve Zigbee gateways mogelijk
 - Deconz/Conbee, Tasmota of Zigbee2MQTT

Xiaomi



Sensors



Gateway



App

Xiaomi kenmerken

- Protocol: Zigbee
- Standaard Chinese Cloud
- Grote Chinese speler
- Sensoren, Switches, IP Camera, Doorbell
- Alternatieve Zigbee gateways mogelijk
 - Deconz/Conbee, Tasmota of Zigbee2MQTT

Tado°



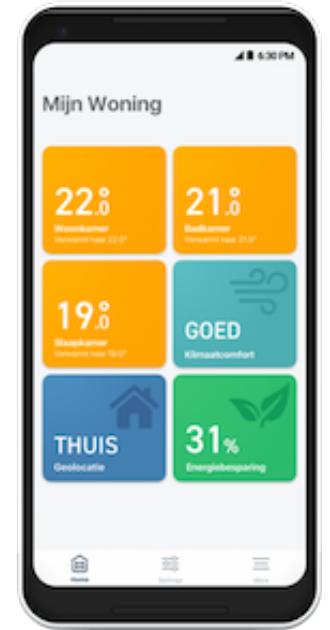
Thermostaat



Kraan



Gateway

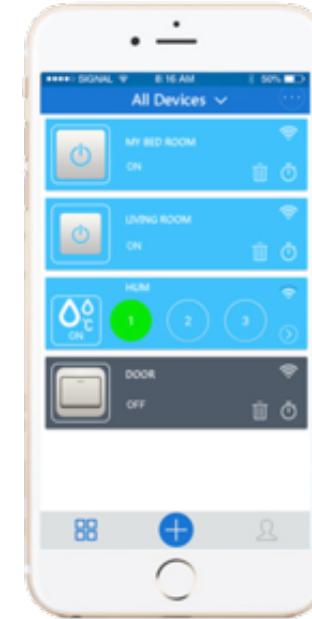


App

Tado° kenmerken

- Protocol: 6LoWPAN (868 MHz, IPv6)
- Germany based company
- Amazon Cloud
- "Smart Heating"
- Focus op efficiënte verwarming
- Warmte "zones" (eigen thermostaatkranen)
- Integraties met HomeKit, Alexa en Google Assistant

Sonoff



Schakelaar

Lamp

App

Sonoff kenmerken

- Protocol: WiFi
- Standaard Chinese Cloud
- Switches met en zonder verbruiks gegevens, lampen, wandschakelaars
- Firmware aanpasbaar (Tasmota)

Sonoff fail



Shelly



Switch

Lamp

App

Shelly kenmerken

- Protocol: WiFi
- Shelly Cloud optional
- Groeiend assortiment
- Kleine inbouw WiFi schakelaars
- Firmware aanpasbaar(Tasmota)
- MQTT-support, out of the box

LSC (Tuya)



Stekker



Lamp



App

LSC (Tuya) kenmerken

- Protocol: WiFi
- Verkoop bij Action
- Voordelig
- Firmware aanpasbaar (Tasmota)
 - Let op: niet alle devices zijn te flashen

LSC (Tuya) firmware



Tuya-Convert (C'T)

Tasmota templates

Works with ... (voice)



Works with Amazon Alexa



Works with Google Assistant

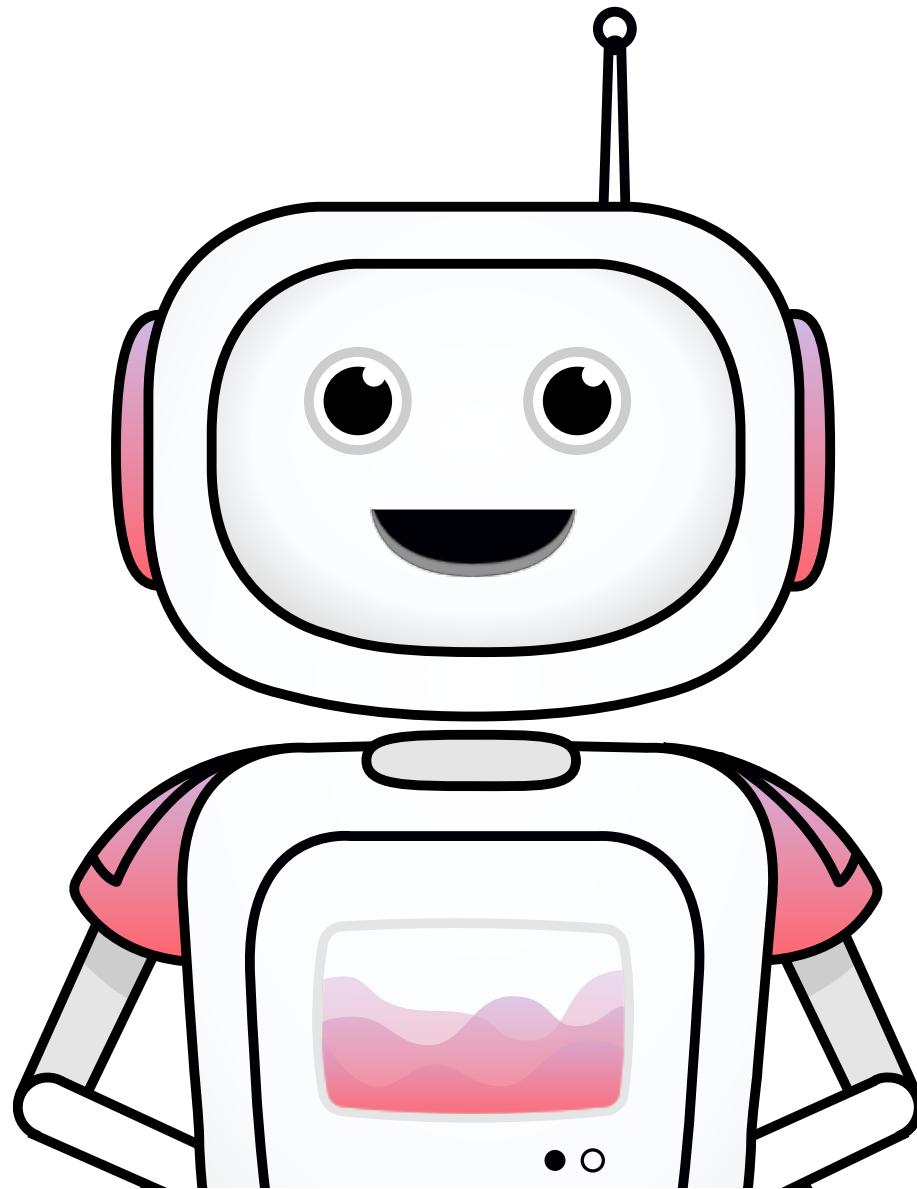


Works with Apple Homekit



Works with
Apple HomeKit

Mozilla Common Voice



Mozilla Common Voice
project

Mozilla Research: Speech &
Machine Learning

Opties: controle vs gemak

- WiFi: leveranciers firmware of eigen?
- Zigbee: leveranciers gateway of eigen?
- DIY / Zelfbouw

	WiFi	Zigbee
Manufacturer	Sonoff, Shelly, Tuya, Espressif	Philps Hue, Ikea TRÅDFRI, Xiaomi
Controller	app, cloud based	on premise, cloud
Modification	Tasmota, ESPHome	Deconz, Conbee, Zigbee2MQTT, Tasmota

WiFi firmware vervangen

Twee opties:

- Fysiek
- OTA

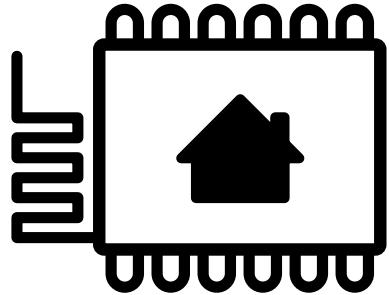
Tasmota



[Tasmota documentation](#)

[Tasmota template list](#)

ESPHome



ESPHome

ESPHome

Zigbee gateway vervangen

Twee opties:

- Gateway kant en klaar kopen
- Gateway onderdelen kopen

Conbee

Connected sensors
Conbee, the universal Zigbee USB gateway



Values

0 Lux, 18 °C

11 °C, 83.93 %, 998 hPa



Contact sensor

18 °C, closed



Contact sensor

23 °C, closed



KantoorMS

Multi sensor

16 °C, 58.88 %, 999 hPa



LogeerkamerMS

Multi sensor

16 °C, 62.22 %, 999 hPa



SlaapkamerMS

Multi sensor

65.55 %, 999 hPa, 16 °C

Zigbee2mqtt



[GitHub/KoenKK/zigbee2mqtt](https://github.com/KoenKK/zigbee2mqtt)

Zigbee2mqtt Documentatie

CC2531 USB sniffer, debugger etc.

Kosten: 18 euro, lange levertijd

Tasmota Zigbee

"Zigbee2mqtt rewrite to make it fit on an ESP82xx"



[Documentation, Device Compatibility Repository](#)

CC2530 device + Wemos

Kosten: 10 of 12 euro, lange levertijd

DIY / Zelfbouw



Espressif: ESP8266 & ESP32

ESP8266 WiFi + IO ~ 3 euro

ESP32 WiFi + BLE + IO ~ 5 euro

ESP32 met camera ~ 6 euro



via Ali Express or Banggood

"The one to rule them all..."



Domoticz



- domoticz.com
- OpenSource
- Loopt een beetje achter
- Extra functies door plugins
- Community wordt kleiner

openHAB



- openhab.org
- OpenSource
- Robuust
- Sterke (Duitse) community
- Ontwikkelingen gaan langzaam
- Minder flexibel

Home Assistant



- home-assistant.io
- OpenSource
- "New cool kid"
- Snelst groeiende community
- Eenvoud is het motto
- Extra functies door plugins
- Snelle ontwikkelingen

Home Assistant in depth



HA-Installatie

- Hassbian (on Raspberry Pi)
- Hass.io (on Raspberry Pi, Intel NUC, VM)
- Hass.io (on Ubuntu / Debian)
- Docker
- Linux/Mac-Python Virtual Environment
- Windows-Python Virtual Environment

Home Assistant Install Methods Comparison Matrix

Home Assistant - Overview

The screenshot displays the Home Assistant interface with the following sections:

- Overview:** Shows a grid of circular icons representing various entities, each with a status (e.g., HOME, AWAY, UNAVAIL) and a value (e.g., 75, 95, 34). Examples include "Updater", "VPIR Motion detected in garage", "TradfriGa...", "Albert", "Ellen", "Amazon 68 9a 87 bf 88 4e", "iMac WiFi", "iPhone Albert", "iPadPro Albert", "RoadRun...", "iPhone Ellen", "AppleWat... Ellen", "DarkDwarf", "HomePa...", "LEDE.Ian", "Gre Bakker OnePlus3...", "Galaxy-A8-2018.I...", "OnePlus5... 00 1f f3 46 MacFurb...", "raspi.Ian b8 27 eb 16 fe 71", "iPad Air 2 van El", "Black[AW... iPhone van Doubles... Ellen", "Battery Level", "TRÅDFRI remote control Battery Level", "Daylight", "Smart Switch Battery Level", "MagicCub... Battery Level", "Traqdrif... Battery Level", "Battery State", "Geocoded Location", "BSSID", "Last Update Trigger", "Activity", "Connecti...", "Battery Level", "72", "lisgoud", "Thom...", "SSID", "Geocoded Location", "Floors Ascended".
- Bedroom:** Contains two light switch controls for "Bedlamp Ellen" and "Bedlamp Albert".
- Kitchen:** Contains two light switch controls for "Poulsen 1" and "Poulsen 2".
- Overloop:** Contains a motion sensor card for "Overloop Bewegingssensor" (status: Clear) and a battery level card for "Overloop Bewegingssensor Batterij" (status: 6.0 lux).
- Living Room:** Contains four light switch controls for "Staande lamp", "Bolletje", "Naast TV", and "Poulsen 3".
- Hal:** Contains a door status card for "VoordeurCS" (status: Closed) and a battery level card for "Voordeur Batterij" (status: 100 %).
- Slaapkamer:** Contains a motion sensor card for "Overloop Bewegingssensor" (status: Clear) and a battery level card for "Overloop Bewegingssensor Batterij" (status: 95 %).
- Office:** Contains a light switch control for "Bureau Albert".
- Garage:** Contains five status cards: "FSM_STATE Motion detected in garage" (status: 0), "Garage" (status: Unavailable), "GarageLamp" (status: Unavailable), "GaragedeurCS" (status: Closed), and "GaragedeurCS Battery Level" (status: 88 %). It also includes temperature and humidity cards: "Garage Temperatuur" (status: 9.3 °C), "Garage Vochtigheid" (status: 75.8 %), and "Garage Luchtdruk" (status: 1008 hPa).
- Developer Tools:** Shows developer tools for Overloop.
- Hass.io:** Shows Hass.io status.
- Configuration:** Shows configuration status.

Home Assistant - Slaapkamer

Home Assistant

Overview

Map

Logbook

History

Configurator

ESPHome

deCONZ

Home

HOME WOONKAMER KANTOOR SLAAPKAMER LOGEERKAMER GARAGE

13.8 °C Temperatuur

54.2 % Vochtigheid

1008 hPa Luchtdruk

Bedlamp Albert

Bedlamp Ellen

This screenshot shows the Home Assistant interface for the 'Slaapkamer' (Bedroom) space. The sidebar on the left lists various components like Overview, Map, Logbook, History, Configurator, ESPHome, and deCONZ. The main dashboard has tabs for HOME, WOONKAMER, KANTOOR, SLAAPKAMER, LOGEERKAMER, and GARAGE, with SLAAPKAMER selected. The dashboard displays three circular gauge cards: Temperatuur (Temperature) at 13.8 °C, Vochtigheid (Humidity) at 54.2 %, and Luchtdruk (Pressure) at 1008 hPa. Below these are two lightbulb icons labeled 'Bedlamp Albert' and 'Bedlamp Ellen', each with a three-dot menu icon.

Home Assistant Demo



Home Assistant Community

Resources

Docs

Forum



Awesome HA

The awesome list

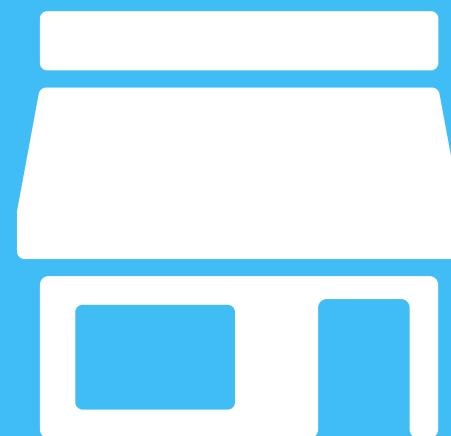
Awesome HA



HACS

Home Assistant Community Store

hacs.xyz



HACS

A blurred background photograph of a swimmer in a starting position at the edge of a swimming pool. The swimmer is wearing a dark swim cap and goggles, and is leaning forward with arms extended over their head. The pool water is blue, and lane lines are visible in the background.

Hoe begin je?

- Doel: wat is het, dat je wil bereiken?
- Inventarisatie: wat heb je nu?
- Analyse: wat ontbreekt er nog?
- Planning: maak een plan
- Actie:
 - middelen
 - kennis
 - aan de slag!



Aan de slag

Installeer Home Assistant



Install Methods Comparison Matrix

DIY Temperatuur sensor

Wemos D1 mini

DHT temperatuur sensor

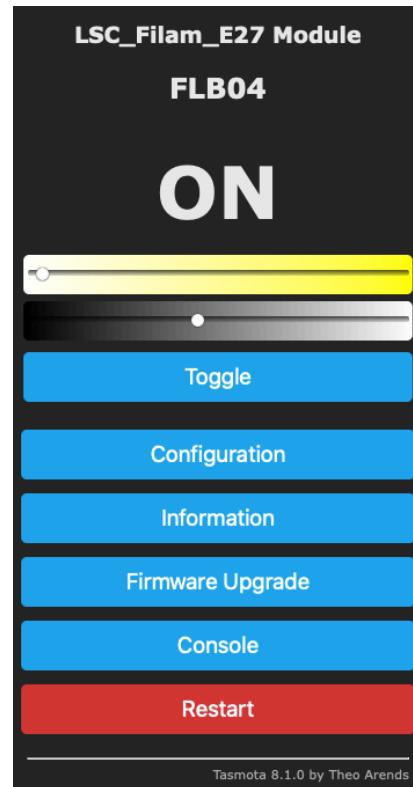
EspHome of Tasmota

DIY Slimme Deurbel



Smart doorbell for just \$2

Flash lamp met Tasmota

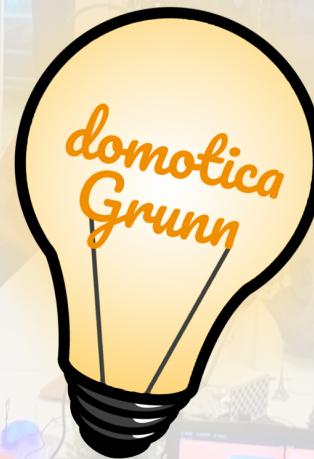


Flash een LSC lamp van de Action met [Tuya - Convert](#)

Lessons learned

- Begin klein
- Plan je tijd (keer 3)
- Omarm Murphy's law
- Beperk de externe afhankelijkheden
- Zorg voor een fall-back scenario
- Houdt rekening met de "PAF"
- Je kunt meer dan je denkt (met een beetje hulp)
- Deel je ervaringen

DomoticaGrunn



Meetup, ongeveer om de 6 weken bij de MaakPlek

Volgende Meetup is gepland voor 19 february



That's all Folks!