

# Home Assistant

## Notifications, Alerts, Garage Sensor

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# Previously ...



- Khalid: IoT and Microcontrollers (Oct 2018)
  - MicroPython, MQTT, Home Assistant
- Tim Laurence (Apr 2024)
  - Sensors: Presence, Humidity
- Khalid: Indoor Climate (Nov 2024)
  - Humidity, CO2, VOC, Radon
  - InfluxDB for data storage
  - Grafana for visualization





# Previously ...



- Khalid: Weather (Feb 2025)
  - Weather Stations
  - RTL-SDR and rtl\_433
  - Lightning strikes
  - WeeWX
- Khalid: (Nov 2025)
  - Automations
  - Weather Alerts
  - AppDaemon
  - Humidifier





# Agenda



- Notifications
  - Text to Speech
  - Email
- Alerts
- Garage Sensor
- Installing Home Assistant
- HVAC integration





# Notifications



- At least 50 notification integrations (at present)
- Persistent Notifications
- Email
- Text to Speech





# Persistent Notifications



- Appear in the Home Assistant web interface
- Until you manually dismiss it

The screenshot shows a mobile notification interface titled "Notifications" with a back arrow in the top right corner. It displays three persistent notifications, each in a white card with rounded corners. Each card contains the text "Weather Alert Issued" on the left and a timestamp on the right. Below each card is a blue "Dismiss" link. The first notification is timestamped "2 hours ago", the second "15 hours ago", and the third "Yesterday". A mouse cursor is visible over the "Dismiss" link of the second notification.

Notification Text	Timestamp	Action
Weather Alert Issued	2 hours ago	Dismiss
Weather Alert Issued	15 hours ago	Dismiss
Weather Alert Issued	Yesterday	Dismiss





# Persistent Notifications



Home Assistant

Overview  
Activity  
History  
Developer tools  
Settings  
Notifications 7

### Weather

- Kitchener-Waterloo Current c... Haze
- Kitchener-Waterloo Tempe... -12.2 °C
- Kitchener-Waterloo Humidity 70%
- Kitchener-Waterloo Wi... 18.00 km/h
- Kitchener-Waterloo Bar... 101.00 kPa
- Kitchener-Waterloo Chan... Unknown

### Indoor

- Thermostat Current Tempe... 21.7 °C
- Thermostat Current Humidity 40.0%
- Indoor Temperature 21.6 °C
- Indoor Humidity 38%
- Indoor Pressure 1,009.0 hPa

Today. Flurries with risk of snow squalls. Local blowing snow. Local amount 2 to 4 cm. Wind west 30 km/h gusting to 50. High minus 10. Wind chill minus 25 this morning and minus 20 this afternoon. UV index 1 or low.

Forecast -13 °C  
-10.6 °C / -13 °C

Kitchener-Waterloo ... -12.2 °C  
-10 °C / -17 °C

### Outdoor

- Local Temperature -11.7 °C
- Local Humidity 83%
- Local Wind Speed 0.0 km/h
- Local Wind Direction 315 degrees
- Local Rainfall 1,349.76 mm

### Fog

Env Can -12.2 °C  
70%

### Cloudy

Met.no -13 °C  
80%

### Cloudy

Met.no -13 °C  
80%

Tue	Wed	Thu	Fri	Sat
-10.6° -13°	-11.2° -15°	-12.3° -24.7°	-18.8° -27.5°	-15.6° -20.7°





# Demo

abits

## Persistent Notifications





# Email Notifications



notify:

- platform: smtp

name: email

server: smtp.example.com

encryption: none

sender: ha@example.com

recipient: you@somewhere.com





# Text To Speech (TTS)



- Depends on how you run Home Assistant
  - Built-in, if you use HAOS
  - Worked with Python venv (discontinued)
  - Docker: had to build my own
    - Shell scripts
    - Python server
- 3.5 mm speaker connected to RaspberryPi





# Custom TTS



- Shell Script + Python Server

```
cat > $TMP_FILE
```

```
FILE=`basename $TMP_FILE`
```

```
curl -s http://127.0.0.1:8787/say/$FILE
```

- Then use
  - `pico2wave`
  - `aplay`





# Combinations



- Combination notifications, using groups  
notify:
  - platform: group
  - name: notify\_email\_say
  - services:
    - action: sayit
    - action: email





# Alerts



- Little used Home Assistant feature
- Binary template sensors + AppDaemon
- Examples:
  - Humidity too low or too high
  - Temperature too cold or too warm
  - Garage doors left open
  - Garage light left on
  - Battery low on some sensors
  - ... etc.





# Alerts - Humidity



```
alert_humidity:
```

```
  name: Humidity Alert
```

```
  entity_id: binary_sensor.humidity_problem
```

```
  repeat:
```

```
    - 20
```

```
    - 20
```

```
    - 60
```

```
  can_acknowledge: true
```

```
  skip_first: true
```





# Alerts - Humidity



message: |

```
Indoor humidity is outside comfort range:  
{{ states.sensor.indoor_humidity.state }}%
```

done\_message: |

```
Indoor humidity normal:  
{{ states.sensor.indoor_humidity.state }}%
```

title: >-

Humidity Alert

notifiers:

- email
- sayit





# Garage Sensor



- Initial motive for Home Assistant (circa 2017 ?)
- ESP32 (Lolin32) on a perfboard
- Powered from a phone charger (5V microUSB)
- Packaged in a food container from Dollarama
- Micropython for programming
- Magnetic Reed sensors
  - One for each door
- Light sensor
- Notifications over Email and Text to Speech





# Programming



- Main loop,
  - read sensors (doors, light)
  - send MQTT message
- Door status checked every second (to detect open/close fast), but no MQTT message
- If no change, send status every minute
- Needed library for BH1750
- Trial and error for light levels

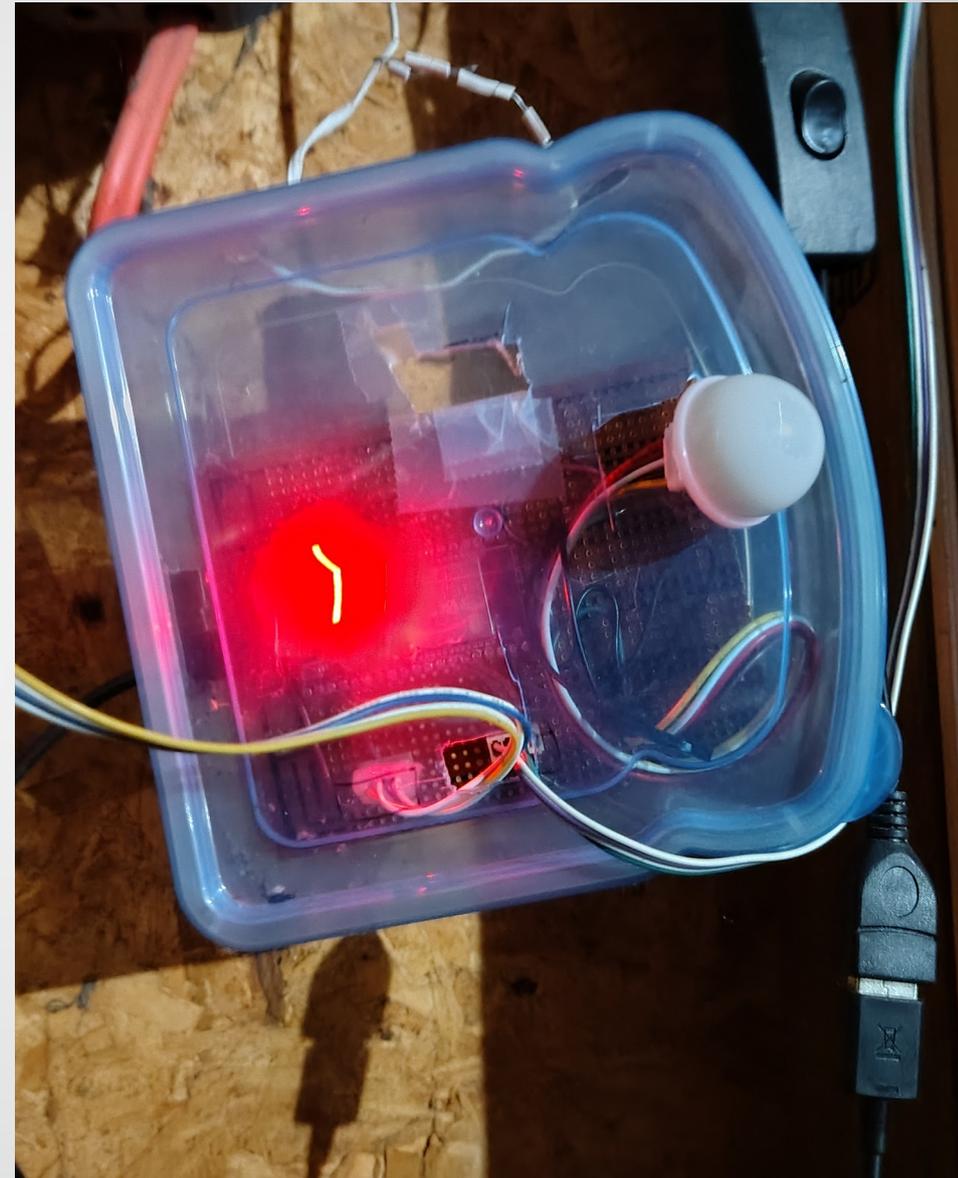




# Garage Sensor



- Red light indicates power
- USB extension cable
- On/Off switch
- Dome of light sensor
- Wires to magnetic reed sensors (left and right)
- Cut hole for DHT22 sensor (not used)





# Garage Open Notification

- Sent over Email and Text to Speech
  - Open too long, Garage Door, North Garage Door
- Upon closure
  - Garage door closed after a while
- Upon lights off
  - Garage light off after a while.





# Alerts - Garage



alert\_garage:

name: Garage open

entity\_id:

- binary\_sensor.garage\_door\_1
- binary\_sensor.garage\_door\_2

repeat:

- 10
- 10
- 30
- 50

can\_acknowledge: true

skip\_first: true





# Alerts - Garage



message: |

```
Open too long
```

```
{%- for s in  
states.group.garage_doors.attributes.entity_id -%}
```

```
{%- if is_state(s, 'on') -%}
```

```
{{      ', ' + state_attr(s, 'friendly_name') }}
```

```
{%- endif -%}
```

```
{%- endfor -%}
```

done\_message: |

```
Garage door closed after a while
```

notifiers:

- email
- sayit





# Garage Light



- 3 separate light bulbs
  - One on motion sensor
  - One per each door opener
- LM393 light sensor, with a photocell and lens
  - Pain to tune, using a potentiometer
  - Positioned to point precisely at the light bulb
  - Worked fine for years, despite pointing issue
  - Stopped working: incandescent to LED
- Replaced with BH1750 I2C
  - Took trial and error to get the thresholds right







# Light Level ON?



- Depends on which lights are on, as well as whether door open, and bright outside

```
# When all light bulbs are off:           0.0
# Only the motion sensor light is on:     2.5
# North garage opener light is also on:  4.166667
# South garage opener light is also on:  5.833333

# This value or higher is considered ON
LIGHT_ON_THRESHOLD = 1.5
```





# Demo

abits

## Garage Sensor

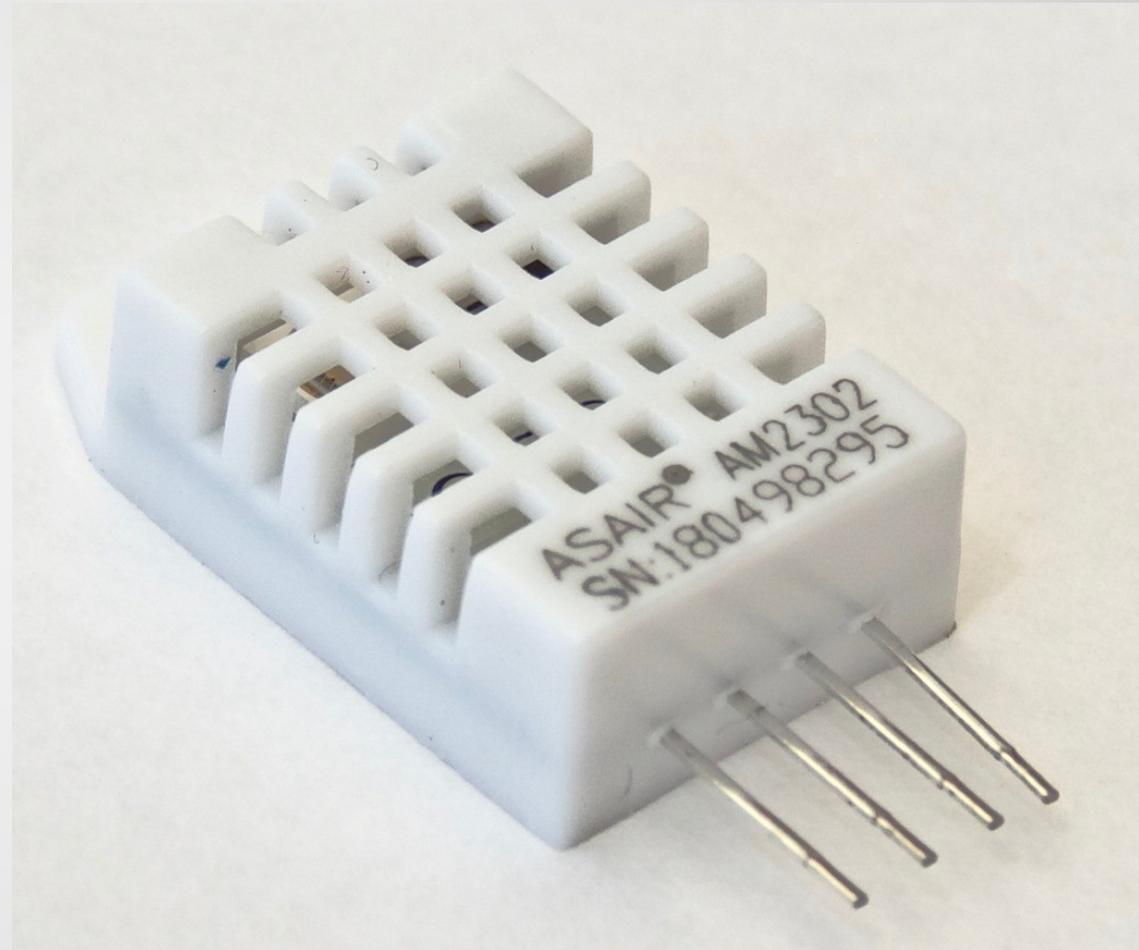




# Past Attempts



- DHT22 Temperature and Humidity sensor
- Had a flimsy connection, so removed it

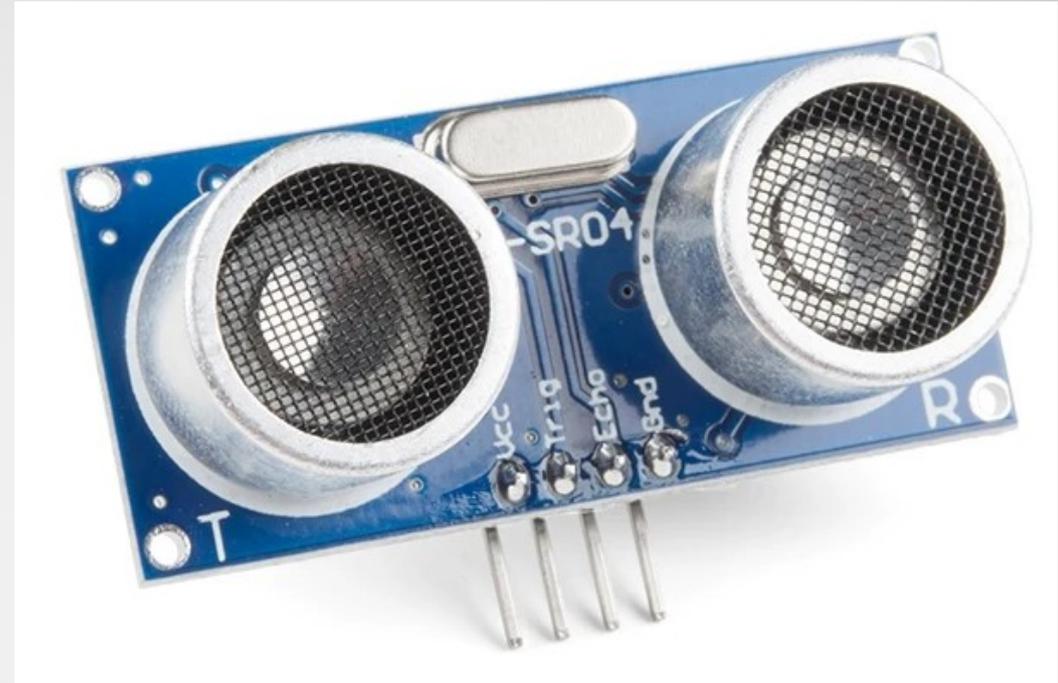




# Past Attempts



- HC-SR04 Ultrasonic Distance Sensor
- To detect if the car was inside the garage or not





# Installing Home Assistant

- Pre-installed device
  - Home Assistant Green
- HAOS
  - Custom barebones Linux distro
  - HA preinstalled in a container
  - Raspberry Pi or x86-64 (NUC or mini PC)





# Installing Home Assistant

- Docker
  - Specifically, Docker Compose
  - Raspberry Pi or x86-64
  - I run it in Ubuntu Server 24.04 LTS
- Python Virtual Env
  - Allowed access to shell scripts and programs
  - No longer recommended/supported





# Show and Tell



Installation Methods  
Integrations





# HVAC and Ecobee



- Most HVAC integrations are through the vendor's cloud service
- Make it local using “HomeKit Device”
- Not dependent on the internet being up, or cloud service working
- You can still use the phone app or web site in parallel
  - e.g. Schedule and Comfort settings





# Wrap Up



- My requirements for Home Automation:
  - Open Source
  - Rich library of integrations
  - Customizable
  - Cloud Free (as much as practical)
  - Large and active community





# Wrap Up



- Sensors
- Automations
- Notifications
- Alerts
- Integrations
  - MQTT
  - InfluxDB / Grafana
  - WeeWx
  - AppDaemon integration





# Future Plans?



- Zigbee
  - Attempt to overcome poor reception for some sensors
  - Off the shelf vs. custom made
  - Wider selection of sensors





# Conclusion



Questions?

Comments?

