Home Assistant

Notifications, Alerts, Garage Sensor

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Previously ...

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- 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 ...

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- Khalid: Weather (Feb 2025)
  - Weather Stations
  - RTL-SDR and rtl_433
  - Lightning strikes
  - WeeWX
- Khalid: (Nov 2025)
  - Automations
  - Weather Alerts
  - AppDaemon
  - Humidifier

Agenda

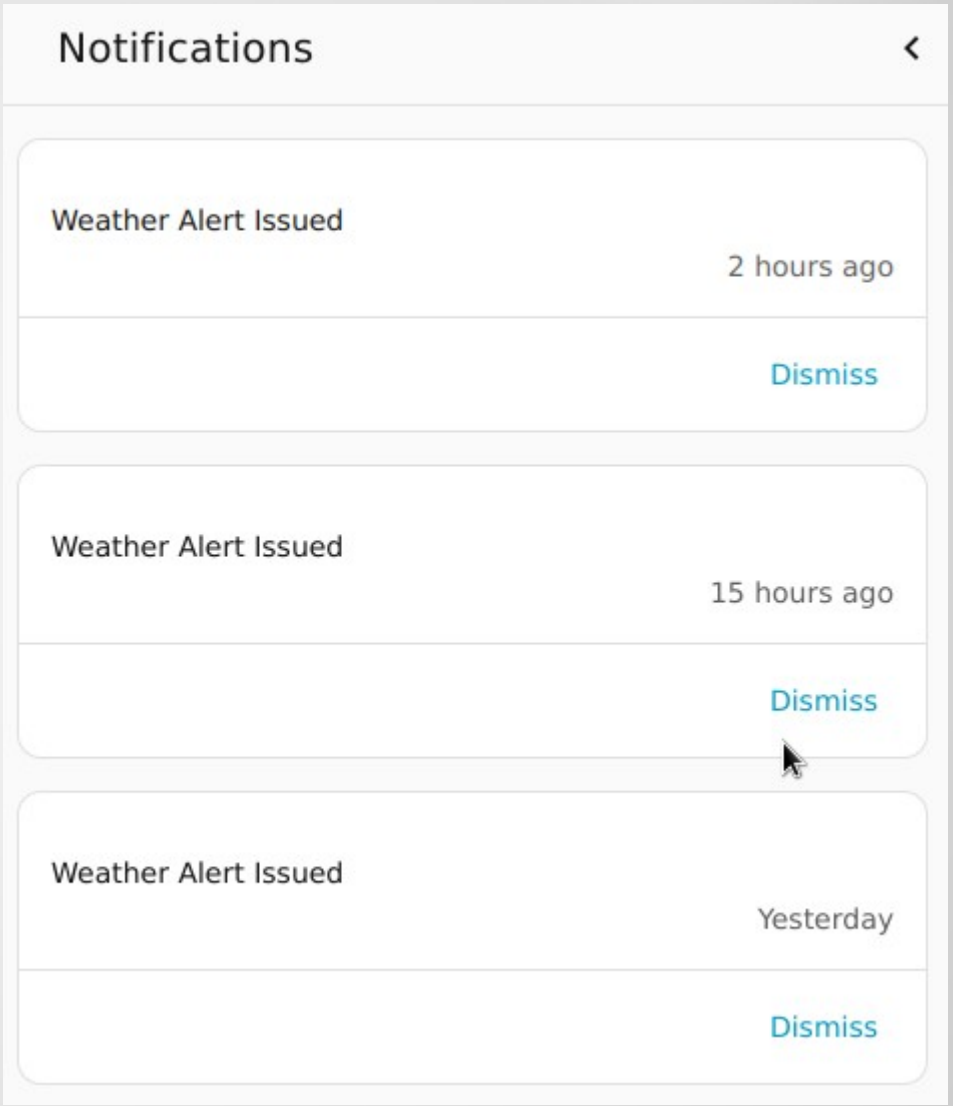
- Notifications
  - Text to Speech
  - Email
- Alerts
- Garage Sensor
- Installing Home Assistant
- HVAC integration

Notifications

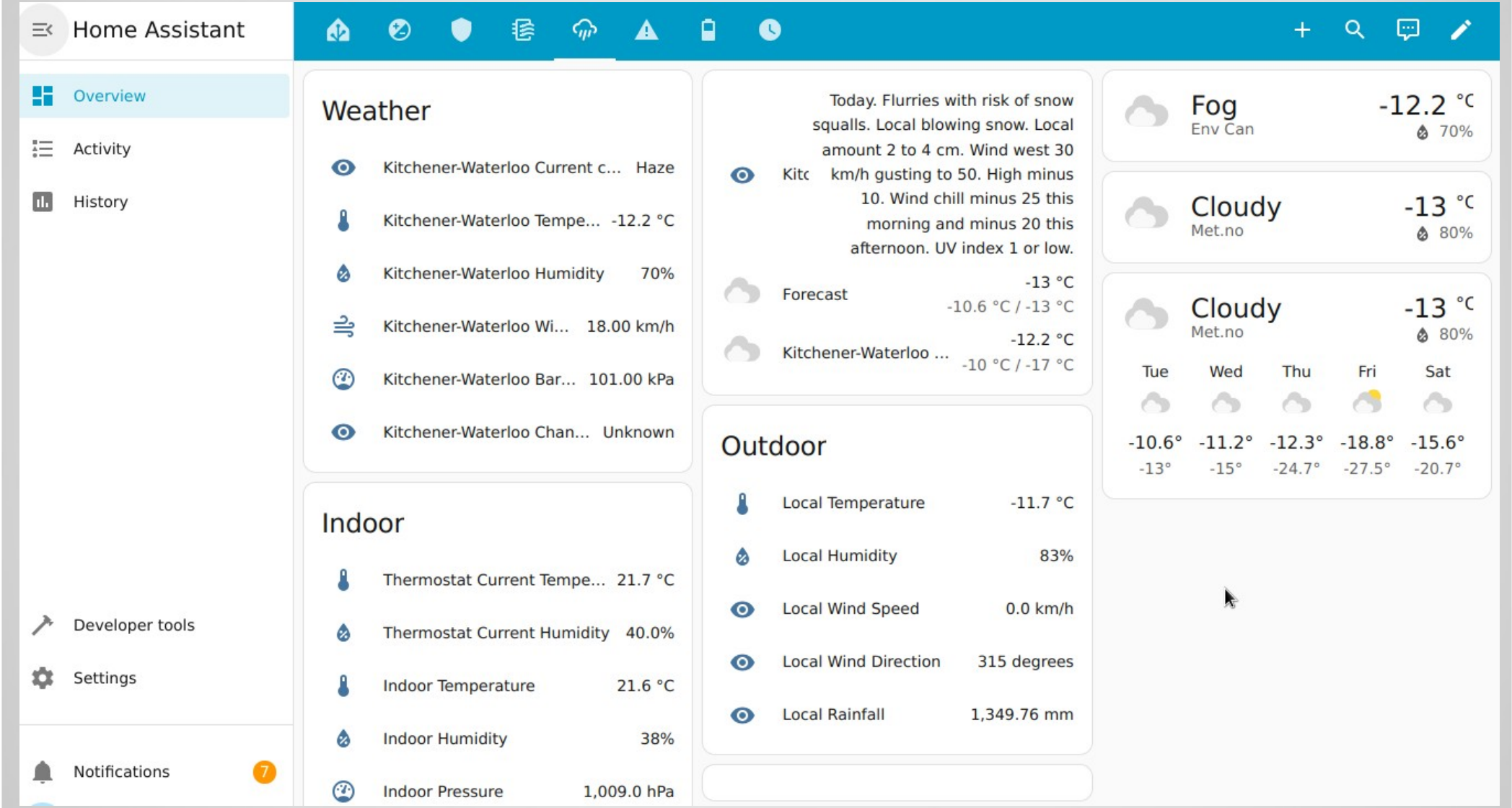
- At least 50 notification integrations (at present)
- Persistent Notifications
- Email
- Text to Speech

Persistent Notifications

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



Persistent Notifications



Demo

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)

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- 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

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- 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

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- Combination notifications, using groups

```
notify:
  - platform: group
    name: notify_email_say
    services:
    - action: sayit
    - action: email
```

Alerts

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- 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

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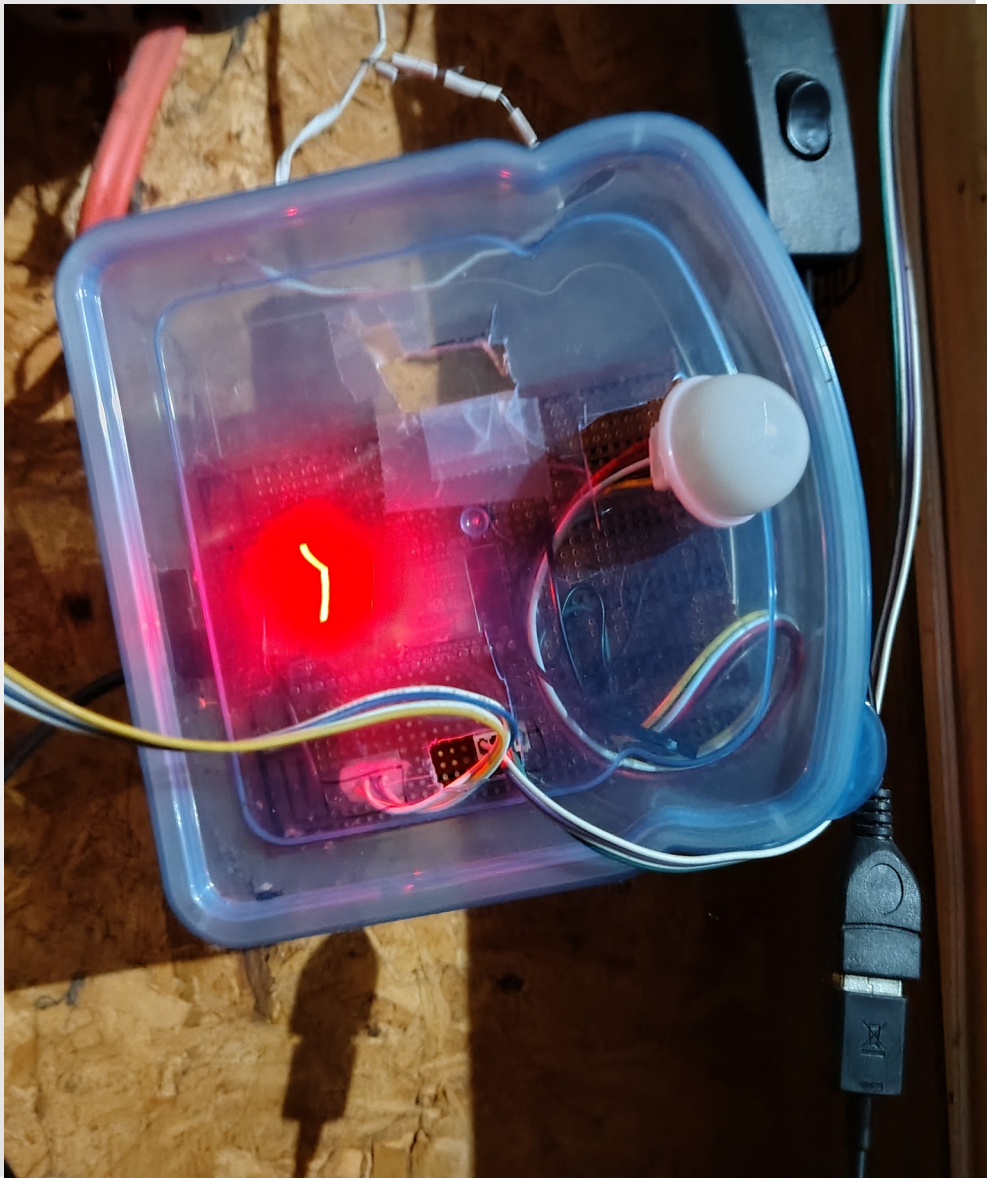
- Initial motive for Home Assistant (circa 2017 ?)
- ESP32 (Lolin32) on a perfboard
- Powered from a phone charger (5V microUSB)
- Packaged in a food container from Dollarama
- Micropython for programming
- Magnetic Reed sensors
  - One for each door
- Light sensor
- Notifications over Email and Text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

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```
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

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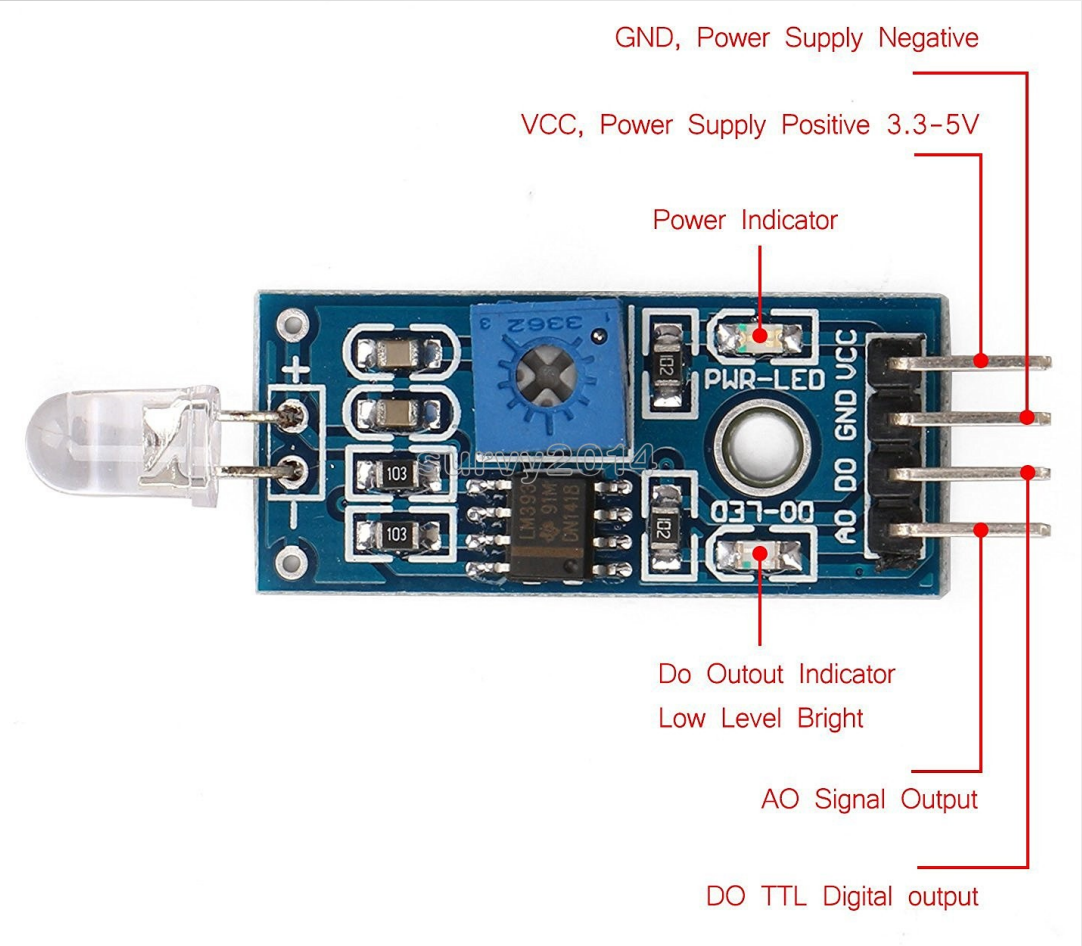
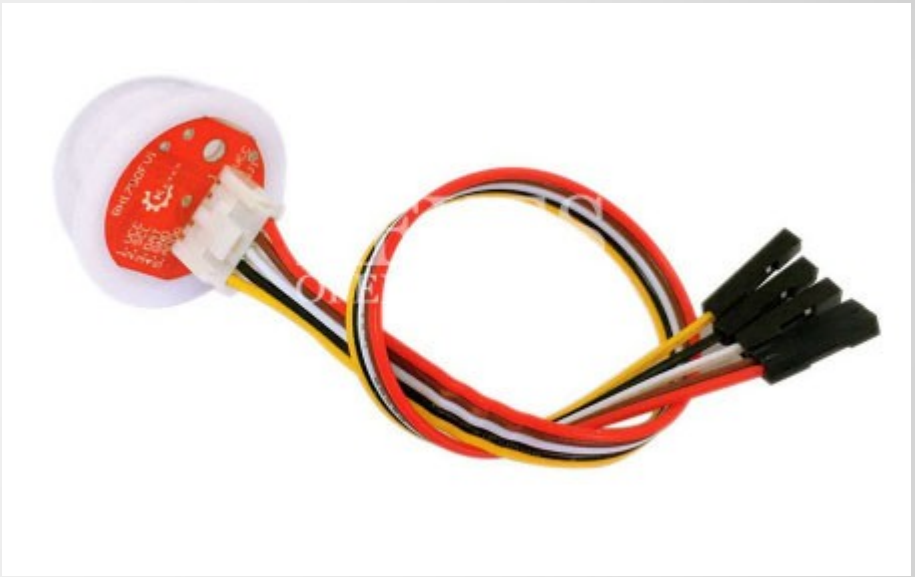
- 3 separate light bulbs
  - One on motion sensor
  - One per each door opener
- LM393 light sensor, with a photocell and lens
  - Pain to tune, using a potentiometer
  - Positioned to point precisely at the light bulb
  - Worked fine for years, despite pointing issue
  - Stopped working: incandescent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

LM393 and BH1750





Light Level ON?

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

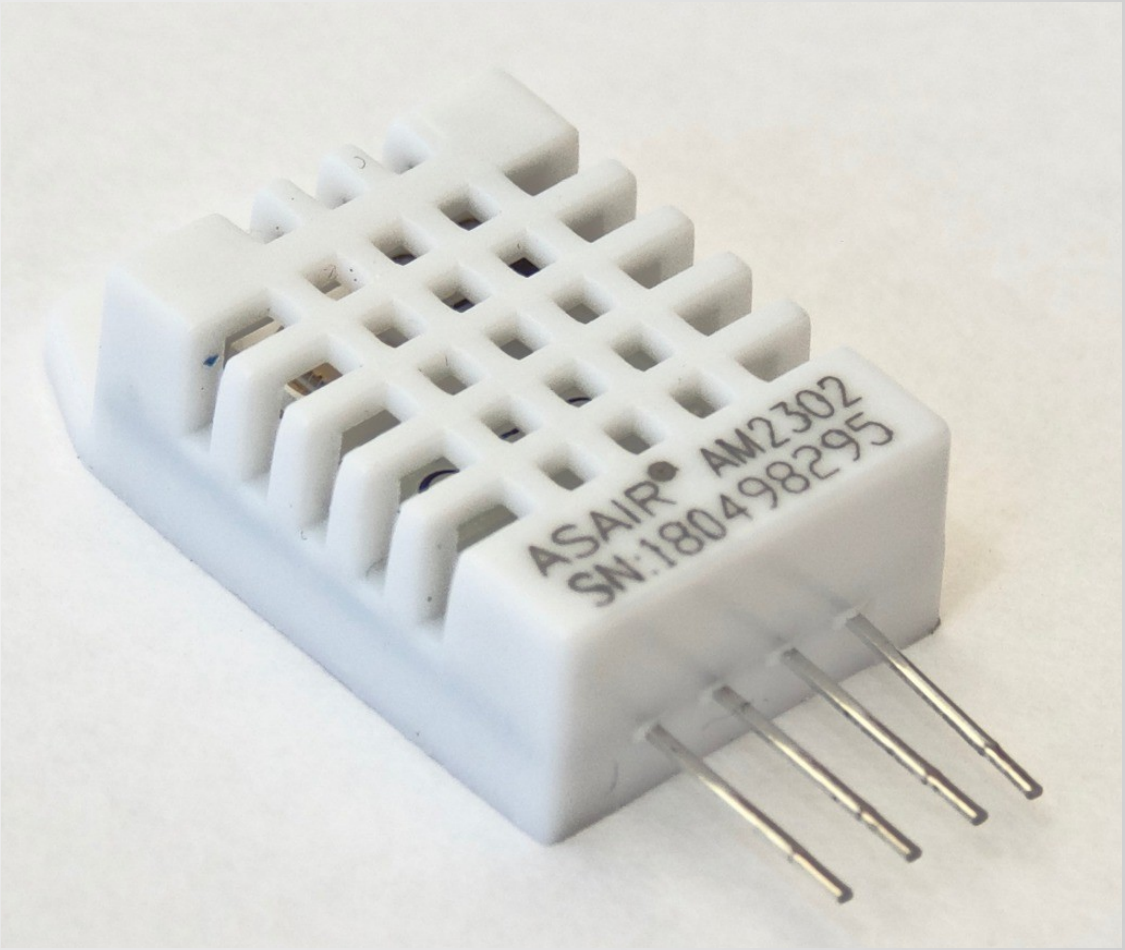
```
# When all light bulbs are off:           0.0
# Only the motion sensor light is on:     2.5
# North garage opener light is also on:   4.166667
# South garage opener light is  also on: 5.833333

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

Demo

Garage Sensor

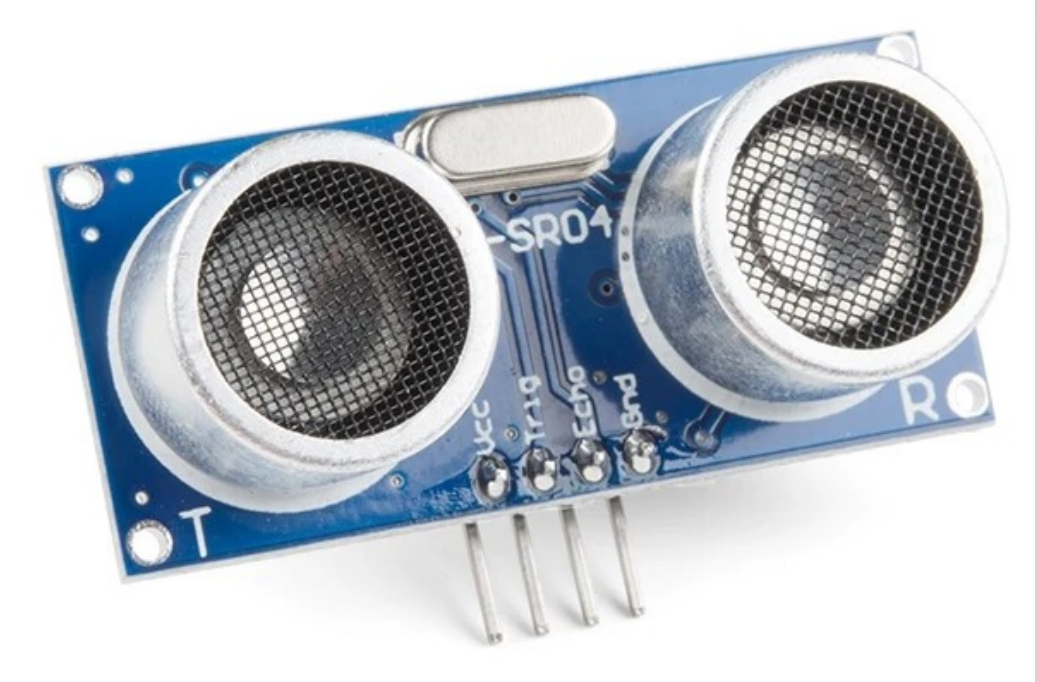
Past Attempts

- 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

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- 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

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

Wrap Up

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- 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

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Questions?

Comments?