

MaxAir – Home Assistant Integration

MaxAir can be configured to enable monitoring and control from Home Assistant. There are currently two ways of achieving this integration, the first is by using MQTT together with a Mosquitto Broker and the second is to use HTTP together with the Homebridge add-on.

MQTT/Mosquitto Broker

This integration requires Home Assistant together with a Mosquitto Broker running on the same or separate device. Please see the document 'Setup Guide MQTT Devices' for details of basic MQTT setup. The MaxAir Gateway script `/var/www/gateway.py` together with the Python library `paho-mqtt` are used to send and receive MQTT data, the MaxAir service `HA_integration.service` is used to pass data between MaxAir and Home Assistant using MQTT as the transport mechanism.

MaxAir will require an account on the Mosquitto Broker which it can access.

Functionalities

- MaxAir CPU Usage - sensor
- MaxAir CPU Load (1m, 5m and 15m) - sensors
- MaxAir CPU temperature - sensor
- MaxAir Memory Use - sensor
- MaxAir Swap Usage - sensor
- MaxAir Disk Use - sensor
- MaxAir Host Ip - sensor
- MaxAir Last Boot - sensor
- MaxAir Network throughput (up & down) - sensors
- MaxAir Wifi Strength - sensor
- MaxAir updates - sensor
- Boiler or HVAC Status - binary sensor
- Climate entity for each zone with the following attributes
 - Away Status (this is the same for all zones)
 - Zone Current Mode (this is the same for all zones)
 - Zone Current Temperature (for each zone)
 - Zone Target Temperature (for each zone)
 - Zone Current Status (for each zone)
 - Zone Boost (for each zone)
 - Zone Live Temperature (for each zone)
 - Zone sensor Last Seen time and date (for each zone)
 - Zone sensor battery percentage (for each zone using a MySensor sensor)
 - Zone sensor battery voltage (for each zone using a MySensor sensor)
- Temperature sensor for each stand-alone temperature sensor in MaxAir with the following attributes
 - Sensor Current Temperature (for each zone)
 - Sensor Last Seen time and date (for each zone)
 - Sensor battery percentage (for each zone using a MySensor sensor)
 - Sensor battery voltage (for each zone using a MySensor sensor)
- Humidity sensor for each stand-alone humidity sensor in MaxAir with the following attributes
 - Sensor Current Humidity (for each zone)
 - Sensor Last Seen time and date (for each zone)
 - Sensor battery percentage (for each zone using a MySensor sensor)
 - Sensor battery voltage (for each zone using a MySensor sensor)

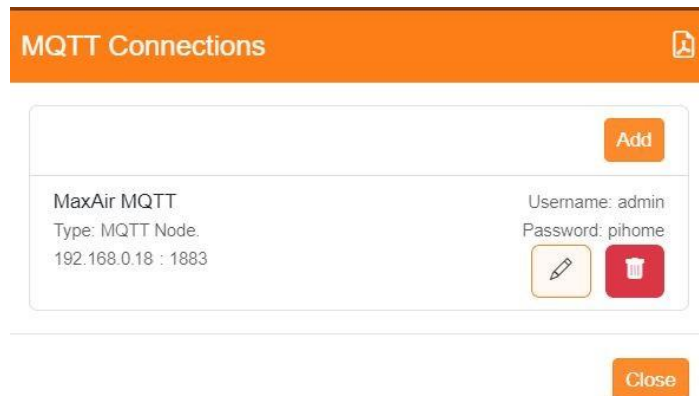
Setup

There are two possible setup scenarios –

1. A Mosquitto broker has already been installed and configured.
2. No Mosquitto broker has been installed.

The Mosquitto broker has already been installed

In this case in all probability a MQTT Connection has already been created for MQTT sensors and/or relays as per the document 'Setup Guide MQTT Devices', if so then a second MQTT Connection to the broker will be required for Home Assistant Integration.

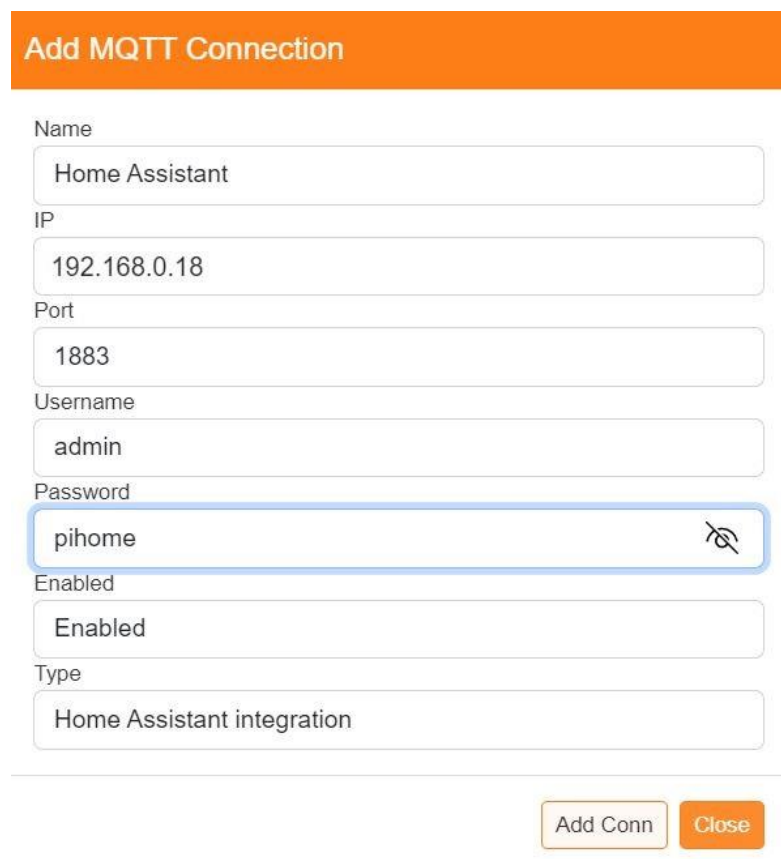


The screenshot shows a window titled "MQTT Connections" with an orange header. Inside, there is a list of connections. One connection is listed: "MaxAir MQTT" with details "Type: MQTT Node." and "192.168.0.18 : 1883". To the right of this entry, it shows "Username: admin" and "Password: pihome". Below the password, there are two icons: a pencil (edit) and a trash can (delete). An "Add" button is in the top right corner of the list area, and a "Close" button is at the bottom center of the window.

From the Settings/System Configuration menu, select MQTT (this example shows one connection has already been configured for MQTT nodes).

Click on the 'Add' button to create a new connection.

Create a new connection for Home Assistant using the details for your already configured Mosquitto broker. The type needs to be selected as 'Home Assistant integration'.



The screenshot shows a form titled "Add MQTT Connection" with an orange header. The form contains the following fields: "Name" (text input with "Home Assistant"), "IP" (text input with "192.168.0.18"), "Port" (text input with "1883"), "Username" (text input with "admin"), "Password" (password input with "pihome" and a toggle icon), "Enabled" (checkbox input with "Enabled"), and "Type" (text input with "Home Assistant integration"). At the bottom right, there are two buttons: "Add Conn" and "Close".

Home Assistant

In Home Assistant follow the steps below to connect to an existing Mosquitto broker:

1. Navigate in your Home Assistant frontend to Settings -> Devices and Services and click on "+ ADD INTEGRATION".
2. Select 'MQTT' from the dropdown list.
3. Enter the details for the MQTT Home Assistant connection you created above and click on the 'SUBMIT' button to create the Integration.

MQTT

×

Please enter the connection information of your MQTT broker.

Broker*

192.168.0.18

Port*

1883

Username

admin

Password

pihome

👁

👁

SUBMIT

The Mosquitto broker has not been installed

This example assumes that you are only using MQTT for Home Assistant Integration (ie. No MQTT sensors and/or relays).

Home Assistant

In Home Assistant follow the steps below to install the Mosquitto MQTT add-on:

1. Navigate in your Home Assistant frontend to Settings -> Add-on Store.
2. Find the "Mosquitto broker" add-on and click it, BUT DO NOT START IT YET.
3. Click on the "INSTALL" button.
4. Navigate in your Home Assistant frontend to Settings -> Add-ons -> Mosquitto broker.
5. Click on Configuration and edit the configuration file as needed. Below is an example of a basic configuration that supports the MaxAir Home Assistant integration. **Note: the username and password will be those used when configuring the MaxAir MQTT Connection/s.**

The screenshot shows the 'Configuration' tab for the Mosquitto broker add-on. At the top, there are four tabs: 'Info', 'Documentation', 'Configuration' (which is active), and 'Log'. The main content area is divided into several sections. The 'Logins' section contains a text area with the following configuration:

```
1 - username: admin
2   password: pihome
3
```

 Below this is a note: 'A list of local users that will be created with username and password. You don't need to do this because you can use Home Assistant users too, without any configuration.' The 'Require Certificate' section has a toggle switch that is currently turned off. Below the toggle is a note: 'If enabled encryption will be enabled using the cert- and keyfile options.' There are two text input fields: 'Certificate File*' with the value 'fullchain.pem' and a note 'A file containing a certificate, including its chain. Place this file in the Home Assistant 'ssl' folder.', and 'Private Key File*' with the value 'privkey.pem' and a note 'A file containing the private key. Place this file in the Home Assistant 'ssl' folder.' The 'Customize' section contains a text area with the following configuration:

```
1 active: false
2 folder: mosquitto
3
```

 Below this is a note: 'See the Documentation tab for more information about these options.' At the bottom left of the configuration area is a toggle switch labeled 'Show unused optional configuration options' which is turned off. At the bottom right is a 'SAVE' button.

6. Click on 'Save' to update the Mosquitto broker configuration.
7. Start the add-on. Have some patience and wait a couple of minutes.
8. Check the add-on log output to see the result.
9. Navigate in your Home Assistant frontend to Settings -> Integrations.
10. MQTT should appear as a discovered integration at the top of the page. Select it and check the box to enable MQTT discovery, and hit submit.

Configure MaxAir to Communicate Using MQTT

Create an MQTT Connection

From Settings/System Configuration/MQTT select 'Add'

MQTT Connections

Add

Close

The example shown is using the Mosquitto Broker with an IP address of 192.168.0.18, default Port number of 1883, the Username and Password were as setup when configuring the Mosquitto broker, the connection is Enabled and the Type is selected as 'Home Assistant integration'.

Add MQTT Connection

Name

Home Assistant

IP

192.168.0.18

Port

1883

Username

admin

Password

pihome

Enabled

Enabled

Type

Home Assistant integration

Add Conn

Close

Install the MaxAir Home Assistant Integration Service

From Settings/System Maintenance/Install Software and select the 'Install' option for 'Install Home Assistant Integration'.

This will install any required dependencies, install and start the service.

Please note that this integration will search for new zones and sensors only at start up. If new sensors or zones are added to the system reboot the system or restart the integration using 'systemctl restart HA_integration.service'.

Install Software

Select Software to be Installed.

> **Install Apache ReWrite**
Install ReWrite for Apache Web Server

Re-Install

> **Apple HomeKit Integration**
Integrate Apple HomeKit to Enable Siri Voice Control

Install

> **Install GPIO 1-Wire Sensor**
Install Support for DS18B20 1-Wire Temperature Sensor

Install

> **Install Auto Hot Spot**
Install Automatic Hot Spot Capability

Install

> **Install Install MySensor Gateway**
Install MySensor Gateway Service

Install

> **Install Install Dependencies for MQTT Nodes**
Install the python dependencies needed for MQTT nodes

Install

> **Install Home Assistant Integration**
This add-on requires Home Assistant with Mosquito Broker running on a separate device.

Install

> **Amazon Echo Integration**
Integrate Amazon Echo Device to Enable Voice Control

Already Installed

Close

The installation will start and run as a scheduled background task, please be patient, once complete the 'Installing Software' dialogue will be updated.

Installing Software















Please Be Patient Installing Software in the background, this could take some time.

```
Model: Raspberry
Python3-dev is already installed
Installing Phyton modules
Looking in indexes: https://pypi.org/simple, https://www.piwheels.org/simple
Requirement already satisfied: paho-mqtt==1.5.0 in /usr/local/lib/python3.9/dist-packages
(from -r /var/www/add_on/HomeAssistant/requirements_RPi.txt (line 1)) (1.5.0)
Requirement already satisfied: psutil==5.6.6 in /usr/local/lib/python3.9/dist-packages (from -r
/var/www/add_on/HomeAssistant/requirements_RPi.txt (line 2)) (5.6.6)
Requirement already satisfied: pytz==2019.2 in /usr/local/lib/python3.9/dist-packages (from -
r /var/www/add_on/HomeAssistant/requirements_RPi.txt (line 3)) (2019.2)
Requirement already satisfied: PyYAML==5.4 in /usr/local/lib/python3.9/dist-packages (from -
r /var/www/add_on/HomeAssistant/requirements_RPi.txt (line 4)) (5.4)
Requirement already satisfied: rpi_bad_power==0.1.0 in /usr/local/lib/python3.9/dist-
packages (from -r /var/www/add_on/HomeAssistant/requirements_RPi.txt (line 5)) (0.1.0)
Creating service for auto start
Starting the service
```

Close

Creation of Home Assistant Entities

The Home Assistant entities will be automatically created via MQTT auto discovery.

 climate.maxair_bedroom  MaxAir Bedroom	auto	hvac_modes: auto, off, heat, dry, fan_only min_temp: 7 max_temp: 35 target_temp_step: 1 preset_modes: none, away current_temperature: 16.5 temperature: 15 hvac_action: idle preset_mode: none aux_heat: off last_seen: 2021-10-10 17:23:16 batt_level: 40.00 batt_voltage: 2.46 friendly_name: MaxAir Bedroom supported_features: 81
 binary_sensor.maxair_boiler  MaxAir Boiler	off	friendly_name: MaxAir Boiler device_class: heat
 binary_sensor.maxair_under_voltage  MaxAir Under Voltage	off	friendly_name: MaxAir Under Voltage icon: mdi:raspberry-pi device_class: problem
 sensor.maxair_cpu_usage  MaxAir Cpu Usage	37.9	unit_of_measurement: % friendly_name: MaxAir Cpu Usage icon: mdi:memory
 sensor.maxair_disk_use  MaxAir Disk Use	79.1	unit_of_measurement: % friendly_name: MaxAir Disk Use icon: mdi:micro-sd
 sensor.maxair_host_architecture  MaxAir Host Architecture	armv6l	friendly_name: MaxAir Host Architecture icon: mdi:chip
 sensor.maxair_host_ip  MaxAir Host Ip	192.168.1.2	friendly_name: MaxAir Host Ip icon: mdi:lan

The Climate entity allows to trigger the MaxAir Boost function (Aux Heat in Home Assistant) for each zone, adjust the Live Temperature for each zone (Temperature in Home Assistant), enable or disable the MaxAir Away status (Pre-set in Home Assistant) and change the MaxAir Mode (Operation in Home Assistant).

If Not installing Homebridge, go to 'Creating a Home Assistant Dashboard'

HTTP/Homebridge

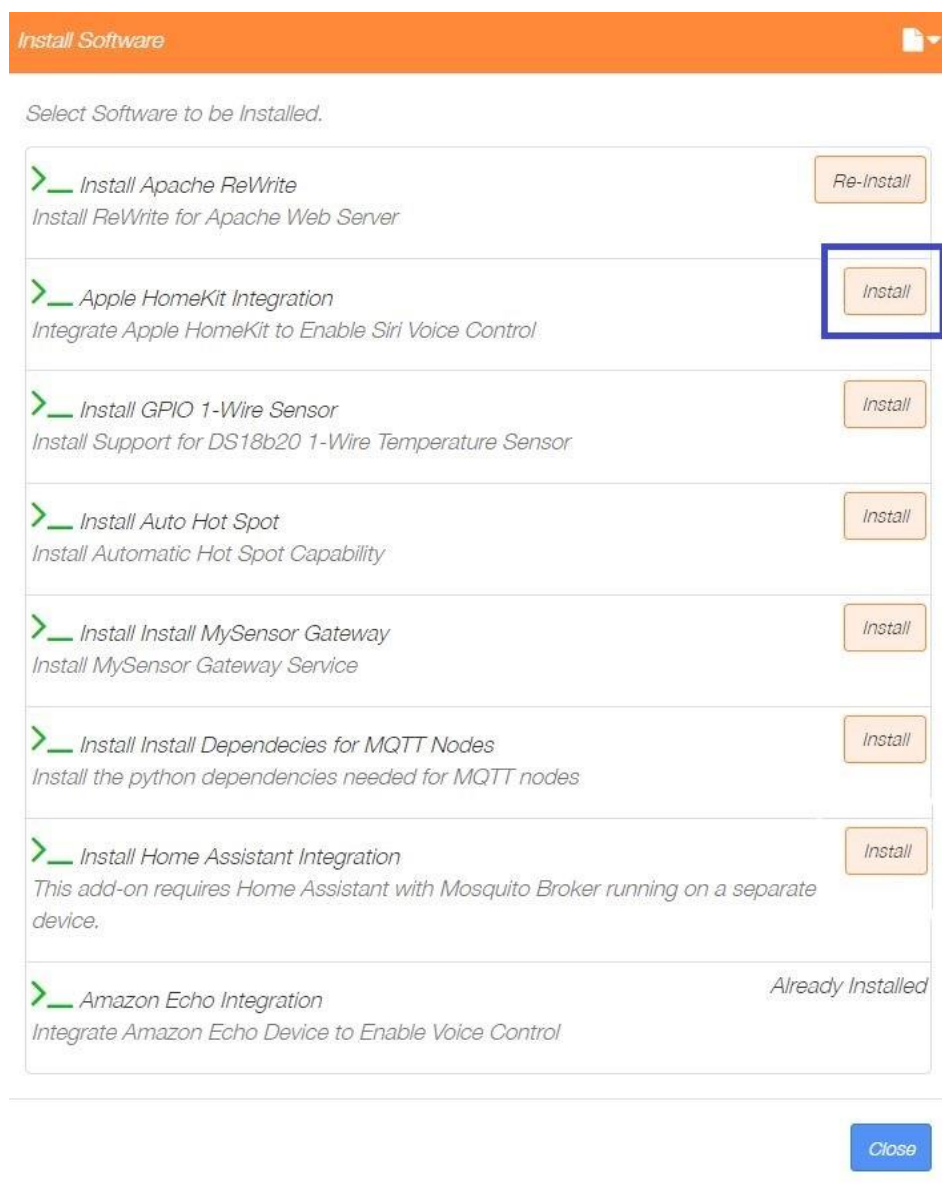
The 'homekit' add-on was initially created to allow voice control using Apple's Siri, the add-on uses 'Homebridge' together with its associated 'Webhooks' plugin to create a HomeKit Bridge device, this can then be accessed using Apple's HomeKit app.

Home Assistant has a 'Homekit Controller' add-on which enables communication with Homekit compliant devices and hence can be used as a mechanism for integration of MaxAir with Home Assistant.

Setup

Homebridge plus Webhooks Plugin

From Settings/System Maintenance/Install Software and select the 'Install' option for 'Apple HomeKit Integration'.



This will install any required dependencies, install and start the services for both Homebridge and the data transfer to Webhooks.

Installing Software

Please Be Patient Installing Software in the background, this could take some time.

```
|Enabling Rewrite
Backing Up and Modifying /etc/apache2/sites-available/000-default.conf
000-default.conf Already Modified
Backing Up and Modifying /etc/apache2/sites-enabled/000-default.conf
000-default.conf Already Modified
Enabling Rewrite
mod_rewrite Already Enabled
Installing/Updating nodejs
Version aarch64
Installing Homebridge

added 457 packages, and audited 458 packages in 2m

69 packages are looking for funding
  run `npm fund` for details

10 vulnerabilities (4 low, 2 moderate, 4 high)

To address all issues, run:
  npm audit fix

Run `npm audit` for details.
Setup Homebridge Service

Manage Homebridge by going to one of the following in your browser:
```

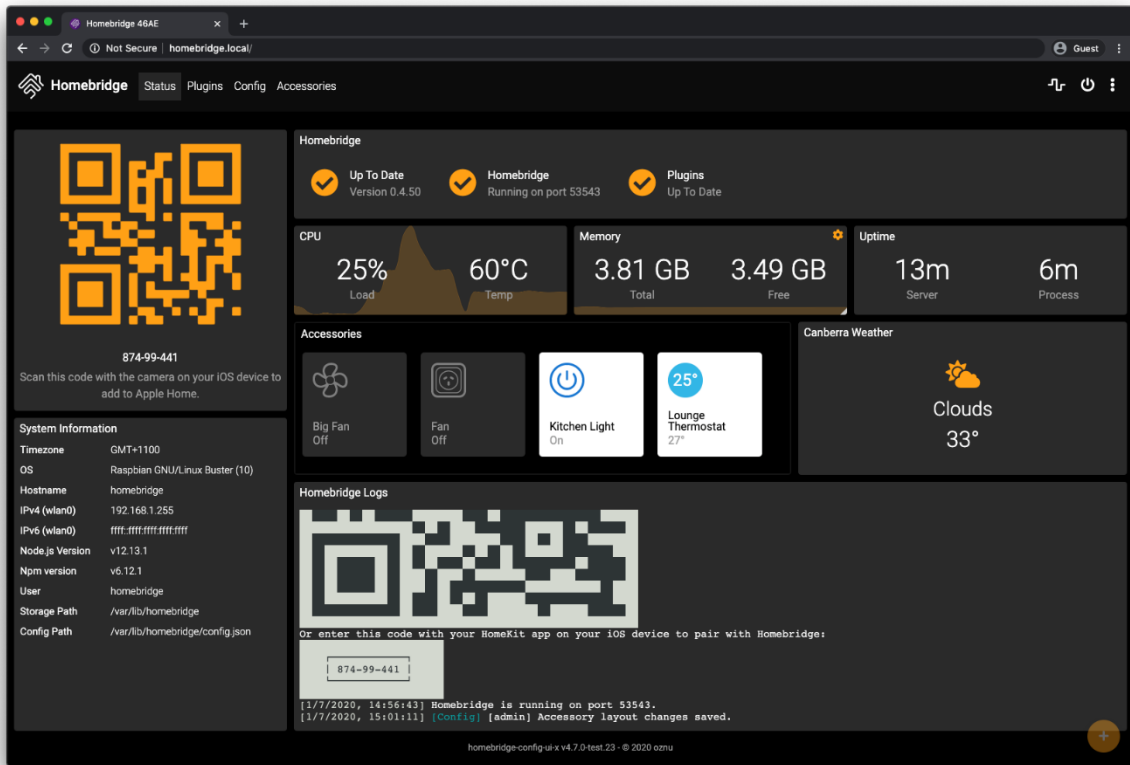
Close

Please note that this integration will search for new zones and sensors only as part of the initial installation. If new sensors or zones are added to then the configuration file `/var/lib/homebridge/config.json` will need to be re-created, this can be achieved by at a console prompt issuing the command `python3 /var/www/add_on/homekit/config_json.py`.

The Homebridge UI web interface will allow you to install, remove and update plugins, and modify the Homebridge `config.json` and manage other aspects of your Homebridge service.

Login to the web interface by going to `http://<ip address of your server>:8581`.

The default user is **admin** with password **admin**.



Configuration Reference

This table contains important information about your setup.

	File Location / Command
Config File Path	/var/lib/homebridge/config.json
Storage Path	/var/lib/homebridge
Restart Command	sudo hb-service restart
Stop Command	sudo hb-service stop
Start Command	sudo hb-service start
View Logs Command	sudo hb-service logs
Systemd Service File	/etc/systemd/system/homebridge.service
Systemd Env File	/etc/default/homebridge

Example Configuration File

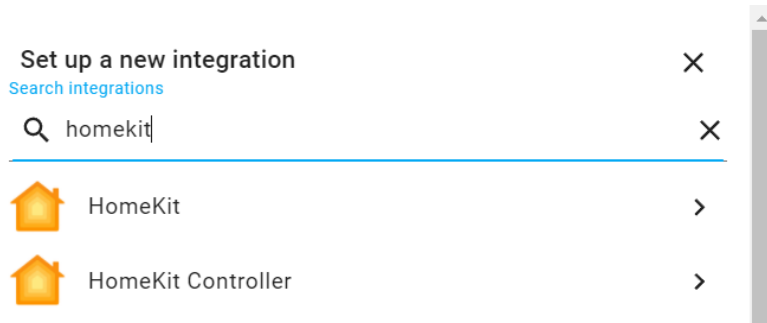
This configuration shows 2 switch zones to control Hot Water and Central Heating Boost, together with 2 temperature sensors.

```
{
  "bridge": {
    "name": "Homebridge 1DF9",
    "username": "0E:AC:C3:AA:1D:F9",
    "port": 51944,
    "pin": "942-89-721",
    "bind": [
      "wlan0"
    ]
  },
  "platforms": [
    {
      "platform": "config",
      "name": "Config",
      "port": "8581"
    },
    {
      "platform": "HttpWebHooks",
      "webhook_port": "51828",
      "cache_directory": "./.node-persist/storage",
      "https": false,
      "switches": [
        {
          "id": "switch38",
          "name": "Hot Water Zone",
          "on_url": "http://127.0.0.1/api/boostSet?zonename=Hot Water&state=1",
          "on_method": "GET",
          "off_url": "http://127.0.0.1/api/boostSet?zonename=Hot Water&state=0",
          "off_method": "GET"
        },
        {
          "id": "switch39",
          "name": "Central Heating Zone",
          "on_url": "http://127.0.0.1/api/boostSet?zonename=Central Heating&state=1",
          "on_method": "GET",
          "off_url": "http://127.0.0.1/api/boostSet?zonename=Central Heating&state=0",
          "off_method": "GET"
        }
      ],
      "sensors": [
        {
          "id": "sensor35",
          "name": "Bedroom&1 Temperature",
          "type": "temperature"
        },
        {
          "id": "sensor36",
          "name": "Bedroom&2 Temperature",
          "type": "temperature"
        }
      ]
    }
  ],
  "accessories": []
}
```

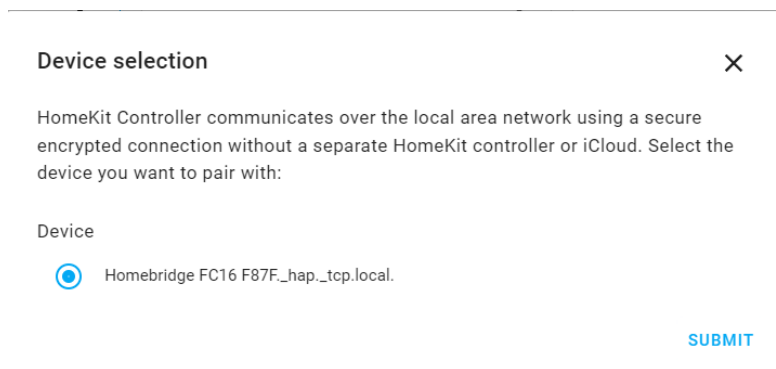
Home Assistant

In Home Assistant follow the steps bellow to install the HomeKit Controller Integration:

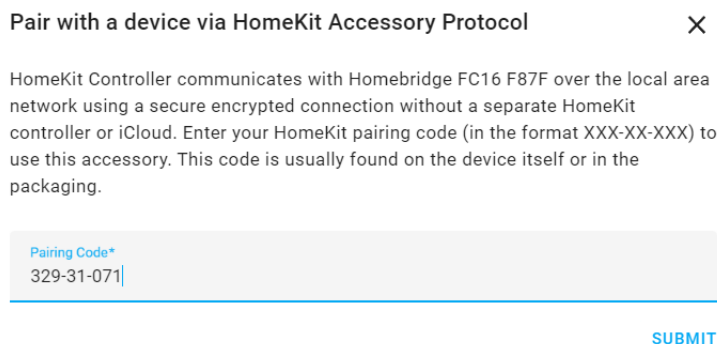
1. Navigate in your Home Assistant frontend to Configuration
2. Select the Devices and Services option
3. Click on + ADD INTEGRATION
4. Search for HomeKit Controller and select



5. Homebridge will be identified, click on SUBMIT



6. You will be prompted for a Pairing Code, this can be found on the Homebridge Status screen, enter and click on SUBMIT

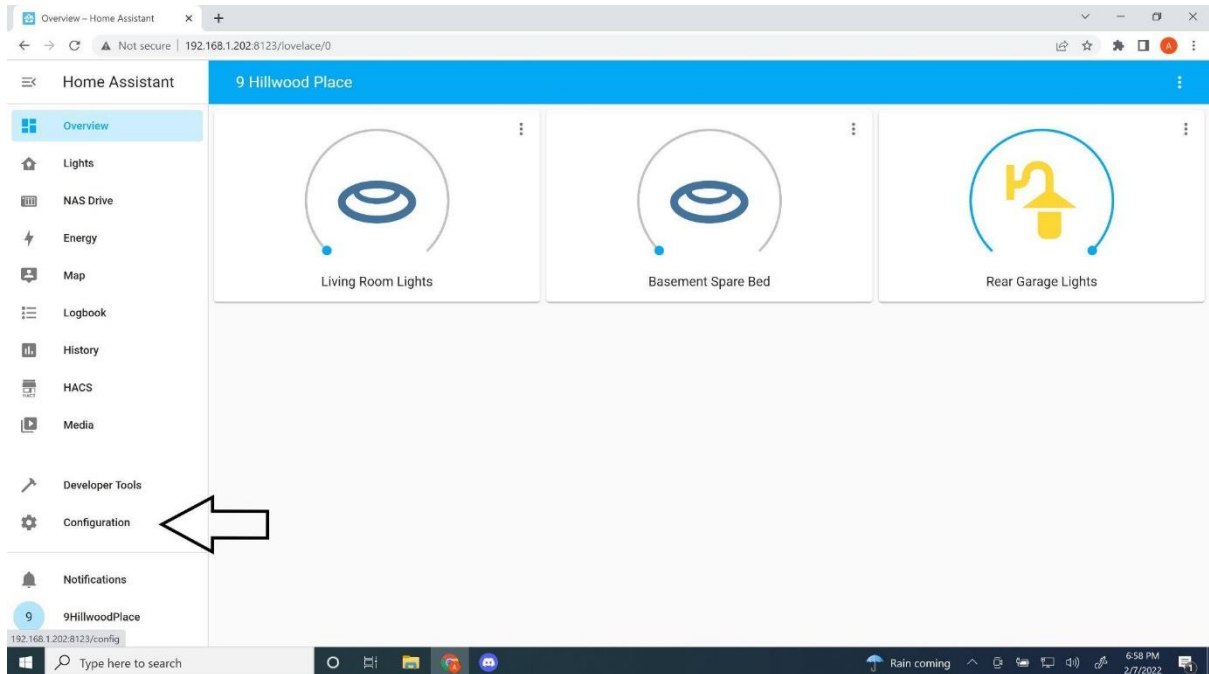


7. The setup should then complete, automatically creating the entities.

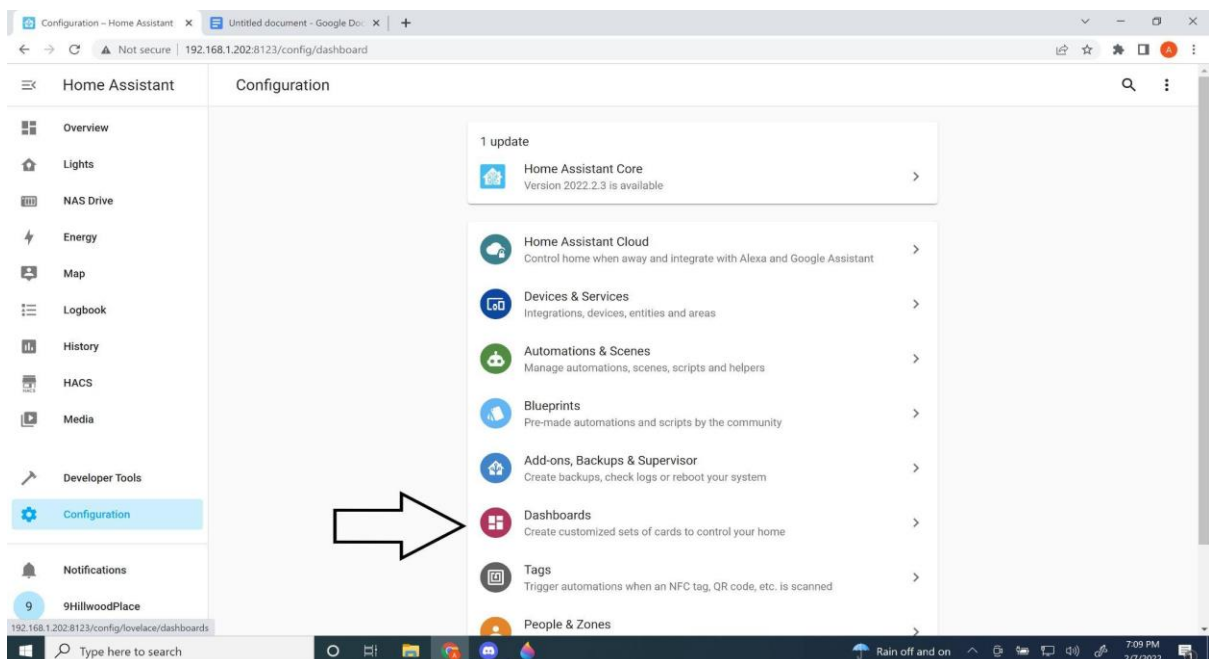
Creating a Home Assistant Dashboard

Get started with setting up a dashboard in home assistant for your MaxAir system. There is a default card created once the home assistant has imported the settings from MaxAir. Follow the directions below to start creating your MaxAir dashboard

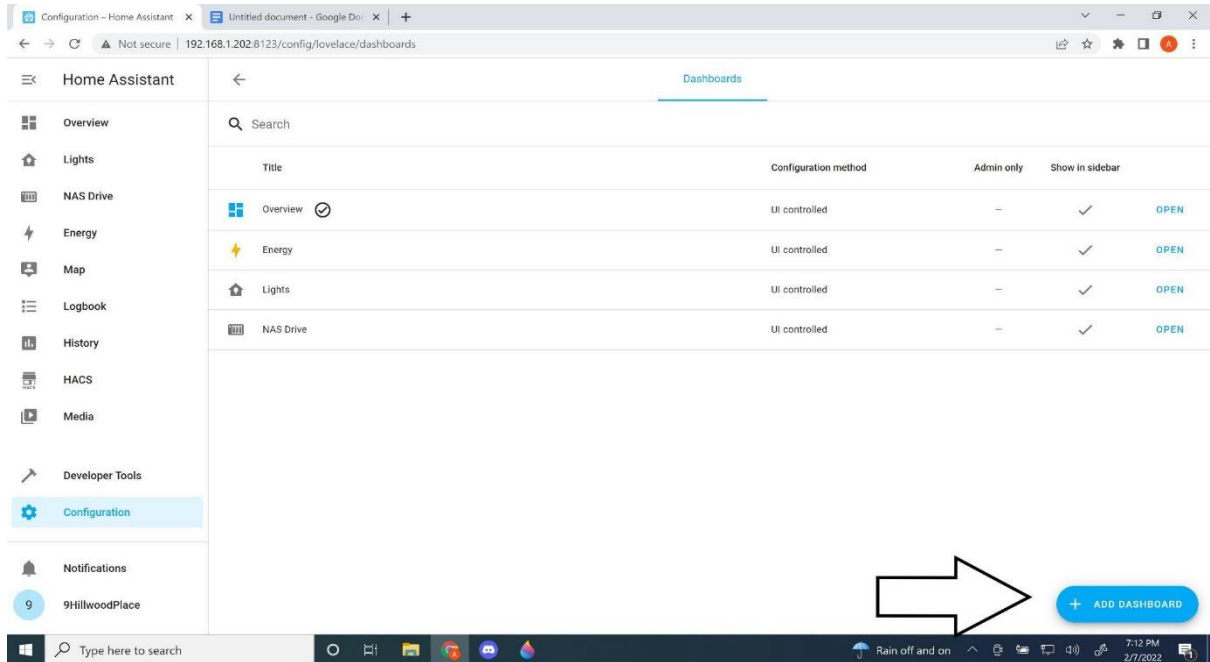
- From home assistant, Select configuration from the left side pane



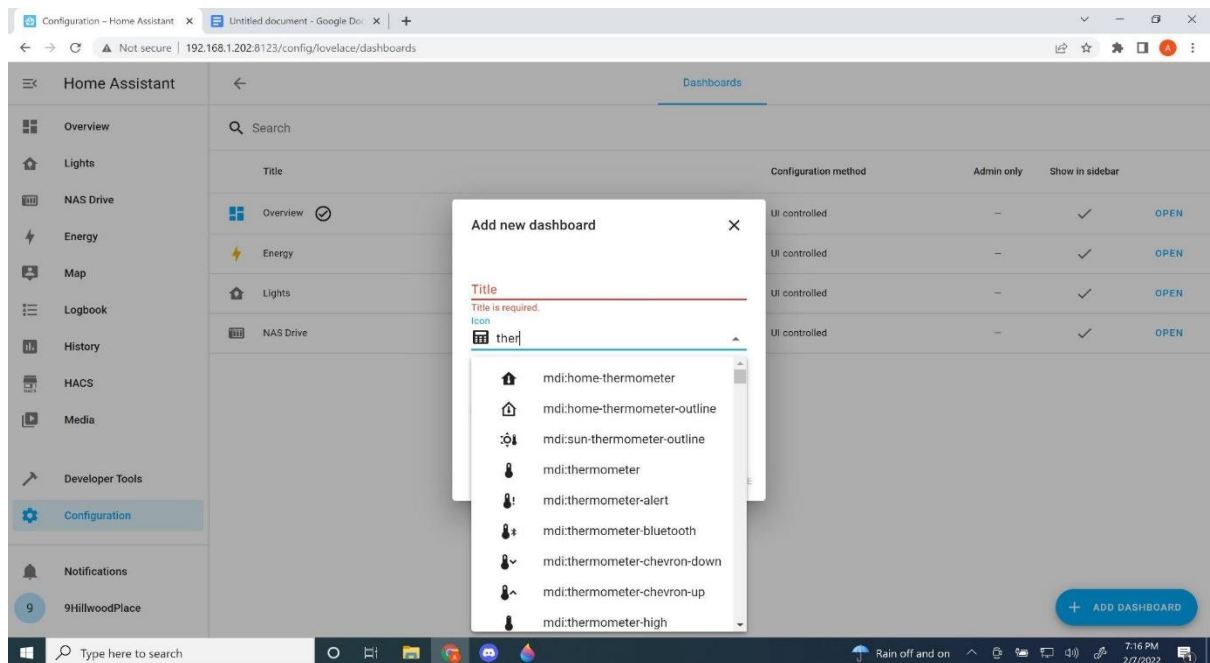
- Select Dashboards



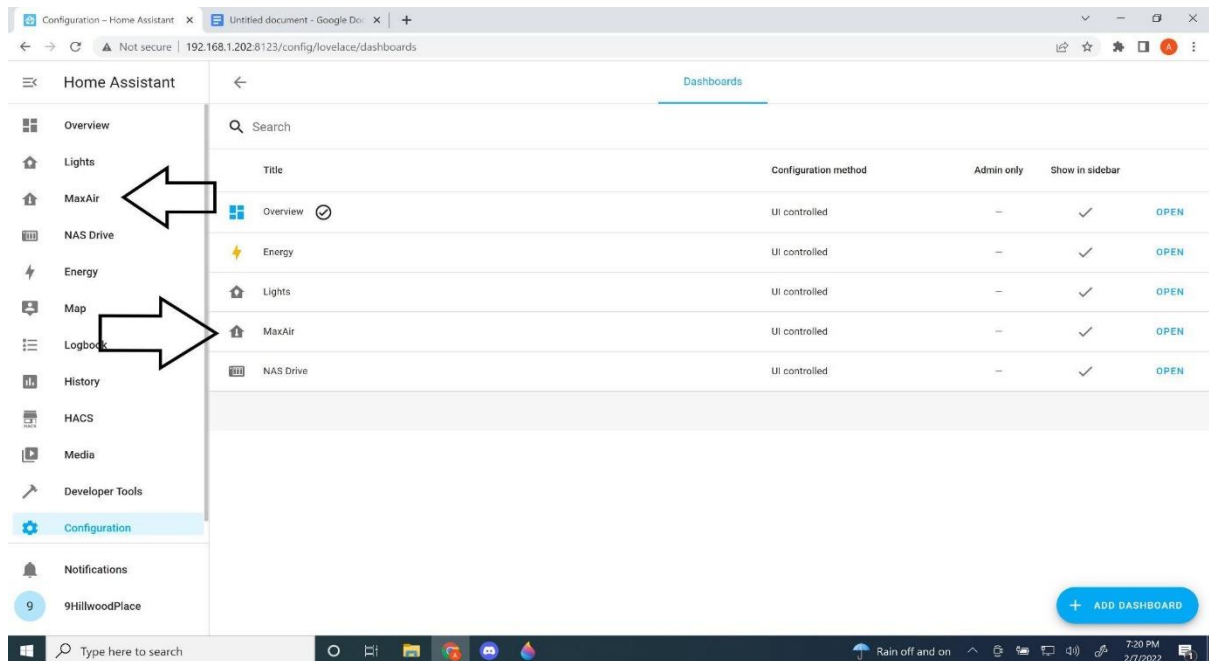
- Select Add Dashboard



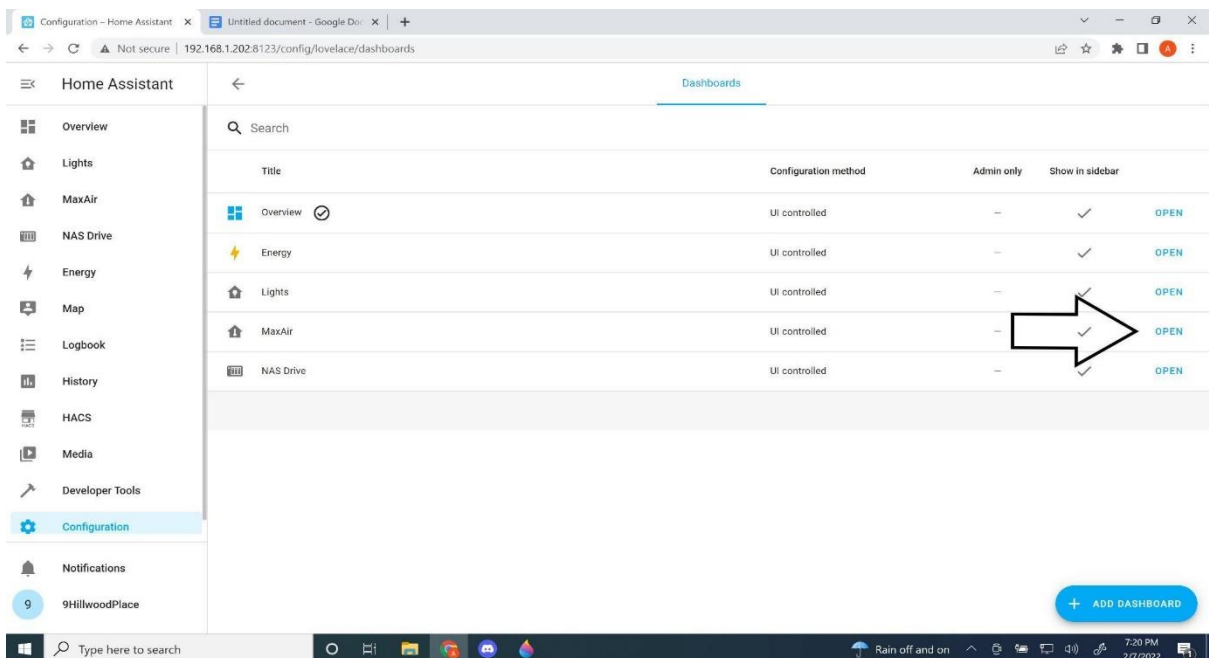
- Give your dashboard a title and icon. Start typing THERM in icon to bring up temperature related icons or choose anyone you want. Then Click create.



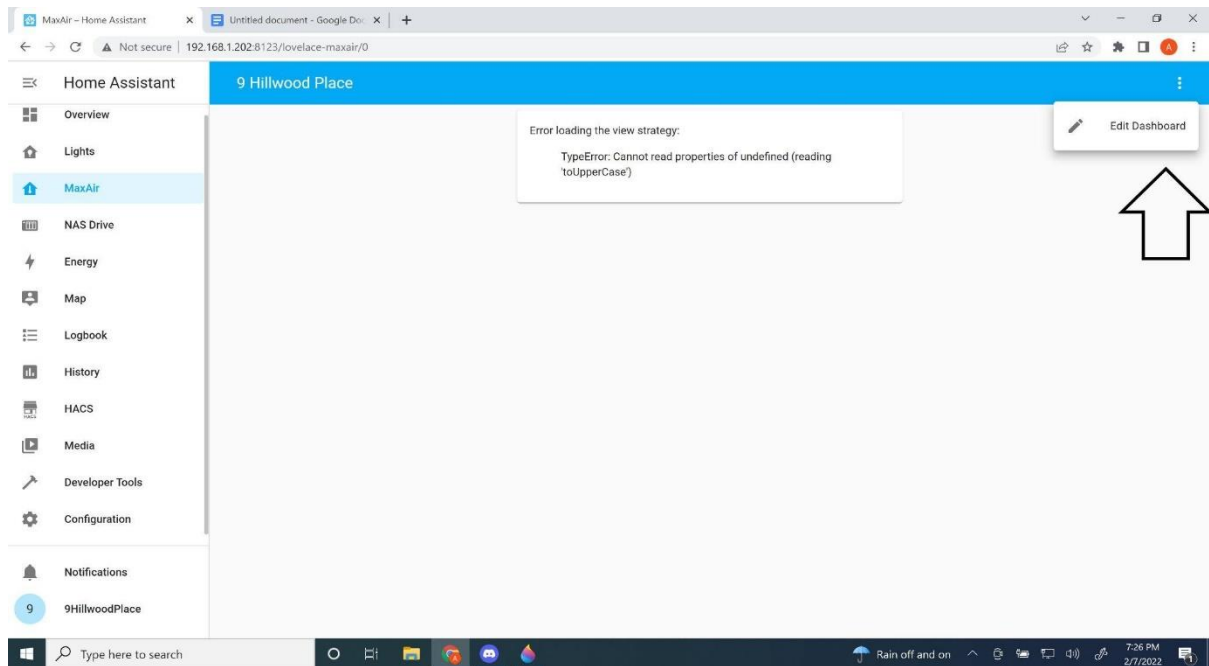
- You will see your newly created dashboard which will appear in the left pane and in the dashboard setting page



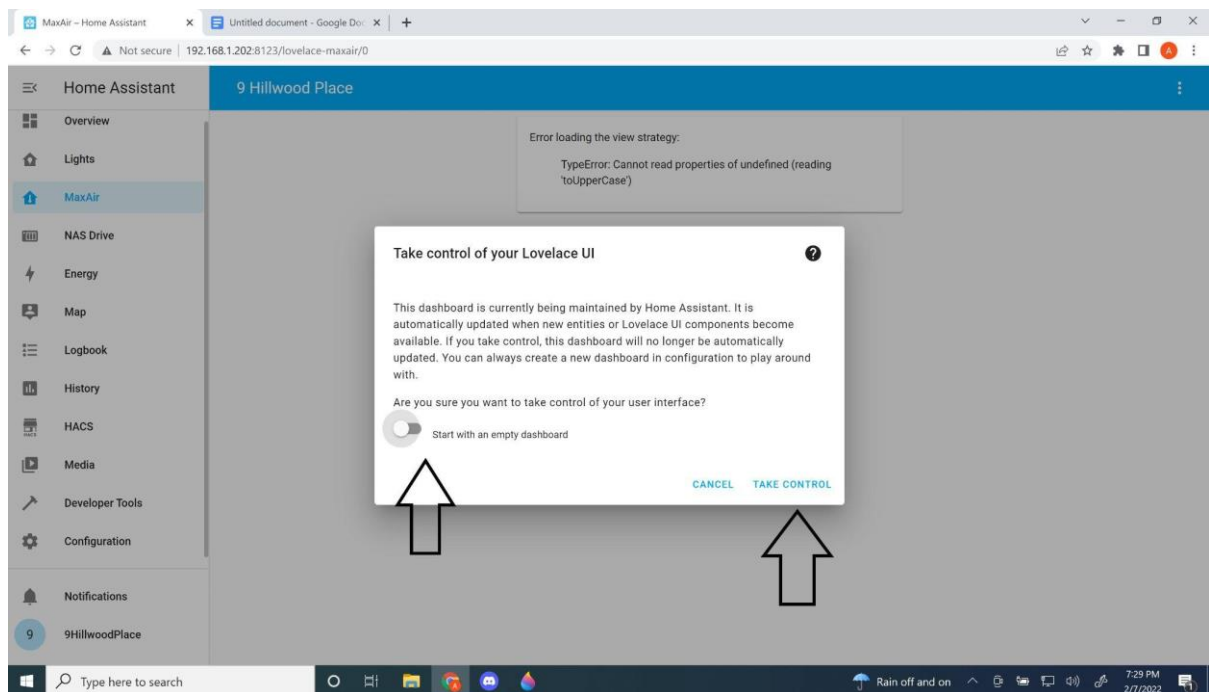
Click open



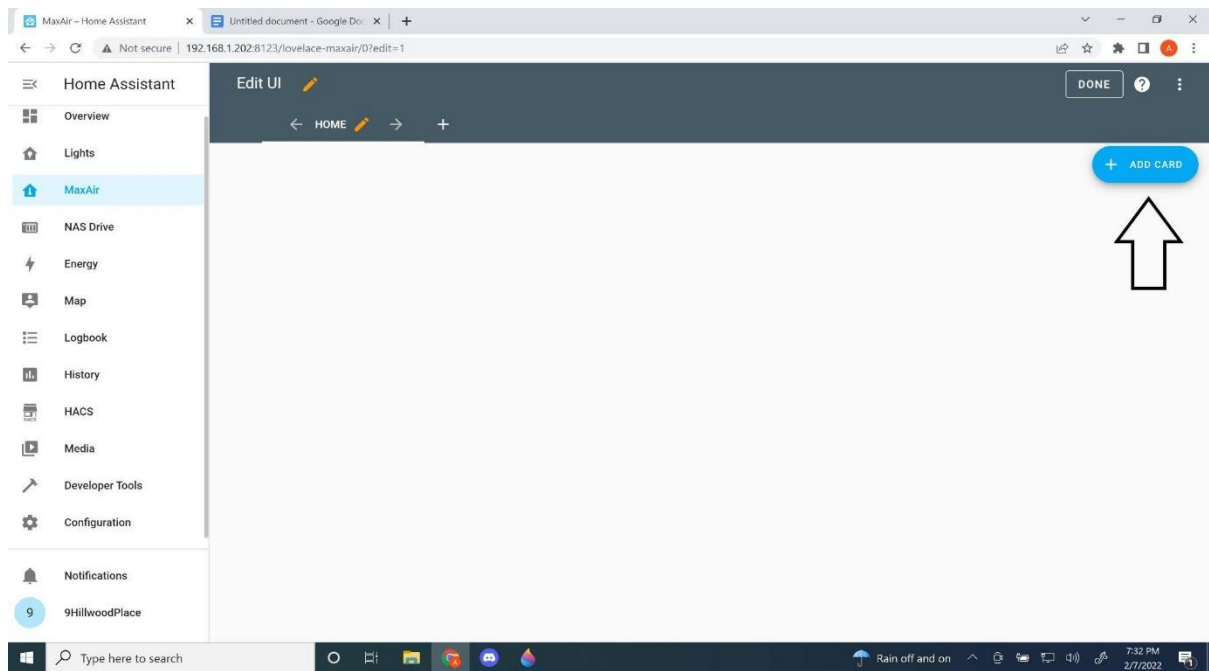
- Click the 3 dots, then click edit dashboard



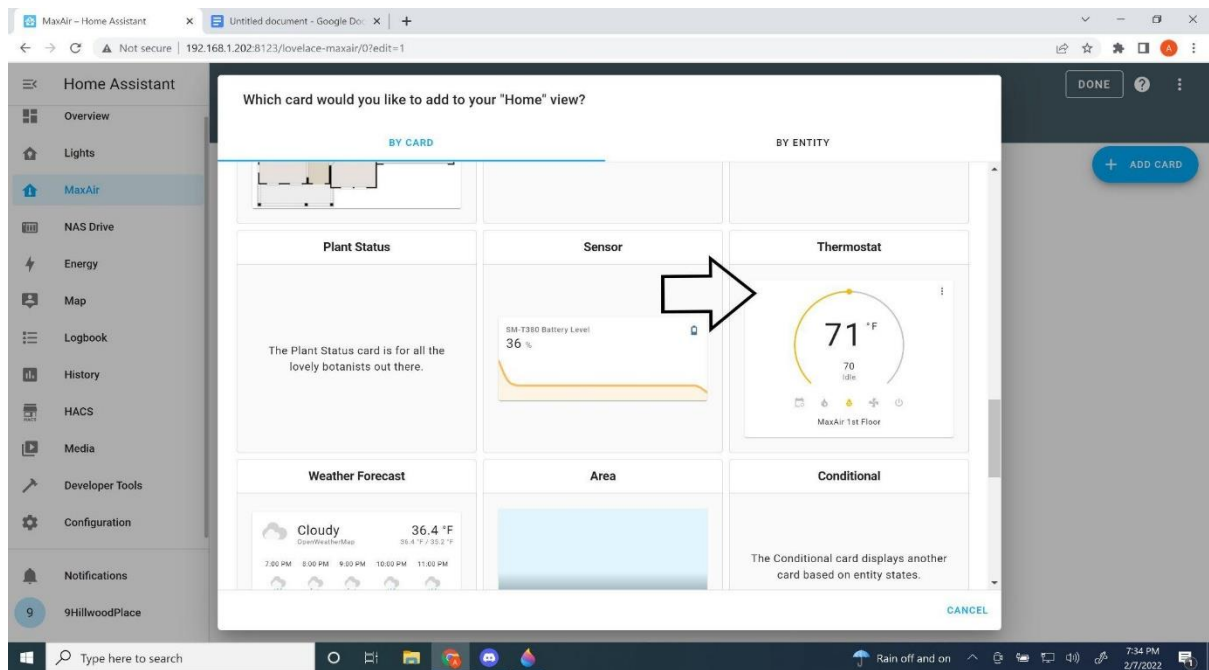
- Click “start with an empty dashboard”, then click “take control”



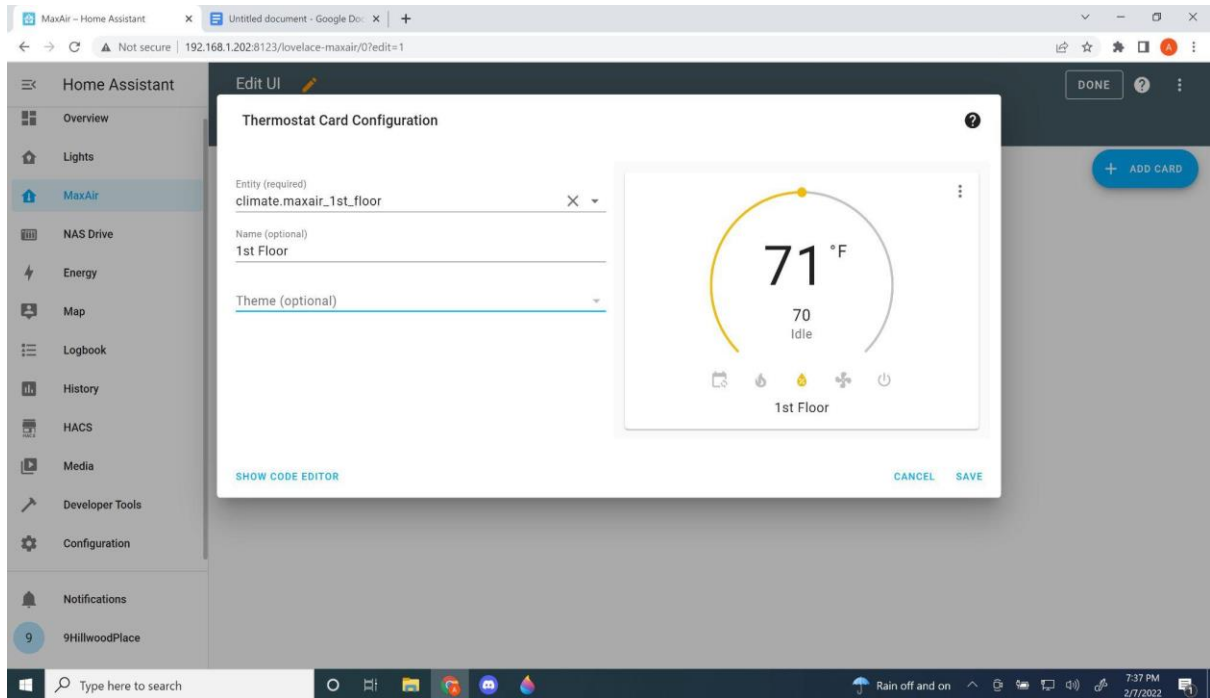
- Click add card



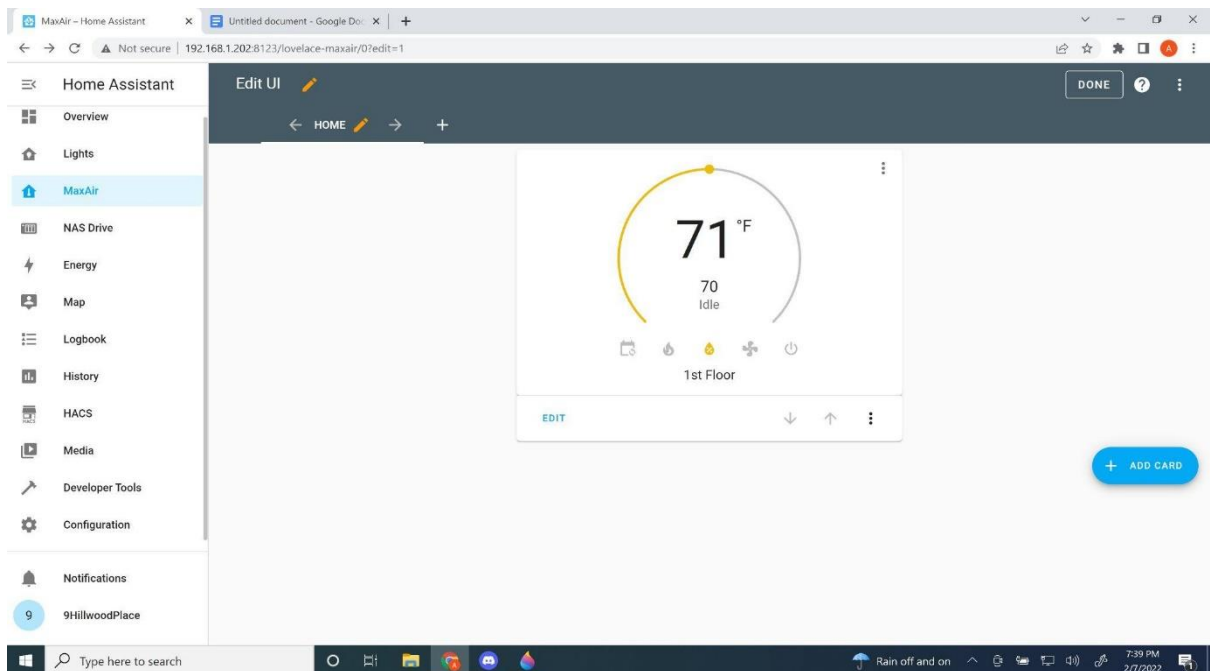
- Scroll down until you find "thermostat" card



- Give a name and optional Theme. Giving a name is recommended or else it will be named by the entity title. Then click “save”

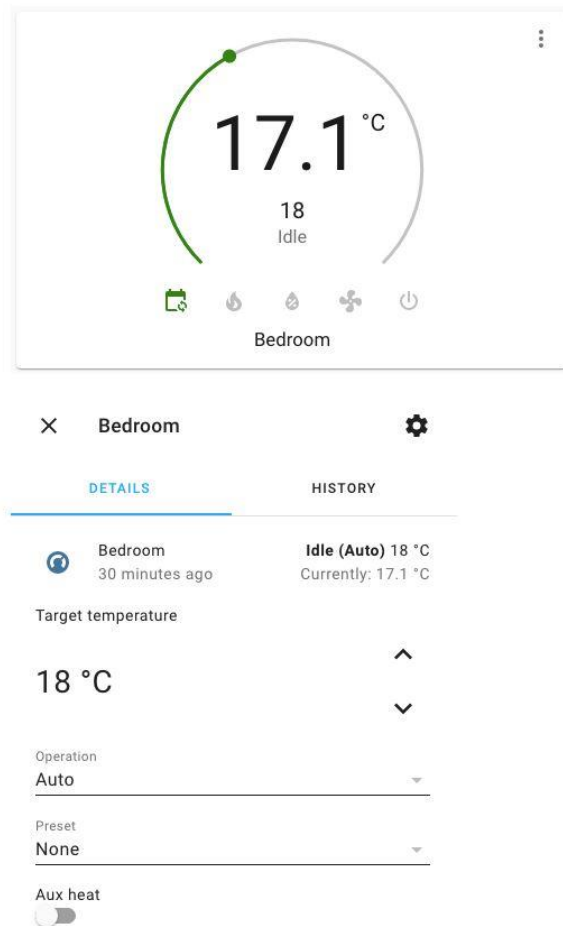


- Continue to click add card until you have added all of your zones.



The format of the thermostat will be different depending if using MQTT/Mosquitto or HTTP/Homebridge.

MQTT/Mosquitto Thermostat



Unfortunately, the climate entity in Home Assistant supports only the following operations: off, auto, heat, cool, fan only and dry. When MaxAir is operating in boiler mode the Home Assistant operations are mapped as follow:

- 0 OFF -> off
- 1 Timer -> auto
- 2 CH -> heat
- 3 HW -> fan_only
- 4 Both -> dry

When MaxAir is operating in HVAC mode the Home Assistant operations are mapped as follow:

- 0 OFF -> off
- 1 Timer -> dry
- 2 Auto -> auto
- 3 Fan -> fan only
- 4 Heat -> heat
- 5 Cool -> cool

HTTP/Homebridge Thermostat



Unfortunately, the climate entity in Home Assistant supports only the following operations: off, auto, heat, cool, fan only and dry. When MaxAir is operating in boiler mode the Home Assistant operations are mapped as follow:

- 0 OFF -> Off
- 1 Timer -> Heat/Cool
- 2 CH -> Heat
- 3 HW -> Cool