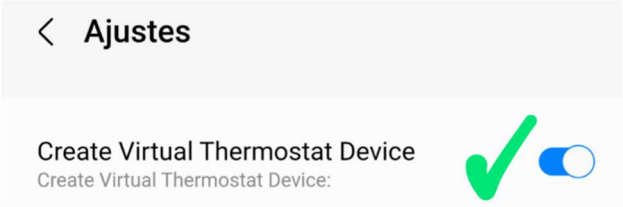
User Manual for Edge Driver Thermostat and Virtual Child Thermostat

This user manual is for the following edge drivers:

- **Edge Driver Zigbee Temp Sensor and Thermostat Mc:** Allows you to convert a device sensor that has the capability of Temperature into a fully programmable Thermostat and usable with Routines and Scenes.
- **Edge Driver Zigbee Temp Sensor and Child Thermostat Mc:** Allows to all devices paired with this driver create a Child device with fully programmable Thermostat and usable with Routines and Scenes.
- **Edge Driver Z-Wave Sensor and Child Thermostat Mc:** Allows to all devices paired with this driver create a Child device with fully programmable Thermostat and usable with Routines and Scenes.
- **Edge Driver Fibaro Smart Implant Mc:** Allows to all devices paired with this driver create a Child device with fully programmable Thermostat and usable with Routines and Scenes.

Driver and device installation:

1. Open the link to my shared channel and install the driver you are going to use on your Hub: https://api.smartthings.com/invitation-web/accept?id=6b68563b-1905-4654-8d2b-e677a2997424
2. Put the device in pairing mode
3. In the App add new device and choose the option "Search Nearby"
4. When the device is paired, it will appear in the room where your Hub is located.
5. For the drivers **Zigbee Temp Sensor and Child Thermostat Mc** and **Z-Wave Sensor and Child Thermostat Mc** you have to enter the Settings Menu and Enable the preference "Create Virtual Thermostat Device".



6. A virtual Thermostat Child device will be created with the name "Thermostat-" and your “Device Name”. It will appear in the Room where your Hub is located.
7. The thermostat will not control the temperature until a first event of the current temperature is received. You can force an event by refresh the physical device or heating the sensor a little with your hand.
8. The Driver will attempt to configure your device to works with the default settings of temperature reports:

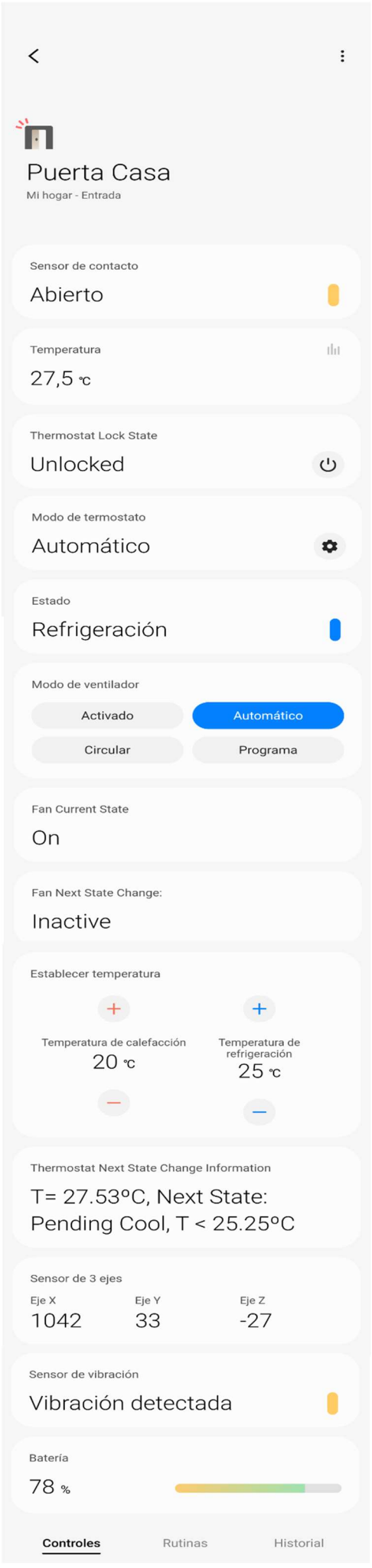
   Minimum Interval: 30 sec

   Maximum Interval: 300 sec

   Reportable temperature change: 0.1ºC

Important considerations:

1. All zigbee sensors emit their reports in ºC. As the maximum precision is 0.1ºC, the minimum precision in ºF will be 0.18ºF, which when rounded to 1 decimal place will be approximately 0.2ºF.
2. The values of the temperature presets have no units and the defaults are equivalent to ºC.
3. If your location use ºF, change the units to ºF in preferences and change the Heat and Cool values to equivalent values ºF.
4. The range for entering temperature in preferences is -50.0 to 250.0.
5. Decimal values can be used. this range covers the values required for ºC and ºF adjustments

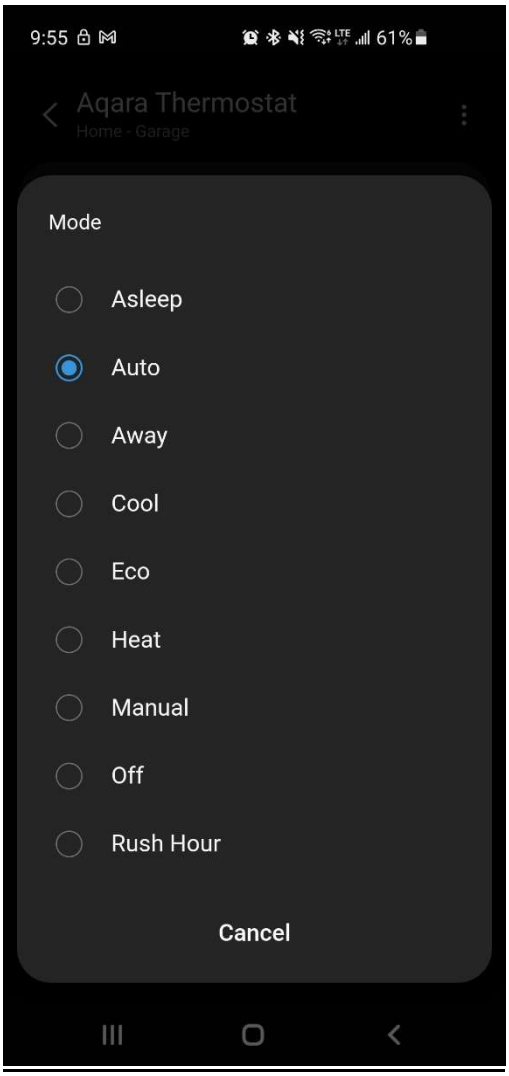

Puerta Casa
Mi hogar - Entrada
Sensor de contacto
Abierto
Temperatura
27,5 °C
Thermostat Lock State
Unlocked
Modo de termostato
Automático
Estado
Refrigeración
Modo de ventilador
Activado
Automático
Circular
Programa
Fan Current State
On
Fan Next State Change:
Inactive
Establecer temperatura
Temperatura de calefacción
20 °C
Temperatura de refrigeración
25 °C
Thermostat Next State Change Information
T= 27.53°C, Next State: Pending Cool, T < 25.25°C
Sensor de 3 ejes
Eje X
1042
Eje Y
33
Eje Z
-27
Sensor de vibración
Vibración detectada
Batería
78 %
Controles
Rutinas
Historial


Thermostat-Environment Sensor
Mi hogar - Sótano
Temperatura
22,9 °C
Humedad
29 %
Thermostat Locked
thermostatLocked
Modo de termostato
Desactivado
Estado
Inactivo
Modo de ventilador
Automático
Circular
Activado
Programa
Sin título
Off
Sin título
Inactive
Establecer temperatura
Temperatura de calefacción
20,0 °C
Temperatura de refrigeración
25,0 °C
Info Panel
infoPanel
No Expected Change in Thermostat State
Controles
Rutinas
Historial

Thermostat Default Capabilities:

1. Thermostat Mode:

1.1. **Asleep:** Control Heat and Cool **with Presets in Preferences** for Heat and Cool Temperature
1.2. **Away:** Control Heat and Cool **with Presets in Preferences** for Heat and Cool Temperature
1.3. **Auto:** Control Heat and Cool **with Presets in Preferences** for Heat and Cool Temperature
1.4. **Rush Hour:** Control Heat and Cool **with Presets in Preferences** for Heat and Cool Temperature
1.5. **Cool:** Controls the temperature for Cooling with the set point entered manually.
1.6. **Eco:** Heat and Cool Control **with Presets in Preferences** for Heat and Cool Temperature
1.7. **Heat:** Controls the temperature for Heating with the set point entered manually.
1.8. **Manual:** Heat and Cool Control **without Presets in Preferences** for Heat and Cool Temperature
1.9. **Off:** Thermostat off. You can use fan On, Circulate, Scheduled modes



2. Thermostat Operating State:

2.1. **Idle:** Thermostat off, no temperature control
2.2. **Heating:** The current temperature is below the HeatSetPoint - User Thermal Inertia temp.
2.3. **Pending Heat:** The current temperature is above the HeatSetPoint - User Thermal Inertia temp.
2.4. **Cooling:** The current temperature is above the CoolSetPoint + User Thermal Inertia temp.
2.5. **Pending Cool:** The current temperature is below the CoolSetPoint + User Thermal Inertia temp.
2.6. **Fan Only:** Active Fan is selected and thermostat mode is Off
2.7. **Vent economizer:** Fan Circulate has been selected and the Thermostat Mode is Off.

3. Thermostat Fan Mode:

3.1. **Auto:** Indicates that the fan will be activated automatically in the climate control

3.2. **On:** The Fan will always be running in On mode.

3.2.1. **Fan Only** will be displayed under Thermostat Status If Thermostat Mode is Off. if thermostat mode is different of **off** the status for heat or cool is displayed

3.3. **Circulate:** The Fan will always be running in Circulate mode.

3.3.1. **Vent economizer:** Fan Circulate has been selected and the Thermostat Mode is Off. if thermostat mode is different of **off** the heat or cool status is displayed

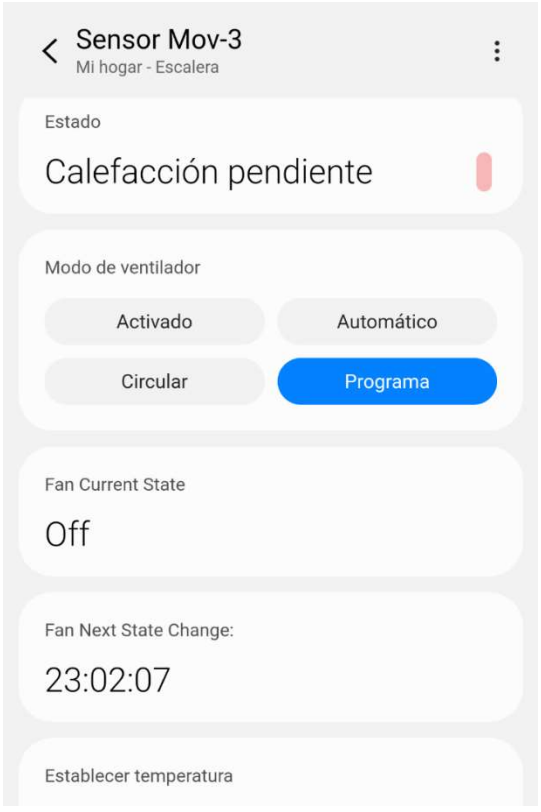
3.4. **Followschedule:** The Fan works with the on and off schedule according to the values, in minutes, chosen in preferences for **Time On** and **Time Off**. (Range between 1 and 60 min).

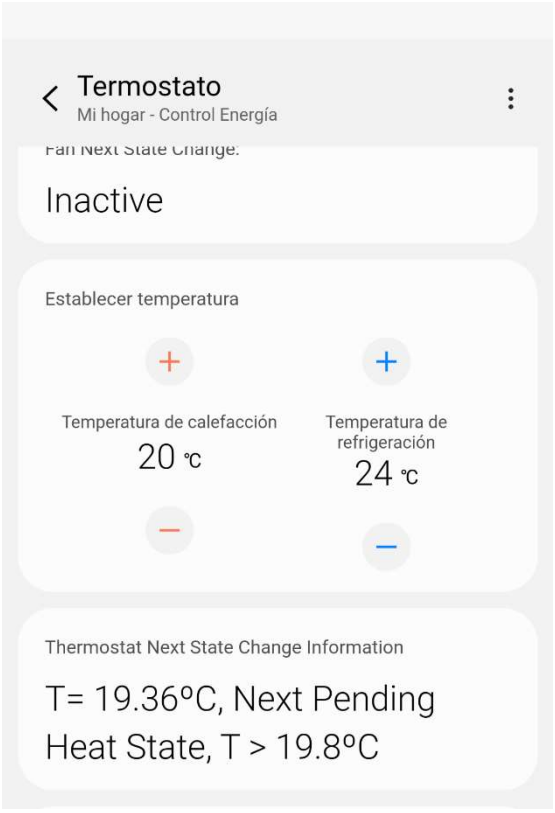
4. The Information Panels (Custom Capabilities):

4.1. **Fan Current State:** Indicates the Fan current Status **On** or **Off**, and can be used in Routines to activate fans, etc ...

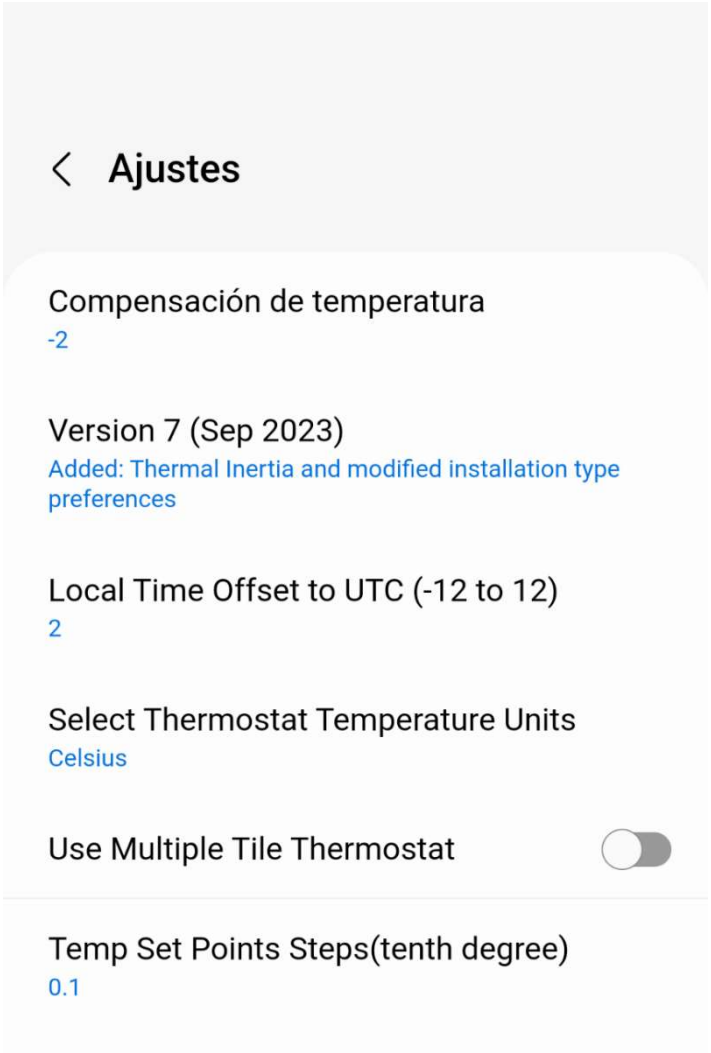
4.2. **Fan Next State Change:** Indicates the time at which the next scheduled Fan state change will occur.

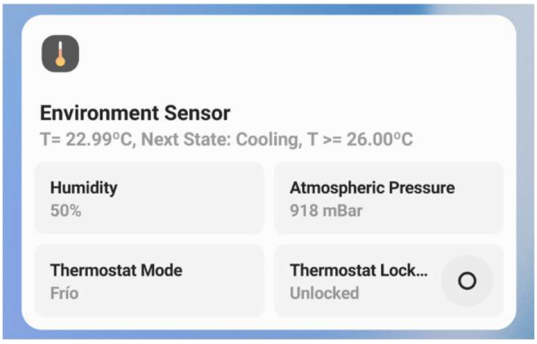
4.3. **Thermostat Next State Change Information**: Displays information of the current ambient temperature, with two decimal places and the next expected thermostat state change and the temperature at which the change will occur

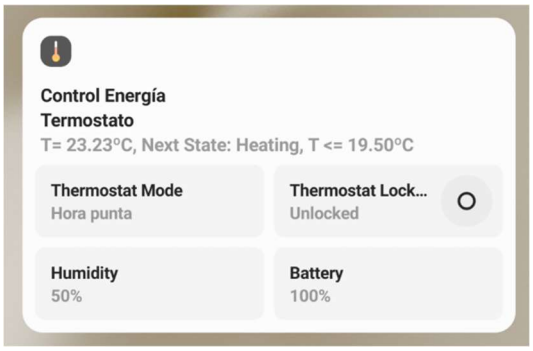


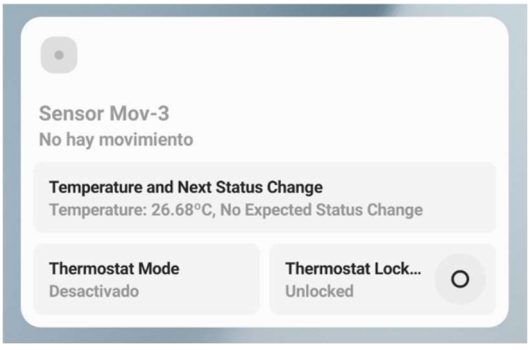


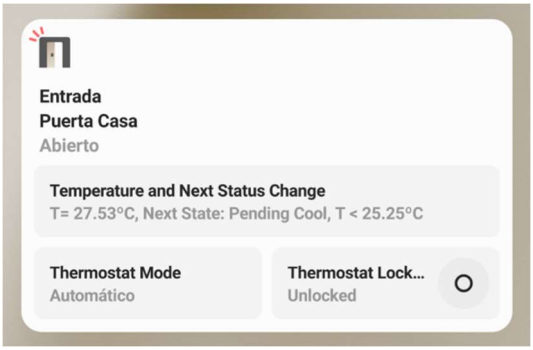
5. **Preferences setting menú**
   - You must choose the units of temperature ºC or ºF according to the units of your location.
   - You can enter the differential of your local time with respect to UTC time. Used to calculate the time of change of state of the Fan when used in Mode Programmed.
   - You can adjust the profile to allute the temperature steps by 0.1º or 0.5º. By default 0.5º
   - You can Use a Multiple tile with up to 5 fields to display various data at a glance and Lock and Unlock the thermostat so that the selected mode or temperature settings cannot be changed accidentally or with routines.
   - The thermostat locks automatically when AWAY or Manual mode is selected so that routines do not accidentally change mode











- **In preferences you can program the temperature preset values for 5 thermostat modes.**
- This allows you to program with simple routines to vary the desired target temperatures for different Hours of the Day or for situations such as to Sleep, away or vacation.
- **Temperature units are in that unit you selected in preferences.**
- **By default values are in the equivalent to ºC, if you change units to ºF, then you have to change the default values to the equivalents in ºF**

SLEEP Mode, HEAT Temperature
19

SLEEP Mode, COOL Temperature
26

AUTO Mode, HEAT Temperature
20

AUTO Mode, COOL Temperature
25

RUSH HOUR Mode, HEAT Temperature
21

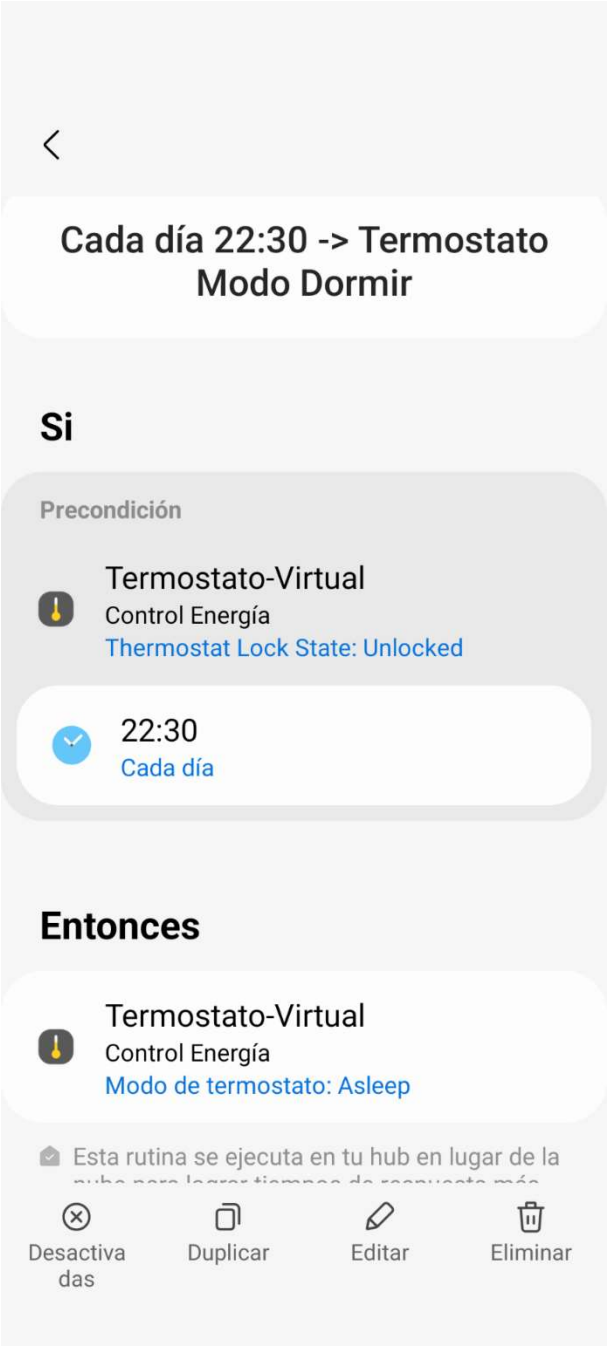
RUSH HOUR Mode, COOL Temperature
24

ECO Mode, HEAT Temperature
17

ECO Mode, COOL Temperature
27

AWAY Mode, HEAT Temperature
15

AWAY Mode, COOL Temperature
28



6. Preference settings to improve the comfort and save energy:

To improve energy savings and comfort it is necessary to introduce in preference settings the **type of heating and cooling** that the thermostat has to control and the **thermal inertia** of the installation.

What is the thermal inertia of the installation?: It is the capacity of a heating or cooling installation to continue emitting heat or cold when the heating or cooling stops.

The thermal inertia is bidirectional, it takes some time for the thermal emitter to lose temperatura and it will also take some time to heat up with the heater.

For example, an installation with external radiators or underfloor, electric, with water or liquid, will continue to emit heat or cold until its temperature equals the ambient temperature, even if it is already stopped.

If installation is underfloor heating or cooling type, the thermal inertia is very large, since the mass to be heated or cooled is very large.

If installation is heating or cooling by air has no thermal inertia. The hot or cold air is forced to circulate and begins to heat or cool instantly and when the system stops then Air stops circulating and quickly equalizes its temperature with the ambient temperature.

How to Use the Preference: "Thermal Inertia of your Installation" Setting

This simulates the acceleration resistance of real mechanical thermostats.

How to calculate Thermal Inertia of your Installation?

We will observe the history events and look for the temperature when thermostat Operating state change to **"Pending Heat"** state and then we will look for the maximum temperature following that event.

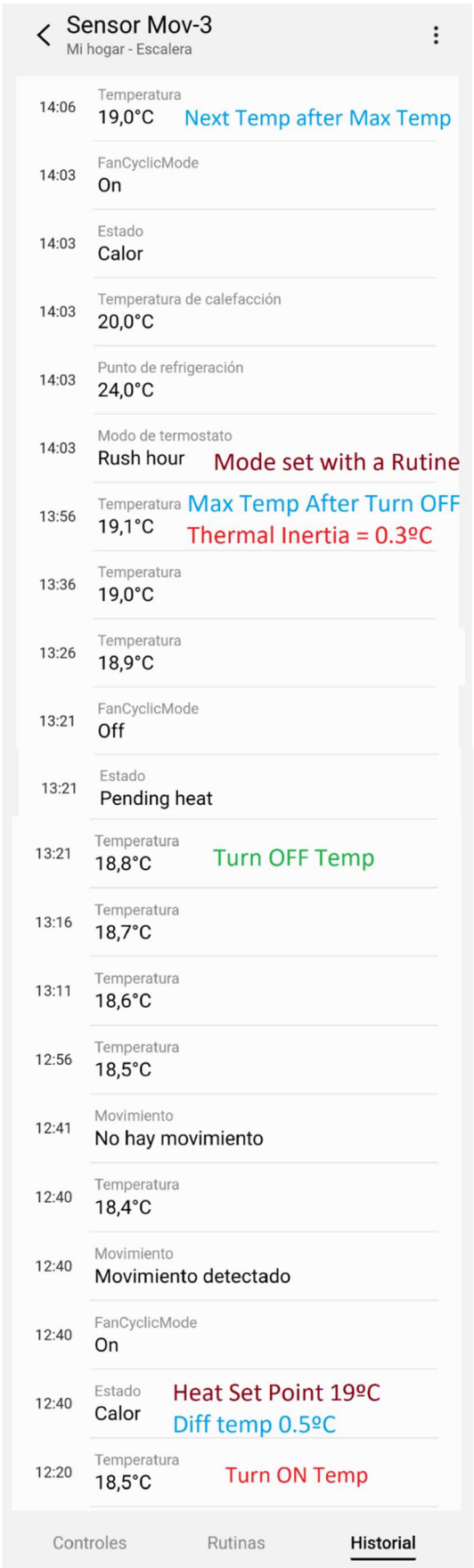
The difference between the maximum temperature reached and that of the event of change to **"Pending Heat"** is approximately equivalent to the thermal inertia of our heating system **with the temperature conditions that we have fixed in the electric emitters, floor or water radiators**.

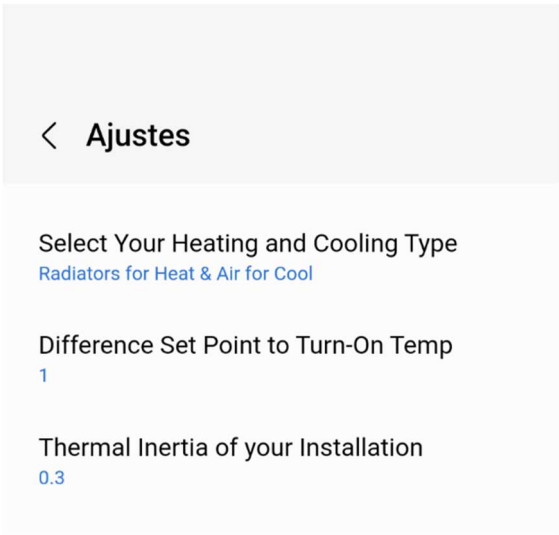
Preference Values are in º in a range of 0º to 1.5º. The unit are in C o F, according to your selection in thermostat temperature unit in preference. Default value is 0.3º

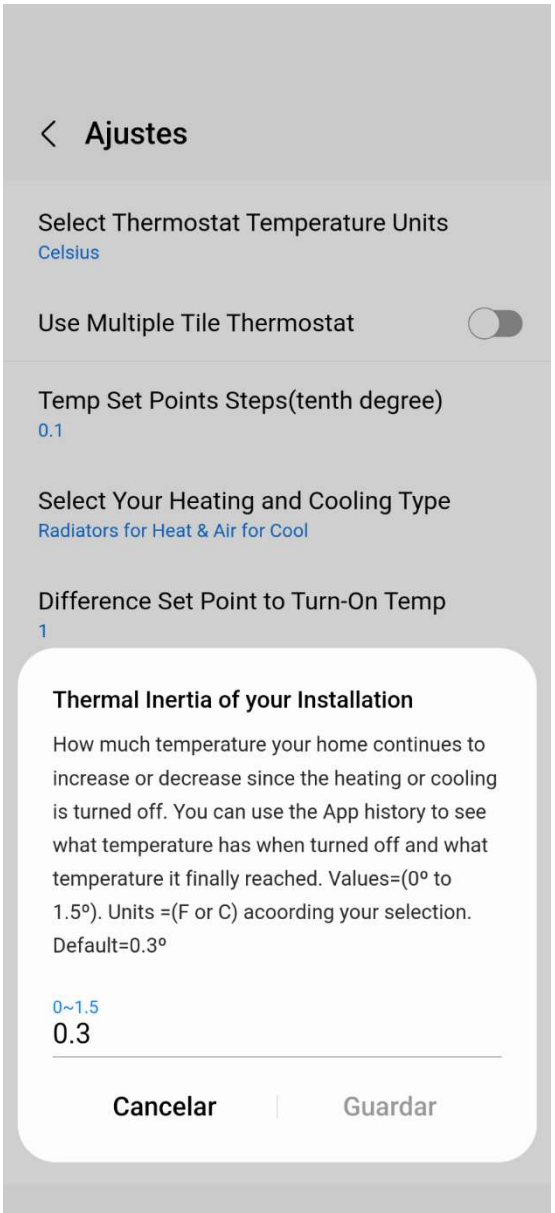
The thermal inertia value is used to calculate the temperature to "stop" the heating or cooling, in order to no exceed or exceed as little as possible the temperature target in the set Point and improve comfort by saving energy.

In Next Picture an Example of calculate with history events the Thermal Inertia **for Heat set Point 19ºC:**

Temperature for Pending Heat state= 18.8ºC
Max. Temperature after Temperature for Pending Heat state= 19.1ºC
Heat Thermal Inertia with Radiator water Temp 55ºC= 0.3ºC
Difference Set Point to Turn-On Temp = 0.6º aprox will be a good value


Sensor Mov-3
Mi hogar - Escalera
14:06 Temperatura 19,0°C
Next Temp after Max Temp
14:03 FanCyclicMode On
14:03 Estado Calor
14:03 Temperatura de calefacción 20,0°C
14:03 Punto de refrigeración 24,0°C
14:03 Modo de termostato Rush hour
Mode set with a Rutine
13:56 Temperatura 19,1°C
Max Temp After Turn OFF
Thermal Inertia = 0.3ºC
13:36 Temperatura 19,0°C
13:26 Temperatura 18,9°C
13:21 FanCyclicMode Off
13:21 Estado Pending heat
13:21 Temperatura 18,8°C
Turn OFF Temp
13:16 Temperatura 18,7°C
13:11 Temperatura 18,6°C
12:56 Temperatura 18,5°C
12:41 Movimiento No hay movimiento
12:40 Temperatura 18,4°C
12:40 Movimiento Movimiento detectado
12:40 FanCyclicMode On
12:40 Estado Calor
Heat Set Point 19ºC
Diff temp 0.5ºC
12:20 Temperatura 18,5°C
Turn ON Temp
Controles
Rutinas
Historial


Ajustes
Select Your Heating and Cooling Type
Radiators for Heat & Air for Cool
Difference Set Point to Turn-On Temp
1
Thermal Inertia of your Installation
0.3

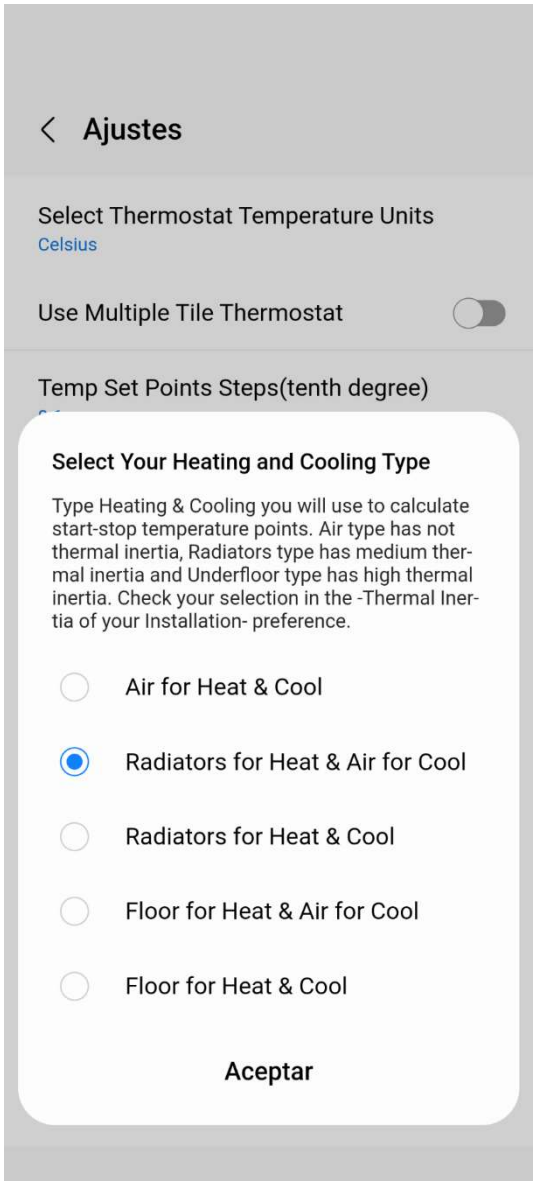

Ajustes
Select Thermostat Temperature Units
Celsius
Use Multiple Tile Thermostat
Temp Set Points Steps(tenth degree)
0.1
Select Your Heating and Cooling Type
Radiators for Heat & Air for Cool
Difference Set Point to Turn-On Temp
1
Thermal Inertia of your Installation
How much temperature your home continues to increase or decrease since the heating or cooling is turned off. You can use the App history to see what temperature has when turned off and what temperature it finally reached. Values=(0º to 1.5º). Units =(F or C) acoording your selection. Default=0.3º
0~1.5
0.3
Cancelar
Guardar

How to Use the Preference: "Select Your Heating and Cooling Type" Setting

This preference is used to tell the thermostat what type of heating and cooling will be used so that it can calculate the heating or cooling on and stop temperature points.

1. **"Air for Heat & Cool"**: Hot air heating and cold air cooling. This system is considered to have zero thermal inertia, regardless of the value entered by the user in the "Thermal Inertia of your Installation" preference.
2. **"Radiators for Heat & Air for Cool"**: Heating by water radiators, electric ceramics and cold air cooling. Thermal inertia is used by subtracting it from the heating set point and zero value of thermal inertia is used for refrigeration.
3. **"Radiators for Heat & Cool"**: Heating and cooling by water radiators. Thermal inertia is used by subtracting it from the heating set point and adding it to the cooling set point.
4. **"Floor for Heat & Air for Cool"**: Underfloor heating of water or electric and cooling by cold air. Thermal inertia is used by subtracting it from the heating set point and zero value of thermal inertia is used for refrigeration
5. **"Floor for Heat & Cool"**: Heating and cooling by underfloor heating of water or electric. Thermal inertia is used by subtracting it from the heating set point and adding it to the cooling set point.

Default value is **"Radiators for Heat & Cool"**



How to Use the Preferences "Difference Set Point to Turn-On Temp" Setting:

This setting is used to calculate the starting and stopping of the heating and cooling and achieve an optimal comfort for each user.

Select the desired Maximum difference between Final Temperature Target (set Points) and Heating or Cooling temperatures to Turn On the system.

For example, if the heating set point is 20ºc and we choose a value **Difference Set Point to Turn-On Temp** = 0.6º, then when the ambient temperature in the thermostat is 19.4ºc, the state of the thermostat will change from Pending Heat to Heating.

In my experience a valid value could be twice the thermal inertia of the heating or cooling system. If the thermal inertia = 0.3ºc, then the value **Difference Set Point to Turn-On Temp** = 0.6ºc approx will be a good value

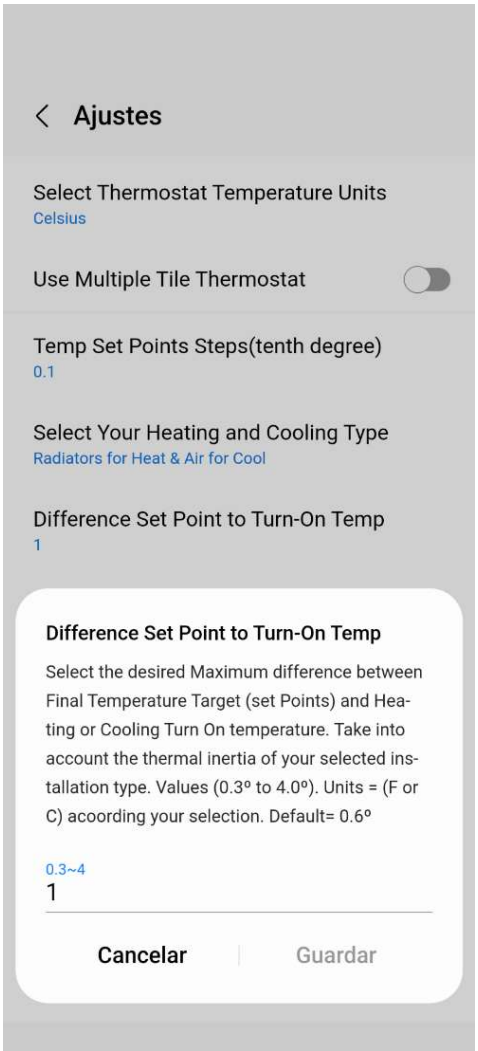
Select a value between 0.3º to 4º. Default value is 0.6º

Values above 1ºc suggest low comfort

For underfloor heating installations, which have a very large thermal inertia and will also take longer to reheat or cool, the starting point is set at 0.15ºc below the stopping point.

For example, if the thermal inertia is 0.5ºc and the heating set point is 20ºc:

- The change point to **Pending Heat** will be: 20ºc - 0.5ºc = 19.5ºc
- The change point to **Heating** will be: 19.5ºc - 0.15ºc = 19.35ºc



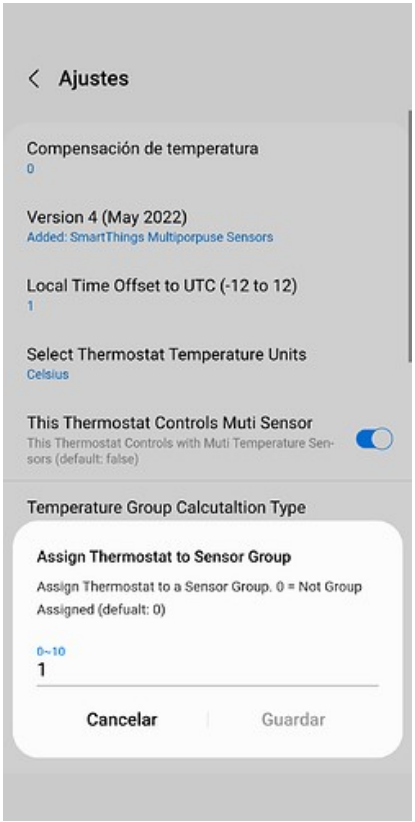
Zigbee Temp Sensor with Thermostat Mc Using Groups

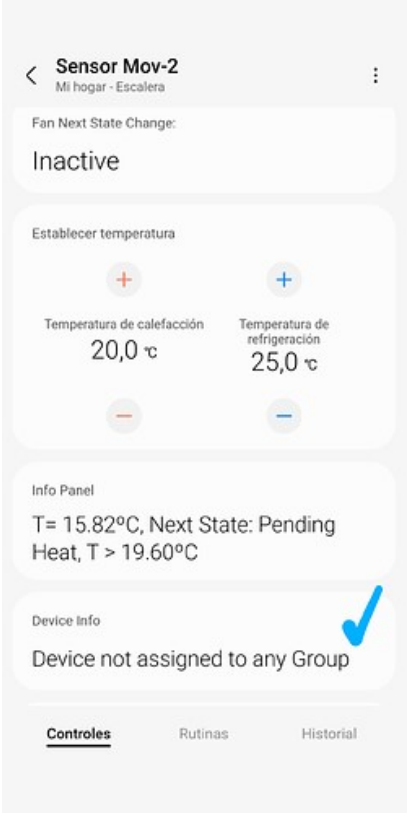
As I have seen that several users are looking for how to control a thermostat with the values of various sensors, this version driver includes:

Added functions for the thermostat to be controlled with temperatures from various sensors that are paired to the same driver:

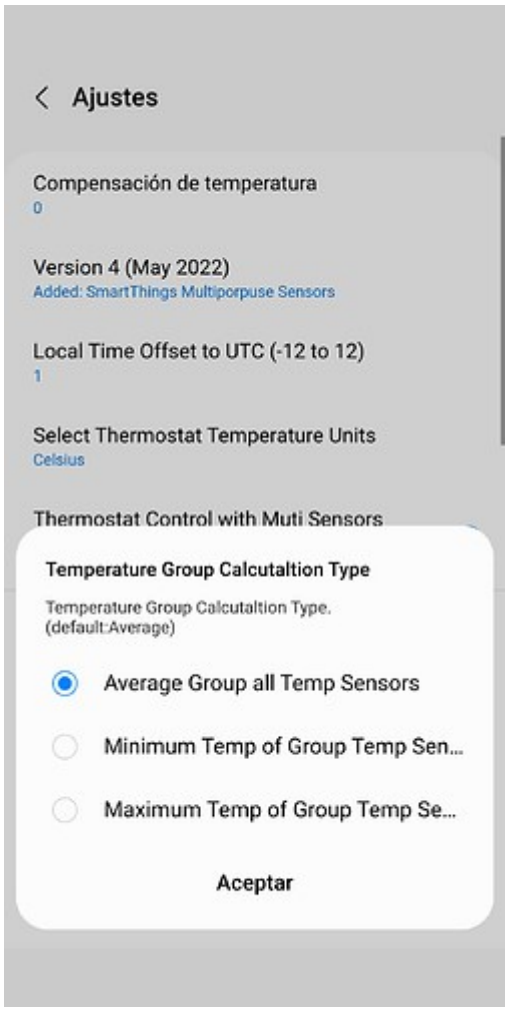
- **Added preference to select This Thermostat Controls Muti Sensor**: value true or false (default False)
    - **IMPORTANT**: It should only be activated on the thermostat that will control the temperature.
    - If more than one device per group is marked as true, the calculations are stopped and the user is informed to solve it.

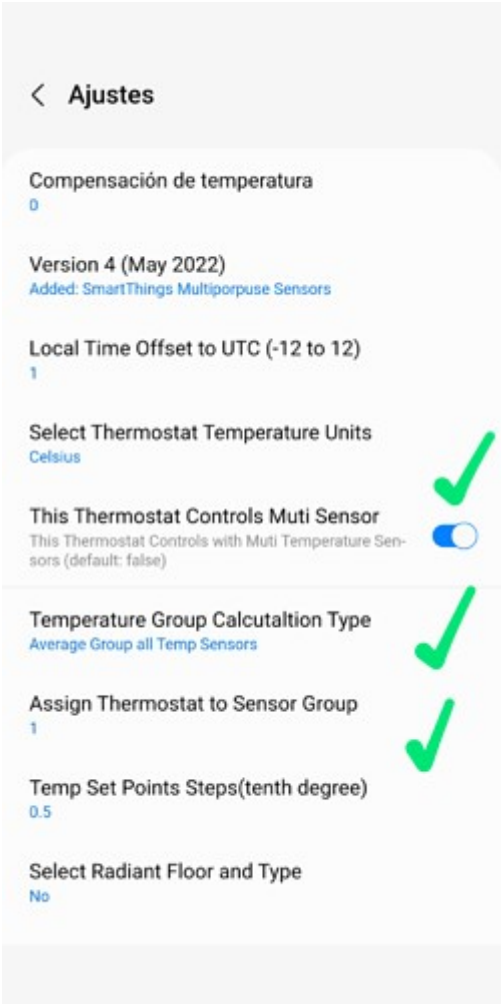
- **Added preference to assign the device to a group of sensors that will control the thermostat.** Values from 0 to 10. (default = 0 No group assigned)
    - If Group Assigned value = 0 then capability device Info will show: "**Device not assigned to any Group**"



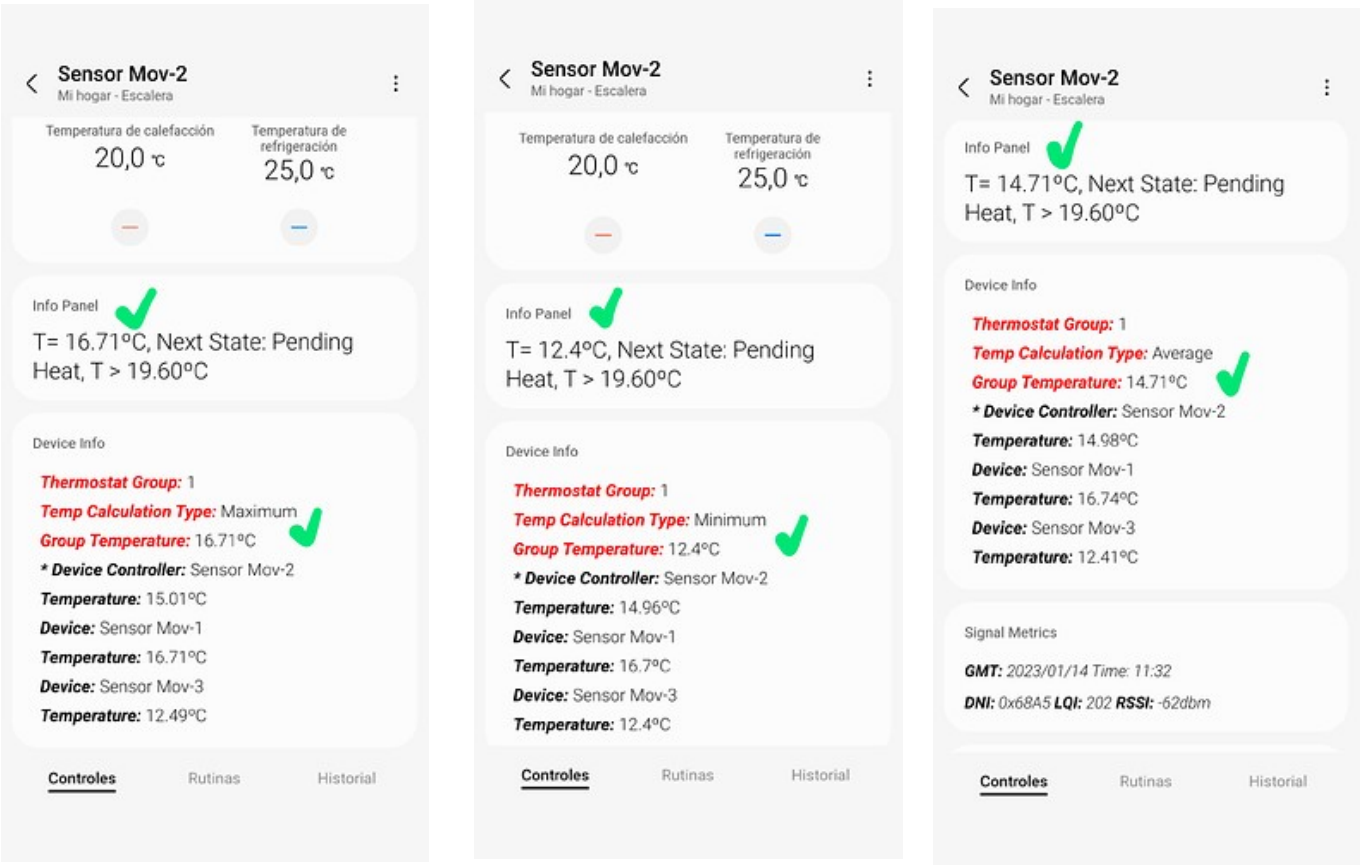


- **Added preference to select the types of calculation that will be done with the temperatures of the group of sensors:**
    - **Average**: the calculation of the average temperature of all the sensors of the group is performed
    - **Maximum**: The maximum temperature of the group sensors is used
    - **Minimum**: The minimum temperature of the group sensors is used
    - The temperature result of the calculation will be used to control only this thermostat of Group and **will be presented in the Info Panel capability with the next expected state change.**





- **Added a custom capability Device Info**: where the information of the Group will be displayed, of the calculated temperature of the group and type of calculation followed by the temperatures of all the devices included in the group. **The device that acts as controller thermostat is marked with * *Device Controller: Name of the device.***
    - The information of this capability is updated when any sensor in the group sends a new temperature value.
    - I have tested it with three Samjin motion sensors (aeotec)



DeviceTemperature capability shows the own sensor temperature

The operation as a group is totally optional and it is enough to not select or in the preference of the assigned group and the use of the thermostat as a group and each device will work independently.

If you don't need to control the Thermostat with sensor groups, then you just have to keep the preference group assignment to value = 0, which is by default

In fact, we can have a thermostat working as a group and the other devices in the group working as independent thermostats or simple temperature sensors.

In order not to increase the number of profiles excessively, I have removed the adjustment option from the set point temperature steps. I have left only the adjustment of steps of 0.5º.
If you want to change less than 0.5º you can manually enter the value with the keyboard