SONY

Building & IoT for TEOS

Installation & User Manual

Document revision 1.2

Overview

This document will explain how to add devices from Building environment using the KNX, DALI or LoRa protocols.

SONY

Requirements

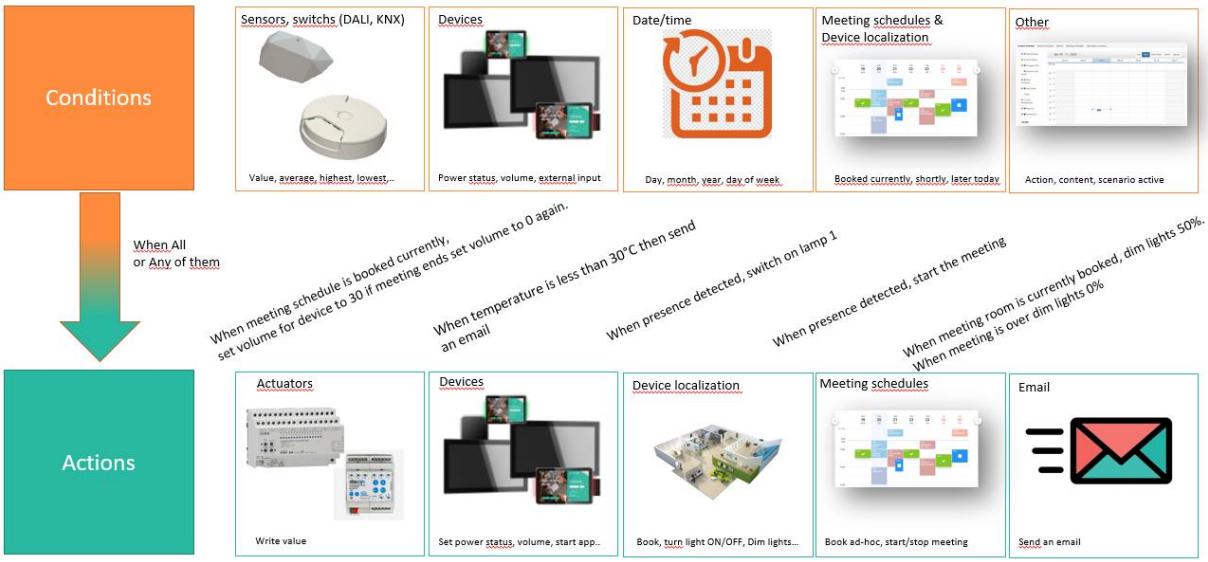
- From Manage for TEOS 2.2 on premise
- **Only LoRaWAN sensors are compatible with CLOUD** platform, KNX and DALI integration are only working on premise
- For KNX: A KNX to IP interface (not supplied)
- For DALI: A DALI to IP interface (not supplied)
- For LoRaWAN: a LoRa gateway (not supplied) and access for Manage for TEOS to internet (for TheThingsNetwork synchronization), the requirement for a gateway for EU region usage a frequency compatibility from 863-870 MHz with 8 channels at least
    - You can find all the LoRaWAN gateways compatible in this URL under thethingsindustries website
    - **Multitech Conduit AP** (https://www.multitech.com/brands/multiconnect-conduit-ap)
    - Seeed Studio The Things Indoor (for demo purpose found in Amazon HERE.
- The Gateway MTCAP-868-001A for the version with power supply and MTCAP2-868-002A-POE for the POE version are proposes by Alcom which are working on deployed installations.
- Access to Manage for TEOS Server as administrator (to install the Sensor listener
- TEM-SL20.xY package of 20 devices licenses to be added into TEOS, you can have for 100 and 1000 users

Table of Contents

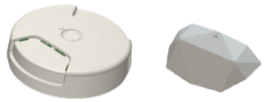
1. Building & IoT devices compatibility & Workflows with TEOS

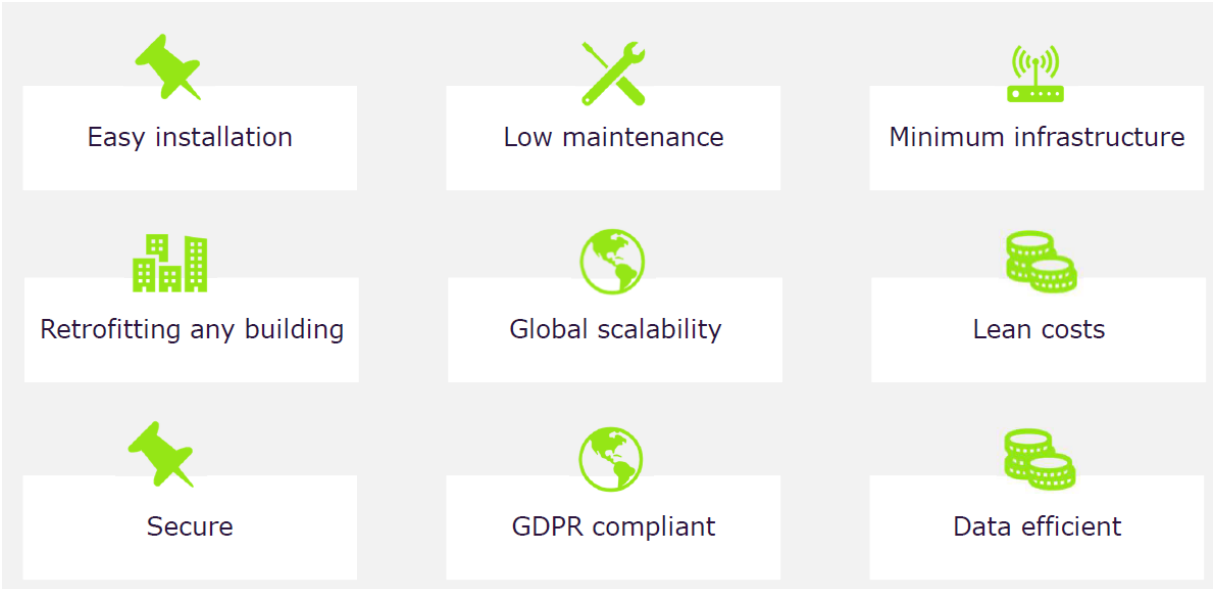
1.1. Usage

From TEOS 2.2, new building & IoT devices are added into TEOS in order to take benefit of the existing building dedicated devices from your building and use them into TEOS to take their benefit and use it into TEOS for AV or Building control.
Using the Building & IoT and the automation scenario in TEOS you will be able to use for example the KNX sensor (if you have) used for the Light where data is retrieved into TEOS to start the meeting and the display. A lot of workflows can be achieved using it.



Get also the flexibility of TEOS Sensors into your existing building to be able to use sensors without having to use cables for them and get a very low consumption technology to keep them for a long time.





1.2 Hardware details for Building & IoT

TEOS Version 2.2 offer an integration with building management. The 3 new building interfaces/gateway integrated into TEOS are:

	KNX	DALI	LoRaWAN
Integration with TEOS	Using KNX to IP interface (not supplied), connection to Address groups	Using DALI to IP interface (not supplied), connection to group, devices and scenes	Using LoRa Gateway and ThethingsNetwork (EU, ASIA, BRAZIL, US-WEST), (not supplied)
End devices compatible	Switchs (including sensors) and actuators	Device (relay, light.), Group, Scene	Sensors for TEOS and other sensors
integrated Data type (DTP) in TEOS	1 (0,1), 5 (0...255), 6 (-128...127), 7, 8, 9, 12, 13, 14, 29	Light (ON/OFF), Lights (Dim level)	Temperature, Humidity, CO2, Presence
Communication with TEOS	3671 TCP/UDP – Com 80/443 TCP – Web service	23 TCP - Communication 80/443 TCP – Web service	1883 TCP – MQTT Connection 80/443 TCP – Web service

During development, the different protocols has been tested with the following devices (examples for test purpose):

- KNX: Enertex® KNXnet/IP Interface (IP interface for TEOS)
  - MeanWell, KNX-20E-640 (Power supply 19,2W for KNX Bus)
  - Jung 4072.01LED (interrupter KNX)
  - Esylux KNX pd 360/8 KNX Basic 360

- DALI: Foxtron Dalinet
  - Foxtron DALIpwr
  - Froxtron DALIdim
  - Foxtron DALIrel4

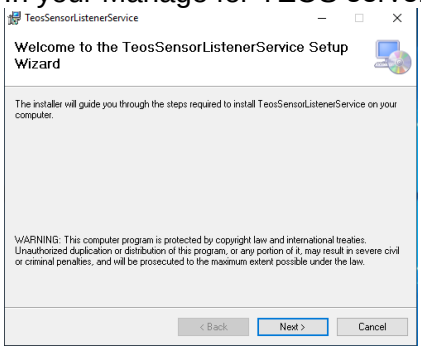
- LoRa:
  - LoRa Gateway: Multitech Conduit AP
  - LoRa Server: TheThingsNetwork console
  - Sensors: DESKSENSE, OFFICESENSE2PRES, OFFICESENSE2COMF (Can be supplied by Sony)

2. Installing and enabling TEOS Sensor service (for on-premise)

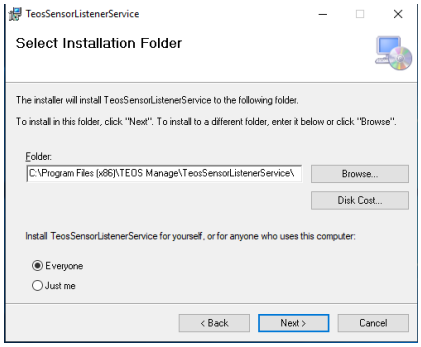
This section explains how to enable into TEOS the possibility to use KNX, DALI and LoRa devices.

2.1 Install Sensor Listener for Service TEOS into your TEOS Server

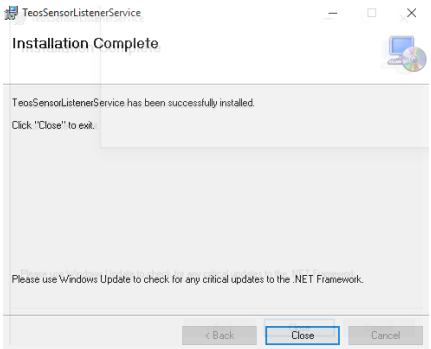
First, you need to go to your Manage for TEOS Server as an administrator. Download the file Sensor Listener for TEOS Server Setup_1.3.msi (you can download it HERE). Or you can find it under https://bit.ly/sonypsetech under 5.1 building and iOT for TEOS.
In your Manage for TEOS server, run the software and press “next”



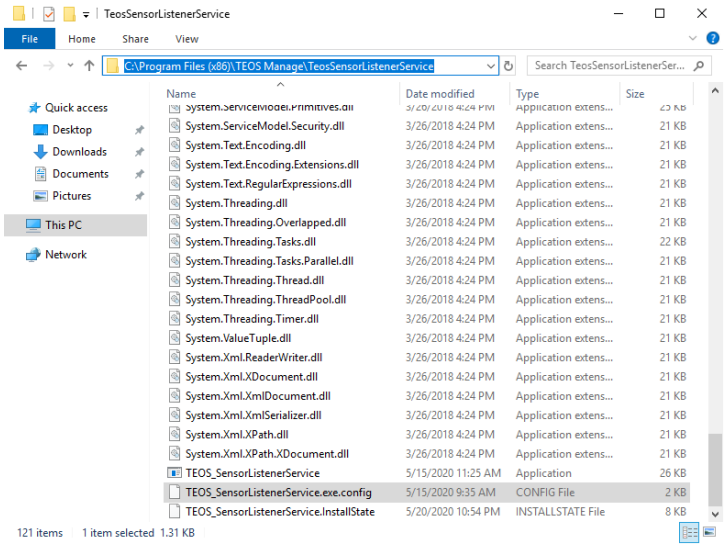
Choose the path for the installation, by default C:\Program Files(x86)\Manage for TEOS\SensorListenerServerforTeos



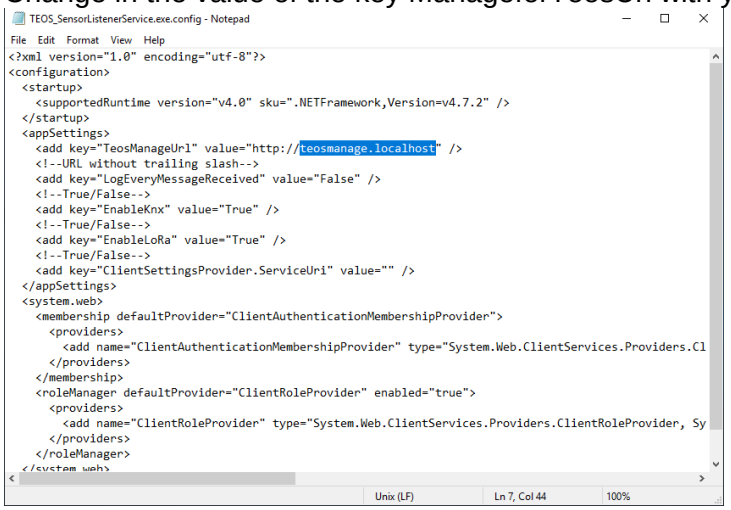
Click “next” and finish after the installation is done.



Go to C:\Program Files(x86)\Manage for TEOS\SensorListenerServerforTeos and open the file TEOS_SensorListenerService.exe.config with a notepad

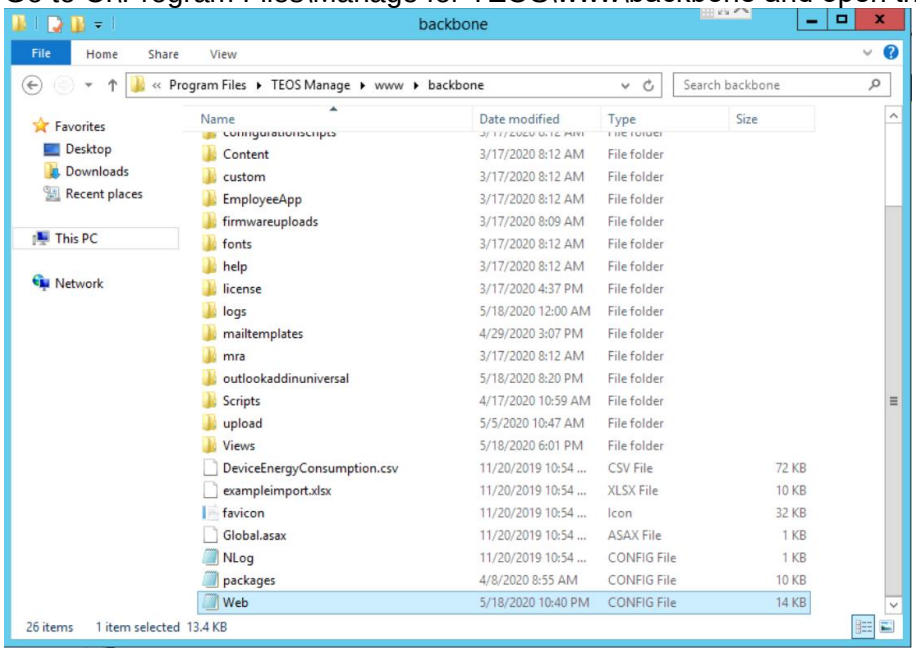


Change in the value of the key ManageforTeosUrl with your own server name

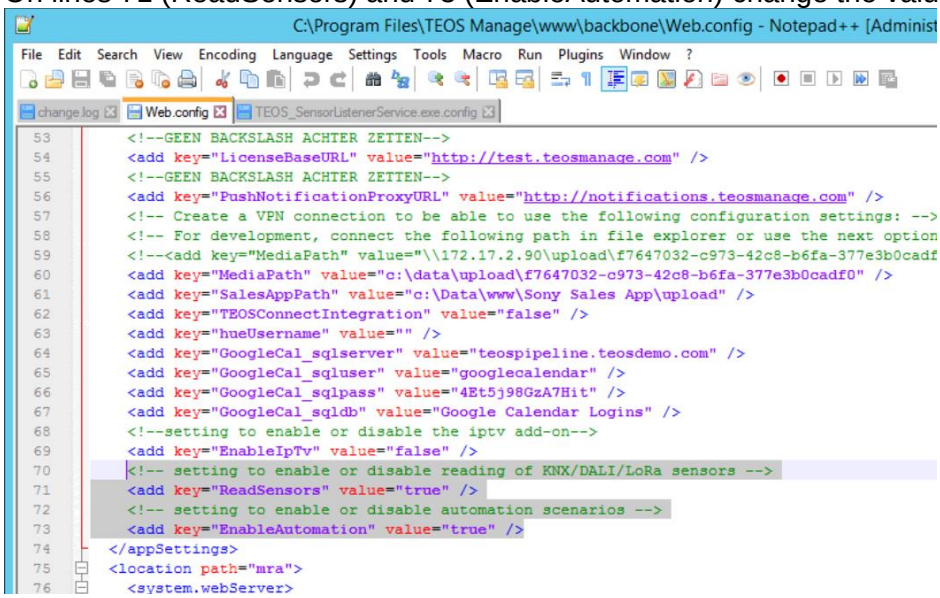


2.2 Enable Sensor Reader under TEOS Backbone web.config

Go to C:\Program Files\Manage for TEOS\www\backbone and open the file “web.config”.



On lines 71 (ReadSensors) and 73 (EnableAutomation) change the value from false to true.



TEOS is now ready to receive and send data using the different building protocols

Go to Services under your server and start the TEOS Sensor listener service. Make sure the service is also setup in automatic to restart automatically if the server reboots.

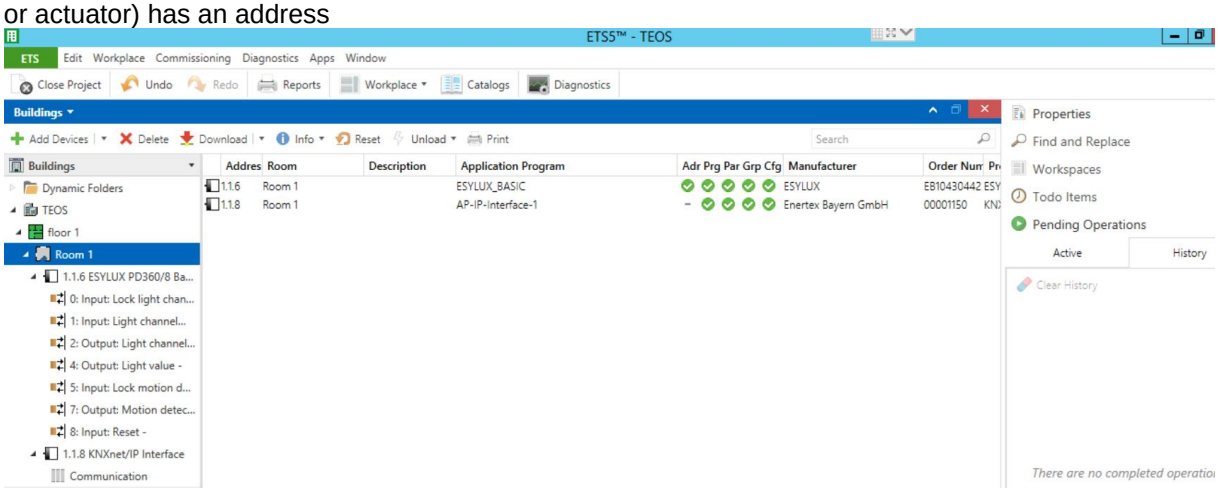
3. Enabling TEOS Sensor service (for CLOUD)

For the Cloud version (SaaS) of TEOS Manage the sensor service is managed by the support team, please contact them with the follow email address support@teos.support and ask to enable the sensor service on your TEOS tenant for it to work under your account.

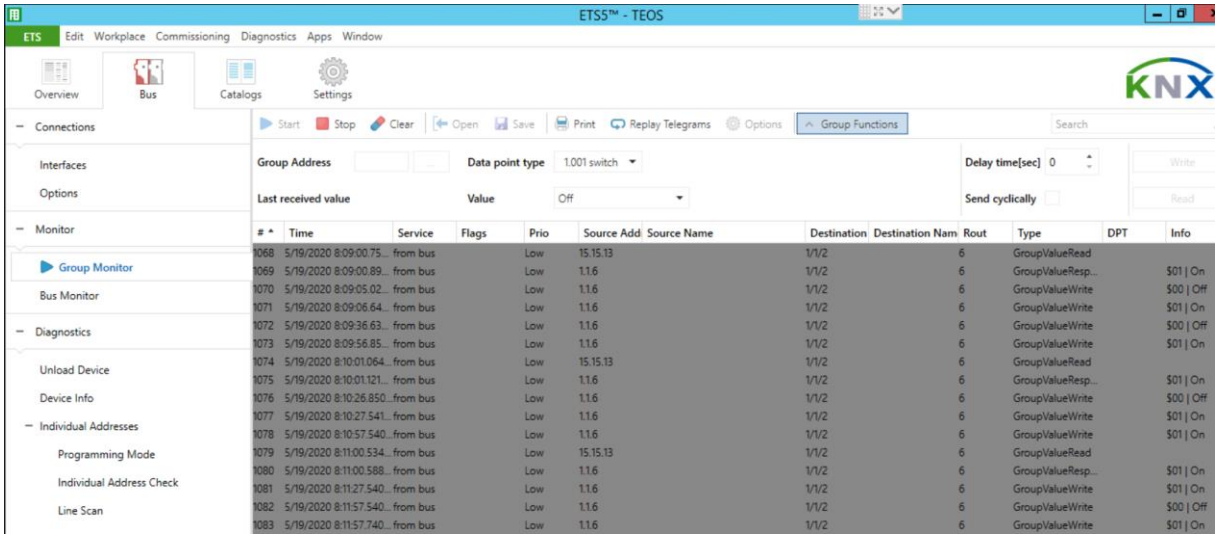
4. Configuring the controllers for the integration of TEOS

4.1. Configure a KNX controller and end device

Using the example of the Enertex gateway the most important is that your device can be accessible on TEOS on an IP level, the port used for the communication with the interface is 80 and 443. TEOS will need to access to the end devices using his address, please make sure the device (such as a sensor or actuator) has an address

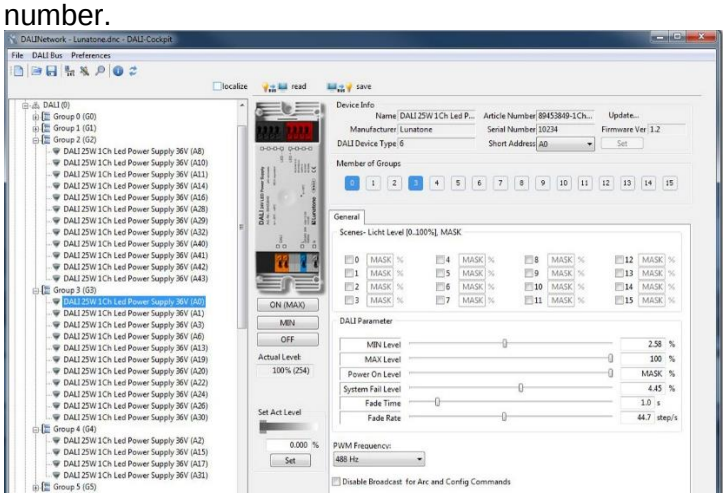


You can monitor under ETS5 software the devices under the KNX bus to see if the data is sent.



4.2. Add a DALI controller and end device*

Using the example of the Foxtron gateway the most important is that your device can be accessible on TEOS on an IP level, the port used for the communication with the interface is 80 and 443. TEOS will need to access to the end devices using a group/device or scene number.



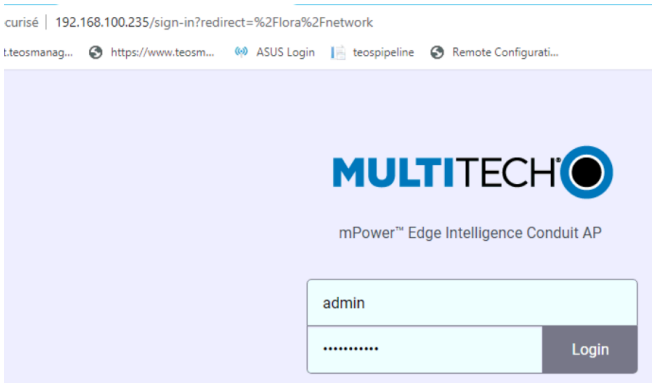
4.3. Add a LoRaWAN controller and end device

For LoRaWAN TEOS Sensors integration and taking the example of the Multitech gateway and TheThingsNetwork integration, please make sure, TTN platform can receive the data from the devices, which means that you have a gateway and an application created.

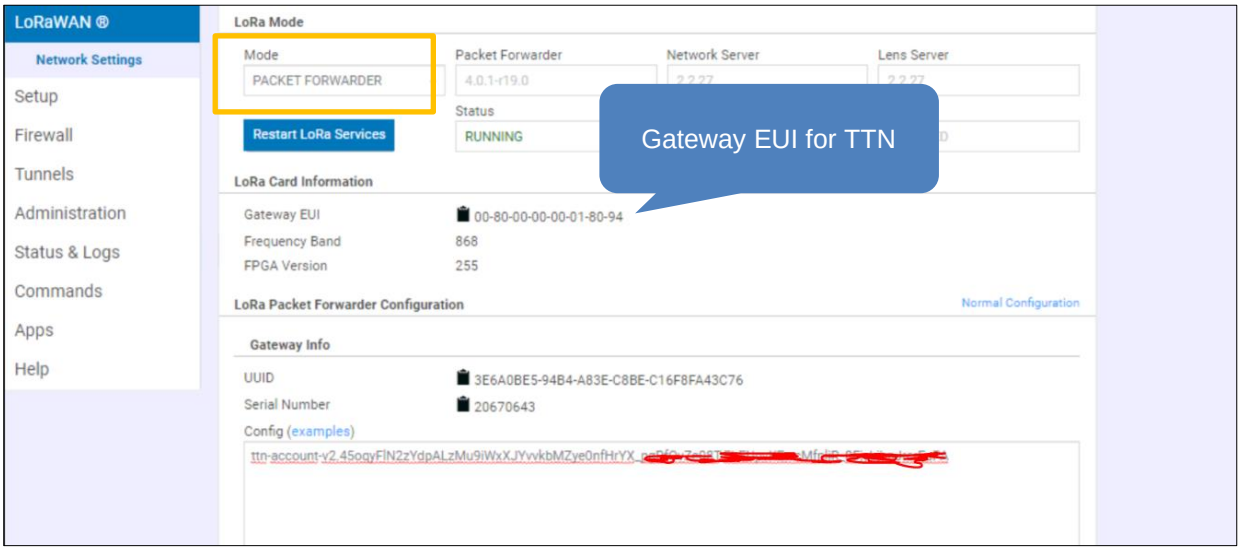
Be aware that from December 2021, the V2 Console will be shut down and thethingsnetwork will be only V3. We recommend you to use directly the V3 platform or to use our Sony thethingsindustry platform (please contact us for that part)

3.3.1 Configuration of the LoRa Gateway

Using the Multitech Conduit AP, connect the device to a network where you can access on and the gateway get an internet access. Open the web browser of the gateway (please follow the steps defined by the vendor for the first usage of the gateway) and login.



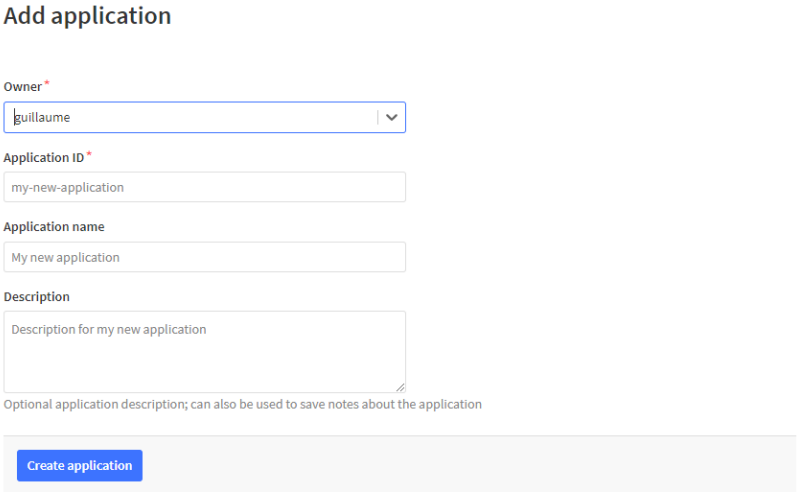
Go to LoRaWAN page and select Network Settings. For the gateway setup the gateway in packet forwarded. By default, the gateway will forward the packet to the public thethingsNetwork.



Save your configuration and restart LoRa Services, the gateway should show the status “RUNNING”

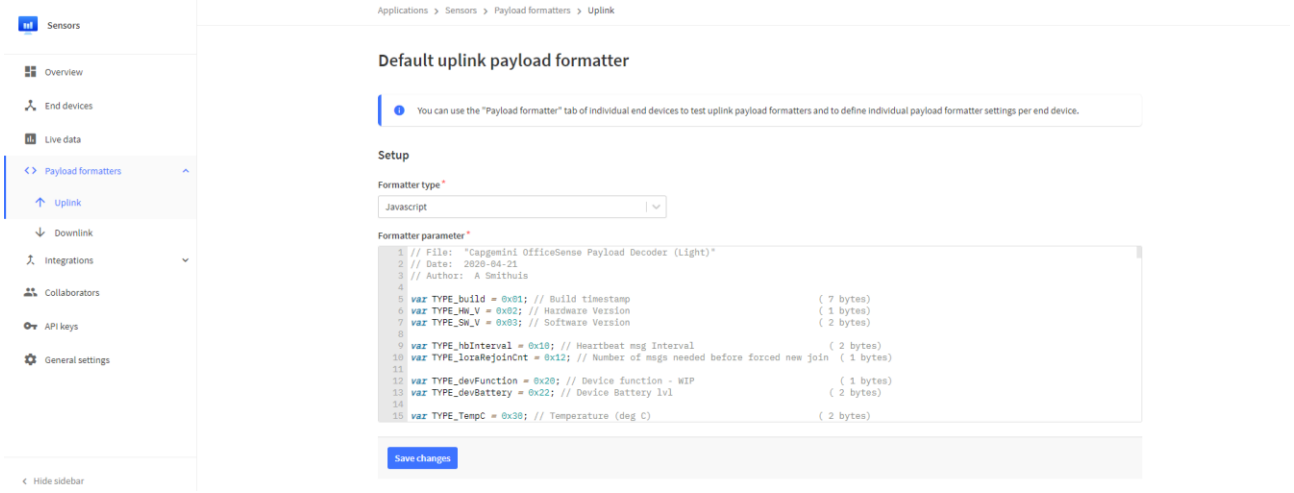
3.3.2 Configuration in TheThingsNetwork

Go back now in TTN console https://console.thethingsnetwork.org and click on Applications>add application. Define here your Application ID, you can add a description and the region of usage and click save. The Application ID generated here will be used in TEOS for the authentication of TEOS with this application.

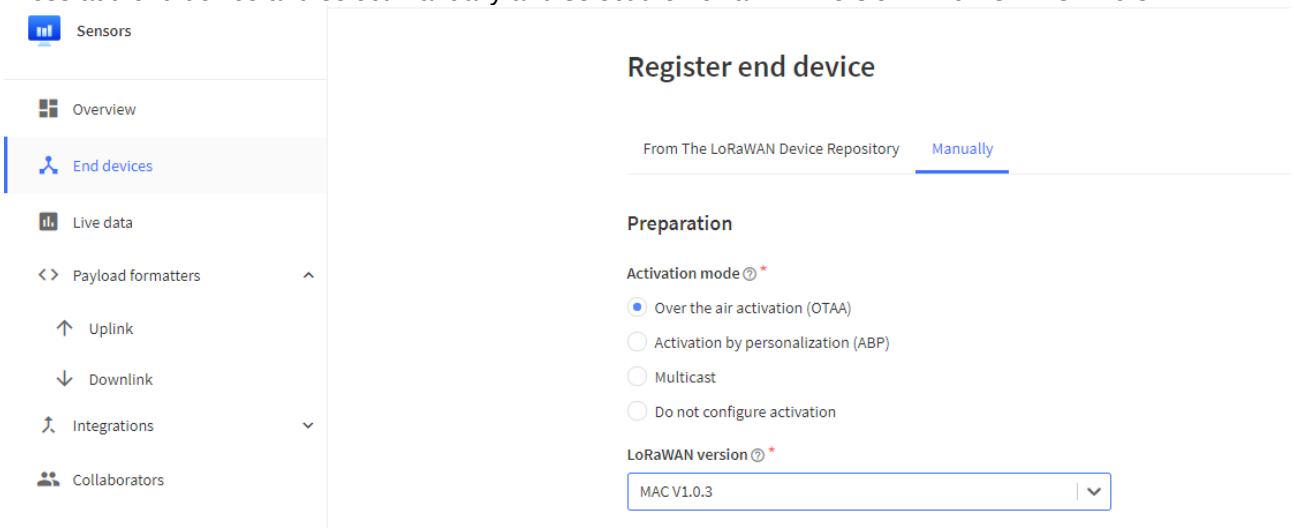


Enter in your application to add the payload data for TTN to decode the data sent by the sensors, add

the type of data you are expecting and the device in this page. Go to payload formatters and uplink. Select javascript and add the following script in the platform. Script can be found under https://bit.ly/sonypse/tech under Building and ioT for TEOS



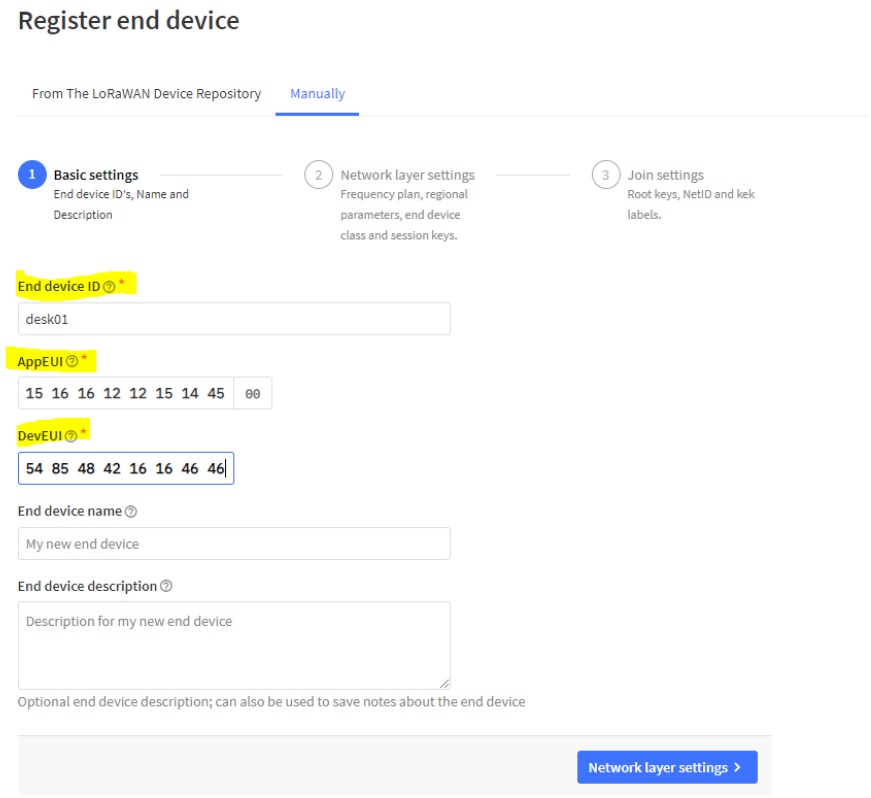
Add your TEOS Sensors into TTN platform.
For that go into Applications > Devices and add a device, add a device ID, the device EUI (for TEOS sensors) is directly into the device and can be sent separately with the app key which is another security key.
Press add end device and select manually and select the LoRaWAN version which is MACV1.0.3



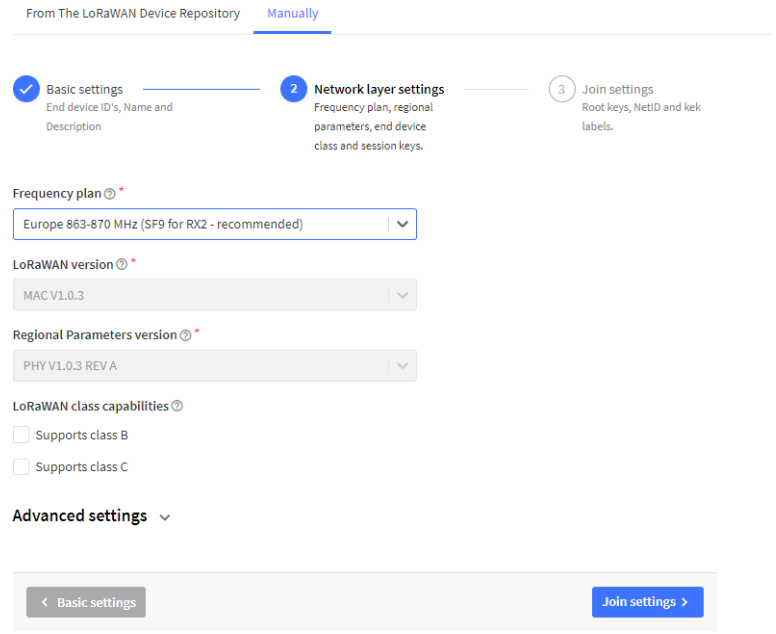
Press start and in the next page insert the end device ID (the one you want), and add the appEUI (you receive in the list from us) and device EUI (which is shown directly in the device hardware sticker. Press after network layer settings to go to the next step.

For TEOS sensors, the application EUIS are:

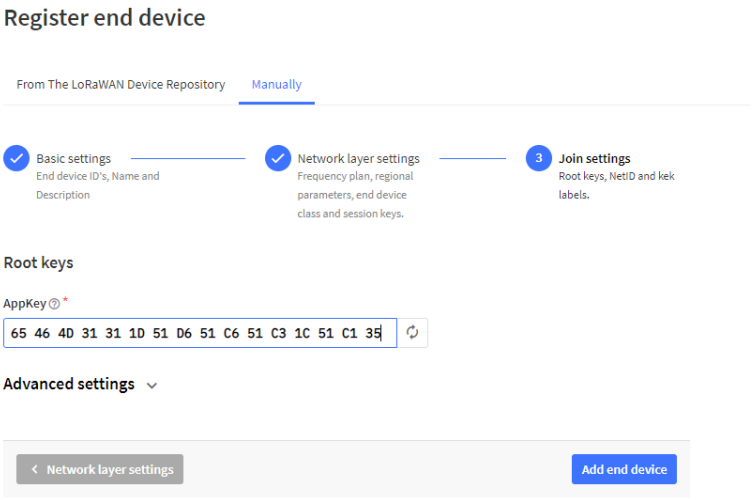
- DESKSENSE (desk): 70B3D5FFFE0B5505
- OFFICESENSE2PRES (Presence sensor): 70B3D5FFFE0B5501
- OFFICESENSE2COMF (comfort sensor): 70B3D5FFFE0B5502



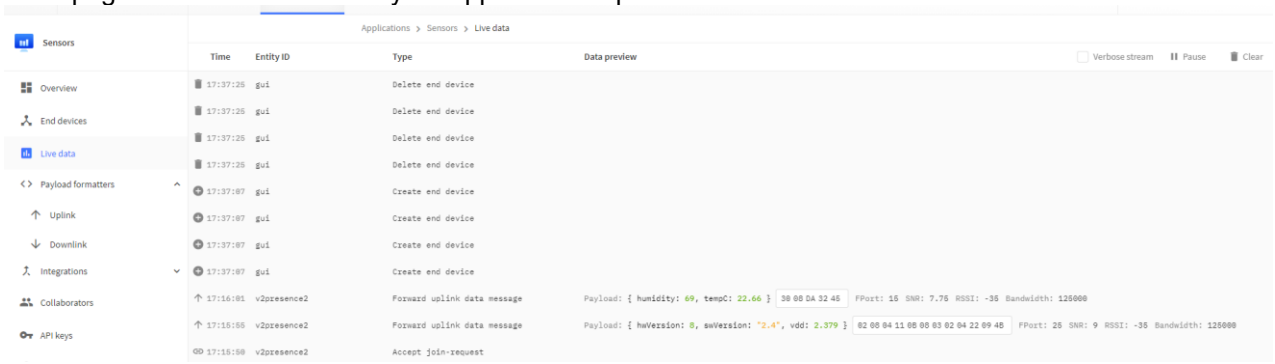
Select now Europe 863-870 MHz (SF9 for RX2 – recommend) frequency for Europe and press join settings



Last step is to add the AppKey that you receive in the list of device when purchasing. Press Add end device to finish the process.



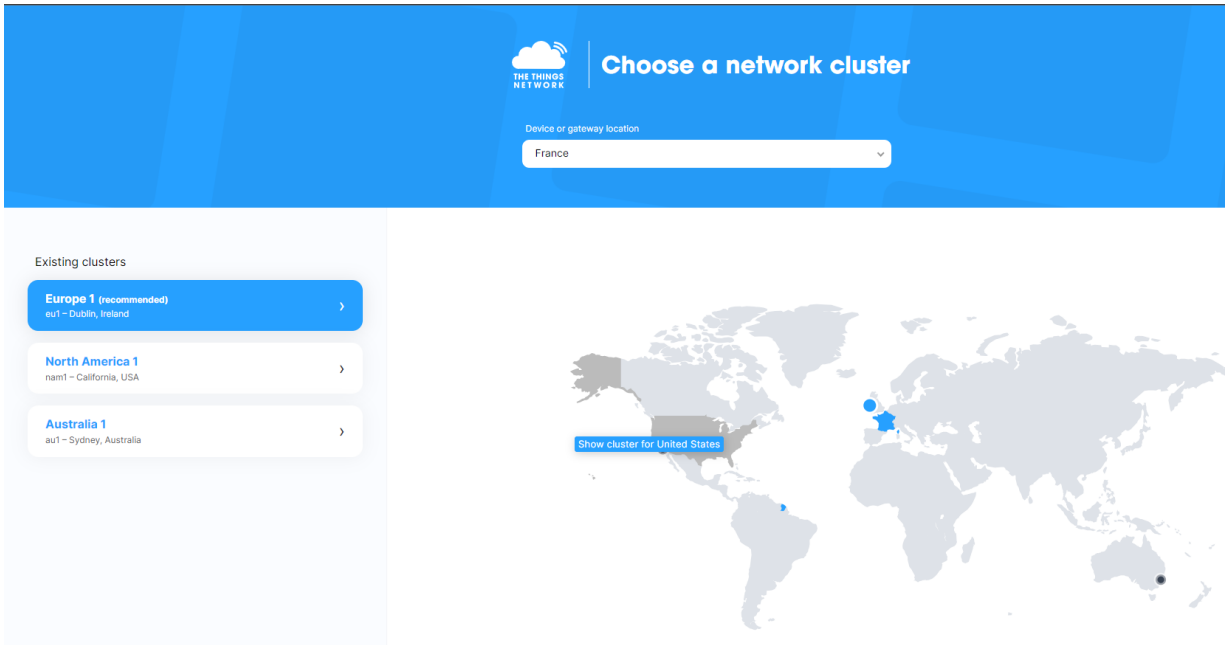
The configuration is now done, you can check the data received and converted by TTN under the “Live data” page for all the devices on your application or per device.



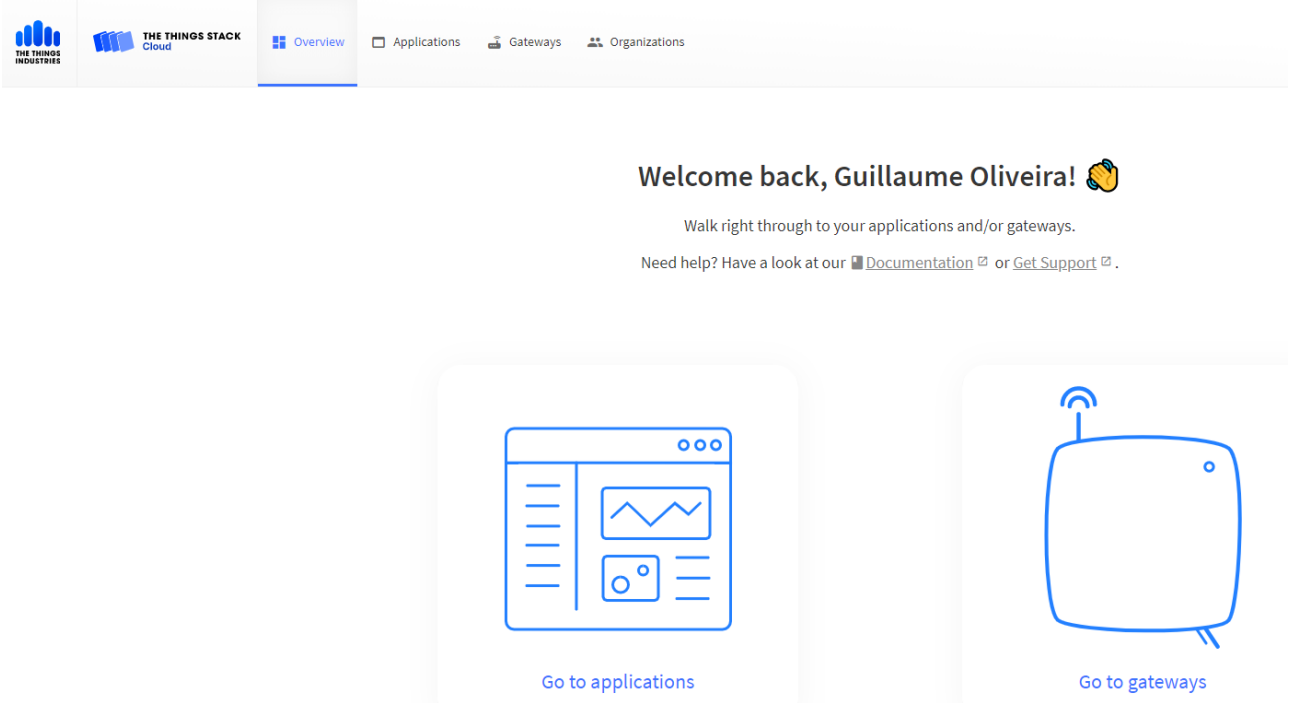
3.3.1 Gateway Creation in TheThingsNetwork (optional)

For you to see if you gateway can connect to ThethingsNetwork and get information from it. This could help for troubleshooting if your device is not connected then you know why you can’t get data

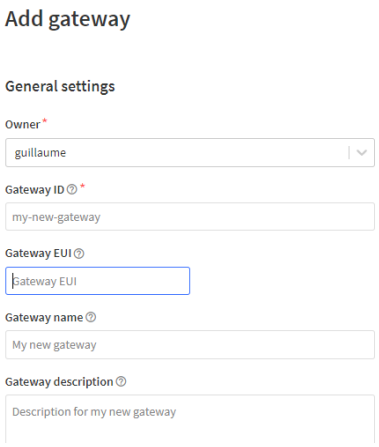
Go to https://console.thethingsnetwork.org and create an account, when you have access to the console, select gateways to create the link between the gateway and TTN. Select the Europe EU1 cluster in Dublin.



After clicking login into your TTN account



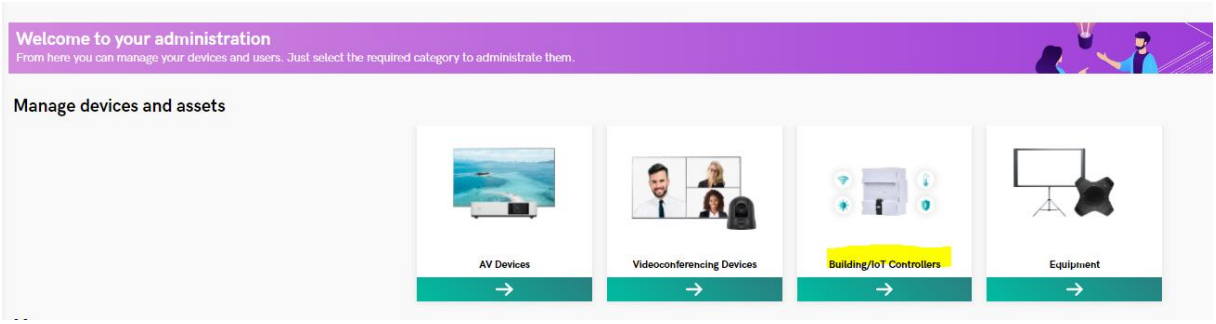
Insert a gateway ID with the gateway EUI (shown below), define the Frequency Plan (868MHz) if you are in Europe and select the TTN server to be used (in our case ttn-router-eu). Press save



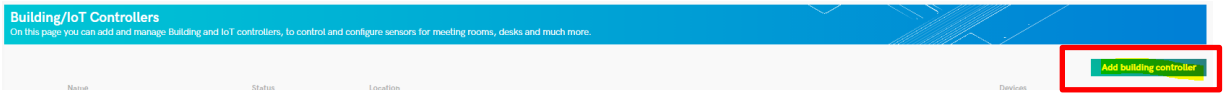
When you save the page, you will have a gateway key that you can copy to be used later in the gateway to synchronize the gateway with TTN.

5. Adding a Building/IoT controller to TEOS

After following the other section, you can now integrate your devices into TEOS
Go to your TEOS web interface and in Administration, select “Building/IoT Controllers.

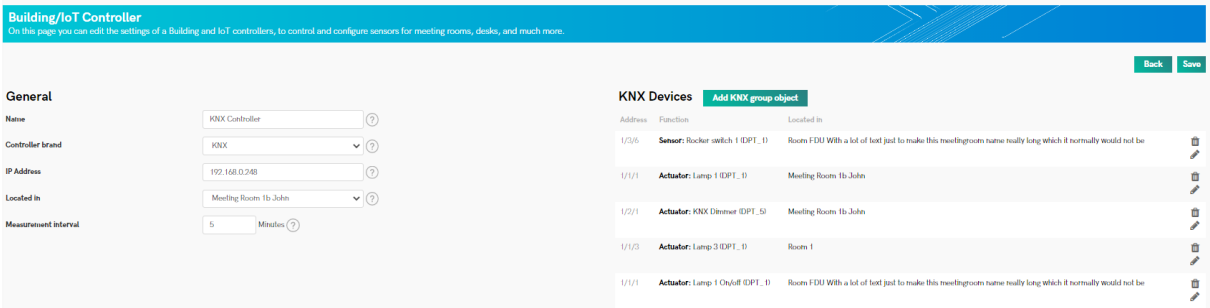


From this menu you can add a KNX, DALI or LoRa controller. Click “add building controller

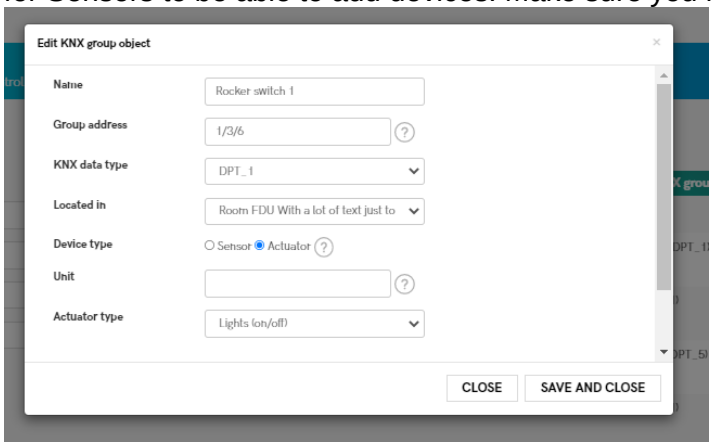


5.1. Add a KNX controller and end device

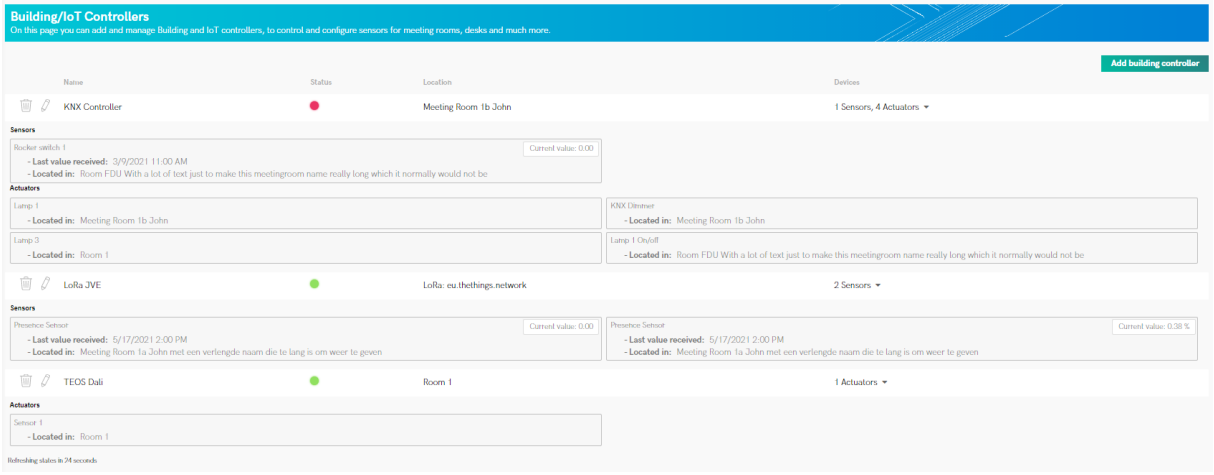
When you select KNX controller in the controller brand, insert a name and the IP address of the KNX to IP interface. You can put a location for the gateway (a site, floor etc) and the measurement interval. In fact, TEOS is requesting using this interval to the IP interface the data of the BUS. Click save and come back to the controller you just created.



To add KNX devices, Click now on “Add KNX GROUP OBJECT”, add a name the group address of your KNX device, the data type (you can find here information about data type) the location of your device, if it is a sensor device or an actuator and the unit TEOS should use and the type of actuator you have to dim lights or turn on/off lights. You need to have licenses for Sensors to be able to add devices. Make sure you have them.

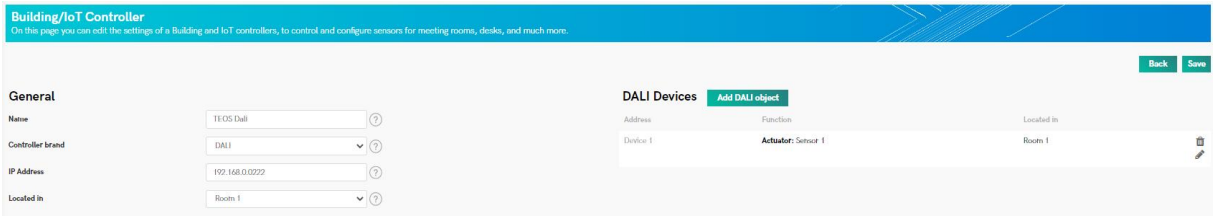


Add all your devices and save. When saving you go back into the controllers list. Wait the measurement interval, every 30s you can see an update directly on TEOS interface with the status of each device and the value.

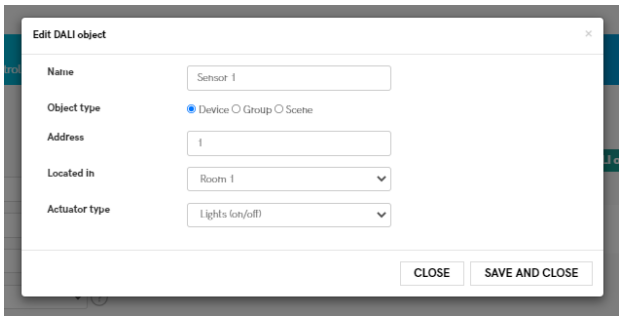


5.2. Add a DALI controller and end device

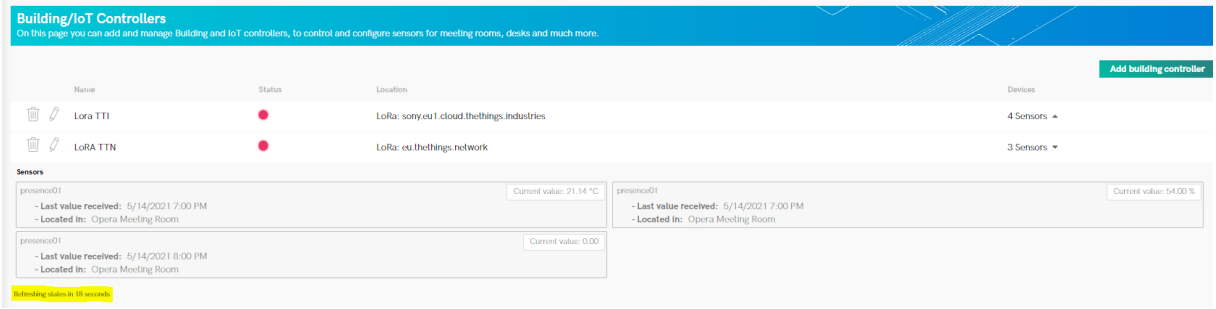
The procedure is similar to KNX procedure. When you select DALI controller in the controller brand, insert a name and the IP address of the DALI to IP interface. You can put a location for the gateway (a site, floor etc). Click save and come back to the controller you just created.



To add DALI devices, click now on “Add DALI OBJECT”, add a name your DALI device, the object type the address of your device, the location of your device, and the type of actuator you have to dim lights or turn on/off lights. You need to have licenses for Sensors to be able to add devices. Make sure you have them.



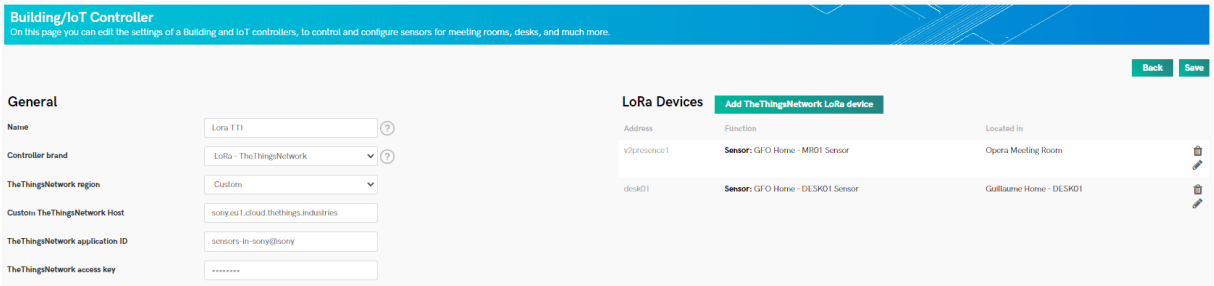
Add all your devices and save. When saving you go back into the controllers list. Wait the measurement interval, every 30s you can see an update directly on TEOS interface with the status of each device and the value.



5.3. Add a LoRaWAN controller and end device

When you select LoRa controller in the controller brand, insert a name of the controller. Select the TheThingsNetwork region you want to use (in our example select

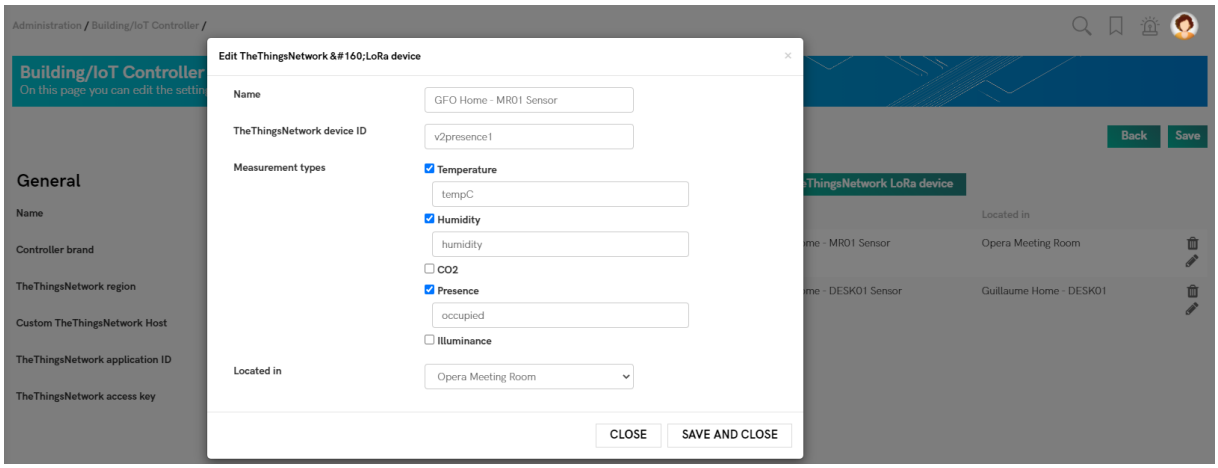
eu.thethings.network). Put after the application ID you have configured in the section upper and the TheThingsNetwork access key generated.



To add a sensor into LoRa you need to know what type of information
Using TEOS Sensors Manage for TEOS can get the following data from each sensor:

- Desk:
  - Occupied
  - Battery level (when starting and each 12hr, in TTN)
- Presence sensor:
  - occupied
  - Humidity
  - TempC (temperature in Celsius)
  - TempF (temperature in Fahrenheit)
  - Battery level (when starting and each 12hr, in TTN)
- Comfort sensor (old version, new version will get the luminance):
  - Co2CalCounter
  - Co2
  - humidity
  - tempC
  - Battery level (when starting and each 12hr in TTN)

Insert the name for the sensor in TEOS, add the name of device created in TTN in device ID. In measurement type, add the values you want to be retrieved from the sensor into TEOS. You can define the location of the sensor, for example in a meeting room to be able to show the data into the site overview.



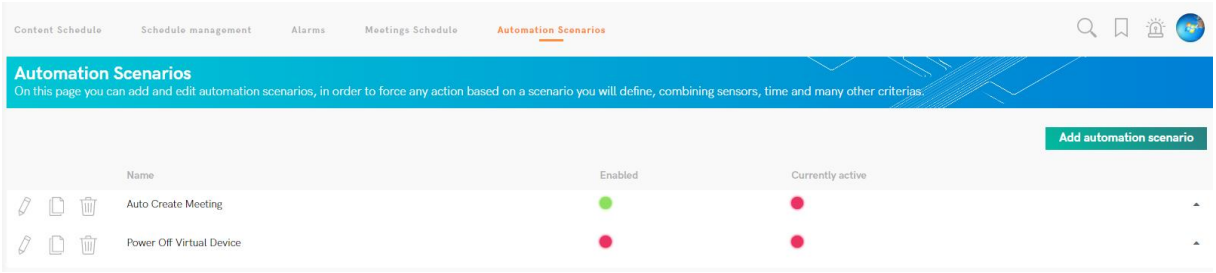
Important to know
About npositive and nsample (that can be seen into TTN) Sensor incorporate a false/positive routine. nSample is the number of samples taken during this routine (which by default should be 6) and nPositive are the amount of those samples where motion was detected. You will see that when over half of those samples are positive(so at least 3) the device will report presence.When the device releases the room (occupancy = 0) these values will be set to 0, which is what the message in your picture represents. Look when the device reports presence (occupied = 1), these fields will have a value.

About presence detection workflow on both desk and presence sensor:
The presence and desk sensors incorporate basically the same routine (with slightly different time

offsets). They do not report the presence information at a fixed interval but rather on a state change of the room/desk (part of what makes sensors more intelligent and prolong the battery life).
The first message indicating the room/desk is occupied will be sent within a few seconds (up to 30 seconds for the desk) after a person takes place behind the desk or inside the room.
The sensor uses this time to go through a false/positive routine to verify someone is indeed there and it was not just someone walking by, grabbing a chair, etc.
At set intervals, the sensor will again verify if someone is still present by going through the same false/positive routine. Whenever no one is there, the sensor will (after a set time) send a second message indicating no one is there anymore.
So, because of this routine the time between the 2 messages (occupied, not occupied) can vary depending on the presence of a person and is not a fixed time.
As for the maximum time to release a room or desk again: the presence sensor will take up to 5 minutes after the person leaves the room to release it again. For the desk this is somewhat longer (up to 30 minutes) to be able to grab a coffee without releasing your desk in the meantime.
All the data (like temperature etc.) is shown at the same time of the presence detection.
When the integration of the sensors you can see all the data refresh into TEOS.

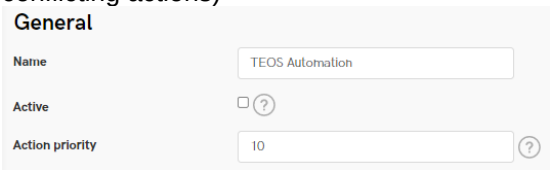
6. Creating Automation scenarios with a Building/IoT devices

You can find automation scenario feature under > Schedules and Alarm > Automation Scenario



Click “Add automation scenario” to create a scenario. In the following screen enter the following details:

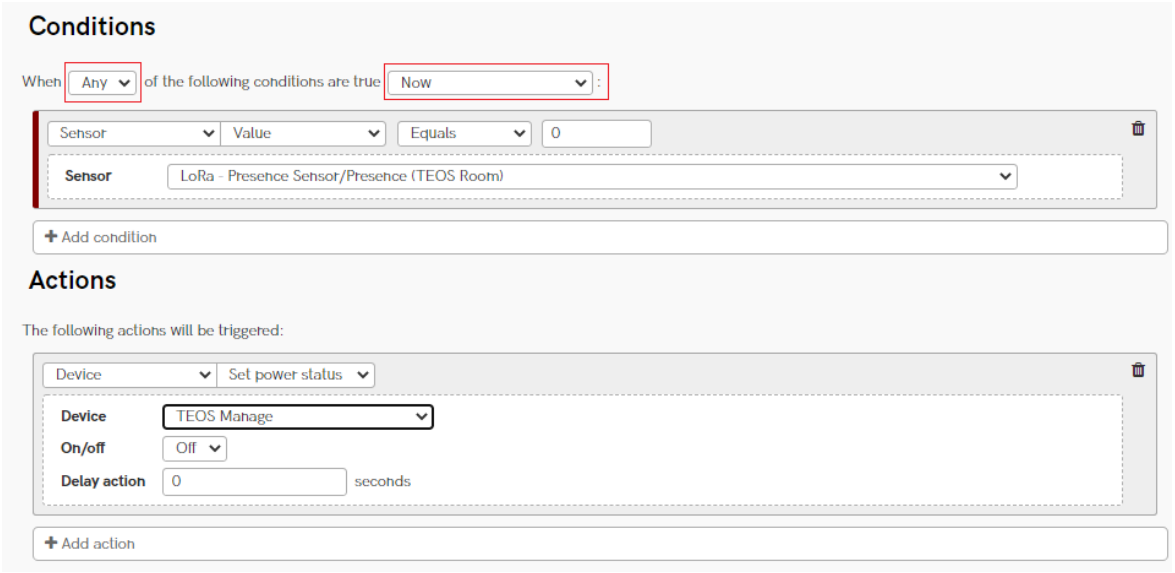
General
Add a name
Activate your automation rule
Define the level of priority
(This will be used to determine which schedule has the highest priority in case schedules have conflicting actions)



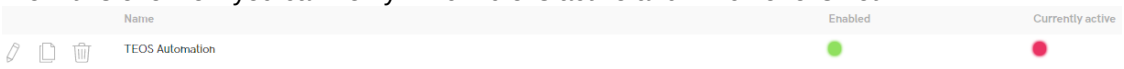
Conditions
This is the part where you can setup your automation rule, in this example we want to have a device turned off in case the value of a sensor equals a specific value.

Please note that it is possible to add multiple conditions, the rule can become active in case it matches all conditions or one of them.
For example when you want to turn a TV off in case there is no presence in a room or when the lights go out.

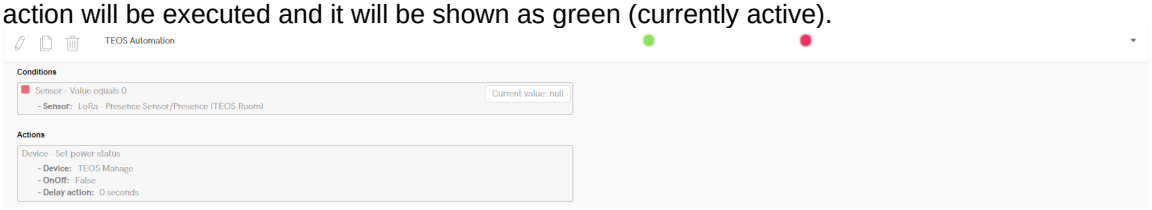
You can also configure that a condition should match a specific value for 5 minutes before the automation rule becomes active. For example in case the lights have been turned off for 5 minutes.



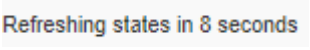
Once you have saved the automation rule you will be returned to the automation rule overview. From this overview you can verify which rule is active and which one is not.



When selecting the arrow on the right side of your rule an overview will be shown, this overview contains the current values for your automation rule. In case the value matches your configuration, the action will be executed and it will be shown as green (currently active).



This overview will be refreshed every 30 seconds, a timer can be found on the bottom right corner.

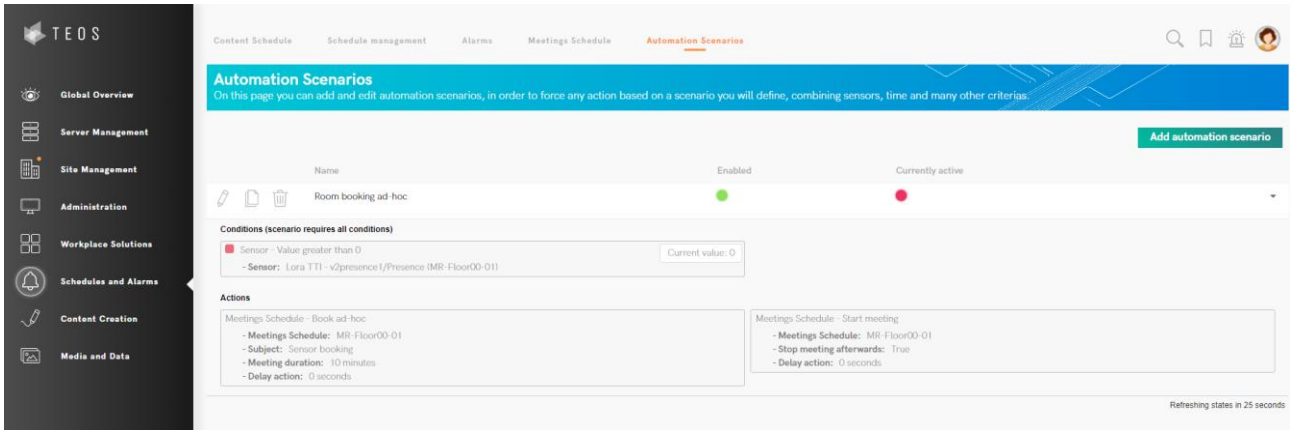


6.1. Room/desk booking, check-in and check-out

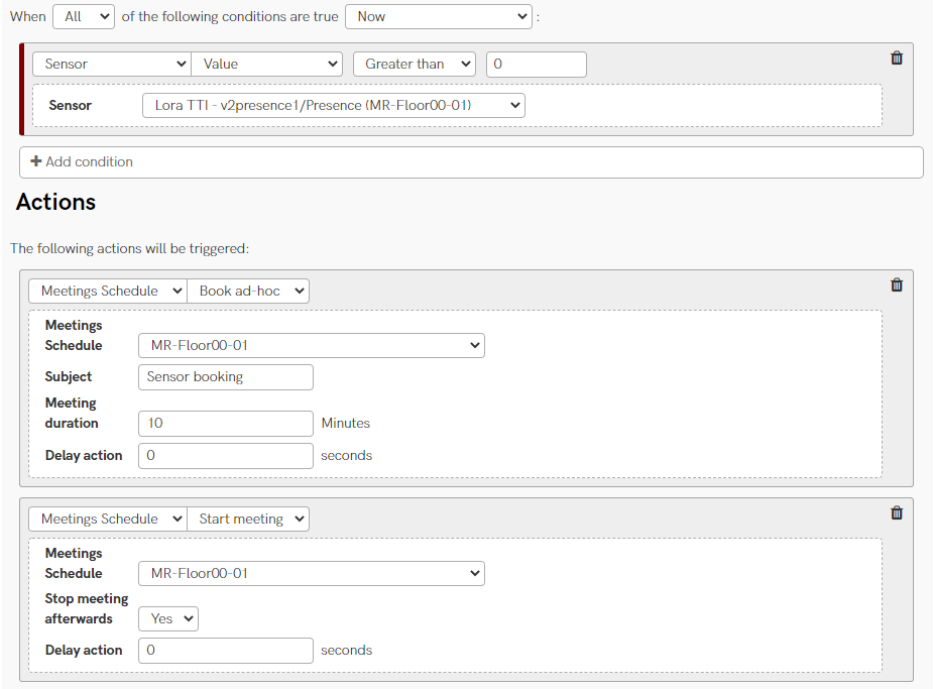
Within TEOS solution one of the targets is to make space efficient and simple to use. Thanks to the sensors technology the following workflows can be achieved in the automation scenarios

1) When room is booked and waiting for a checkin, the sensor detects a presence and the checkin is automatically done. If there is no presence, the checkin is not done and the room become available
2) When the room is not booked and presence is detected, book the room for a selectable time in the automation scenario
3) When desk is booked and waiting for a checkin, the sensor detects a presence and the checkin is automatically done. If there is no presence, the checkin is not done and the desk become available
4) When the desk is not booked and presence is detected, book the desk for a selectable time in the automation scenario"

To make that possible after having your sensor connected to TEOS you need to go to schedules and alarms and to Automation Scenarios:



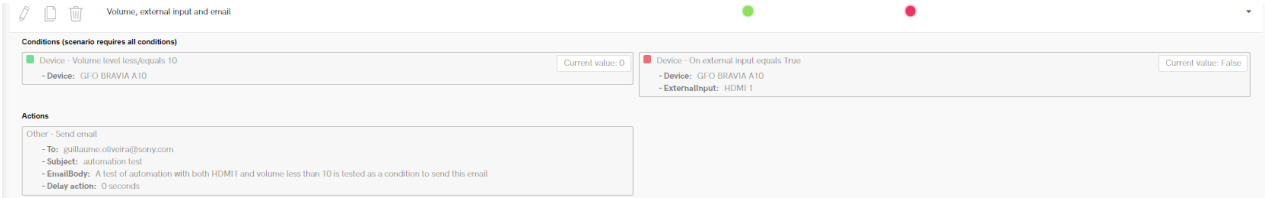
Create a new automation scenario where you select as condition the sensor to have a greater value than 0 and i fit is the case as actions to book automatically the calendar of your room with a subject such as “autobooking” and the meeting duration which is recommending to be 10 minutes or 5 minutes ranges. If you want also to do the autocheck-in you can add in the action the start meeting option for the same room calendar with the option to autocheck-out if the is no presence. TEOS will manage the rest of the usage and will check every with a background task the statuses and calendars to make that workflow working. This is different from for example the fact of starting a device based on the sensor detection, this will be done only once and when for example there is no presence, the state of the device will not change. You need to add another scenario fort he power Off if sensor as no presence.



6.2. Actions on AV devices

When an action scenario is used to do actions on AV devices such as a BRAVIA for example when you want to power it on/off based on a condition, take into account that when the condition rule is validated the command to the device is send one time.

If you want also to change the status of the device based on the reverse of the condition, you will need to create a dedicated condition for that. The condition change will not change the two status but only change it once based on the condition validation value.



SONY

For more Information
https://teos.solutions