ATOMITY

MASTER SERVER

AT-4D-MS-MS-02

Integrator Manual

v2.0

big Blue

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SETUP CLOUD

Prerequisites

1. **Power supply**

   Master Server requires a DIN rail power outlet for its own supply. Not included.

2. **Network**

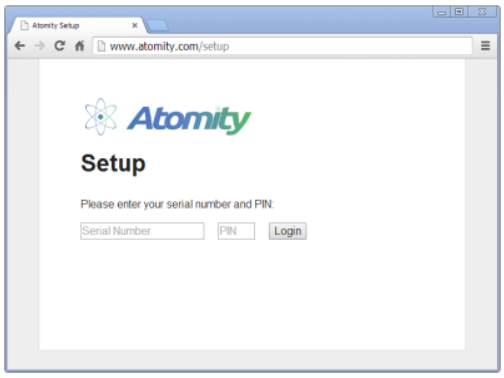
   Master Server needs access to the internet for syncing the configuration stored in our cloud server during *Initial Setup*.

3. **Master Server**

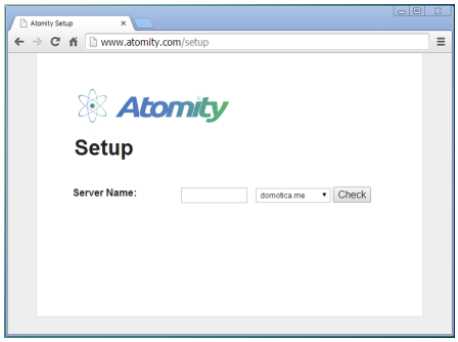
   Locate the unique serial number and PIN included in the package content.

Cloud Setup

1. Connect the device to a router with internet connection using an ethernet cable and power it on.
2. Go to www.atomity.com/setup and identify your Master Server: Enter its serial number and PIN and click "*Login*" button.

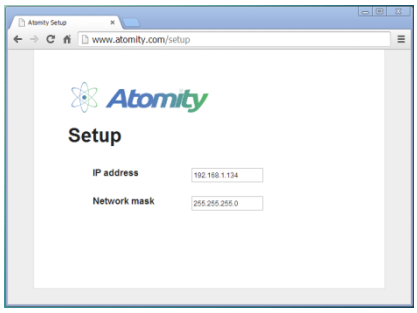


3. Choose a server name to identify it. Enter the name and press "Check" to verify it is not in use. Click "Save" button.



Please take into account it is not possible to undo this action later

4. Change network parameters if necessary. Default IP address: 192.168.1.220.



5. Add user groups: You can create up to 4 different groups of users. At least one of them must be "Admin".

Differences between existing types of users:

Type	Access to...	System recipes visibility
Admin	All pages	Yes
Owner	All pages except *Settings* > *Devices*	No
User	All pages except *Settings*	No

At this point, our Cloud Server will update your Master Server. Once the update process has finished a message will be shown. Otherwise, please refer to Annexes - Troubleshooting section.

NOTE: iOS and Android devices register process is made *per User* via Master Server app. Please go to *Visualization* section for more information about it

FIRST ACCESS

1. Open your favorite web browser (Chrome, Firefox...) and go to its local IP (default http://192.168.1.220). The *Welcome page* will be shown:

2. Log in using administrator user and go to *Settings* menu (hidden menu at the right of the screen).

BASIC CONFIGURATION

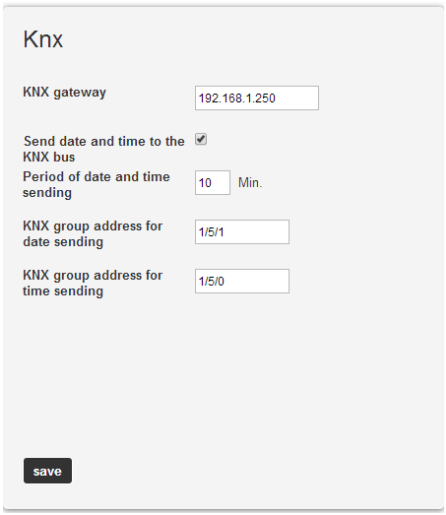
Please go to *Settings* » **Configuration**

Basic configuration requires adjusting the following parameters:

1. **Latitude and longitude** of building localization (astronomical clock)

   These values can be obtained in the web page http://itouchmap.com/latlong.html

2. **KNX NET/IP gateway address**. The Master Server will connect to KNX system using this device.

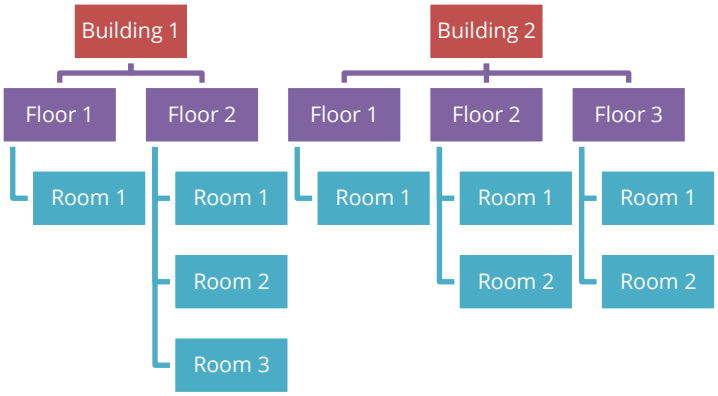


The rest of parameters (language, currency, etc.) will not affect to its functionality.

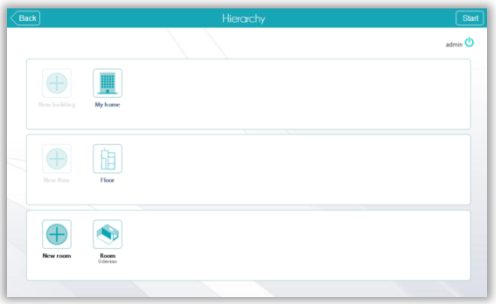
> NOTE: In case of changing network parameters, the system will require a reset (*Settings* » **Reset**) to ensure its correct application

BUILDING HIERARCHY DEFINITION

Go to *Settings* » **Hierarchy** for defining the installation physical structure, consisting in a certain number of *Buildings*, *Floors* and *Rooms*.



Factory default includes a basic hierarchy structure containing one Building, one Floor and one Room:



Define its hierarchy by creating “New buildings”, “New floors” and “New rooms”. Properties per room:

- Name
- Icon
- Background image (JPG o PNG)
- Container opacity

This structure can be customized using these different actions:

- **Adding new zones**

  Definition of zones of the building can be performed using *New building, floor and room* buttons.

- **Modifying and removing existing zones**

  Please hold the button of the desired zone. Two new buttons will appear:

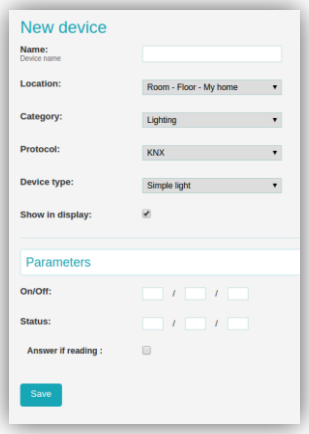
  X: remove zone
  E: edit zone

Once the whole building structure is complete you can begin to define different zone *Devices*.

WORKING WITH DEVICES

Please follow the next steps to define building devices:

1. Go to *Settings* » **Devices**, section "New device"



2. Give the new device an unambiguous *Name*
3. Choose an icon
4. Indicate which will be its *Location* in the installation, according to the previously defined hierarchy
5. Select the *Category* which best matches device *class*:

Lighting	HVAC	Generic controls	Energy
Blinds	Safety	Weather	Multimedia

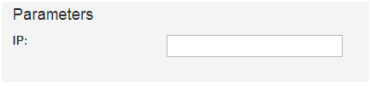
6. Define its *Protocol*:

KNX	Sonos	Philips Hue

7. Define if this particular device should be shown in the display or not
8. Indicate the *Type* of device, depending of both selected *Category* and *Protocol*. Examples:

KNX

Sonos



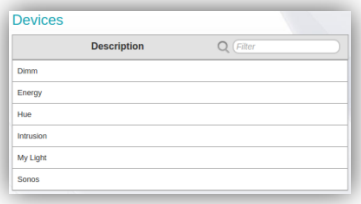
Philips Hue

IP Cameras

> Sonos devices: please remember to assign them a static IP (linking its MAC address via router configuration) to ensure it doesn't change with time

9. Store the declared *Device* by pressing *Save* button

Existing devices declaration can be accomplished by repeating previous steps. A list of all created devices can be found in *Devices* section:

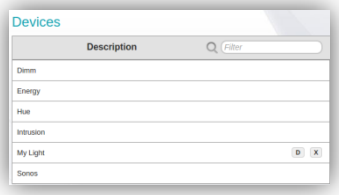


Modifying, copying or removing an already created device

In case of pressing over an already existing *Device*:

1. *New Device* section will show its actual parameters, permitting to edit them.
2. Furthermore, two additional buttons will appear to perform the following actions:

    - Remove the selected device (X)
    - Duplicate it (D)



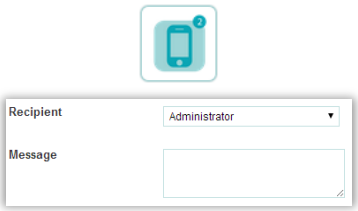
Other devices

In addition to declared devices, the Master Server provides some special devices:

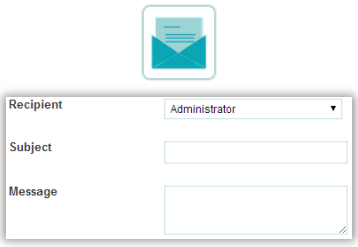
Communications

Scenes, Recipes & Calendars » Categories » Communications

1. ***Push notification*** *device*, for sending customized notifications to any registered (via user) iPhone/iPad.



1. ***Email*** *device*, for sending users an email with the desired text.



This particular device can be utilized for sending *Zennio Energy Meter* device stored values using one of the following pointers:

Energy (kWh)	<<@@EnerT@@>>

Cost (€)	<<@@CosteT@@>>
Total emisions (ppm)	<<@@CO2T@@>>
Power (W)	<<@@Potl@@>>

Weather

Recipes » Categories » Weather (once both latitude and longitude values have been declared)

1. ***Astro**: Dawn* and *Nightfall devices*

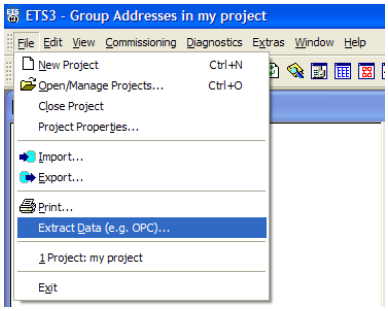
2. ***Yahoo Weather**: Temperature* and *Wind speed* devices, read from Yahoo Weather service. **Internet connection required**.

Importing KNX Devices from an ETS database

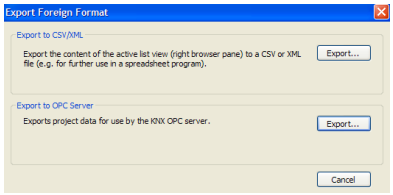
Master Server helps you in the task of defining new devices by allowing you to import all your project group addresses. It can be accomplished as follows:

1. Open your ETS project

2. **ETS3:** Go to File » Extract Data



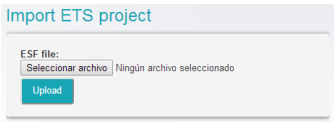
Go to *Export to OPC Server* section and click *Export* button



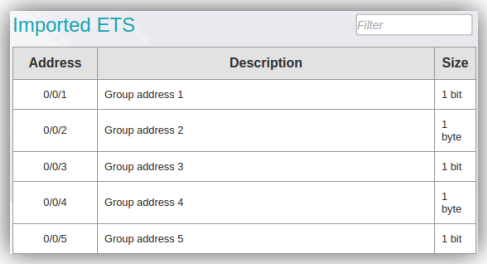
ETS4: Go to Extras » Export to OPC Server

3. Give it a name without blank spaces and save it as an .esf file (i.e. my_project.esf)

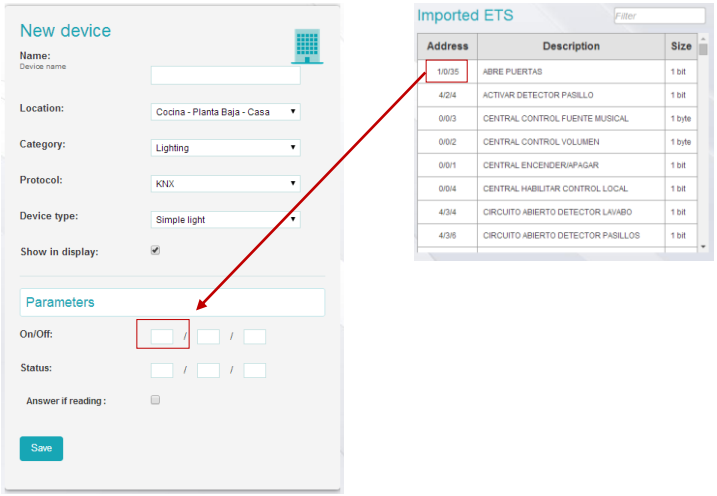
4. Go to *Settings »* **Devices**, section "Import ETS project" and select the *.esf file



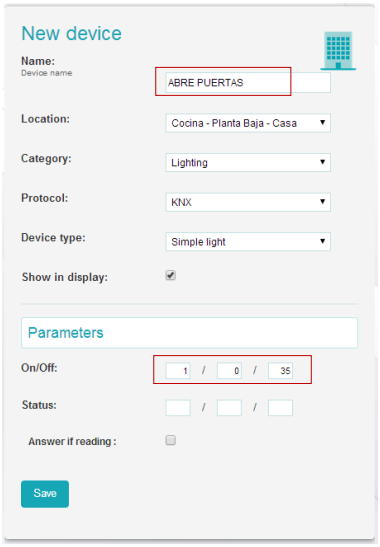
5. Click *Upload* button. ETS group addresses will appear in "Imported ETS" section once the process has finished:



6. At this point, it is possible to drag and drop any of the imported group addresses to *Parameter* section.



As a result, both *Group address* and *Description* will be copied to *Parameter* and *Name* fields:



THE VISUALIZATION

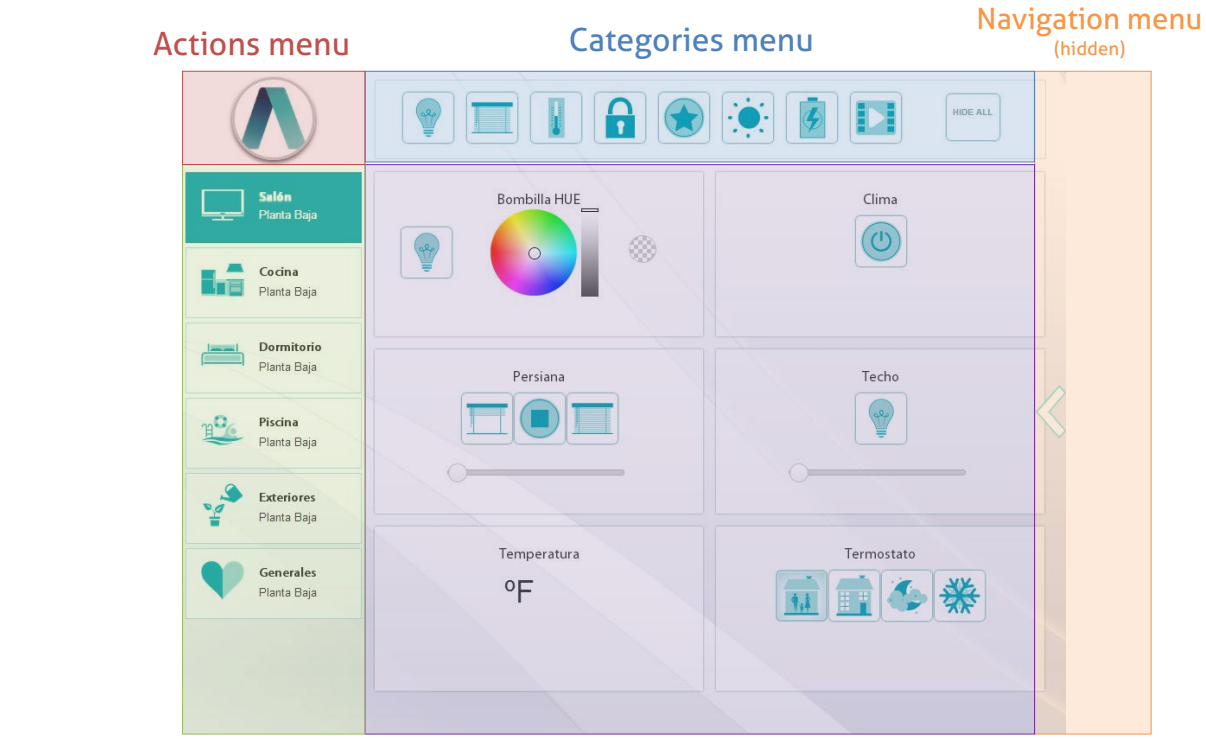
The visualization permits end users to:

1. Examine and modify the state of various constituent building elements
2. Display actual values of measured variables (wind speed, humidity, room temperature, etc.)

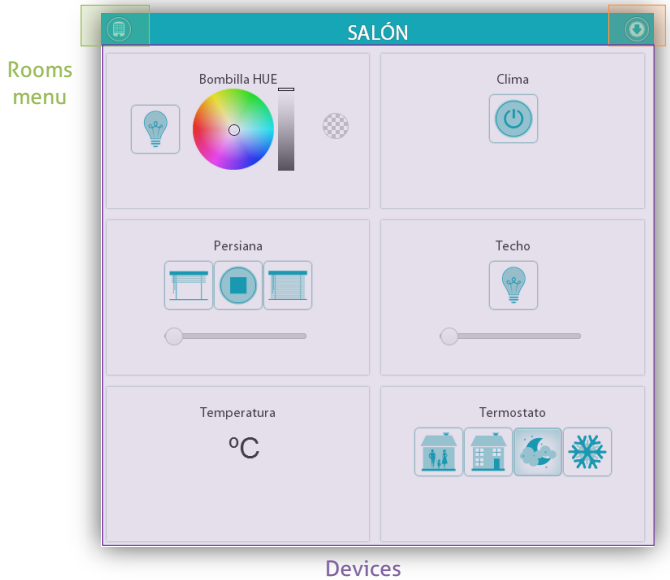
4 visualizations in 1, **generated automatically**.

PC, SMART TV,... (web browser devices) + Tablet (Horizontal Layout)

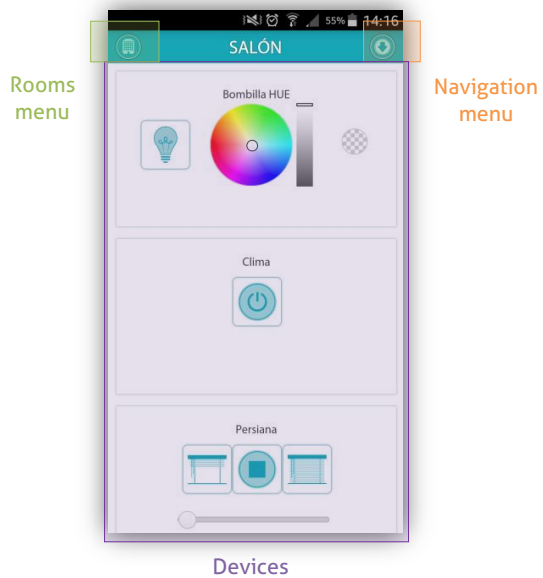
Its structure can be divided in 5 sections:



Tablet (Vertical Layout)



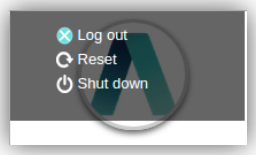
Smartphone



Actions menu

Tap over it to show basic actions menu:

- User Log out
- Reset/Shut down the Master Server



Rooms menu

It consists in a list of all the created rooms when defining the building *hierarchy*.

In case of pressing over any of them, selected room devices will be displayed.

Categories menu

Filter menu (lighting, blinds, scenes, etc.), to help in building control by displaying only selected category devices.

The filter can be globally controlled by pressing “Hide/Show all” button.

Devices

Main section of the page. It displays all the existing devices, depending on:

1. Selected room
2. Filtered categories

Navigation menu

Initially hidden menu which contains a link to Scenes, Recipes, Calendars,...

To display it, please perform a “right-to-left swipe” movement over the right side arrow.

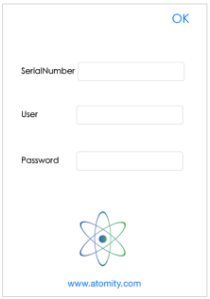
iOS/Android app: Master Server app

Master Server app is a free application which allows users to access directly to the visualization, without requiring remembering its IP address, nor having to enter user and password.

You can install and configure it as follows:

1. Go to the App Store/Google Play and search for “Master Server”
2. Install and open it

3. Configuration page will be shown:



Enter required data and press “OK”. The iOS device will be linked to the selected *User* (remember push notifications are sended *per User*, consisting in one or more iOS devices) and all the parameters stored in our Cloud server will be automatically downloaded.

In case any of the data is wrong please shake your device to return to Configuration page.

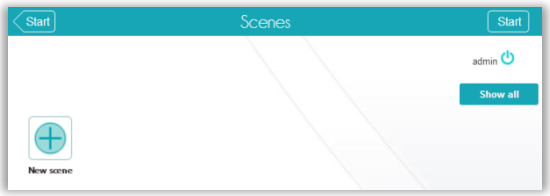
Please take into account remote access requires ports **80 and 8000** to be opened

SCENES

List of actions to be performed jointly. Example *"Not at home"*: Blinds down; Climate off; Lights off

A new scene can be created following these steps:

1. Go to *Visualization* » *Sidebar* » **Scenes**



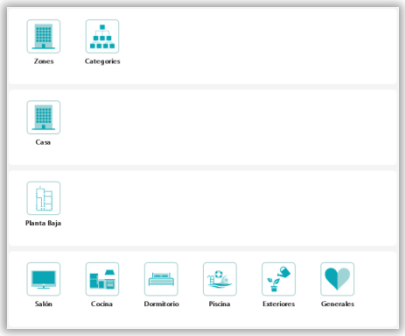
2. Press "New scene" button

3. Configure the new scene basic parameters:

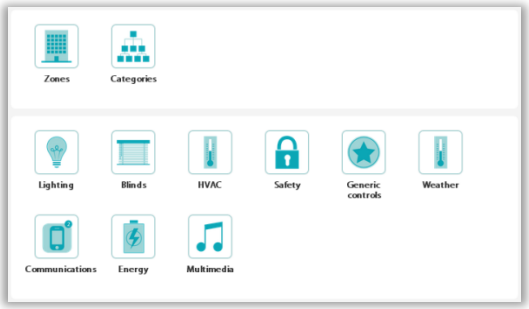
   - Name
   - Icon
   - Room allocation (if necessary, for displaying it in the visualization)

4. Press "New action" button to select a particular building Device and its desired state. This selection can be done by Zones or Categories, showing in each case a list of all existing devices:

Zones



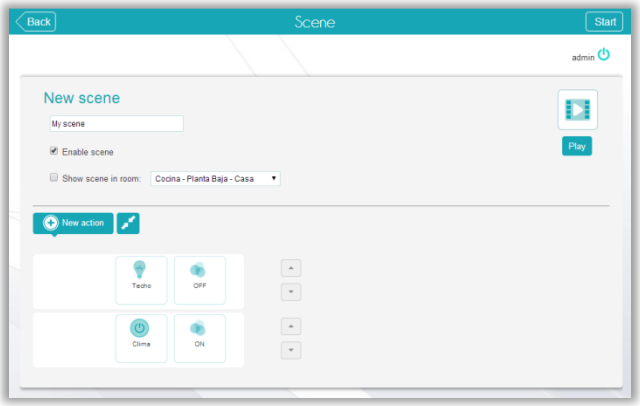
Categories



   A delay can be configured for each new added action.

5. Press "Save" button

It is possible to create a list of actions to be performed repeating previous steps:



Rearranging the list of actions

This action can be accomplished by clicking over the up/down arrows existing at the right of each listed device.

Modifying, copying or removing an already associated action of a scene

In case of pressing over any "already added to scene" *Device*:

1. Both actual configured state and associated delay will appear to permit its modification.
2. Two additional buttons will become visible to perform one of the following actions:

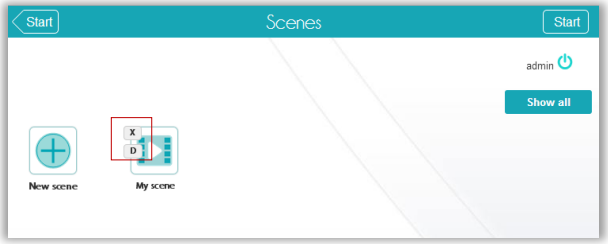
    - X: Remove the selected action from the scene
    - D: Duplicate it

Copying and deleting an already created scene

This action can be performed this way:

1. Go to *Visualization » Sidebar »* **Scenes**
2. Hold the scene button. Two new buttons will become visible:

    - X: Remove the selected scene
    - D: Duplicate it



Playing an scene externally using a URL

Please go to the API reference to know how to do this action.

RECIPES: BASIC LOGICAL FUNCTIONS

Immediate logical functions for end user, “if this event happens then these actions must be performed”.

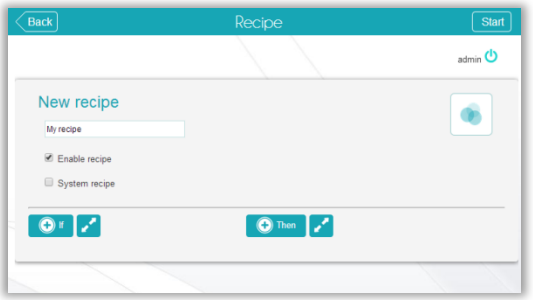
Steps:

1. Go to *Visualization* » *Sidebar* » **Recipes**

2. Press “New recipe” button

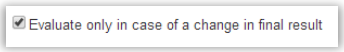
3. Configure the new recipe basic parameters:

   - Name
   - Icon
   - System recipe (depending on whether you want it to be visible or not for Owner/User users)

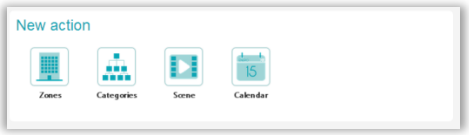


4. Press “If” button to select:

   - a particular building *Device*; This selection can be done by *Zones* or *Categories*, showing in each case a list of all existing devices
   - the condition that must be met in order the action to be performed
   - if the result of the condition must be evaluated with every new received value or just when a change in previous result happens:



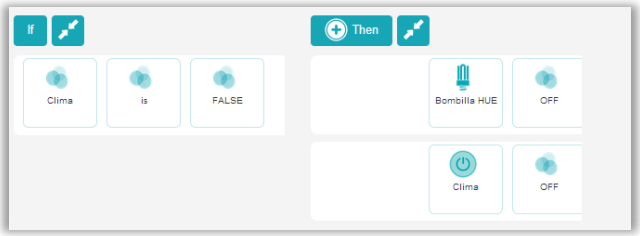
5. Press “Then” button to select a particular buiding *Device* and its desired state. This selection can be done by *Zones*, *Categories*, *Calendars or Scenes*.



   A delay can be configured for each new added action.

6. Press “Save” button.

It is possible to create a list of actions to be performed repeating previous steps:



Rearranging the list of actions

This action can be accomplished by clicking over the up/down arrows existing at the right of each listed device.

Modifying, copying or removing an already associated action of a recipe

In case of pressing over any "already added to recipe" *Device*:

1. Both actual configured state and associated delay will appear to permit its modification.
2. Two additional buttons will become visible to perform one of the following actions:

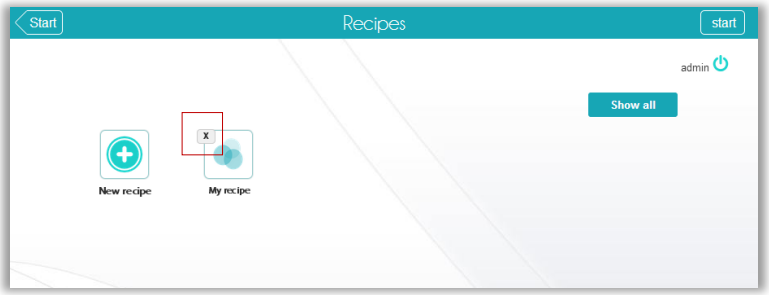
    - X: Remove the selected action from the recipe
    - D: Duplicate it

Copying and deleting an already created recipe

This action can be performed this way:

1. Go to *Visualization* » *Sidebar* » **Recipes**
2. Hold the recipe button. A new button will become visible:

    - X: Remove the selected recipe

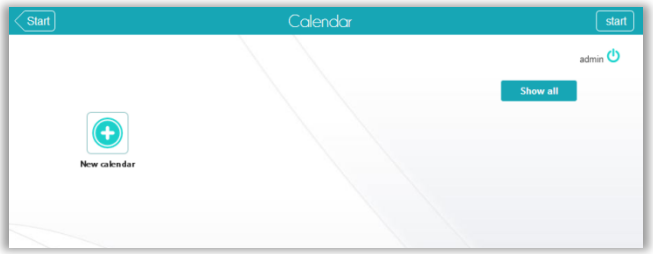


CALENDARS: PROGRAMMED ACTIONS

Daily, weekly, monthly and yeary schedules.

Steps:

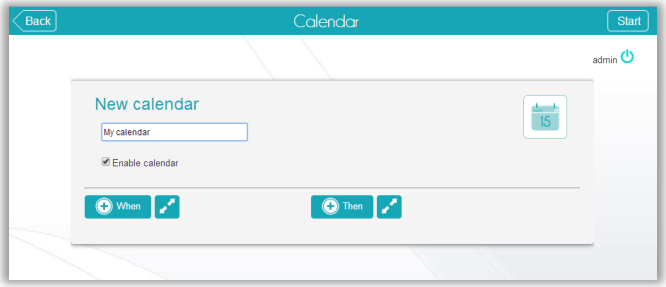
1. Go to *Visualization* » *Sidebar* » **Calendars**



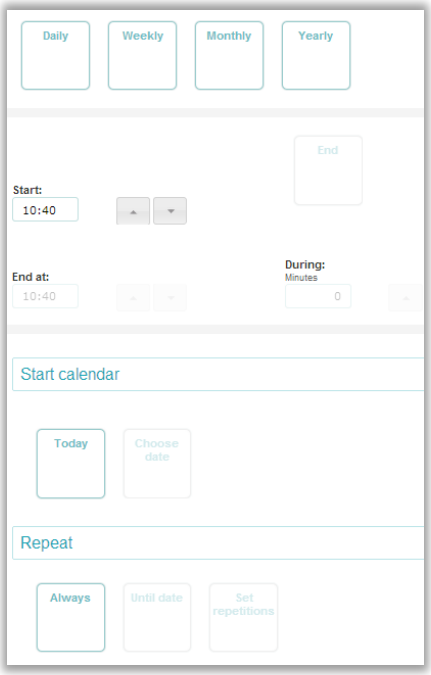
2. Press “New calendar” button

3. Configure the new calendar parameters:

   - Name
   - Icon



1. Press “When” button to select new calendar periodicty. Example:



Summary of options:

When	Value	OR	Type of value
Daily	Start		hour
	End	*At*	*hour*
		During	*minutes*
	Calendar start	Today	
		Date	date
	Repeat	Always	
		Until date	date
Weekly	Frequency	Day of the week	M-S (1 or more days)
	Start		hour
	End	*At*	*hour*
		During	*minutes*
	Calendar start	Today	
		Date	date
	Repeat	Always	
		Until date	date
Monthly	Frequency	Day of month	1-31 (1 or more days)
			First, Second, etc. Day, Working day, Non-working day M-S
	Start		hour
	End	*At*	*hour*
		During	*minutes*
	Calendar start	Today	
		Date	date
	Repeat	Always	
		Until date	date
Yearly	Frequency	Month + Day	J-D + 1-31 (1 or more months & days)
	Start		hour
	End	*At*	*hour*
		During	*minutes*
	Calendar start	Today	
		Date	date
	Repeat	Always	
		Until date	date

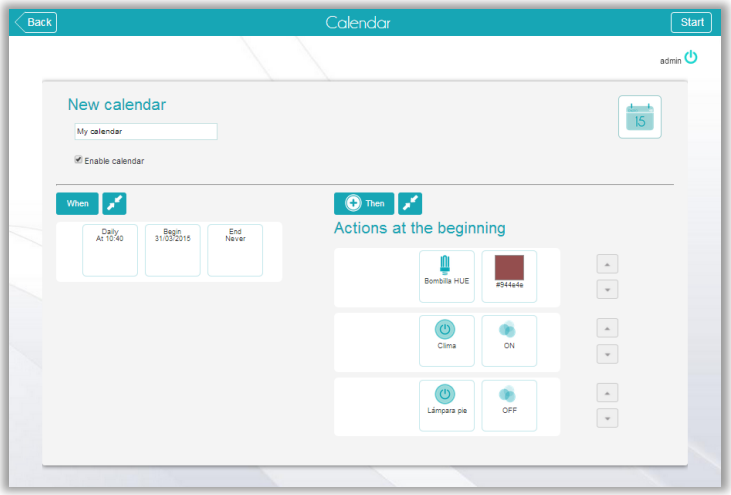
1. Press “Then” button to select a particular building *Device* and define its desired state, at the beginning or/and the end of calendar. This selection can be done by *Zones*, *Categories*, *Scenes or Scripts (LUA)*.

A different delay can be configured for each new added action.

4. Press “Save” button.

Not enabled calendars will exist but not launch.

It is possible to create a list of actions to be performed (at the beginning or at the end) repeating previous steps:



Rearranging the list of actions

This action can be accomplished by clicking over the up/down arrows existing at the right of each listed device.

Modifying, copying or removing an already associated action of a calendar

In case of pressing over any "already added to calendar" *Device*:

1. Both actual configured state and associated delay will appear to permit its modification.
2. Two additional buttons will become visible to perform one of the following actions:

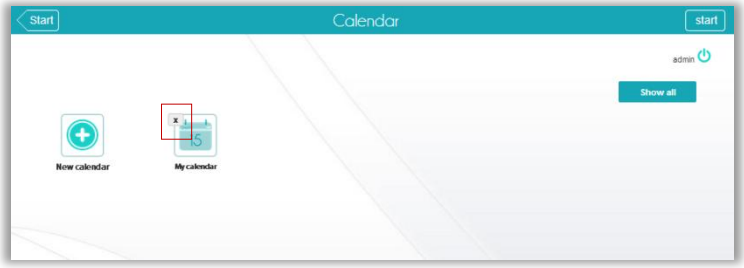
    - X: Remove the selected action from the calendar
    - D: Duplicate it

Copying and deleting an already created calendar

This action can be performed this way:

1. Go to *Visualization* » *Sidebar* » **Calendars**
2. Hold the calendar button. A new button will become visible:

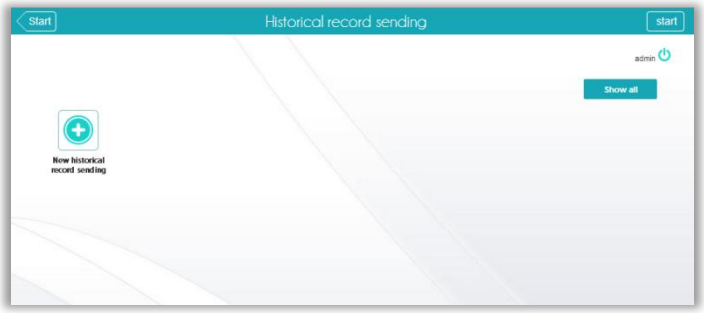
    - X: Remove the selected calendar



HISTORICAL: DATA LOGGER

Steps:

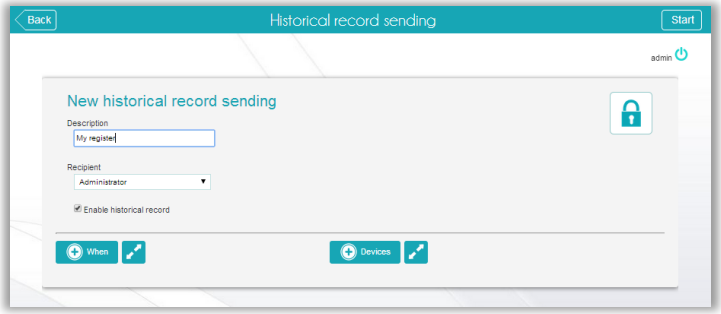
1. Go to *Visualization* » *Sidebar* » **Historical**



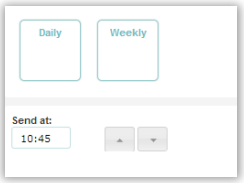
2. Press “New historical record” button

3. Configure new historical basic parameters:

   - Description
   - Icon
   - Recipent, the user who will receive the historical



4. Press “When” button to select new historical periodicty. Example:

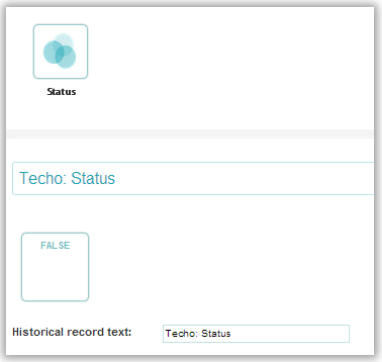


Summary of options:

When	Value		Type of value
Daily	Send at		hour
Weekly	Frequency	Day of the week	M-S
	Send at		hour

5. Press “Devices” button to select:

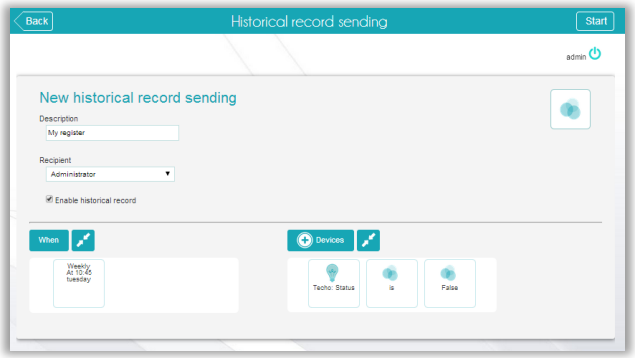
- a particular device of the building; This selection can be done by *Zones* or *Categories*.
- the status that must be met;
- a text to define



6. Press “Save” button to store the changes.

Not enabled historical will record devices status but will not send emails.

It is possible to create a list of devices (and its status) to be recorded:



In this example, the Master Server will log “My new device” and “My push button” changes and will send a daily report at 11:00 to “My user” associated email address:

```
From: Mail server
At: 2013-05-03 11:00:00
Subject - Historical: My historical

        Sending frequency: Daily at 11:00 h

        My new device: Status ON         Value for alarm:       1
                Event 1, Date: 2013-05-02 11:53:10, reading: 1
                Event 2, Date: 2013-05-02 17:00:00, reading: 1

        My push button: Status pressed   Value for alarm:       1
                There has been no readings during the period.
```

Modifying, copying or removing an already associated device of a historical

In case of pressing over any "already added to historical" *Device*:

1. Both actual configured status and text will appear to permit its modification.
2. Two additional buttons will become visible to perform one of the following actions:

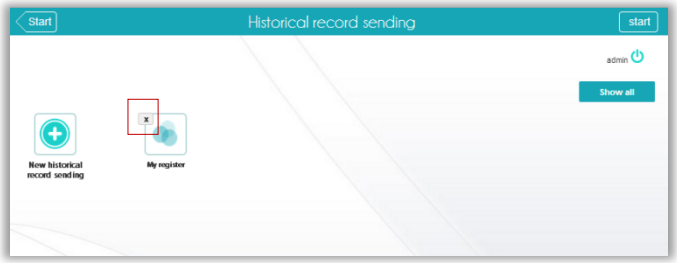
    - X: Remove the selected device from the historical
    - D: Duplicate it

Copying and deleting an already created historical

This action can be performed this way:

1. Go to *Visualization* » *Sidebar* » **Historical**
2. Hold the calendar button. A new button will become visible:

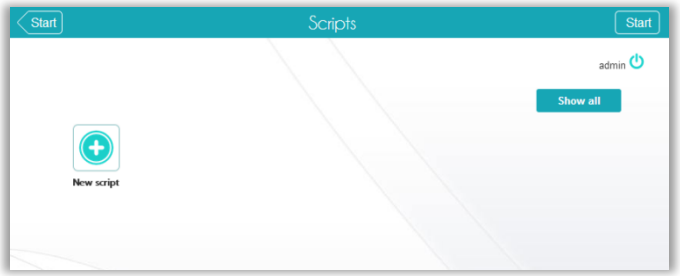
    - X: Remove the selected historical



LUA SCRIPTING: ADVANCED LOGICAL FUNCTIONS FOR SYSTEM INTEGRATOR

Steps:

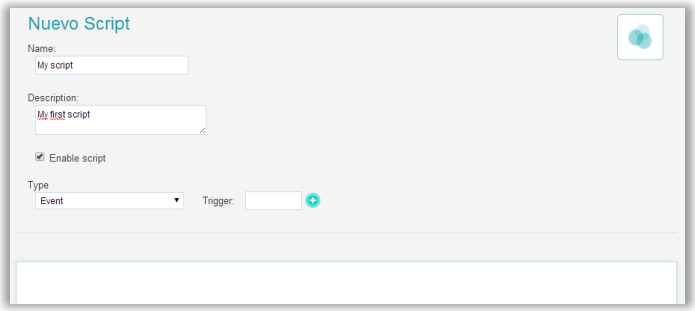
1. Go to *Visualization* » *Sidebar* » **Logic**



1. Press “New script” button

7. Configure its basic parameters:

   - Name
   - Description
   - Icon
   - Script type



Script types:

Type	Trigger	
Event	KNX group address(es)	Executed as a result of a reading of certain KNX group address
Resident	1 to 1.000.000 segundos	Evaluated each certain number of seconds
Scheduled	Calendar	Launched by a certain daily, weekly, monthly or yearly calendar
On init	-	Executed during Master Server boot
On shutdown	-	Executed during Master Server shutdown process

2. Press “Save” to store changes. It is possible to verify any particular script by pressing “Execute” and “Result” button.

   LUA documentation: http://www.lua.org/manual/5.3/
   Master Server functions: http://www.atomity.com/es/referencia-lua

Functions resume:

Function	Example
KNX.read(groupAddr)	x = KNX.read('1/1/1')
KNX.write(groupAddr,value)	KNX.write('1/1/2',1)
PUSH.send(usrGroup,txt)	PUSH.send('admin','My push notification')
EMAIL.send(usrGroup,txt)	EMAIL.send('admin','My email')
ROOMBA.clean(ip)	
ROOMBA.dock(ip)	
UTILS.sleep(x)	UTILS.sleep(5)
UTILS.ping(ip)	res = UTILS.ping('192.168.0.200')
UTILS.set(name,value)	UTILS.set(myGlobal,1)
UTILS.get(name)	myLocal = UTILS.get(myGlobal)

Examples

Two-point control

```
temp = KNX.read('1/0/0')

consigna = 90
histeresis = 2

IF temp < consigna - histeresis THEN

    KNX.write('1/0/1',1) -- SAUNA ON

ELSE IF temp > consigna + histeresis THEN

    KNX.write('1/0/1',0) -- SAUNA OFF

END IF
```

Pulse counter

```
contador = 1
numveces = 5
disparador = KNX.read('3/0/0') -- Disparador Script

if contador <= numveces then

  contador = contador + 1

else

  contador = 0 -- Reset

end


if contador == numveces then

  -- Acciones
  KNX.write('3/0/1',1)
  SLEEP(10)                -- Retardo 10 segundos
  KNX.write('3/0/2',1)
  SLEEP(5)                 -- Retardo 5 segundos
  KNX.write('3/0/3',1)
  SLEEP(10)
  -- Etc.

end
```

Overconsumption RGB alarm

```
potenciainstantanea = KNX.read('7/0/0')
umbralalerta = 10000

WHILE potenciainstantanea >= umbralalerta DO

  -- ROJO
  KNX.write('1/0/8',255)  -- R
  KNX.write('1/0/9',0)    -- G
  KNX.write('1/0/10',0)   -- B
  UTILS.SLEEP(2)

  -- OFF
  KNX.write('1/0/8',0)    -- R
  KNX.write('1/0/9',0)    -- G
  KNX.write('1/0/10',0)   -- B

  UTILS.SLEEP(5)

END
```

OR (climate)

```
zone1 = KNX.read("3/1/1")
zone2 = KNX.read("3/1/3")
zone3 = KNX.read("3/1/5")

IF zone1 OR zone2 OR zone3 THEN -- Demanda alguna de las zonas

  KNX.write("3/1/11",1) -- EV abierta
  UTILS.sleep(5) -- Retardo 5 segundos
  KNX.write("3/1/10",1) -- Bomba impulsión encendida
  -- etc.

ELSE -- Fin Demanda alguna de las zonas

  KNX.write("3/1/10",0)
  UTILS.sleep(5) -- Retardo 5 segundos
  KNX.write("3/1/11",0)
  -- etc.

END
```

Master Server reboot - Push notification

```
usrGroup = "admin"
txt = "Master Server is booting"

PUSH.send(usrGroup,txt)
```

Network Server monitoring system

```
ip = '192.168.0.50' -- Servidor red
usr = 'propietario'
txt = 'El servidor no se encuentra disponible'

res = UTILS.ping(ip)

IF res == 0 THEN
  PUSH.send(usr,txt)
END IF
```

CREATING A BACKUP

It is highly recommended to make a copy of the entire programming so you can restore it in the future.

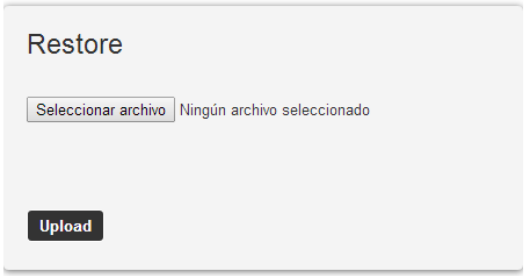
This action can be performed following these steps:

1. Go to *Settings* » **Backup**, section "*Make copy*"

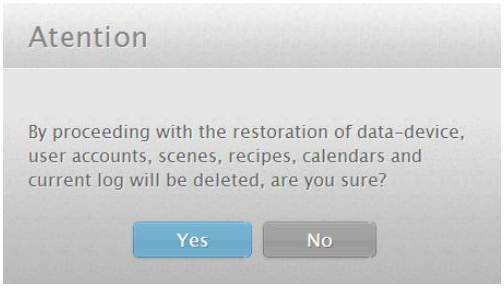
2. Give it a name and click *Download* button
3. A *Name.hpb* file will be created with the entire configuration. Save it in a safe location

Restoration process can be done easily:

1. Go to *Settings* » **Backup**, section "*Restore*"



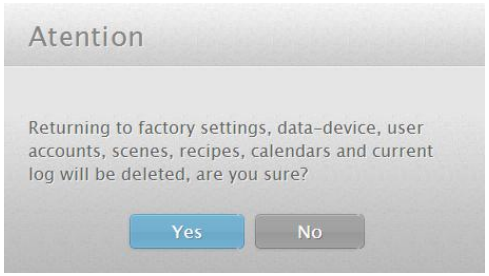
2. Select the file (*Name.hpb*) which contains the previous configuration
3. Click *Upload* button. A message will be shown asking for your confirmation before proceeding:



Icon list

Factory reset

1. Go to *Settings* » **Backup,** section "*Factory reset*" and click *Restore* button. A message will be shown asking for your confirmation before proceeding



Your device will reboot with its default settings. It is possible to login into to the system to restore any previously created backup with the following user and password:

User	admin
Password	admin

API

v0.1

Scenes

External Call to a Scene

Scenes can be played from any external app capable of sending URL commands:

http://master_server_IP/ordenesJSON.php?idEscena=**X**

Scene ID (**X**) can be obtained following these steps:

1. Go to *Scenes*
2. Select the particular scene you want to be called
3. The ID is shown at the end of the URL (i.e.: http://192.168.1.145/escenas4.php?id=**3**)

IP cameras

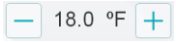
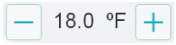
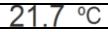
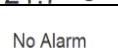
IP cameras database: http://www.ispyconnect.com/sources.aspx

> Please verify IP camera URL in any web browser before filling out Master Server required fields

Troubleshooting

Device types

KNX

Category	ID	Type	Visualization	Parameters	R	EIS	Format	Values
Lighting	K11	Simple light		ON/OFF		1	1 bit	[0,1]
				Status	x	1	1 bit	[0,1]
	K12	Dimmable light		ON/OFF		1	1 bit	[0,1]
				Value		6	1 byte	[0...100]
				Value status	x	6	1 byte	[0...100]
	K13	RGB light		Red value		6	1 byte	[0...255]
				Green value		6	1 byte	[0...255]
				Blue value		6	1 byte	[0...255]
				Status red	x	6	1 byte	[0...255]
				Status green	x	6	1 byte	[0...255]
				Status blue	x	6	1 byte	[0...255]
Blinds	K21	Simple blind		Stop object		7	1 bit	[0,1]
				Movement object		7	1 bit	[0,1]
	K22	Adjustable blind		Stop object		7	1 bit	[0,1]
				Movement object		7	1 bit	[0,1]
				Position		6	1 byte	[0...100]
				Status	x	6	1 byte	[0...100]
	K23	Special blind		Stop object		7	1 bit	[0,1]
				Movement object		7	1 bit	[0,1]
				Position object	x	6	1 byte	[0...100]
				Status object		6	1 byte	[0...100]
				Slats position		6	1 byte	[0...100]
				Slats position object	x	6	1 byte	[0...100]
HVAC	K31	ON/OFF control		ON/OFF		1	1 bit	[0,1]
				Status	x	1	1 bit	[0,1]
				Invert logic		-	-	
	K32	KNX thermostat control		KNX mode selection		6	1 byte	[0...255]
				Status	x	6	1 byte	[0...255]
	K33	Temperature control		Setpoint input		5	2 bytes	[-273...670760]
				Setpoint output	x	5	2 bytes	[-273...670760]
	K34	Jung thermostat temperature control		Setpoint modification input		6	2 bytes	[0...255]
				Setpoint temperature	x	5	2 bytes	[-273...670760]
				Re-send setpoint modifcation input	x	6	1 byte	[0...255]
	K35	Temperature		Temperature value	x	5	2 bytes	[-273...670760]
Safety	K41	Technical alarm		Alarm status	x	1	1 bit	[0,1]
				Text if no alarm				
				Text if alarm				
Generic controls	K51	Control (1 bit)		ON/OFF		1	1 bit	[0,1]
				Status	x	1	1 bit	[0,1]
	K52	Generic control (0-100%)		Value (0-100%)		6	1 byte	[0...100]
	K53	Generic control (0-255)		Value (0-255)		6	1 byte	[0...255]

	K54	1 bit control (without status)		ON/OFF		1	1 bit	[0,1]
Weather	K61	Temperature	21.7 °C	Temperature value	x	5	2 bytes	[-273…670760]
	K62	Wind		Wind speed	x	5	2 bytes	[-670760…670760]
	K63	Brightness	35491.84 KLux	Brightness value	x	5	2 bytes	[-670760…670760]
	K64	Rain	NO	It rains	x	1	1 bit	[0,1]
	K65	Twilight sensor		Twilight	x	5	2 bytes	
	K66	Humidity		Humidity value	x	10	2 bytes	[0…65535]
Energy	K71	Zennio three-phase energy meter	Total energy 6 KWh Total cost 0.71 € Total emissions 2.85 CO2 Instantaneous power 1.85 KW	Total energy	x	11	4 bytes	[0…4294967295]
				Total cost	X			
				Total emissions	x	5	2 bytes	
				Partial reset		1	1 bit	[0,1]
				Energy Reading request		1	1 bit	[0,1]
				Instantaneous power	x	5	2 bytes	[-670760…670760]

R = In case "Answer if reading" checkbox is checked, Master Server will send to the bus the last stored value

Philips Hue

Category	ID	Type	Visualization	Parameters
Lighting	H11	Philips Hue Light		ID
	H12	Philips Hue Group		ID

SONOS

Category	ID	Type	Visualization	Parameters
Multimedia	S81	SONOS Component	-	IP

IP

Category	ID	Type	Visualization	Parameters
Safety	I41	IP Camera		URL
				Left button scene
				Right button scene
				User
				Password