Configuration manual

stream

Energy Management System HTG5xxH

:hager

Related documents

Document	Reference
agardio.manager user manual	**6LE001606C**
stream installation manual	**6LE007612A**
stream exploitation manual	**6LE007616A**

Used notations

Provides tips, insights, and precisions.

Marks a risk in terms of loss of data or access to it.

Table of contents

1. Introduction

stream is an Energy Management System (EMS). Its aim is to help you to exploit your energy data in a pertinent manner, based on the configuration it is provided.

The configuration provided to stream is expected to reflect the reality of your energy-metering installation, so gathered data can be properly contextualised and above all human-readable.

All kinds of real-life entities are recognised by stream, such as:

- **Sites**, representing real-world areas with geographical unity in terms of time zone, language, and address, and which gather one or more buildings monitored for energy consumption
- **Buildings** monitored for their energy consumption
- **Floors** and **rooms** of a building whose energy consumption is specifically monitored
- **Zone categories**, which are the various types of zones in which electrical energy is consumed
- **Usages**, which are the various reasons why electrical energy is consumed
- **Sources**, which represent the origin of electrical energy
- **Meshes**, as user-defined custom perimeters of energy metering, across zones, usages, and even sources, as deemed pertinent

All these elements are used to contextualise energy consumption, represent it by pertinent associations when it is exploited. What is nice is that they do not require your installation being online or even off the ground to be configured. Everything can all be configured beforehand in anticipation.

Example: your building is still under construction, but you already have its blueprints. You already know how everything is going to be wired, and which monitoring products you are going to use on your future electrical network. You do not have to wait for construction to be over to prepare your agardio.manager configuration(s) in stream. You can prepare everything in advance and perform deployment in a few clicks once the real-world has caught up with your preparations.

- To discover how to integrate the structure of your installation in stream, see Chapter 4.
- To learn how to configure the rest of the context for your energy monitoring (usages, zone categories, sources, etc.), see Chapter 3.

The primary data collectors for stream are **agardio.manager devices** deployed in the field. As you may already know, they retrieve data from **products**, which measure energy and more at both ends of an electrical network.

A network of agardio.manager devices can be supervised by stream in 2 different manners:

- When working with an existing energy-monitoring installation, which has already lived, it is capable of retrieving its product configuration and take it over smoothly.
- When working with a brand-new energy-monitoring installation, it is capable of sending it a product configuration prepared in advance.
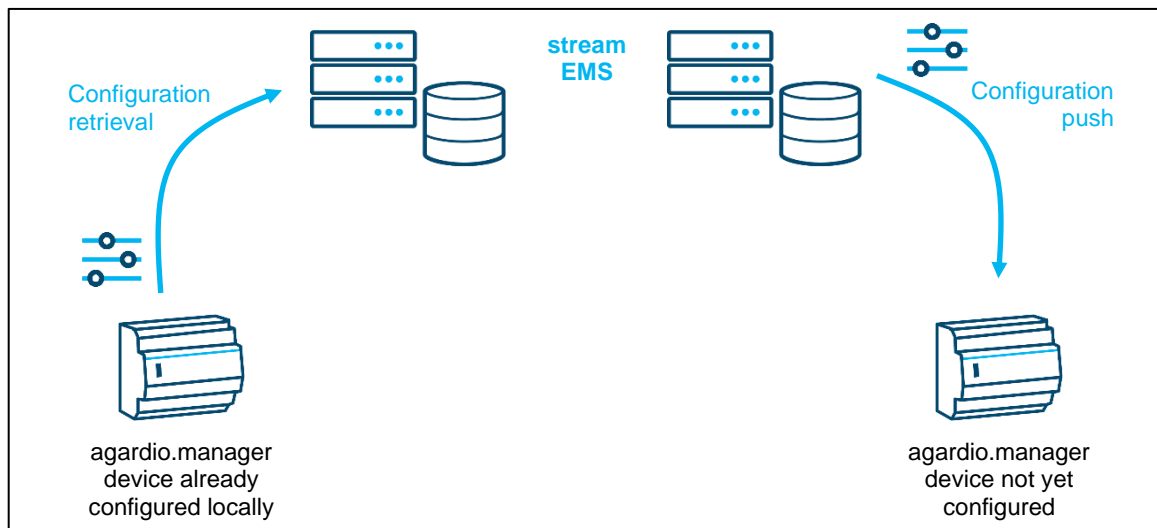
Figure 1 – Integration of stream to pre-existing or new energy-monitoring installation

This means that a pre-existing product configuration can be imported in stream and does not need to be entered a second time.

Moreover, when your agardio.manager devices have not had any product configuration input yet, you can prepare it for all of them in one place, before they are even online, and deploy it in one fell swoop when all the hardware is properly plugged in and available.

Once connected to stream whichever way is more convenient for you, agardio.manager devices can then:

- Be **locked** in your stream system, so as to avoid any faulty manipulation.
- Be **momentarily deactivated**, for example during maintenance operations which could risk accumulating erroneous data.
- Accept **hardware replacement** without loss of data continuity.

See Chapter 5 for any action you may want to perform in regards to your agardio.manager devices, Chapter 6 to know how to deal with their products, and Chapter 7 to handle the data they provide. Compliance with your licence is explained in Chapter 8.

Cost computations according to a tariff schedule is possible. See Chapter 9 for what you need to configure to obtain such a result.

stream is also capable of gathering **weather data** for further contextualisation as well as normalisation of energy consumption. Chapter 10 explains how to implement this.

stream also integrates determination of the **Electrical Installation Efficiency Class** of your buildings, based on the second Edition of norm 60364-8-1 of the International Electrotechnical Commission (IEC). See Chapter 11 for more information on the subject.

stream has **email notification** and **FTP storage** capabilities, in connection with:
- The **alarms** it raises about any technical difficulty it encounters or can raise about variations in the measurements it reads.
- The **reports** it can generate, both about occurrences and about stored data.

All notions of data monitoring are exposed in Chapter 12.

Time is a crucial notion when gathering and exploiting data. For this reason, stream has advanced **time synchronisation and time zone configuration**, as you can see in Chapter 13.

Language is also important, and as well as coming with its interface translated in several languages already, stream is capable of internationalisation of its custom content, as explained in Chapter 14.

Access to stream server and functionalities can be granted or restricted thanks to **user management**. See Chapter 15 for explanations.

Maintenance tools are available in stream, both for its own system and its agardio.manager devices. See Chapter 16.

2. Getting started

2.1. Configuration menus

Once you are logged in, you can see that stream is organised across 7 menus, including a personal one. Not all those menus concern configuration. Data and event exploitation menus are described in the _stream exploitation manual_.

2.1.1. Configure your installation

Figure 2 - Configuration menu

The second stream menu has the most content of all. It allows you to access the configuration of your installation, from its context to its structure, along with your agardio.manager devices and their products, and even reports and translations.

2.1.2. Control stream connections to remote servers

Figure 3 - Network menu

The Network menu regards stream's connection to remote servers:

- ▪ a single SMTP server
- ▪ as many FTP servers as needed

2.1.3. Check the state of your stream system

Figure 4 - Maintenance menu

The Maintenance menu allows you to check on stream and its connected agardio.manager devices, to analyse issues when they occur.

2.1.4. Manage users

Figure 5 - User management menu

The Users menu leads to the management of accounts and groups and their permissions.
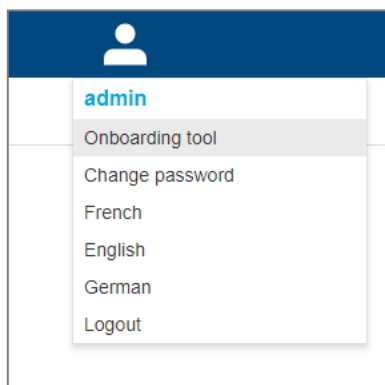
2.1.5. Access the onboarding tool

Figure 6 - Personal menu

The personal menu in the top right corner gives you access to an onboarding tool for configuration.

2.2. Preparations for configuration

2.2.1. Connection settings to agardio.manager devices

For each agardio.manager device you are planning on connecting to stream, you have to prepare:

- ▪ The **IP address or hostname** to reach the device, and the associated **HTTP port**.
- ▪ The credentials for a **user with administrator profile** on the device.

ℹ stream communicates with agardio.manager devices switched in a specific mode called Supervised mode. Any attempt to connect stream to an agardio.manager not in Supervised mode is rejected.

⚠ If you are planning on communicating with agardio.manager devices with a web certificate different from the default one, you need to have made the machine hosting stream accept those certificates. To do this, refer to the *stream installation manual*.

2.2.2. Configuration of agardio.manager devices

Whether you are planning on retrieving the configuration of your devices or pushing one you will have prepared in stream, you should be aware of this configuration.

- - When planning on retrieving it, it means you can check it for validity and tinker with it if need be.

- - When planning on pushing it, you simply have to be able to enter it.

ℹ A commissioning report generated prior to switching to Supervised mode can help to confirm the rightful transfer of configuration from the device to the supervisor.

2.2.3. Installation structure

You should be aware of which of your **buildings** are equipped with agardio.manager devices set to be supervised by stream, and how each of these buildings is organised in terms of **floors** and **rooms** and their associated type.

First of all, it should make product configuration more straightforward, and from there ensure pertinent aggregations in runtime.

2.2.4. Pricing schedules for cost computation

For proper cost computations, you should know the pricing schedule of all your **sources of energy**. The aim is to be in a position to confidently and easily enter it into stream.

2.3. Onboarding

stream comes with an onboarding tool for its configuration, which guides you, in order, through its main configuration interfaces. Following these steps allows putting a minimal configuration in place before digging a little deeper into what stream can do.

You can also call on this onboarding tool when you are new to stream even though you are working with a fully configured installation. It grants you a first overview of the main configuration interfaces.

Before you are familiar with stream, the onboarding tool prevents you from getting lost and having to go back and forth across menus.
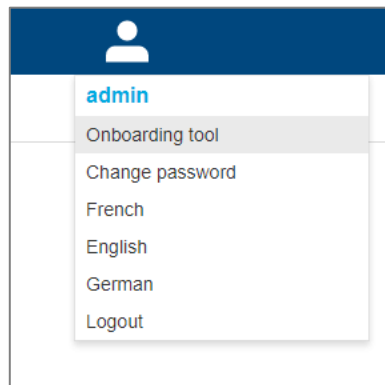
Figure 7 – The onboarding tool for stream configuration is accessed through the personal menu

The following chapters provide a step by step of the interfaces the onboarding tool takes you through and what you are supposed to do when it does.

2.3.1. Set storage frequencies for types of measurements

If you are familiar with agardio.manager, you can think of Sampling references as the evolution of data management configuration.

Essentially, a sampling reference determines at what frequency measurements of each category are to be stored.

> At least one Sampling reference has to exist in your stream system. It is a prerequisite for site creation, and a site is required to create a building which is necessary to instantiate any agardio.manager device.

- If you only plan on using a single data management policy across your installation, updating the default sampling reference to fit your needs is the way to go. You may not even have to do that if it already suits you.

- If you plan on having various data management policies across your installation for whatever reasons (differences in local legislation or preferences on energy consumption data storage), then you can update the default sampling reference and create others. It is not advised to keep a sampling reference you are never going to call upon.

Refer to §7.2 for more details about sampling references and their application.

2.3.2. Configure sources of electrical energy

Sources not only determine the origin of electrical energy, they are also the basis of costs computation. When a product is associated with a source, the energy it monitors is valued following the pricing schedule of that source.

What you need to do in this interface is create at least **one source of type Grid for each of the currencies in use within your installation**. This is necessary for site creation.

After that, you are advised to prepare a source for each one you are using across your installation, with the correct source type and currency.

You do not have to input pricing schedules right away; they can be entered later.

Refer to §3.3 for more details about source management and how to make them available to be monitored energy-metering by products.

Refer to Chapter 9 for more details about pricing schedules and the associated computation of costs.

2.3.3. Configure the reasons for energy consumption

Usages are pertinent for data exploitation.

- If the list of predefined usages already present in agardio.manager is enough for the needs of your installation, you don't need to do anything in this interface.

- If you are interested in a more detailed definition of usages (for example to make the distinction between various processes or motors), you should create them in anticipation of product configuration further down the road.

Refer to §3.1 for more details about the management of usages.

2.3.4. Configure the types of spaces which consume electrical energy

Zones categories are pertinent in data exploitation. They are used to gather several zones together.

- If the list of predefined zone categories is enough for the needs of your installation, you don't have to do anything in this interface.

- If you are interested in a more detailed definition of zone categories (for example to distinguish several types of offices or storage spaces), you should create them in anticipation of building configuration further down the road.

Refer to §3.2 for more details about the management of zone categories.

2.3.5. Reflect your installation structure

In stream, the installation structure is represented with 3 main levels:

- Sites
- Buildings
- Floors and rooms

Sites can also be gathered in directories, but that is optional as well as available later during configuration. Unless you already have a very structured vision of your overall installation, you don't need to come up with one right away.

What you need to do here is create **sites** and then **buildings** within those sites, in order to be able to instantiate your agardio.manager devices later.

You are not obligated to create floors and rooms inside your buildings right away, although you are advised to do so in anticipation of product configuration.

Refer to Chapter 4 for more details about the management of your installation structure.

> Installation structure is also used to enforce restrictions on permission, as explained in Chapter 15.

2.3.6. Manage your agardio.manager devices

Once all the buildings monitored by agardio.manager devices exist in your installation structure, you can start instantiating those devices.

- If your devices have been online for some time already, then you most likely want to integrate their configuration and associated data. In this case, there is no need to input any product configuration in stream before connection. This saves product creation time.

- If your devices are brand new, you have two choices, depending on your preference in terms of product configuration input:
   - If you are more comfortable with an installer locally entering it before connection to stream, then you should retrieve this configuration, and don't need to input it in stream.
   - If you are more comfortable with preparing the product configuration of your device before it is even online and before connecting stream to it, then overwriting is the way to go.

Product configuration preparation is especially interesting when you are expected to initialise several agardio.manager devices. The process is centralised in one interface instead of several, having to manually connect to the web server of each device.

Refer to Chapter 5 for more details about the management of your agardio.manager devices in stream, Chapter 6 for more details about the management of their products, and §7.1 for the management of the services provided by these products.

2.3.7. Enter a SMTP server

For stream to be able to notify anyone via email (of event occurrences as well as data report generation), a SMTP server has to be configured. The default configuration is not valid.

Refer to §12.1.1 and §12.1.2 for more details about the configuration of a SMTP server for stream.

2.3.8. Set recipients for event reports

By default, stream comes with 2 reports:

- One for system events, regarding IT and hardware

- One about process events, regarding monitored variations in measurements (which is of little use until such alarms have been configured, but whose recipients should nevertheless be configured in anticipation)

The point of going through this interface right away is to pre-establish the recipient of email notifications about each type of events.

1. Select the report.
2. Get to **Publication**.
3. **Modify** email publication settings.
4. Add as many recipients as you see fit.
5. Save.

Refer to §12.4 for more details about report configuration,§12.2 for their FTP storage, and §12.1.3 for their email publication.

3. Contextualising your energy consumption

Any gathered data is only ever interesting in context. For this reason, stream requires you provide it with:
- The reasons why electrical energy is consumed in your installation, as **usages**.
- The types of places it is consumed in, as **zone categories**.
- Where it comes from in the first place, as **sources**.

stream also allows the configuration of custom groups of energy-metering products you wish to gather according to a logic of your own. These groups are called **meshes**, in reference to a concept used for the load-shedding of electrical equipment.

All this allows stream to represent your energy consumption in context.
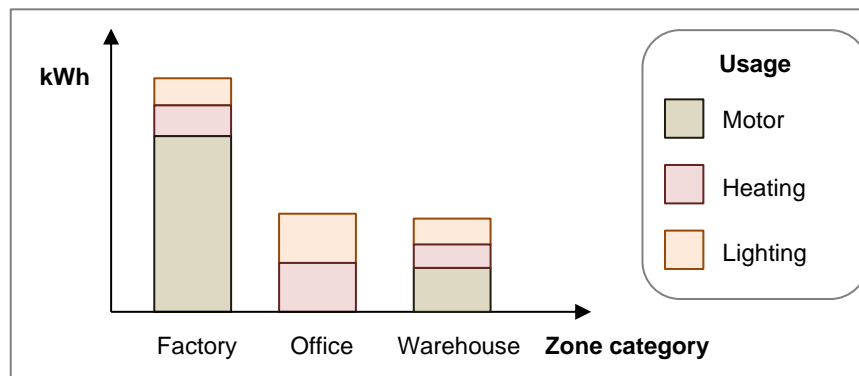

Figure 8 - Example of energy consumption in context

3.1. Usages

3.1.1. Consult your available usages

Usages represent the various reasons for electrical energy consumption.

1. Log in with an account with Global configurator permission (at least).
2. Get to **Configuration**.
3. Get to **Elements**.
4. Get to **Usages**.

stream comes with a list of predefined usages which cannot be removed or updated. These 10 basic usages ensure continuity with agardio.manager devices, which also have those same 10 usages by default.

3.1.2. Create a custom usage

Custom usages can be created to better match the reality of the reasons for electrical energy consumption across your installation.

1. **Add usage**.
2. Enter a unique usage name.
3. Save.

Where agardio.manager software only allows a fixed number of custom usages, due to the limited perimeter it can monitor as well as its limited storage capacity, stream is not restricted in that regard.

3.1.3. Update a custom usage

Usages appear in runtime and are called upon during product configuration, so their names should be relevant.

No worries, when a usage is updated, it remains associated to all the products it is associated with.

1. Select the usage you want to update.
2. Make the changes you want to make, staying within the constraint of usage name uniqueness.
3. Save.

3.1.4. Remove a custom usage

Keeping unused custom usages in your usage list has no other impact than taking up a little space on your database server and being confusing when associating a product to a usage.

To avoid these consequences however small, when a custom usage is not associated with any product, it can be removed.

1. Click the bin icon 🗑 next to the usage you want to remove.
2. Confirm.

3.2. Zone categories

3.2.1. Consult your available zone categories

Zone categories represent the various types of spaces where energy is consumed across your installation. They are associated with the floors and rooms for which energy consumption is monitored.

1. Log in with an account with Global configurator permission (at least).
2. Get to **Configuration**.
3. Get to **Elements**.
4. Get to **Zone categories**.

> stream comes with a list of predefined zone categories, to get you started, but you are free to use them or remove them from the list.

3.2.2. Create a zone category

Zone categories can be created to better match the reality of the types of spaces in your installation which consume electricity.

1. **Add zone category**.
2. Enter a unique zone category name.
3. Save.

3.2.3. Update a zone category

Zone categories appear in runtime and are called upon during floor and room configuration, so their names should be relevant.

No worries, when a zone category is updated it remains associated to all the floors and rooms it is associated with, and by extension all the products it is indirectly associated with.

1. Select the zone category you want to update.
2. Make the changes you want to make, staying within the constraint of zone category name uniqueness.
3. Save.

3.2.4. Remove a zone category

Keeping unused zone categories in your list of zone categories has no other impact than taking up a little space on your database server and being confusing when associating a floor or room to a zone category.

To avoid these consequences however small, when a zone category is not associated with any floor or room, it can be removed.

1. Click the bin icon 🗑 next to the zone category you want to remove.
2. Confirm.

3.3. Sources

3.3.1. Consult your available sources

Sources represent the various origins of electrical energy in your installation.

You should create as many sources as you have across your installation, with the correct type and currency, so as to be able to manage each of their pricing schedules accordingly.

See Chapter 9 for explanations on pricing schedule configuration and associated cost computations.

1. Log in with an account with Global configurator permission (at least).
2. Get to **Configuration**.
3. Get to **Elements**.
4. Get to **Sources**.

3.3.2. Declare a source

1. **Add source**.
2. Enter a unique source name.
3. Pick a type of source.
4. Pick a currency.
5. Save.

The currency of a source is not only important so its computed costs are expressed in the correct currency, but also for its affectation to a site. Sites have a currency and can only use sources of that currency.

3.3.3. Update a source

If you want to update the type and/or currency of a source, make sure:

▪ The source is not associated with a site.

▪ No costs have been computed for it.

This last precaution is there to ensure traceability of computed costs.

Pricing data – meaning costs and carbon footprint computations – is preserved for 20 years.

1. Select the source you want to update.
2. **Modify**.
3. Make the changes you want to make, staying within the constraint of source name uniqueness.
4. Save.

3.3.4. Remove a source

If you want to remove a source, make sure:

- The source is not associated with a site.
- No costs have been computed for it.

This last precaution is there to ensure traceability of computed costs.
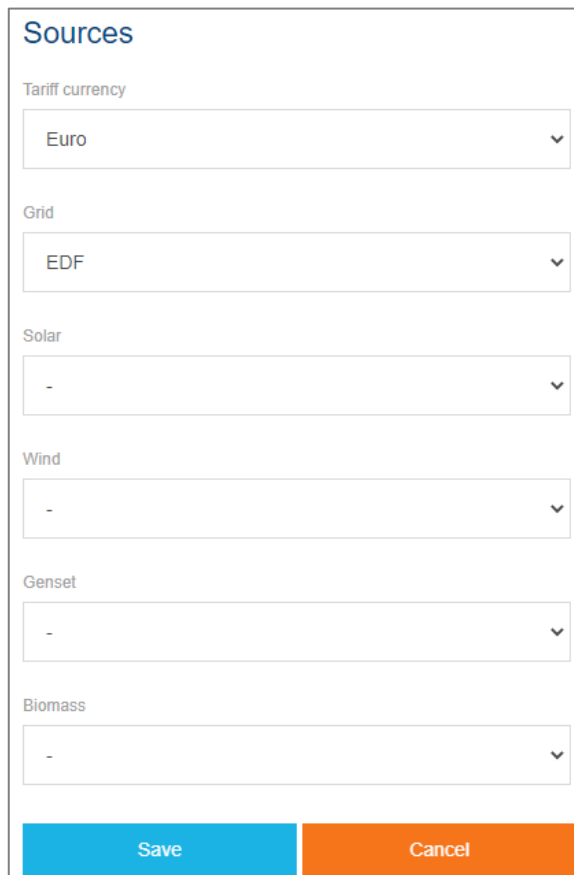
🛈 Pricing data – meaning costs and carbon footprint computations – is preserved for 20 years.

1. Click the bin icon 🗑 next to the source you want to remove.
2. Confirm.

3.3.5. Make a source available

When you want to declare a product as monitoring a source, you first have to associate that source with the corresponding site.

1. Get to **Configuration**.
2. Get to **Structure**.
3. Select the concerned site.
4. **Modify** its sources.

Figure 9 – Declare which sources of electrical energy are being used in a site

5. In case the selected currency is not the correct one, change that selection.
6. Select the desired source in the dropdown list of its type.
7. Save.

Because a single site is unlikely to use more than one source of the same type, a site can only be associated with one source of each type.

This association can also be performed at site creation. This is why it is advised to prepare sources before getting to installation structure configuration.

3.3.6. Replace a source with another of same type

If you ever change energy provider or local energy source for a given source type, and you do not wish to make the currently configured one evolve to match the new one (which would indeed create a break in data continuity), you can replace the current source with the new one of the same type in each affected site. Follow the same steps as listed in §3.3.5.

Any product within the concerned site declared as monitoring the previous source is automatically registered as monitoring the new one. The replacement is completely transparent in that regard. This means that, unless you have changed your monitoring architecture as well as your energy provider or local energy source, no action is required in product configuration.

In order to replace a source of a given type by one of different type, associate them both to the site, and then go to product configuration to associate every product monitoring the previous source to the source of the new type.

See §6.2.1 for the configuration of energy-metering products associated with an entry of the electrical network.

3.3.7. Declare a source obsolete

If a source ever becomes obsolete in your installation, you have the option to prevent it from being associated with products, so as to avoid erroneously accumulating any costs on it.

You have 2 options:

- In case no source of the same type is envisioned to replace this one, you can remove it from all the sites that refer to it. This can however only be done after all associated products have been dissociated from it, and cannot be done for a source of type Main Grid.

A Main Grid source is mandatory for a site, seeing as a postal address cannot be defined without being attached to the electrical network.

1. Get to **Configuration**.
2. Get to **Structure**.
3. Select the concerned site.
4. **Modify** its sources.
5. Select no source for the concerned source type (except Main Grid).
6. Save.

- In case the type of source remains available but you have changed energy provider or local energy source, you can replace the source with another of the same type and currency in every site it is associated with.

1. Get to **Configuration**.
2. Get to **Structure**.
3. Select the concerned site.
4. **Modify** its sources.
5. Select the new source in the dropdown list of its type.
6. Save.

3.4. Meshes

3.4.1. Understand meshes

Meshes are meant to gather energy-metering products in groups of custom significance.

Examples: meshes can be groups of products monitoring similar usages and/or zones of similar zone category, such as lighting in offices and open spaces, and motors in factories.
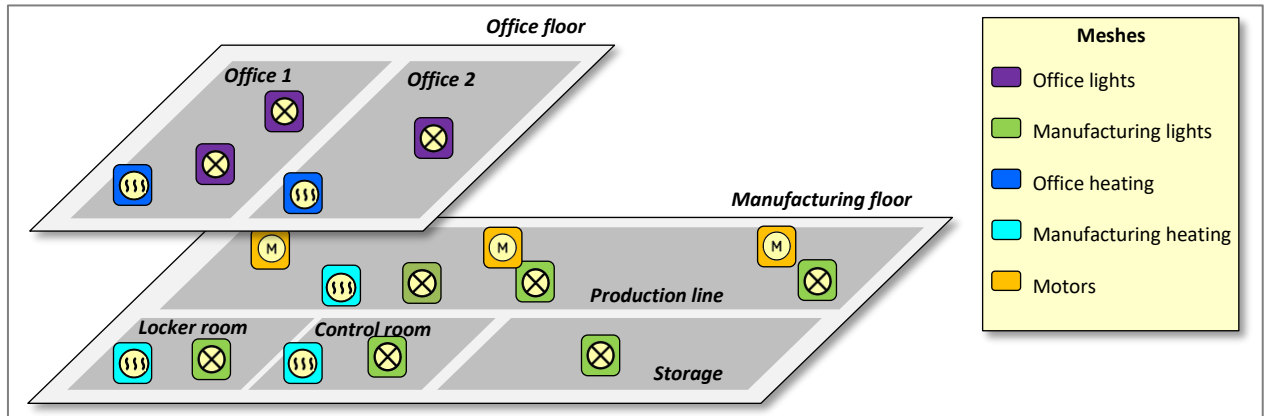
Figure 10 - Meshes reflecting usage per floor

Meshes can also regroup energy-metering products at every level of the monitoring architecture, so as to be able to represent lack of energy monitoring all along the electrical network, from sources to loads.

Meshes can also be used to represent the responsibility of energy consumption, in case several tenants or services occupy various parts of the same building.

3.4.2. Consult your defined meshes

In stream, meshes are managed at the site level.

1. Get to **Configuration**.
2. Get to **Structure**.
3. Select the site in which you want to handle custom groups of products.

3.4.3. Add a mesh

1. **Add mesh**.
2. Enter a unique mesh name among meshes of the site.
3. Save.

Example:

- If you have chosen to use meshes to gather products across monitored usages and zone categories, you can name your meshes something along the lines of:
    o "Lighting x Offices"
    o "Motor x Factories"
    o "Socket x Offices"
    o "Heating x Offices"

- If you have chosen to use meshes to gather products across levels of your electrical structure, you can name them along the lines of:
  - o "Origin products"
  - o "First layer"
  - o "Second layer"
  - o "Loads"

- If you have chosen to use meshes to gather various long-term tenants of a building, you can name them in accordance.

3.4.4. Update a mesh

Meshes appear in runtime and are called upon during product configuration, so their names should be relevant.

No worries, when a mesh is updated it remains associated to all the products it is associated with.

1. Select the mesh you want to update.
2. Make the changes you want to make, staying within the constraint of name uniqueness among meshes of the site.
3. Save.

3.4.5. Remove a mesh

Keeping unused meshes in your list of meshes has no other impact than taking up a little space on your database server and being confusing when associating a product to a mesh.

To avoid these consequences however small, when a mesh is not associated with any product, it can be removed.

Only meshes which are not associated with any product can be removed.

1. Click the bin icon 🗑 next to the mesh you want to remove.
2. Confirm.

4. Reflecting your installation structure

Any gathered data is only ever interesting in context. For this reason, stream requires a spatial and organisational representation of your installation.

Figure 11 – stream installation structure representation

In bold in the figure above are the elements of the structure also used for navigation on top of context.

The first steps to any intervention on your installation structure are:
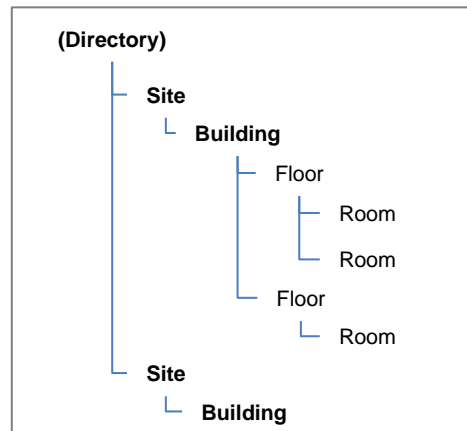
1. Log in with an account with any Configurator permission (at least).
2. Get to **Configuration**.
3. Get to **Structure**.

> Only users with the Global configurator permission can create directories and sites at the root of the installation. This means that when a user only has local permission(s) on a site or site(s), they cannot create a directory. Because sites only contain buildings.

4.1. Directories

Directories are optional containers which allow you to organise your installation structure as you please. Their main impact is on navigation, both during configuration and exploitation.

They also play a part in privilege enforcement, as explained in Chapter 14.

4.1.1. Create a directory

- In case you wish to create a directory at the root of your installation (which requires your account to have the Global configurator permission, at least):
  a. Click "**Add site / directory at the root**".
  b. Click "**Add new directory**".
- In case you wish to create a directory within another directory (which requires your account to have the Global and/or Local configurator permission on the directory, at least):
  a. Select the directory you want to create a directory in.
  b. Click the + sign.
  c. Click "**Add new directory**".
1. Enter a unique directory name.
2. Save.

4.1.2. Update a directory

Because directories are used in navigation, their name has to be meaningful. As long as your account has either Global and/or Local configurator permission on a directory, you are free to update it.

> When your account has Local configurator permission on a site in a directory, you can see the parent directory but not update it.

1. Select the directory you want to update.
2. **Modify**.
3. Make the changes you want to make, staying within the constraint of directory name uniqueness.
4. Save.

4.1.3. Move a directory

As your installation structure grows, you might find yourself needing to organise it a little differently. As long as your account has Global configurator permission and/or Local configurator permission on a directory, you have the option to move it around.

> When your account has Local configurator permission on a site or directory inside a directory, you can see the parent directory but not move it. You are also forbidden from moving the site or directory to the root of the installation. Only users with Global configurator permission can move sites and directories to the root.

Any directory can be moved:

- to another directory, as long as it does not already contain it and it is not already there.

- to the root of the installation, as long as it is not already there.

> ⚠ Everything a directory contains is moved along with it. This may have an impact on permissions, so be careful.

1. Select the directory you want to move.
2. **Move directory**.
3. Select where you want to put the directory ("**Move to installation**" or a specific directory).
4. In case you have selected a specific directory, click the "**Select**" button.
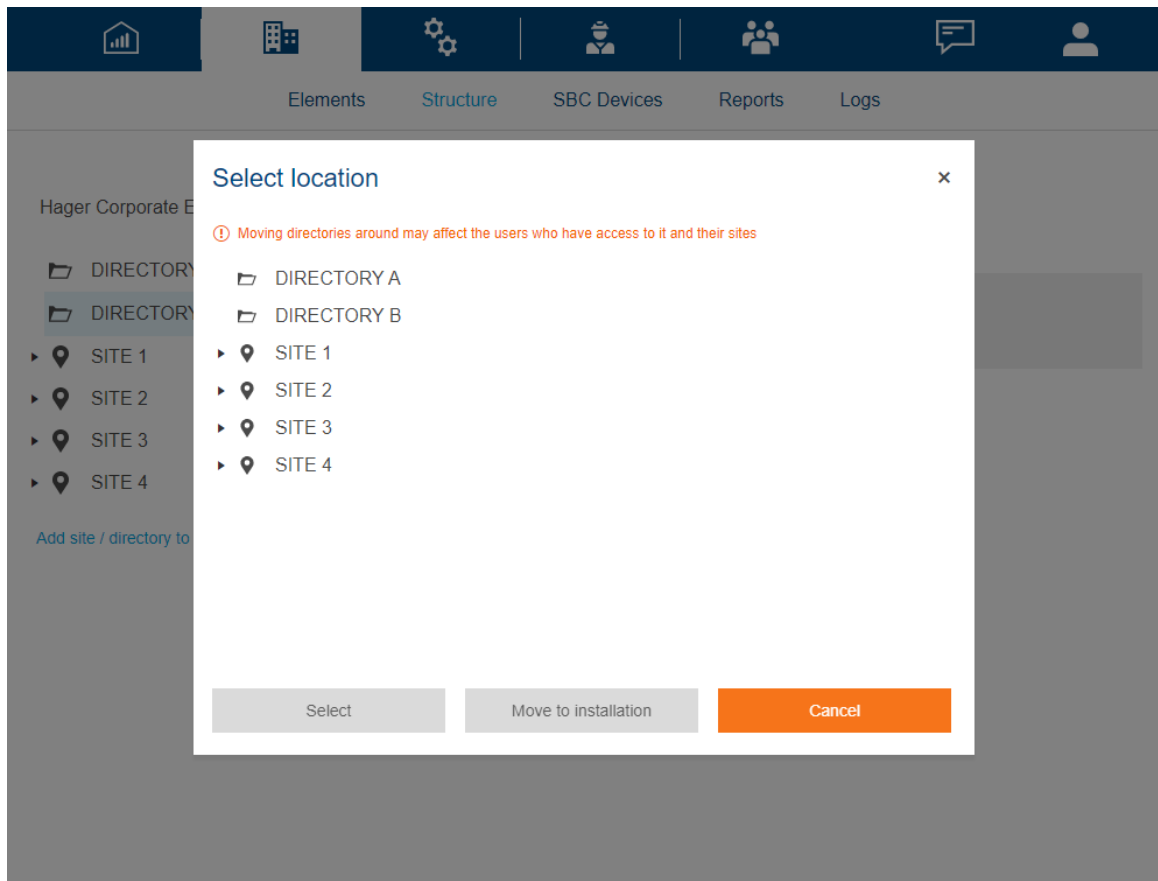
Figure 12 – stream interface for moving a directory

4.1.4. Remove a directory

When you no longer have use for a directory, you can remove it from your installation structure, as long as your account has Global and/or Local configurator permission on that directory.

> When your account has Local configurator permission on a site in a directory, you can see the parent directory but not remove it.

Only directories which do not contain anything besides other directories can be removed.

1. Select the directory you want to remove.
2. Click the "**Delete directory**" button.
3. Confirm.

4.2. Sites

Sites are meant to contain buildings within a geographical perimeter of some unity (same **time zone**, same address, same **language**, etc.). They are elements of installation structure navigation both in configuration and exploitation.

Sites also play a part in privilege enforcement, as explained in <u>Chapter 14</u>.

Sites are associated with a **sampling reference**, which is why it is advised to configure all the sampling references you might need before the installation structure.

Sites are also associated with a **currency** and **sources**, which is why it is advised to configure all your sources with the correct currency before entering your installation structure.

> stream only allows one source of each type per site. This means one main grid energy provider, one wind power provider, one solar energy provider, and so on for each of the five types of energy source handled by stream. Keep this in mind when defining your sites.

> stream requires each site to be associated with a Main Grid source. Other types of sources are optional, but this one is mandatory.

Most direct parameters of a site are purely informative and have no impact beyond that site, except:

- Site name, which is present in navigation, both in configuration and exploitation.
- Site time zone, time synchronisation method, language, and sampling reference, which are propagated to all agardio.manager devices within that site.
- Site time zone also has an impact on which products can appear together with the products of that site in a data report, as explained in §12.4.2.
- Zip code, country, and ISO 3166-2 country code, which are necessary for proper temperature sample retrieval through Hager Weather service.

> The ISO 3166-2 country code for France is FR, the one for Germany is DE, and the one for Switzerland is CH.

4.2.1. Create a site

- In case you wish to create a site at the root of your installation (which requires your account to have Global configurator permission, at least):
  a. Click "**Add site / directory at the root**".
  b. Click "**Add new site**".
- In case you wish to create a site within a directory (which requires your account to have Global and/or Local configurator permission on the concerned directory, at least):
  a. Select the directory you want to create a site in.
  b. Click the + sign.
  c. Click "**Add new site**".
  1. Enter a unique site name.
  2. Select the correct time zone.
  3. If there is more than one sampling reference in your installation, select the correct one.
  4. Select the correct currency.

5. For each type of source, select the one which is available within that site. There might be no source of a type, except Main Grid. Sources declared here are the ones which are available to be monitored by the products attached to a building of the site.
6. Save.

4.2.2. Update the details of a site

Because sites are used in navigation, their name has to be meaningful. As long as your account has either Global and/or Local configurator permission on a site, you are free to update it.

1. Select the site you want to update.
2. **Modify**.
3. Make the changes you want to make, staying within the constraint of site name uniqueness.
4. Save.

4.2.3. Update the currency of a site

A change in currency for a site should not happen very often. The most likely scenario is that the site was first created in the default currency and it needs to be updated to the correct one. At this point impact and constraints should remain limited, because agardio.manager devices probably have not been declared within the site yet, which means no products have been associated with sources.

Whatever happened to make you want to change the currency of a site (human error or actual change in currency for a country), the first thing you need to do is prepare the sources the site is using in its desired currency. After that:

1. Select the site you want to update.
2. **Modify** its sources.
3. Select the new currency you want to be using for that site.
4. In case there is more than one Main Grid source for the selected currency, select the one the site is using.
5. If any product within the site is already declared as monitoring a source of any other type than Main Grid, select the source of each type that the site is using.
6. Save.

4.2.4. Move a site

Any site can be moved:

- to a directory, as long as it is not already in it.

- to the root of the installation, as long as it is not already there.

⚠ Site displacement has impact on navigation and privileges enforcement (Chapter 14).

1. Select the site you want to move.
2. **Move site**.
3. Select where you want to put the site ("**Move to root**" or a specific directory).
4. In case you have selected a specific directory, click the "**Select**" button.

4.2.5. Remove a site

Only sites which do not contain any building can be removed.

⚠️ When a site is removed, any weather data gathered for it is removed.

1. Select the site you want to remove.
2. Click the "**Delete site**" button.
3. Confirm.

4.3. Buildings

Buildings belong to sites. A building is a perimeter monitored for its energy, and an element of installation structure navigation both in configuration and exploitation.

4.3.1. Create a building

1. Select the site you want to create a building in.
2. Click the + sign.
3. Enter a unique building name among buildings of the site.
4. Save.

4.3.2. Update a building

1. Select the building you want to update.
2. **Modify**.
3. Make the changes you want to make, staying within the constraint of name uniqueness among buildings of the site.
4. Save.

4.3.3. Remove a building

Only buildings which do not contain any agardio.manager device can be removed.

All floors and rooms of a building are removed along with it, as well as its EIEC score and its configuration.

1. Select the building you want to remove.
2. Click the "**Delete building**" button.
3. Confirm.

4.4. Floors and rooms

Floors and rooms have a zone category, which is why it is advised to configure zone categories before the installation structure.

Floors and rooms are monitored for their energy consumption by energy-metering products, which is why it is advised to configure them before getting to the management of agardio.manager devices, whether you plan on preparing their product configuration or retrieving it.
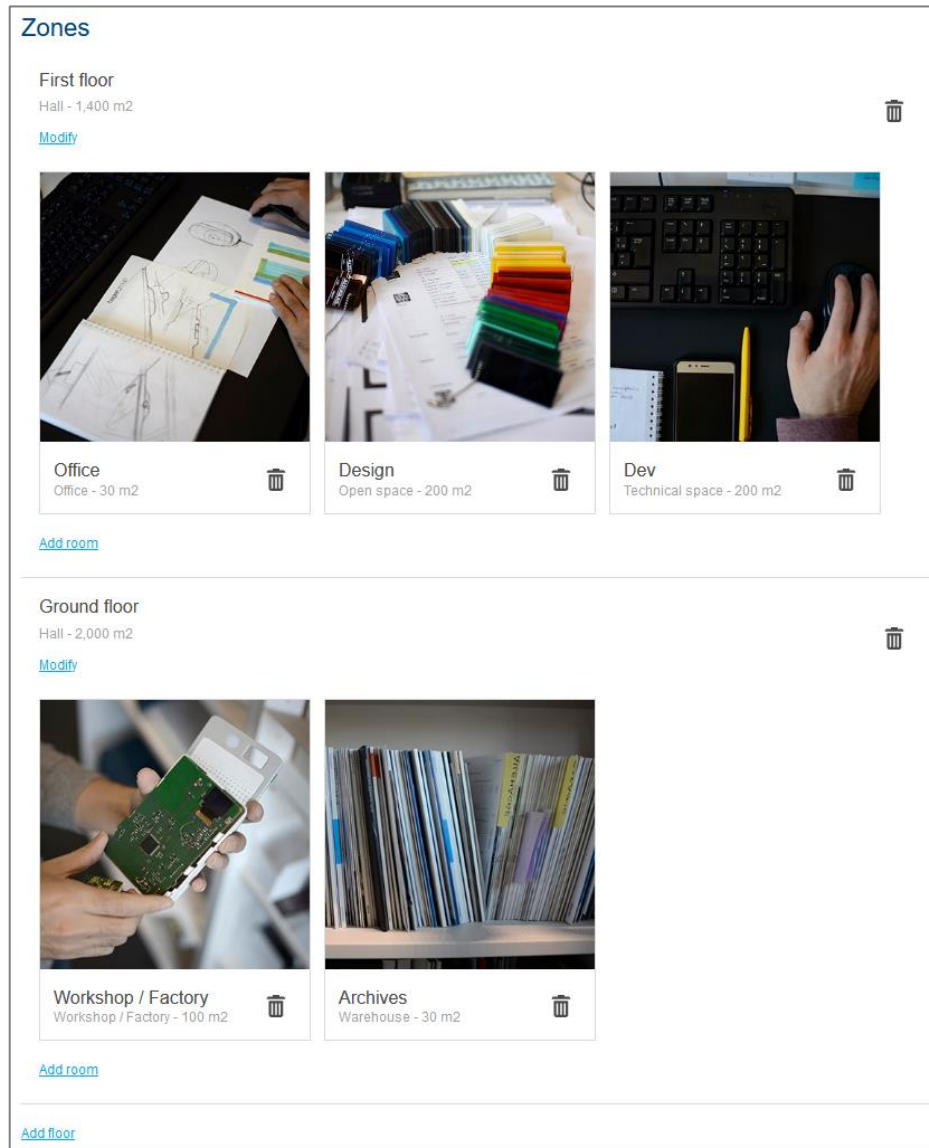

Figure 13 - Overview of the floors and rooms of a building

4.4.1. Create a floor

Floors can be created in buildings.

1. Select the building you want to add a floor to.
2. **Add floor**.
3. Enter a unique zone name among zones of the building.
4. Save.

4.4.2. Create a room

Rooms can be created in floors.

1. Select the building you want to add a room to.
2. Inside the floor you want to create a room in, **Add room**.
3. Enter a unique zone name among zones of the building.
4. Save.

> Rooms cannot be created at the root of buildings like they could be in agardio.manager.

4.4.3. Update a room

Rooms appear in runtime and are called upon during product configuration, so their names should be relevant. Also, their zone category is used for data aggregation in runtime.

No worries, when a room is updated it remains associated to all the products it is associated with.

1. Select the building in which the room you want to update is.
2. Click the room.
3. Make the changes you want to make, staying within the constraint of name uniqueness among zones of the building.
4. Save.

4.4.4. Update a floor

Floors appear in runtime and are called upon product configuration, so their names should be relevant. Also, their zone category is used for data aggregation in runtime.

No worries, when a floor is updated it remains associated to all the products it is associated with.

1. Select the building in which the floor you want to update is.
2. **Modify** the floor.
3. Make the changes you want to make, staying within the constraint of name uniqueness among zones of the building.
4. Save.

4.4.5. Remove a room

Only rooms which are not associated with any product can be removed.

1. Select the building from which you want to remove a room.
2. Click the bin icon 🗑 next to the room you want to remove.
3. Confirm.

4.4.6. Remove a floor

Only floors which do not contain any room and are not associated with any product can be removed.

1. Select the building from which you want to remove a floor.

2. Click the bin icon 🗑 next to the floor you want to remove.
3. Confirm.

5. Handling your agardio.manager devices

agardio.manager devices are the primary data collectors for stream. They communicate with products from which they retrieve measurements. Those measurements are mainly about electrical energy but can also be about all sorts of adjacent data pertaining to the electrical network, such as voltages, currents, powers, etc.

1. Log in with an account with any Configurator permission (at least).
2. Get to **Configuration**.
3. Get to **agardio.manager devices**.

5.1. agardio.manager device connection

5.1.1. Instantiate an agardio.manager device

Because an isolated agardio.manager device is intended to monitor part of a building or a small building at most, in the context of stream, agardio.manager devices are gathered under buildings. This helps locate them, and it is the reason why it is advised to configure the installation structure before agardio.manager devices.
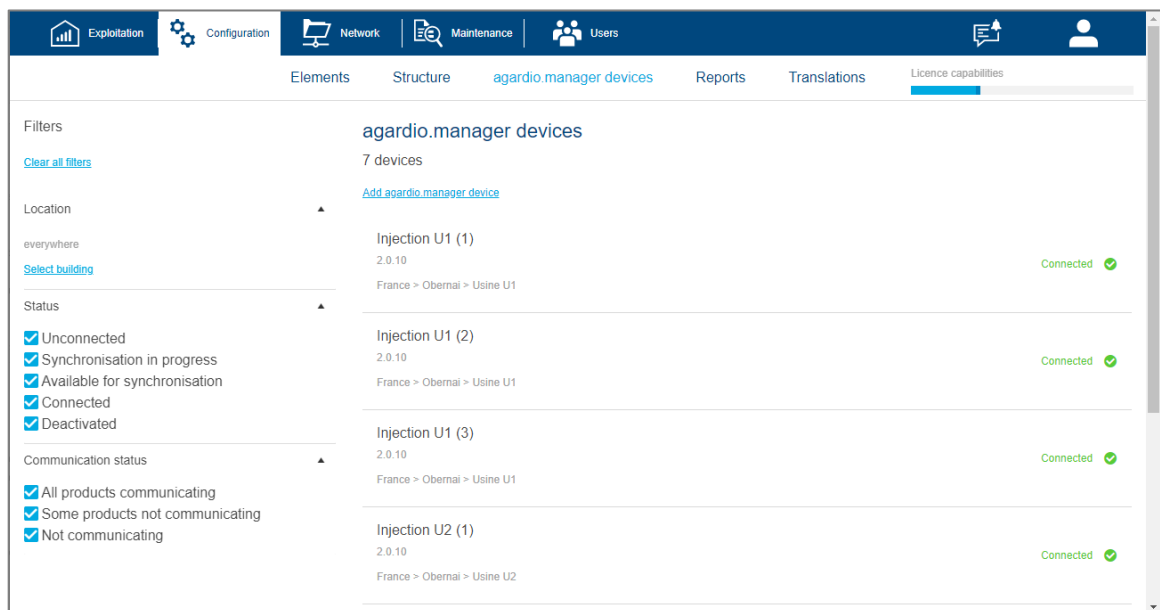
1. **Add agardio.manager device**.

Figure 14 – Management interface for agardio.manager devices

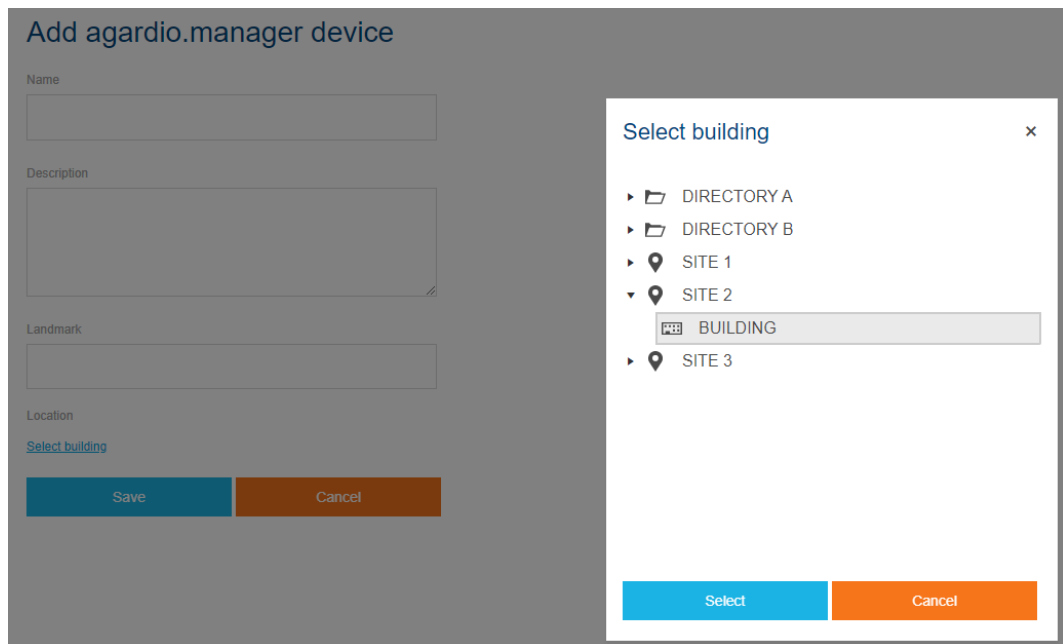2. Enter a unique agardio.manager device name.
3. **Select building**.

Figure 15 – agardio.manager device location selection interface

4. Select a building in the installation structure.
5. Click the "**Select**" button.
6. Save.

5.1.2. Connection settings

Connecting an agardio.manager device in any way requires its connection settings to have been entered. Before then, no connection attempt can be made. After their very first entry, they can be updated at any stable time in the lifetime of the device, to ensure its first connection, prevent any loss of communication, or make its reactivation or replacement possible.

> ⚠ An agardio.manager device in Setup mode can be connected to stream, but stream will not be able to retrieve any measurement data from it. For proper measurement data acquisition and storage by stream, an agardio.manager device needs to be in Normal mode. Refer to the *agardio.manager user manual* to learn about modes and how to switch between them.

5.1.2.1. Hostname and port

Enter the IP address or hostname at which your device can be reached, along with the corresponding HTTP port.

> ℹ Don't forget to consider your network configuration, including firewalls, routers, and proxies.

5.1.2.2. Login and password

The login and password of a local administrator on the device are required to connect to it.

ℹ It is highly recommended to use a dedicated account, to avoid any unwanted demotion, removal, or password update. All these scenarios lead to loss of communication with the device as far as its configuration is concerned.

5.1.3. Retrieve agardio.manager configuration and data

Your agardio.manager device may have had a life of its own before you brought stream to your installation. It may also, although new, have already been locally configured right after being set up. In either of these cases, what you want to do is retrieve the existing local configuration and any stored data associated with it.
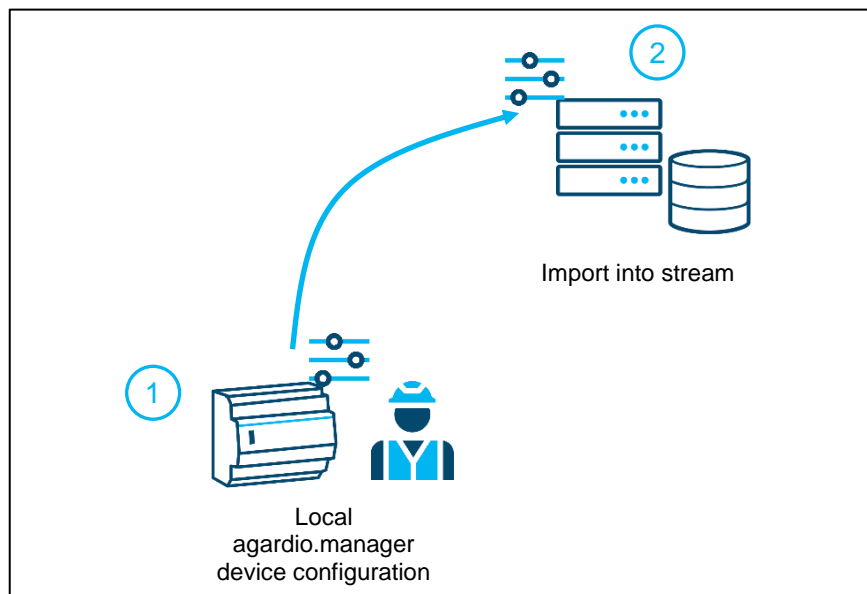
Figure 16 – Retrieval of the local configuration

1. Select the desired unconnected agardio.manager device.
2. Click the "**Connect**" button.
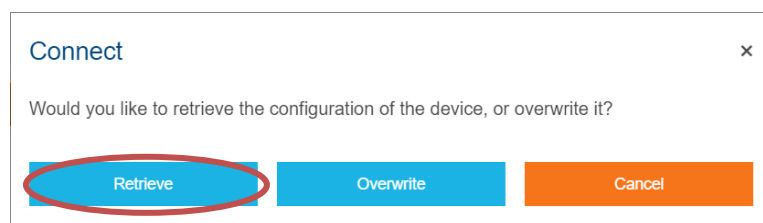
Figure 17 – agardio.manager device connection options

3. Choose to "**Retrieve**" local agardio.manager configuration.
4. Confirm.
5. Wait for configuration retrieval to be over.

ℹ The retrieval process might take up to a few minutes, depending on the number of products configured on the device.

At this point, you have the option to tinker with device configuration. This is useful in case something strikes you as odd and you want to fix it before finalising connection. It may also be a good idea to get a head start in terms of product associations (source, usage, zone, mesh), and process alarm configuration (see §12.3).

Symbol	Product state
🔵	Retrieved product.
⊘	Retrieved product set to be removed from the device upon connection.
	Product newly created among retrieved products, before or after their retrieval.

Table 1 - State of products on a retrieved device

When selecting an imported product, its configuration in agardio.manager in terms of zone, usage, and source is available as reference, to make its integration to stream easier.

When an energy-metering product had a zone, usage, or source configured on agardio.manager before being retrieved in stream, each of the concerned fields is marked with a 🔵. Hovering over that blue dot provides the label. This way, if the corresponding zone, usage, or source is not available yet in stream (zone not configured in the building of the device yet, custom usage not created, or no source of that type associated with the site of the device), then you have the opportunity to create it before coming back to product configuration and entering the same one as in agardio.manager.
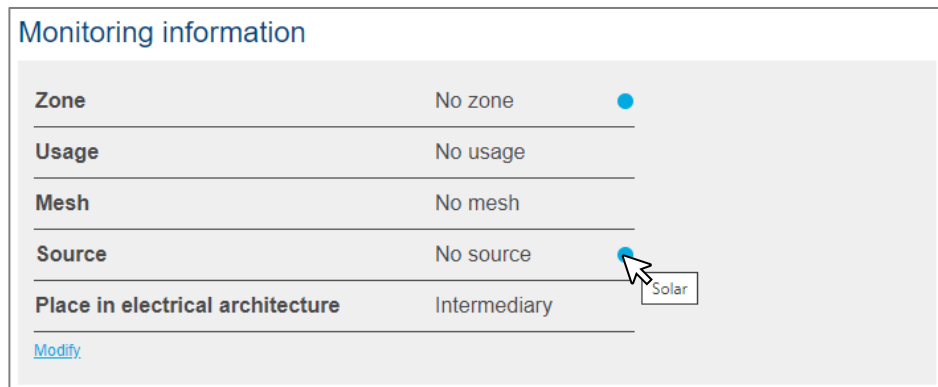
Figure 18 - Visualisation of the monitoring information of a product imported with a zone and source

Figure 19 – Configuration of the monitoring information of a product imported with a zone and source

6. Once you are satisfied with product configuration, click the "**Synchronise**" button.

Figure 20 – agardio.manager synchronisation confirmation interface, with number of products and services, both in total and stored

7. Confirm.

5.1.4. Overwrite agardio.manager configuration

When an agardio.manager first arrives in your installation, it is a blank slate. At this point, you have 2 choices:

- Perform its configuration locally, right after setting it up, and then retrieve it in stream for synchronisation (as seen in §5.1.3).

- Take advantage of stream to prepare your desired configuration before the device is even set up, and push it onto the device after a much quicker install, only putting it on the

Network and in Supervised mode, without any local product configuration. Refer to _agardio.manager user manual_ for how to proceed.
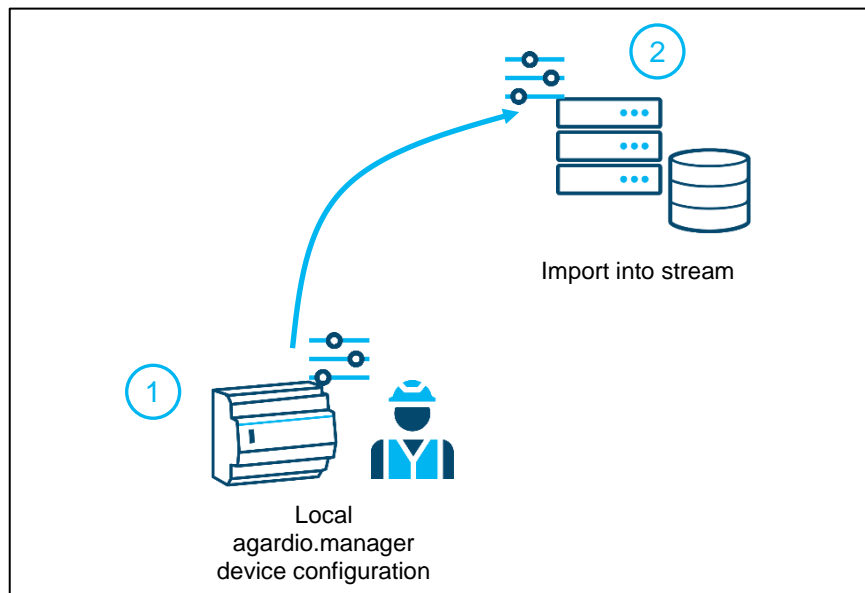
Figure 21 – Overwrite of the local configuration

1. Select the desired unconnected agardio.manager device.
2. Click the "**Connect**" button.
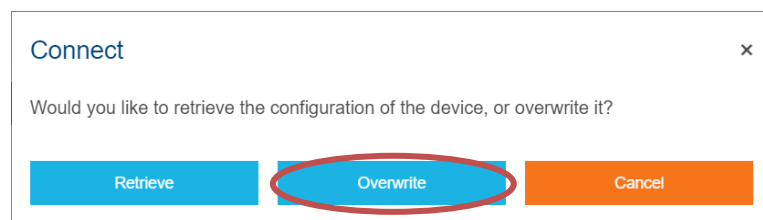
Figure 22 – agardio.manager device connection options

3. Choose to "**Overwrite**" local agardio.manager configuration.
4. Confirm.

5.1.5. Consult past history of agardio.manager device

Whenever an agardio.manager device changes state in stream (connection, deactivation, lock, etc.) or any delay in its stored measurements has been caught up with (due to an import of its configuration and associated data, or a loss of communication), it is logged in its history. This allows understanding any discontinuities in its stored measurements.

1. Select the agardio.manager device you are interested in.
2. Get to **History**.

ℹ️   Traceability of agardio.manager device history is ensured for 5 years.

5.2. Protection against deactivation and removal of agardio.manager

5.2.1. Lock an agardio.manager device

Once an agardio.manager device has been synchronised with stream, you have the option to lock it down to avoid any mishandling. When an agardio.manager device is locked this way, its synchronisation with stream cannot be manually messed with without multiple confirmations; more specifically it cannot be deactivated or removed. Its product configuration however remains available.

1. Select the unlocked connected agardio.manager device you want to protect.
2. Click the "**Lock**" button.

Figure 23 - Unlocked agardio.manager device

5.2.2. Unlock an agardio.manager device

Whenever you need to perform an action on an agardio.manager device which may affect its synchronisation with stream (deactivation or removal), that device has to be unlocked.
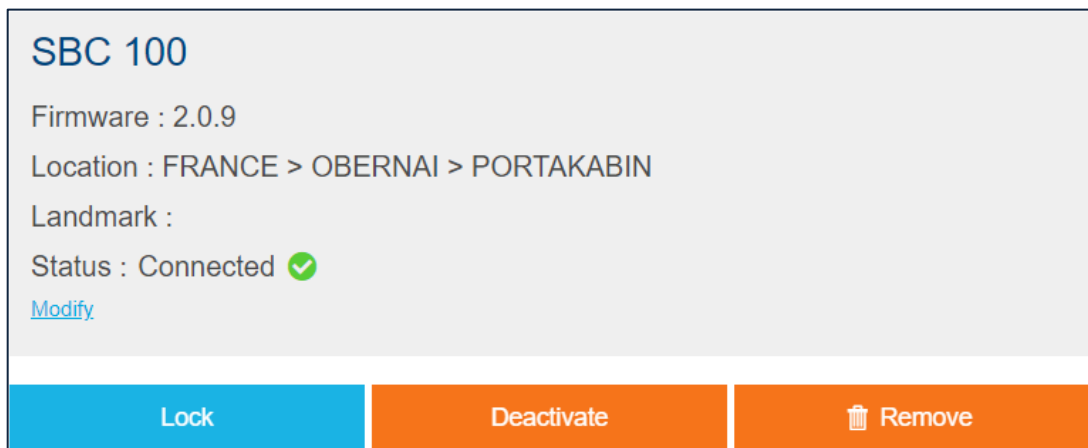
1. Select the locked agardio.manager device you want to unlock.
2. Click the "**Unlock**" button.
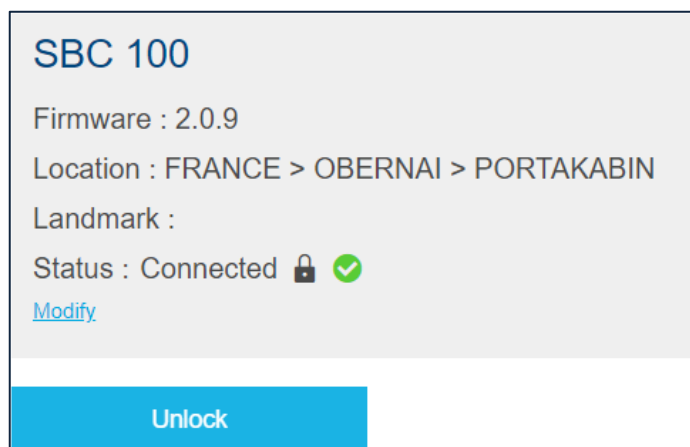
Figure 24 - Locked agardio.manager device

5.3. agardio.manager device deactivation

The very first step to the deactivation of an agardio.manager device is unlocking it, if it is locked. See §5.2.2 for how to proceed.

5.3.1. Temporarily deactivate an agardio.manager device still in service

When a device is undergoing maintenance, you can avoid storing any faulty measurements from it by deactivating it. While a device is deactivated, its configuration and stored data are locked down. More importantly, no new data is retrieved from it, in terms of measurements as well as any local configuration. The device is essentially suspended in time, awaiting reactivation.

1. Select the unlocked agardio.manager device you want to deactivate.
2. Click the "**Deactivate**" button.
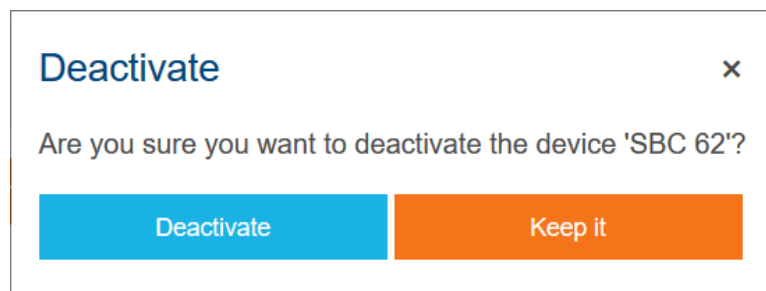
Figure 25 - agardio.manager deactivation confirmation interface

3. Confirm.

5.3.2. Permanently deactivate an out of service agardio.manager device

When you no longer have access to a device for any reason, stream is incapable of communicating with it. Even then, you may want to retain its configuration for reference and all the data stored in connection with it in the past. When in this situation, you can force deactivation.

1. Select the unlocked non-communicating agardio.manager device you want to permanently deactivate.
2. Click the "**Deactivate**" button.
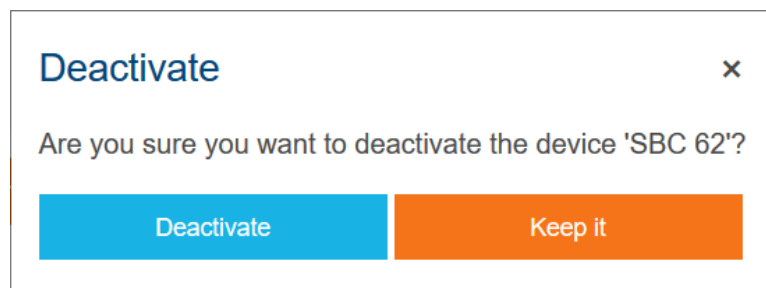
Figure 26 - agardio.manager deactivation confirmation interface
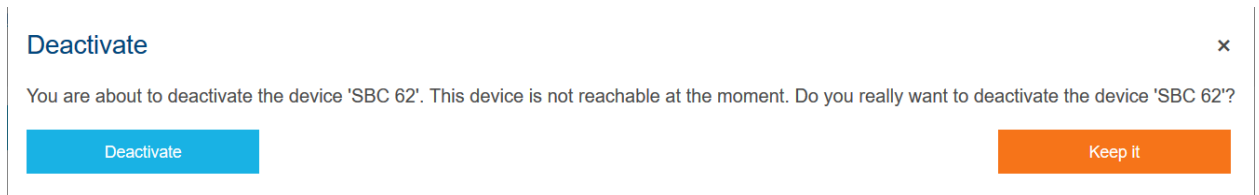
3. Confirm.

Figure 27 – agardio.manager device forced deactivation confirmation interface

4. Confirm.

5.3.3. Reactivate an agardio.manager

A deactivated device can be reactivated when it has been diagnosed and starts working again. When reactivated, it starts gathering data again.

> ℹ️ Any data gathered by the device while it was deactivated is never retrieved in stream. This is the whole point of deactivation; to not store unwanted data.

1. Select the deactivated agardio.manager device you want to reactivate.
2. Click the "**Reactivate**" button.
3. Confirm.

If you want to reactivate a device after its hardware has been replaced, see §5.4.2.

5.4. Hardware replacement of an agardio.manager device

Sometimes agardio.manager hardware needs replacing and is switched out for a different one. When this happens, stream loses the ability to communicate with the device. This is true even if the substitute hardware has been configured at the same address on the network as the one it replaces. This comes from a protection in place based on serial number so as not to send configuration requests to the wrong device by mistake and thus create inconsistencies in synchronisation with stream.

If the substitute hardware has different network and web server settings than the one it replaces, the very first step towards the replacement of the agardio.manager device is to update the connection settings in stream to match those.

> **i** In case the device is activated, communication will not be restored right away after connection settings update. This is normal. Protections are in place so no configuration requests are sent to the wrong device.

5.4.1. Replace an active agardio.manager device

When communication with an agardio.manager device has been lost, stream asks whether that may be due to a new hardware, and offers to replace it.
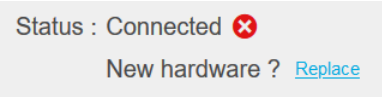
> ⚠ DO NOT perform replacement if your device's hardware has not in fact been replaced! When in this situation, ignore the question and look for the reason behind the loss of communication somewhere else. You can refer to Chapter 16 for diagnosis pointers.
>
> Attempting to replace a device which is not communicating for any other reason than hardware replacement will end in failure. In order to get back on your feet at this point, you have to not only restore communication with the device, of course, but also return it to factory before overwriting its configuration. This means it loses all its locally stored history, including any it had gathered while it was not communicating with stream.

Only perform replacement when:

- The hardware of the concerned device has indeed been replaced.
- That new hardware is indeed on the other end of the configured connection settings.

1. Select the not communicating agardio.manager device whose hardware you know to have been replaced.

Status : Connected ❌
New hardware ? Replace

Figure 28 - Hardware replacement access

2. Click "**Replace**" next to "New hardware?".
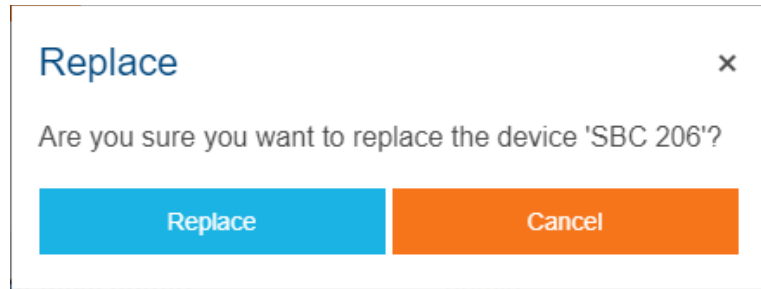
Figure 29 - Device replacement confirmation interface

    3.   Confirm.

5.4.2. Deal with failure of agardio.manager device replacement

If replacement ever fails for any reason, the device is brought back to an unconnected state. At this point, you have to connect it again, and only the option to overwrite the configuration of the target device is available. This allows taking over for failed replacement and ensuring data storage continuity just like it should.

5.5. Configuration of agardio.manager device

5.5.1. Change the Modbus RTU communication settings of an agardio.manager device

The Modbus RTU communication settings of an agardio.manager device can be configured from stream if need be.

> ℹ They are also still available for local configuration, from the device's own web server. When changed there, the update is retrieved by stream within 10 minutes, for reference. This can explain why they may change over time with seemingly no intervention on the stream side.

Modbus communication settings

Baud rate (Bd)	19200	Timeout (s)	0.25
Parity	Even	Retry number	3
Number of stop	1	Data length	8

Modify

Figure 30 – Modbus RTU communication settings in stream

5.5.2. Change the data management policy of an agardio.manager device

The data management policy of an agardio.manager device is imposed by stream through the sampling reference associated with its site.

See §4.2.2 about updating the details of a site.

See §7.2 for details on sampling references.

> ℹ The data management of an agardio.manager device can no longer be configured from its local web server while it is in Supervised mode.

5.6. agardio.manager device removal

Removal of an agardio.manager device is advised when it is no longer relevant to your installation.

A device stops being relevant to your installation when it is no longer gathering data on your behalf - either because it is no longer under your purview or because it has been taken offline -, and when anything which has been retrieved from and in connection with the device in the past no longer concerns you. This encompasses:

- Any history stored for services of its products.
- Any costs and carbon footprint computed for any of its products, including products which have already been removed.
- The history of all process events in connection with its products and their services.
- The history of all system events in connection with it.
- The history of its products (details, commands, and settings).
- Its own device history.

⚠️ When you remove an agardio.manager device, all of the information listed above is removed along with it. Most of it cannot be retrieved when connecting the device a second time, so take your responsibilities when removing an agardio.manager device. Keep in mind removal is final.

When you are no longer using a device for any reason but you wish to preserve its past data, you should deactivate it, as explained in §5.3.

The very first step to the removal of an agardio.manager device is unlocking it, if it is locked. See §5.2.2 for how to proceed.

5.6.1. Remove a reachable agardio.manager

Removing a reachable agardio.manager device, regardless of its activation status, is the cleanest way to free it up to be connected to a new supervisor or to be returned to Standalone mode.

1. Select the unlocked communicating agardio.manager device you want to remove.
2. Click the "**Remove**" button.

Figure 31 - agardio.manager device removal confirmation interface

3. Confirm.

5.6.2. Force removal of an unreachable agardio.manager

When an agardio.manager device cannot be reached by stream, regardless of its activation status, you are still in a position to remove it from your stream system and get rid of its data.
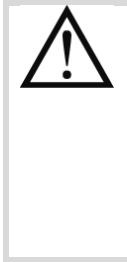
> ⚠ DO NOT force removal unless you are certain that the device which corresponds to the agardio.manager device you are removing will never be reachable again by your stream server. If you force removal for a device which is only temporarily unreachable, its hardware will need to be returned to factory settings before it can be fully exploited again, either on its own or with another supervisor. This entails a complete loss of configuration and associated data.

Forced removal is adapted for a device which has been destroyed or returned to factory already.

1. Select the unlocked not communicating agardio.manager device you want to remove.
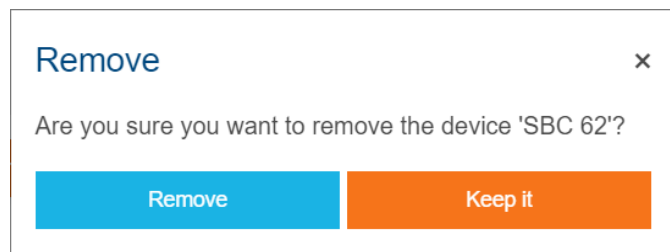2. Click the "**Remove**" button.
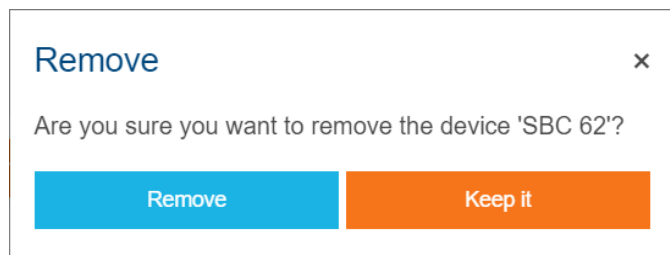
Figure 32 - agardio.manager device removal confirmation interface
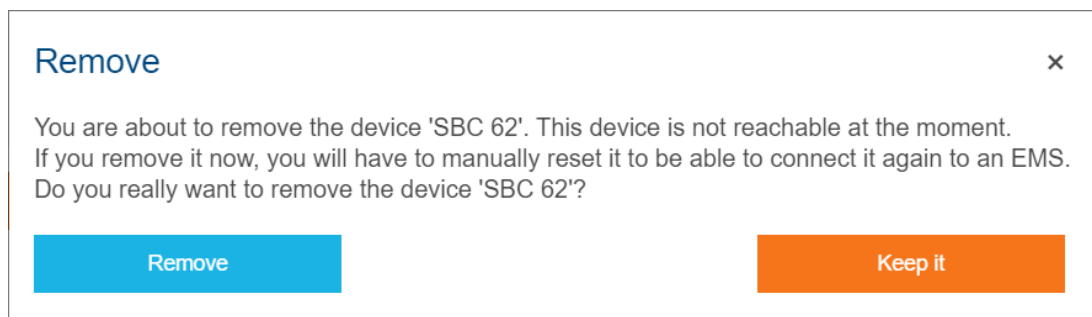
3. Confirm.

Figure 33 – agardio.manager device forced removal confirmation interface

4. Confirm.

6. Dealing with your products

When dealing with your products, the first steps are always as follows:

1. Log in with an account with any Configurator permission (at least).
2. Get to **Configuration**.
3. Get to **agardio.manager devices**.
4. Select the agardio.manager device whose product configuration you want to interact with.
5. Get to **Products**.

6.1. Product management

6.1.1. Know when to manage products

You can manage the products of an agardio.manager device:

- before its connection, including right after its local configuration has been retrieved.
- after its connection, as long as it is communicating.

The main difference is going to be at what point your changes are applied.
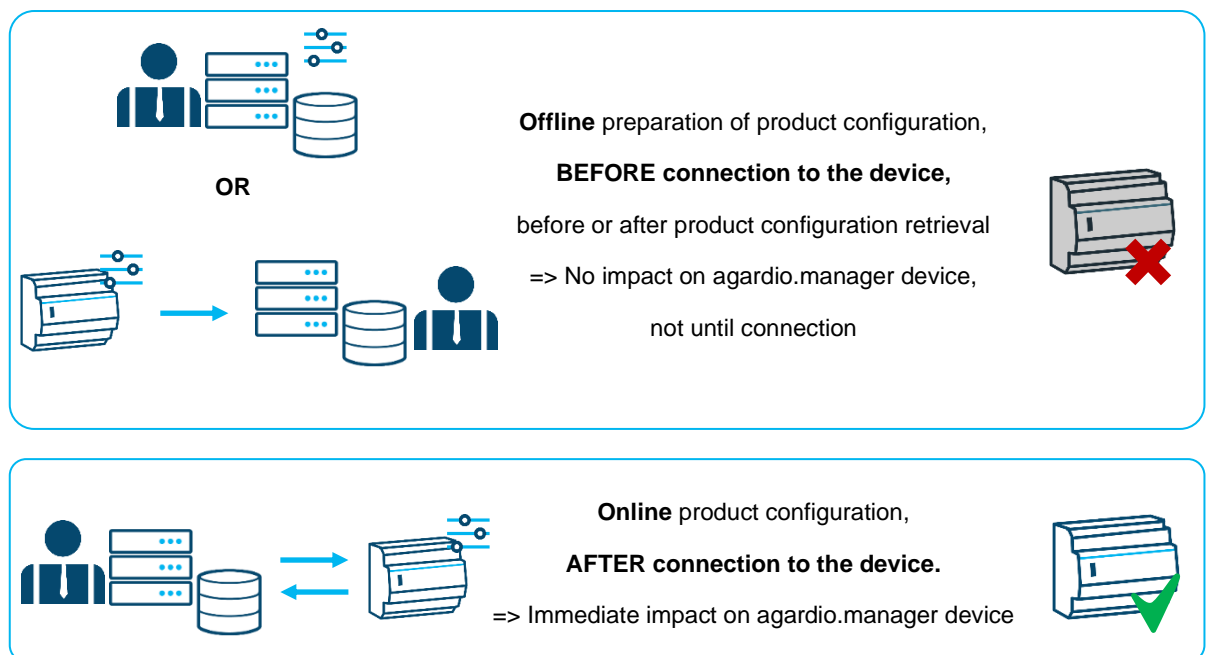
Figure 34 - Offline and online product configuration from stream

- When preparing a product configuration to be deployed on an agardio.manager device (for example because it is not yet installed in its electrical cabinet and/or wired to its products), you are working offline. Because of this, products can be added and removed without any impact on the real-world device. Only products present at the time of connection are actually deployed on the device.

- After having retrieved the product configuration of an agardio.manager, you are only working semi-offline, because any change operated on a product retrieved from the product (update or removal) has an impact upon synchronisation. New and retrieved products, whether updated or untouched, are present on the device after connection,

whereas removed retrieved products are no longer there and any stored history they might have had is lost.

- After agardio.manager device connection, any product configuration action (creation, update, retrieval) immediately impacts the connected agardio.manager device, as long as it can be reached.

ℹ When an agardio.manager device is not communicating, its product configuration is locked. This prevents dyssynchronisation. The same can be said while an agardio.manager is in a transition state or deactivated.

6.1.2. Check available types of products and their capabilities

agardio.manager devices work with a catalogue of products that they are capable of communicating with. If you are ever unsure of what types of products you can declare on your agardio.manager devices, stream has access to its own catalogue.

1. Log in with an account with Global configurator permission (at least).
2. Get to **Configuration**.
3. Get to **Elements**.
4. Get to **Catalogue**.

To understand the capabilities of a given product type, select it in the list. Its fieldbus or fieldbuses and features appear.

Feature	What it means for products of a type with that feature
energyMetering	They provide at least one **positive active energy index**.
timeSynchronisation	They accept **time synchronisation** with their agardio.manager device.
PowerQuality-regular	They provide **statistical services** about voltages, currents, and frequency.
PowerQuality-advanced	They provide **Power Factor and/or THD services**.
Commands	Depending on their local settings, they might accept **commands to reset their energy indexes**.
Tariff.slave	They provide a positive active energy index for each of the tariffs they can register.
	Depending on their local settings, they might accept to be informed by their agardio.manager device of which **tariff index** to accumulate energy consumption on. The device sends out this information to a tariff.slave product based on its configured pricing schedule for the source the product is associated with.
Protection	They are circuit-breakers with protection settings.

Table 2 - Existing product type features

6.1.3. Add a new product to an agardio.manager

1. **Add product**.
2. Select a type of product in the catalogue.
3. Manage services. (See §7.1 for details on that subject if you are not familiar with it yet.)
4. Click the "**Next**" button.
5. Enter a unique product name among products of that agardio.manager device.
6. In case several are available, select the fieldbus the product is communicating on.
7. If you know them, select and/or enter the connection settings for the product on its fieldbus.
8. In case of an energy-monitoring product, if you know it, enter its monitoring information. (See §6.2 for details on energy-metering product monitoring information.)
9. Save.

6.1.4. Update a product on an agardio.manager

Apart from its type and that of its fieldbus, you can update everything about a product that you picked upon its creation, as well as its description.

Its creation date is also set in stone.

6.1.5. Deactivate a product

The activation status of a product determines whether data is set to be stored for it and whether it is set to be available in real-time consultation.

Typically, a product is deactivated when it is no longer online or experiencing issues.

> ⚠ When you deactivate a product, you also deactivate any alarm set on its services. And when you want to reactivate the product, you need to manually reactivate those alarms. See §12.3.3.

6.1.6. Remove a product from an agardio.manager

> ⚠ When you remove a product, most of the data which has been stored in connection with it is removed along with it. This includes:
>
> - Any history stored for its services.
>
> - The history of all process events in connection with it and its services.
>
> - Its own product history (details, commands, and settings).
>
> When you are no longer using a product for any reason but you wish to preserve its past data, you should deactivate it, as explained in §6.1.5.
>
> For traceability reasons, costs and carbon footprint computed in relation with a product are preserved upon its removal. Costs and carbon footprint are only ever removed upon device removal from the installation.

1. Select the product you want to remove.
2. Click the "**Delete product**" button.
3. Confirm.

Reminder: removal of a product which was retrieved from an agardio.manager device is only applied upon synchronisation, as explained in §5.1.3.

6.1.7. Consult past product configuration

Whenever a product undergoes a change which could have an impact of the exploitation of its data, it is logged in its history. Product updates with such an impact concern:

- Activation status
- Monitoring perimeter (zone, usage, mesh, source, and place in the hierarchy)
- Fieldbus connection settings

1. Select the product whose past configuration changes you want to know.
2. Get to **History**.
3. If need be, filter by "Product information".

ℹ️ Traceability of product history is ensured for 5 years.

6.2. Energy-metering product monitoring information

The monitoring information of an energy-metering product is crucial for the exploitation of energy data. This is where all the context prepared in Chapter 3 and Chapter 4 comes into play.
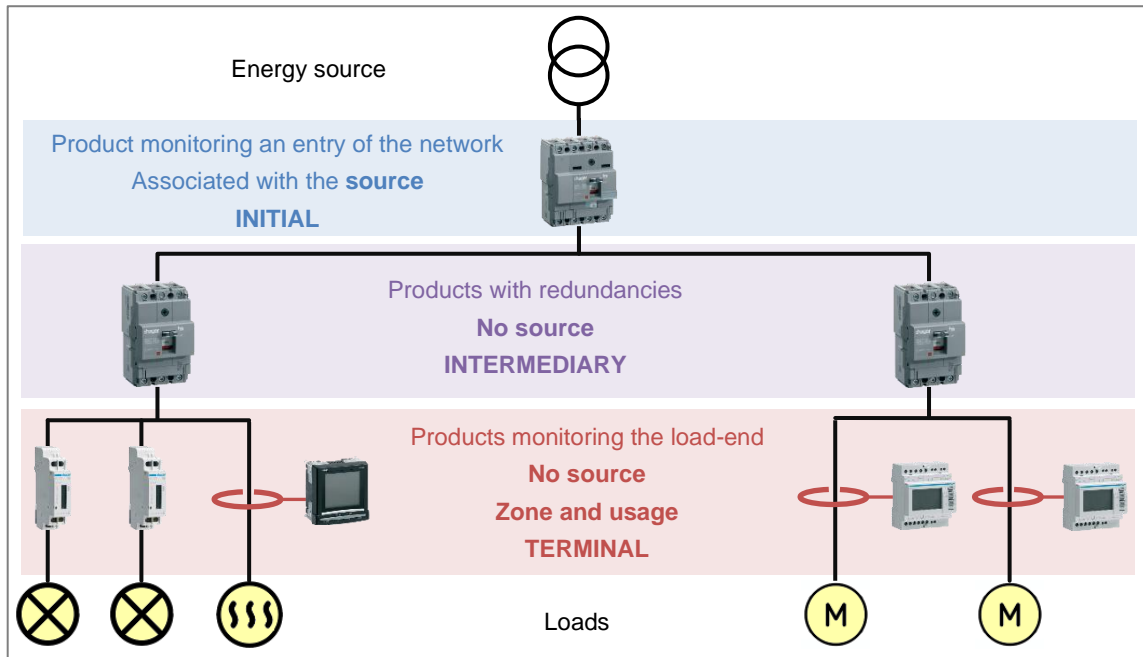
Figure 35 - Correlation between monitoring architecture and energy-metering product configuration

As can be seen in the figure above, a complex monitoring architecture has redundancies. When properly built, each of its levels measures the same amount of electrical energy.

Knowing the information of the level in the electrical hierarchy for a product allows stream to only count the same energy consumption once in exploitation. And the level of a product also impacts the relevance of the rest of its monitoring information.

6.2.1. Configure a product monitoring an entry of your electrical network
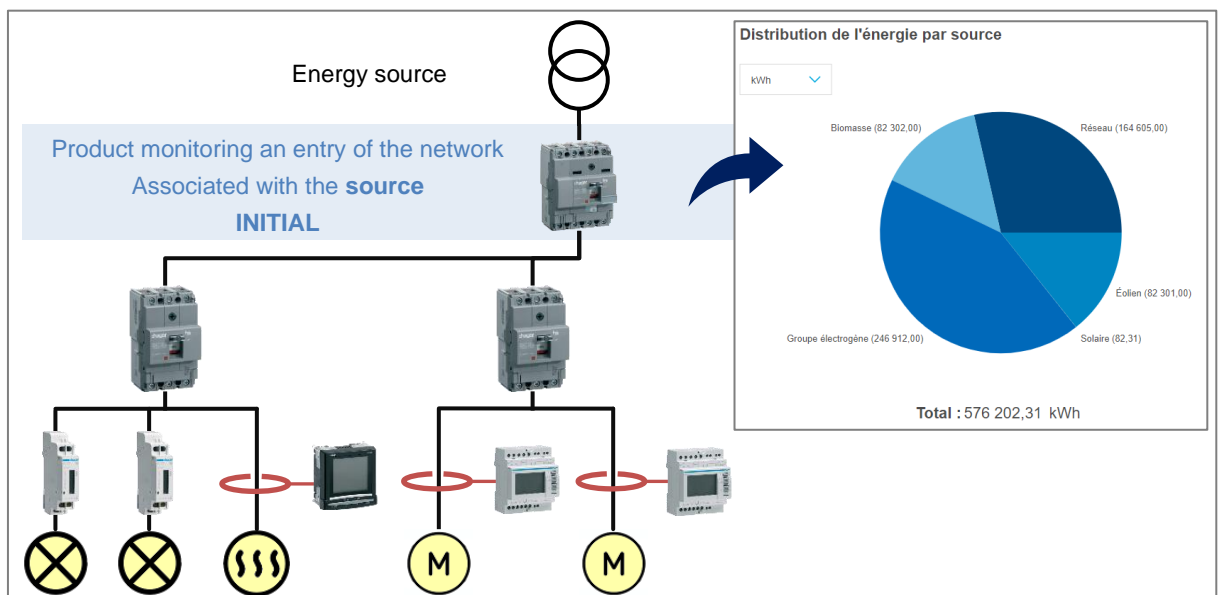
Figure 36 – Initial products are the only ones to be taken into account in charts about the distribution of energy per source

When an energy-metering product monitors an entry on your electrical network, then you should associate it with the **source** of the corresponding type defined for the site.

When a product is associated with a source, its place in the electrical hierarchy is automatically switched to *Initial*.

For such a product, association with a zone or usage is moot and does not enter into account in data exploitation, so you should not waste time with it.

Mesh association for such products is entirely up to you and the way meshes have been defined in the site.

6.2.2. Configure a product at the load-end of your electrical network

Figure 37 – Terminal products are the only ones to be taken into account in charts about energy consumption (per usage, zone, zone category, or sector of activity)

When an energy-metering product does not monitor an entry on your electrical network but rather a load, then you should associate it with a **zone and/or usage, ideally both**, and set it to be a *Terminal* product. This ensures it is taken into account in data exploitation.

Mesh association for such products is entirely up to you and the way meshes have been defined in the site.

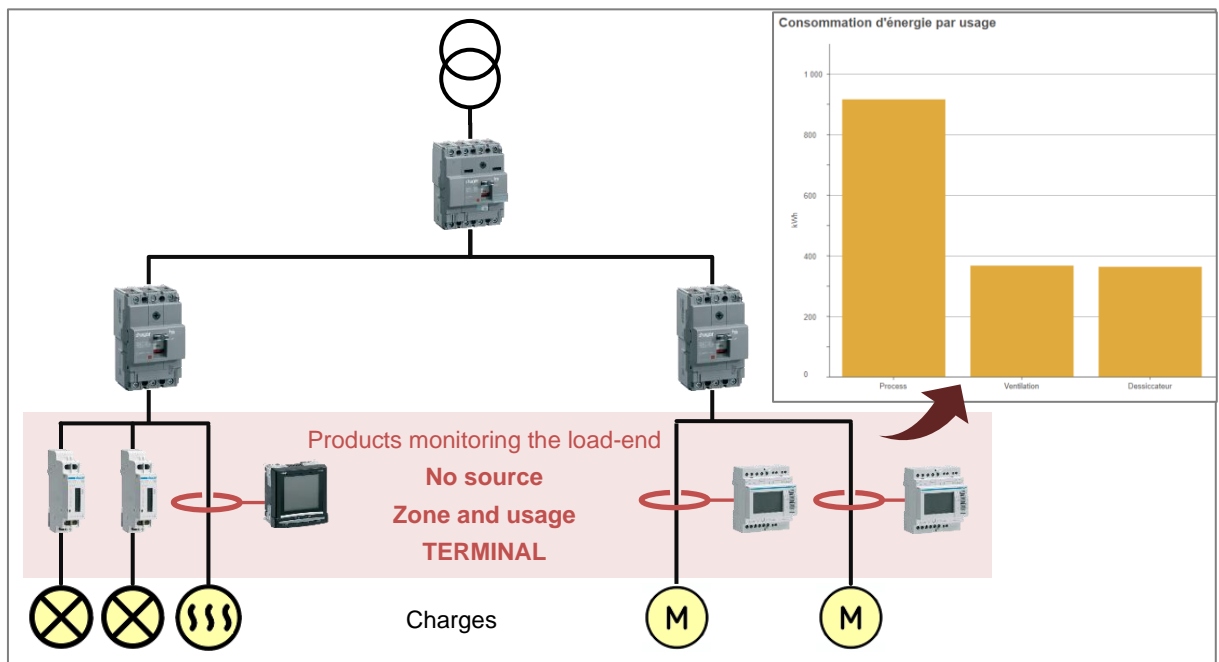6.2.3. Configure a product in the middle of your electrical network
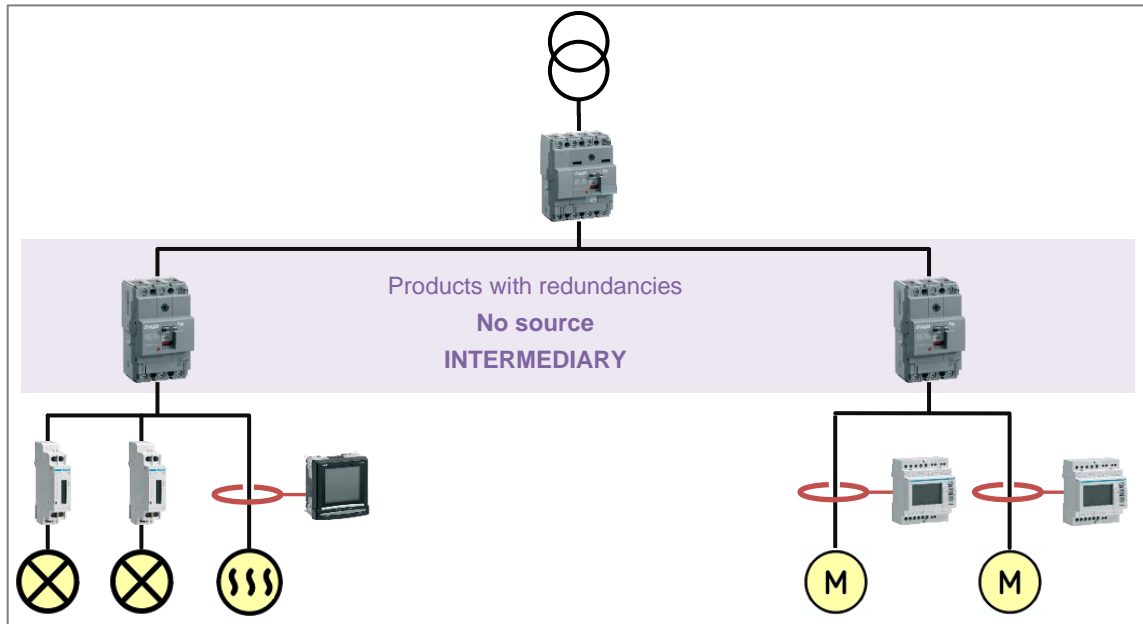
Figure 38 - Intermediary products are only taken into account in charts about energy distribution per mesh

When an energy-metering product is not at either end of your electrical network, meaning it does not monitor an entry nor a load, then you should set it to be an *Intermediary* product. This ensures it is only taken into account in data exploitation where meshes are concerned, so as to avoid the same energy consumption being accounted for more than once in other visualisations.

Mesh association for such products is entirely up to you and the way meshes have been defined in the site.

6.2.4. Deal with products with multiple energy-metering channels

Some product types can monitor several distinct points in an electrical network. For this reason, they are granted as many monitoring perimeters as they have channels. Each of their channels can therefore have all the same characteristics as a regular product. The reasoning is exactly the same, based on place in the architecture.

Also, products with multiple energy channels allow a name for each of them, so they can be told apart during data exploitation.

6.3. Interactions with products after connection to the agardio.manager device

6.3.1. Confirm product type

An interesting feature available on connected agardio.manager devices, for certain types of products, is the ability to confirm that type. **Identification** - with which you might already be familiar from local agardio.manager web interface - allows you to make sure a product of the expected type is at the configured connection settings on the fieldbus.

Identification can be performed in two places:

■ During product creation, to make sure you are using the correct fieldbus connection settings before confirming creation and deployment.

■ Once the product is created, for example when your fieldbus connection settings have been mixed up.

6.3.2. Execute a command on a product

Product commands can only be executed on activated products on a connected agardio.manager device, of a type and settings compatible with command execution.

1. Select the product on which you would like to execute a command.
2. Get to **Commands**.
3. Click the "**Execute**" button next to the command you are interested in for the selected product.
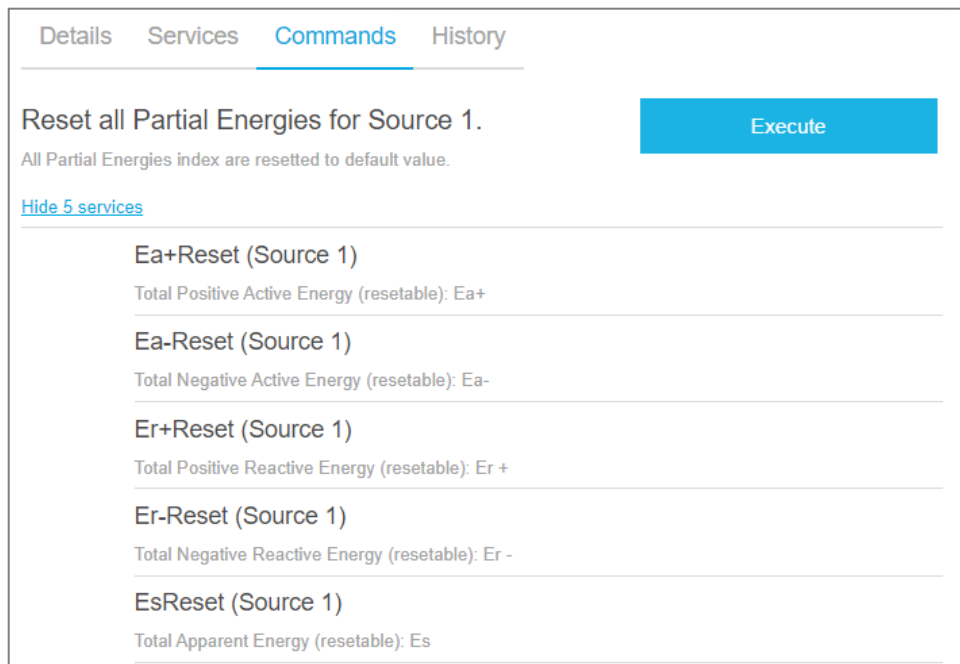
Figure 39 - Product command interface, with the list of impacted services

6.3.3. Consult past product command executions

1. Select the product whose past command executions you want to see.
2. Get to **History**.
3. If need be, filter for "Commands".

Figure 40 - Product command history

ℹ️ Traceability of product command history is ensured for 5 years.

6.3.4. Consult product settings and their evolution

Products sometimes come with settings. You can consult them in stream shortly after product deployment.

1. Select the product whose current settings you wish to know.
2. Get to **History**.
3. If need be, filter for "Settings".
4. Check the latest entry for the setting you are interested in.

ℹ️ Traceability of product settings evolution is ensured for 20 years.

6.3.5. Deal with local product management

Products can always be managed from the local web interface of an agardio.manager device. When that device is supervised by stream, any local change is registered and submitted to arbitration.

Configuration from stream
Products are declared and configured
through stream's web interface
(and pushed to agardio.manager devices)

Local configuration
Products are declared and configured
through agardio.manager's web interface
(and retrieved by stream for synchronisation)
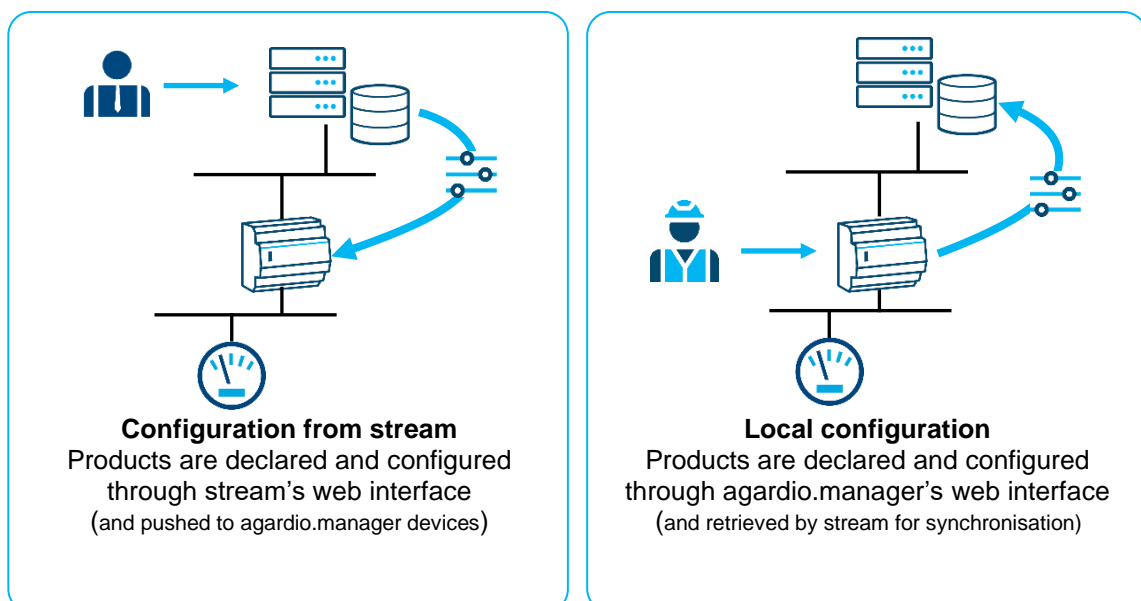
Figure 41 - Product configuration from stream or from local web interface

When a product has been locally created, removed, or updated directly on an agardio.manager device under its supervision, stream registers that change within 10 minutes.

At that point, arbitration of the modification has to be given in the stream web interface before it is propagated to the whole stream system (namely exploitation).
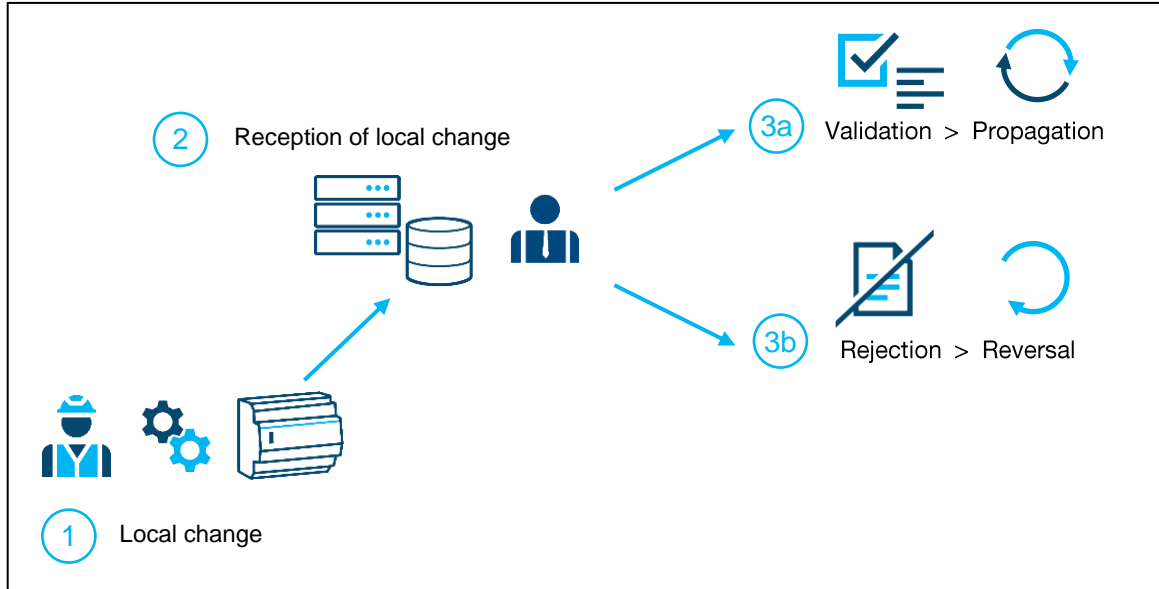
Figure 42 - Impact and handling of local changes

A product which has been locally modified is marked with a ⬤. You have to click the "**Review local changes**" button to know what has actually been done to the product in question.

6.3.5.1. Deal with local product creation

- If you agree with the local creation of a product, accept it, and the product will appear in runtime.

> ⚠️ A product created from the local web interface of its device only appears in stream runtime once its local creation has been manually accepted in stream. And any history gathered by the product between its creation and its acceptation in stream is not retrieved.

- If you disagree with the local creation of a product, then reject it, and it will be removed from the agardio.manager device.
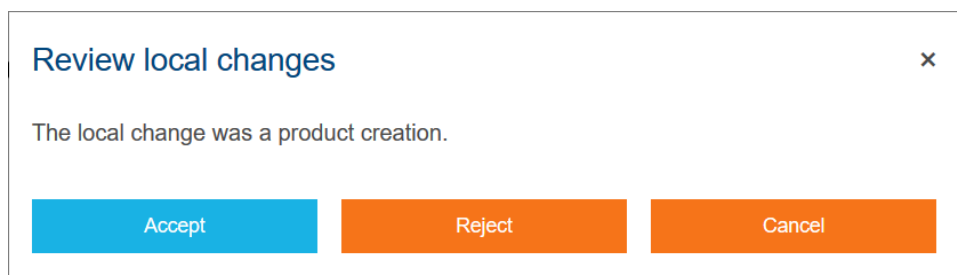
Figure 43 - Local product creation arbitration interface

6.3.5.2. Deal with local product removal

- If you agree with the local removal of a product, accept it, and the product will be removed from runtime.

> ⚠️ A product removed from the local web interface of its device only disappears from stream runtime once its local removal has been manually accepted in stream. In the meantime, it stays selectable and its stored history remains available. From the moment it is locally removed, however, no new valid data can be read or stored in relation to it.

- If you disagree with the local removal of a product, reject it, and the product will be re-created on the agardio.manager device, with no loss of previously stored history.

> ⚠️ Any data which could have been stored by a product removed from the local web interface of its device, between the moment of its local removal and the moment this removal was rejected from stream, can never be accessed. Any data stored in relation to it prior to its local removal is however fully preserved.


Review local changes   ✕

The local change was a product removal.

[Accept]   [Reject]   [Cancel]
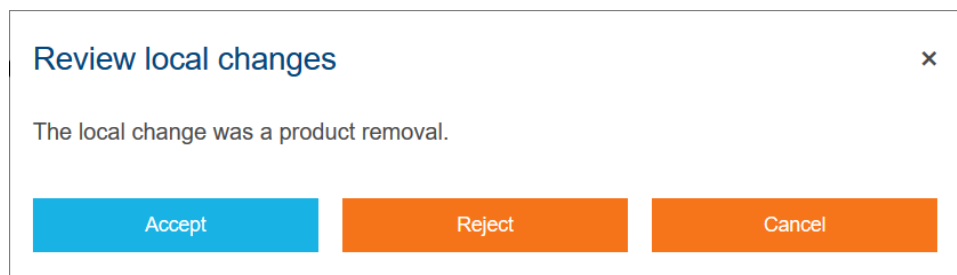
Figure 44 - Local product removal arbitration interface

6.3.5.3. Deal with local product update

When a product has been locally updated, any change it has undergone cannot be automatically reverted.

- If the local changes on the product suit you, propagate the update.

- If the local changes on the product do not suit you, change anything you do not agree with before propagating the update.

> ℹ️ Monitoring information is under the sole purview of stream and cannot be updated locally. What can be locally updated for a product is its service configuration, name, activation status, description, and landmark.

Review local changes   ✕

The local change was a product update.

[Propagate]   [Cancel]
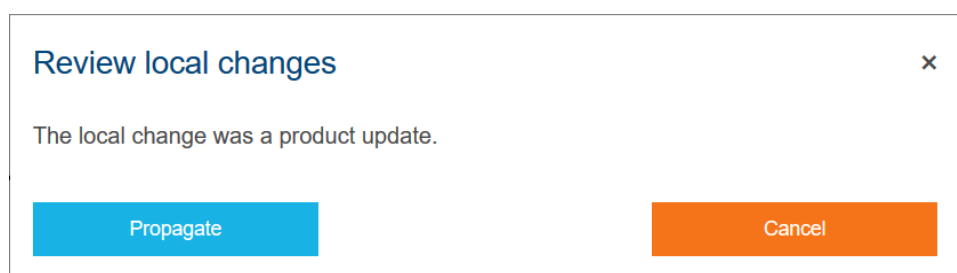
Figure 45 - Local product update arbitration interface

7. Configuring your data storage

7.1. Service management

Products provide measurements for services. It is up to you to decide which ones you are interested in, and among those, the values of which ones are worth being stored over time.

1. Select the product.
2. Get to **Services**.
3. Click the "**Configure services**" button.

Figure 46 - Acquisition and storage principle

7.1.1. Activate storage of a service

When you want to store measurements in relation to a service of a product, all you have to do is check the corresponding box and save.

> ℹ Measurements are stored both on stream server and on the corresponding agardio.manager device. stream has more storage space and ensures much longer data preservation (up to 20 years). Devices however keep their local storage to ensure short-term redundancy in the eventuality of communication failure.

The frequency at which data measurements are stored is discussed in §7.2.

7.1.2. Only acquire a service

When the value of a service is of some interest to you at certain given times, for real-time consultation, but you do not deem its evolution relevant enough to be stored on the long term, you can set it for acquisition only. This way, its instantaneous value is available in real-time during exploitation, but the service does not take storage space.

> ℹ Setting a previously stored service to acquisition only does not remove any history stored for it.

7.1.3. Remove stored history for a service

- When you want to stop storing a service but are still interested in its past history, uncheck storage but leave acquisition checked. Confirmation is required to remove a service from storage, even before saving service configuration as a whole.

- When you want to purge the history gathered for a service, you need to remove it from acquisition, even if only momentarily. Confirmation is required to remove a service from storage and to remove it from acquisition (which makes 2 confirmations in total), even before saving service configuration as a whole.

agardio.manager automatically acquires and stores all active energy services and non-electrical resource services, and stream follows that same rule. This is why storage (and acquisition, for that matter) of all services of those families cannot be deactivated.

Name	Description	Unit	Resolution	Offset	Acquisition ☑	Storage ☐	
▾ First channel (16)							
Ea+NotReset	Total Positive Active Energy (not resetable): Ea+	kWh	1	0	☑	☑	✎
Ea-NotReset	Total Negative Active Energy (not resetable): Ea-	kWh	1	0	☑	☑	✎
Ea+Reset	Total Positive Active Energy (resetable): Ea+	kWh	1	0	☑	☑	✎
Ea-Reset	Total Negative Active Energy (resetable): Ea-	kWh	1	0	☑	☑	✎

Figure 47 - Active energy services cannot be removed from storage

Even when a product does not provide any required service, it still has to acquire at least one service for its configuration to be valid.

7.1.4. Change the resolution of a service

All services measured by pulse counters and analogue inputs come with what is called a **resolution**. This is due to the fact that many types of hardware with many different configurations can be behind that type of product in the catalogue, and this has an impact on how much of the monitored quantity is represented by:

- a single pulse, in the case of a pulse counter.
- the current returned between 4 and 20 mA, in the case of an analogue input.

So, in order for the agardio.manager device charged with monitoring these types of products to properly understand what it reads from them, a resolution and an offset are needed.
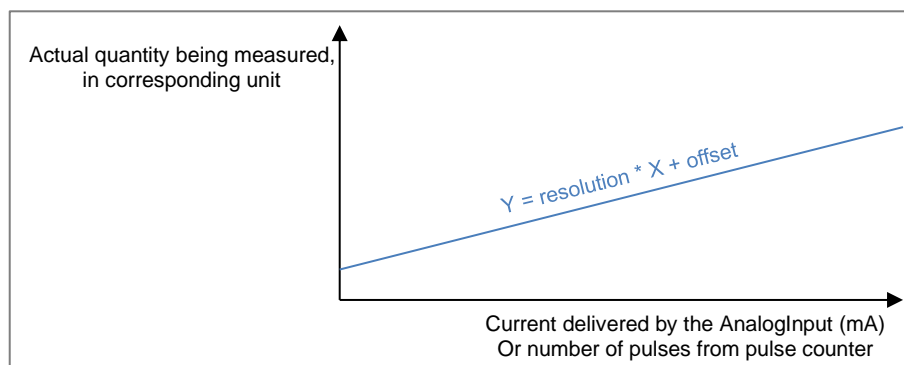
Figure 48 - Meaning of resolution for an analogue input or pulse counter

7.1.5. Put an offset on a service

Some services such as AnalogInput, and all main electrical and non-electrical energy services allow what is called an **offset**.

For pulse counters and analogue inputs, the role of this offset is explained above in §7.1.4.

For index services, an offset helps to compensate an excess or lack of monitored consumption for a counter, for example if it went offline for a little while.
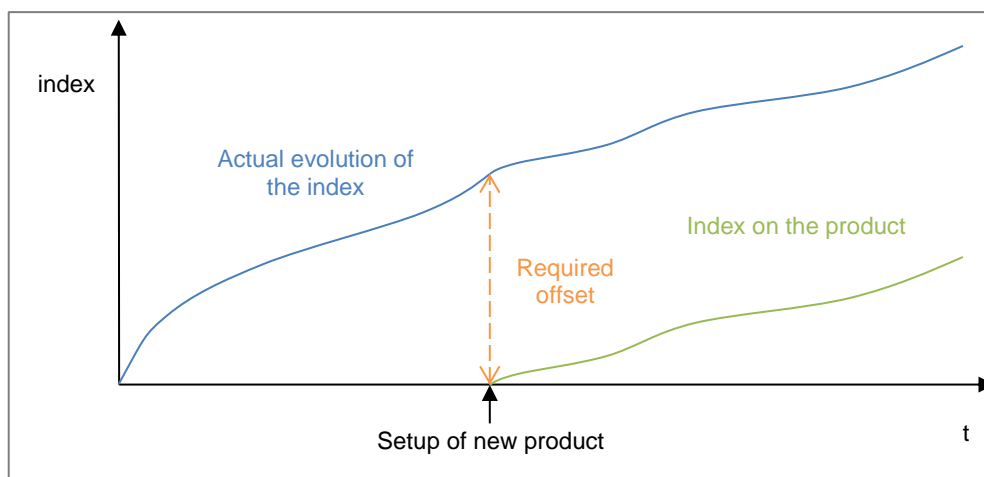
Figure 49 - Illustration of offset usefulness

7.2. Storage frequency

7.2.1. Understand sampling references

If you are familiar with the way data management is handled in agardio.manager, the same principle is applied and expanded in stream.

Services monitored by products are considered in groups (phase to phase voltages, phase to neutral voltages, currents, frequencies, powers, power factors, etc.), and when under the purview of the same sampling reference, services in the same group are stored at the same frequency.

Available frequencies are tailored to fit the same number of measurements in every hour, on a round time of day:

- Every 5 minutes (at HH:00, HH:05, HH:10, and so on)

- Every 10 minutes (at HH:00, HH:10, HH:20, and so on)

- Every 15 minutes (at HH:00, HH:15, HH:30, and so on)

- Every 20 minutes (at HH:00, HH:20, HH:40, and so on)

- Every 30 minutes (at HH:00 and HH:30)

- Every hour (at HH:00)

> ℹ stream stores samples at the same time and at the same frequency the corresponding agardio.manager device does. This allows a level of redundancy in data storage and therefore makes the stream system more resilient to a loss of communication between stream and its data-gathering devices.

Figure 50 – Extract of the default sampling reference

> ℹ Stream comes with the same default sampling reference as the default data management configuration on agardio.manager devices. You are free to use that default sampling reference, change it, or remove it altogether.

7.2.2. Configure sampling references

stream can have a number of agardio.manager devices under its supervision. And depending on the size of your installation, those devices may be distributed across frontiers, time zones, and most importantly legislations. For this reason, stream allows more than one data management policy within your installation, in case one country imposes a high storage frequency and you are not particularly attached to doing the same for other countries. The definition of a data management policy is called a sampling reference.

1. Log in with an account with Global configurator permission (at least).
2. Get to **Configuration**.
3. Get to **Elements**.
4. Get to **Sampling references**.
5. **Add new sampling reference**.
6. Enter a unique sampling reference name.
7. For each type of service, select the desired storage frequency.
8. Save.

7.2.3. Apply a sampling reference

All agardio.manager devices of a **site** follow the same sampling reference. This ensures consistency of data storage within the perimeter.

If you are unsure of how to update the details of a site, see §4.2.2.

7.2.4. Update a sampling reference

If the data storage legislation or needs a sampling reference corresponds to ever change, you have the option to update it to match those new requirements.

1. Log in with an account with Global configurator permission (at least).
2. Get to **Configuration**.
3. Get to **Elements**.
4. Select the sampling reference you want to update.
5. **Modify**.
6. Make the changes you wish to make, staying within the constraint of sampling reference name uniqueness.
7. Save.

7.2.5. Remove a sampling reference

Keeping unused sampling references in the list has no other impact than taking up a little space on your database server and being confusing when associating one to a site.

To avoid these consequences however small, when a sampling reference is not associated with any site, it can be removed.

1. Log in with an account with Global configurator permission (at least).
2. Get to **Configuration**.
3. Get to **Elements**.
4. Select the sampling reference you are interested in
5. Click the "**Delete sampling reference**" button.
6. Confirm.

8. Staying within the limits of your licence

8.1. Licence calibration

8.1.1. Calculate how big of a licence you need

stream works with a licence system. A stream licence is calibrated to the dimensions of the installation it is attached to. Basically, the more stored services you intend on having, the bigger the licence you need. Refer to the *stream installation manual* for a simplified licence estimation method.

8.1.2. Be advised of the consequences of using too small a licence

⚠️ Using too small a licence for your needs entails storage and processing issues.

To avoid any of those issues, the first step is to use a properly dimensioned licence. After that, a good way to proceed is to keep track of how much of it your current configuration is already using, and how much of it is left. This is important so you do not configure some devices to the detriment of others (by giving them more stored services than anticipated). This also helps you determine when a licence extension is becoming necessary.

8.1.3. Quantify your current and predicted licence consumption

At all times, your stream licence is distributed into 3 parts:

- How much of it you are currently consuming.
- How much of it you are about to be consuming if you decide to connect all prepared agardio.manager devices.
- How much of it is still fully available to be consumed.

1. Get to **Configuration**.
2. Get to **agardio.manager devices**.
3. Check the top right corner.

Figure 51 - Licence capabilities = Used + Predicted + Still available

8.1.4. Quantify your current and predicted licence consumption per agardio.manager device

agardio.manager devices consume licence capabilities. Each has a current or predicted licence consumption, depending on its connection status.

- A connected device can only have actual licence consumption.
- A prepared device can only ever have a predicted licence consumption.

1. Get to **Configuration**.
2. Get to **agardio.manager devices**.
3. Check the top right corner.
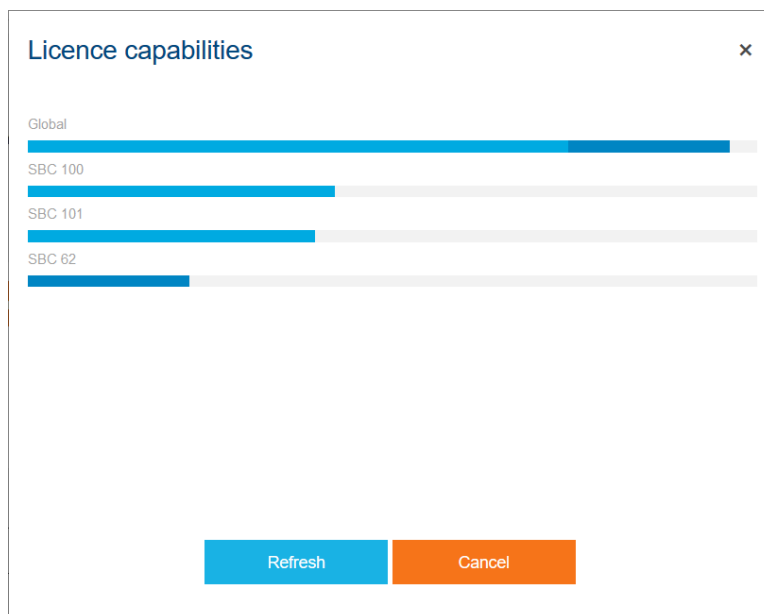4. Click the licence capabilities consumption bar.

Figure 52 - Details of licence consumption per agardio.manager device

8.2. Licence capacity reached

Figure 53 - Licence capacity reached

8.2.1. Without any connected agardio.manager device

Reaching the limits of your licence before any agardio.manager device is connected is not an issue. All it means is that you have prepared more services from storage than expected. You cannot safely connect all the currently configured agardio.manager devices, but you are not experiencing any problems yet.

- If you find yourself in this situation because your licence has not been set up yet, do not worry. Keep preparing agardio.manager devices as you see fit, in accordance with the licence you have ordered. Once it is in place, everything should be in order for the connection of every device you have prepared.

- If you find yourself in this situation even though your licence is already in place, then you may have a licence calibration issue. Or, you have prepared more stored services than you initially intended. At this point you have 2 options:
  - Extend your licence to fit your new intentions.
  - Remove some services from storage so as to respect your original plans.

8.2.2. With connected agardio.manager devices

Reaching the limits of your licence with connected agardio.manager devices is an issue, as presented in §8.1.2.

- If you are satisfied with your current configuration in terms of agardio.manager devices, you need a licence extension.

- If you are not particularly attached to your current configuration, then remove some services from storage on the activated products of your connected agardio.manager devices.

8.3. Licence capacity set to be reached

Figure 54 - Licence capacity set to be reached

When in this situation, you are not experiencing any data storage or processing issues yet. All stream is doing is warning you that it could happen, based on your current configuration, were you to connect all the agardio.manager devices you have prepared, on top of those which are already connected.

- If you do not wish to connect your prepared devices, then you are safe. You may remain in this licence situation indefinitely without encountering any issue.

- If you do wish to connect your prepared devices, in their current configuration in terms of stored services, but are not particularly attached to the configuration of already connected devices, then you should remove some stored services from the activated products of your connected agardio.manager devices.

- If you do wish to connect your prepared devices, but you are not particularly attached to their configuration, then you should reduce the amount of services set for storage on activated products of these prepared devices.

- If you do wish to connect your prepared devices, in their current configuration in terms of stored services, and you do not want to alter your current configuration for already connected devices, then you have no choice but to buy a licence extension and wait for it to be put in place.

Whatever the action to take, once you have available space on your licence, you can connect your prepared agardio.manager devices without any problem.

9. Including costs

Sources, as presented in §3.3, are not only used to contextualise the origin of electrical energy. They are also the basis of cost computation in your installation. With properly configured pricing schedules, stream is in a position to determine the cost of your energy consumption.

> ℹ Costs are computed daily at 01:00, for the previous day, based on the time zone defined for the considered perimeter.

1. Log in with an account with Global configurator permission (at least).
2. Get to **Configuration**.
3. Get to **Elements**.
4. Get to **Sources**.
5. Select the source whose pricing schedule you want to update.

9.1. Tariffs

A different price is affected to energy across the year, across the week, and even across a single day. This price is called a tariff.

In stream, by default, sources are created with a single tariff, with an associated price of 0 ¤ (¤ being the selected currency for the source).

Figure 55 – 3 pricing tariffs for an electrical energy source in €

9.1.1. Add a new tariff to a source

1. **Add tariff**.
2. Enter a unique tariff name among tariffs of the source.
3. Enter a tariff as a price per energy unit.
4. Save.

In accordance with agardio.manager limitations, a single source can only have up to 4 tariffs. This restriction is inherited from certain types of products which are capable of counting the energy for each tariff on a different index, and only have 4 of those indexes. These products would not know how to handle a tariff synchronisation command for a fifth tariff or beyond.

9.1.2. Update a tariff

To ensure the integrity of computed costs, a tariff can never be removed, only updated.

Updating a tariff has no impact on past computed costs, only those not computed yet.

Because costs are computed daily for the previous day, a tariff update on a given day affects costs computation for that day.

9.1.3. Define a default tariff for a source

To make pricing schedule configuration easier, the notion of default tariff has been made available on stream. The default tariff for a source is the one applied to any hour of the day for which no specific tariff has been entered in its schedule.

To ease schedule configuration, you should mark as the default tariff the one which is applicable most of the time.

When you make a different tariff the new default tariff, it becomes associated with every hour of the schedule you haven't explicitly associated with one. Doing this on an already configured and used schedule might be risky.

9.2. Pricing periods

In agardio.manager, a weekly pricing schedule is configured. Every hour of the day for every day of a generic week is associated with a tariff. If untouched, the same weekly pattern is repeated every week, all year long.

In stream, a pricing week is also configured in the same manner, with the addition that this schedule may vary across periods of the year, without the need for user intervention.

By default, the year is covered by one period, from January 1st to December 31st. In the figure below, the year has been divided in seasons.
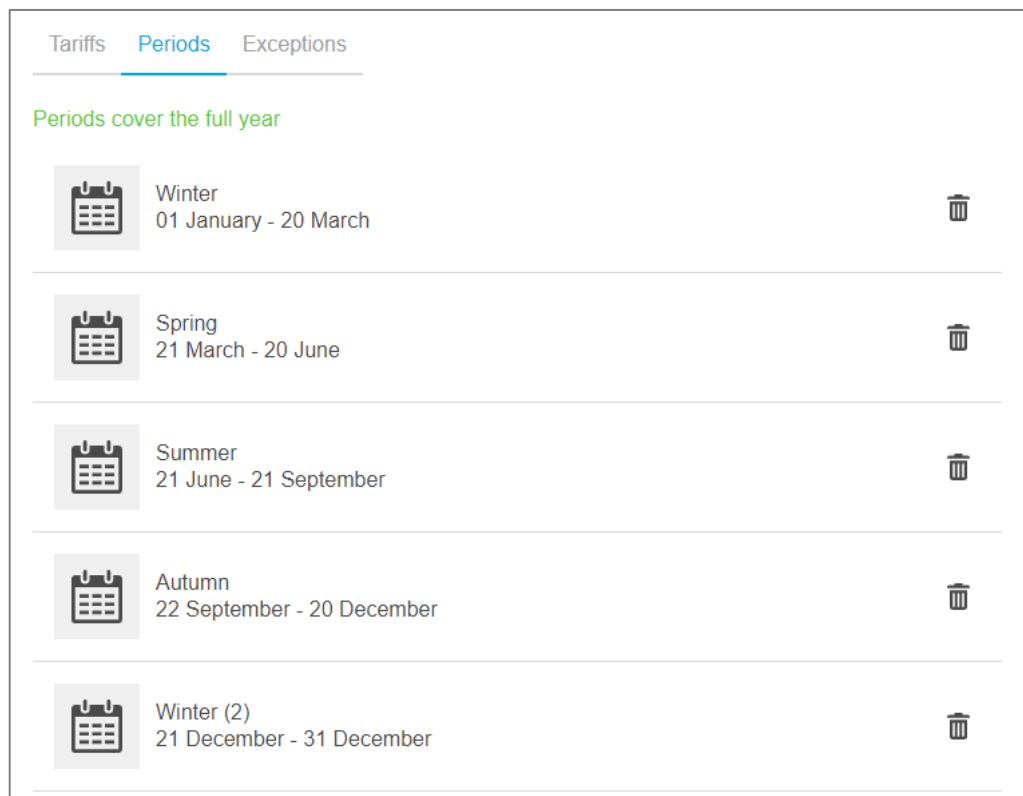
Figure 56 – Example of seasonal pricing periods across the year

9.2.1. Manage pricing periods

No new pricing period can be inserted in the year until there are dates not contained within a period. Dates can be opened up for a new period by updating or removing one.

    1. Get to **Periods**.

To update a pricing period:
        a. Click the pricing period you want to update.
        b. Change its start date and/or its end date.
        c. Save.

To remove a pricing period:

        a. Click the bin icon 🗑 next to the pricing period you want to remove.
        b. Confirm.

⚠️ Leaving the year not completely covered exposes to mistakes in cost computations. Indeed, when a date for which no pricing schedule is defined comes up, the last valid pricing schedule for the same day of the week is applied, which may not reflect the actual schedule in place and therefore lead to incorrect costs being computed. And past costs can never be computed again with the retroactive application of a corrected schedule.

Once there are open dates in the year:

1. **Add period**.
2. Enter a unique period name among periods of the source.
3. Enter a start date and end date so as not to overlap with any other period there might already be in the year.
4. Save.

ℹ️ A period begins at midnight on its first day and ends at 23:59 on its last day. In other words, its first and last days are included in a period.

9.2.2. Configure weekly pricing schedule for a period of the year

The weekly pricing schedule applied during a period of the year can be configured at period creation or update.

1. Get to **Periods**.
2. Select the period whose weekly pricing schedule you want to update.
3. Click the "**Insert tariffs**" button.

Figure 57 - Interface for tariff insertion in weekly pricing schedule

4. Select a start time and end time in a day.
5. Select a tariff.
6. Select the concerned days of the week.
7. Confirm.
8. Repeat steps 3 to 7 as many times as necessary.
9. Save.

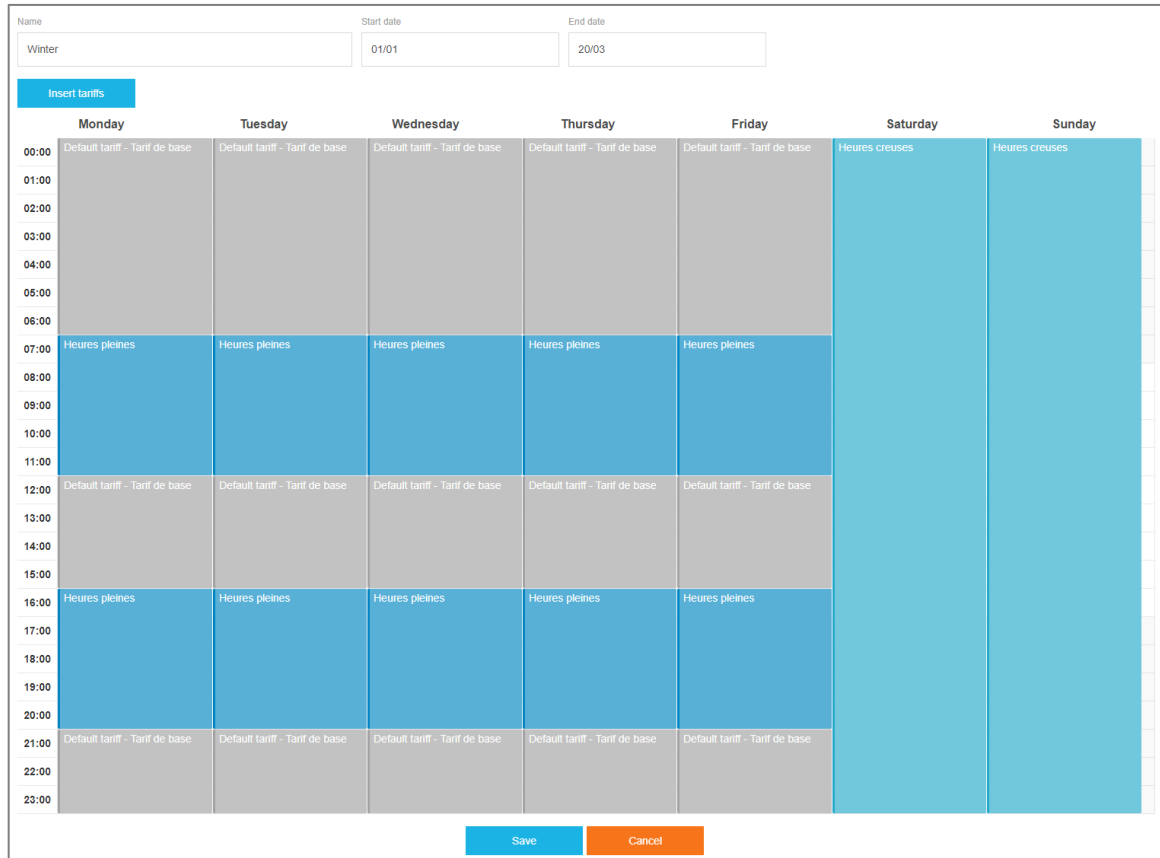Figure 58 - Weekly tariff schedule for a pricing period

When you select a time slot of a day associated with a tariff, you have 2 choices:

- **Modify** it, in order to extend it in the day of the week or across other days of the week.
- **Delete** it; the concerned time slot of the day goes back to using the default tariff.

Figure 59 - Modify or remove a tariff association in a day of the week

9.3. Exceptions in pricing schedules

Pricing schedules, like all types of schedules, sometimes come with exceptions to the rule.

When periods of the year with a weekly schedule are inadequate to tackle the specificities of a given pricing schedule, this is where exceptions come in.

Pricing exceptions allow for the application of a specific daily schedule on days of the year which do not fit a continuous period of the year.

9.3.1. Manage an exceptional daily pricing schedule

1. Get to **Exceptions**.
    - In case you want to add a new exceptional daily pricing schedule:
        a. **Add exception**.
        b. Enter a unique exception name among exceptions of the source.
    - In case you want to update an existing one:
        a. Select the exception whose schedule you want to update.
2. Click the "**Insert tariffs**" button.

Figure 60 - Daily pricing schedule management for a pricing exception

3. Select a start time and end time in a day.
4. Select a tariff.
5. Click the "**Add**" button.
6. Repeat steps 2 to 5 as many times as needed.
7. Save.

You always have the option to remove an exceptional daily pricing schedule, by clicking the bin icon 🗑 next to it.

9.3.2. Register applicable days for an exceptional daily pricing schedule

Once you have defined an exceptional daily schedule, stream needs to know when it is applicable. The defined daily schedule is applied every day which falls into at least one of its application periods.

To add an application period to the considered exceptional daily schedule, you can follow this procedure right after exception creation or during exception update:

1. **Add application period**.
2. Enter a unique application period name among application periods of the exception.
3. Pick a type of application period.
4. Enter the desired settings.
5. Save.

You can add as many application periods as you wish to a single pricing exception.

There are 3 types of application periods:

- The type "***Date***" is ideal for specific dates of the year (typically holidays), or very regular date pattern (every 1st of the month, every Monday of every other month, etc.):
  1. Select a year (or any year).
  2. Select a month (or any month, or every other month, either odd or even).
  3. Select a day of the month (or any day of the month, or every other day, either odd or even).
  4. Select a day of the week (or any day of the week).
  5. Save.

- The type "***Date range***" is ideal for a specific continuous period of a specific year, which you do not want to enter in your generic yearly schedule because it is not planned on happening again:
  1. Select a start date (any date if you want it to start right away).
  2. Select an end date (any date in case you do not know when it ends yet).
  3. Save.

- The type "***Weeks and days***" is used to represent more atypical date patterns (every last 7 days of every month, every first Tuesday of the month, etc.):
  1. Select a month of the year (or any month, or every other month, either odd or even).
  2. Select a week of the month (or the last seven days, or any week of the month).
  3. Select a day of the week (or any day of the week).

9.3.3. Remove an application period for an exceptional daily pricing schedule

In case you ever wish for an exceptional daily pricing schedule to no longer be applicable on one of its defined application periods, you have the option to remove it from the list:

1. Get to **Exceptions**.
2. Select the exception whose application periods you want to change.
3. Click the bin icon 🗑 next to the application period you no longer want the concerned exceptional daily pricing schedule to be applicable on.
4. Confirm.

9.3.4. Change the days an exceptional daily pricing schedule is applicable on

In case you ever wish to change an application period of an exceptional daily pricing schedule, you have the option to update it:

1. Get to **Exceptions**.
2. Select the exception whose application periods you want to change.
3. Select the application period you want to alter.
4. Change the settings to your liking.
5. Save.

> ℹ️ You cannot change the type of an application period. If it is no longer in adequation with your needs, you should remove the application period and create a new one.

9.3.5. Manage pricing exception priority

When configuring application calendars for several exceptional daily schedules, it is possible for some to be in conflict.

Example: one exception is about holidays, and concerns May 1st, and another exception is about every other weekend. Years during which May 1st is on a weekend are bound to happen.

Because two different schedules cannot be applied on the same day, you need to order your exceptions by order of priority by granting each of them a priority level. This can be performed at exception creation or update.

Priority level 1 is the highest, and priority decreases with the level.

Two exception cannot share the same priority level, but there is however no need for priority levels to be continuous. This allows you to insert new exceptions between 2 existing ones.

Example: you can grant priority level 1 to the exception about Holidays (always overruling any other), and priority level 14 to the one about every other weekend (which is not much of a priority). If a new exception ever arises to overrule the second one but not the first, you can grant it any priority level between 2 and 13.

10. Gathering weather data

Under certain circumstances, energy consumption might be correlated to outside temperature. This is especially true for heating in winter, and air conditioning in summer. For this reason, stream offers 2 options:

- Visualise energy with temperature as a backdrop, to get a general idea on a potential correlation between them.

- Normalise energy by the number of Degree Day for the considered period, to make sure an increase or decrease is indeed weather-related.

To have access to these functionalities in exploitation, you need to subscribe for temperature samples to be gathered and degree days to be computed for each of your sites.

10.1. Temperature

10.1.1. Gather hourly temperature samples for a site using Hager Weather Service

10.1.1.1. Geolocate your sites

Hager Weather service can provide weather data from all over the world. All it needs to be able to provide the outside temperature for the right place are a few parameters.

1. Get to **Configuration**.
2. Get to **Structure**.
3. Select a site for which you want to have weather contextualisation.
4. **Modify** its details.
5. Enter:
   - o Its zip code
   - o Its country
   - o Its country code (ISO 3166-2)
6. Save.

10.1.1.2. Activate the gathering of temperature samples

1. Get to **Configuration**.
2. Get to **Structure**.
3. Select a site for which you want to have weather contextualisation, and for which proper geolocation parameters for the Hager Weather Service have been entered.
4. **Modify** its Weather configuration.
5. Select *HAGER Weather*.
6. Enter a base cooling temperature below base heating temperature (see §10.2 for definition). These are used for degree day computation.
7. Save.

> Temperature sample gathering entails degree day computation. You cannot have one without the other, although you are free to only rely on one of them.

10.1.2. Stop collecting temperature samples for a site

If at any time you no longer wish to collect temperature samples for a site, you can deactivate this functionality.

Degree day computation is of course deactivated along with temperature sample retrieval since it is based on those samples.

Any temperature samples collected and daily degree days calculated in the past are however preserved.

1. Get to **Configuration**.
2. Get to **Structure**.
3. Select the site for which you no longer want to collect temperature samples.
4. **Modify** its Weather configuration.
5. Select *None*.
6. Save.

10.2. Degree Day

10.2.1. Understand degree days

Degree Days essentially represent how much and how long energy consumption has been correlated to outside temperature.

There are 2 types of Degree days:

- **Heating degree days (HDD)** measure how much (in degrees) and how long (in days) the outside temperature has been **lower** than a heating base temperature.

- **Cooling degree days (CDD)** measure how much (in degrees) and how long (in days) the outside temperature has been **higher** than a cooling base temperature.

10.2.2. Choose a degree day computation method

Several computation methods based on measured outside temperatures and provided base temperatures exist for degree days. stream knows 2:

- The **COSTIC** method, elaborated by the *COmité Scientifique et Technique des Industries Climatiques*, the French Scientific and Technical Committee of the HVAC Industry.
- The **Mean** method.

Because Degree days are used to normalise energy consumption so it can be compared across places and periods of different climates, stream only uses one computation method at a time.

1. Get to **Configuration**.
2. Get to **Structure**.
3. Select your installation to edit its properties.
4. **Modify** its properties.
5. Select a Degree Day computation method.
6. Save.

For more information on each computation method, refer to §18.3.

10.2.3. Set base temperatures for a site

Whichever computation method is selected for degree days, base temperatures are needed.

- Cooling base temperature is the temperature **above** which the energy consumption of your buildings becomes correlated to the outside temperature.

- Heating base temperature is the temperature **below** which the energy consumption of your buildings becomes correlated to the outside temperature.

By definition, heating base temperature is below cooling base temperature.
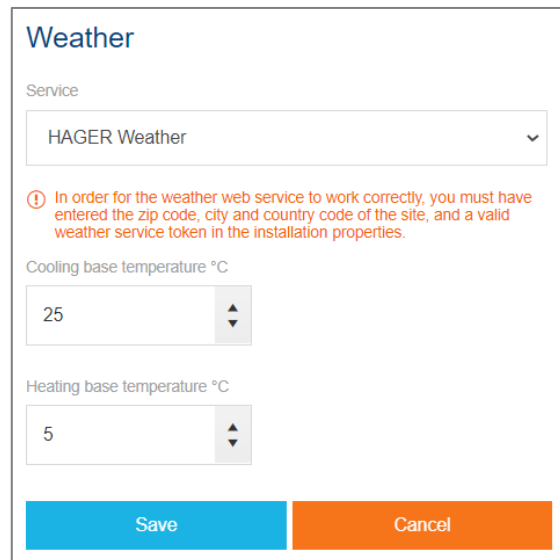
> **i**   Standard heating and cooling base temperatures in Europe are around 18°C et 22°C, respectively.

In stream, just like temperature samples are gathered per site, degree days are computed per site as well. This is why base temperatures have to be entered for every site you want weather normalisation for.

1. Get to **Configuration**.

2. Get to **Structure**.
3. Select a site for which you want to update base temperatures.
4. **<u>Modify</u>** its Weather configuration.

Figure 61 - HAGER Weather service degree day configuration

5. Select a temperature service if one isn't already selected.
6. Enter a base cooling temperature above base heating temperature.
7. Save.

11. Estimating Electrical Installation Efficiency Class

The Second Edition of norm 60364-8-1 of the International Electrotechnical Commission (IEC) defines 23 parameters to estimate/compute in order to determine the Electrical Installation Efficiency Class (EIEC) of a building.

Depending on sector of activity, the value for each parameter grants a certain number of points. The points for all the parameters cumulate into a final score. That score determines the class of the building.

For every building in your installation structure, stream presents each parameter as one or more multiple-choice question(s), with only one answer available for selection at a time for each question. Based on your answers for a building and its sector of activity, a score is computed and available for exploitation.

1. Get to **Configuration**.
2. Get to **Structure**.
3. Select the building whose EIEC you want to estimate.
4. **Modify**.

EIEC

Initial installation parameters - II

Determination of energy consumption – II01 :	≥83% and <90%
Consumption of the main substation – II02 :	<50%
Location of the main substation – II02 :	≤0.3 and >0.16
Voltage drop – II03 :	≤3% and >2%
Performance of the transformer(s) – II04 :	≥99.5%
Performance of current-using equipment – II05 :	<1.05

Energy management parameters - EM

Zones – EM01 :	≥80%
Usages – EM02 :	≥80% and determined for each zone
Demand response – EM03 :	≥40%
Duration of the load shedding – EM03 :	<10min
Meshes – EM04 :	2
Measurement by usages – EM05 :	≥90%
Detection of the occupancy by zone – EM06 :	
Detection of occupancy by zone – EM06 :	
Implementation of an EEMS – EM07 :	

Figure 62 - EIEC settings for a building

ℹ There are more than 23 questions to answer because the norm defines some parameters as a combination of several sub-parameters.

12. Monitoring your data

stream offers 2 ways to monitor your data from a distance: email notification and FTP delivery.

Your data is monitored through data and event reports.

12.1. Email notification of reports

12.1.1. Configure a SMTP server

If you ever plan on having stream send email notifications, you first need to provide it with a SMTP server.

1. Log in with an account with Server administrator permission (at least).
2. Get to **Network**.
3. Get to **SMTP server**.
4. **Modify**.
5. Enter the connection settings to a valid SMTP server:
   - a hostname, in IP or DNS format
   - a port, between 1_{dec} and 65535_{dec}, 25 by default
   - a security mode (none or SSL)
   - an authentication mode (none or password)
   - a sender email address, which does not necessarily exist on the server, depending on its policies, but does need to be of valid email address format
   - a test receiver email address, which should be a valid email address in order for the test of the SMTP configuration to be relevant
6. Save.

12.1.2. Test the connection to the SMTP server

As long as you have configured an existing email address as test receiver, you have the option to make sure stream can reach and use the configured SMTP server. The test consists in asking the server to send a test email to the designated inbox.

1. Log in with an account with Server administrator permission (at least).
2. Get to **Network**.
3. Get to **SMTP server**.
4. Click the "**Send test email**" button.

A toast notification informs of the success or failure of the test. In case of success, a generic email is present in the test receiver's inbox.

12.1.3. Manage email recipients

The emails sent out by stream contain reports, about stored data or about events. See §12.4 for details about reports and their configuration.

When a report is set to be sent out via email, it is marked with a ✉ .

1. Log in with an account with Global configurator permission (at least).
2. Get to **Configuration**.
3. Get to **Reports**.
4. Select the report you are interested in.
5. Get to **Publication**.
6. <u>**Modify**</u> email publication settings.
7. Enter the email address you want the report to be sent to.
8. Click the "**Add**" button.
9. Repeat steps 7 and 8 as many times as necessary.

10. If you want to remove any address from the recipient list, click the bin icon 🗑 next to it.
11. Save.

12.2. FTP storage of reports

12.2.1. Create a new FTP server connection

If you ever plan on having stream store reports on an FTP server, you first need to configure its connection to it.

1. Log in with an account with Server administrator permission (at least).
2. Get to **Network**.
3. Get to **FTP Servers**.
4. **Add new FTP server**.
5. Enter a unique FTP server name.
6. Enter the connection settings to a valid FTP server.

    - a hostname, in IP or DNS format

    - a port, between 1_{dec} and 65535_{dec}, 21 by default

    - a security mode (FTP or FTPS)

    - an authentication mode (none or password)

    - a path, which leads to the root of the FTP server when left empty

7. Save.

ℹ A good use of multiple FTP servers can be to handle different paths in the same server, so as not to mix reports about different perimeters, for example.

12.2.2. Update an FTP server connection

1. Log in with an account with Server administrator permission (at least).
2. Get to **Network**.
3. Get to **FTP Servers**.
4. Select the FTP server you wish to update.
5. **Modify**.
6. Make the changes you want to make, staying within the constraint of FTP server name uniqueness.
7. Save.

ℹ The update of FTP connection settings does not transfer reports stored in the past, using the previous connection settings.

12.2.3. Remove an FTP server connection

When you no longer wish for a specific FTP server to be available to stream, you have the option to remove it, as long as no report is currently configured to use it. This precaution is in place to avoid unknowingly leaving a report with no place to be published.

1. Log in with an account with Server administrator permission (at least).
2. Get to **Network**.
3. Get to **FTP Servers**.
4. Select the FTP server you no longer want to be used in stream.
5. Click the "**Delete FTP server**" button.
6. Confirm.

12.2.4. Manage the FTP storage of a report

Stream uses FTP servers to store reports, about stored data or about events. See §12.4 for details about reports and their configuration.

When a report is set to be stored on at least one FTP server, it is marked with a ⬆ .

1. Log in with an account with Global configurator permission (at least).
2. Get to **Configuration**.
3. Get to **Reports**.
4. Select the report you are interested in storing on an FTP server.
5. Get to **Publication**.
6. **Modify** FTP configuration.
7. Select a configured FTP in the dropdown list.
8. Click the "**Add**" button.
9. If you want to remove any FTP server from the destination list, click the bin icon 🗑 next to it.
10. Save.

When you stop storing a report on an FTP server, it has no impact on the previous iterations of that report which have already been stored there. Your management of your FTP server is your own.

12.3. Alarms

stream offers the possibility of putting alarms on the value of at least acquired services. If you are not familiar with the notion of acquisition, refer to §7.1.

1. Log in with an account with any Configurator permission (at least).
2. Get to **Configuration**.
3. Get to **agardio.manager devices**.
4. Select the agardio.manager device whose services you are interested in monitoring.
5. Get to **Alarms**.

12.3.1. Set an alarm on a service

stream offers the possibility of putting alarms on the value of services monitored by your products.

Depending on what service you are considering, a process alarm can be triggered by:

- A non-cumulative analogue value going over a high threshold or below a low threshold (see §12.3.6).

- The increase of a cumulative analogue value during a given calendar period (day, week, month) going over a high threshold (see §12.3.7).

- A change in binary value (see §12.3.8).

1. **Add new alarm**.
2. Select a product.
3. Select a service.
4. Enter a unique alarm name.
5. Select a priority.
6. Select an alarm type.
7. Choose triggering conditions.
8. Save.

Only alarms of Critical priority are notified via email as soon as they are triggered (as long as there are recipients entered for at least one process event report). Alarms of any other priority only appear in periodic process event reports.

Priority	Meaning
Critical	Immediate danger which requires immediate action
Major	High impact but no immediate danger
Minor	Limited impact
Warning	Incitation to continued vigilance

Table 3 - Accepted meaning of each alarm priority

You also have the option to create an alarm on a service of a product directly from service management (in the **Services** tab of the product), by clicking the bell icon ✚🔔 next to the service in question. At this point, a counter indicates how many alarms are already configured to monitor that service.

A product needs to be activated for an alarm to be created on it.

Also, some alarm types require the corresponding service to be stored.

12.3.2. Update an alarm on a service

In case an alarm you have set on a service no longer suits your needs (for example the high threshold you picked is a little too low and the alarm gets triggered too often to your liking), you have the option to update it:

1. Select the alarm you are interested in.
2. Make any changes you want, staying within the constraint of alarm name uniqueness.
3. Save.

12.3.3. Manage the activation status of an alarm on a service

When an alarm is momentarily of no interest to you, stream gives you the option to deactivate it. This leaves it up for reactivation later.

You can also use deactivation to no longer use an alarm but preserve its history of past occurrences.

1. Select the alarm you are interested in deactivating or re-activating.
2. Toggle with activation status.
3. Save.

⚠ An alarm is automatically deactivated when the product it is associated with is deactivated, but when that product is reactivated, the alarm needs to be manually reactivated.

12.3.4. Remove an alarm on a service

In case an alarm you have set on a service and its past occurrences are no longer of any interest to you, you have the option to get rid of it all.

⚠ When you remove an alarm, any history of its past occurrences is removed along with it. When you are no longer using this alarm for any reason but you wish to preserve the history of its past occurrences, you should deactivate it, as explained above in §12.3.3.

1. Click the bin icon 🗑 next to the alarm you want to remove.
2. Confirm.

12.3.5. Avoid repeat alarm notifications thanks to alarm delay

When an alarm is set on a service with a highly fluctuating value, or with a very sensitive set of thresholds, it may weave in and out of its triggering conditions in short sequence. In this situation, you most likely do not require to be notified every time the measurement enters triggering conditions. You only need a notification the very first time it happens. Any time shortly enough after that is just a needless repeat of the information.

To avoid an avalanche of notifications in these types of scenarios, stream offers to set a **delay** on threshold and binary alarms. This delay indicates how long it takes for the alarm to be in a position to be notified again after its very first notification.

By default, binary and threshold alarms have a delay of an hour. This delay can be increased up to a whole day, or decreased down to 1 minute.
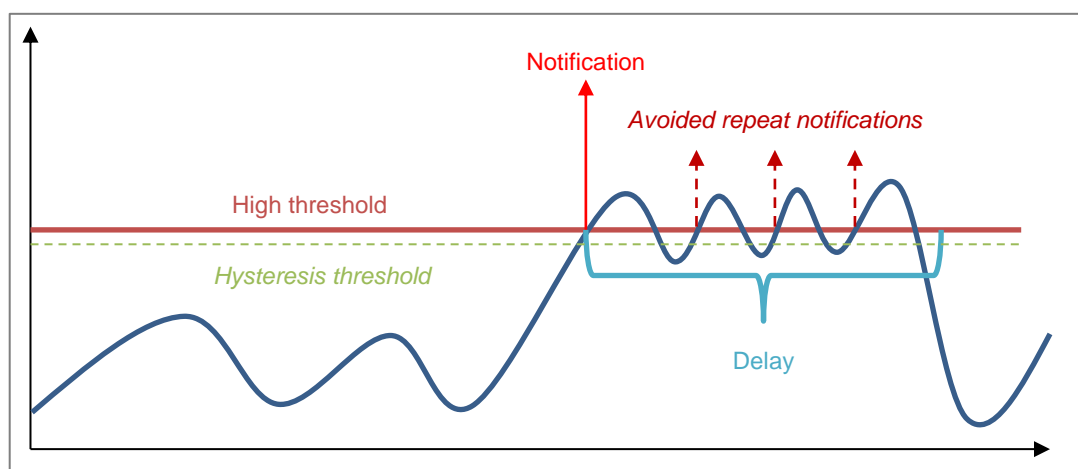
Figure 63 – Avoiding repeat notifications thanks to alarm delay

12.3.6. Configure a threshold alarm on a non-cumulative analogue service

When working with a service with non-cumulative analogue values, such as temperature or current, you may want to monitor that they do not go above or under certain thresholds.

For this reason, like agardio.manager, stream offers 3 types of threshold alarms for these kinds of services:

- High threshold
- Low threshold
- High and low thresholds

Each threshold comes with 2 additional thresholds: a **warning** threshold and a **hysteresis** threshold.

- **Main threshold** determines when the alarm is full on triggered. This is the value you do not want your measurement going above (in the case of a high threshold) or below (in the case of a low threshold).

- **Warning threshold** determines when a warning shot should be fired, so as to have the opportunity to intervene before the main alarm threshold is reached.

ℹ If you do not want to receive warning shots, you can deactivate warning threshold by setting it to 0.

▪ **Hysteresis threshold** determines when the issue notified by the alarm can be considered as no longer present. When the value has gone back below (in the case of a high threshold alarm) or back above (in the case of a low threshold alarm) hysteresis threshold, it means the issue is over.
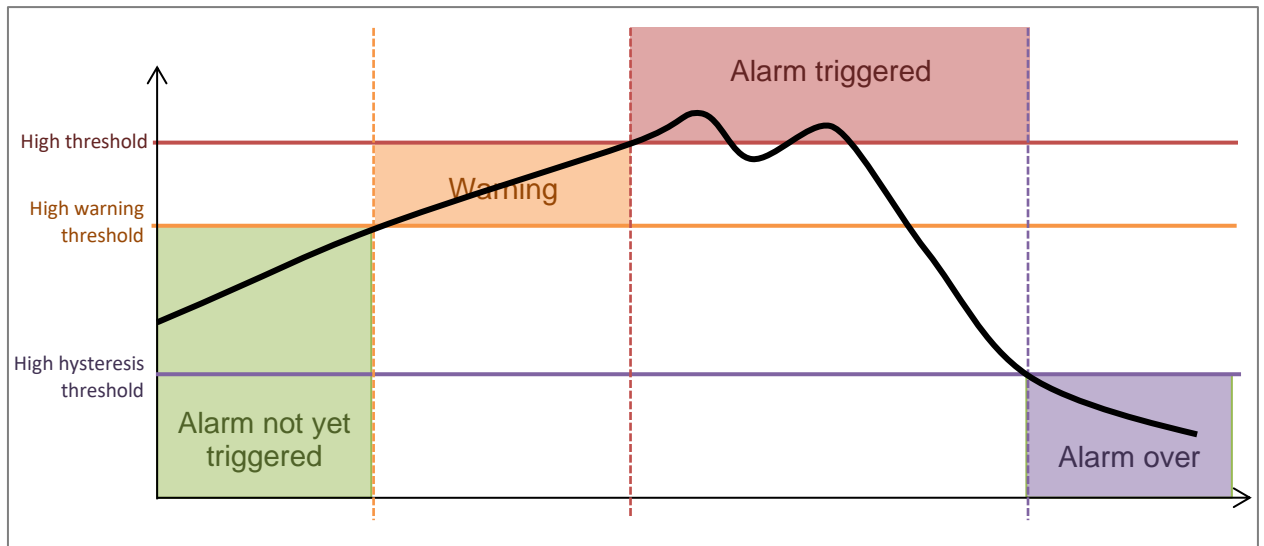
Figure 64 - Concept of high threshold for an alarm

12.3.7. Configure a differential alarm on a cumulative analogue service

When working with a service with cumulative analogue values, a simple threshold is not very helpful.

▪ A low threshold below current value is never reached.

▪ A low threshold below current value is only active until the value goes above it and never again.

▪ A high threshold below current value is always going to be active.

▪ A high threshold above current value becomes active forever once reached.

None of this is much use.

What is interesting when working with a service with cumulative analogue values is what stream calls a Differential threshold. Alarms of this type are built to be triggered when the increase measured during a determined period of time is above a high threshold. This is especially useful with energy indexes.
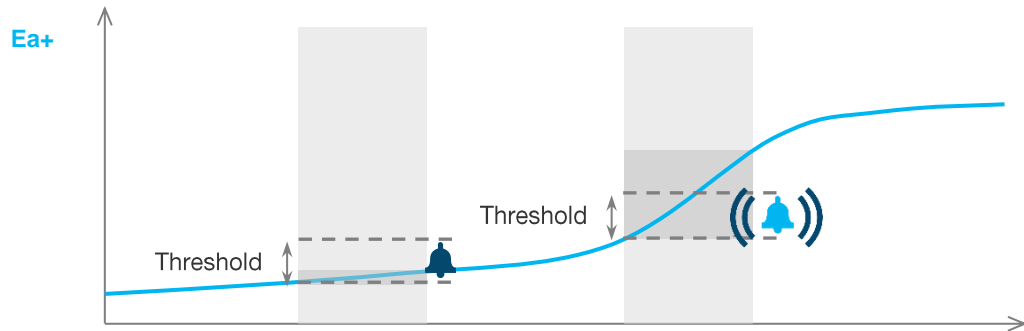
Figure 65 – Illustration of differential threshold alarm behaviour

The period a differential alarm works with is calendar:

- When **day** is selected, the increase is evaluated every day for the previous day.
- When **week** is selected, the increase is evaluated every Monday, between previous Monday morning to Sunday evening.
- When **month** is selected, the increase is evaluated every 1st of the month, between the 1st day and last day of the previous month.

> ⚠ The notification is only sent out at time of increase evaluation, not when the threshold is first reached.
>
> **Example**: even if your monthly energy consumption is already above the defined threshold on the 12th of the month, you will only be alerted on the 1st of next month.

12.3.8. Configure an alarm on a binary service

When working with a service with a binary value expected to remain stable, a change in status can be worth an alarm. The way this type of alarms works is straightforward.

12.4. Reports

stream offers the possibility to be periodically notified of event occurrences or the evolution of the value of stored measurements.

1. Log in with an account with any Configurator permission (at least).
2. Get to **Configuration**.
3. Get to **Reports.**

12.4.1. Understand report settings

12.4.1.1. Report name

The name of a report not only allows locating it in configuration, it also determines the name of the generated file. All spaces are removed from the human-readable name entered and the first and last day of report content are added at the end.

Example: the file for a report named "My Energy Report", generated about the week of September 28th 2020 to October 4th 2020 is named "MyEnergyReport_2020-09-28_2020-10-4".

12.4.1.2. Periodicity

Periodicity of a report determines the frequency at which it is generated, as well as the period its content is taken from

Example: a report configured for the 1st of every month is about the previous month, from first to last day of that month, no matter how many days there are in the considered month.

> A monthly report programmed for a day which does not exist every month (typically the 29th, 30th, or 31st) is going to be generated on the last day of every month for which the day in question does not exist.

Example: during a leap year, a report set to be generated on the 31st of every month is generated:

- On February 29th, about the period from January 31st to February 28th.
- On March 31st, about the period from February 29th to March 30th.
- On April 30th, about the period from March 31st to April 29th.
- And so on.

During a regular non-leap year, a report set to be generated on the 31st of every month is generated:

- On February 28th, about the period from January 31st to February 27th.
- On March 31st, about the period from February 28th to March 30th.
- On April 30th, about the period from March 31st to April 29th.
- And so on.

12.4.1.3. Granularity

The **granularity** of a data report determines how the time interval designated by periodicity is divided for aggregation of measurements.

ⓘ Due to the impossibility to aggregate event occurrences, granularity is only applicable to data reports.

A granularity of "All" means all measurements are reported, which invalidates the need for an aggregation function. You still need to pick one during content configuration, however, in case report granularity is ever changed.

12.4.1.4. Aggregation functions

In its data reports, stream allows 3 aggregation functions for measurements:

- ▪ *Last value*, which returns the last stored measurements for the considered time interval.
- ▪ *Average*, which returns the average of all the measurements stored for the considered time interval.
- ▪ *Delta*, which returns the difference between the very last value and the very first value stored for the considered time interval.

Example: for an hourly granularity, the difference between the value stored at HH:00 and the value stored at HH-1:00 is returned for every hour of the considered time interval.

ⓘ Although no restriction is in place, it is highly recommended to only ever use Average for non-cumulative services, and Delta for cumulative services.

⚠ When using Delta with "Hourly" granularity, if a measurement of bad quality was stored on the hour at either end of the considered hour, the difference cannot be computed. stream does not use the closest value stored within the hour.

The considered time interval is determined in accordance with granularity, as explained above in §12.4.1.3.

12.4.2. Program a data report

All measurements stored by stream can be exported for safekeeping in a data report.

1. **Add report**.
2. Enter a unique report name.
3. Select the language you want the report to be in (which includes the names of concerned entities, as well as decimal separator and date format, as explained in §18.2).
4. Select type of report "Data".
5. Select the time zone of the products you are interested in for that report.

ⓘ For consistency reasons, the measurements from products in different time zones cannot appear in the same data report.

6. Select a periodicity and associated generation time.
7. Select a granularity.
8. Select a file format and associated settings if any.
9. Save.
10. Get to **Content**.

Settings	Content	Publication		

Modify

Product	Service	Aggregate
SM103E_3 Genset (SBC 100)	Ea+Reset (General measures)	Delta
SM101C_1 Light (SBC 100)	Ea+Reset	Delta
SM102E_2 Socket Technical (SBC 100)	Ea+Reset	Delta
EC366_4 Genset (SBC 100)	Ea+NotReset	Delta
EC376_5 Genset (SBC 100)	Ea+NotReset	Delta
H³+_7 Solar (SBC 100)	Ea+NotReset	Delta
PT100 (SBC 100)	Temperature	Average

Figure 66 - Example of data report content

11. **Modify** report content.
12. Select an aggregation function.
13. Navigate across available products to select all the services whose values you want to see in your report, aggregated with the currently selected aggregation function.
14. Repeat steps 12 and 13 as many times as necessary.
15. Save.

You can **Modify** report content at will, to remove services or add new ones, including to change the aggregation function used for a service. In this case, remove the service from the list (by clicking the bin icon 🗑 next to it) and add it again after having made sure the desired aggregation function was selected.

Start date – End date				
	Pdct A – Serv X	Pdct A – Serv Y	Pdct B – Serv Y	Pdct C – Serv X
t1	…	…	…	…
t2	…	…	…	…
t3	…	…	…	…

Table 4 - Concept of a data report

When using a granularity different from "All", the start and end of each time interval are listed.

The unit of each service is mentioned.

12.4.3. Program an event report

To avoid having to connect to stream to check that everything is in order just as you left it, you can configure event reports. They provide regular notifications of all events which may have occurred.

> ℹ️ If no event has occurred during the time interval designated by periodicity, no report is sent out.

Because they might concern different people, events of different scopes are handled in separate reports.

- **System events** are about technical occurrences, such as any loss of communication which may happen (with products, with agardio.manager devices, with remote servers such as FTP, etc.) and overall system malfunctions (CPU, temperature, RAM, etc.).
- **Process events** are about significant data variations, they are the alarms which have been set on monitored services.

1. **Add report**.
2. Enter a unique report name.
3. Select the language you want the report to be in (which includes event label as well as date format, as explained in §18.2).
4. Select type of report "Process events" or "System events".
5. Select the time zone you want the time of event occurrences to be expressed in.
6. Select a periodicity and associated generation time, based on the selected time zone.
7. Select a file format and associated settings, if any.
8. Save.

The content of an even report cannot be configured. Event reports list all the events within the considered scope (process or system) which have occurred during the time interval designated by the periodicity and generation date and time. In the case of alarms, only the ones still active at time of report generation are present. An alarm is considered active when it hasn't been acknowledged yet and/or its triggering conditions are still in effect.

12.4.4. Program a pricing report

In case you have some products associated with a source, stream computes the cost of your energy consumption daily, based on the corresponding pricing schedules.

To avoid having to connect to stream to check your costs, you can configure pricing reports, to be regularly notified of costs.

1. **Add report**.
2. Enter a unique report name.
3. Select the language you want the report to be in (which includes source, product, and tariff labels, as well as decimal separator and date format, as explained in §18.2).
4. Select type of report "Pricing".
5. Select the time zone you want to base report generation time on.
6. Select a periodicity and associated generation time, based on the selected time zone.

⚠ Costs for a given day are computed by agardio.manager devices at 1:00 the next day, local time. To ensure the last day of the configured period can indeed be taken into account in a pricing report, make sure that report is generated after 2:00 in that same time zone.

7. Select a file format and associated settings, if any.
8. Save.

A pricing report contains a list of all sources which were in use during the considered time interval. And for each of these sources, a list of all products associated with it during the considered time interval. And for each of these products, the amount of energy and money associated with each tariff of the source.

Start date – End date							
	Energy	Cost	Energy	Cost	Energy	Cost	Energy	Cost
Source A	Tariff A1		Tariff A2		Tariff A3		Tariff A4	
Product PA1	…	…	…	…	…	…	…	…
Product PA2	…	…	…	…	…	…	…	…
	Energy	Cost						
Total	…	…						
	Energy	Cost	Energy	Cost	Energy	Cost	Energy	Cost
Source B	Tariff B1		Tariff B2		Tariff B3		Tariff B4	
Product PB1	…	…	…	…	…	…	…	…
	Energy	Cost						
Total	…	…						

Table 5 - Concept of a pricing report

Sources are listed with their type and currency.

Products are listed with their site, building, and agardio.manager device.

Energy is expressed in kWh.

12.4.5. Update a report

1. Select the report you are interested in updating.
2. **Modify**.
3. Make the changes you want to make, staying within the constraint of report name uniqueness.

ℹ The type of a report cannot be changed. If you wish to do so, remove the report and create a new one.

⚠ Changing the time zone of a data report has impacts on the products and services available to be added to its content. Current content is however unaffected when report time zone is changed, which may lead to inconsistencies at generation time.

4. Save.

All past files generated and published in connection with the report are untouched by its update.

12.4.6. Remove a report

Whatever the type of report considered, or its registered publication method(s), you are free to remove it.

1. Click the bin icon 🗑 next to the report you want to remove.
2. Confirm.

All past files generated and published in connection with the report are untouched by its removal.

12.4.7. Force report generation

Whatever its type, you always have the option to force the generation of a report. This allows making sure the output is the one you were aiming for and nothing is missing.

A report generated by force is published according to its current configuration except for generation date and time. Its content is about the time interval designated by the periodicity but based on current date instead of the one selected for previous or next generation.

Example: a monthly report is configured to be generated on the 1st of each month. On May 15th, the last iteration of the report was generated on May 1st, about the period from April 1st to 30th. The next iteration is planned for June 1st, about the period from May 1st to 31st. On that same day of May 15th, a forced generation of the report creates one about the period from April 15th to May 14th.

Forcing report generation is also useful right after generation and/or publication has failed for any reason.

Example: the FTP server a report is supposed to be sent on is momentarily unavailable at time of report generation. When you receive the corresponding alarm notification about publication failure, you come back to stream, fix the issue with the FTP if it hasn't already been resolved, and force report generation so the file does end up on the server as it was initially meant to.

> In this scenario, if emails have already been sent out for this report, you may want to temporarily remove the recipient list to avoid them being notified a second time.

> ⚠ If report generation or publication has failed and you come back some much as a day later, you will not be able to force the generation of the exact same report as the missing one. The days between expected publication date and forced generation date will not be reported.

> When using forced generation to preview a report in advance, it is advised to do so without all intended email addresses and FTP entered as recipients, so as not to needlessly spam either of them.

13. Synchronising clocks

13.1. Time synchronisation of agardio.manager devices

agardio.manager devices have an internal clock which needs to be properly synchronised for:

- stored measurements to be correctly timestamped.

- pricing schedules to be correctly applied to products which accept tariff synchronisation commands (see §6.1.2 for the tariff.slave feature).

13.1.1. Use NTP synchronisation

An NTP server allows very precise time synchronisation with UTC on which all time zones are based. When this method has been selected, stream sends out the address for an NTP server to all concerned devices, which then all use this address to synchronise their internal clocks to the same reference.
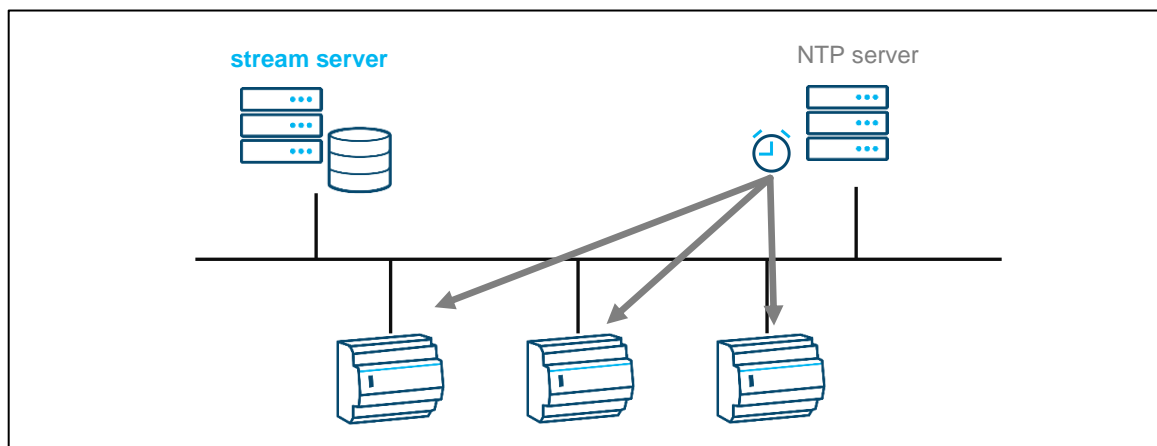

Figure 67 - NTP time synchronisation

What is interesting with NTP time synchronisation is that it is not affected by network latencies because the protocol takes it into account when sending back the time.

> The NTP server hostname entered to be sent out does not have to be reachable for stream itself, only for all targeted agardio.manager devices.

13.1.2. Use Automatic synchronisation

Automatic time synchronisation relies on the time of the server on which stream is installed. When using this method, server UTC is regularly sent out to every concerned agardio.manager device.

> ⚠ This method is much less reliable than an NTP server, because it does not take network latencies into account. It should only be used for agardio.manager devices which cannot reach any NTP server due to IT restrictions.
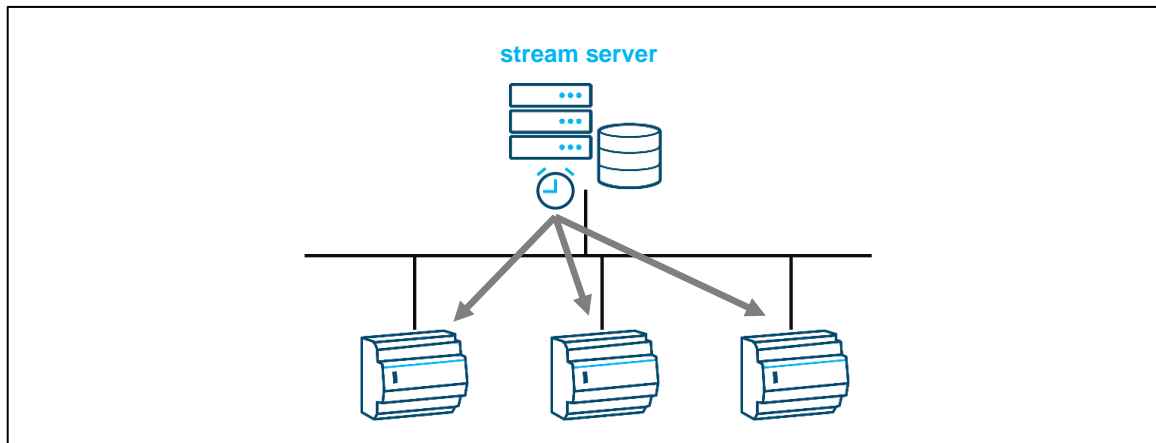
Figure 68 – Automatic time synchronisation

13.1.3. Synchronise the clocks of all agardio.manager devices the same way

Time synchronisation method can be configured at the installation level. If you plan on having all your agardio.manager devices use the same method in that regard, this is the only configuration you need to take care of.

1. Log in with an account with Global configurator permission (at least).
2. Get to **Configuration**.
3. Get to **Structure**.
4. Select your installation.
5. **Modify**.
6. Select a time synchronisation method.
7. Save.

13.1.4. Synchronise each site separately

By default, all sites refer to the time synchronisation method of the installation. But this method can be locally overridden at the site level. This is useful in case the agardio.manager devices of a certain site have a specific IT configuration which for example does not allow them access to the same NTP server as the rest of the installation, if at all.
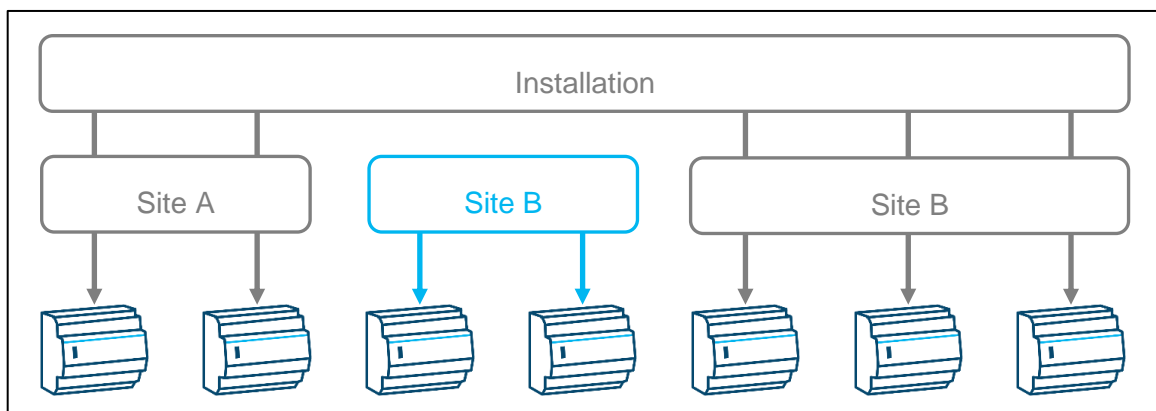

Figure 69 - Different time synchronisation methods across your installation

13.2. Time zone configuration

Time zone is configured for a site and propagated to every agardio.manager device within that site. This is important for the proper interpretation of pricing schedules and the cost computations they entail.

Site time zone also impacts the visualisation of stored data on a time scale. Measurements are stored timestamped in UTC but when consulted they are put back in context with the appropriate time difference.

Example: your company has a site in Sydney and a site in Paris, which have very different time zones. When comparing the energy consumption of these sites for a given day, you are interested in that same local day, because when it is night for a site, it is broad daylight for the other. Comparing a day from 00:00 to 00:00 in France to the same day from 9:00 to 9:00 the next day in Australia makes little sense. stream takes care of this and always aligns data according to their local time.

14. Handling translations

stream handles several languages. For default labels such as menus, system events, local notifications and default entities, translations are provided upon install.

For custom labels entered during configuration, such as the name of custom usages, zone categories, or even the name of products, translations can be provided if several languages are used by people consulting data in stream.

> ℹ️ Until a translation has been provided, the label entered in configuration is used.

- If all your stream users speak the same unified language or you decide to adopt a common tongue for your project, you do not need to bother with translations.

14.1. Provide a translation for a label for the name of an entity

To register a translation for a label which requires one (meaning which appears during data exploitation):

1. Log in with an account with Global configurator permission (at least).
2. Get to **Configuration**.
3. Get to **Translations**.
4. Select the language in which you want to provide the translation of a label.
5. If need be, filter for the type of the entities whose labels you want to provide a translation for.
6. Click the pencil icon ✏ next to the entity whose label you want to provide a translation for.

Figure 70 - stream translation interface

7. Enter the translation of the considered label in the selected language.
8. Save.

14.2. Impact of translations

stream translations are only ever applied in exploitation. During configuration, a neutral value is displayed and entered, as reference for translations in other languages.

If that neutral label is ever updated, its translations in other languages are not affected.

Example: a zone category is called "Bathroom", which a French translator translates as *Salle de bain*. If the neutral value of "Bathroom" is ever changed to "Restroom", the French translation remains *Salle de bain* until the translator comes back and changes it to something maybe more appropriate such as *Toilettes*.

15. Managing stream users and privileges

When first connecting to stream, you are using the original admin account. By default, this account has all privileges on your stream system. As a precaution, so stream can always be accessed, this account cannot be removed and its main privileges cannot be revoked.

The original admin account is however only intended as a precaution, and not meant for everyday use. For day to day access to stream, new user accounts should be created, with specific privileges tailored to the needs of their role.

Privileges across stream are about:

- Administrating its connection to remote servers such as SMTP and FTP (Server administrator).

- Administrating users and groups of users, and their permissions (User administrator).

- Configuring the installation or specific parts of it (Global or Local configurator).

- Consulting the data for the installation or specific parts of it (Global or Local viewer).

15.1. User management

15.1.1. Get started

When you first access stream user management, you are guided through the creation of all the accounts you might need to manage your stream system, and their association to the permissions they need.

- If you are not already familiar with user management in stream, following these steps should help you to get a first handle on it.

- If you are already familiar with user management in stream, and feel more comfortable with the menus, you are welcome to skip this wizard and fend for yourself.

Each step of the wizard presents you with a specific range of privileges. For each of these ranges, you have two not mutually exclusive options:

- Create a new account for someone who needs the described privileges.
- Select an account you have already created while going through another step, in order to grant them the described privileges.

Navigating back and forth across steps is possible in case you forgot an account in a certain permission, or you want to go back on your decision to grant a specific account a certain range of privileges.

Figure 71 - Third step of the user management wizard

ℹ Simplified user management is only accessible while no user account exists beside the original `admin` account. If you unintentionally skipped the setup too soon and want to access it again, you can only do so by removing all other existing accounts.

15.1.2. Create a user

You are free to create as many user accounts as you see fit.

1. Log in with an account with User administrator permission (at least).
2. Get to **Users**.
3. Get to **Users**.
4. **Add user**.

Figure 72 - User creation interface

5. Enter a name.
6. Enter a unique user login. Be careful, for it cannot be changed later.
7. Enter a password and its confirmation.
8. Select a default language for the account.
9. Save.

The language of an account is the one in which the interface is displayed whenever logging in with it.

15.1.3. Respect user password policy

stream password policy is that a password should be above 8 characters and contain at least:

- a capital letter.
- a lowercase letter.
- a numeral.
- a non-alphanumerical character.

Also, accents are prohibited.

To change the password for an account:

1. Log in with an account with User administrator permission (at least).
2. Get to **User management**.
3. Get to **Users**.
4. Select the account whose password you want to update.
5. Click the "**Change password**" button.

Figure 73 - Password update interface

6. Enter the current password for the account, then a new password and its confirmation.
7. Save.

ℹ The original admin account does not need to provide the current password of an account to change it. This is one of the reasons why it is advised to reserve the use of this account for emergencies only.

15.1.4. Update the username and language of an account

Username is what the user sees in their personal settings when connected. If an account changes hands, it might be more comfortable to update its username to match the new person using the account.

In the same way, if the person using the account is more comfortable with one language over another, updating the default language for the account might be a good idea to avoid them systematic action upon connection.

1. Log in with an account with User administrator permission (at least).
2. Get to **User management**.
3. Get to **Users**.
4. Select the user you want to update.
5. **Modify**.
6. Update name if you want to.
7. Select the default language for the account.
8. Save.

> ℹ️ The login for an account cannot be changed. If you have made a typo in the login when creating an account, create another account instead.

15.1.5. Remove a user (including kicking him off the web application)

Any user account besides the original admin account can be removed.

When a connected user is removed, they are automatically logged out.

3. Log in with an account with User administrator permission (at least).
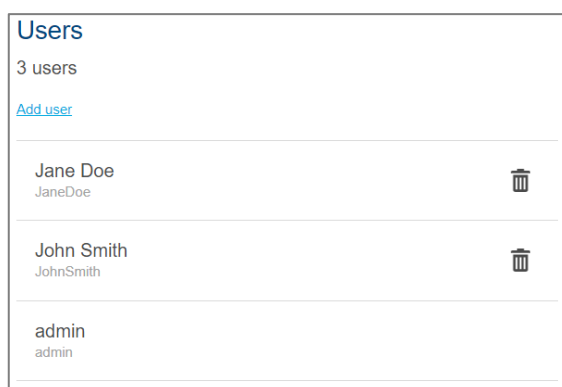4. Get to **User management**.
5. Get to **Users**.

Figure 74 - User management interface

6. Click the bin icon 🗑️ next to the account you want to remove.
7. Confirm.

> ℹ️ You cannot remove the account you are currently logged in with.

15.2. Types of privileges

By default, user accounts are created without any privileges, which means they are pretty much useless. It is possible to log in with the registered credentials, but no part of the web application is available until permissions have been granted.

15.2.1. Understand user management privileges (global)

Figure 75 – Icon for the menu accessible with User administrator permission

User management privileges are associated with the **User administrator** global permission. With this permission, a user can:

- Create new accounts.
- Update existing accounts, except for the password of those with the User administrator permission.
- Remove other accounts, except those with the User administrator permission.
- Create new groups.
- Update existing groups.
- Remove groups, except for the one granting their account User administrator permission.
- Add users to groups.
- Remove users from groups, except their own account from the group granting it User administrator permission.
- Grant permissions to users and groups.
- Take away permissions from users, except the User administrator permission from their own account, and the user administrator and server administrator permission from the original admin account.
- Take away permission from groups, except the User administrator permission from the group granting it to their own account.

15.2.2. Understand server administration privileges (global)

Figure 76 – Icons for the menus accessible with server administrator permission

Server administrator privilege allows managing stream connection to remote servers, namely:

- FTP servers.
- SMTP server.

This permission also gives access to system events not related to any agardio.manager device.

This permission fits an IT profile, someone with knowledge and responsibility of the network infrastructure.

Server administrator is one of the privileges you cannot take away from the original admin user.

15.2.3. Understand configuration privileges (global or local)

Figure 77 – Icons for the menus accessible with global configurator permission

The whole of stream configuration encompasses:

- Data management policies.
- Installation context:
  - Sources.
  - Usages.
  - Zone categories.

- Installation structure:
  - Directories.
  - Sites, including weather service and meshes.
  - Buildings, including EIEC parameters.
  - Floors and rooms.

- Management of agardio.manager devices, including products and their services, and alarms.
- Reports (see §12.4).
- Translations (see Chapter 14).
- Maintenance (see Chapter 16).

There are 2 levels of configurator permission: **global** and **local**.

- **Global configurator** permission grants access to all the interfaces listed above.
- **Local configurator** permission is granted for a directory or site, and it only allows installation structure and management of agardio.manager devices for that perimeter. An account with that permission only allows creating directories and sites within a directory to which it grants access to. An account can cumulate local permissions on various directories and/or sites.

For consistency reasons, configurator permission entails viewer permission for the same perimeter.

15.2.4. Understand data exploitation privileges (global or local)

Figure 78 – Icons for the menus accessible with viewer permission

Data exploitation privileges are granted by a Viewer permission.

There are 2 levels of viewer permission: **global** and **local**.

- **Global viewer** permission grants access to all of data exploitation.

- **Local viewer** permission is granted for a directory or site, and it only allows data exploitation for that perimeter. An account can cumulate local viewer permissions on various directories and/or sites.
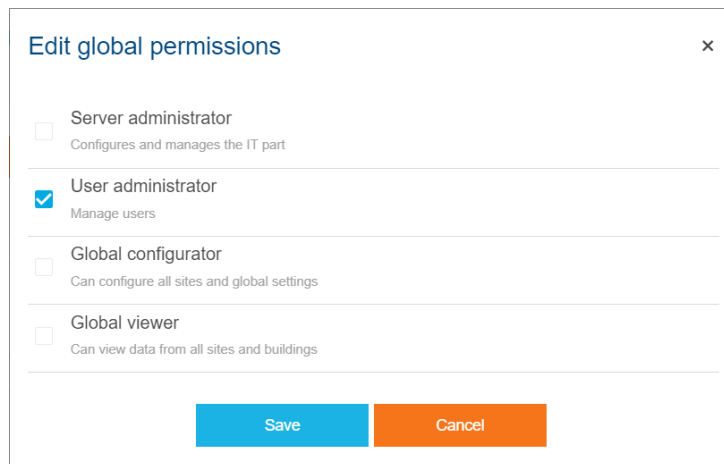
15.3. Privilege management

15.3.1. Check permissions

- If you want to know the effective permissions of a specific account or group, go to its profile. Effective permissions include the ones an account inherits from its membership to a group.

- If you want to know who possesses a specific permission, go to the management of that permission. To avoid confusion, groups are listed without their members. Only direct owners of a permission are listed.

15.3.2. Grant a global permission

There are 2 ways to grant a global permission:

- In case you are interested in a specific account or group, especially if you wish to grant it several global permissions, you should:
    1. Log in with an account with User administrator permission (at least).
    2. Get to **User management**.
    3. Get to **Users / Groups**.
    4. Select the user / group you want to grant the permission(s) to.
    5. **Modify** Global permissions.

Figure 79 – Interface to manage the global permissions of a user or group

    6. Check the desired global permission(s).
    7. Save.

- In case you are interested in a specific global permission, especially if you want to grant it to several accounts and/or groups, you should:
    1. Log in with an account with User administrator permission (at least).
    2. Get to **User management**.
    3. Get to **Global permissions**.
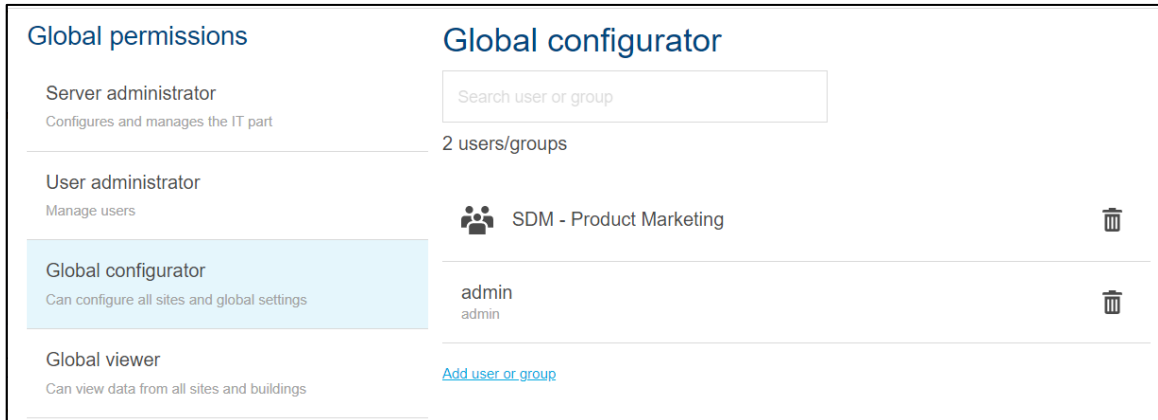   4. Select the global permission you are interested in.

Figure 80 - Global permission management
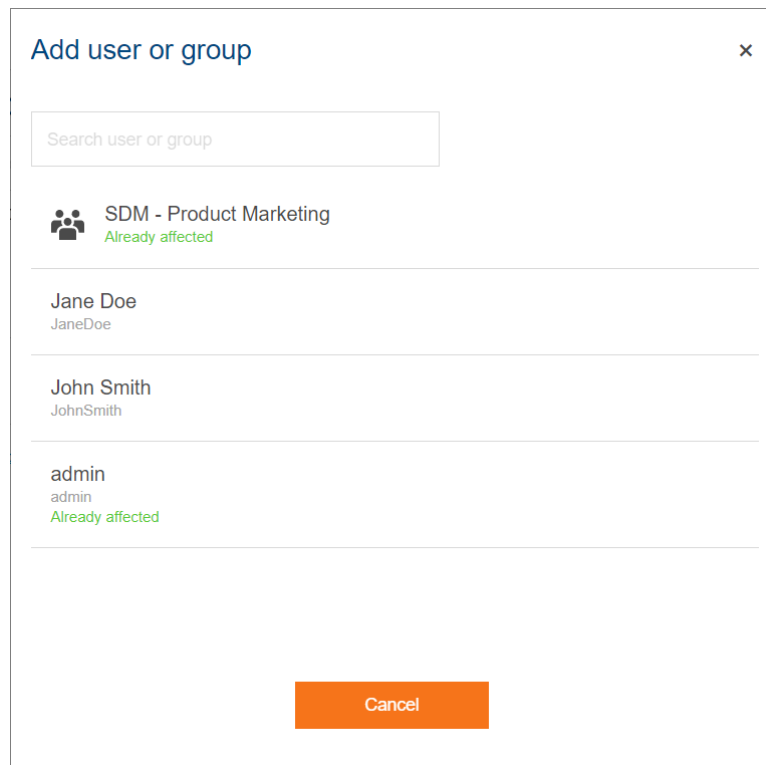
5. **Add user or group**.

Figure 81 - User or group affectation interface

6. Select the user or the group you want to grant the global permission to.
7. Repeat steps 5 and 6 as many times as necessary.

15.3.3. Grant a local permission

There are 2 ways to grant a local permission:

- In case you are interested in a specific account or group, especially if you wish to grant it a level of local permission on several directories and/or sites, you should:
    1. Log in with an account with User administrator permission (at least).
    2. Get to **User management**.
    3. Get to **Users / Groups**.
    4. Select the user / group you want to grant local permission(s) to.
    5. **Modify** Local permissions.

Figure 82 - Interface to manage the local permissions of a user or group

    6. For the desired directories and/or sites, check the box corresponding to the desired level of local permission.
    7. Save.

- In case you are interested in a specific directory or site, especially if you wish to grant several accounts and/or groups a level of local permission on it, you should:
    1. Log in with an account with User administrator permission (at least).
    2. Get to **User management**.
    3. Get to **Local permissions**.
    4. Select the directory or site you want to grant one or several users and/or groups a level of local permission on.

Figure 83 - Local permission management interface
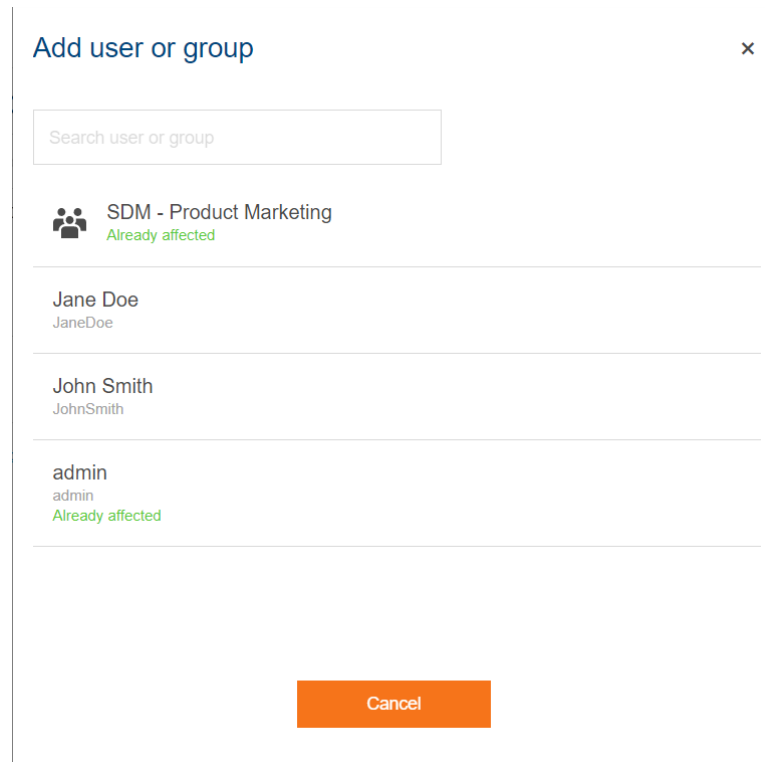
    5. **Add a user or group**.

Figure 84 - User or group affectation interface

6. Select the user or the group you want to grant a level of local permission on the considered directory or site.
7. Repeat steps 5 and 6 as many times as necessary.
8. For each of the user(s) and/or group(s) you have selected, check the box corresponding to the level of local permission you want to grant them.
9. Save.

15.3.4. Revoke a permission from a user

Users get their privileges one of 2 ways:

- They have been granted a permission directly.
- They are member of a group with a permission.

- To revoke permissions not inherited from a group:
  1. Log in with an account with User administrator permission (at least).
  2. Get to **User management**.
  3. Get to **Users**.
  4. Select the account whose permission(s) not inherited from a group you want to revoke.
  5. **Modify** Global or Local permissions.
  6. Uncheck the box(es) corresponding to the permission(s) you want to revoke for the account.
  7. Save.

ℹ Any attempt to revoke a permission inherited from group membership is either impossible or rejected, with the mention of the group(s) which stand(s) in your way.
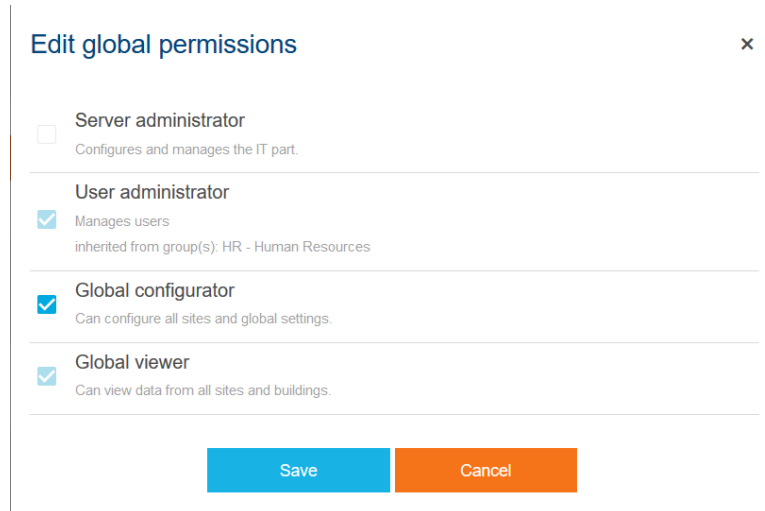
Figure 85 – Interface for the management of the global permissions of a user, with personal and inherited permissions

- To revoke the permissions an account inherits, you need to remove the user from the group or groups granting it to them. This can be performed directly from user profile:
  1. **Modify** Groups.

Figure 86 - Group membership management interface

  2. Uncheck the box(es) corresponding to the group(s) you know to grant the account the permission(s) you want to revoke.
  3. Save.

If the permission remains, it means the account also possesses it for itself. The first protocol described above should be applied.

⚠ When a connected user has any of their privileges revoked, they are instantly logged out, to ensure they do not overstep. This is also true for a User administrator affecting the permissions of their own account.
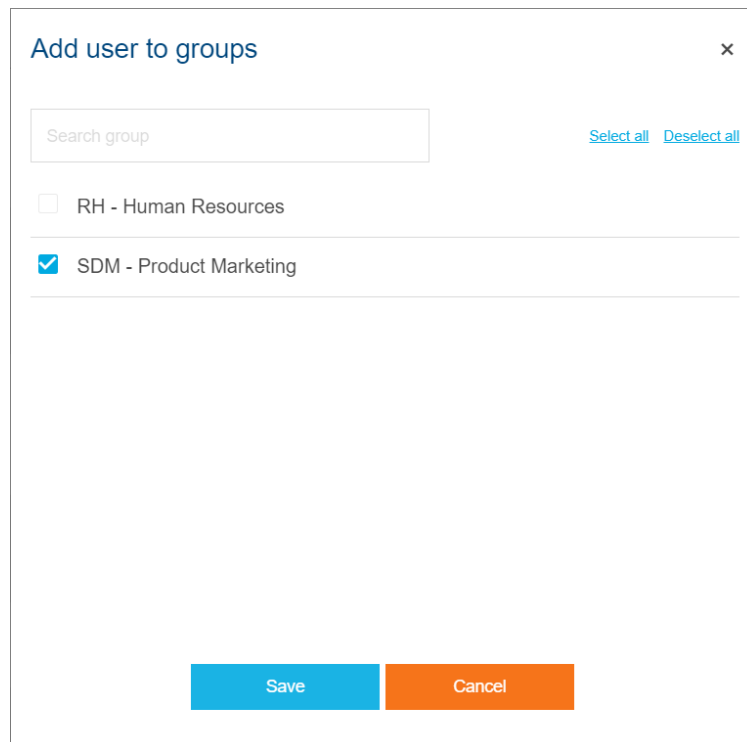
15.3.5. Revoke a permission from a group

1. Log in with an account with User administrator permission (at least).
2. Get to **User management**.
3. Get to **Groups**.
4. Select the group whose permission(s) you want to revoke.
5. **Modify** Global or Local permissions.
6. Uncheck the box(es) corresponding to the permission(s) you want to revoke.
7. Save.

⚠ Revoking the permission from a group revokes it for its members. And when a connected user has any of their privileges revoked, they are instantly logged out to ensure they do not overstep. This is also true for a User administrator revoking any other permission of a group they are a member of.

15.4. Group management

If you plan on having many users connect to stream with distinct accounts, you might want to handle them in bulk rather than individually.

Example: you have a site which has many facility managers. Rather than granting each of them the local configurator permission on that site (which could become quite tedious quite fast), it is easier for you to have a group with local configurator permission on that site, in which you can add accounts at will.

15.4.1. Create or update a group

Groups in stream are only meant to gather users in order to make granting them the same permission(s) easier. They come with members and permissions. Their name has no other impact than facilitating their management; a given user without User administrator permission has no way to know which group they are a part of.

1. Log in with an account with User administrator permission (at least).
2. Get to **User management**.
3. Get to **Groups**.
- In case you wish to create a new group:
     a. **Add group**.
     b. Enter a unique group name.
     c. Save.
- In case you wish to update an existing group:
     a. Select the group you want to update.
     b. **Modify**.
     c. Update its name.
     d. Save.

15.4.2. Manage group membership

There are 2 ways to manage group membership:

- In case you are only interested in a specific account, you should:
     1. Log in with an account with User administrator permission (at least).
     2. Get to **User management**.
     3. Get to **Users**.
     4. Select the user in question.
     5. **Modify** Groups.

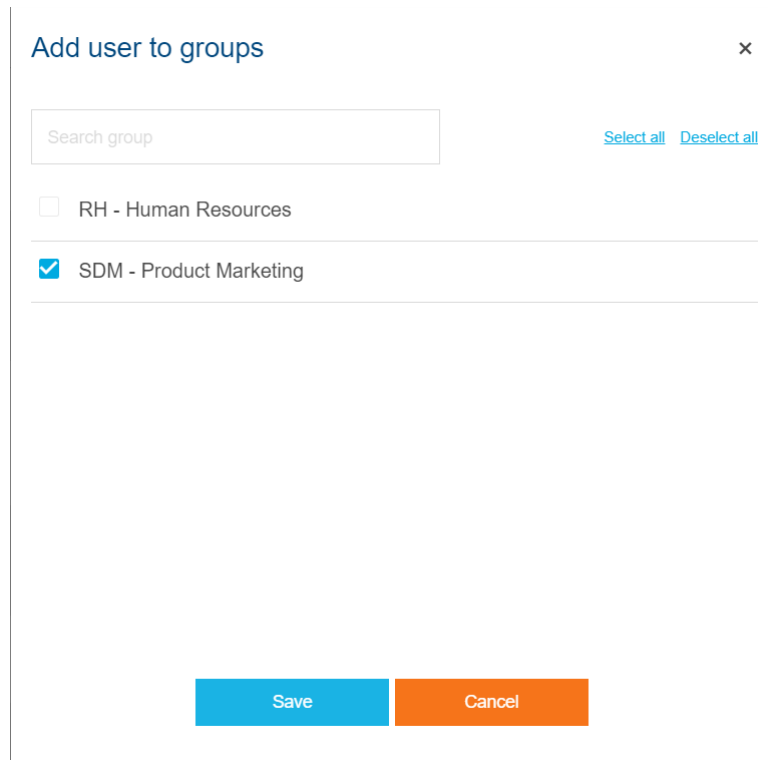Figure 87 - Group membership management interface

6. Check or uncheck one or several group(s) in the list.
7. Save.

- In case you are interested in the members of a specific group, you should:
    1. Log in with an account with User administrator permission (at least).
    2. Get to **User management**.
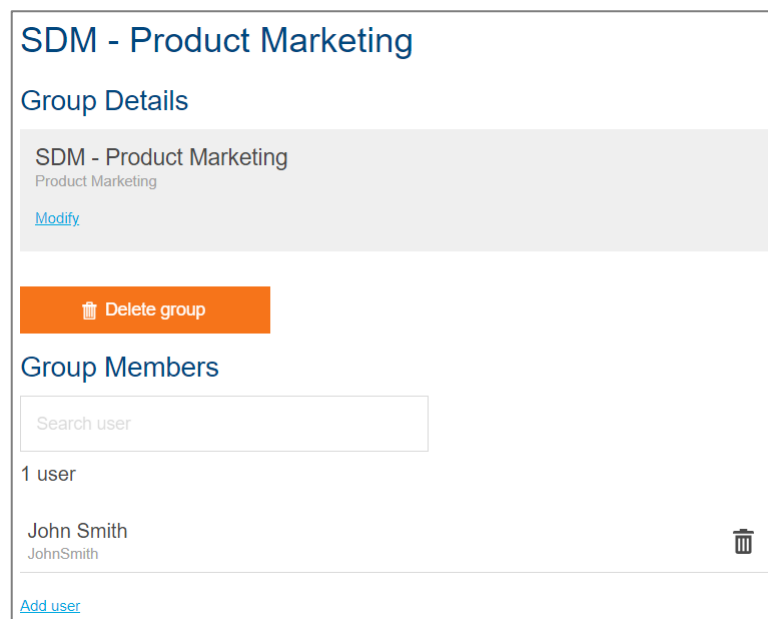   3. Get to **Groups**.
    4. Select the group in question.

Figure 88 - Group details and members

- In case you wish to add a member:
  a. **Add user**.
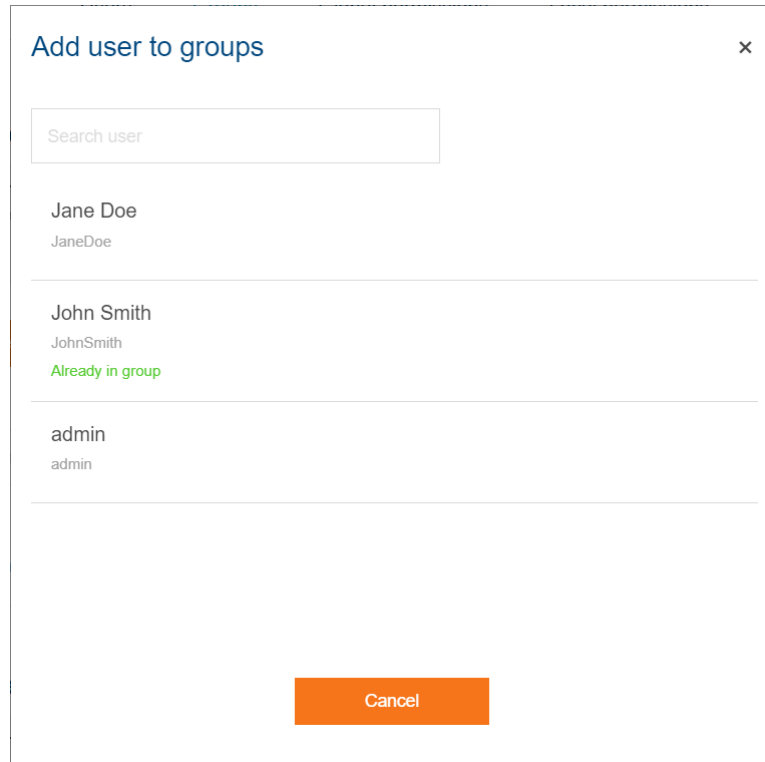
Figure 89 - Interface to add a user to a group

  b. Select a user you want to add to the group.

- In case you wish to remove a member:

  a. Click the bin icon 🗑 next to the account you want to remove from the group.
  b. Confirm.

ℹ️ You cannot remove the account you are currently using from any group granting it user administration privileges. This precaution is in place to avoid any user taking away their own user management privileges.

⚠️ Removing an account from a group takes away any permissions the group granted it. And when a connected user has any of their privileges revoked, they are instantly logged out to ensure they do not overstep. This is also true for a User administrator removing their own account from a group.

15.4.3. Remove a group

Any group can be removed from stream as long as the account used to perform the action does not inherit User administrator permission from it. This precaution is in place to avoid any user taking away their own user management privileges.

⚠️ Removing a group does not remove its members. Any permissions it granted them is however revoked. And when a connected user has any of their privileges revoked, they are instantly logged out to ensure they do not overstep. This is also true for a User administrator removing a group they are a member of.

1. Log in with an account with User administrator permission (at least).
2. Get to **User management**.
3. Get to **Groups**.
4. Select the group you want to remove.
5. Click the "Delete group" button.
6. Confirm.

16. Maintaining stream

stream has tools to ensure its own maintenance and that of the agardio.manager devices it is connected to.

16.1. Firmware updates of agardio.manager devices

stream allows for a collective firmware update of the agardio.manager devices under its purview. This not only ensures consistency across its ecosystem but also saves a lot of time in individual update of each device.
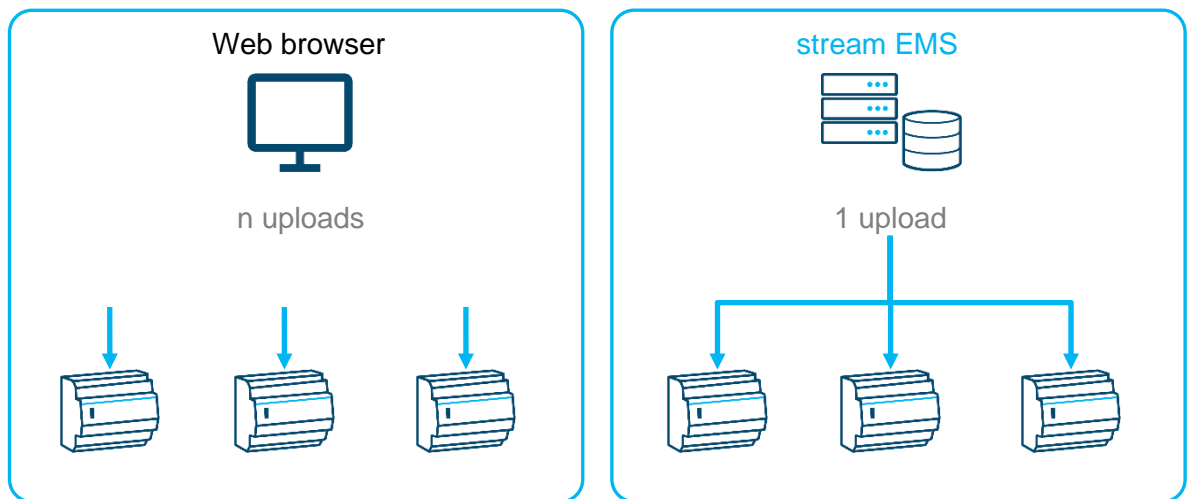

Figure 90 – Centralisation of agardio.manager firmware updates using stream

16.1.1. Upload and validate an agardio.manager firmware file

Once you have retrieved the .tar.bz2 file provided by Hager for the new agardio.manager firmware:

1. Log in with an account with Global configurator permission (at least).
2. Get to **Maintenance**.
3. Get to **Firmware updates**.
4. Click the "**Select file**" button.
5. Browse your local files for the agardio.manager firmware update file in **tar.bz2** format.
6. Open it.
7. Click the "**Push**" button.
8. Wait for the file to be uploaded and its status to change from *New* to its final verdict.

When an agardio.manager firmware update file is pushed onto stream, it is checked for compatibility. This relies on several factors:

▪ The file is recognised as an agardio.manager firmware update file.

▪ The firmware version it contains is higher than any ever uploaded before, regardless of deployment status.

- Any file which is not compatible for any reason is *Rejected* and can never be deployed. It is only inserted in firmware update history for reference, and can be removed from the list at any time.

- When a file is compatible, the option to deploy it on connected agardio.manager devices becomes available. The file is marked as *Active* in firmware update history, and remains in this status until its very first deployment, at which point it becomes *Deployed*.

> ⚠ It is highly recommended to maintain all your agardio.manager devices up to date.
>
> Uploading a compatible agardio.manager firmware immediately impacts stream catalogue, even before that firmware has been deployed on any device. Until both sides are in adequation, you may encounter issues when creating products whose type isn't known or fully known by the targeted agardio.manager device.
>
> Example: if stream defines a type of product as providing more services than an agardio.manager device does, then those additional services are not going to be available on a product of that type created on that device.

16.1.2. Deploy an agardio.manager firmware update

On stream, the latest compatible firmware can be deployed on multiple agardio.manager devices at once.

Click the upload icon ⬆ next to it to set all eligible agardio.manager devices for firmware update.

The criteria for an agardio.manager device to be eligible for a firmware update are:

- Be connected.
- Be activated.
- Be in a lower version than the one contained in the firmware update.

This means that in order to prevent a specific device from being updated, you can momentarily deactivate it. See §5.3 for how to proceed and how to reverse it.

Only one firmware update attempt is made on each targeted agardio.manager device. Don't worry though, in case it fails on any, or a new one is added to the installation, you can reiterate the firmware deployment process as many times as necessary, until a new compatible firmware update file is uploaded. At this point, this latest compatible firmware becomes the only one to be available for deployment.

16.1.3. Consult agardio.manager firmware update history

The list of uploaded firmware files is available for traceability, along with their contained version (for compatible firmware), and current status.

Firmware status	Meaning for the concerned firmware
New	Still currently being evaluated for compatibility
Rejected	Not deemed compatible (invalid content, version too low, etc.)
Not deployed	Deemed compatible but never deployed before a new compatible firmware was uploaded
Active	Latest compatible firmware to be uploaded, which has not been deployed yet
Deployed	Has been deployed at least once

Table 6 - agardio.manager firmware status

All past firmware uploads can be removed from your stream system by clicking the bin icon 🗑 next to them.

16.2. Analysis of agardio.manager devices

To allow for centralised analysis of possible issues with agardio.manager devices, diagnostics information is available in stream for any which is currently communicating with it.

16.2.1. Check the hardware of agardio.manager devices

Information about the hardware of each agardio.manager device (CPU temperature, internal temperature, CPU usage, RAM usage, size of each database) is available.

1. Log in with an account with Global configurator permission (at least).
2. Get to **Maintenance**.
3. Get to **Analysers**.
4. Select the agardio.manager device whose hardware you are interested in.
5. Select **Diagnosis**.
6. If need be, **Refresh**.

16.2.2. Check Fieldbus communication of agardio.manager devices

Information about the communications of each agardio.manager device across its known fieldbuses is available.

1. Log in with an account with Global configurator permission (at least).
2. Get to **Maintenance**.
3. Get to **Analysers**.
4. Select the agardio.manager device whose fieldbus communications you are interested in.
5. Select **Fieldbus**.
6. If need be, **Refresh**.

16.3. stream diagnosis

16.3.1. Check status of data synchronisation between stream and its devices

As mentioned multiple times already, stream retrieves data from agardio.manager devices. In order to do so, it needs to be communicating with them. As long as it does, it accumulates all the data the devices are gathering themselves. This is nominal behaviour.

When communication is lost with an agardio.manager device for any reason, then stream has a certain amount of locally stored information to catch up on. More precisely, any data gathered by the device between the last time it communicated with stream and the time it was reached again.

Another situation in which data retrieval is necessary is when the configuration of an agardio.manager device has been retrieved. Any data it might have stored in the past (before its connection to its supervisor) is also retrieved by stream upon its synchronisation.

Due to the amount of time the data retrieval process can take, its progress can be tracked on a dedicated interface.

1. Log in with an account with Global configurator permission (at least).
2. Get to **Maintenance**.
3. Get to **Data import**.

Every connected agardio.manager device is listed, along with the amount of data retrieval tasks currently on the dock for it, and the amount which have already been processed.

When an agardio.manager has no data retrieval task planned, it can be in 2 situations:

- It is currently communicating ✅ and therefore up to date with stream as far as stored measurements are concerned. Its history import is marked as "***Done***".
- It is not currently communicating ❌ and as a consequence stream is not up to date with it in terms of stored measurements. Its history import is marked as "***Pending***". As soon as communication with it is re-established, new data history import tasks shall be created for stream to catch up with the device.

16.3.2. Track impactful changes and occurrences

The security audit trail tracks every action and occurrence relevant to or impactful on IT security. Any action or occurrence which might incapacitate stream or disturb its data collection is listed, with account and computer of origin if available.

- stream-specific Windows service start up and shut down.
- Logins, logouts, and any attempt to overreach one's permission.
- Time synchronisation and time zone updates.
- Updates of connection settings to remote servers (SMTP or FTP).
- User creations and removals.
- Password updates.
- Group creations and removals.
- Permission allocations and revocations.

- Creations, state changes, removals, and updates of the connection settings of agardio.manager devices, as well as loss and re-establishment of communication with them, and firmware update successes and failures.

Traceability for entries of the security audit trail is ensured for 1 year.

16.3.3. Trace successes and errors

When an issue occurs during configuration, a local notification of failure appears. This is useful, but quite often limited in information and always ephemerous. For traceability of past failures and more details about their origin, stream makes its Deployment tasks logs accessible.

These logs are quite technical and may not always be easy to understand for someone unfamiliar with the intricacies of stream implementation. They should only be consulted by advised users.

1. Log in with an account with Global configurator permission (at least).
2. Get to **Maintenance**.
3. Get to **Deployment tasks**.
4. If need be, filter by date, and/or concerned entity, and/or result.

For context, a deployment task is the sequence launched to ping pong among stream services involved in and impacted by a configuration action. Indeed, most configurations entered require to be propagated across various parts of the stream system.

Example: a product is first removed from runtime before being removed from its agardio.manager device, and reversely, a product is first created on the device before being created in runtime.

Details can be provided as to the reasons behind the result of the task, as well as the part of the stream system which encountered an error. Again, this information is destined for advanced stream users with some technical understanding of its behaviour.

Traceability of deployment tasks is ensured for 1 year.

17. Troubleshooting

For any issues when connecting to the web server or logging in, refer to the _stream installation manual_.

17.1. Configuration issues

17.1.1. Unavailable agardio.manager device configuration

Symptoms

- Modbus RTU communication settings are not available for update.
- Product creation, removal, identification and update are unavailable.
- Alarm creation is unavailable, both in service list and the dedicated interface.
- Alarm removal and update are unavailable.

Possible causes

If only Modbus RTU communication settings are unavailable, the agardio.manager device is probably not connected yet. Only connected agardio.manager devices can have their Modbus RTU communication settings updated.

If all configurations are locked, then the agardio.manager device is either in a transition state (synchronisation in progress) or not communicating.

Workarounds

- Connect the agardio.manager device.
- Wait for synchronisation to be over, or investigate why it could be blocked.
- Investigate and fix the communication issue with the device.

17.1.2. Products and services unavailable in report content configuration

Symptom

- Some products cannot be found during data report content configuration.
- Some services of certain products cannot be found during data report content configuration.
- Some services can no longer be found in data report content configuration even though they are present in past reports.

Possible causes

- The time zone for your report does not match (or no longer matches) the time zone for the site the products you are looking for are in.
- The services you are looking for are not (or no longer) set for storage.

When a service is removed from storage but not acquisition, it remains in the content of any report it was made a part of when it was stored. At a certain point, however, that report won't be able to provide any data for it until the service is set for storage again.

When a service is removed from both storage and acquisition, it is removed from the content of any report it was a part of.

Workarounds

- Adjust the time zone of your data report.
- Adjust the time zone of the site.
- Set services for storage.

17.1.3. Product stuck in 'synchronisation in progress'

Symptoms

After product creation or update, the product remains marked with a circling arrow ↻ , and its status is labelled as 'synchronisation in progress'.

Possible causes

Product creation or update has failed because:

- A product of the same name and/or connection settings already exists on the device; it may have been locally created and not have been retrieved by the EMS yet.
- Communication has been lost with the device at time of product creation or update.
- The product type is unknown to the device.
- The fieldbus is unknown to the device.

Workarounds

- Change the product's name and/or connection settings. If the locally created product is the one you meant to create, then the one you just created in stream is no longer needed, and you should remove it.
- Fix communication with the device. See §17.2.1.
- Upload the plugin in the agardio.manager device.
- Update the firmware of the agardio.manager device.

Once the origin of the failure has been diagnosed and dealt with, if you still wish to create the product, update any part of it. No change is necessary. This will trigger a second attempt at its creation or update.

17.2. Communication issues

17.2.1. Communication issue with agardio.manager devices

In stream, connected and activated agardio.manager devices are marked for their communication status. They can have one of 3 communication statuses:

- Communication OK ✔, which means stream is able to reach the device and all its activated products are communicating properly with it.

- Not all products communicating ⚠, which means stream is able to reach the device, but some of or all its activated products are not communicating properly with it.

- Communication KO ✖, which means stream is unable to reach the device at all, and by extension the communication status of its products is not relevant.

When communication with an agardio.manager device is lost, there can be several reasons for it. Whichever has been encountered is mentioned in the corresponding system event, in the Security Audit Trail, and announced when updating the connection settings for the device.

17.2.1.1. Serial number mismatch

Symptom

Serial number mismatch out of the blue, upon connection settings update, or product or alarm management attempt.

Possible causes

- Exchanged address with another agardio.manager device by mistake.
- Hardware has been replaced.

Workarounds

- Update connection settings to match the correct device.
- If hardware has indeed been replaced, perform replacement as explained in §5.4.

17.2.1.2. Authentication issue

Symptom

Authentication issue out of the blue, upon connection settings update, or product or alarm management attempt.

Possible causes

- The account used to connect stream to the device no longer exists.
- The password for the account used to connect stream to the device has changed.

Workarounds

- Update connection settings to use an existing account with administrator profile.
- Recreate the account on the agardio.manager device.
- Update the password for the chosen account.

17.2.1.3. Authorisation issue

Symptom

Authorisation issue out of the blue, upon connection settings update, or product or alarm management attempt.

Possible cause

- The profile of the account used to connect stream to the device is not or no longer "Administrator".

Workarounds

- Update connection settings to use another account with administrator profile.
- Grant the chosen account the administrator profile (maybe again).

17.2.1.4. Timeout

Symptom

Timeout out of the blue, upon connection settings update, or product or alarm management attempt.

Possible causes

- ■ Wrong address.
- ■ Wrong port.
- ■ No Network access for stream.
- ■ No Network access for the device.
- ■ The device is turned off.

Workarounds

- ■ Check the Internet access of the device.
- ■ Check its network configuration to change it back or update the connection settings entered in stream.
- ■ Check the configuration of the network infrastructure between stream and the device to update the connection settings in stream.

17.2.2. Communication issues with products

When an agardio.manager device is connected and communicating, the communication status of its products can be determined.

Symbol	Indication about product
⊗	Not communicating properly
✓	Properly communicating
↻	Set for update
⊘	Set for removal
●	Retrieved from its agardio.manager device

Table 7 - Product status markers

A greyed-out product is deactivated.

Symptom

Product marked as not properly communicating.

Possible causes

- ■ Product or agardio.manager device unplugged from the fieldbus.
- ■ Wrong connection settings on the fieldbus.

- Product malfunctioning.
- Wrong product type.
- Wrong Modbus RTU communication settings.

Workarounds

- Check that everything is properly plugged in (local intervention).
- Update product connection settings (from stream).
- Replace product (from the embedded web interface of the device).
- Update Modbus RTU communication settings for the agardio.manager device (from stream or the embedded web interface for the device).
- Update Modbus RTU communication settings for the product (local intervention on product hardware).

17.3. Apparent loss of synchronisation with agardio.manager device

Your agardio.manager device is communicating properly, and yet you have noticed discrepancies in stream and local configuration.

Check failed Deployment tasks (§16.3.3).

17.3.1. Different time synchronisation method

Symptoms

Failed time synchronisation method update task (after installation or site update task).

Possible cause

Momentary loss of communication with the agardio.manager device (can be confirmed through alarms and Security Audit Trail).

Workaround

Update the site or the installation again, even without changing anything, to force propagation of the time synchronisation method.

17.3.2. Different time zone

Symptoms

Failed time zone update task (after a site update task).

Possible cause

Momentary loss of communication with the agardio.manager device (can be confirmed through alarms and Security Audit Trail).

Workaround

Update the site again, even without changing anything, to force propagation of the time zone.

17.3.3. Different data management

Symptoms

- Failed Sampling reference update task.
- Failed Sampling reference propagation task (after a site update task).

Possible cause

Momentary loss of communication with the agardio.manager device (can be confirmed through alarms and Security Audit Trail)

Workarounds

- Update the site, even without changing anything, to force propagation of its data management policy again.
- Update the sampling reference, even without changing anything, to force its propagation to the concerned agardio.manager devices.

17.3.4. Different pricing schedule

Symptoms

- Failed Source update task.
- Failed periodic pricing schedule deployment in EMSSbcManager.log.xml.

Possible causes

- Momentary loss of communication with the agardio.manager device (can be confirmed through alarms and Security Audit Trail).
- Pricing periods do not cover the whole year for the concerned source, and namely not the current period.

Workarounds

- Update the source again, even without changing anything, to force propagation of its pricing schedule again.
- Update the pricing schedule to cover the whole year.

17.3.5. Product on an agardio.manager device not in stream

Possible cause

Unretrieved local product creation.

Workaround

- Wait 10 minutes.
- Check that the EMSSbcManager service is running.

17.3.6. Product in stream not on the agardio.manager device

Possible causes

- Failed product creation; the product should be marked with a ↻ .
- Unretrieved local product removal.

Workaround

- Update the concerned product in order to make a new attempt at its creation.
- Wait 10 minutes.
- Check that the EMSSbcManager service is running.

17.4. Status of weather service

When configuring the gathering of outside temperature samples for a site, it is possible to test that everything is in order.

Ideally, Status ok is returned. You may however see other error messages.

17.4.1. "Failed to connect to HAGER Weather service (Error=XXX.)"

Possible cause

Your firewall blocks stream from accessing the web service.

Workaround

Open up your firewall to let queries to the web service through.

17.4.2. "The parameters of the site are not valid to connect to the HAGER Weather service."

Possible cause

Invalid geographical parameters for the concerned site, either non-existent or inconsistent.

Workarounds

Make extra sure zip code and country code are correct. ISO 3166-2 only expects 2 characters as a country code.

18. Appendix

18.1. List of system alarms

Description
Firmware update failure
Communication timeout with agardio.manager device
agardio.manager certificate rejection
agardio.manager login rejection
agardio.manager permission rejection
agardio.manager serial number mismatch
agardio.manager data import
agardio.manager CPU usage
agardio.manager memory usage
Free available space on agardio.manager eMMC
Free available space on agardio.manager µSD
Unavailable µSD
agardio.manager CPU temperature
agardio.manager power on
agardio.manager power fail
Unreachable agardio.manager services
Unavailable NTP server
Modbus communication error
Communication timeout with Modbus product
Tariff synchronisation command rejection
Three consecutive failed login attempts
Unreachable RDBM server
Unreachable FTP server
Wrong login for FTP server
FTP certificate rejection
No writing permission on FTP server
Unreachable SMTP server
Wrong login for SMTP server
SMTP certificate rejection
Weather service unavailability

18.2. Formats

Language	Date	Decimal separator	Thousand separator *
English (United Kingdom)	DD/MM/YYYY	.	,
French (France)	DD/MM/YYYY	,	(space)
German (Germany)	DD.MM.YYYY	,	.
Swedish (Sweden)	YYYY-MM-DD	,	(space)

* Only appears in data visualisation, not data reports.

18.3. Degree days computation methods

There are several ways to calculate degree day depending on the country and depending on the organisation that processes it.

> ℹ️ In order for normalisation by degree day to be used for comparison purposes, degree days must have been computed using the same method and temperature samples in the same unit.
>
> This is why stream gathers temperature samples from a single weather service, and computes degree days using a single method.
>
> Refer to Chapter 10 to know where weather service and degree day computation method are configured.

18.3.1. Mean degree-hours

The mean of **heating degree hours** consists in computing the mean of the difference between the base heating temperature and the outside air temperature for every hour of the day.

For hours when outside air temperature was **above** base heating temperature, the difference is considered null and never negative.

The mean of **cooling degree hours** consists in computing the mean of the difference between the outside air temperature and the base cooling temperature for every hour of the day.

For hours when outside air temperature was **below** base cooling temperature, the difference is considered null and never negative.

$$HDD_d = \frac{\sum_{h=1}^{24}\left(T_{HB} - T_{O,h}\right)_{\left((T_{HB}-T_{O,h})>0\right)}}{24}$$

$$CDD_d = \frac{\sum_{h=1}^{24}\left(T_{O,j} - T_{CB}\right)_{\left((T_{O,h}-T_{CB})>0\right)}}{24}$$

Where:

- HDD_d is the heating degree day of day d.
- CDD_d is the cooling degree day of day d.
- T_{HB} is the heating base temperature.
- T_{CB} is the cooling base temperature.
- $T_{O,h}$ is the outside air temperature for the hour h

18.3.2. COSTIC method

In France, energy management professionals have adopted the COSTIC (*Comité Scientifique et Technique des Industries Climatiques*) formula.

$$\begin{cases} T_{min} > T_{HB} \Rightarrow HDD_d = 0 \\ T_{min} < T_{HB} < T_{max} \Rightarrow HDD_d = (T_{HB} - T_{min}) \times \left(0.08 + 0.42 \times \dfrac{T_{HB} - T_{min}}{T_{max} - T_{min}}\right) \\ T_{max} < T_{HB} \Rightarrow HDD_d = T_{HB} - \dfrac{T_{min} + T_{max}}{2} \end{cases}$$

$$\begin{cases} T_{min} > T_{CB} \Rightarrow CDD_d = \dfrac{T_{min} + T_{max}}{2} - T_{CB} \\ T_{min} < T_{CB} < T_{max} \Rightarrow CDD_d = (T_{max} - T_{CB}) \times \left(0.08 + 0.42 \times \dfrac{T_{max} - T_{CB}}{T_{max} - T_{min}}\right) \\ T_{max} < T_{CB} \Rightarrow CDD_d = 0 \end{cases}$$

Where:

- HDD_d is the heating degree day of day d
- CDD_d is the cooling degree day of day d
- T_{HB} is the heating base temperature
- T_{CB} is the cooling base temperature
- T_{min} is the minimal outside air temperature of day d
- T_{max} is the maximal outside air temperature of day d

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