



# IndaPortal

## User Documentation

# Content

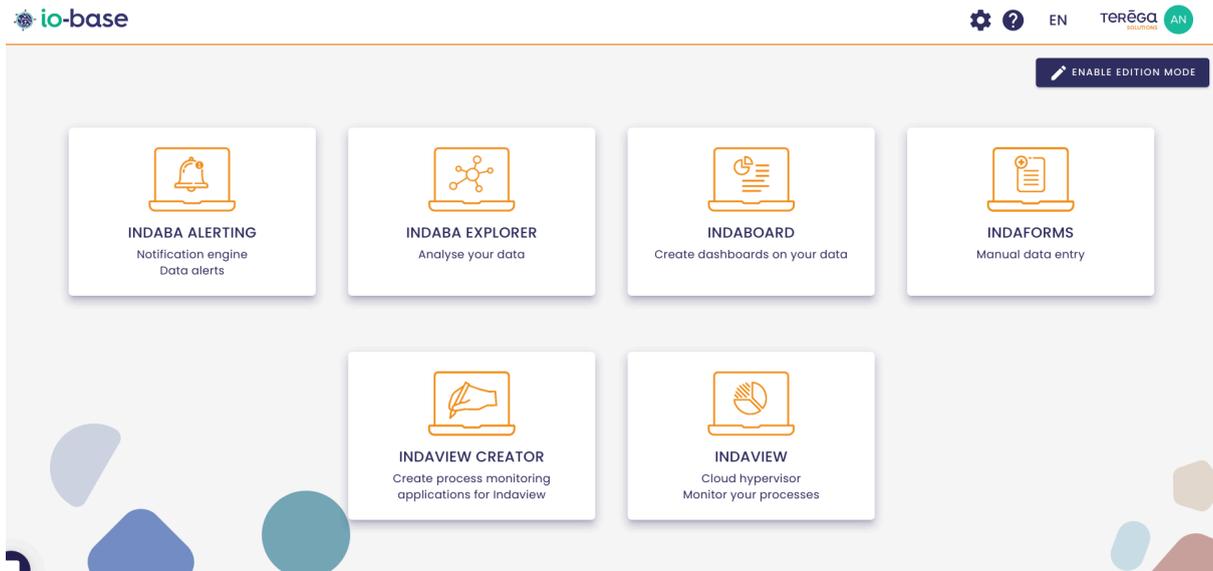
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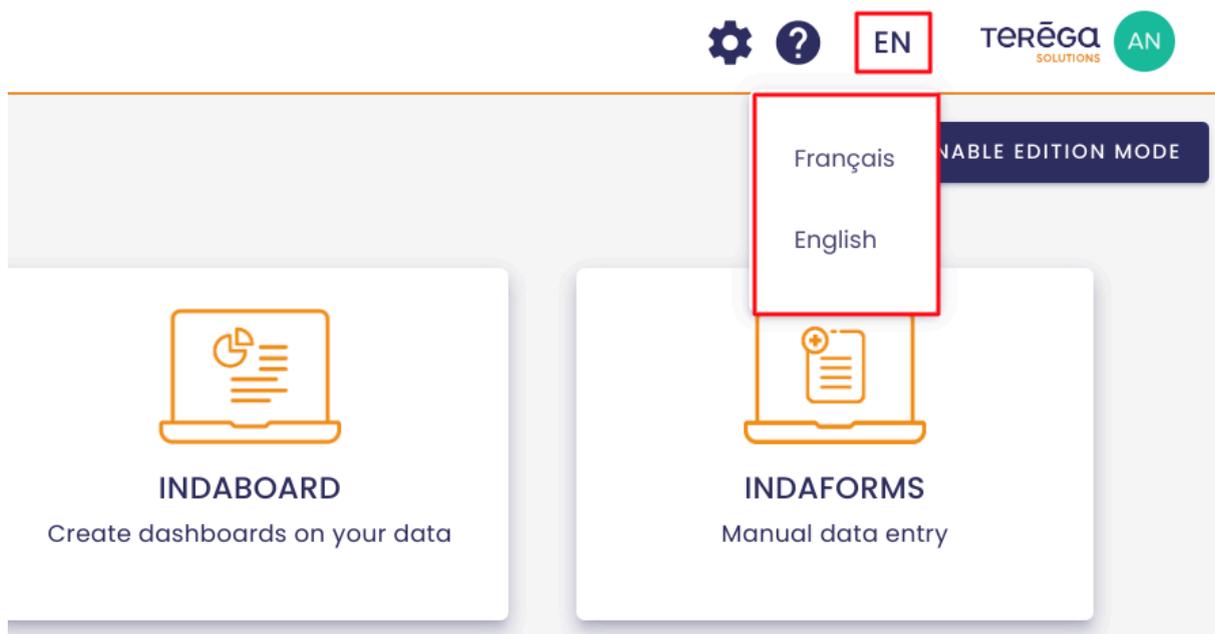
# 1. Changing the language

Log in to the IndaPortal website.



It is possible to display the web application in English or French. This change of language can be made at any time.

Click on the flag at the top right of the screen.



Both languages are displayed. Click on the desired language.

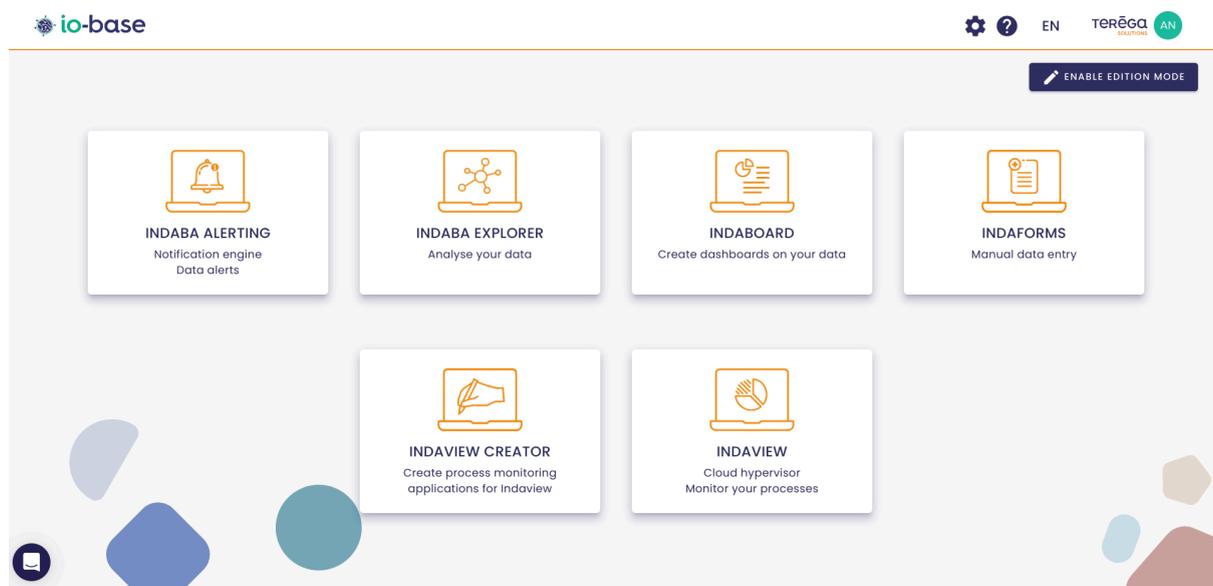
The page is now in the selected language.

## 2. Dynamic tiles management

A user with the functional administrator role can manage the tiles on the homepage.

Access the Io-base portal.

The **Enable edition mode** button allows you to set up the home screen: add, modify, and delete tiles.



### 2.1 Adding a tile

To add a tile, click on the **Enable edition mode** button.

Complete the **Add an application** form.

**Note** : Make sure to complete both the english and the french tab.

## Add an application

### Informations



Title \*

Description \*

You must fill in all translation fields

**Note:** In the **Position** field you can only indicate a value equal or above 5. Places 1,2,3 and 4 are reserved for the lo-Base main applications.

Click on the **Save** button. The new tile has been added.

## 2.2 Editing a tile

To edit a tile, click on the **Enable edit mode** button.

Select the tile you want to edit.

## Add an application

### Informations



Français



English

Title \*

Description \*

You must fill in all translation fields

Position \*

### Access

Link \*

### Images

Logo



Image



Images must have png, jpg, jpeg, webp, svg extension

Modify the required information.

Click on the **Save** button to save the changes.

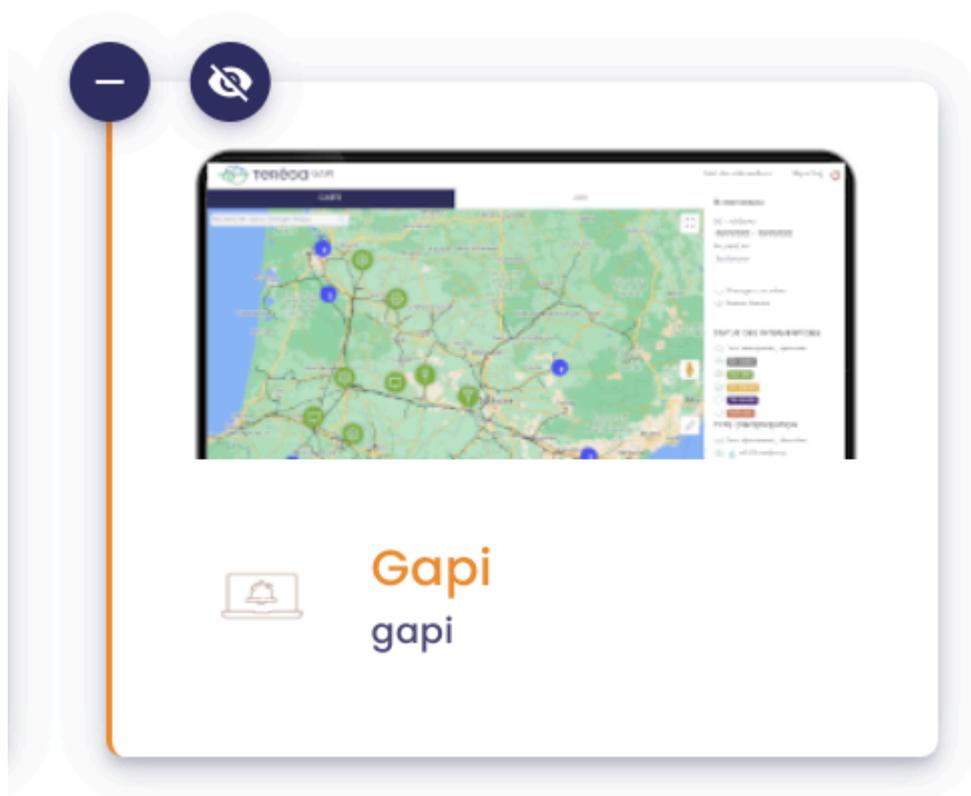
Click on the **Cancel** button to ignore the changes.

**Note:** In the **Position** field you can only indicate a value equal or above 5. Places 1,2,3 and 4 are reserved for the lo-Base main applications.

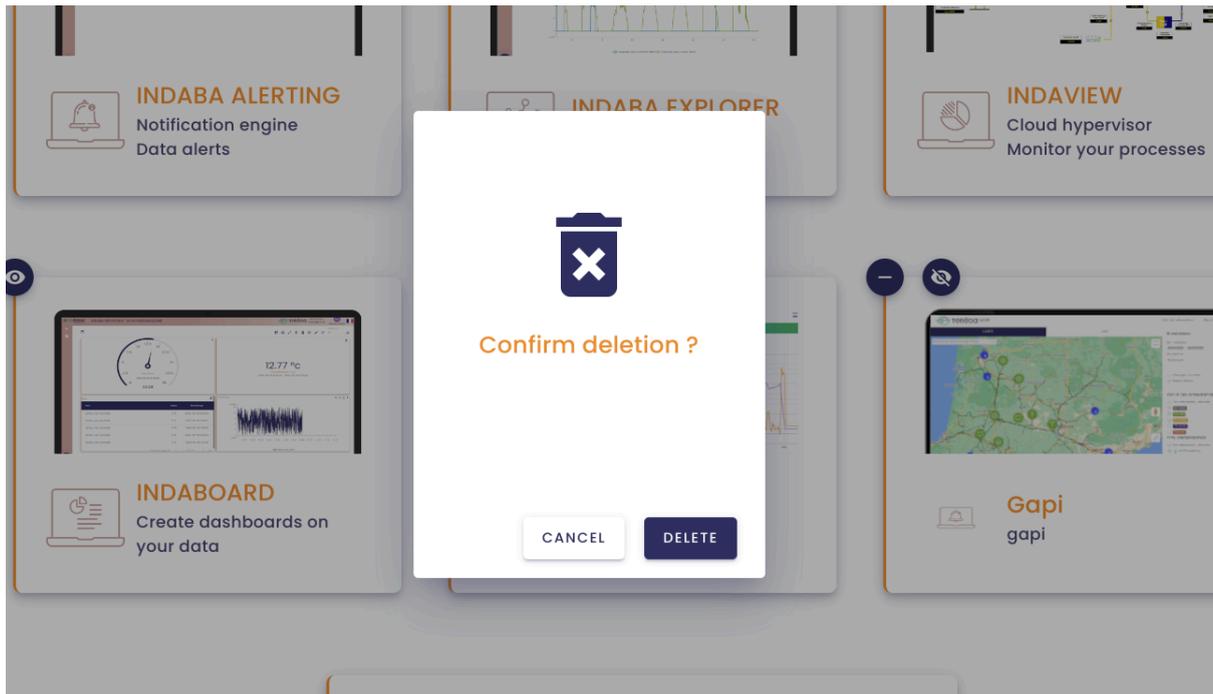
**Note:** the image formats allowed are PNG, JPG, JPEG, WEBP and SVG.

## 2.3 Deleting a tile

To delete a tile, click on the **Enable edition mode** button, then the " - " icon at the top left of the tile.



A confirmation window opens.



Click on **Delete** to continue.

Click **No** to cancel.

**Note:** The main tiles of the Io-Base suite cannot be deleted. However, it is possible to hide them.

## 2.4 Hiding a tile

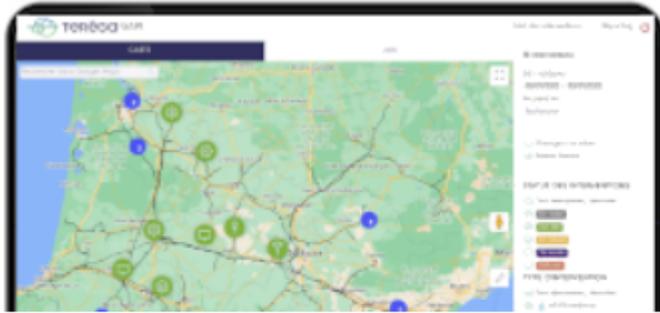
To hide a tile, click on the **Enable edition mode** button.

Then click on the

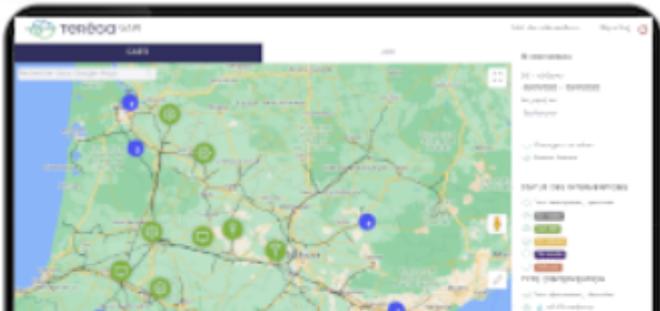


icon :

- if the eye is not crossed out : the tile is visible from the home screen,
- if the eye is crossed out : the tile is not visible.



Gapi  
gapi



Gapi  
gapi

Then click on the **Disable edition mode** button.

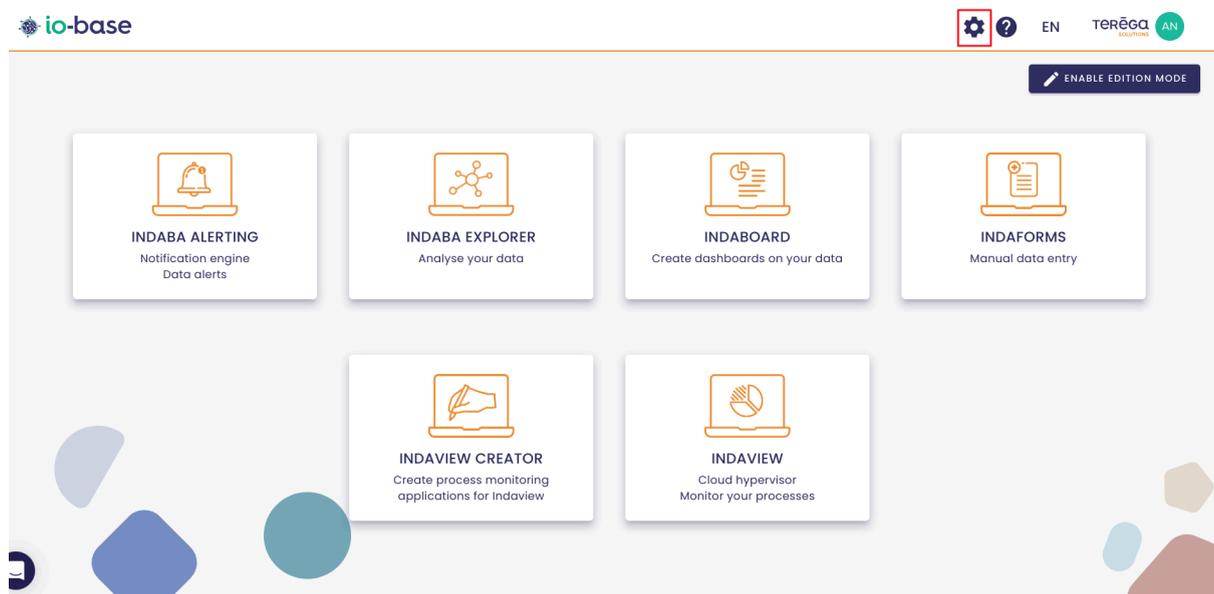
✕ DISABLE EDITION MODE

### 3. Import an IndaView file

**Prerequisites** : this feature is available for users with a **ViewCreator** role.

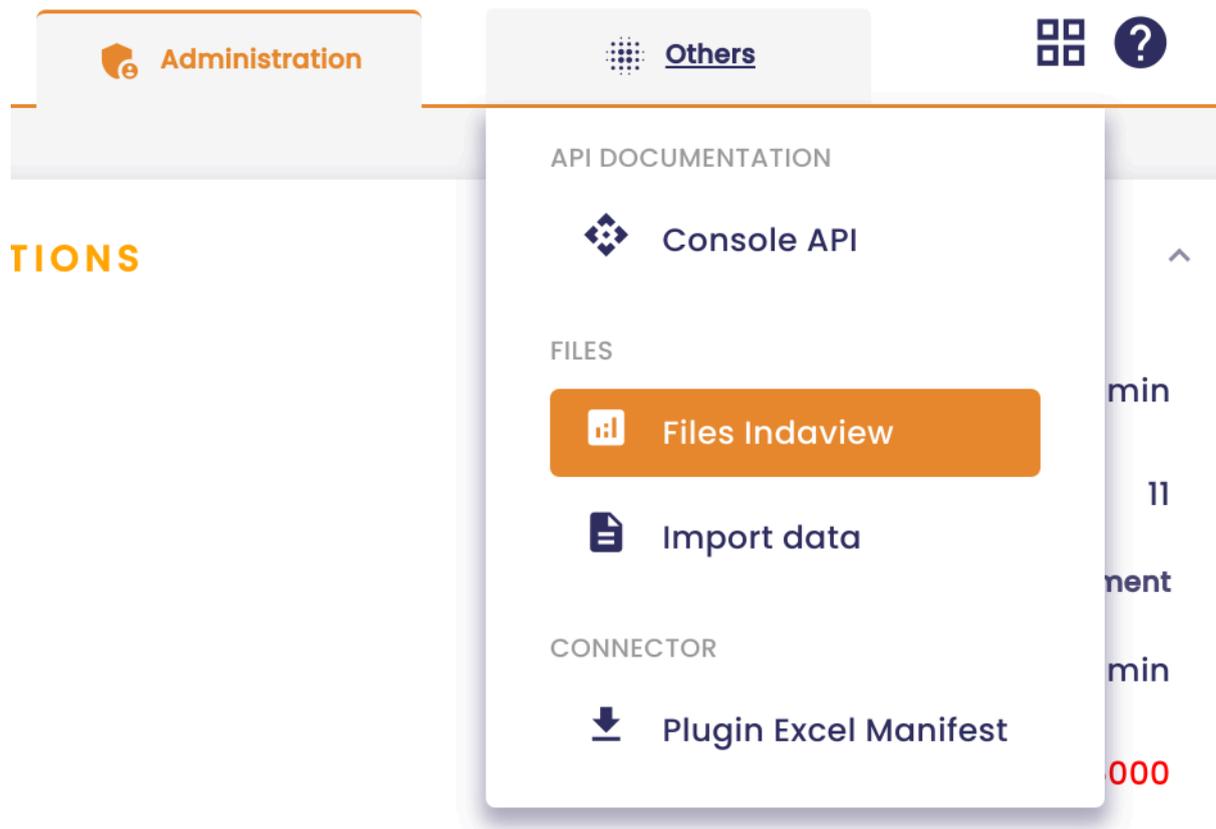
lo-base includes a menu where you can save files to use in IndaView Creator (such as images, synoptics, and more).

To access it, log in to **lo-base** and click the button at the top right of your screen, highlighted below :



The lo-base administration page opens.

Go to the **Others/Files IndaView** menu.



### 3.1 Import a file

To import a new file, click on the



button.

Then, select a file from your library.

Others > Files Indaview



My files



Screenshot 2024-12-31 14.05.27.png

You can choose to display the files in a card view or list view by using the button below :



Others > Files Indaview



+ UPLOAD FILE



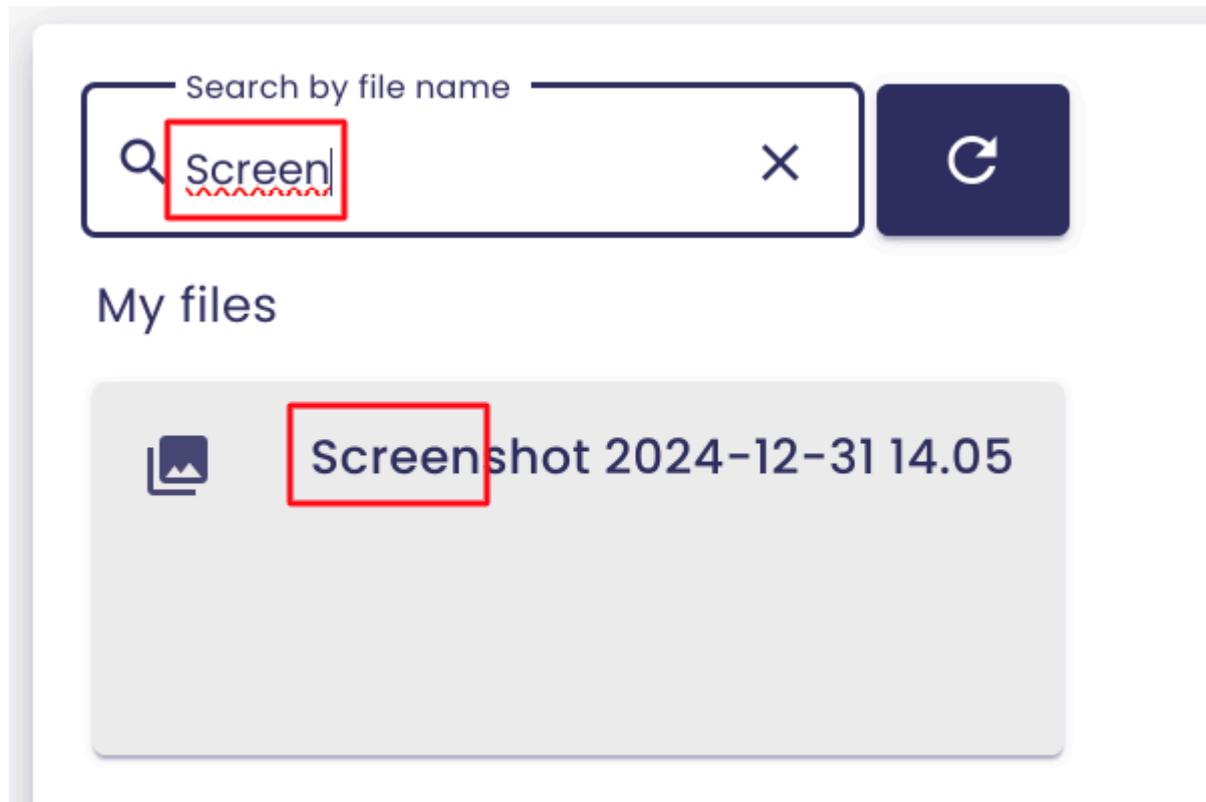
My files



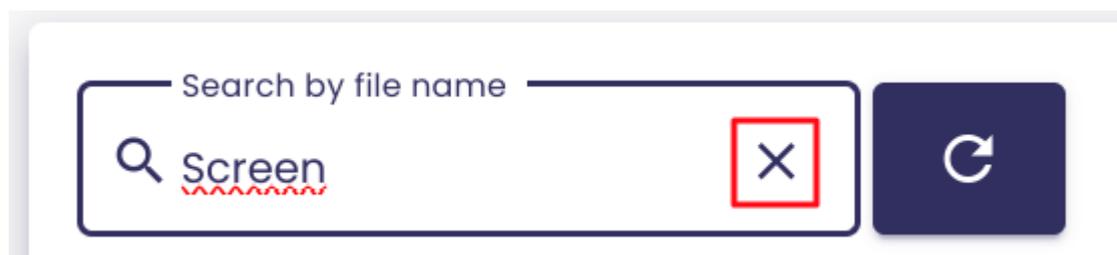
Screenshot 2024-12-31 14.05

1 file(s) in current directory

A search area is available to help you easily find the desired file.



**Note** : to reset the search area, click on the cross button.



### [3.2 Importing images to IndaView Creator](#)

To use images directly in your IndaView Creator synoptics, you will first need to import them into **lo-base**.

To do so, follow the procedure below :

In the **Import IndaView** menu, you will find an "**IndaView**" folder.

Search by file name



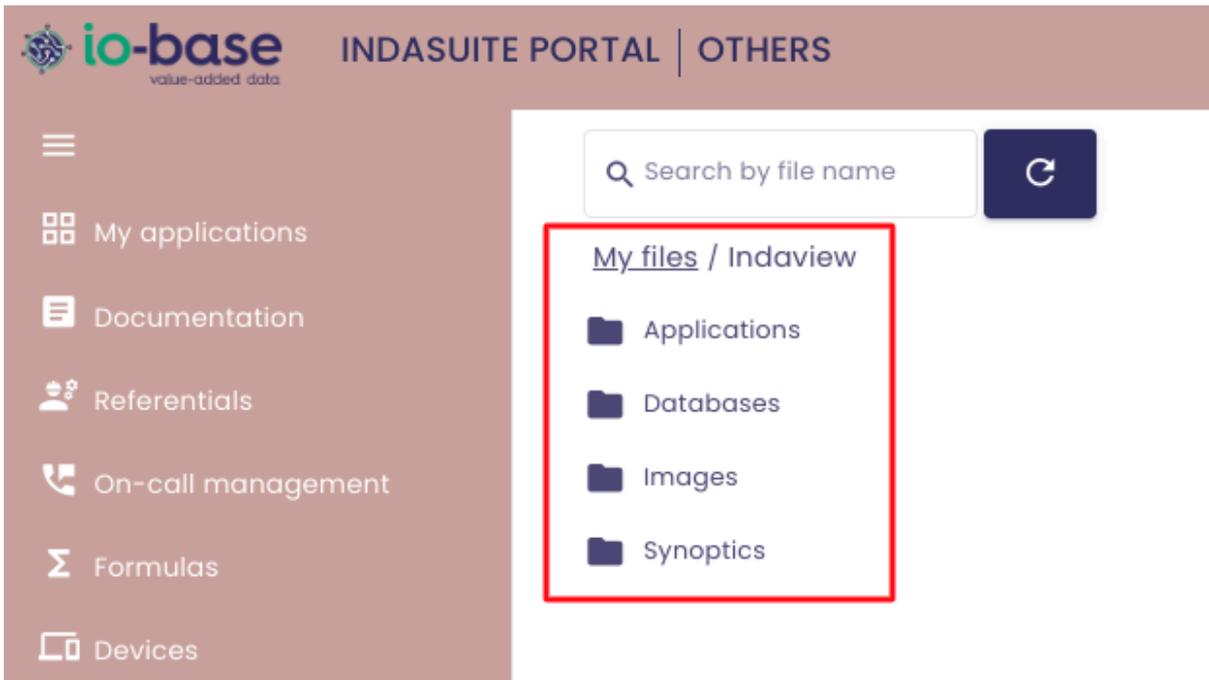
My files

 Indaview

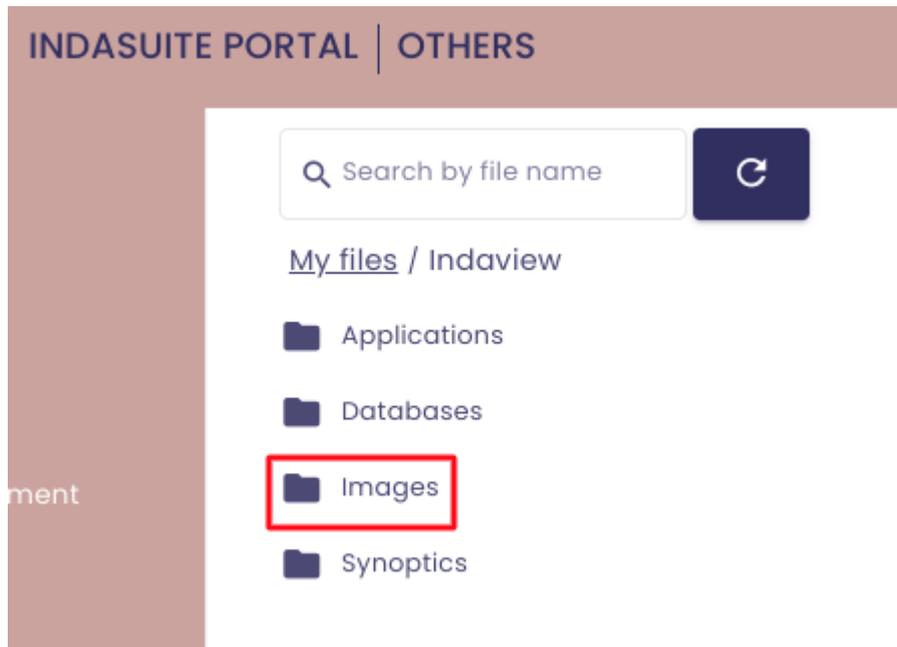
 Test\_20241105.pdf

ement

Open the folder :



Then, go to the "**Images**" folder :



Now, import the image you want as described earlier.



All images imported and stored in this folder will be available in "IndaView Creator" :

In the action bar, click on the dropdown menu to create new objects :

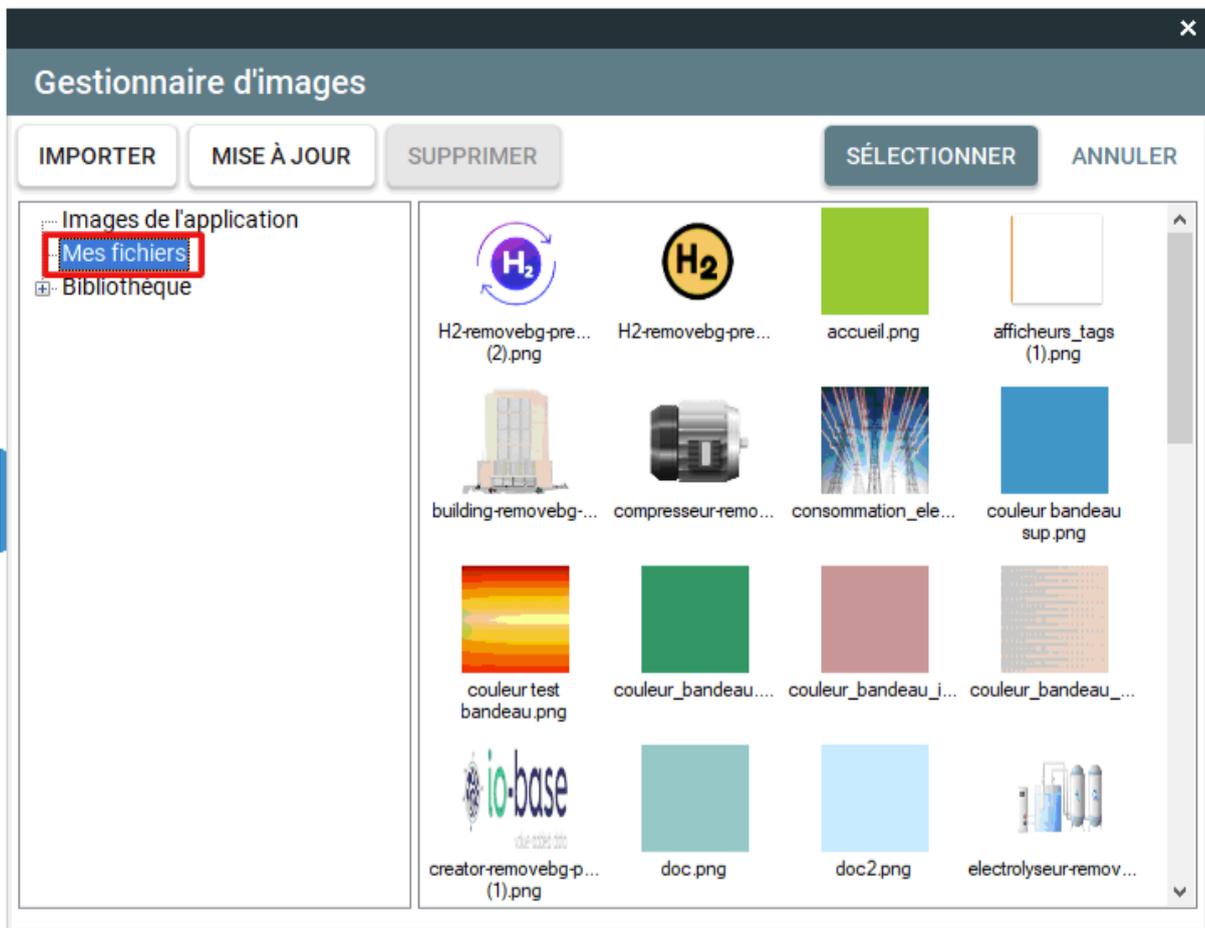


Then select "Image".



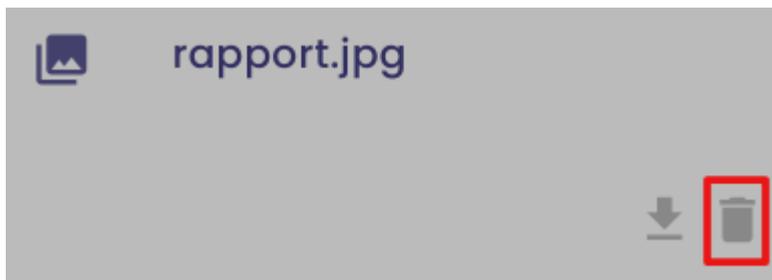
Next, choose **My Files**.

The images stored in the Io-base "**Images**" folder will appear.



### 3.3 Delete a file

To delete a file, hover the file and click on the bin icon.



### 3.4 Download a file

To download a file, hover the file and click on the download icon.



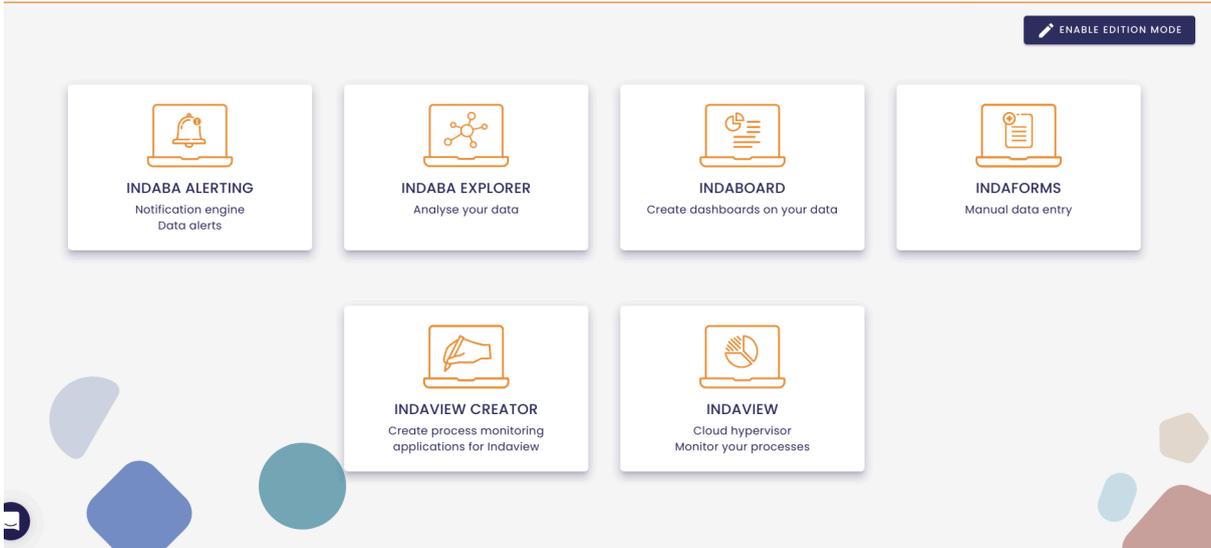
## 4. Data file import

**Prerequisite** : this feature is available for users with a writer role.

You can import Indaba data files into lo-base.

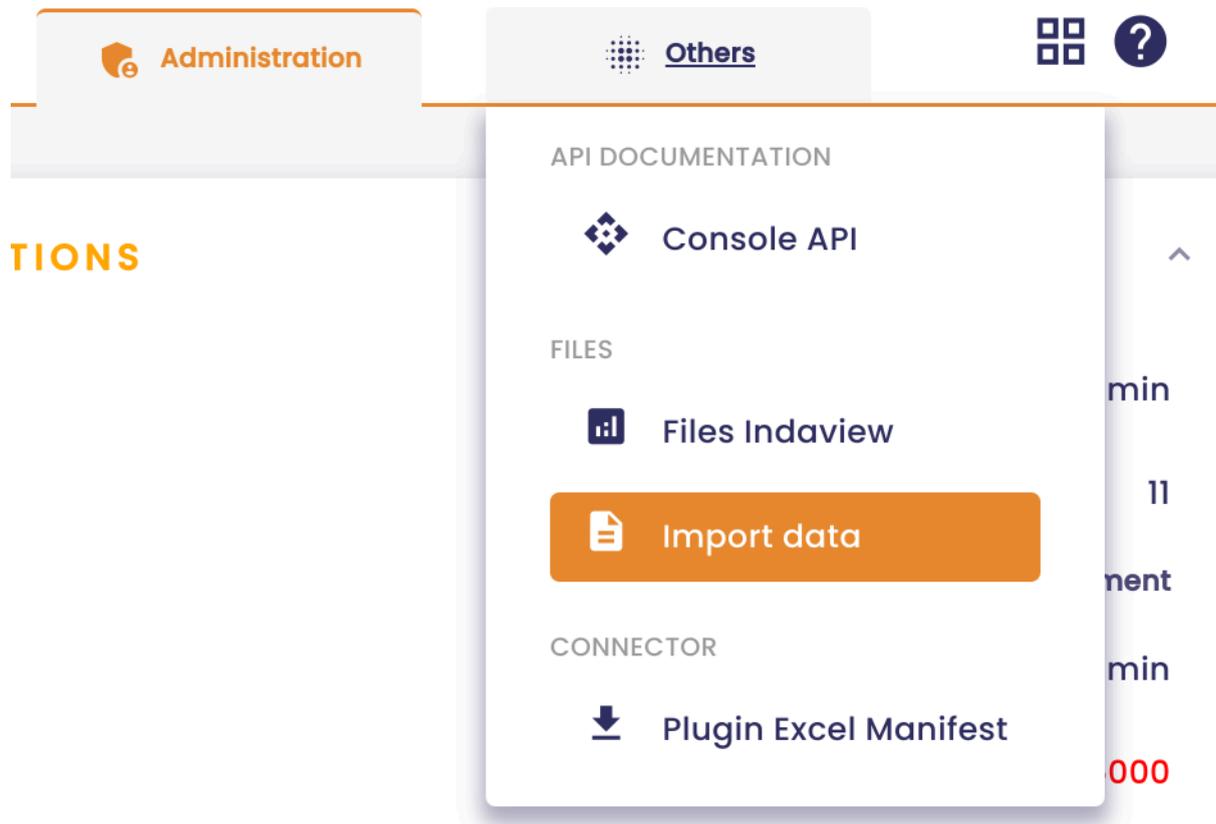
This allows you to keep historical data files and/or add new data.

Log in to **lo-base** and click the button at the top right of your screen, highlighted below :



The io-base administration page opens.

Go to the **Others/Import data** menu.

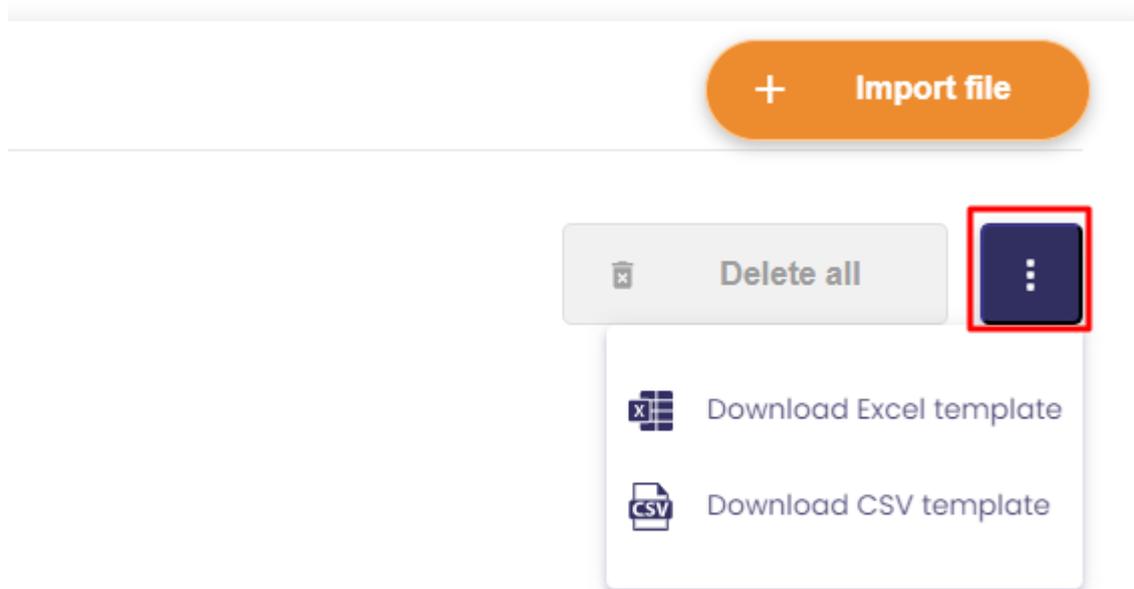


To import a file, it must follow a specific template. Begin by downloading the templates available in Excel and CSV formats.

To do so, click on the



button, on the right side of the screen, then download the file template in your preferred format.



Open the downloaded file :



# metricsXlsxTemplate.xlsx

Fichier Modifier Insérer Format Aide Toutes les modifications ont bien été enregistrées

fx ↶ ↷ 🔍 🔍 Calibri ▾ 11 ▾ **B** *I* U ~~ABC~~ ▾ 📏 📏 ▾

	A	B	C	D
1	Metric	Timestamp	Value	
2	cip_30	2023-11-14T02:42:00.000+02:00	11	
3	cip_30	2023-11-14T01:31:00.000+02:00	10.14	
4	cip_01	2023-11-15T01:53:00.000+02:00	1.145	
5	cip_01	2023-11-15T02:53:00.000+02:00	1.2	
6	cip_41	2023-11-14T03:15:00.000+02:00	40.15	
7	cip_41	2023-11-14T04:15:00.000+02:00	40	
8	cip_41	2023-11-14T05:15:00.000+02:00	39.14	
9	cip_41	2023-11-14T06:15:00.000+02:00	42	
10	cip_06	2023-11-15T01:07:00.000+02:00	-1.55	
11				
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46				

**Important** : To begin with, change the name of the sheet. It must bear the name of the database containing the metrics.

42	
43	
44	
45	
46	
main	

## 4.1 Write new values

If you want to write new values from your file, enter the following in the corresponding columns :

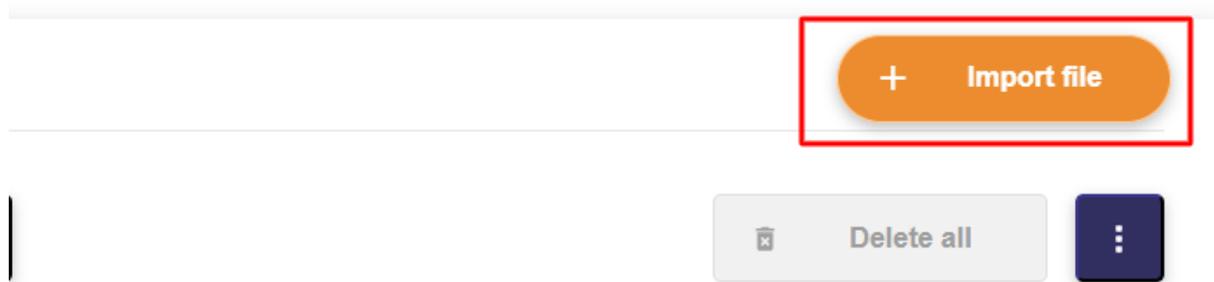
- Metric : enter the name of the desired metric
- Timestamp : enter the timestamp
- Value : enter the value to be injected

metricsXlsxTemplate (1).xlsx  
Fichier Modifier Insérer Format Aide Toutes les modifications ont bien été enregistrées en local.

	A	B	C	D	E	F
1	Metric	Timestamp	Value			
2	cip_30	2023-11-14T02:42:00.000+02:00	11			
3	cip_30	2023-11-14T01:31:00.000+02:00	10.14			
4	cip_01	2023-11-15T01:53:00.000+02:00	1.145			
5	cip_01	2023-11-15T02:53:00.000+02:00	1.2			
6	cip_41	2023-11-14T03:15:00.000+02:00	40.15			
7	cip_41	2023-11-14T04:15:00.000+02:00	40			
8	cip_41	2023-11-14T05:15:00.000+02:00	39.14			
9	cip_41	2023-11-14T06:15:00.000+02:00	42			
10	cip_06	2023-11-15T01:07:00.000+02:00	-1.55			
11	cip_06	2024-09-15T01:07:00.000+02:00	50			
12						
13						
14						

**Note** : You must have access rights to a metric in order to write values to it.

Once you have completed your file with the required data, click on the '**Import file**' button.



The following window will appear :

## Import Files

DATASOURCE

List of databases \*

SELECTION OF FILES

Drag and Drop  
or  
Browse files

Import my files

Select the database that contains the Indaba data included in the file(s) you wish to import.



# Import Files

## DATASOURCE

List of databases \*  
main

## SELECTION OF FILES

**Important :** Before importing an Excel data file, make sure the sheet name matches the selected database.

For example, if you select the "main" database, the sheet name must also be "main."

21	nj26uv_etat	2024-05-21T	-4,1326726			
22	nj26uv_etat	2024-05-21T	-0,9078588			
23	nj26uv_etat	2024-05-21T	-3,2214562			
24	nj26uv_etat	2024-05-21T	4,76446101			
25	nj26uv_etat	2024-05-21T	1,85988623			
26	nj26uv_etat	2024-05-21T	6,77899658			
27	nj26uv_etat	2024-05-21T	7,31003413			
28	nj26uv_etat	2024-05-21T	11,6828588			
29	nj26uv_etat	2024-05-21T	0,52273038			
30	nj26uv_etat	2024-05-21T	-1,5042597			
31	nj26uv_etat	2024-05-21T	0,79192264			
32	nj26uv_etat	2024-05-21T	-11,148849			
33	nj26uv_etat	2024-05-21T	1,71468109			
34	nj26uv_etat	2024-05-21T	-1,1117045			
35	nj26uv_etat	2024-05-21T	-1,8194299			

main (+)

Drop the files to be imported into the "**Selection of files**" area by clicking the "**Browse Files**" button or by dragging the files into the drop zone.



# Import Files

## DATASOURCE

List of databases \*

main

## SELECTION OF FILES

Drag and Drop  
or  
**Browse files**

1 file selected

Documentation.xlsx

**Import my files**

Next, click **Import my files**.

Browse files

1 file selected

Documentation.xlsx

Import my files

Wait for the import to complete, then click **Finish**.

Browse files

1 file selected

Documentation.xlsx



Finish

The file will appear in the **Processed** tab.

io-base Referentials Administration Others

Others > Import data

In progress In error **Processed** + Import file

List of databases Search by file name Delete all

Datasource	Name	Author	Import date	Actions
main	Documentation.xlsx	Andre Matos Calhau	12/31/2024, 2:19 PM	[Download] [Delete]

You can delete or download it at any time in the **Actions** column.

Delete all

Actions

[Download] [Delete]

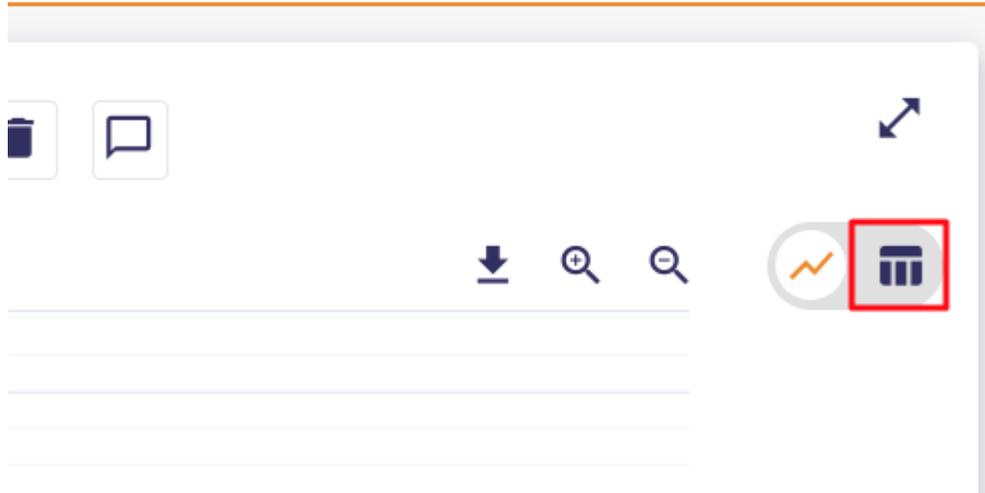
**Note** : You can import several files at the same time.

## [4.2 Accessing data files from explorer](#)

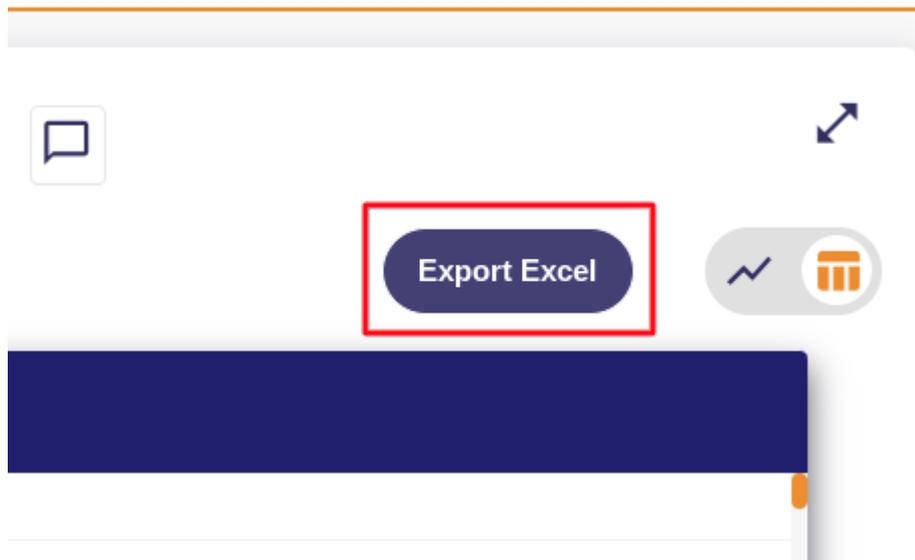
You can directly retrieve data files from Explorer and import them to keep a record.

To do so, go to [Indaba Explorer](#) and [view the graph with the data you want](#).

Then, click on the boxed button below to display the curve values in tabular form.



Then click Export Excel to download the file.





data.xlsx

Fichier Modifier Insérer Format Aide

Toutes les modifications ont bien été enregistrées en local.

	A	B	C
1	metric	timestamp	value
2	nj26uv_etat_vanne_elementaire	2024-10-02T09:10:36+02:00	111.12
3	nj26uv_etat_vanne_elementaire	2024-10-02T09:10:40+02:00	-192.41
4	nj26uv_etat_vanne_elementaire	2024-10-02T09:10:43+02:00	101.11
5	nj26uv_etat_vanne_elementaire	2024-10-02T09:10:47+02:00	105.12
6	nj26uv_etat_vanne_elementaire	2024-10-02T09:10:51+02:00	-9.74
7	nj26uv_etat_vanne_elementaire	2024-10-02T09:10:54+02:00	-5.37
8	nj26uv_etat_vanne_elementaire	2024-10-02T09:10:58+02:00	-19.27
9	nj26uv_etat_vanne_elementaire	2024-10-02T09:11:01+02:00	198.38
10	nj26uv_etat_vanne_elementaire	2024-10-02T09:11:05+02:00	-36.78
11	nj26uv_etat_vanne_elementaire	2024-10-02T09:11:09+02:00	157.09
12	nj26uv_etat_vanne_elementaire	2024-10-02T09:11:12+02:00	-9.85
13	nj26uv_etat_vanne_elementaire	2024-10-02T09:11:16+02:00	-12.14
14	nj26uv_etat_vanne_elementaire	2024-10-02T09:11:20+02:00	-146.33
15	nj26uv_etat_vanne_elementaire	2024-10-02T09:11:23+02:00	104.96
16	nj26uv_etat_vanne_elementaire	2024-10-02T09:11:27+02:00	114.14
17	nj26uv_etat_vanne_elementaire	2024-10-02T09:11:30+02:00	77.21
18	nj26uv_etat_vanne_elementaire	2024-10-02T09:11:34+02:00	85.77
19	nj26uv_etat_vanne_elementaire	2024-10-02T09:11:38+02:00	-20.72
20	nj26uv_etat_vanne_elementaire	2024-10-02T09:11:41+02:00	130.52
21	nj26uv_etat_vanne_elementaire	2024-10-02T09:11:45+02:00	-21.52
22	nj26uv_etat_vanne_elementaire	2024-10-02T09:11:49+02:00	58.69
23	nj26uv_etat_vanne_elementaire	2024-10-02T09:11:52+02:00	-151.29
24	nj26uv_etat_vanne_elementaire	2024-10-02T09:11:56+02:00	-126.67
25	nj26uv_etat_vanne_elementaire	2024-10-02T09:12:00+02:00	90.48
26	nj26uv_etat_vanne_elementaire	2024-10-02T09:12:03+02:00	-199.91
27	nj26uv_etat_vanne_elementaire	2024-10-02T09:12:07+02:00	-84.94
28	nj26uv_etat_vanne_elementaire	2024-10-02T09:12:10+02:00	177.62
29	nj26uv_etat_vanne_elementaire	2024-10-02T09:12:14+02:00	18.61
30	nj26uv_etat_vanne_elementaire	2024-10-02T09:12:18+02:00	172.27
31	nj26uv_etat_vanne_elementaire	2024-10-02T09:12:21+02:00	-111.42
32	nj26uv_etat_vanne_elementaire	2024-10-02T09:12:25+02:00	131.14
33	nj26uv_etat_vanne_elementaire	2024-10-02T09:12:29+02:00	135.69
34	nj26uv_etat_vanne_elementaire	2024-10-02T09:12:32+02:00	-3.42
35	nj26uv_etat_vanne_elementaire	2024-10-02T09:12:36+02:00	62.84
36	nj26uv_etat_vanne_elementaire	2024-10-02T09:12:39+02:00	-76.25
37	nj26uv_etat_vanne_elementaire	2024-10-02T09:12:43+02:00	-85.11
38	nj26uv_etat_vanne_elementaire	2024-10-02T09:12:47+02:00	125.91
39	nj26uv_etat_vanne_elementaire	2024-10-02T09:12:50+02:00	141.7
40	nj26uv_etat_vanne_elementaire	2024-10-02T09:12:54+02:00	102.54
41	nj26uv_etat_vanne_elementaire	2024-10-02T09:12:58+02:00	-188.91
42	nj26uv_etat_vanne_elementaire	2024-10-02T09:13:01+02:00	87.91

main

Change the name of the Excel sheet to match the database of metrics contained in the file.

Then follow the steps above to import the file.

### 4.3 "In error" files

Files with errors will appear in the "In Error" tab.

io-base Referentials Administration Others

Others > Import data

In progress **In error** 1 Processed

List of databases Search by file name

Datasource	Name	Author	Import date
main	data.xlsx	Andre Matos Calhau	12/31/2024, 2:23 PM

Click the eye-shaped icon to view the error preventing the file from being imported.

Datasource	Name	Author	Import date	Actions
main	data.xlsx	Andre Matos Calhau	12/31/2024, 2:23 PM	  

1 error: The sheet does not have the same name as the selected data source

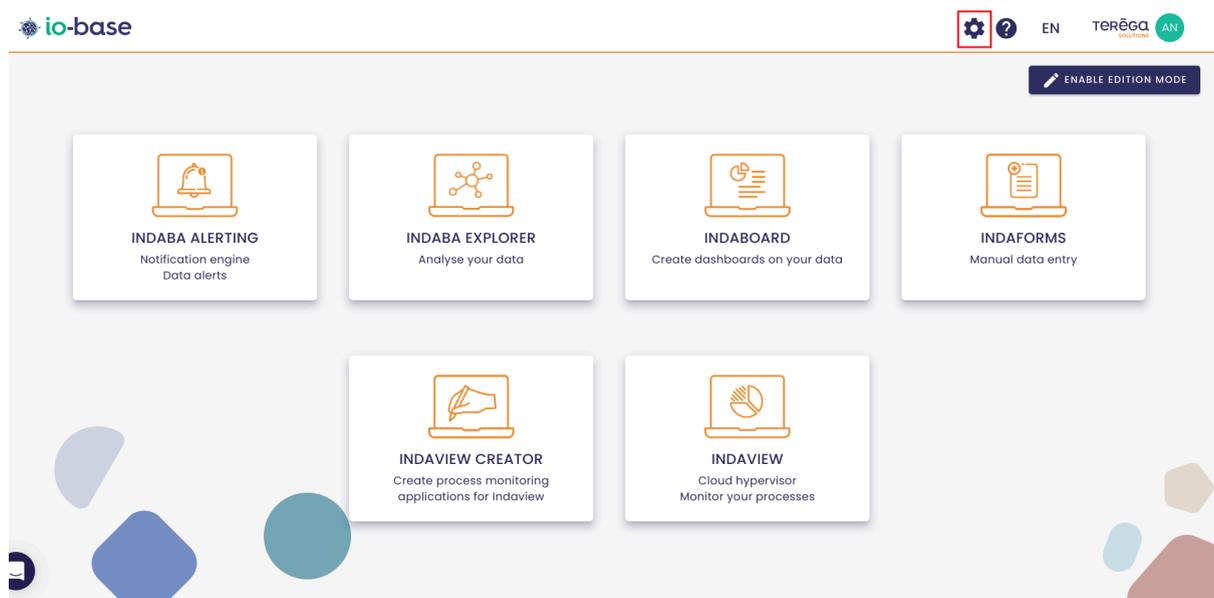
## 5. Data writing settings

**Prerequisite** : You must have a functional administrator role to access this feature.

## 5.1 Setting up writing in the future

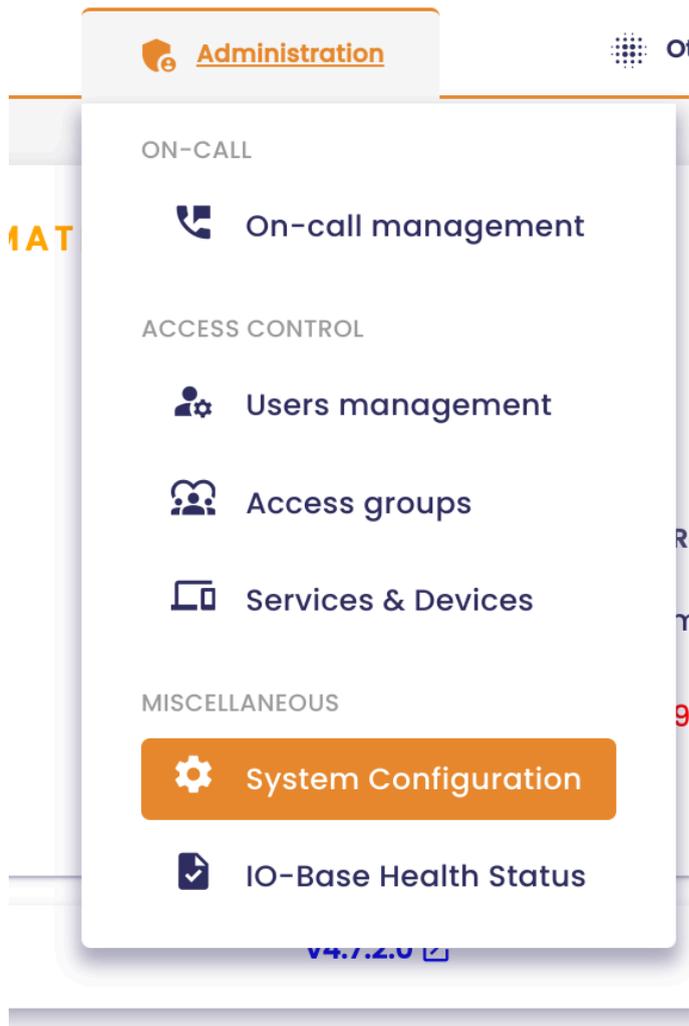
In the lo-base database, it is possible to write data into the future. This writing into the future can be parameterized to define a maximum tolerance time. In concrete terms, values written in the future beyond this time will be rejected.

Log in to **lo-base** and click the button at the top right of your screen, highlighted below :



The lo-base administration page opens.

Go to the **Administration/System Configuration** menu.



An input field is available to configure the Indaba data writing settings.

Enter a value that defines the maximum allowed time for future data entry.

### ⇒ Indaba data writing settings

#### Restrict data writing in the future

Tolerance in minutes before rejecting data (0 = no time limit)

Authorize partial writes

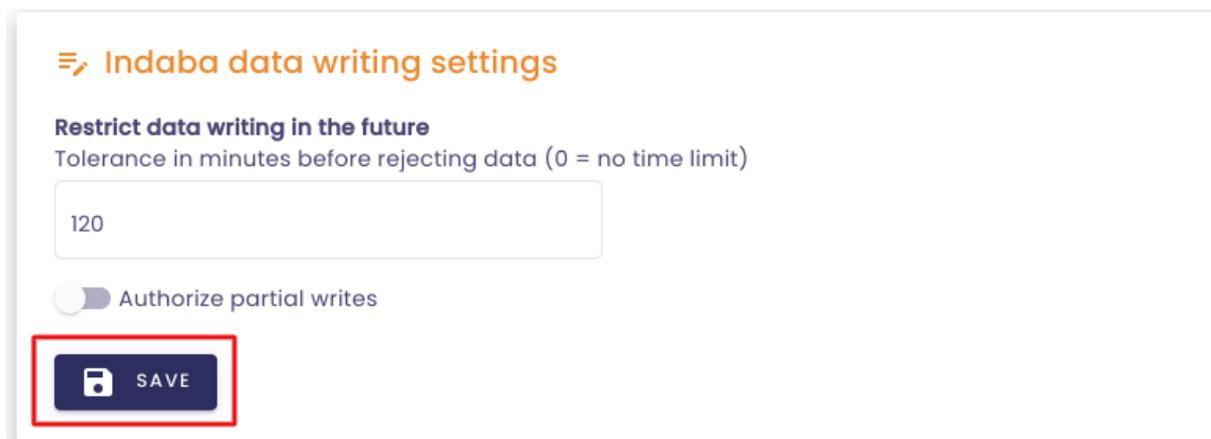
The period is entered in minutes. For example, if you enter "120", it means that it will

be impossible to write data in the database for a date/time greater than 120 minutes in the future. If it is 3pm, no data can be entered after 5pm.

**Note**: The period is applied to all the metrics in the database.

If you wish to enter data in the future without any restrictions, you must enter 0 in the tolerance period.

Once you have entered the value you need, click on **Save**.



The screenshot shows a settings panel titled "Indaba data writing settings" with a hamburger menu icon. Below the title is the section "Restrict data writing in the future" with the subtitle "Tolerance in minutes before rejecting data (0 = no time limit)". A text input field contains the value "120". Below the input field is a toggle switch labeled "Authorize partial writes", which is currently turned off. At the bottom left of the panel, a dark blue button with a white floppy disk icon and the text "SAVE" is highlighted with a red rectangular border.

## 5.2 Partial write settings

The "Authorize partial writes" parameter determines Indaba's behavior if a data write request includes both authorized and unauthorized metrics.

- By default (unchecked), the request is refused (return code 403) and no data is sent to indaba.

## ☰ Indaba data writing settings

### Restrict data writing in the future

Tolerance in minutes before rejecting data (0 = no time limit)

 Authorize partial writes

SAVE

- If partial writing is allowed, only authorized metrics will be transmitted to Indaba. A '202 Accepted' return code will indicate that the request has been accepted.

## ☰ Indaba data writing settings

### Restrict data writing in the future

Tolerance in minutes before rejecting data (0 = no time limit)

 Authorize partial writes

SAVE

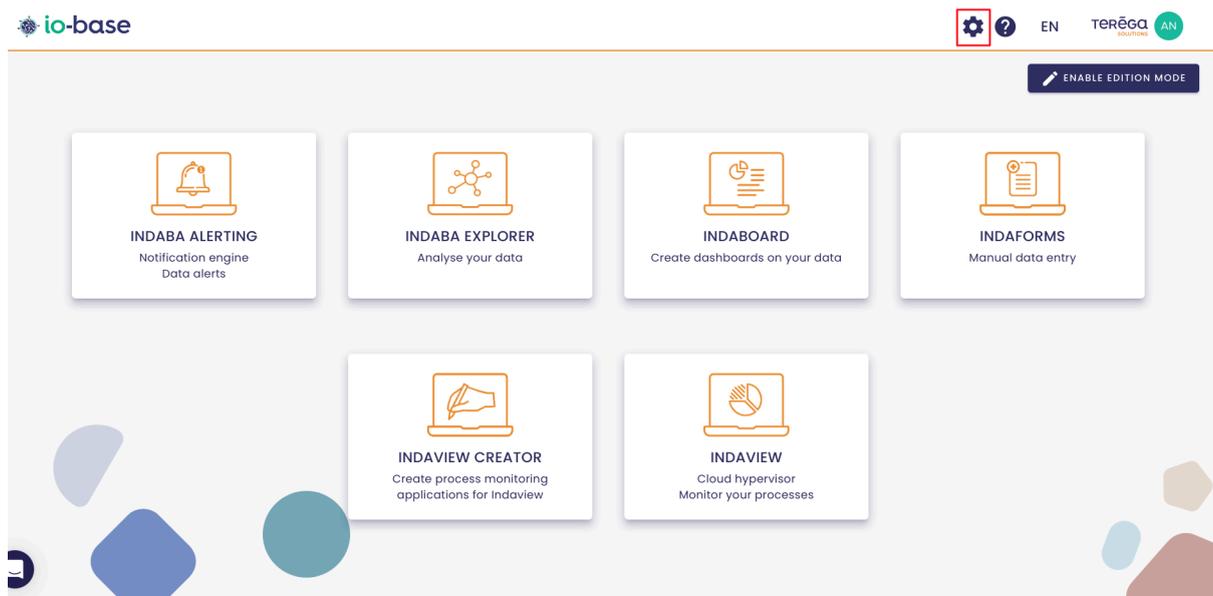
## 6. Viewing the status page

The **lo-base** status page allows you to quickly check the operational status of the APIs in use and identify any potential issues.

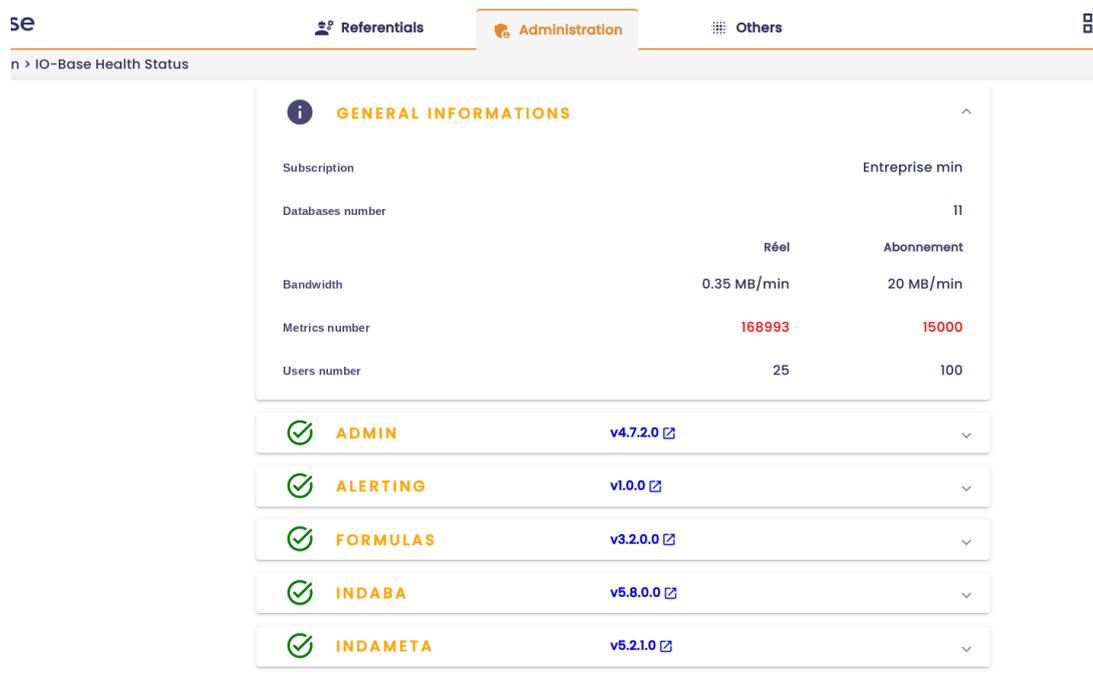
## 6.1 Accessing the Io-base Health Status Page

To view the status of the APIs, follow these steps :

Log in to **io-base** and click the button at the top right of your screen, highlighted below :



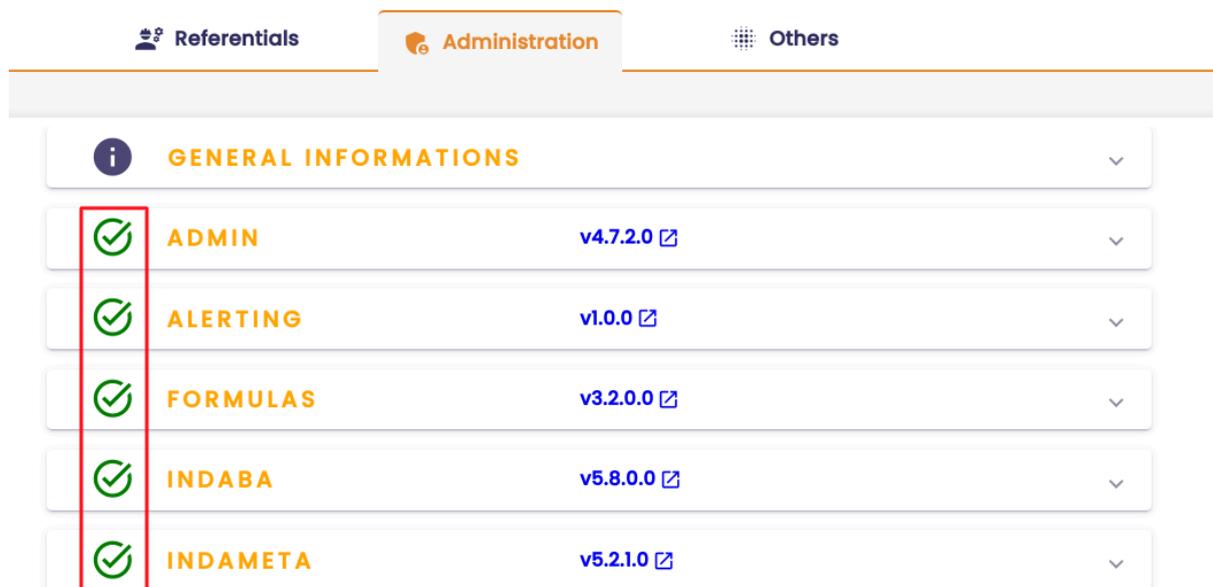
The io-base administration page opens.



## 6.2 Interface of the status page

Once on the status page, you will see a list of lo-base APIs, along with icons indicating their status :

- **Green Icon** : The API is functioning normally.



The screenshot shows a navigation bar with three tabs: 'Referentials', 'Administration' (selected), and 'Others'. Below the navigation bar is a list of API status items. Each item consists of a status icon, the API name, and the version number. A red box highlights the green checkmark icons for the first five items: ADMIN, ALERTING, FORMULAS, INDABA, and INDAMETA.

API Name	Version
ADMIN	v4.7.2.0
ALERTING	v1.0.0
FORMULAS	v3.2.0.0
INDABA	v5.8.0.0
INDAMETA	v5.2.1.0

- **Red Icon** : The API is experiencing an issue.
- **Yellow Icon** : The limits of your subscription will soon be exceeded.

## 6.3 API Details

To obtain more information about each API, expand the corresponding section :

**GENERAL INFORMATIONS**

**ADMIN** v4.7.2.0 [^](#)

API status Operational

CPU usage

RAM usage

## 6.4 Accessing Release Notes

You can view the various deployed versions of the APIs. Each line in the list includes a link to the release notes, detailing the changes and improvements made in each update. This allows you to track the evolution of features and fixes.

To do this, click on the link for the corresponding API :

**Referentials Administration Others**

**GENERAL INFORMATIONS**

**ADMIN** v4.7.2.0 [^](#)

**ALERTING** v1.0.0 [^](#)

**FORMULAS** v3.2.0.0 [^](#)

**INDABA** v5.8.0.0 [^](#)

**INDAMETA** v5.2.1.0 [^](#)

You will be redirected to the user documentation containing all the release notes for that API.

[All Collections](#) > [Release Notes](#) > [Indaba Alerting](#)

## Indaba Alerting

13 articles

- Indaba Alerting v3.5.0 >
- Indaba Alerting v3.4.2 >
- Indaba Alerting v3.4.1 >
- Indaba Alerting v3.4.0 >
- Indaba Alerting v3.3.0 >
- Indaba Alerting v3.2.2 >
- Indaba Alerting v3.2.1 >
- Indaba Alerting v3.2.0 >
- Indaba Alerting : v3.1.0 >

## [7. Formulas \(Calculated metrics\)](#)

### [7.1 Presentation and access to the formulas module](#)

#### [7.1.1 Présentation du module Formules](#)

The **Formulas** module allows you to manage your own metrics, which are calculated from the values of other metrics.

To access the **Formulas** module, you must have the **Functional Administrator** role in io-base.

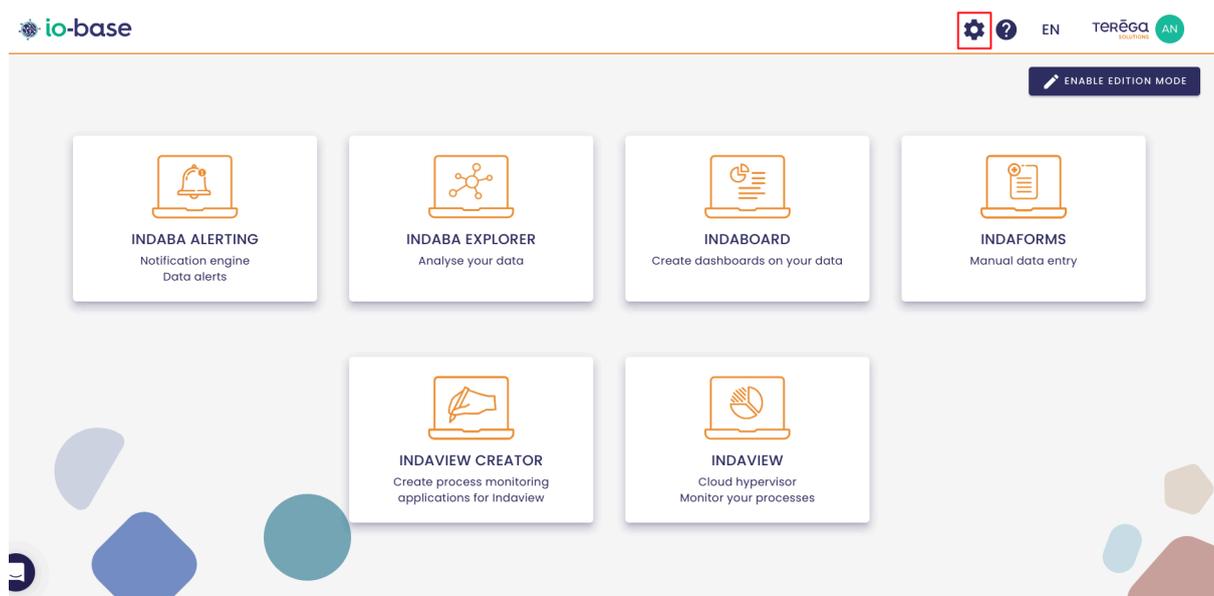
The **Formulas** screen will enable you to create new metrics, whose values will be automatically calculated based on the values of other metrics. These are referred to as **Calculated metrics**.

These metrics are added to your database, just like all the others that are linked to your devices.

You can then view the values of these metrics in Indaba Explorer or Indaview for example.

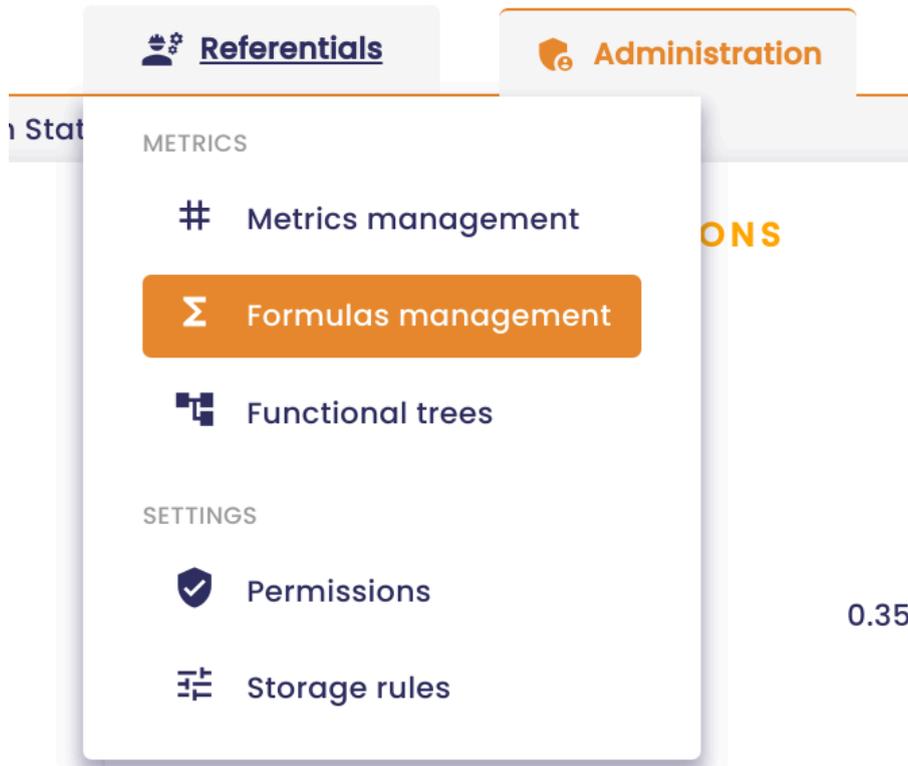
## 7.1.2 Access to the Formulas module

Log in to **io-base** and click the button at the top right of your screen, highlighted below :

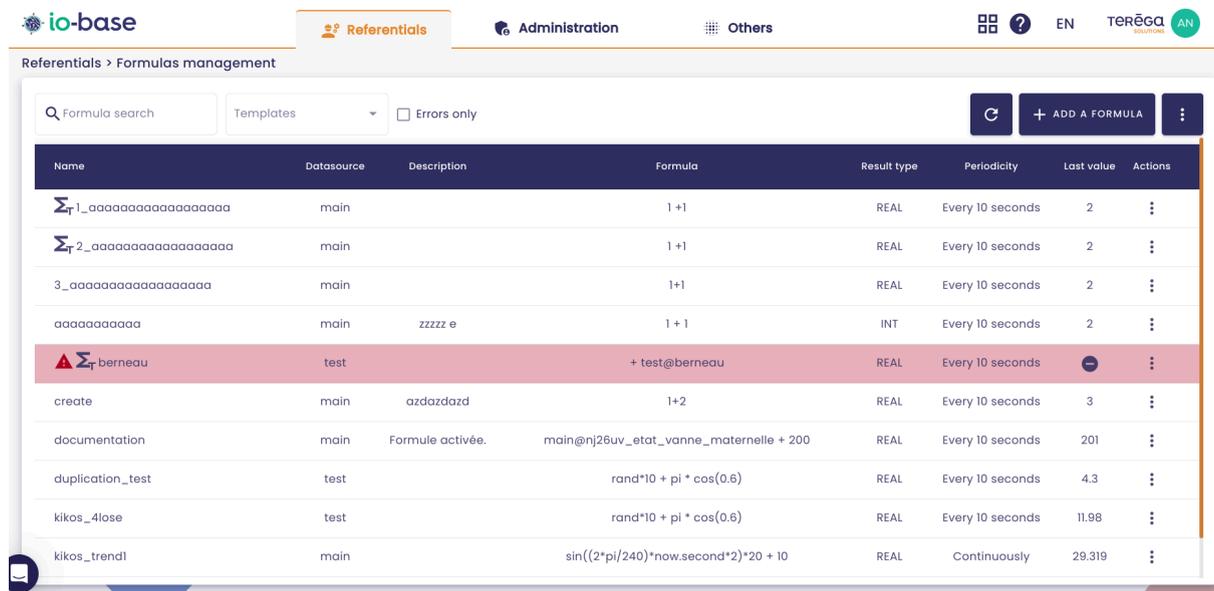


The io-base administration page opens.

Go to the **Referentials/Formulas management** menu.



The formula management module is displayed. This is where you can create, edit and delete your calculated metrics.



**Note** : the new metrics created through the formulas are subject to the same

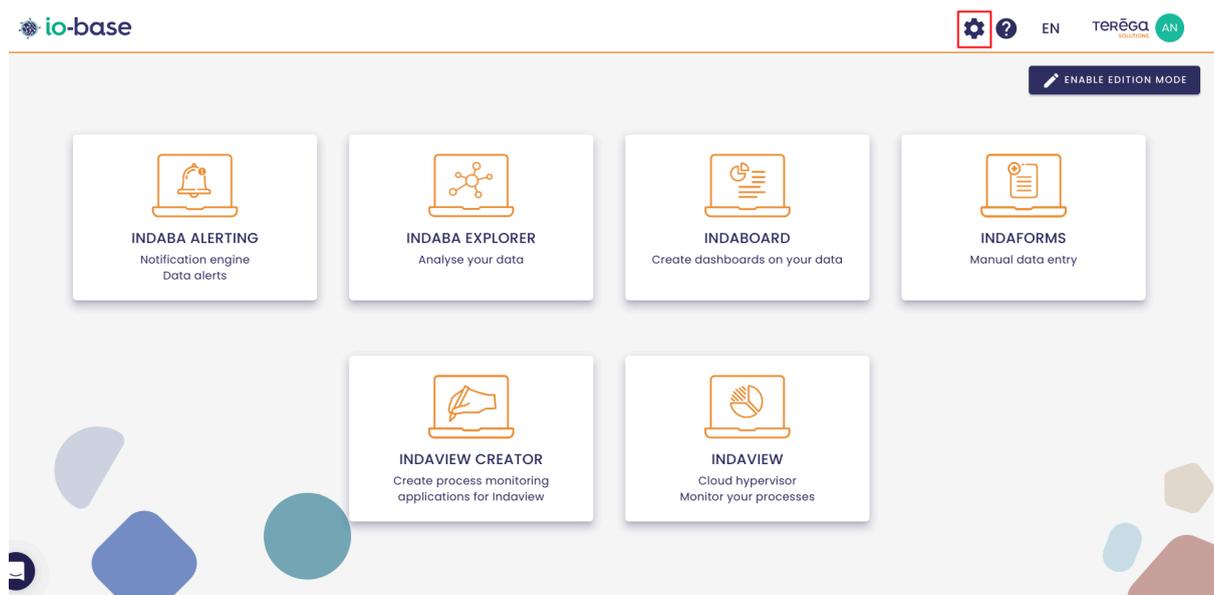
access rules as the classic ones. In order to view the values, you must therefore belong to a sufficient permission group (you can refer to the Permissions documentation for more details).

If you do not have the rights to view the calculated metric, the last result will not appear in the table column. An icon indicates that this is a rights problem.

## 7.2 Create a formula (calculated metric)

**Prerequisite:** to manage the calculated metrics, you must have the role of **Functional Administrator** in io-base.

Log in to **io-base** and click the button at the top right of your screen, highlighted below :



The io-base administration page opens.

Go to the **Referentials/Formulas management** menu.

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io-base Referentials Administration Others EN TEREQA SOLUTIONS

Referentials > Formulas management

Formula search  Templates   Errors only + ADD A FORMULA

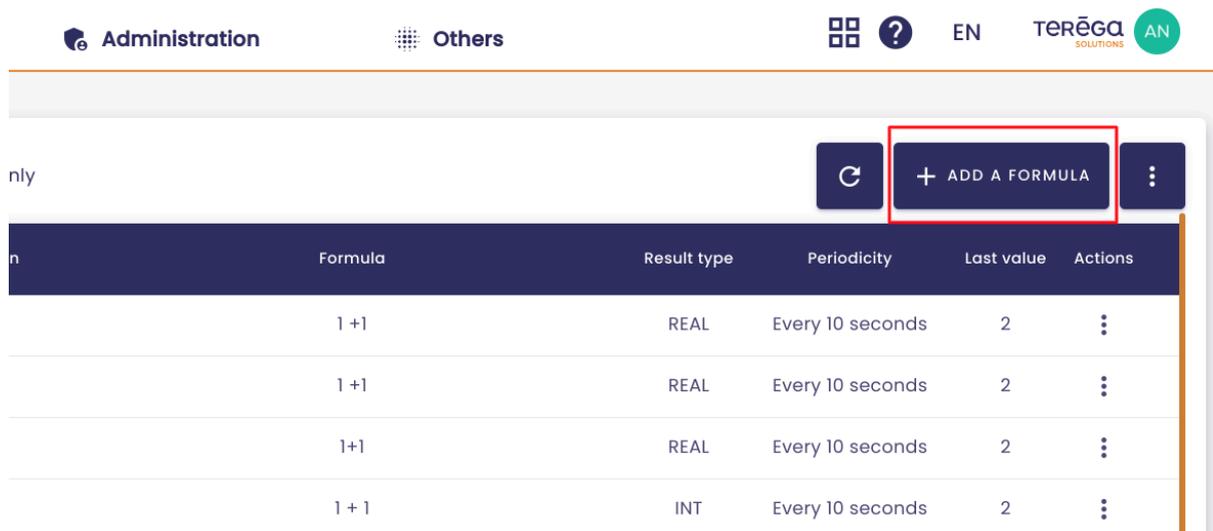
Name	Datasource	Description	Formula	Result type	Periodicity	Last value	Actions
Σ_1_aaaaaaaaaaaaaaaaaaaa	main		1 +1	REAL	Every 10 seconds	2	⋮
Σ_2_aaaaaaaaaaaaaaaaaaaa	main		1 +1	REAL	Every 10 seconds	2	⋮
3_aaaaaaaaaaaaaaaaaaaa	main		1+1	REAL	Every 10 seconds	2	⋮
aaaaaaaaaaaa	main	zzzz e	1 + 1	INT	Every 10 seconds	2	⋮
 Σ_berneau	test		+ test@berneau	REAL	Every 10 seconds	-	⋮
create	main	azdazdazd	1+2	REAL	Every 10 seconds	3	⋮
documentation	main	Formule activée.	main@nj26uv_etat_vanne_maternelle + 200	REAL	Every 10 seconds	201	⋮
duplication_test	test		rand*10 + pi * cos(0.6)	REAL	Every 10 seconds	4.3	⋮
kikos_4lose	test		rand*10 + pi * cos(0.6)	REAL	Every 10 seconds	11.98	⋮
kikos_trendI	main		sin((2*pi/240)*now.second*2)*20 + 10	REAL	Continuously	29.319	⋮

This "Formulas" screen allows you to create new metrics, with values

automatically calculated based on the values of other metrics. These metrics are referred to as "**Calculated metrics**".

These metrics are added to your database, in the same way as the metrics coming from the measuring devices.

To begin the creation of a new calculated metric, click on the "**Add a formula**" button :



The screenshot shows the 'Administration' section of a software interface. At the top, there are navigation links for 'Administration' and 'Others', along with a language selector set to 'EN' and the 'TEREGA SOLUTIONS' logo. Below the navigation bar, there is a table of calculated metrics. The table has columns for 'Formula', 'Result type', 'Periodicity', 'Last value', and 'Actions'. The 'ADD A FORMULA' button is highlighted with a red box. The table contains four rows of data, all with the formula '1 + 1' and a last value of '2'.

Formula	Result type	Periodicity	Last value	Actions
1 + 1	REAL	Every 10 seconds	2	⋮
1 + 1	REAL	Every 10 seconds	2	⋮
1 + 1	REAL	Every 10 seconds	2	⋮
1 + 1	INT	Every 10 seconds	2	⋮

The creation of a formula involves three steps :

- Defining the metric to be added to the database
- Configuring the frequency (periodicity) for calculating the metric's values
- Writing the formula to calculate the values

Once the three parts have been entered, simply click on the "**Add the formula**" button.

The new formula will appear in the table, and the metric will be created in the database and available in the different tools (Indaba Explorer...).

**Note** : for the "**Add the formula**" button to be available, all input fields must be valid (including the formula expression and the metric's name).

## 7.2.1 Definition of the metric

## New formula



### Definition

Metric name \*

Documentation

Metric database

main

Description

This formula was created for doc

Unit

V



This metric will be added to default access zone



### Periodicity



### Formula

The **Definition** section allows you to give general information about the new metric :

- **Metric name** : special characters and spaces are not allowed
- **Database** : the database in which the metric will be stored
- **Description** : allows you to give indications on the metric
- **Unit** : unit of the metric values

**Note** : the fields **Metric name** and **Metric database** cannot be modified after the creation of the metric. If you want to modify them, you will have to delete and recreate the metric.

## 7.2.2 Calculation periodicity

### New formula

The screenshot shows a configuration interface for a new formula. It features a vertical sidebar on the left with three sections: 'Definition' (checked), 'Periodicity' (selected and highlighted in grey), and 'Formula' (with a summation symbol). The 'Periodicity' section contains three radio buttons: 'Simplified' (selected), 'Advanced', and 'Continuously'. To the right of these buttons is the text 'Every' followed by a text input field containing '10' and a dropdown menu showing 'seconds'. Below this is a 'Timezone \*' label and a text input field containing 'Europe/Paris'. At the bottom of the interface are two buttons: 'CANCEL' and 'ADD THE FORMULA'.

The **Periodicity** field allows you to define the frequency with which the metric values will be calculated. There are three possible options :

- **Continuous** : the values will be calculated continuously (every 10 seconds), if a value of a metric used in the formula changes.
- **Simplified** : allows to define a number of seconds/minutes/hours between the calculation of two values

- **Advanced** : allows you to define a more complex frequency, using "**CRON Expressions**". A help link is available on the screen, to help you write this frequency.

To summarise, the frequency will be defined by 5 characters.

- minute
- hour
- day of the month
- month
- day of the week
- Special characters can be entered:
  - \* : any value
  - , : value separator for a list
  - - separator for a value range
  - / : step valueExample: 5 0 \* 8 \* means "At 00:05 in August".

**Note** : For the simplified periodicity, it is not possible to enter a value below 10 seconds.

Please also specify the **timezone** you want to configure for your formula.

An **autocomplete feature** is available : simply start typing, and the available timezones will be displayed :

**New formula**

Definition  
 Periodicity

Simplified  
 Advanced  
 Continuously

Every

Timezone \*

- Europe/Amsterdam
- Europe/Andorra
- Europe/Astrakhan
- Europe/Athens
- Europe/Belgrade

When entering your data, begin by specifying the continent, followed by the capital (or economic capital) of the country, separated by a slash (/).

**examples :**

Timezone \*

Timezone \*

**Note :** You have the option to adjust the timestamp of the result, when your

formula is calculated.

To do so, simply specify the desired offset :

 Periodicity

Simplified

Advanced

Continuously

See the help : [crontab.guru](https://crontab.guru)

CRON expression

Every 2 minutes

Move back the writing date by...

Timezone \*

For example, if you enter "1h", the value of your formula will be timestamped one hour **before** the calculation time.

So, if the calculation happens at 12:00 PM, the value will be recorded with a timestamp of 11:00 AM in the database.

### 7.2.3 Defining the formula

**New formula**

- ✓ Definition
- ✓ Periodicity
- Formula**

Data validity in seconds \*  ?

Result type \*  ▼

Operators  ▼

( + - \* / % ^ = > <> And

Or Xor << >>

Expression  ?

This section was made to define the formula that will be applied to calculate the values of the new metric. It contains the following fields :

- **Data validity in seconds** : This value ensures that the calculated values are based on valid data.

For example, if the expression is `main@tag + 5`, and the validity time is 60 seconds. When the formula needs to recalculate, it will analyse the date of the last value in base for `main@tag`. If this date is older than 60 seconds, then the value is considered unreliable. The formula will not be

recalculated, and no new value will be inserted for the moment.

If you want to recalculate a value every time, and ignore this feature, simply enter 0 in this field.

- **Result type:** indicates in which format the calculated values will be stored in the database:
  - BOOL : boolean
  - INT : integer
  - REAL : decimal
  
- **Expression :** this is the field that will contain the formula.

You can type directly into the text box, or use the various buttons to help you.

With the **Search Metric** button, you can search for an existing metric in the database to avoid typing it.

The buttons below show the list of operators that can be used in the expression.

The **?** button available on the **Expression** field gives you additional explanations on how to enter a formula. An article about "[Expressions and Formulas](#)" is available.

Once you have entered your formula expression, you need to test it by clicking the **Test Expression** button. If the formula is correct, the expression field will be framed in green. Otherwise, it will be red.

Example of a valid expression :

## Formula

Data validity in seconds \*  ?

Result type \*

Operators

METRIC SEARCH

( ) + - \* / % ^ = > <> And

Or Xor << >>

Expression  ?

The decimal separator is the period.

CANCEL

ADD THE FORMULA

Example of an invalid expression :

## Formula

Data validity in seconds \*  ?

Result type \*

Operators

METRIC SEARCH

( ) + - \* / % ^ = > <> And

Or Xor << >>

Expression  ?

The decimal separator is the period.

The equation result type does not match the expected type

TEST THE EXPRESSION ERASE

CANCEL ADD THE FORMULA

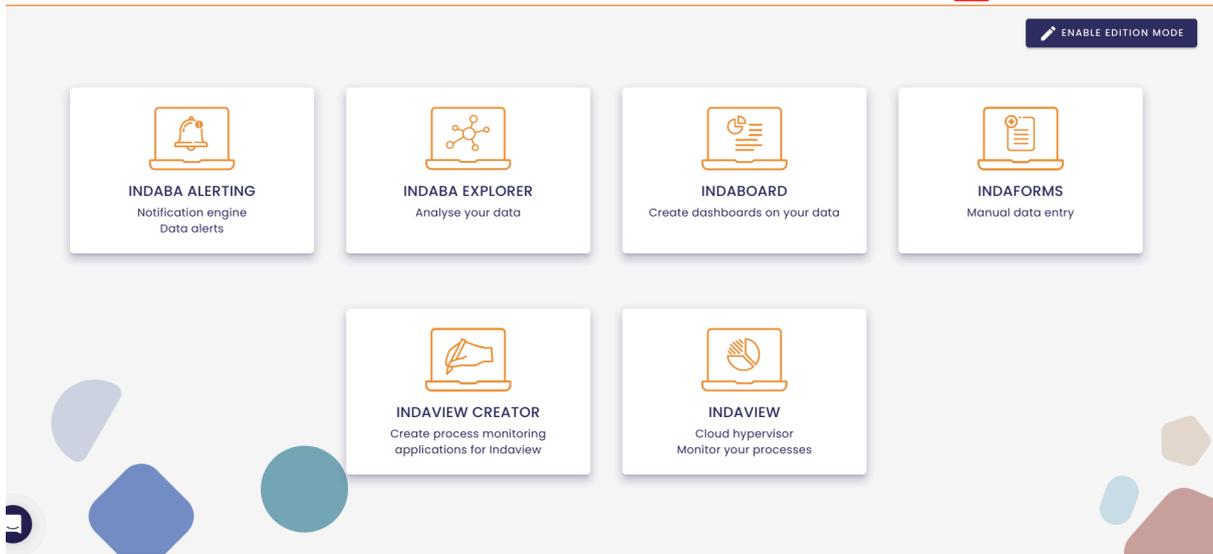
If the expression is invalid, an indication appears to explain where the error comes from.

The **Erase** button allows you to clear the content of the **Expression** field to start the input again.

### 7.3 Enable/Disable a formula (calculated metric)

**Prerequisite** : To access this feature, you must have a **Functional Administrator** role.

Log in to **lo-base** and click the button at the top right of your screen, highlighted below :



The io-base administration page opens.

Go to the **Referentials/Formulas management** menu.

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Formula search  Templates   Errors only 🔄 + ADD A FORMULA ⋮

Name	Datasource	Description	Formula	Result type	Periodicity	Last value	Actions
Σ_1_aaaaaaaaaaaaaaaaaaaa	main		1 +1	REAL	Every 10 seconds	2	⋮
Σ_2_aaaaaaaaaaaaaaaaaaaa	main		1 +1	REAL	Every 10 seconds	2	⋮
3_aaaaaaaaaaaaaaaaaaaa	main		1+1	REAL	Every 10 seconds	2	⋮
aaaaaaaaaaaa	main	zzzz e	1 + 1	INT	Every 10 seconds	2	⋮
 Σ_berneau	test		+ test@berneau	REAL	Every 10 seconds		⋮
create	main	azdazdazd	1+2	REAL	Every 10 seconds	3	⋮
documentation	main	Formule activée.	main@nj26uv_etat_vanne_maternelle + 200	REAL	Every 10 seconds	201	⋮
duplication_test	test		rand*10 + pi * cos(0.6)	REAL	Every 10 seconds	4.3	⋮
kikos_4lose	test		rand*10 + pi * cos(0.6)	REAL	Every 10 seconds	11.98	⋮
kikos_trendI	main		sin((2*pi/240)*now.second*2)*20 + 10	REAL	Continuously	29.319	⋮

This screen shows all the metrics whose values come from a formula.

You can decide at any time to disable a formula.

By disabling the formula, no more values will be recorded in the database for the calculated metric.

**Note** : if a formula is disabled, there will be no more new values for the metric, but the old values will remain in the database. And the calculated metric will always be present in the database. If you want to remove the metric and the old values, you will have to use the delete action.

To quickly identify which formulas are active/inactive, simply look at the colours of the lines.

- White : enabled
- Grey : disabled

io-base

Referentials Administration Others

Referentials > Formulas management

Formula search  
documentation

Templates  Errors only

Name	Datasource	Description	Formula
documentation	main	Enabled formula.	main@nj26uv_etat_vanne_maternelle + 200
documentation2	main	Disabled formula	main@nj26uv_etat_vanne_elementaire+10

### 7.3.1 Disable a formula

To disable a formula, click on the edit button of the relevant formula.

Refresh + ADD A FORMULA

	Result type	Periodicity	Last value	Actions
200	REAL	Every 10 seconds	201	⋮
+10	REAL	Every 2 minutes	110	⋮

- Add recalculation
- Edit**
- Delete
- Duplicate
- Open in explorer

In the edit pop-up, click on the Disable the formula button.

### Update a formula

**Definition**

Metric name: documentation2

Metric database: main

Description: Disabled formula

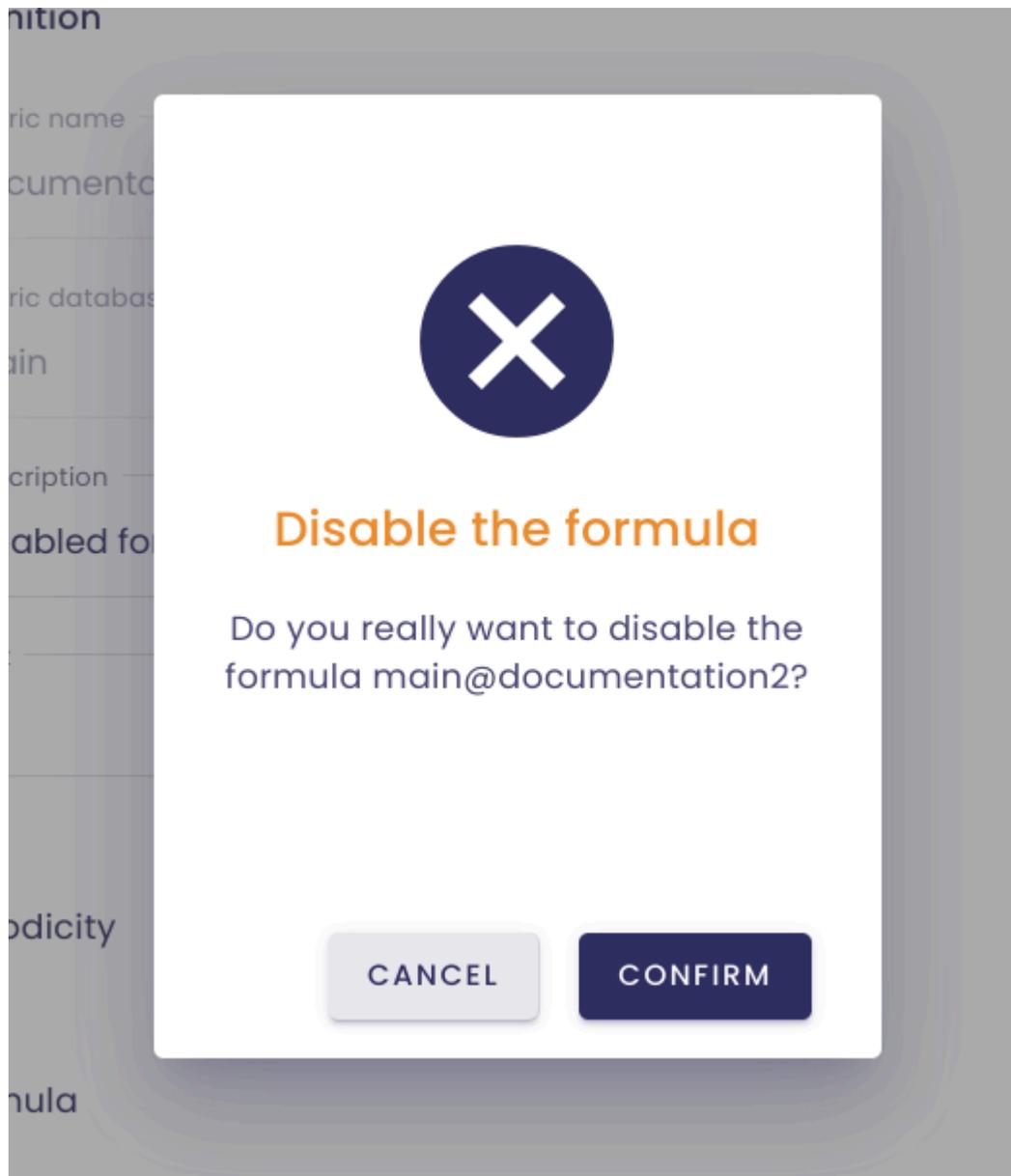
Unit: V

**Periodicity**

**Formula**

CANCEL **DISABLE THE FORMULA** UPDATE THE FORMULA

A confirmation message appears. **Confirm** to continue.



When formulas are disabled, their rows appear in grey in the table.

## Referentials &gt; Formulas management

Formula search  Templates  Errors only

Name	Datasource	Description	
documentation	main	Enabled formula.	main@nj2
documentation2	main	Disabled formula	main@nj

### 7.3.2 Enable a formula

To enable a formula, click on the edit button of the relevant formula.

Refresh + ADD A FORMULA

type	Periodicity	Last value	Actions
AL	Every 10 seconds	201	⋮
AL	Every 2 minutes	110	⋮

- Add recalculation
- Edit**
- Delete
- Duplicate
- Open in explorer

In the editing window, click on **Enable the formula**.

Administration

### Update a formula

**Definition**

Metric name  
documentation2

Metric database  
main

Description  
Disabled formula

Unit  
V

**Periodicity**

**Formula**

A confirmation pop-up appears. **Confirm** to continue.



### Enable the formula

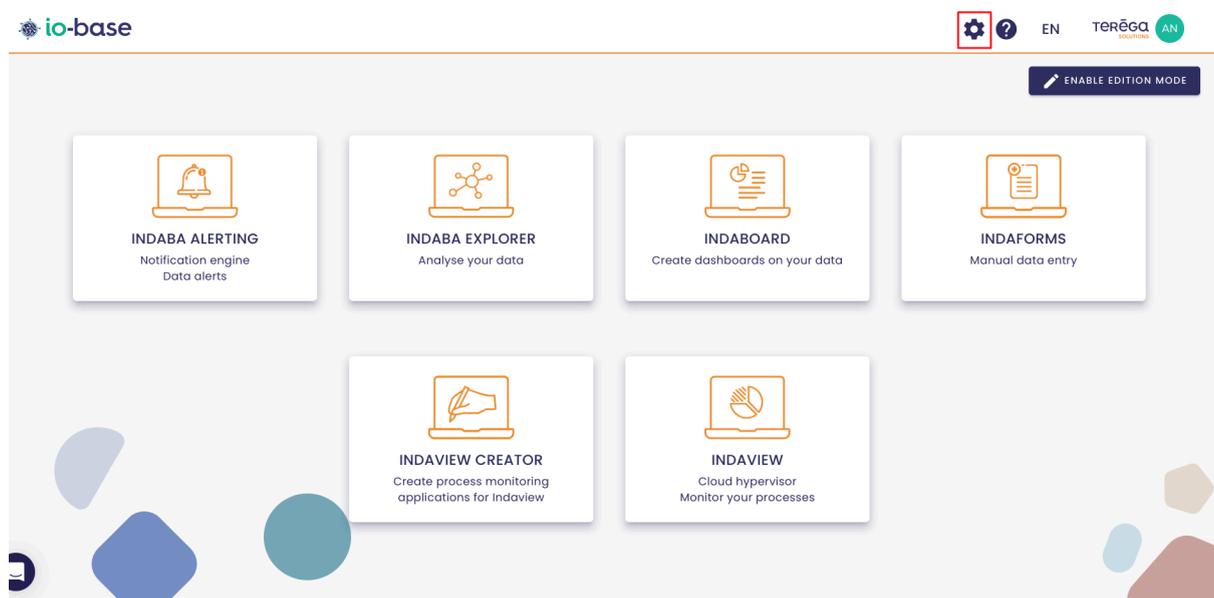
Do you really want to enable the formula main@documentation2?

The formula is reactivated, and the row appears again in white in the table.

## 7.4 Editing a formula (calculated metric)

Prerequisite: to manage the calculated metrics, you must have the role of Functional Administrator in io-base.

Log in to io-base and click the button at the top right of your screen, highlighted below :



The io-base administration page opens.

Go to the Referentials/Formulas management menu.

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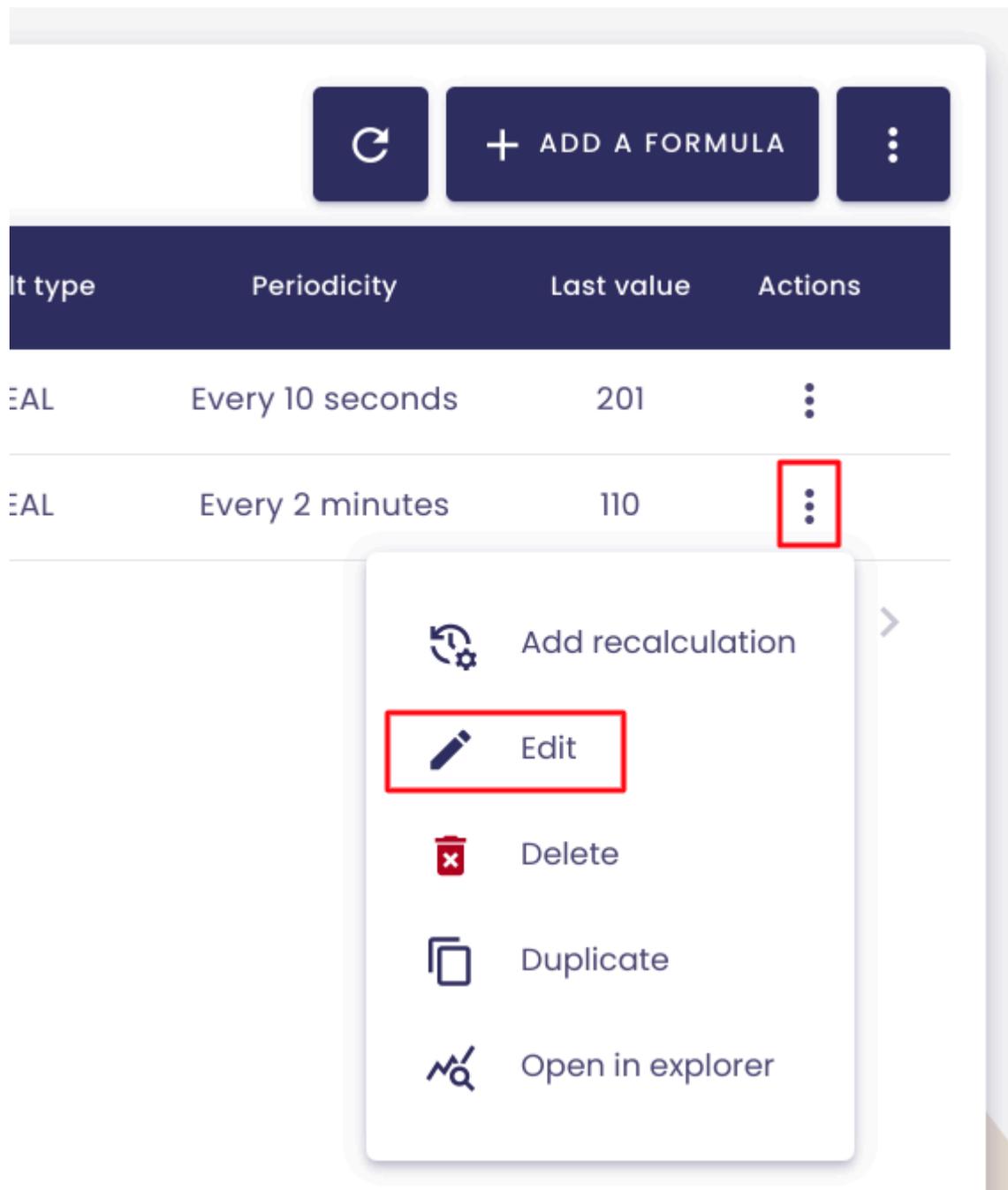
ONS

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Q Formula search    Templates     Errors only        **+ ADD A FORMULA**    

Name	Datasource	Description	Formula	Result type	Periodicity	Last value	Actions
Σ_1_aaaaaaaaaaaaaaaaaaaa	main		1 + 1	REAL	Every 10 seconds	2	
Σ_2_aaaaaaaaaaaaaaaaaaaa	main		1 + 1	REAL	Every 10 seconds	2	
3_aaaaaaaaaaaaaaaaaaaa	main		1 + 1	REAL	Every 10 seconds	2	
aaaaaaaaaaaa	main	zzzz e	1 + 1	INT	Every 10 seconds	2	
 Σ_berneau	test		+ test@berneau	REAL	Every 10 seconds		
create	main	azdazdazd	1 + 2	REAL	Every 10 seconds	3	
documentation	main	Formule activée.	main@nj26uv_etat_vanne_maternelle + 200	REAL	Every 10 seconds	201	
duplication_test	test		rand*10 + pi * cos(0.6)	REAL	Every 10 seconds	4.3	
kikos_4lose	test		rand*10 + pi * cos(0.6)	REAL	Every 10 seconds	11.98	
kikos_trend1	main		sin((2*pi/240)*now.second*2)*20 + 10	REAL	Continuously	29.319	

The editing of a formula is accessible from the edit button in the Action column.



From the edit screen, you can disable or enable a formula (click [here](#) for further information).

You can also change the settings of the formula.

Note: it is impossible to modify the name of the calculated metric, as well as the metric database. To do this, you must delete the formula and recreate it.

The screen for editing a formula is divided into three parts:

- definition of the metric that will be added to the database
- setting up the periodicity for calculating the metric's values
- writing the formula for calculating the values

Once the information has been changed, click on the Update the Formula button. For the button to be available, the formula expression must be tested and valid.

### 7.4.1 Definition of the metric

**Update a formula**

**Definition**

Metric name  
documentation2

Metric database  
main

Description

Unit  
V

**Periodicity**

**Formula**

CANCEL    DISABLE THE FORMULA    UPDATE THE FORMULA

The **Definition** zone allows you to modify the general information on the calculated metric :

- Metric name : cannot be modified
- Metric database : the database in which the metric is, cannot be modified
- Description : allows you to give indications on the metric
- Unit : unit of the metric values

## 7.4.2 Calculation periodicity

### Update a formula

---

✓ Definition

✎ Periodicity

Simplified      Every

Advanced

Continuously

Timezone \*

Σ Formula

---

The **Periodicity** field allows you to define the frequency with which the metric values will be calculated. There are three possible options:

- Continuous: the values will be calculated continuously, if a value of a metric used in the formula changes.
- Simplified: allows to define a number of seconds/minutes/hours between the calculation of two values
- Advanced: allows you to define a more complex frequency, using "CRON Expressions". A help link is available on the screen, to help you write this frequency.

To summarise, the frequency will be defined by 5 characters.

- minute
- hour
- day of the month
- month
- day of the week
- Special characters can be entered:
  - \* : any value
  - , : value separator for a list
  - - separator for a value range
  - / : step value

Example: 50\*8\* means "At 00:05 in August".

**Note** : For simplified periodicity, it is not possible to enter a value below 10 seconds.

Please also specify the **timezone** you want to configure for your formula.

An **autocomplete feature** is available: simply start typing, and the available timezones will be displayed :

## Update a formula

Definition

Periodicity

Simplified      Every

Advanced

Continuously

Timezone \*

- Europe/Amsterdam
- Europe/Andorra
- Europe/Astrakhan
- Europe/Athens
- Europe/Belgrade

When entering your data, begin by specifying the continent, followed by the capital (or economic capital) of the country, separated by a slash (/).

**examples :**

Timezone \*



### 7.4.3 Defining the formula

#### Update a formula

A screenshot of the 'Update a formula' interface. At the top, there are two tabs: 'Periodicity' (with a checkmark icon) and 'Formula' (with a pencil icon). The 'Formula' tab is active. Below the tabs, there are several input fields and buttons. On the left, 'Data validity in seconds \*' is a text input with the value '0' and a question mark icon. On the right, 'Result type \*' is a dropdown menu with 'REAL' selected. Below these, 'Operators' is a dropdown menu with 'Common' selected, and a 'METRIC SEARCH' button with a magnifying glass icon. A row of circular buttons contains mathematical symbols: '(', ')', '+', '-', '\*', '/', '%', '^', '=', '>', '<>', 'And', 'Or', 'Xor', '<<', and '>>'. Below the operators is an 'Expression' text input containing the formula 'main@nj26uv\_etat\_vanne\_elementaire+10' and a question mark icon. A note below the expression states 'The decimal separator is the period.' At the bottom, there are three buttons: 'TEST THE EXPRESSION' (dark blue), 'ERASE' (red), and 'UPDATE THE FORMULA' (dark blue). At the very bottom, there are three more buttons: 'CANCEL' (light blue), 'DISABLE THE FORMULA' (red), and 'UPDATE THE FORMULA' (dark blue).

This area was made to define the formula that will be applied to calculate the values of the new metric. It contains the following fields:

- **Data validity in seconds**: This value ensures that the calculated values are based on valid data.

For example, if the expression is `main@tag>5`, and the validity time is 60 seconds. When the formula needs to recalculate, it will look at the date of the last value in base for `main@tag`. If this date is older than 60 seconds, then the value is considered unreliable. The formula will not be recalculated, and no new value will be inserted for the moment. If you want to recalculate a value every time, and ignore this feature, just put 0 in this field.

- **Result type** : indicates in which format the calculated values will be stored in the database:
  - BOOL : boolean
  - INT : integer
  - REAL : decimal
  
- **Expression** : this is the field that will contain the formula.

You can type directly into the text box, or use the various buttons to help you.

With the **Search Metric** button, you can search for an existing metric in the database to avoid typing it.

The buttons below show the list of operators that can be used in the expression.

The **?** button available on the **Expression** field gives you additional explanations on how to enter a formula.

Once you have entered your formula expression, you need to test it by clicking the **Test Expression** button. If the formula is correct, the expression field will be framed in green. Otherwise, it will be red.

**Example of a valid expression :**

---

Data validity in seconds \*  ?

Result type \*

Operators

METRIC SEARCH

( ) + - \* / % ^ = > <> And

Or Xor << >>

Expression  ?

The decimal separator is the period.

TEST THE EXPRESSION ERASE

CANCEL DISABLE THE FORMULA UPDATE THE FORMULA

### Example of an invalid expression :

---

Or Xor << >>

Expression  ?

The decimal separator is the period.

**Syntax error in the formula**

TEST THE EXPRESSION ERASE

CANCEL DISABLE THE FORMULA UPDATE THE FORMULA

---

If the expression is invalid, by passing the mouse over the red circle ? , an indication appears to explain where the error comes from.

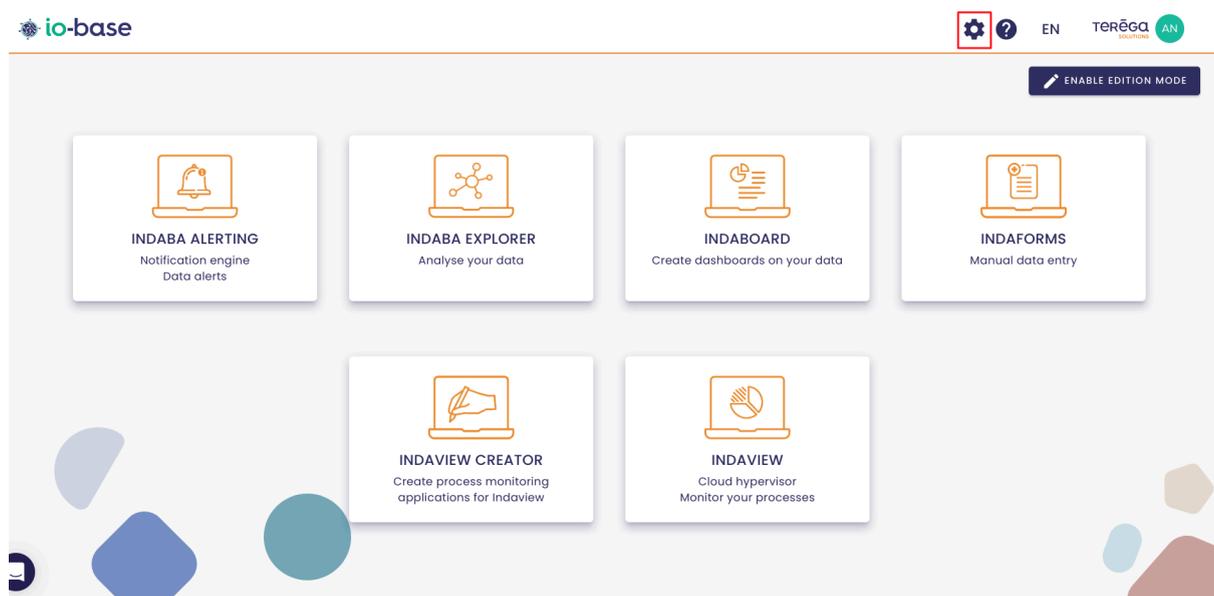
The **Erase** button allows you to clear the content of the **Expression** field to start

the input again.

## 7.5 Deleting a formula (calculated metric)

**Prerequisite** : to manage the calculated metrics, you must have the role of **Functional Administrator** in io-base.

Log in to **io-base** and click the button at the top right of your screen, highlighted below :



The io-base administration page opens.

Go to the **Referentials/Formulas management** menu.

Stat

METRICS

# Metrics management

**Σ Formulas management**

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Errors only



+ ADD A FORMULA



Name	Datasource	Description	Formula	Result type	Periodicity	Last value	Actions
Σ_1_aaaaaaaaaaaaaaaaaaaa	main		1 + 1	REAL	Every 10 seconds	2	⋮
Σ_2_aaaaaaaaaaaaaaaaaaaa	main		1 + 1	REAL	Every 10 seconds	2	⋮
3_aaaaaaaaaaaaaaaaaaaa	main		1 + 1	REAL	Every 10 seconds	2	⋮
aaaaaaaaaaaa	main	zzzzz e	1 + 1	INT	Every 10 seconds	2	⋮
 Σ_berneau	test		+ test@berneau	REAL	Every 10 seconds		⋮
create	main	azdazdazd	1+2	REAL	Every 10 seconds	3	⋮
documentation	main	Formule activée.	main@nj26uv_etat_vanne_maternelle + 200	REAL	Every 10 seconds	201	⋮
duplication_test	test		rand*10 + pi * cos(0.6)	REAL	Every 10 seconds	4.3	⋮
kikos_4lose	test		rand*10 + pi * cos(0.6)	REAL	Every 10 seconds	11.98	⋮
kikos_trendI	main		sin((2*pi/240)*now.second*2)*20 + 10	REAL	Continuously	29.319	⋮

In the **Actions** column, a button allows you to delete a formula :

The screenshot shows a user interface for managing formulas. At the top, there are three buttons: a refresh icon, a button labeled '+ ADD A FORMULA', and a three-dot menu icon. Below this is a table with the following columns: 'Result type', 'Periodicity', 'Last value', and 'Actions'. The table contains two rows of data:

Result type	Periodicity	Last value	Actions
REAL	Every 10 seconds	201	⋮
REAL	Every 30 seconds	101	⋮

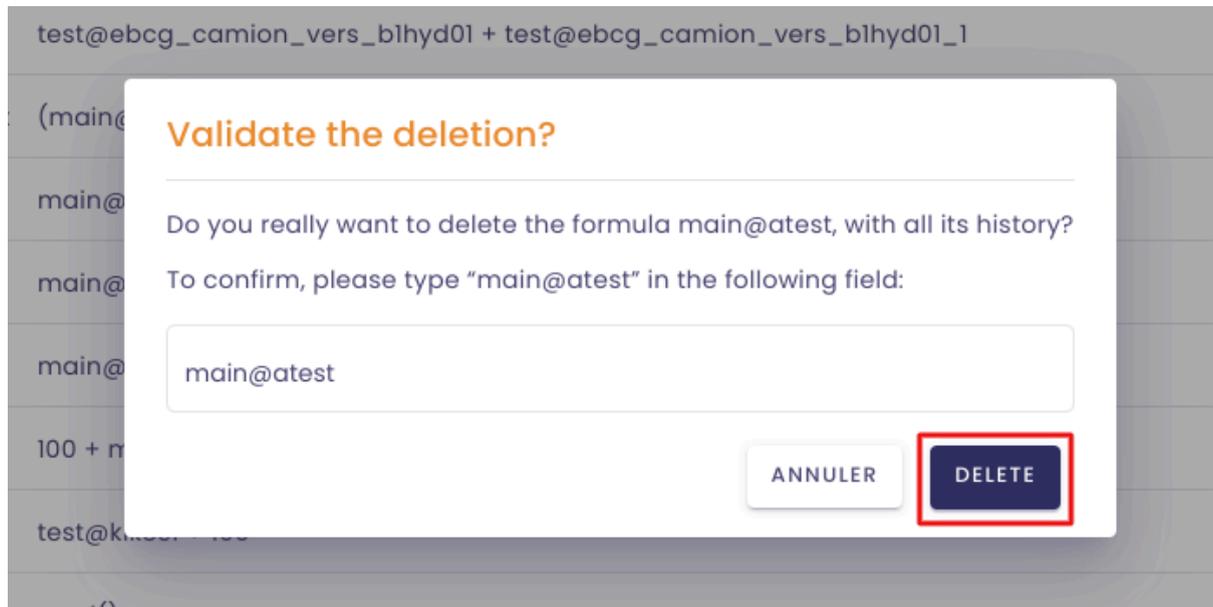
A dropdown menu is open for the second row, listing the following actions: 'Add recalculation', 'Edit', 'Delete', 'Duplicate', and 'Open in explorer'. The 'Delete' option is highlighted with a red box.

Click on the delete button for the desired formula.

The screenshot shows a confirmation dialog box titled 'Validate the deletion?'. The text inside the dialog reads: 'Do you really want to delete the formula main@documentation2, with all its history? To confirm, please type "main@documentation2" in the following field:'. Below this text is a text input field containing the text 'main@documentation2'. At the bottom of the dialog, there are two buttons: 'ANNULER' and 'DELETE'.

A pop-up window appears. Its purpose is to ensure that no deletions are made by mistake. Also, to be able to delete the selected formula, the exact name of the metric must be re-entered in the field. Once the correct name has been entered,

the **Delete** button becomes accessible.



**Note** : Copy and paste is not allowed in the field to avoid errors.

Click on **Delete** to continue.

**Note** : deleting a formula will delete the calculated metric from the database, as well as all the values recorded for this metric.

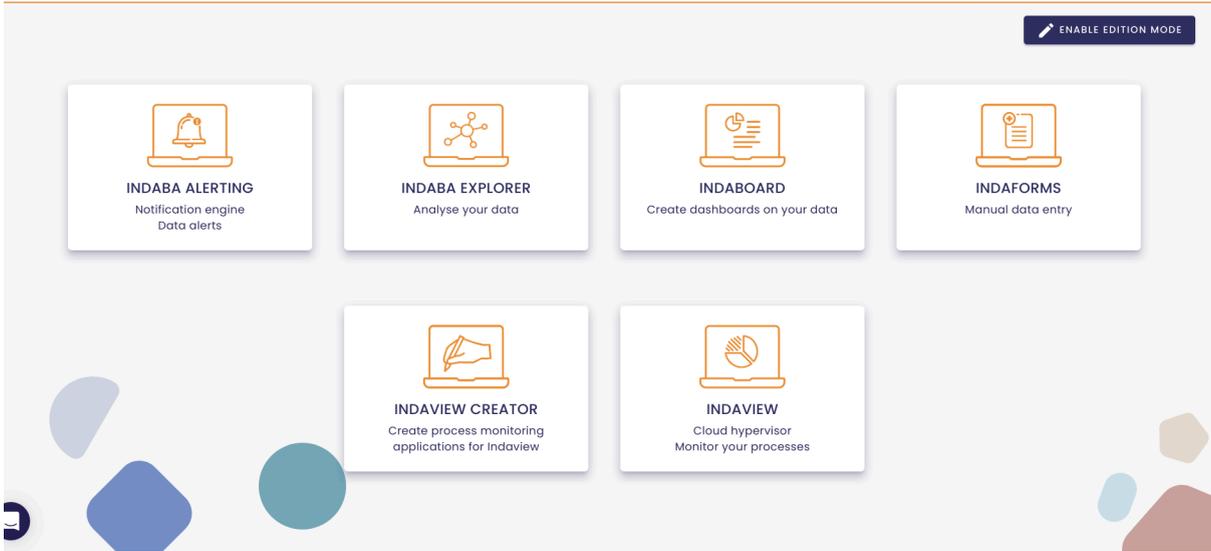
If you wish to keep the metric and the historical values, but no longer update it, you must disable the formula and not delete it.

## 7.6 Formula recalculation

The formula recalculation function is used to restart the calculation of a formula over a given period of time.

**Prerequisite** : you must have a functional admin role to access the **Formulas** module

Log in to **lo-base** and click the button at the top right of your screen, highlighted below :



The io-base administration page opens.

Go to the **Referentials/Formulas management** menu.

Stat

METRICS

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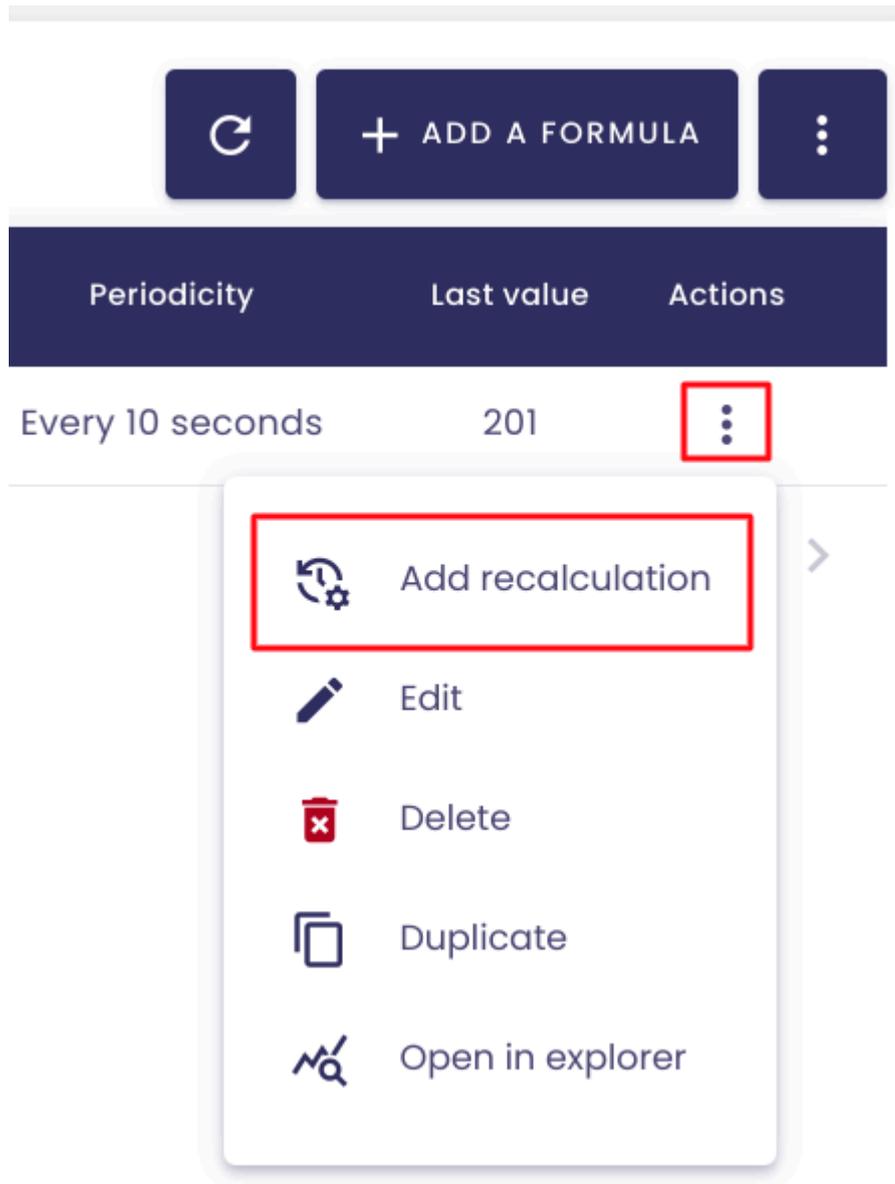
ONS

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Q Formula search    Templates     Errors only        **+ ADD A FORMULA**    

Name	Datasource	Description	Formula	Result type	Periodicity	Last value	Actions
Σ_1_aaaaaaaaaaaaaaaaaaaa	main		1 + 1	REAL	Every 10 seconds	2	
Σ_2_aaaaaaaaaaaaaaaaaaaa	main		1 + 1	REAL	Every 10 seconds	2	
3_aaaaaaaaaaaaaaaaaaaa	main		1 + 1	REAL	Every 10 seconds	2	
aaaaaaaaaaaa	main	zzzz e	1 + 1	INT	Every 10 seconds	2	
 Σ_berneau	test		+ test@berneau	REAL	Every 10 seconds		
create	main	azdazdazd	1 + 2	REAL	Every 10 seconds	3	
documentation	main	Formule activée.	main@nj26uv_etat_vanne_maternelle + 200	REAL	Every 10 seconds	201	
duplication_test	test		rand*10 + pi * cos(0.6)	REAL	Every 10 seconds	4.3	
kikos_4lose	test		rand*10 + pi * cos(0.6)	REAL	Every 10 seconds	11.98	
kikos_trend1	main		sin((2*pi/240)*now.second*2)*20 + 10	REAL	Continuously	29.319	

In the **Actions** column, click on the "Add recalculation" button.



A pop-up window opens. It will allow you to enter the beginning and the ending dates of your recalculation.

### Add formula recalculation

Do you want to recalculate the formula "test@var1"?

Beginning date  

Ending date  

This action will generate data for the specified range. Any existing data will not be replaced.

I wish to continue

The recalculation will generate new values for the period you specify. However, the new values will **NOT** replace the old ones.

To confirm, check the "I wish to continue" box and click on **Create**.

### Add formula recalculation

Do you want to recalculate the formula "test@var1"?

Beginning date  

Ending date  

This action will generate data for the specified range. Any existing data will not be replaced.

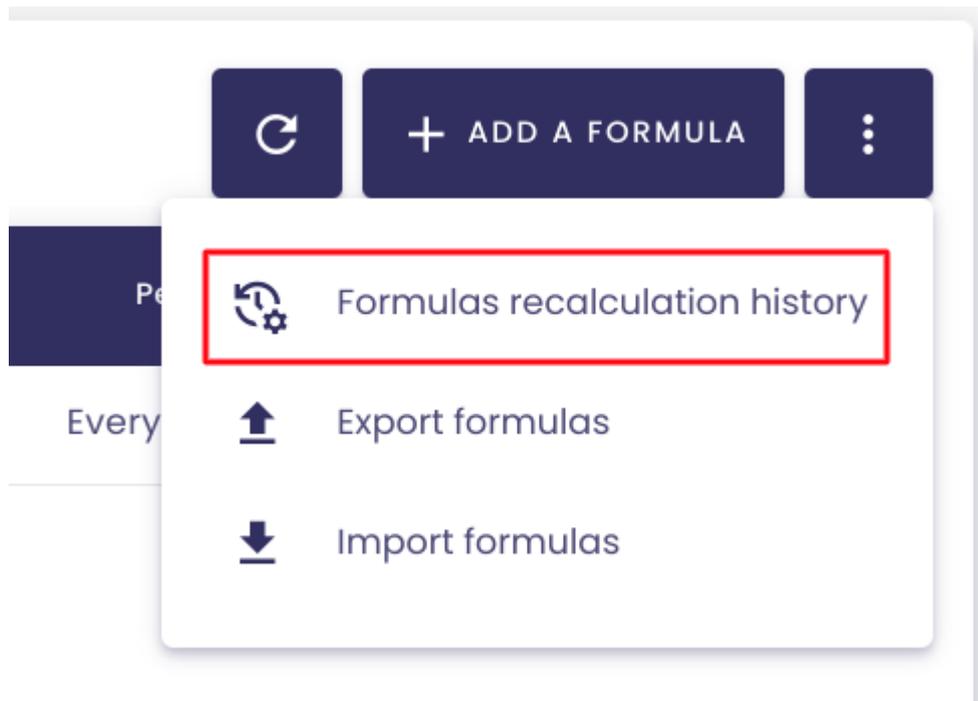
I wish to continue

**Note :** In order for the recalculation to be operated, the selected formulas must contain metrics.

For instance, if the expression of a formula is "rand()+3", the recalculation is not possible.

It becomes possible if you add a metric to the expression.

You can check the progress and history of your formula recalculation by clicking on the button at the top right.



#### List of formula recalculations

Recalculation creation	Formula	Status	Recalculation beginning	Progress	Recalculation ending
2/14/2024, 11:56:49 AM	test@var1	Finished	2/14/2024, 7:00:00 AM	4 hr - 100.00%	2/14/2024, 11:00:00 AM

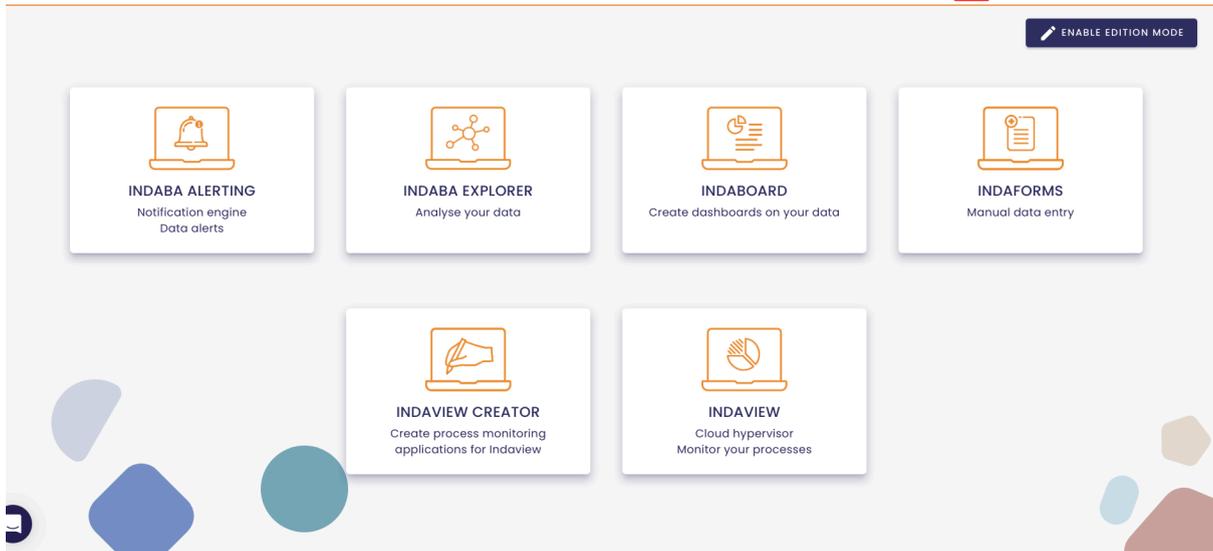
Once the recalculation is complete, you can view the result with **Indaba Explorer**.

## 7.7 Duplicate a formula

**Prerequisite** : You must have a functional administrator role to access this feature.

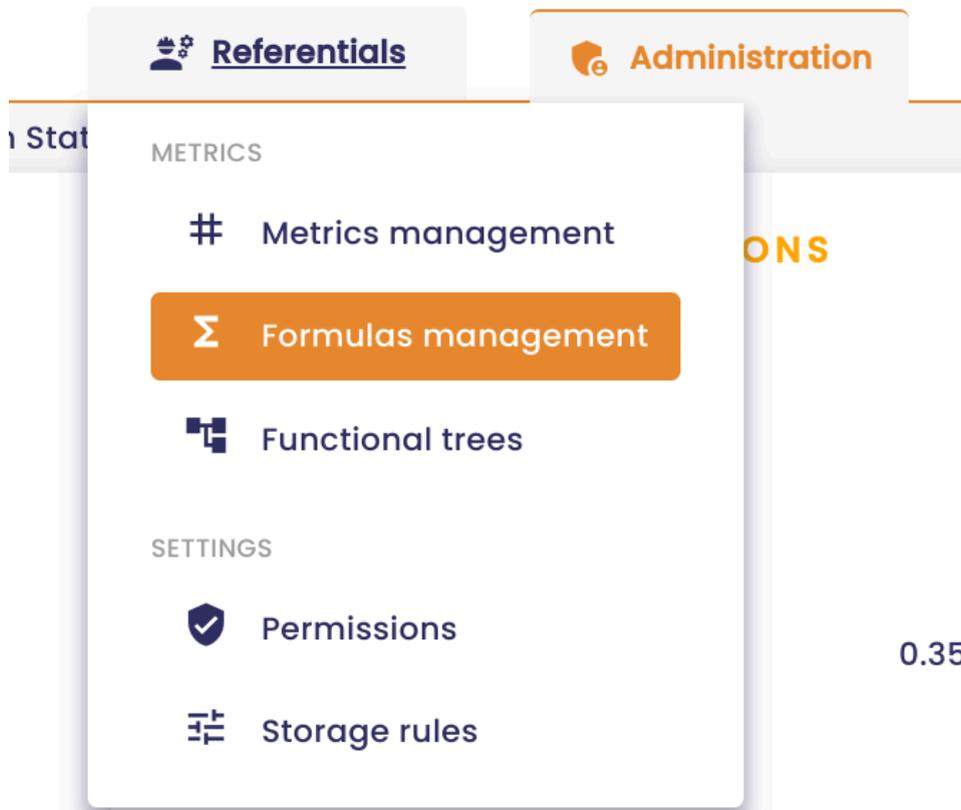
Log in to **lo-base** and click the button at the top right of your screen, highlighted below :

ENABLE EDITION MODE



The io-base administration page opens.

Go to the **Referentials/Formulas management** menu.



io-base Referentials Administration Others EN TEREGA SOLUTIONS AN

Referentials > Formulas management

Formula search Templates Errors only + ADD A FORMULA

Name	Datasource	Description	Formula	Result type	Periodicity	Last value	Actions
$\Sigma_1$ aaaaaaaaaaaaaaaaaaaa	main		1 +1	REAL	Every 10 seconds	2	⋮
$\Sigma_2$ aaaaaaaaaaaaaaaaaaaa	main		1 +1	REAL	Every 10 seconds	2	⋮
3_aaaaaaaaaaaaaaaaaaaa	main		1+1	REAL	Every 10 seconds	2	⋮
aaaaaaaaaaaa	main	zzzz e	1 + 1	INT	Every 10 seconds	2	⋮
$\Sigma_{\text{berneau}}$	test		+ test@berneau	REAL	Every 10 seconds	2	⋮
create	main	azdazdazd	1+2	REAL	Every 10 seconds	3	⋮
documentation	main	Formule activée.	main@nj26uv_etat_vanne_maternelle + 200	REAL	Every 10 seconds	201	⋮
duplication_test	test		rand*10 + pi * cos(0.6)	REAL	Every 10 seconds	4.3	⋮
kikos_4lose	test		rand*10 + pi * cos(0.6)	REAL	Every 10 seconds	11.98	⋮
kikos_trend1	main		sin((2*pi/240)*now.second*2)*20 + 10	REAL	Continuously	29.319	⋮

To duplicate a formula, go to the **Actions** column and click on



Then, click on **Duplicate**.

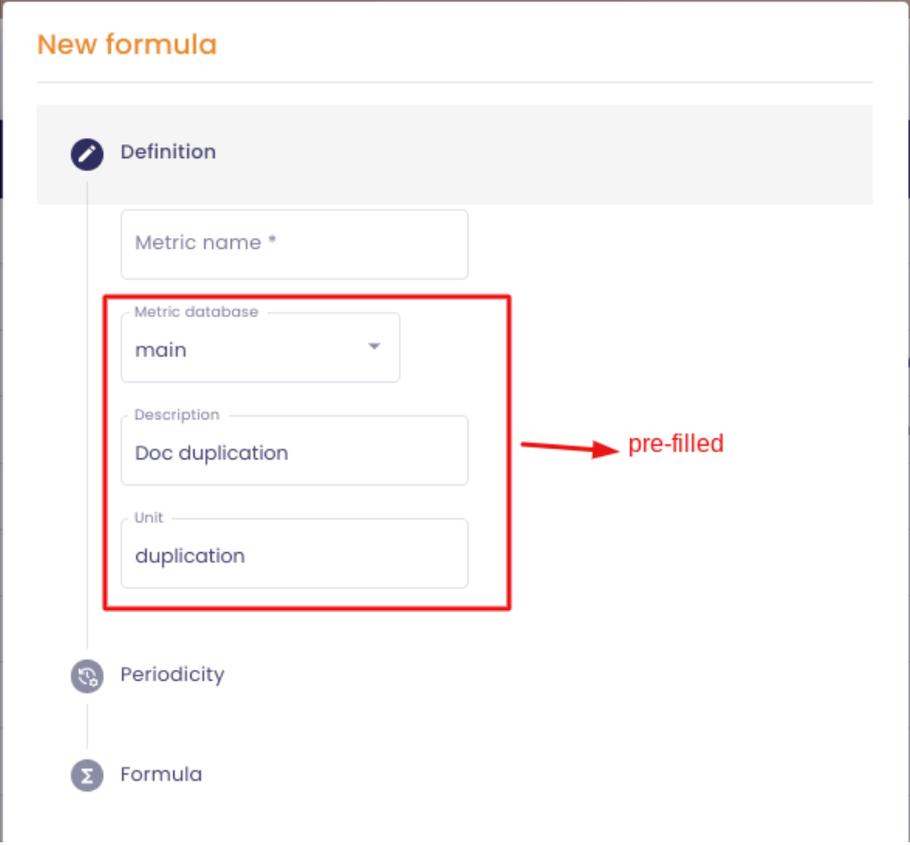
+ ADD A FORMULA

Periodicity	Last value	Actions
Every 10 seconds	201	⋮

- Add recalculation
- Edit
- Delete
- Duplicate**
- Open in explorer

The screen for creating a new formula will open.

In this screen, the fields of the metric will already be pre-filled with the information from the duplicated metric (except for the metric name).



The screenshot displays the 'New formula' interface. At the top, the title 'New formula' is shown in orange. Below it, a grey header bar contains a pencil icon and the word 'Definition'. The main content area features several input fields: 'Metric name \*' (empty), 'Metric database' (dropdown menu with 'main' selected), 'Description' (text field with 'Doc duplication'), and 'Unit' (text field with 'duplication'). A red rectangular box highlights the 'Metric database', 'Description', and 'Unit' fields. A red arrow points from the text 'pre-filled' to the 'Description' field. On the left side, a vertical navigation bar includes icons and labels for 'Definition', 'Periodicity', and 'Formula'.

## New formula

Definition

Periodicity

- Simplified  
 Advanced  
 Continuously

 pre-filled

Every

Timezone \*

Formula

## New formula

✓ Definition

✓ Periodicity

✎ Formula

Data validity in seconds \*  ?

Result type \*  ▼

Operators  ▼

( + - \* / % ^ = > <> And

Or Xor << >>

Expression  ?

TEST THE EXPRESSION ERASE

pre-filled

CANCEL

ADD THE FORMULA

**Note:** However, you still have the option to modify the pre-filled information as you

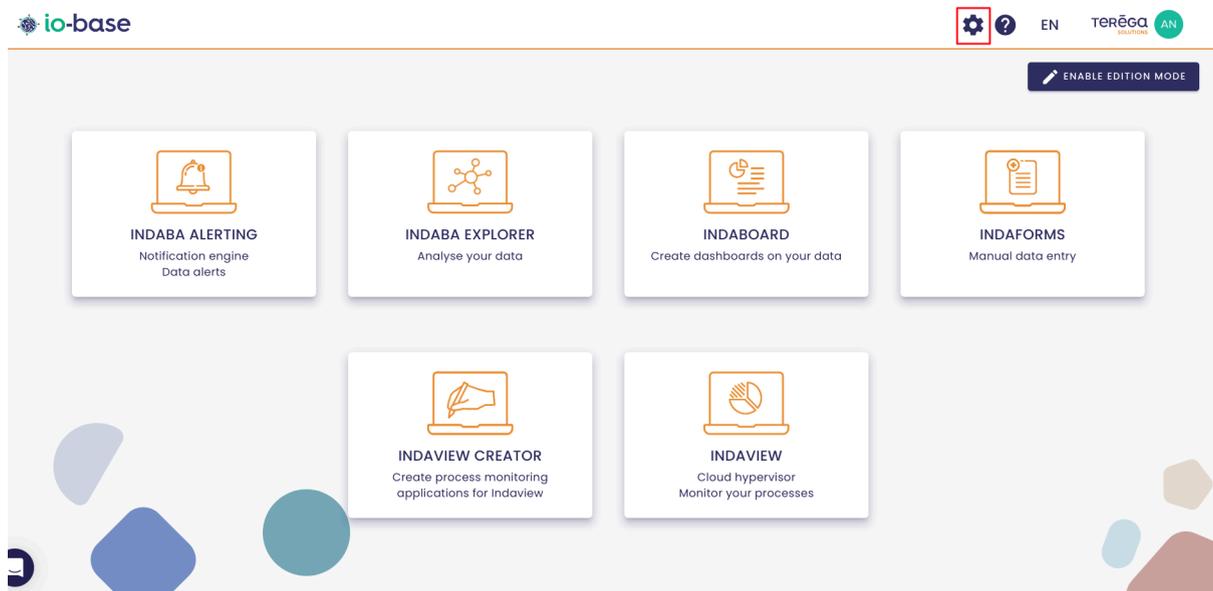
see fit.

Click on **Add Formula**. A copy of your formula has been created.

## 7.8 Import/Export formulas

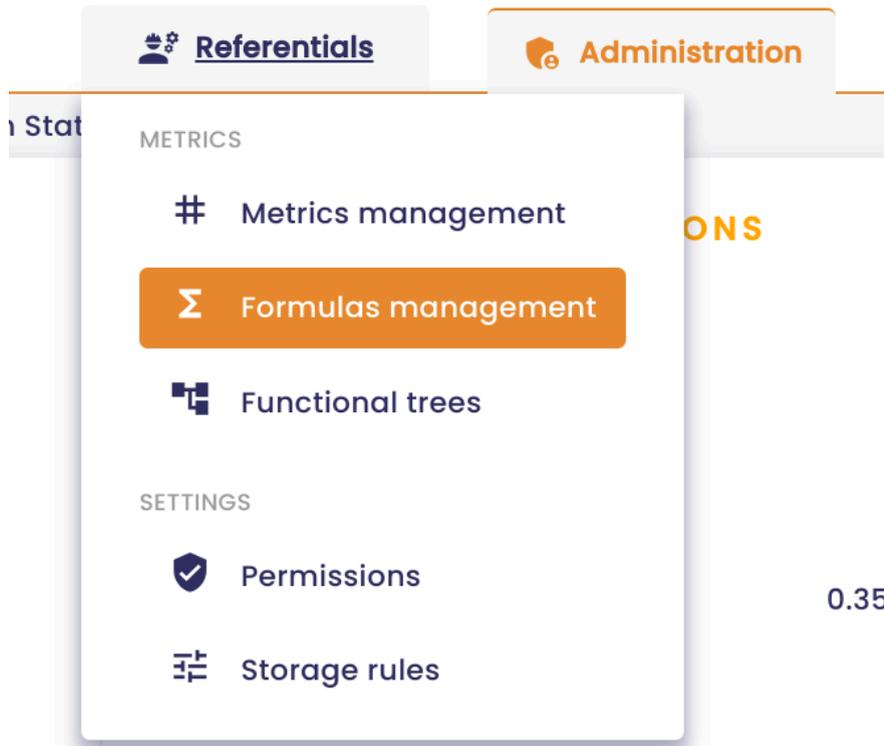
**Prerequisites** : This feature is available for users with a functional administrator role.

Log in to **lo-base** and click the button at the top right of your screen, highlighted below :



The lo-base administration page opens.

Go to the **Referentials/Formulas management** menu.



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io-base Referentials Administration Others EN TEREGA SOLUTIONS

Referentials > Formulas management

Formula search Templates Errors only + ADD A FORMULA

Name	Datasource	Description	Formula	Result type	Periodicity	Last value	Actions
$\Sigma_1$ _aaaaaaaaaaaaaaaaaaaa	main		1 +1	REAL	Every 10 seconds	2	⋮
$\Sigma_2$ _aaaaaaaaaaaaaaaaaaaa	main		1 +1	REAL	Every 10 seconds	2	⋮
3_aaaaaaaaaaaaaaaaaaaa	main		1+1	REAL	Every 10 seconds	2	⋮
aaaaaaaaaaaa	main	zzzz e	1 + 1	INT	Every 10 seconds	2	⋮
$\Sigma_{\text{berneau}}$	test		+ test@berneau	REAL	Every 10 seconds	-	⋮
create	main	azdazdazd	1+2	REAL	Every 10 seconds	3	⋮
documentation	main	Formule activée.	main@nj26uv_etat_vanne_maternelle + 200	REAL	Every 10 seconds	201	⋮
duplication_test	test		rand*10 + pi * cos(0.6)	REAL	Every 10 seconds	4.3	⋮
kikos_4lose	test		rand*10 + pi * cos(0.6)	REAL	Every 10 seconds	11.98	⋮
kikos_trend1	main		sin((2*pi/240)*now.second*2)*20 + 10	REAL	Continuously	29.319	⋮

You have the possibility to export and import your formulas.

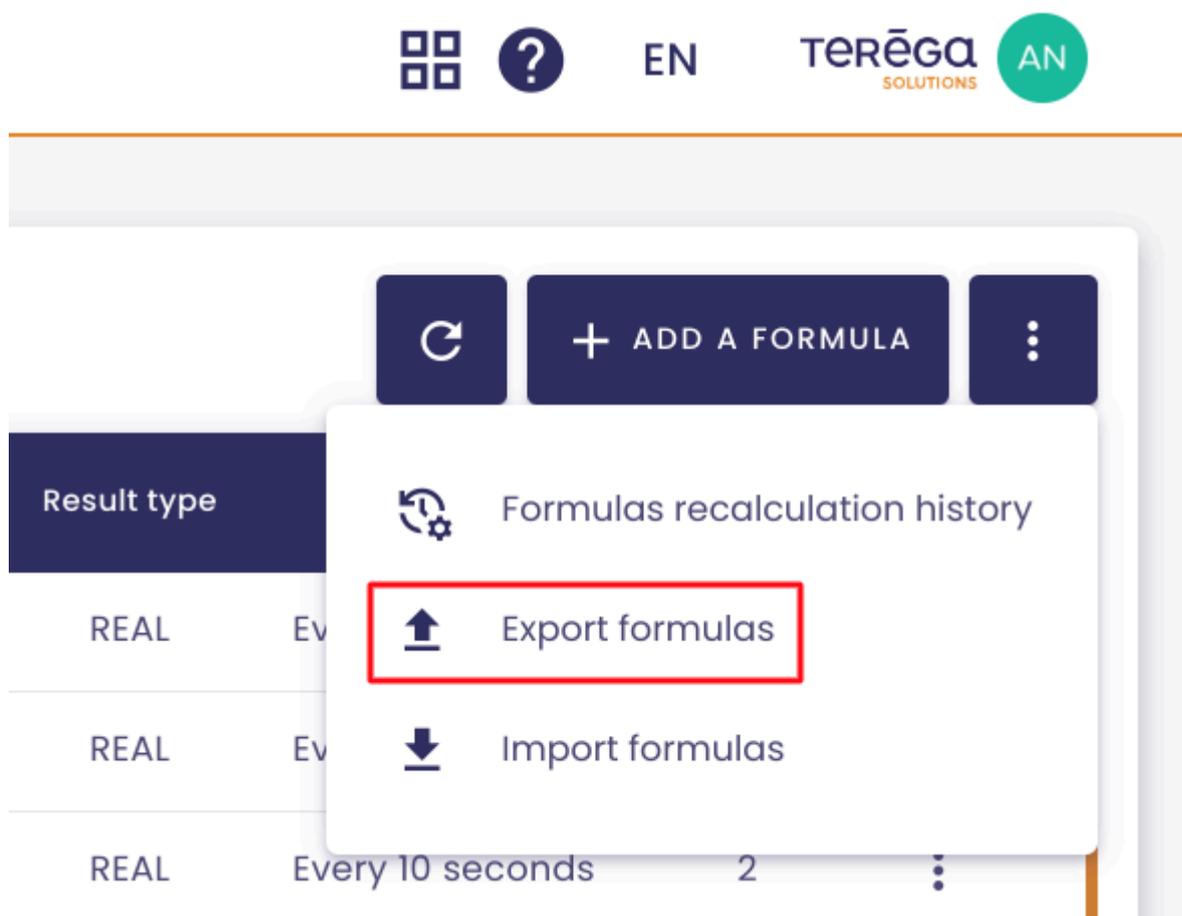
### 7.8.1 Export formulas

To export formulas, click on the

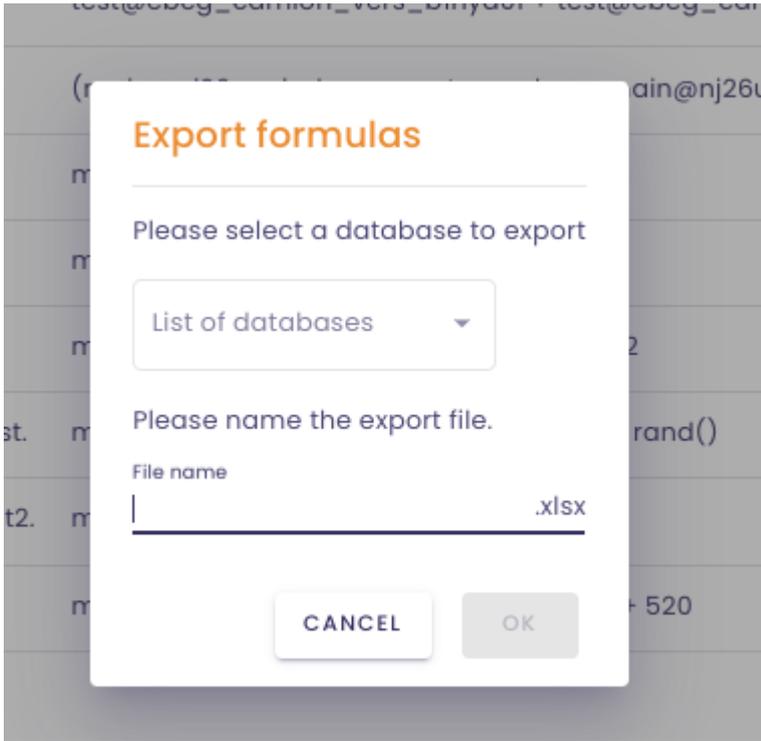


button, at the top-right of your screen.

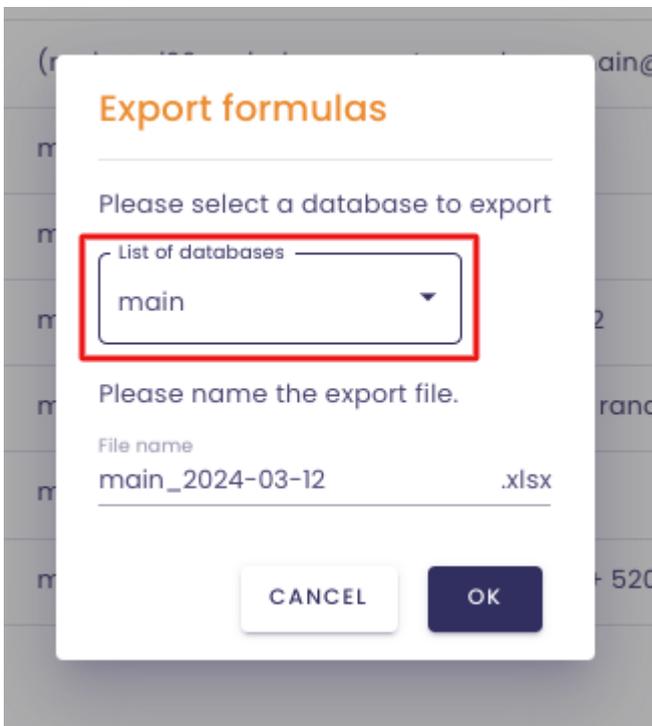
Then, click on **Export formulas**.



A pop-up window with a drop-down list opens.



In the drop-down list, select the database for which you want to export the calculated metrics.



By default, a file name is generated as **[database name]\_[today's date]**. You can modify it if you wish.



The file contains a sheet (named after the selected database) with several columns:

- **ID:** Formula identifier
- **Name:** Formula name
- **Description:** Formula description
- **Formula:** Expression of the formula
- **Periodicity:** Calculation frequency of the formula
- **Timezone:** Time zone applied to the formula
- **SourceValidityInSeconds:** The formula won't execute if the data is older than this value
- **ResultType:** Result type (REAL, INT, BOOLEAN)
- **Unit:** Unit of the calculated metric
- **Enabled:** Indicates whether the formula is active (**TRUE**) or inactive (**FALSE**).

## 7.8.2 Import formulas

You have the possibility to import formulas from an excel file.

### 7.8.2.1 Import Rules

When a file is imported, the following rules apply:

- Import does **not** allow the deletion of metrics. If there are missing rows in the file compared to the referential, nothing will happen. To delete calculated metrics (formulas), go to the **Referentials / Metrics Management** menu.
- Import allows modification of the following:
  - Description
  - Formula expression
  - Calculation periodicity
  - Time zone
  - Data validity in seconds
  - Result type
  - Unit
  - Enable/disable a formula

## 7.8.2.2 Creating Formulas via Import

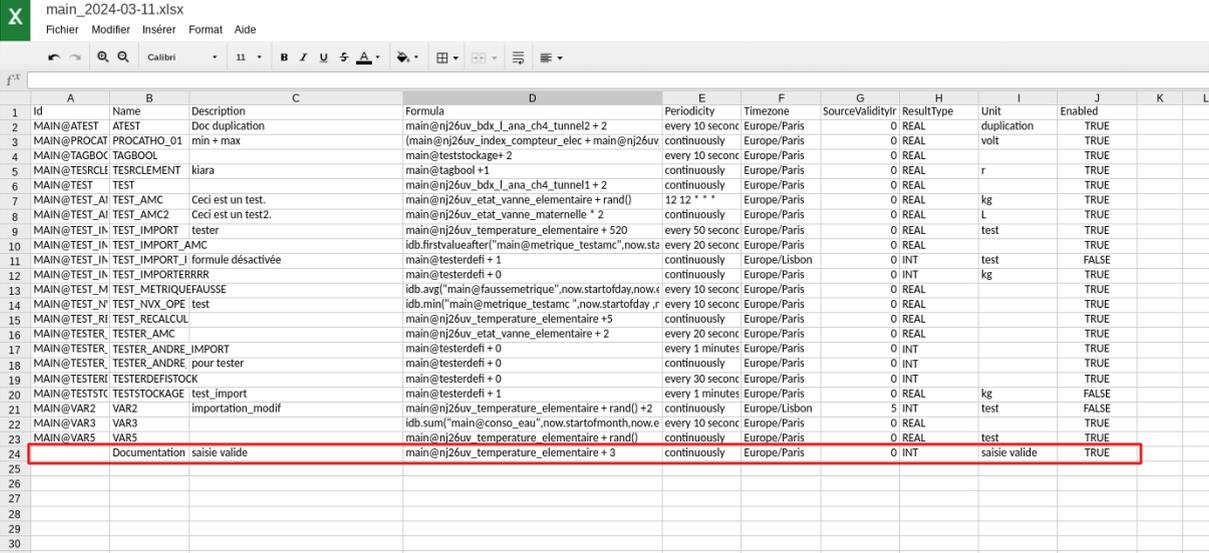
Import also enables you to create calculated metrics (formulas).

**Warning!** To create metrics via import, leave the first column “ID” empty.

Then, you can fill in the other columns as desired. However, be cautious not to use Excel-like formulas during data entry.

**Note:** The metric name should not contain special characters (only underscores (“\_”) and periods (“.”) are accepted).

Below, highlighted in red, is a valid entry for creating a metric via import for the “main” database.



ID	Name	Description	Formula	Periodicity	Timezone	SourceValidity	ResultType	Unit	Enabled
1	MAIN@ATEST	ATEST	Doc duplication	main@nj26uv_bdx_l_ana_ch4_tunnel2 + 2	every 10 second	Europe/Paris	0 REAL	duplication	TRUE
3	MAIN@PROCAT	PROCATHO_01	min + max	(main@nj26uv_index_compteur_elec + main@nj26uv	continuously	Europe/Paris	0 REAL	volt	TRUE
4	MAIN@TAGBOC	TAGBOOL		main@teststockage+ 2	every 10 second	Europe/Paris	0 REAL		TRUE
5	MAIN@TESRCLI	TESRLEMENT	kiara	main@tagbool +1	continuously	Europe/Paris	0 REAL	r	TRUE
6	MAIN@TEST	TEST		main@nj26uv_bdx_l_ana_ch4_tunnel1 + 2	continuously	Europe/Paris	0 REAL		TRUE
7	MAIN@TEST_AI	TEST_AMC	Ceci est un test.	main@nj26uv_etat_vanne_elementaire + rand()	12 12 * * *	Europe/Paris	0 REAL	kg	TRUE
8	MAIN@TEST_AI	TEST_AMC2	Ceci est un test2.	main@nj26uv_etat_vanne_maternelle * 2	continuously	Europe/Paris	0 REAL	L	TRUE
9	MAIN@TEST_IN	TEST_IMPORT	tester	main@nj26uv_temperature_elementaire + 520	every 50 second	Europe/Paris	0 REAL	test	TRUE
10	MAIN@TEST_IN	TEST_IMPORT_AMC		idb.firstvalueafter("main@metrique_testamc",now.sta	every 20 second	Europe/Paris	0 REAL		TRUE
11	MAIN@TEST_IN	TEST_IMPORT_J	formule désactivée	main@testerdefi + 1	continuously	Europe/Lisbon	0 INT	test	FALSE
12	MAIN@TEST_IN	TEST_IMPORTERRRR		main@testerdefi + 0	continuously	Europe/Paris	0 INT	kg	TRUE
13	MAIN@TEST_M	TEST_METRIQUEFAUSSE		idb.avg("main@faussetmetrique",now.startofday,now.e	every 10 second	Europe/Paris	0 REAL		TRUE
14	MAIN@TEST_N	TEST_NVX_OPE	test	idb.min("main@metrique_testamc",now.startofday,r	every 10 second	Europe/Paris	0 REAL		TRUE
15	MAIN@TEST_RI	TEST_RECALCUL		main@nj26uv_temperature_elementaire +5	continuously	Europe/Paris	0 REAL		TRUE
16	MAIN@TESTER	TESTER_AMC		main@nj26uv_etat_vanne_elementaire + 2	every 20 second	Europe/Paris	0 REAL		TRUE
17	MAIN@TESTER	TESTER_ANDRE_IMPORT		main@testerdefi + 0	every 1 minutes	Europe/Paris	0 INT		TRUE
18	MAIN@TESTER	TESTER_ANDRE_pour tester		main@testerdefi + 0	continuously	Europe/Paris	0 INT		TRUE
19	MAIN@TESTER	TESTERDEFISTOCK		main@testerdefi + 0	every 30 second	Europe/Paris	0 INT		TRUE
20	MAIN@TESTSTC	TESTSTOCKAGE	test_import	main@testerdefi + 1	every 1 minutes	Europe/Paris	0 REAL	kg	FALSE
21	MAIN@VAR2	VAR2	importation_modif	main@nj26uv_temperature_elementaire + rand() +2	continuously	Europe/Lisbon	5 INT	test	FALSE
22	MAIN@VAR3	VAR3		idb.sum("main@conso_eau",now.startofmonth,now.e	every 10 second	Europe/Paris	0 REAL		TRUE
23	MAIN@VAR5	VAR5		main@nj26uv_temperature_elementaire + rand()	continuously	Europe/Paris	0 REAL	test	TRUE
24		Documentation saisie valide		main@nj26uv_temperature_elementaire + 3	continuously	Europe/Paris	0 INT	saisie valide	TRUE

**Note :** The creation of metrics via the importation is not available for Google Sheet.

Therefore, prefer using Excel for this functionality.

## 7.9 Expressions and formulas (Formulas)

**Prerequisites:** You must have a functional administrator role for formula creation (calculated metrics).

For the creation of your formulas, the Formulas module includes basic operators

as well as the ability to add certain functions.

### 7.9.1 Formula with basic operators

A formula can be created with a single metric, or a set of metrics linked together by operators.

#### **List of available operators :**

<b>Operator</b>	<b>Description</b>	<b>Example</b>
+,-	Addition/Subtraction	100 + a
*,/,%	Multiplication/Division/Modulo	100*2 / (3 % 2)
^	Exponentiation	2 ^ 16
-	Negation	-6 + 10
+	Concatenation	"abc" + "def"
<<, >>	Offset	0 x 80 >> 2
=, <>, <, >, <=, >=	Comparison	2.5 > 100
And, Or, Xor, Not	Logical operation	(1 > 10) and (true or not false)
And, Or, Xor, Not	Binary operation	100 And 44 or (not 255)
If	Condition	If(a > 100, "greater", "less")
"123"	Character string	"String!"
true/false	Boolean constant	true AND false

### 7.9.2 Advanced functions

The functions allow more complex evaluations to be carried out. Here is the list of functions that are available.

### **7.9.2.1 "If" function**

**Purpose** : Allows to evaluate the equation passed in the condition parameter. The function returns the values passed in the "trueValue" and "falseValue" parameters according to the result of the evaluation.

**Definition** : If(condition, trueValue, falseValue)

### **7.9.2.2 "Ifthen" function**

**Purpose** : Returns a value X if the condition is valid.

**Definition** : ifthen([condition], [result if true])

### **7.9.2.3 "Rand" function**

**Purpose** : Generates a random number greater than or equal to 0.0 and less than 1.0

**Definition** : rand()

### **7.9.2.4 "Watchdog" function**

**Purpose** : Monitor the status of the data-transmitting equipment (Indabox, eWon, etc.)

**Definition** : bool Watchdog(string [idMetric], int [duration], bool [watchValueChange])

**Functioning** :

If the metric [idMetric] has not been written within [duration] seconds, the function returns **True**.

If the [watchValueChange] parameter = true, the function monitors the change in value between two writings.

If the last 2 values written in [idMetric] are equal, the function returns **True**.

**Equation** : result = ( [LastRefresh]<[Now]-[Duration] ) OR ( [watchValueChange]

AND [PreviousValue]=[CurrentValue])

Expression

Watchdog(main@nj26uv\_temperature\_maternelle,12,true) ?

TEST EXPRESSION ERASE

### **7.9.2.5 "DateFromString" function**

**Purpose** : To generate a fixed, absolute date from a character string.

**Functioning** :

Accepted date formats are :

- 2024-04-17T13:49:00Z -> timezone UTC
- 2024-04-17T13:49:00+02 -> timezone hours only
- 2024-04-17T13:49:00+02:30 -> timezone hours + minutes

The formula is invalid if the date is not entered in one of these formats.

Operators  Q METRIC SEARCH

Expression  ?

**Example of a valid expression :**

Expression  ?

### **7.9.2.6 PreviousValue function**

**Purpose** : Allows returning the value prior to the current value of a metric.

**Definition** : `previousValue("[metric]")`

**Functioning** : Simply replace the parameter [metric] with the desired metric. The function will return the value that the metric had just before its current value.

**Example** : To determine the variation in the value of a metric "temperature" between two readings, take the current value of the metric ("main@temperature") and subtract the previous value of the metric ("previousValue(main@temperature)").

Expression

`main@temperature-previousValue("main@temperature")`

TEST THE EXPRESSION ERASE

### 7.9.3 Indaba Functions and time operators

In addition to advanced formulas, you have access to "Indaba" operators that allow you to customize your calculated metrics to meet more specific needs.

When configuring these Indaba operators, you will need to specify the period you wish to analyze.

To do so, **you must use the time operators provided.**

**Note** : Indaba functions cannot be used in a formula where the periodicity is "continuous".

**Note** : You can use a maximum of 4 Indaba functions in a formula.

#### 7.9.3.1 Time Operators

##### Formula

Data validity in seconds \*  ?

Result type \*

Operators

METRIC SEARCH

**Time Operators:**

- now
- now.startOfDay
- now.endOfDay
- now.startOfYear
- now.endOfYear
- now.startOfMonth
- now.endOfMonth
- now.startOfWeek
- now.endOfWeek

In the system of time operators, the term "now" represents the current date. Then you have several methods (or functions) to manipulate the current date, with each function representing a value :

- `now.startOfDay` : start of the current day
- `now.endOfDay` : end of the current day
- `now.startOfYear` : start of the current year
- `now.endOfYear` : end of the current year
- `now.startOfMonth` : start of the current month
- `now.endOfMonth` : end of the current month
- `now.startOfWeek` : start of the current week
- `now.endOfWeek` : end of the current week

**For example :**

The screenshot shows a user interface for testing an expression. At the top, there are two buttons: `now.startOfWeek` and `now.endOfWeek`. Below them is an "Expression" input field containing the code `idb.max("main@doc",now.startOfDay,now.endOfDay)`. A red arrow points from the text "start date" to the `now.startOfDay` part of the expression. Another red arrow points from the text "end date" to the `now.endOfDay` part. Below the input field are two buttons: "TEST THE EXPRESSION" and "ERASE".

Here, the indicated period will be the start of the current day (start date) and the end of the current day (end date).

### 7.9.3.2 Indaba Functions

#### ldb.min :

**Purpose** : Returns the minimum value of a metric for a given period.

**Definition** : `ldb.min("[metric]", [start date], [end date])`

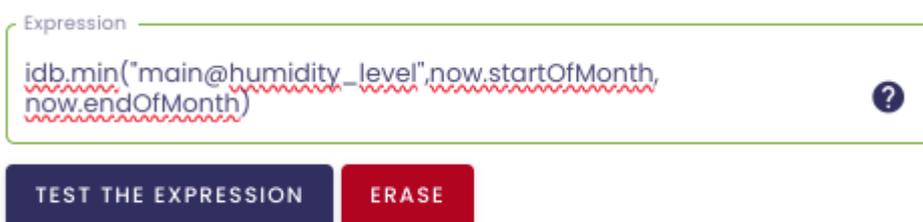
**Functioning** : Replace the [metric] parameter with the metric for which you want to know the minimum value during a period. To define this period, replace the [start date] and [end date] parameters with the aforementioned temporal operators.

**Example** : Suppose you want to know the minimum humidity level in one of your installations during the current month.

Your humidity level is represented by the metric "humidity\_level".

To indicate the desired period, use the temporal operators. Here, we want the data for the current month, so we will use "now.startOfMonth" (start of the month) to indicate the start of the period and "now.endOfMonth" (end of the month) to indicate the end of the period.

This results in the following expression :



The screenshot shows a code editor interface. At the top, the word "Expression" is written in a light blue font. Below it, a text input field contains the following code: `ldb.min("main@humidity_level",now.startOfMonth,now.endOfMonth)`. The code is styled with red wavy underlines under the metric name and the temporal operators. To the right of the input field is a circular help icon with a question mark. Below the input field are two buttons: a dark blue button labeled "TEST THE EXPRESSION" and a red button labeled "ERASE".

#### ldb.max

**Purpose** : Returns the maximum value of a metric for a given period.

**Definition** : `ldb.max("[metric]", [start date], [end date])`

**Functioning** : Same operation as for the `ldb.min` operator.

Replace the [metric] parameter with the metric for which you want to know the

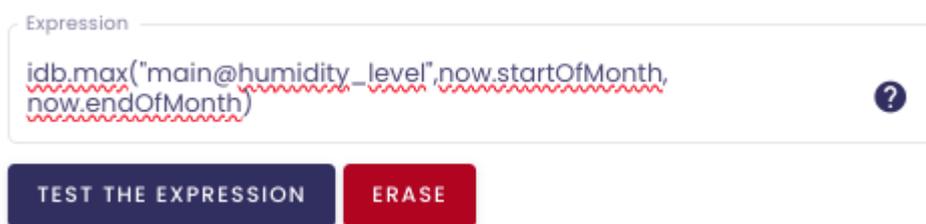
maximum value during a period. To define this period, replace the [start date] and [end date] parameters with the time operators mentioned before.

**Example :** Suppose you want to know the maximum humidity level in one of your installations during the current month.

Your humidity level is represented by the metric "humidity\_level".

To indicate the desired period, use the time operators. Here, we want the data for the current month, so we will use "now.startOfMonth" (start of the month) to indicate the start of the period and "now.endOfMonth" (end of the month) to indicate the end of the period.

This results in the following expression:



### **Idb.avg :**

**Purpose :** Returns the average value of a metric for a given period.

**Definition :** `idb.max("[metric]", [start date], [end date])`

**Functioning :** Replace the [metric] parameter with the metric for which you want to know the average value during a period. To define this period, replace the [start date] and [end date] parameters with the time operators mentioned before.

**Example :** Suppose you want to know the average temperature of a compressor during the current week.

Your temperature is represented by the metric "temperature". To indicate the desired period, use the time operators. Here, we want the data for the current week, so we will use "now.startOfWeek" (start of the week) to indicate the start of the period and "now.endOfWeek" (end of the week) to indicate the end of the period.

This results in the following expression :

Expression

```
idb.avg("main@temperature",now.startOfWeek,  
now.endOfWeek)
```

TEST THE EXPRESSION ERASE

### **Idb.sum :**

**Purpose :** Returns the sum of the values of a metric for a given period.

**Definition :** idb.sum("[metric]", [start date], [end date])

**Functioning :** Replace the [metric] parameter with the metric for which you want to know the sum of the values reported during a period. To define this period, replace the [start date] and [end date] parameters with the operators mentioned before.

**Example :** Suppose you want to know the total water consumption of a compressor during the current month.

Your water consumption is represented by the metric "water\_consumption". To indicate the desired period, use the time operators. Here, we want the data for the current month, so we will use "now.startOfMonth" (start of the month) to indicate the start of the period and "now.endOfMonth" (end of the month) to indicate the end of the period.

This results in the following expression :

Expression

```
idb.sum("main@water_consumption",now.startOfMonth,  
now.endOfMonth)
```

TEST THE EXPRESSION ERASE

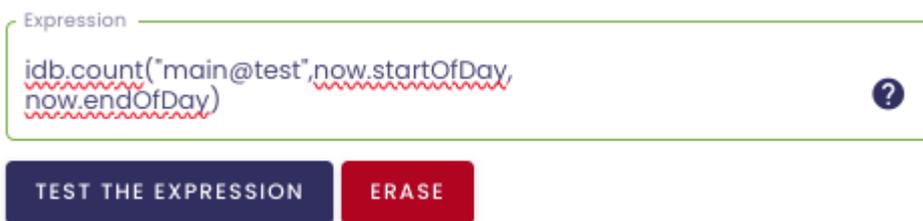
### **ldb.count :**

**Purpose** : Determines how many times a value has been reported for a given metric.

**Definition** : `ldb.count("[metric]", [start date], [end date])`

**Functioning** : Replace the [metric] parameter with the metric for which you want to know the number of reported values during a given period. To define this period, replace the [start date] and [end date] parameters with the time operators mentioned before.

**Example** : You want to check how often your equipment reports values during the current day.



### **ldb.firstValueBefore :**

**Purpose** : Returns the last value before a given date.

**Definition** : `ldb.firstValueBefore("[metric]", [date])`

**Functioning** : Replace the [metric] parameter with the metric for which you want to know the last value before a given date. To define this date, replace the [date] parameter using the time operators mentioned before.

**Example** : You want to know the last value reported by a piece of equipment before the start of the current day.

Expression

```
idb.firstValueBefore("main@documentation",now.startOfDay)
```

TEST THE EXPRESSION ERASE

### **Idb.firstValueAfter :**

**Purpose :** Returns the first value after a given date.

**Definition :** idb.firstValueAfter("[metric]", [date])

**Functioning :** Replace the [metric] parameter with the metric for which you want to know the first value after a given date. To define this date, replace the [date] parameter using the time operators mentioned before.

**Example :** You want to know the first value reported by a piece of equipment within the current day.

Expression

```
idb.firstValueAfter("main@documentation",now.startOfDay)
```

TEST THE EXPRESSION ERASE

### **Idb.median :**

**Purpose :** Returns the median value of a data range.

**Definition :** idb.median("[metric]", [start date], [end date])

**Operation :** Replace the parameter [metric] with the metric for which you want to know the median value over a given period. To define this period, replace the parameters [start date] and [end date] using the temporal operators mentioned above.

**Example :** You want to know the median temperature value of a device for the current day.

### **Idb.stdDev :**

**Purpose :** Returns the standard deviation of a data range.

**Definition :** `idb.stdDev("[metric]", [start date], [end date])`

**Operation :** Replace the parameter [metric] with the metric for which you want to know the standard deviation over a given period. To define this period, replace the parameters [start date] and [end date] using the temporal operators mentioned above.

### **Idb.first :**

**Purpose:** Returns the first value of a data range.

**Definition:** `idb.first("[metric]", [start date], [end date])`

**Operation:** Replace the parameter [metric] with the metric for which you want to know the first value over a given period. To define this period, replace the parameters [start date] and [end date] using the temporal operators mentioned above.

### **Idb.last :**

**Purpose:** Returns the last value of a data range.

**Definition:** `idb.last("[metric]", [start date], [end date])`

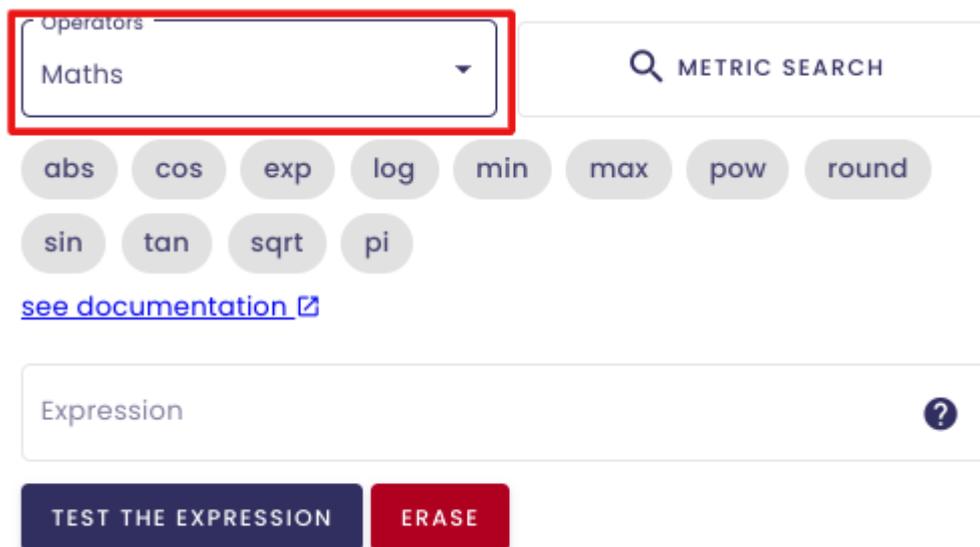
**Operation:** Replace the parameter [metric] with the metric for which you want to know the last value over a given period. To define this period, replace the parameters [start date] and [end date] using the temporal operators mentioned above.

## 7.9.4 Additional Features

In addition to the previously mentioned functions, the formula engine allows for other types of calculations.

### 7.9.4.1 Mathematical Calculations

Various mathematical methods and constants can be used in formulas.



Operators  
Maths

METRIC SEARCH

abs cos exp log min max pow round  
sin tan sqrt pi

[see documentation](#)

Expression ?

TEST THE EXPRESSION ERASE

For example, it is possible to return the absolute value of a number by entering :  
**Abs(Double)**.



Expression ?

abs(8)

TEST THE EXPRESSION ERASE

Or, to return the logarithm of a specified number :

**Log(Double)**

Expression

**TEST THE EXPRESSION** **ERASE**

You also have the possibility to include mathematical constants.

E	Represents the natural logarithmic base specified by the constant $e$ .
IP	Represents the ratio of the circumference of a circle to its diameter, specified by the constant $\pi$ .
tau	Represents the number of radians in a single revolution, specified by the constant, $\tau$ .

**Example :**

Expression

**TEST THE EXPRESSION** **ERASE**

**Note :** The list of operators available in the formula creation screen is not comprehensive. For an exhaustive list of the possibilities, click on "see the documentation."

Operators

abs cos exp log min max pow round

sin tan sqrt pi

[see documentation](#)

Expression

**TEST THE EXPRESSION** **ERASE**

### 7.9.4.2 Date configuration

In addition to the time operators seen previously :

 Formula

Data validity in seconds \*  ?

Result type \*  ▼

Operators  ▼

 METRIC SEARCH

You can customize the dates used in your formulas using the following functions :

- **AddDays(Double)** : Returns a new "DateTimeOffset" object that adds a specified number of whole and fractional days to the value of this instance.
- **AddHours(Double)** : Returns a new "DateTimeOffset" object that adds a specified number of whole and fractional hours to the value of this instance.
- **AddMinutes(Double)** : Returns a new "DateTimeOffset" object that adds a specified number of whole and fractional minutes to the value of this instance.
- **AddMonths(Double)** : Returns a new "DateTimeOffset" object that adds a specified number of months to the value of this instance.
- **AddYears(Double)** : Returns a new "DateTimeOffset" object that adds a specified number of years to the value of this instance.

This list is not exhaustive, and you can find all the possibilities available by [clicking here](#).

In practice, if we use the "now.startOfDay" operator, for example, it will represent the beginning of the current day.

But let's say we want to have yesterday's date. We can complete our time operator with the AddDays function :

```
now.StartOfDay.AddDays(-1).
```

By adding .AddDays(-1), we indicate that we want the current day minus one day.

You can thus add/remove days, hours, months, years... to your date.

**Example** : We want to know the average temperature of an installation over the past 3 years (excluding the current year, which we will call n).

You need to set the period :

- the start of the period represents the beginning of year n-3:  
`now.startOfYear.AddYears(-3)`
- the end of the period represents the end of year n-1:  
`now.endOfYear.AddYears(-1)`

Expression

```
idb.avg("main@temperature",now.startOfYear.AddYears(-3),  
now.endOfYear.AddYears(-1))
```

TEST THE EXPRESSION ERASE

## 7.9.5 Calculations Associated with Dates

You have the option to include temporal operators outside of Indaba functions.

This feature offers various possible use cases :

### **7.9.5.1 Date comparison**

It is possible to compare dates using comparison operators (>, >=, <, <=, =).

**For example :**

```
Expression  
if now > dateFromString("2024-04-17T13:49:00Z"), 1, 2
```

Here, we compare the current date (with the temporal operator "now") and a fixed date.

### **7.9.5.2 Calculating a duration**

A subtraction of dates (date - date) returns an object of type **"TimeSpan,"** which represents a duration.

This object can be utilized by combining it with other functions.

For example, it is possible to calculate the number of hours that have elapsed since the beginning of the month :

```
Expression  
(now - now.StartOfMonth).TotalHours
```

TESTER L'EXPRESSION    EFFACER

Here, (now - now.StartOfMonth) represents the duration between the current date and the beginning of the month.

We then multiply this duration by the function TotalHours to return the number of hours passed in the month.

For more use cases, [click here](#).

**Note :** It is not possible to add two dates. To add a duration to a date, you must

use the .Add[time unit] functions seen previously.

## 8. Devices management

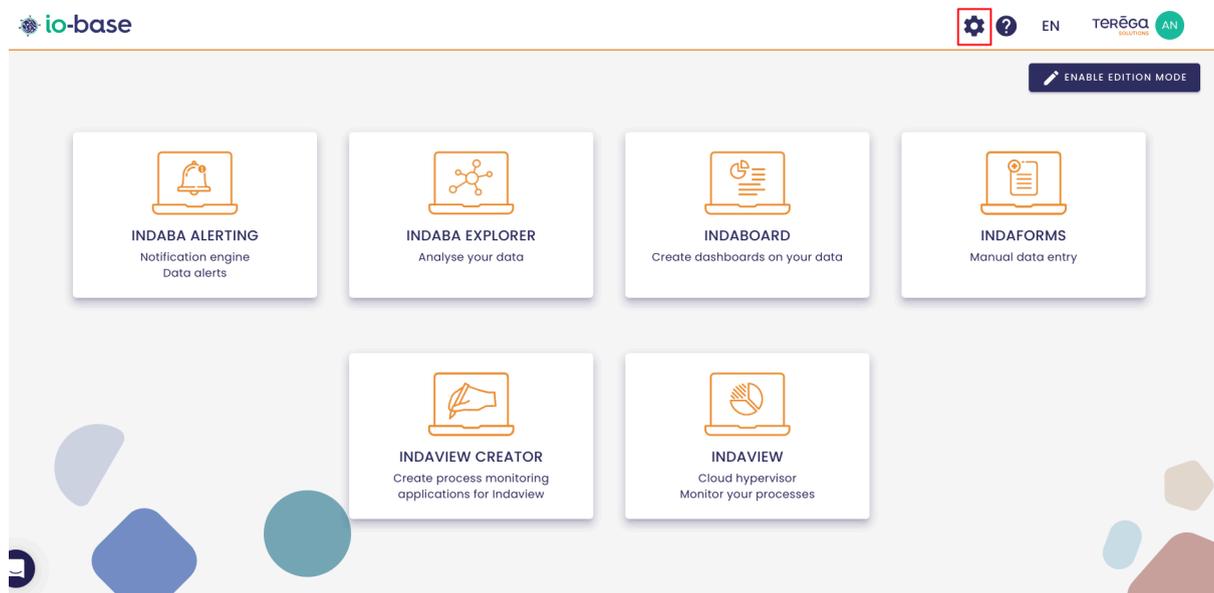
### 8.1 Overview and access to the devices management portal

**Prerequisite:** this feature is available to users with the Functional Administrator role.

The **Devices** portal was created to ensure a secure communication between your devices and IO-Base.

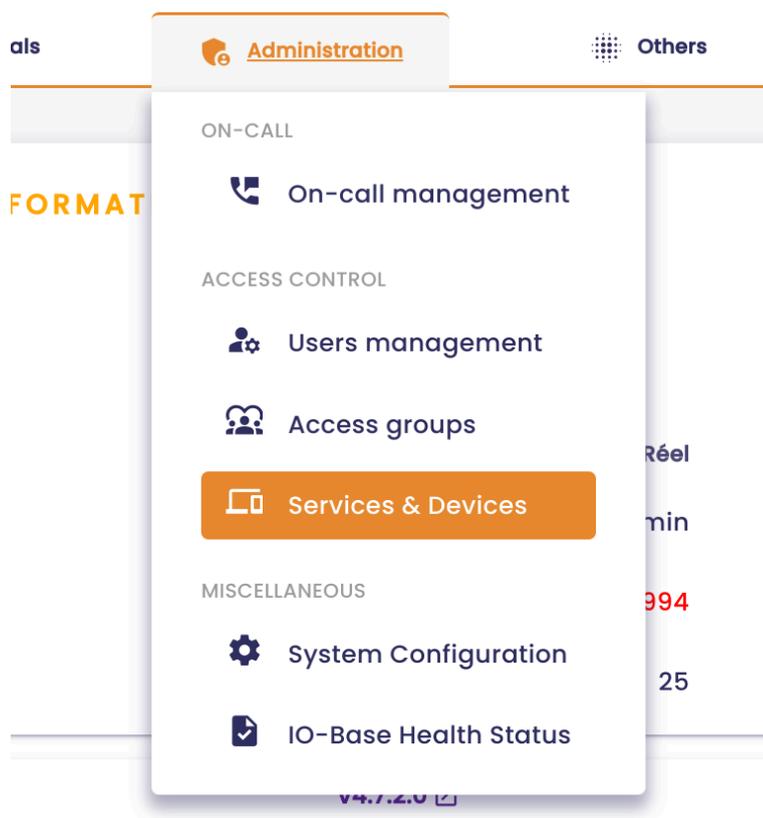
Once installed, functional administrators must validate the authenticity of a device before it can be associated with IO-base.

Log in to **IO-base** and click the button at the top right of your screen, highlighted below :



The IO-base administration page opens.

Go to the **Administration/Services and devices** menu.



You are redirected to the **Devices** management screen.

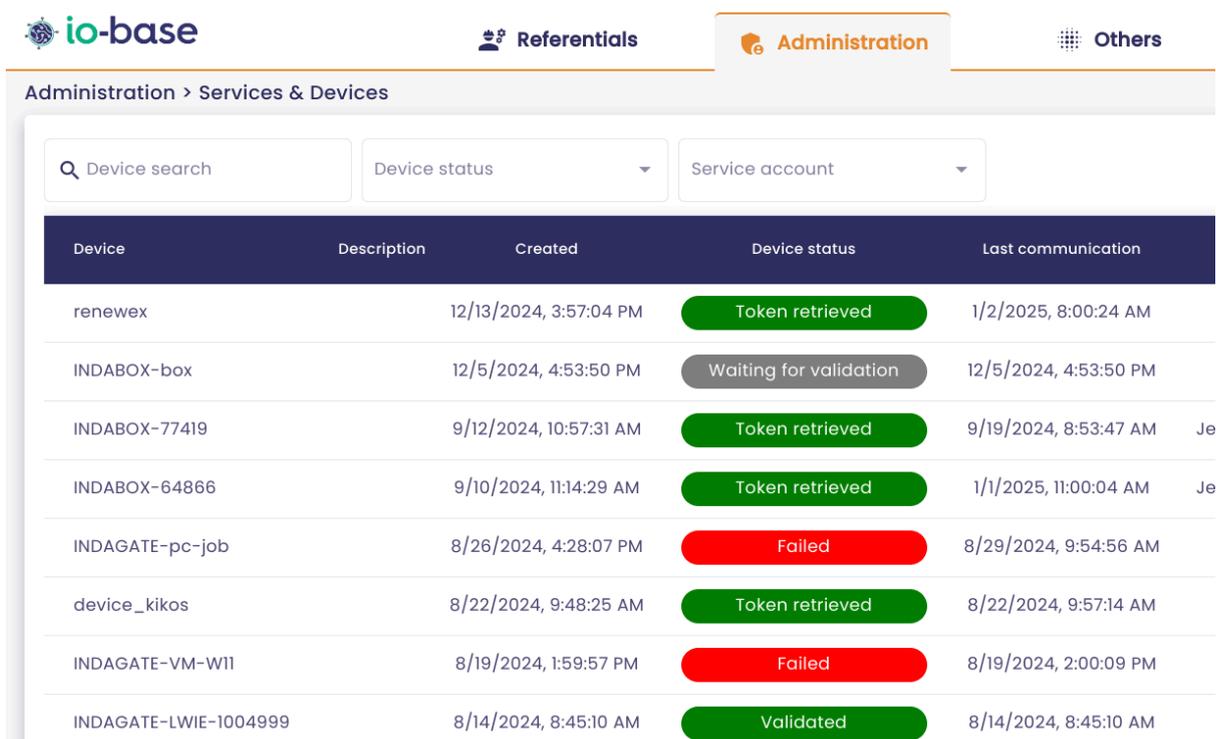
The screenshot shows the 'Administration > Services & Devices' management screen. At the top, there are navigation tabs for 'Referentials', 'Administration' (selected), and 'Others'. Below the tabs, there is a breadcrumb 'Administration > Services & Devices' and a search bar with the text 'Device search'. To the right of the search bar are two dropdown menus: 'Device status' and 'Service account'. Below these elements is a table with the following columns: 'Device', 'Description', 'Created', 'Device status', and 'Last communication'.

Device	Description	Created	Device status	Last communication
renewex		12/13/2024, 3:57:04 PM	Token retrieved	1/2/2025, 8:00:24 AM
INDABOX-box		12/5/2024, 4:53:50 PM	Waiting for validation	12/5/2024, 4:53:50 PM
INDABOX-77419		9/12/2024, 10:57:31 AM	Token retrieved	9/19/2024, 8:53:47 AM
INDABOX-64866		9/10/2024, 11:14:29 AM	Token retrieved	1/1/2025, 11:00:04 AM
INDAGATE-pc-job		8/26/2024, 4:28:07 PM	Failed	8/29/2024, 9:54:56 AM
device_kikos		8/22/2024, 9:48:25 AM	Token retrieved	8/22/2024, 9:57:14 AM
INDAGATE-VM-WII		8/19/2024, 1:59:57 PM	Failed	8/19/2024, 2:00:09 PM

## 8.2 Device validation

**Prerequisite:** this feature is available to users with the Functional Administrator role.

Connect to lo-base and go to the **Devices** menu.



The screenshot shows the io-base Administration interface. The top navigation bar includes the io-base logo, 'Referentials', 'Administration' (selected), and 'Others'. Below the navigation bar, the breadcrumb 'Administration > Services & Devices' is visible. The main content area features a search bar for 'Device search', a 'Device status' dropdown menu, and a 'Service account' dropdown menu. Below these filters is a table with the following columns: Device, Description, Created, Device status, and Last communication. The table contains eight rows of device data.

Device	Description	Created	Device status	Last communication
renewex		12/13/2024, 3:57:04 PM	Token retrieved	1/2/2025, 8:00:24 AM
INDABOX-box		12/5/2024, 4:53:50 PM	Waiting for validation	12/5/2024, 4:53:50 PM
INDABOX-77419		9/12/2024, 10:57:31 AM	Token retrieved	9/19/2024, 8:53:47 AM
INDABOX-64866		9/10/2024, 11:14:29 AM	Token retrieved	1/1/2025, 11:00:04 AM
INDAGATE-pc-job		8/26/2024, 4:28:07 PM	Failed	8/29/2024, 9:54:56 AM
device_kikos		8/22/2024, 9:48:25 AM	Token retrieved	8/22/2024, 9:57:14 AM
INDAGATE-VM-W11		8/19/2024, 1:59:57 PM	Failed	8/19/2024, 2:00:09 PM
INDAGATE-LWIE-1004999		8/14/2024, 8:45:10 AM	Validated	8/14/2024, 8:45:10 AM

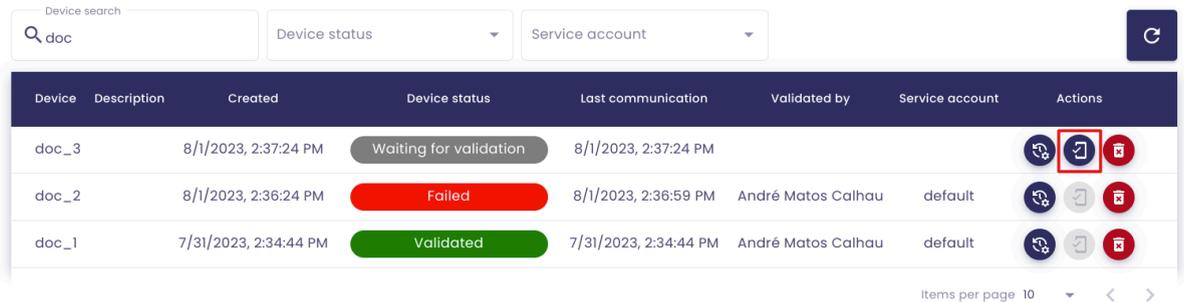
You can view the status of a device in the table. Several statuses are possible:

- Waiting validation (awaiting validation by a functional administrator)
- Validated (a functional administrator has validated the authenticity of the device)
- Token retrieved (the device can now access to lo-base)
- Expired (the device token has expired)
- Failed (device association to lo-base is blocked)

When a device is connected for the first time, its status is **Waiting for validation**.

**Note :** You can now be alerted by e-mail when a device is awaiting validation ([click here to see the related article](#)).

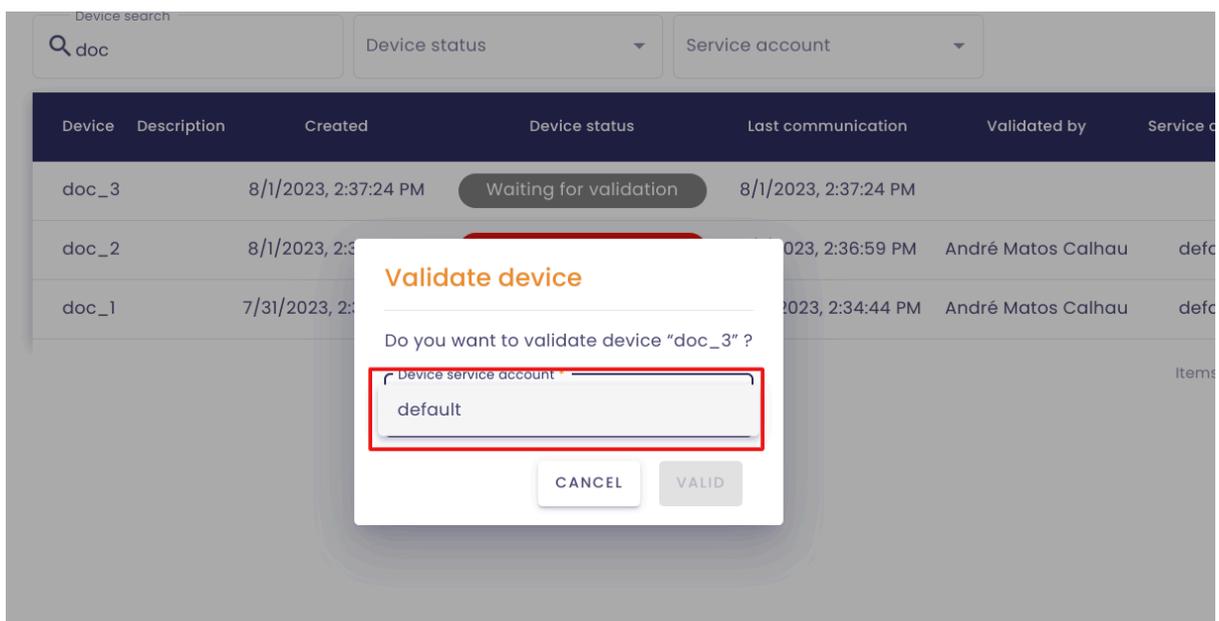
Click on the **Validate Device** button.



Device	Description	Created	Device status	Last communication	Validated by	Service account	Actions
doc_3		8/1/2023, 2:37:24 PM	Waiting for validation	8/1/2023, 2:37:24 PM			  
doc_2		8/1/2023, 2:36:24 PM	Failed	8/1/2023, 2:36:59 PM	André Matos Calhau	default	  
doc_1		7/31/2023, 2:34:44 PM	Validated	7/31/2023, 2:34:44 PM	André Matos Calhau	default	  

A pop-up opens. From the drop-down list, select the service account you wish to associate with the equipment.

Then, click **Valid**.



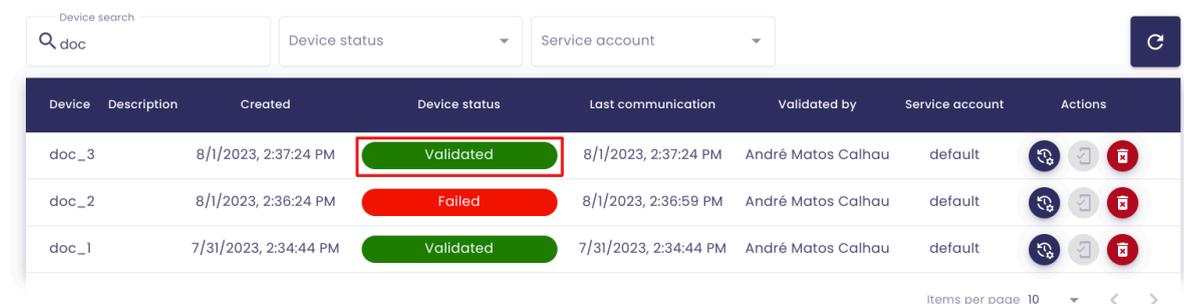
**Validate device**

Do you want to validate device "doc\_3" ?

Device service account: default

CANCEL VALID

The device is now validated.

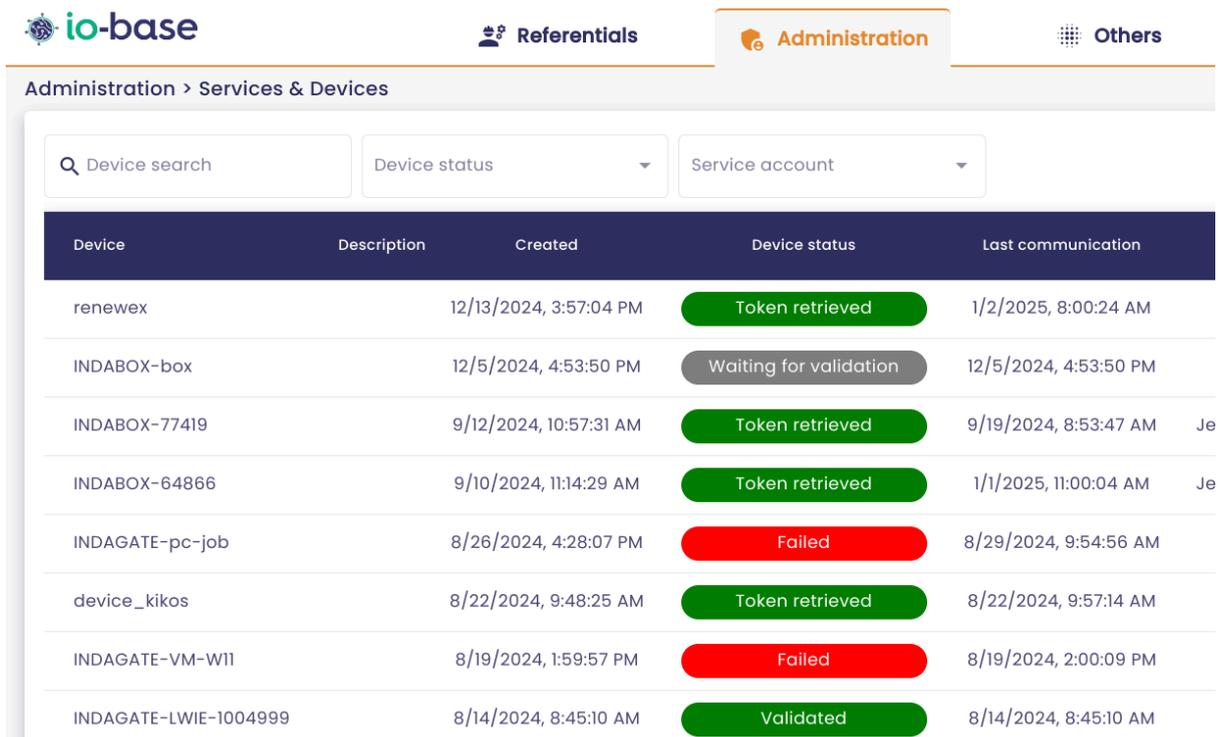


Device	Description	Created	Device status	Last communication	Validated by	Service account	Actions
doc_3		8/1/2023, 2:37:24 PM	Validated	8/1/2023, 2:37:24 PM	André Matos Calhau	default	  
doc_2		8/1/2023, 2:36:24 PM	Failed	8/1/2023, 2:36:59 PM	André Matos Calhau	default	  
doc_1		7/31/2023, 2:34:44 PM	Validated	7/31/2023, 2:34:44 PM	André Matos Calhau	default	  

## 8.3 Access a device history

**Prerequisite** : this feature is available to users with the Functional Administrator role.

Connect to Io-base and go to the **Devices** menu.



The screenshot shows the io-base Administration interface. The top navigation bar includes the io-base logo, 'Referentials', 'Administration' (highlighted), and 'Others'. Below the navigation bar, the breadcrumb 'Administration > Services & Devices' is visible. The main content area features a search bar labeled 'Device search', a 'Device status' dropdown menu, and a 'Service account' dropdown menu. Below these filters is a table with the following columns: Device, Description, Created, Device status, and Last communication. The table contains eight rows of device records.

Device	Description	Created	Device status	Last communication
renewex		12/13/2024, 3:57:04 PM	Token retrieved	1/2/2025, 8:00:24 AM
INDABOX-box		12/5/2024, 4:53:50 PM	Waiting for validation	12/5/2024, 4:53:50 PM
INDABOX-77419		9/12/2024, 10:57:31 AM	Token retrieved	9/19/2024, 8:53:47 AM
INDABOX-64866		9/10/2024, 11:14:29 AM	Token retrieved	1/1/2025, 11:00:04 AM
INDAGATE-pc-job		8/26/2024, 4:28:07 PM	Failed	8/29/2024, 9:54:56 AM
device_kikos		8/22/2024, 9:48:25 AM	Token retrieved	8/22/2024, 9:57:14 AM
INDAGATE-VM-W11		8/19/2024, 1:59:57 PM	Failed	8/19/2024, 2:00:09 PM
INDAGATE-LWIE-1004999		8/14/2024, 8:45:10 AM	Validated	8/14/2024, 8:45:10 AM

In the **Actions** column, click on the



button.

The **Device History** appears.

### Device history "doc\_3"

Created	Device status	Ip address	Error
8/1/2023, 2:55:15 PM	Validated	::ffff:172.16.8.8	
8/1/2023, 2:37:24 PM	Waiting for validation	83.173.126.2	
7/31/2023, 3:01:08 PM	Validated	::ffff:172.16.8.93	
7/31/2023, 2:38:54 PM	Waiting for validation	83.173.126.2	

Items per page 10 < >

CLOSE

## 8.4 Delete a device

**Prerequisite:** this feature is available to users with the Functional Administrator role.

Connect to io-base and go to the **Devices** menu.

The screenshot shows the io-base Administration interface. The top navigation bar includes the io-base logo, a 'Referentials' menu, an active 'Administration' menu, and an 'Others' menu. Below the navigation bar, the breadcrumb 'Administration > Services & Devices' is visible. The main content area features a search bar labeled 'Device search', a 'Device status' dropdown menu, and a 'Service account' dropdown menu. Below these filters is a table with the following columns: Device, Description, Created, Device status, and Last communication. The table contains eight rows of device data, with status indicators in colored boxes (green for 'Token retrieved', grey for 'Waiting for validation', and red for 'Failed').

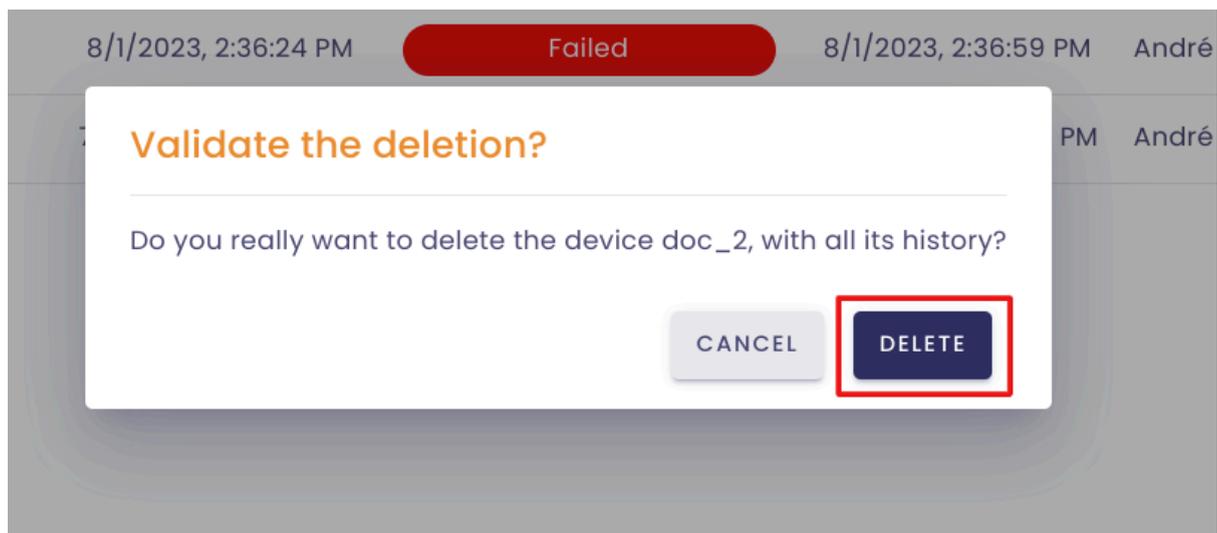
Device	Description	Created	Device status	Last communication
renewex		12/13/2024, 3:57:04 PM	Token retrieved	1/2/2025, 8:00:24 AM
INDABOX-box		12/5/2024, 4:53:50 PM	Waiting for validation	12/5/2024, 4:53:50 PM
INDABOX-77419		9/12/2024, 10:57:31 AM	Token retrieved	9/19/2024, 8:53:47 AM Je
INDABOX-64866		9/10/2024, 11:14:29 AM	Token retrieved	1/1/2025, 11:00:04 AM Je
INDAGATE-pc-job		8/26/2024, 4:28:07 PM	Failed	8/29/2024, 9:54:56 AM
device_kikos		8/22/2024, 9:48:25 AM	Token retrieved	8/22/2024, 9:57:14 AM
INDAGATE-VM-WII		8/19/2024, 1:59:57 PM	Failed	8/19/2024, 2:00:09 PM
INDAGATE-LWIE-1004999		8/14/2024, 8:45:10 AM	Validated	8/14/2024, 8:45:10 AM

To delete a device, click on the



button.

A confirmation window opens. Click on **Delete**.



The device is now **deleted** and no longer appears in the device list.

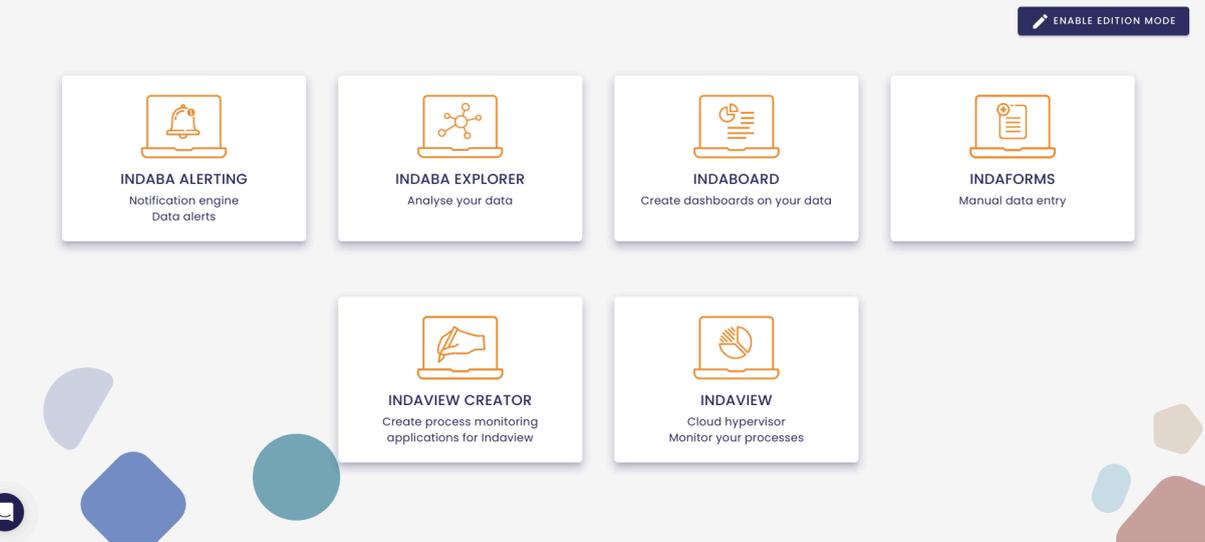
## 8.5 Email notification settings

**Prerequisite:** this feature is available to users with the Functional Administrator role.

The email configuration feature is linked to the **Devices** management portal.

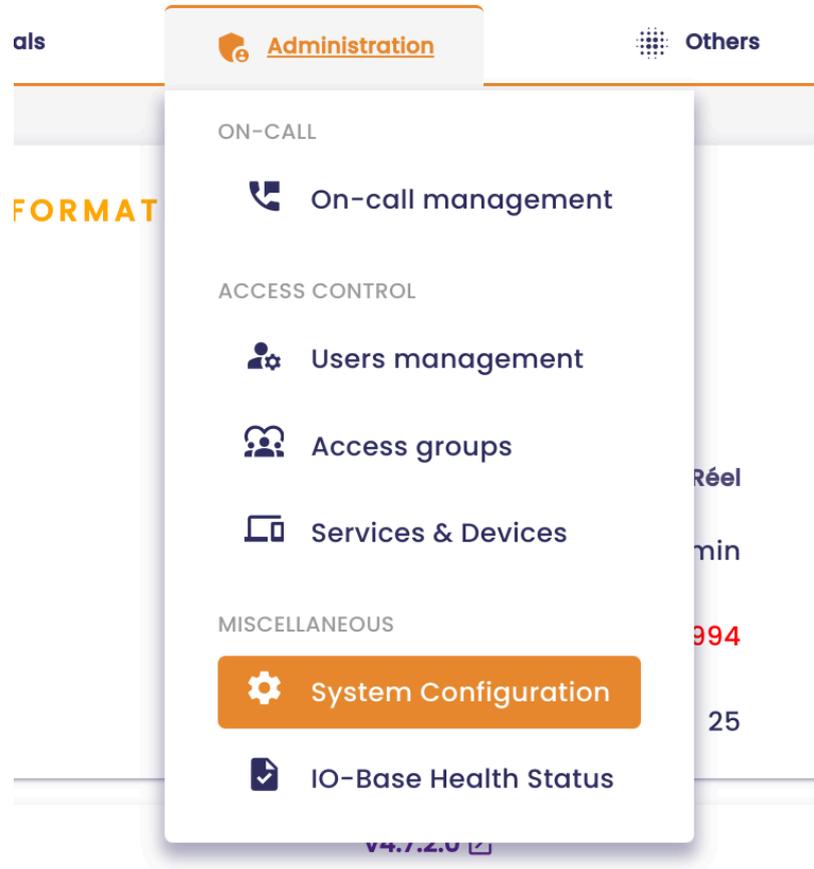
It allows you to set email addresses to which a notification will be sent when a device is awaiting validation by a functional administrator.

Log in to **lo-base** and click the button at the top right of your screen, highlighted below :



The io-base administration page opens.

Go to the **Administration/System configuration** menu.



Administration &gt; System Configuration

## Devices portal settings

Send an email to: 

No email saved

Send a copy to: 

No email saved



To add an email address, click on the



button.

An input area appears. Specify the desired email address.

Send an email to:

A dark blue rectangular button with rounded corners. On the left, there is a white circle containing a plus sign. To the right of the circle, the word "ADD" is written in white, uppercase letters.

**Note** : It is possible to set several email addresses. Click on **Add** again to open a new input area.

You can also add email addresses in CC. To do so, click on the **Add** button.

## Devices portal settings

Send an email to:



ADD

No email saved

Send a copy to:



ADD

Cc email \*



SAVE SETTINGS

To confirm, click on



SAVE SETTINGS

## 8.6 lo-base authentication procedure (DAP)

### 8.6.1 Introduction

#### **Purpose of the DAP**

The purpose of the Device Access Proxy (DAP) is to secure the communication between devices or services and **lo-base**.

The system relies on the distribution of authentication tokens which ensure that only approved devices can communicate with **lo-base**.

#### **Service accounts**

When requesting tokens, the device (or service) will use a service account.

(refer to section 3 : Device validation in lo-base).

There is a generic "default" service account, which should ideally be used for tests.

Before starting the procedure, we highly recommend that you request a service account dedicated to the use of the device (or service), to have better control over access rights on lo-base.

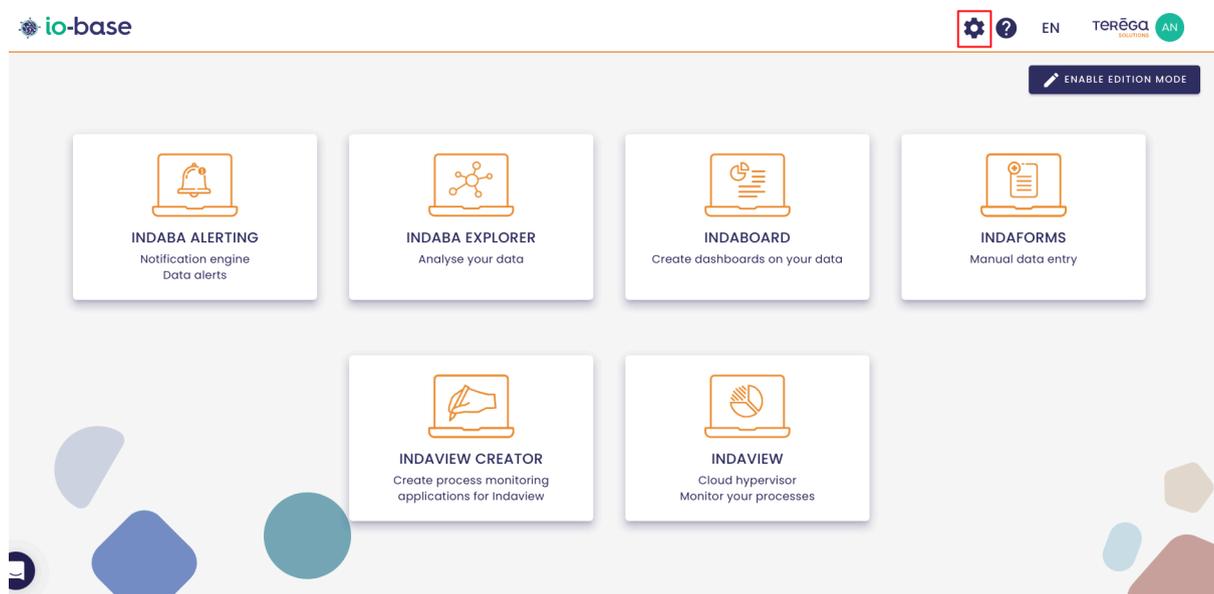
To request a DAP service account, contact support, specifying :

- service account name
- the rights required : read, write or read/write

In this way, if required, you can restrict rights to the metrics you need.

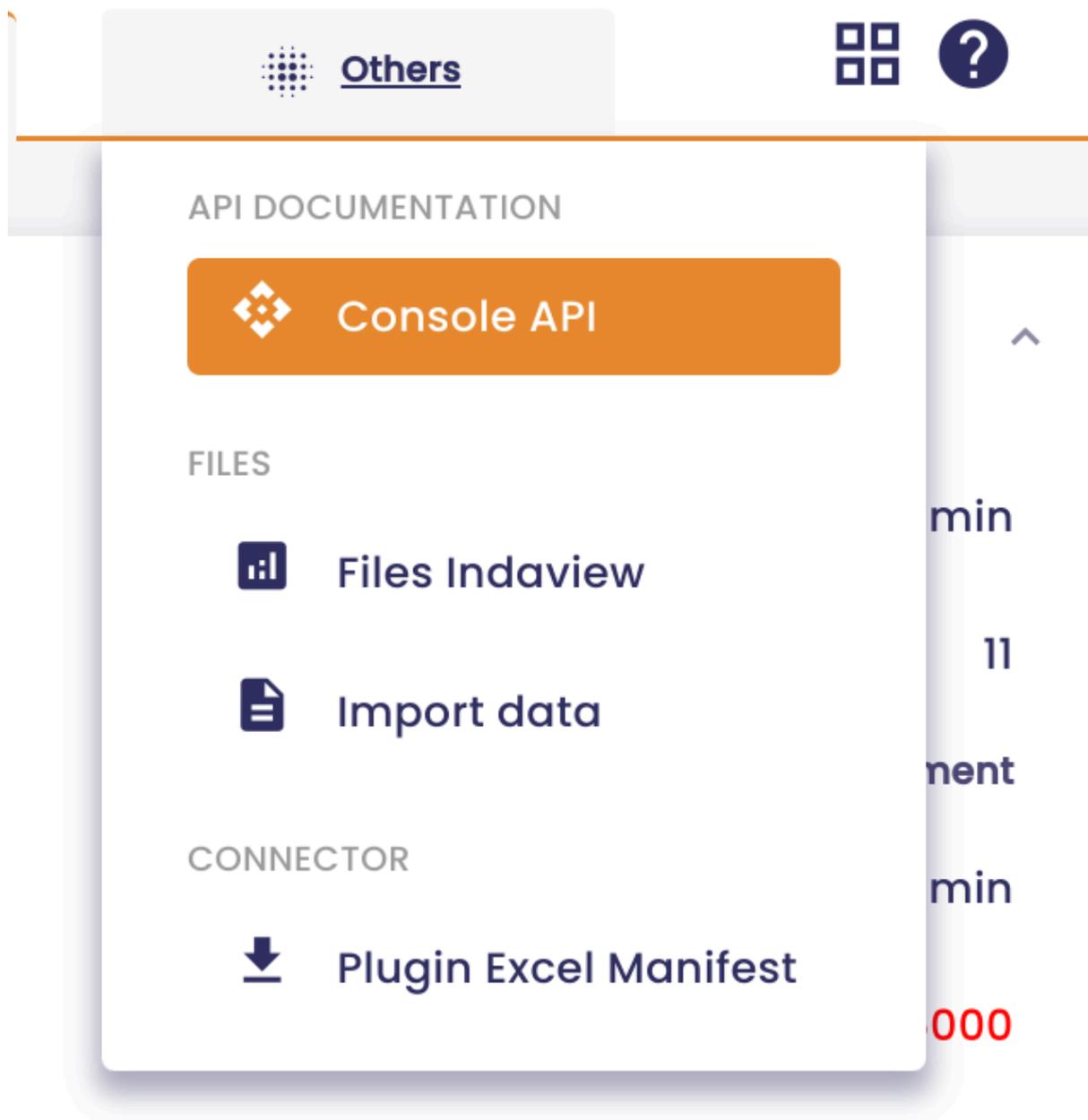
## 8.6.2 Accessing the API query interface

Log in to **lo-base** and click the button at the top right of your screen, highlighted below :



The lo-base administration page opens.

Go to the **Others/Console API** menu.



Select the **Device Authentication Proxy** API, using the drop-down list at the top left of the screen.

Others > Console API

Select an API

Indaba

Admin

Indameta

Alerting

Formulas

Device Authentication Proxy

Servers

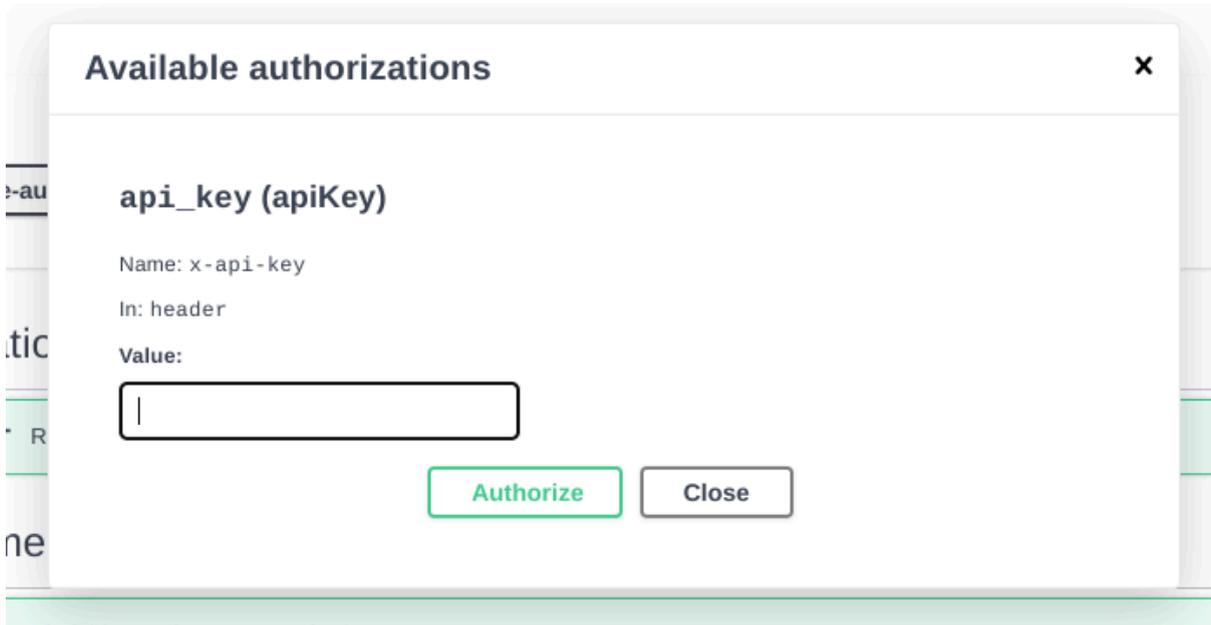
Then, click on the **Authorize** button.

AS 3.0

Authorize 



Enter the requested API key (contact your administrator if necessary), then click on **Authorize**.

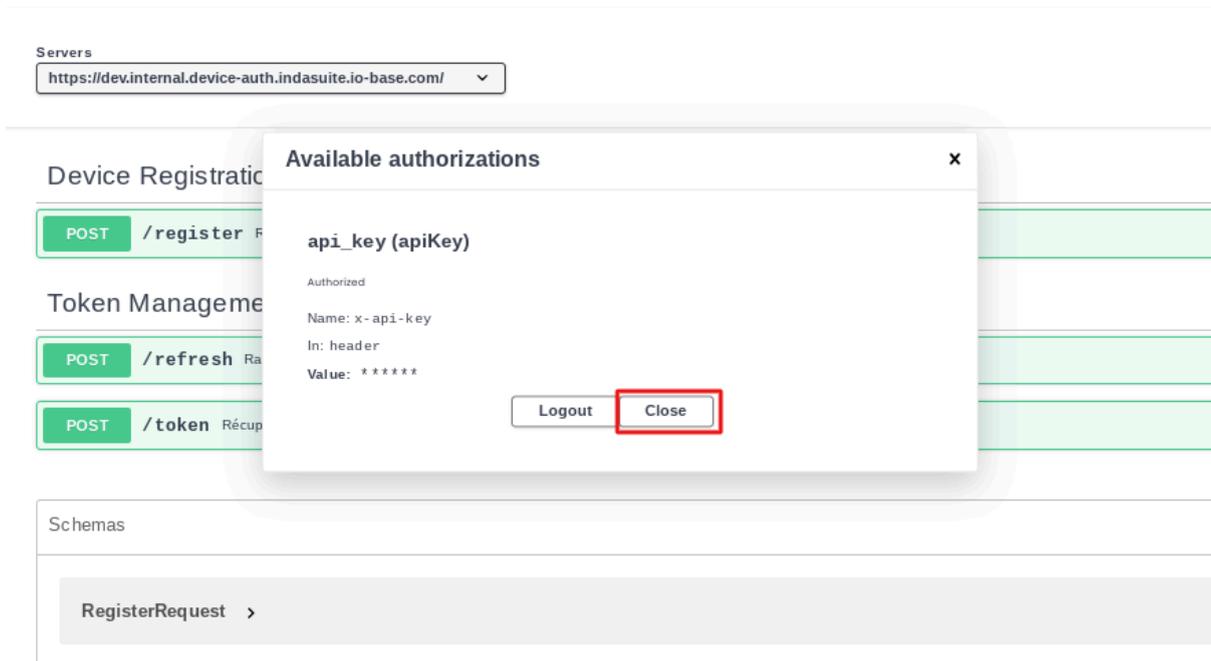


You can now close the window by clicking on **Close**.

## Device Authentication Proxy API 1.0 OAS 3.0

<https://dev.docs.indasuite.io-base.com/dap/openapi.json>

API pour l'authentification des équipements via le Device Authentication Proxy (DAP).



### 8.6.3 Device registration

You can now register the new device.

Go to the **Device Registration** section, then click on **POST / register**.

## Device Authentication Proxy API 1.0 OAS 3.0

<https://dev.docs.indasuite.io-base.com/dap/openapi.json>

API pour l'authentification des équipements via le Device Authentication Proxy (DAP).

### Servers

<https://dev.internal.device-auth.indasuite.io-base.com/> ▼

### Device Registration

**POST** / **register** Register a new device

### Token Management

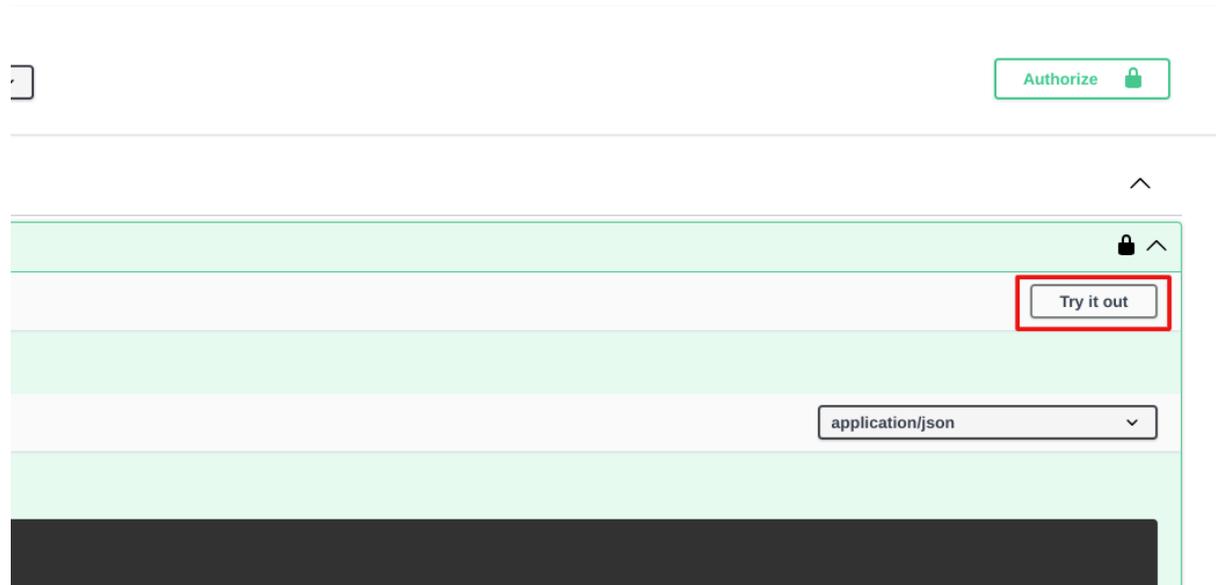
**POST** / **refresh** Rafraîchit un token pour un équipement.

**POST** / **token** Récupère un token pour un équipement enregistré.

### Schemas

Click on the **“Try it out”** button.

Authentication Proxy (DAP).



The screen below appears :

### Device Registration

**POST** /register Register a new device

Parameters

No parameters

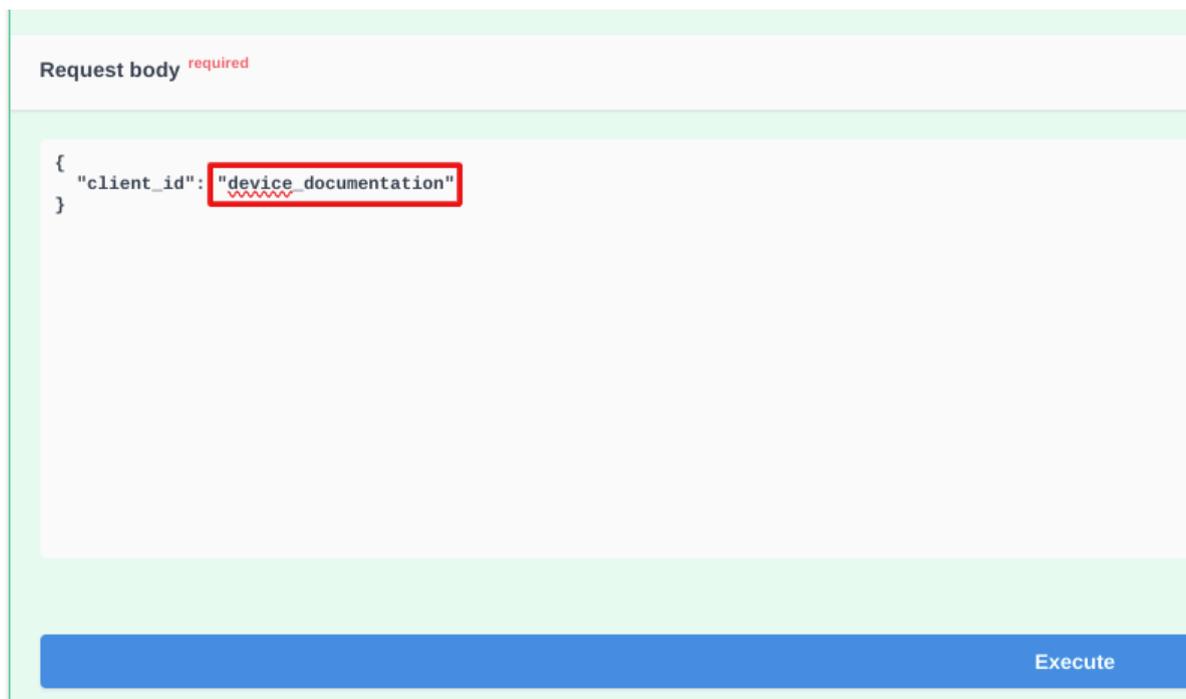
**Request body** required

```
{  
  "client_id": "device_test"  
}
```

Execute

Complete the query by entering a name to identify your device. In our example :  
"device\_documentation".

Then, click on **Execute**.



The screenshot shows a REST client interface. At the top, it says "Request body" with a red "required" label. Below this, a JSON object is displayed in a text area: `{ "client_id": "device_documentation" }`. The value "device\_documentation" is highlighted with a red rectangular box. At the bottom right of the interface, there is a blue button labeled "Execute".

A response with a Code 200 appears : the device has been successfully registered.

Code	Details
200	<p>Response body</p> <pre>{   "device_code": "5BK5pr3S-nj3uufSPXVqNpMb",   "user_code": "",   "verification_uri": "",   "verification_uri_complete": "",   "interval": 5,   "expires_in": 0 }</pre>

In the body of this response, keep the "**device\_code**" parameter, as it will be

useful when retrieving the access token (refer to section **4 : Access token retrieval**).

Code	Details
200	<p>Response body</p> <pre>{   "device_code": "5BK5pr3S-nj3uufSPXVqNpMb"   "user_code": "", }</pre>

**Note** : If a device with the same name has already been registered, registration is not possible and you will receive a response with a 403 code :

Server response	
Code	Details
403	<p>Error: response status is 403</p> <p>Response body</p> <pre>{   "error": "device_already_exists",   "error_description": "There is already a device with the specified id" }</pre> <p>Response headers</p> <pre>content-length: 101 content-type: application/json</pre>

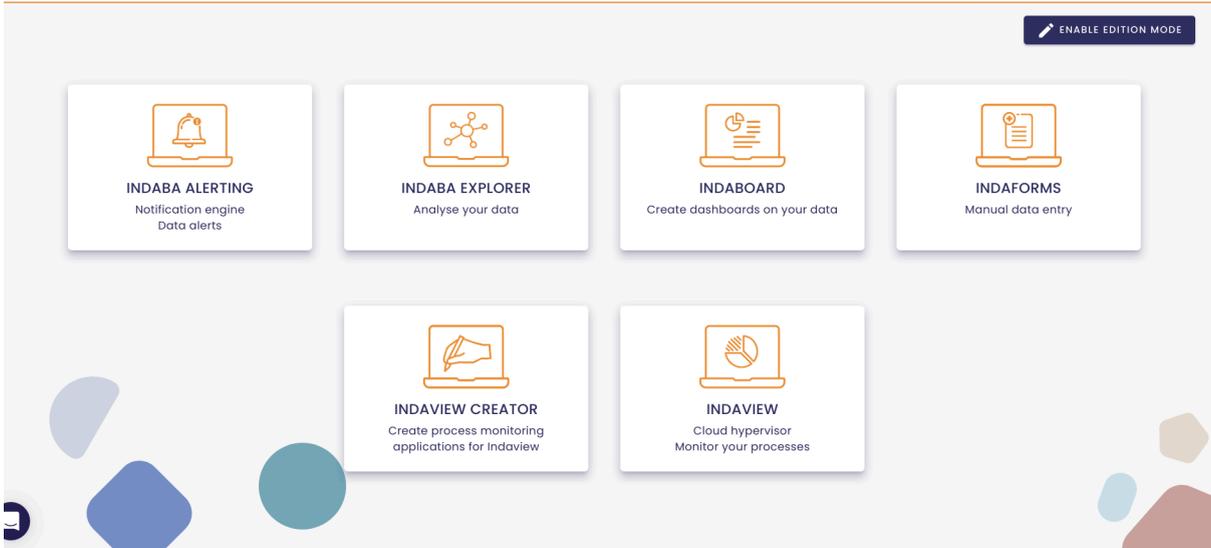
### 8.6.4 : Device validation in lo-base

This action must be carried out by an administrator.

Your device has been registered. It must now be validated by a user with a functional administrator role.

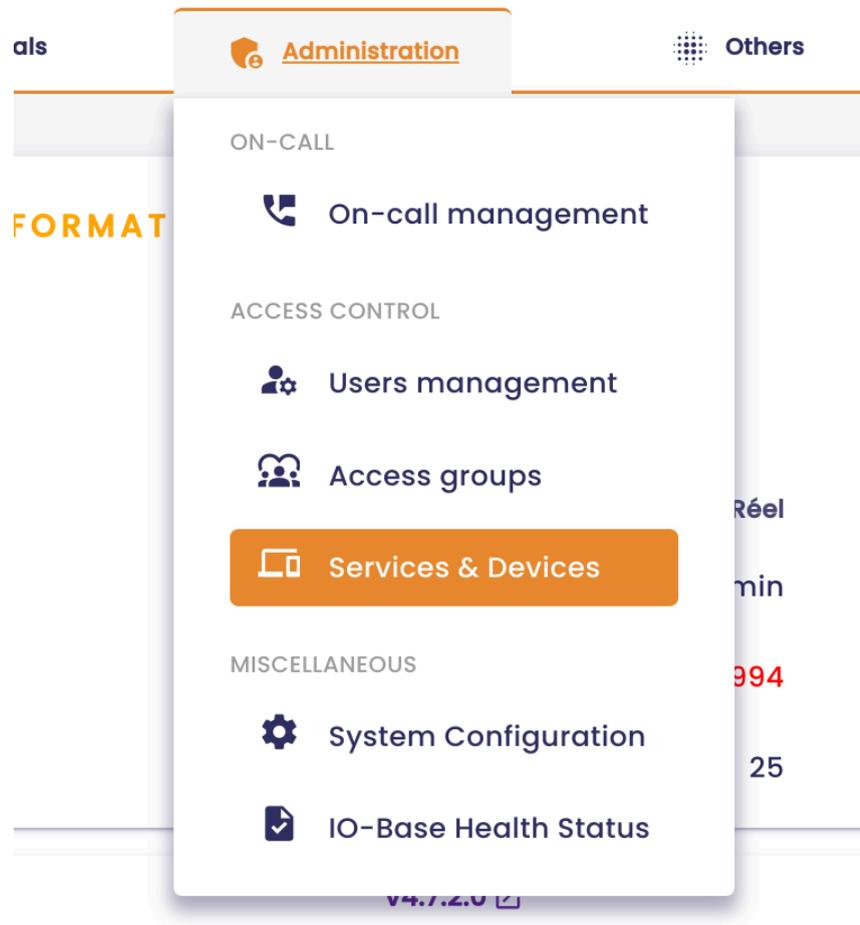
Here's the procedure for the administrator :

Log in to **lo-base** and click the button at the top right of your screen, highlighted below :



The io-base administration page opens.

Go to the **Administration/Services and devices** menu.



You are redirected to the **Devices** management screen.

The device "device\_documentation" is **Waiting for validation**.

Administration > Services & Devices

Device search Device status Service account

Device	Description	Created	Device status	Last com
device_documentation		1/2/2025, 10:26:41 AM	Waiting for validation	1/2/2025,
renewex		12/13/2024, 3:57:04 PM	Token retrieved	1/2/2025,

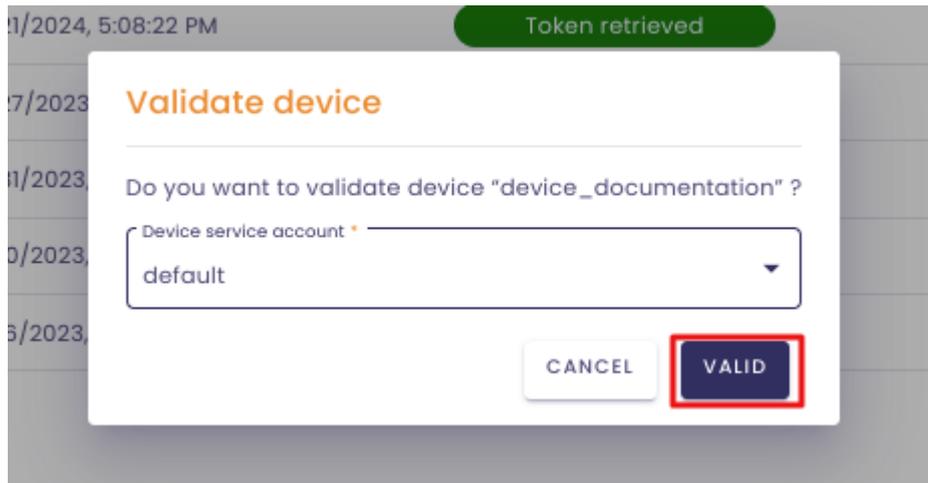
In the **Actions** column, click on the **Validate device** button.

Refresh

Validated by	Service account	Actions
		  
id LABURTHE	default	  

A window opens. In the drop-down list, choose the service account you wish to associate with the equipment.

Then click on **Validate**.



**Note** : It is preferable here to use a service account dedicated to the device rather than the default service account (refer to the **Introduction**).

Administration > Services & Devices

Device	Description	Created	Device status	Last co
device_documentation		1/2/2025, 10:26:41 AM	Validated	1/2/202
renewex		12/13/2024, 3:57:04 PM	Token retrieved	1/2/202

The device is now validated.

For further information on the **Devices** portal, refer to our [Devices management](#) documentation.

### 8.6.5 : Access token retrieval

Once your device has been registered and validated by an administrator, it will be able to retrieve an access token, which enables to call Indaba APIs.

The token has a validity period, so once it has expired, a new one needs to be requested (refer to section **5 : Refreshing the token**).

Follow the procedure below to retrieve an access token :

Access the API request interface again (refer to section 1: **Accessing the API request interface**).

Go to the **Token management** section, then click on **Post / Token**.

## Device Authentication Proxy API 1.0 OAS 3.0

<https://dev.docs.indasuite.io-base.com/dap/openapi.json>

API pour l'authentification des équipements via le Device Authentication Proxy (DAP).

Servers

### Device Registration

**POST** /**register** Register a new device

### Token Management

**POST** /**refresh** Rafraîchit un token pour un équipement.

**POST** /**token** Récupère un token pour un équipement enregistré.

Complete the request by entering :

- **device\_code** : code sent in the body of the response received following your device registration request (refer to section **2 : Device registration**).

Request body required

```
{  
  "device_code": "aBTXHQqZHvtNu6-9cxFzqCx6",  
  "client_id": "device_documentation"  
}
```

- **client\_id** : the name you entered when registering your device, in our example "device\_documentation".

Request body required

```
{  
  "device_code": "aBTXHQgZHvtNu6-9cxFzqCx6",  
  "client_id": "device_documentation"  
}
```

Then, click on **Execute** :

Request body required

```
{  
  "device_code": "aBTXHQgZHvtNu6-9cxFzqCx6",  
  "client_id": "device_documentation"  
}
```

Execute

The following response appears :

Server response	
Code	Details
200	<p>Response body</p> <pre>{   "access_token": "eyJhbGciOiJSUzI1NiIsInR5cCI6IkpXVCIsImtpZCI6Ikp1LUD1 WRaeTFUHVKeU820GNuMktEaGR0RUx0OEF1QGNsaWVudHMlLCJhdWQiOiJodHRwczovL2F Ui0iJtZXRyaWNzOnJlYWQgbWV0cm1jc3p3cm10ZSI6ImNsaWVudC1jcmVkaW50aV yZWFKIiwibWV0cm1jc3p3cm10ZSI6ImNsaWVudC1jcmVkaW50aVJDSNPPxEmZsR5T d0nld4b6FKUG1nPB55CRLDtuWj35xHVFosNgV6cbq1_9HMc2RjCXcmeCV9MpFzY1t8u cHuDoG0c-21mvC0Qa5iQA26J9bmL-L5n80oP1Ijfyw547Zu99ZhoypgQA68snV_e138IJC0ug",   "refresh_token": "fB4ZUr7gNG5K6sf1IUt6Uy2UeSCH2d+/yaAz45FygRRFRjC5zY 6P0dQ==",   "token_type": "Bearer",   "expires_in": 86400 }</pre>

In the response body, you can find :

- the **access\_token**, to call Indaba APIs:

Code	Details
200	<p>Response body</p> <pre>{   "access_token": "eyJhbGciOiJSUzI1NiIsInR5cCI6IkpXVCIsImtpZCI6Ikp1LUD1s- wRaeTFUHVKeU820GNuMktEaGR0RUx0OEF1QGNsaWVudHMlLCJhdWQiOiJodHRwczovL2Fw Ui0iJtZXRyaWNzOnJlYWQgbWV0cm1jc3p3cm10ZSI6ImNsaWVudC1jcmVkaW50aV yZWFKIiwibWV0cm1jc3p3cm10ZSI6ImNsaWVudC1jcmVkaW50aVJDSNPPxEmZsR5T d0nld4b6FKUG1nPB55CRLDtuWj35xHVFosNgV6cbq1_9HMc2RjCXcmeCV9MpFzY1t8u cHuDoG0c-21mvC0Qa5iQA26J9bmL-L5n80oP1Ijfyw547Zu99ZhoypgQA68snV_e138IJC0ug",   "refresh_token": "iagvxjSHnPoRH/IpergvoBUSTRxzpcH4HNJR3I2Jfxg0Lt2SsJ9V S66jw==",   "token_type": "Bearer",   "expires_in": 86400 }</pre>

- the **refresh token** : to renew access to lo-base when the validity of the access token has expired

Code	Details
200	<p>Response body</p> <pre>{   "access_token": "eyJhbGciOiJSUzI1NiIsInR5cCI6IkpXVCIsImtpZCI6IjRaeTFTUHVKeU820GNuMk tEaGR0RUx0 OEF1QGNsaWVudHM iLCJhdWQiOiJodHRU   Ui0iJtZXRYaWNzOnJlYWQgbWV0cm1jc z p3cm10ZSI sImd0 eSI6ImNsaWVudC1j   yZWFKIiwibWV0cm1jc z p3cm10ZS JdfQ . JDSNPPxEmZsR5T d0nld4b6FKU61nPB   35xHVFosNgV6cbq1_9HMc2RjCX CmeCV9MpFz Y1t8ucHuDo60c-21mvC0Qa5iQA   5n80oP1Ijf vw547Zu99ZhoypgQA68snV_e138IJc0ug",   "refresh_token": "iagvxj SHnPoRH/Ip ergvo BUSTRxzpCH4HNJR3I2Jfx   S66jw=",   "token_type": "Bearer",   "expires_in": 86400 }</pre>

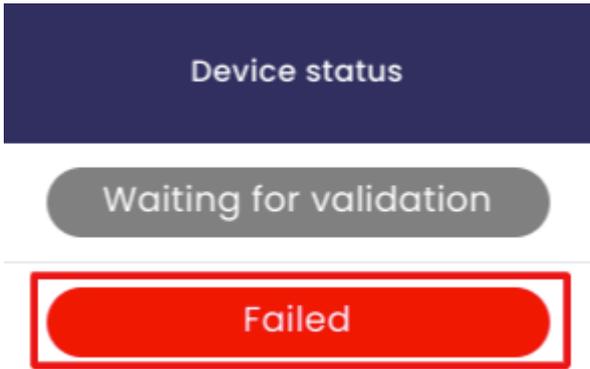
**Note** : in the lo-base **Devices** portal, the device status changes to “Token retrieved”.

Device status		
4	Token retrieved	5
M	Token retrieved	8

**Warning**, for security purposes, token calls are only valid once.

If the same token is used twice, the device status switches to "failed".

Code	Details
403	<p>Error: response status is 403</p> <p>Response body</p> <pre>{   "error": "authorization_failed",   "error_description": "The token was already retrieved, the device is now in error" }</pre>



In this case, the device must [be deleted](#) by an administrator in lo-base, and the procedure has to be repeated.

**Note** : If the device has not been validated by an administrator, the access token cannot be retrieved.

The response will be a code 425 : "Authorization Pending".

Server response

Code	Details
425	Error: response status is 425

Response body

```
{
  "error": "authorization_pending",
  "error_description": "User has yet to authorize device code."
}
```

Make sure the device is validated, then perform the operation again.

### 8.6.6 : Refresh token

The access token allocated to the equipment has a limited validity period. To continue communicating with lo-base, you'll need to renew this token.

To do this, return to the API request interface (refer to section 1: Accessing the API query interface).

In the **Token Management** section, click on **Post/refresh**.

# Device Authentication Proxy API 1.0 OAS 3.0

<https://dev.docs.indasuite.io-base.com/dap/openapi.json>

API pour l'authentification des équipements via le Device Authentication Proxy (DAP).

Servers

## Device Registration

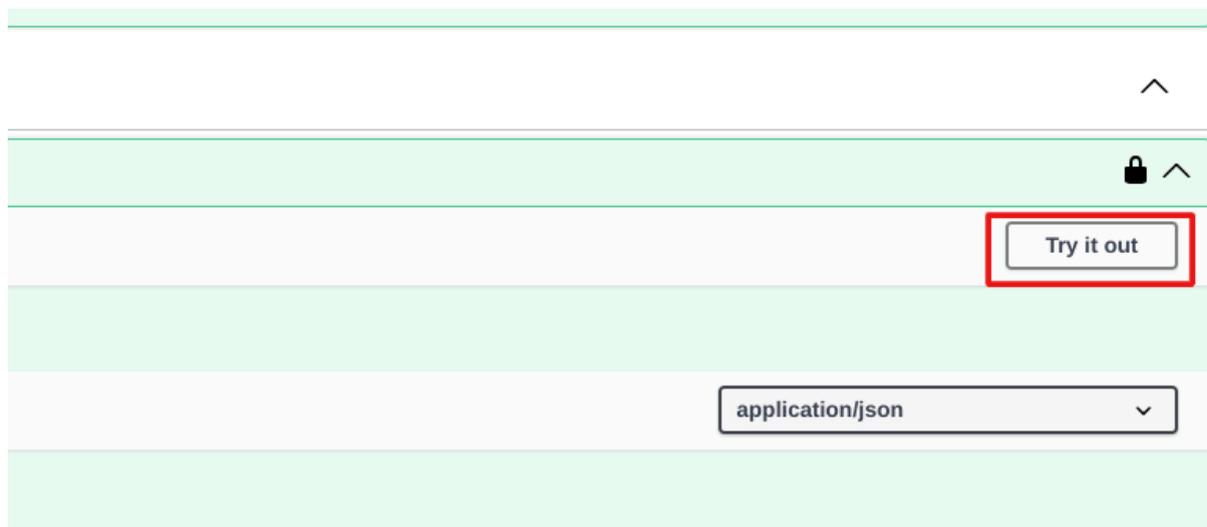
**POST** /**register** Register a new device

## Token Management

**POST** /**refresh** Rafraîchit un token pour un équipement.

**POST** /**token** Récupère un token pour un équipement enregistré.

Then, **Try it out**.



The following screen appears :

**POST** /refresh Rafraîchit un token pour un équipement.

Parameters

No parameters

Request body required

```
{
  "refresh_token": "string",
  "client_id": "string"
}
```

Complete the query by entering :

- the **"refresh\_token"**: which you can find in the body of the previous retrieved token response. In our case, here :

```
{
  "access_token": "eyJhbGciOiJSUzI1NiIsInR5cCI6IkpXVCIsImtpZCI6IjRaeTFUHVKeU820GNuMktEaGR0RUx00EF1QGNsaWVudHM iLCJh dWQiOiJodHRw U iOiJt ZXRYaWNzOnJlYWQgbWV0cm1jc z p3cm10ZSI sImd0 eSI6ImNsaWVudC1jc yZWFKIiwibWV0cm1jc z p3cm10ZSJdfQ . q1UWAtj7G x09t60Ib _VjV00Y3qMebMT U zODG6mtfxp770P4eCqD64Lwvt4v_ qm_ rgSwDhJuQjrkDr gmGmgKPKua3BeFovT Q8BS1NZBGxi8JRyqWAWAo1Le2_ aMjxsYFILp1vpUKhQA",
  "refresh_token": "fb4ZUr7gNG5K6sf1IUt6Uy2UeSCH2d+/yaAz45FygRR 6P0dQ==",
  "token_type": "Bearer",
  "expires_in": 86400
}
```

- the **"client\_id"** : the name you entered when registering the device, in our case "device\_documentation" (refer to section **2 : Device registration**)

The request body for our example will be :

Request body required

```
{
  "refresh_token": "iagvxjShnPoRH/IpergvoBUSTRxzpCH4HNJR3I2Jfx",
  "client_id": "device_documentation"
}
```

Then, click on **Execute** :

```
{
  "refresh_token": "iagvxjShnPoRH/IpergvoBUSTRxzpCH4HNJR3I2Jfxg0Lt2SsJ9PnpF46300Hfc96As02WIR2kEf0b266IbJS06KASJEQGUXkI
  "client_id": "device_documentation"
}
```

A screenshot of a REST client interface. The top part shows a JSON request body with two fields: "refresh\_token" and "client\_id". The "client\_id" value is "device\_documentation". Below the request body is a blue bar with a white "Execute" button. The button is highlighted with a red rectangular border.

The token has been refreshed and communication between the device and lo-base is ensured (response with code 200) :

Server response

Code	Details
200	<p>Response body</p> <pre>{   "access_token": "eyJhbGciOiJSUzI1NiIsInR5cCI6IkpXVCIsImtpZCI6IklLUWRaeFTUHVKeU820GNuMk tEaGR0RUx0OEF1QGNsaWVudHM iLCJhdWQiOiJodHRwczovL U iOiJtZXRYaWNzOnJlYWQgbWV0cm1jc3p3cm10ZSI sImd0eSI6ImNsaWVudC1jcmVkJW yZWFKIiwibWV0cm1jc3p3cm10ZSIjdfQ .YVyHluqDnWYobU1VtqVE08g7E6ZD7CFgsULP wiqq28YHTauPegWiB8h0gGs3oha207mQYj3Wsu11qg8GCnA_xjangdLVNHzhwPfkcgwu vTUyz3Wr_wX1n405NSzERAIXKrJSBtRLFr2an-o18iw",   "refresh_token": "/SM07K6WITK0JP+fWDg2XLh3SpMgU0SXvJ8irRop+4ptfgB p4DCw=",   "token_type": "Bearer",   "expires_in": 86400 }</pre>

In the response body, you can find :

- the **access\_token**, for calling Indaba APIs :

200

Response body

```
{
  "access_token": "eyJhbGciOiJSUzI1NiIsInR5cCI6IkpXVCIsImtpZCI6Ikd1LUD1sa081WWRaeTFTUHVKeU820GNuMk tEaGR0RUx00EF1QGNsaWVudHM iLCJhdWQiOiJodHRwczovL2FwaS5pbUioiJtZXRYaWNzOnJlYWQgbWV0cm1jc z p3cm10ZSI sImd0eSI6ImNsaWVudC1jcmVkZW50aWFscy yZWFKIiwibWV0cm1jc z p3cm10ZSI sImd0eSI6ImNsaWVudC1jcmVkZW50aWFscy yjP9twf0s8GMJlZCK-ZaMe16GboF9nxz1f0cL6vzo4Y_pS9ho46QwWJBwvoDcoIXNNdyMmi t6Bc0WcNK20Kixuegok_-Bsv_KXElujYyhqFQn8LR_Cd28s9A",
  "refresh_token": "zj0imK1C+/b0yZcGb+x+sELTi1MX2fE8bbLFZN0ZvVQTLqquc1MTP3N1GKH0Q==",
  "token_type": "Bearer",
  "expires_in": 86400
}
```

- the **refresh token** : to renew communication between the device and lo-base when the new token expires

200

Response body

```
{
  "access_token": "eyJhbGciOiJSUzI1NiIsInR5cCI6IkpXVCIsImtpZCI6Ikd1LUD1sa081WWRaeTFTUHVKeU820GNuMk tEaGR0RUx00EF1QGNsaWVudHM iLCJhdWQiOiJodHRwczovL2FwaS5pbUioiJtZXRYaWNzOnJlYWQgbWV0cm1jc z p3cm10ZSI sImd0eSI6ImNsaWVudC1jcmVkZW50aWFscy yZWFKIiwibWV0cm1jc z p3cm10ZSI sImd0eSI6ImNsaWVudC1jcmVkZW50aWFscy yjP9twf0s8GMJlZCK-ZaMe16GboF9nxz1f0cL6vzo4Y_pS9ho46QwWJBwvoDcoIXNNdyMmi t6Bc0WcNK20Kixuegok_-Bsv_KXElujYyhqFQn8LR_Cd28s9A",
  "refresh_token": "zj0imK1C+/b0yZcGb+x+sELTi1MX2fE8bbLFZN0ZvVQTLqquc1MTP3N1GKH0Q==",
  "token_type": "Bearer",
  "expires_in": 86400
}
```

**Warning**, a "refresh\_token" can only be used once.

If the same token is used twice, the device status switches to "failed".

Server response

Code	Details
------	---------

403	Error: response status is 403
-----	-------------------------------

Response body

```
{
  "error": "authorization_failed",
  "error_description": "Forbidden operation, wrong refresh token, device is now in error"
}
```

Response headers

```
content-length: 114
content-type: application/json
```

Device status

Waiting for validation

Failed

In this case, the device must [be deleted](#) by an administrator in lo-base, and the procedure has to be repeated.

## 9. Users management

### 9.1 User list

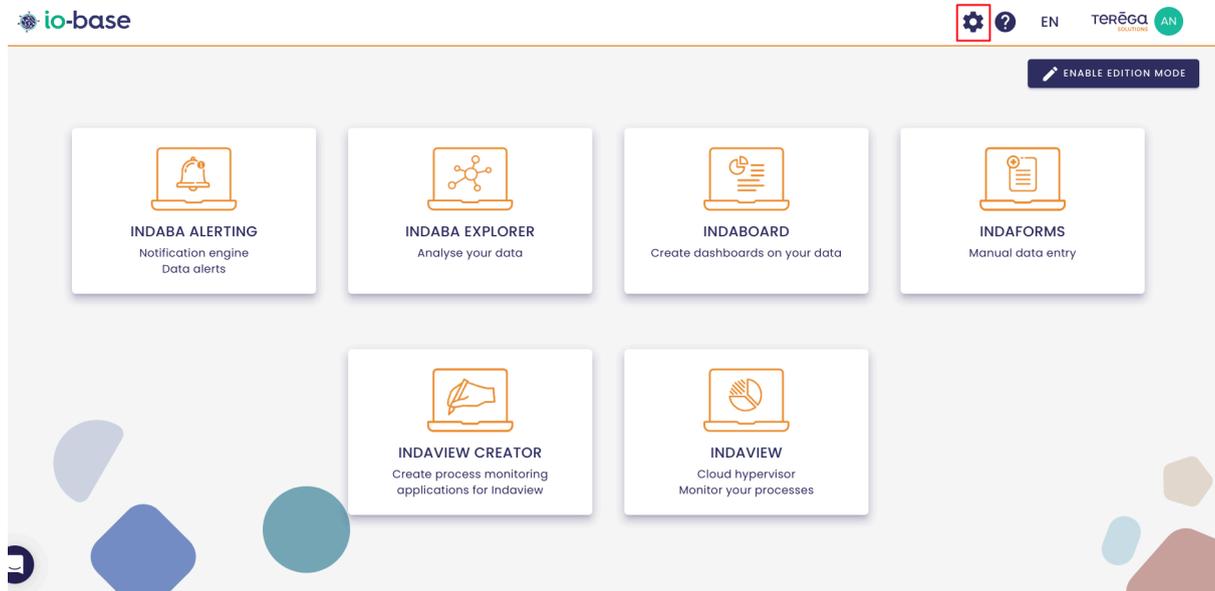
**Prerequisite** : You must have a functional administrator role to access this feature.

**lo-base** functional administrators can manage the users of the platform :

- add a user
- delete a user
- manage the rights of a user

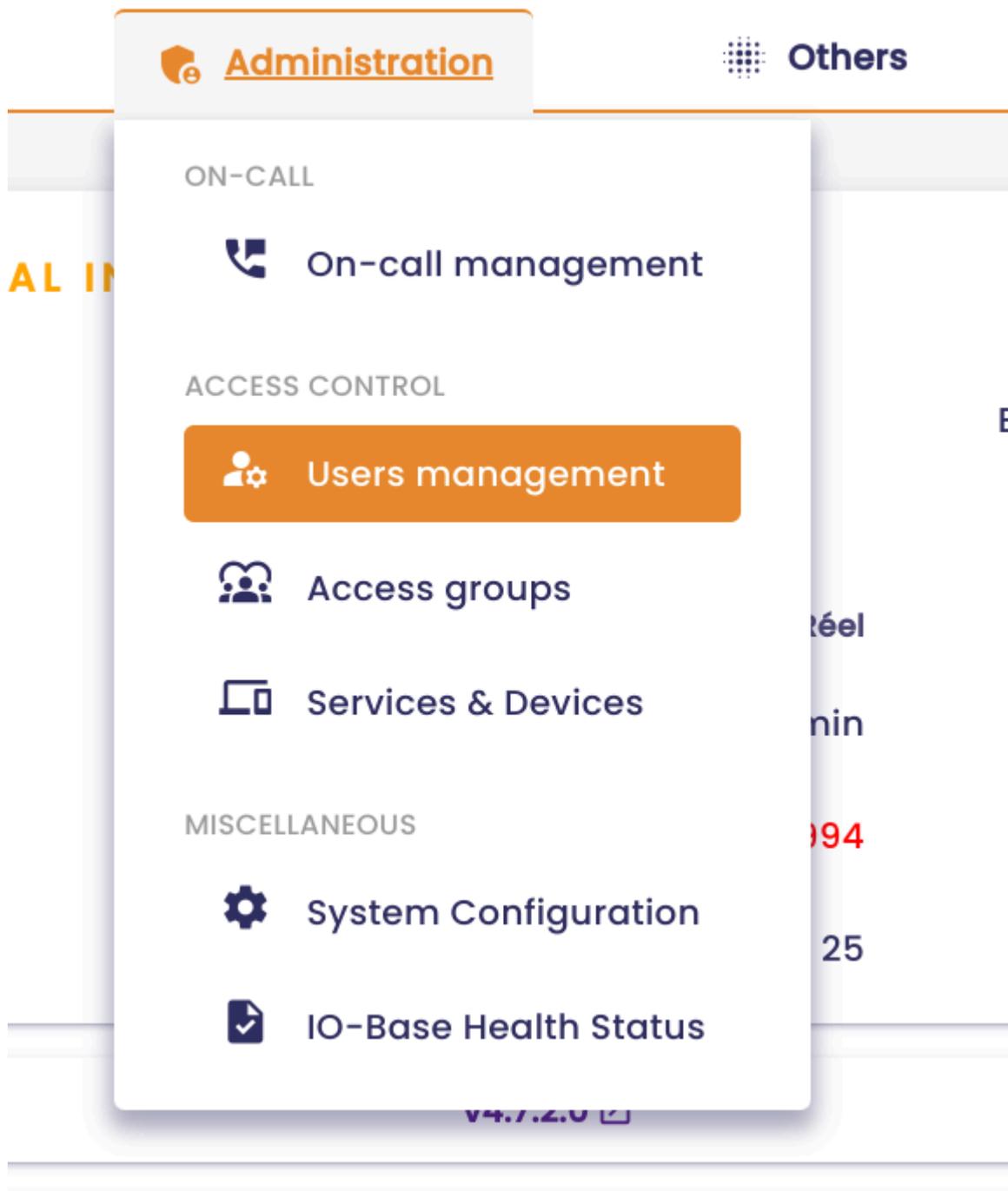
- update the user's information

Login to **io-base**, and click the button at the top right of your screen, highlighted below :



The io-base administration page opens.

Go to the **Administration/Users management** menu.



The table displays the list of users who can access the **io-base** platform, as well as their roles. To learn more about the roles, please refer to the article [Editing a User](#), which offers a detailed description of each role.

First name	Last name	Email	Roles	Actions
Application				🛡️
Application				🛡️
André			Functional admin, Reader, ViewCreator, Writer	🛠️ 🛑
Aurelien			Reader, Writer, Support Global	🛠️ 🛑
Bruno			Reader, Support, Technical admin, ViewCreator	🛠️ 🛑
kilos-new				🛠️ 🛑
Christophe			Reader, ViewCreator, Writer, Support Global	🛠️ 🛑
David			Support	🛠️ 🛑
florent			Reader, Writer	🛠️ 🛑
Hugo				🛠️ 🛑

It is possible to filter the table by using the search area.

**Note** : The search is effective on the **First Name** and **Last Name** fields.

As on most **io-base** tables, the pagination is available at the bottom right.

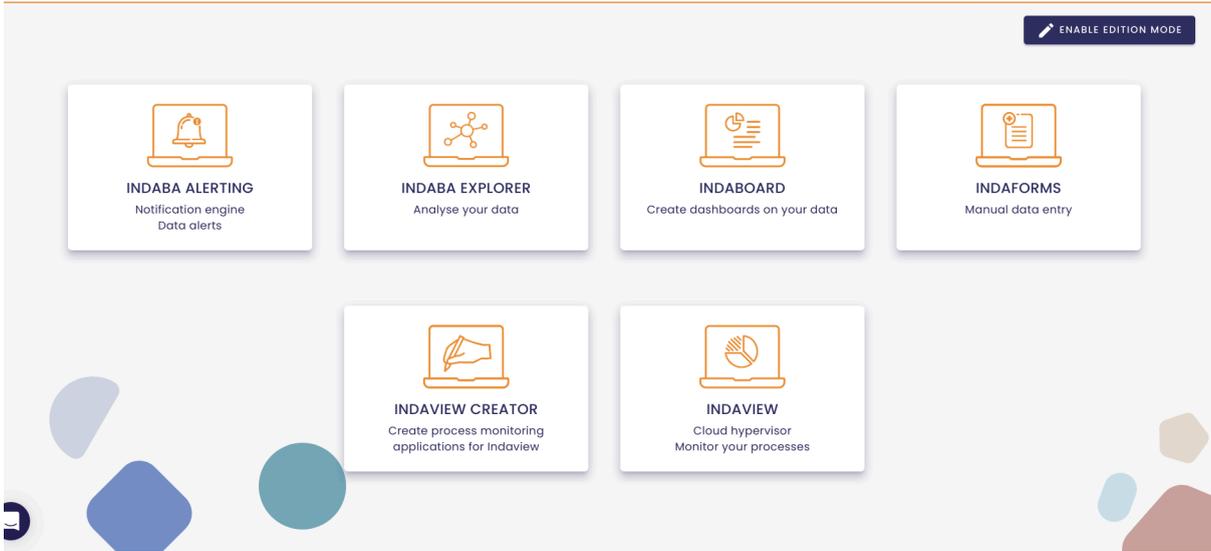
**Note** : A shield icon is displayed next to the first name of certain users to indicate their **Global Support** role, representing the Terega Solutions support team.

These users can be removed if necessary.

## 9.2 Adding a user

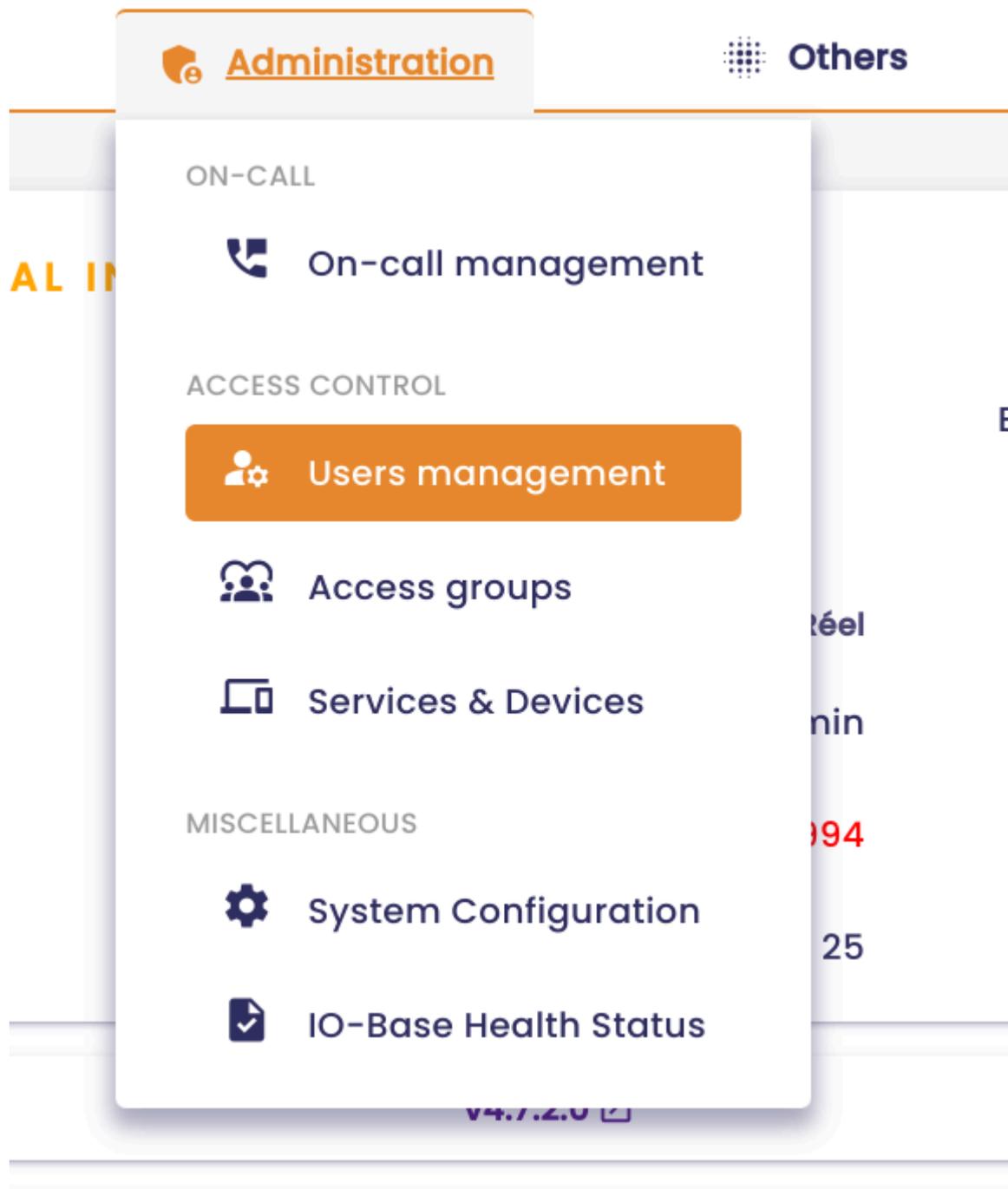
**Prerequisite** : This feature is available for users with a **functional administrator** role.

Login to **io-base**, and click the button at the top right of your screen, highlighted below :

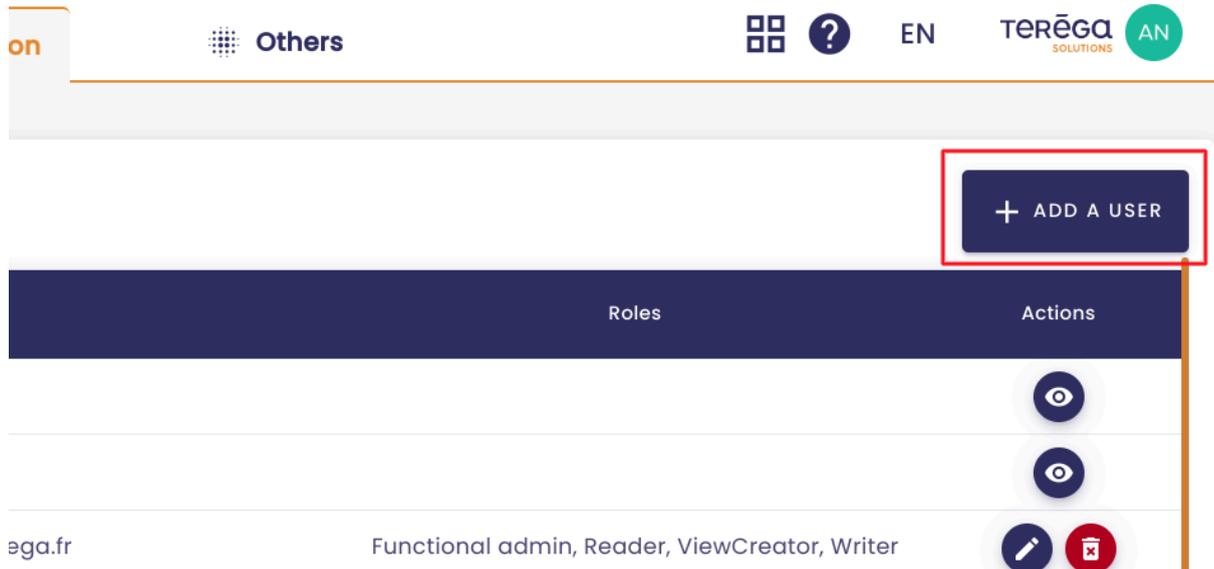


The io-base administration page opens.

Go to the **Administration/Users management** menu.



The user listing screen is displayed. Click on the **"Add a user"** button at the top right.



The "**New User**" window appears. It contains the following fields :

- First name (required)
- Last name (required)
- Email (required)

A checkbox enables you to specify whether the new user should have default permissions. For more information on permissions, please refer to the dedicated articles in the [Permissions \(Metrics Rights\) section](#).

## New user

First name \*

documentation

Last name \*

Documentation

Email \*

doc@gmail.com

Include in the default access zone

### All roles

Functional admin	+
Reader	
Support	+
Technical admin	+
ViewCreator	+
Writer	+

### User roles

Reader	
--------	---



CANCEL

ADD USER

**Note** : It is not possible to add a user with the same email address as an existing user.

By default, the role assigned to the new user is set to **Reader**. It allows access to the io-base portal with read rights.

The possible roles are as follows :

- **Reader** : read access to the io-base portal
- **Functional Admin** :
  - read access to the io-base portal
  - access to the Forms module
  - access to the administration area

- access to the administration of repositories
- **Support** : reserved for people who need to access the portal for support purposes
- **Technical Admin** : reserved for technical administrators
- **Writer** : necessary to have writing rights in the Indaba database.

**Note** : the Writer and Reader roles alone are not sufficient to view the metrics values or add data. They must be completed by the **Permissions** set on the metrics.

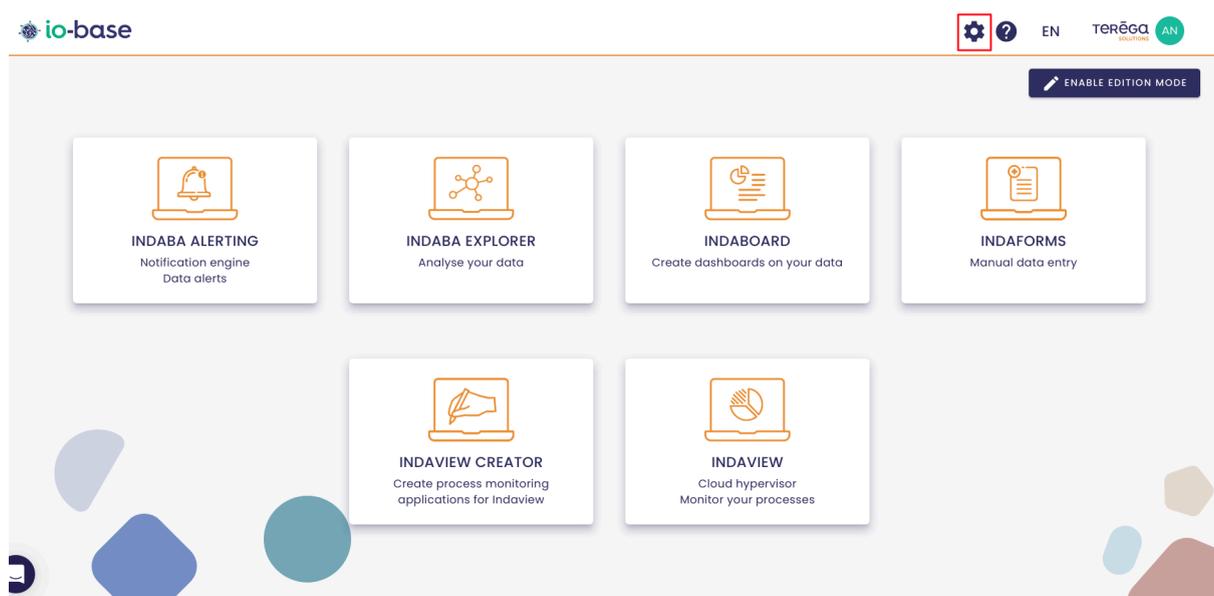
For further details on Permissions, refer to the dedicated articles in the section [Permissions \(metrics rights\)](#).

Once you have entered all the information about the new user, click on **Add user** to confirm.

### 9.3 Editing a user

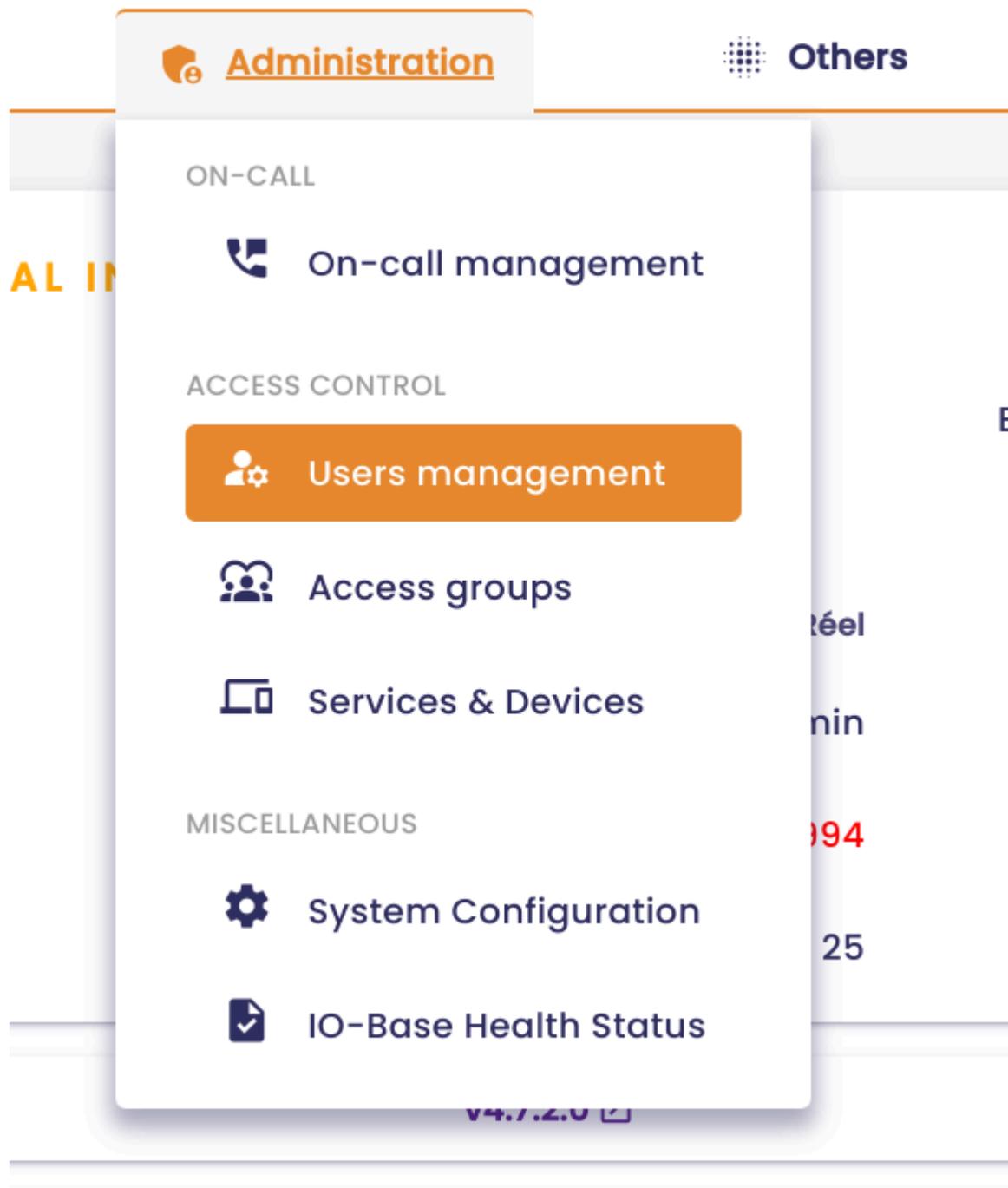
**Prerequisite** : this feature is available to users with the **Functional Administrator** role.

Login to **io-base**, and click the button at the top right of your screen, highlighted below :



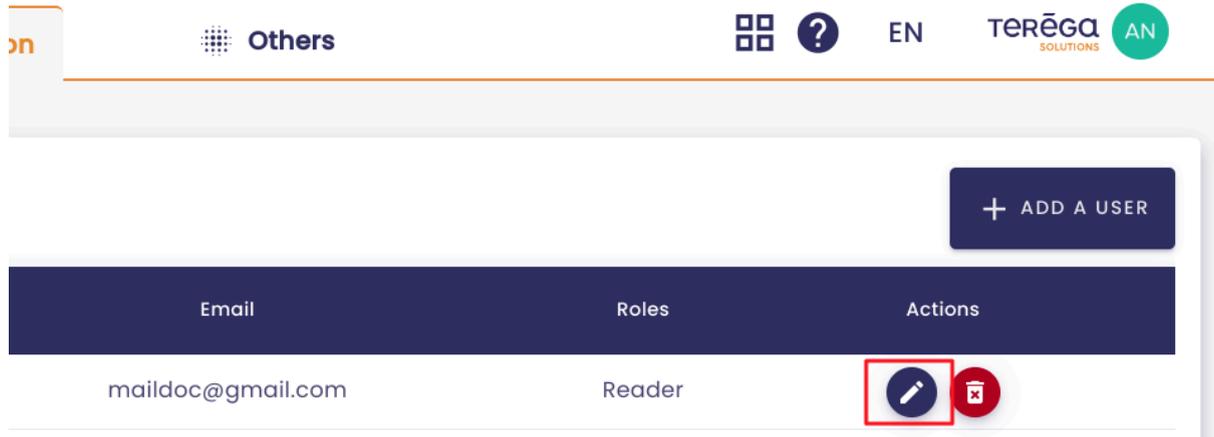
The io-base administration page opens.

Go to the **Administration/Users management** menu.

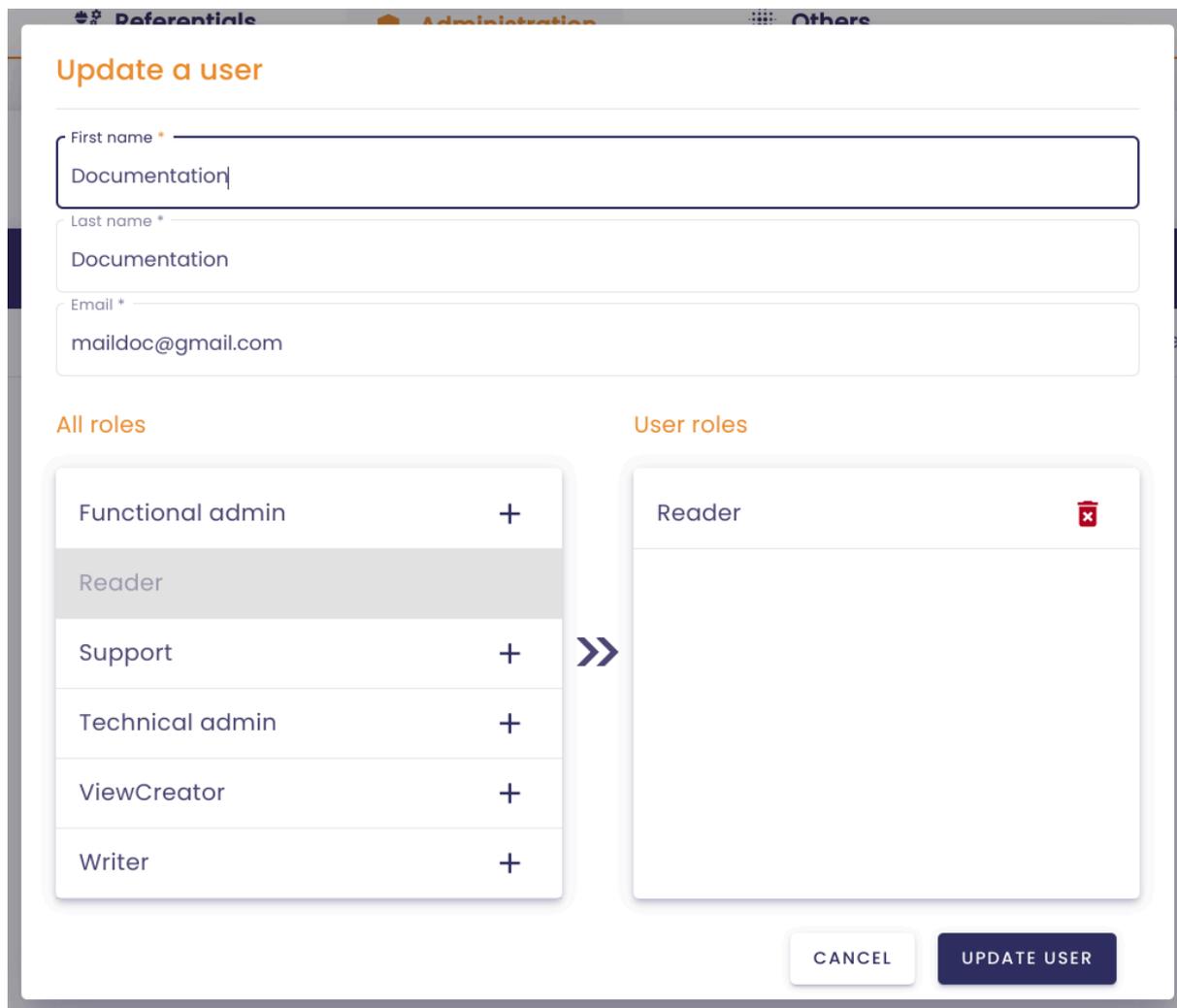


The user listing screen is displayed.

In the **Actions** column, a button allows you to edit users.



Click on the button. The user's editing window is displayed.



Several fields are displayed :

- First name (required)

- Last name (required)
- Email (required)

**Note** : For users in the **Global Support** role, these values cannot be changed.

**Note** : It is not possible to edit a user with the same email address as another existing user.

You can change the roles assigned to the user.

The possible roles are as follows :

- Reader : read access to the io-base portal
- Functional Admin :
  - read access to the io-base portal
  - access to the Forms module
  - access to the administration area
  - access to the administration of repositories
- Support: reserved for people who need to access the portal for support purposes
- Technical Admin: reserved for technical administrators
- Writer: necessary to have writing rights in the Indaba database.

**Note** : the Writer and Reader roles alone are not sufficient to view the metrics values or add data. They must be completed by the **Permissions** set on the metrics.

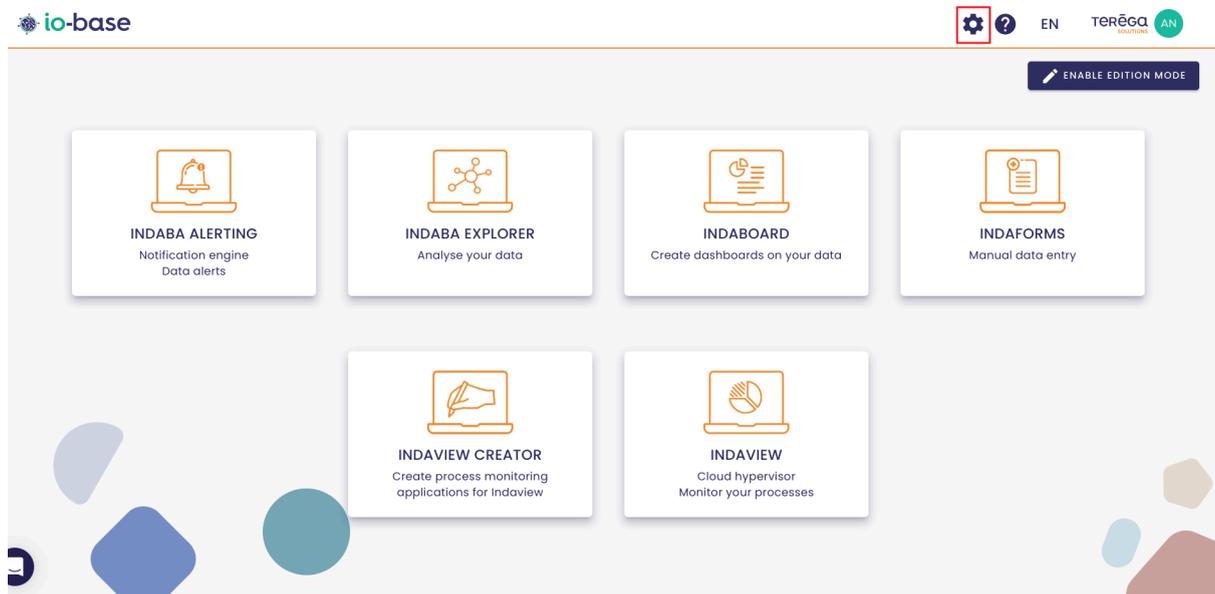
For more details on **Permissions**, refer to the dedicated articles in the section [Permissions \(metrics rights\)](#).

Once you have made the desired changes, click **Update User** to confirm.

## 9.4 Deleting a user

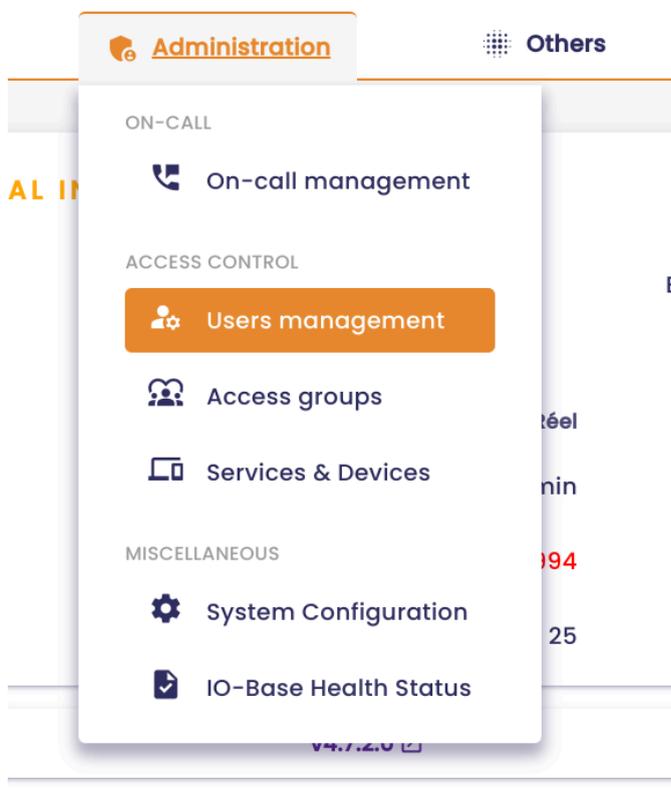
**Prerequisite**: This feature is available to users with the Functional Administrator role.

Login to **io-base**, and click the button at the top right of your screen, highlighted below :



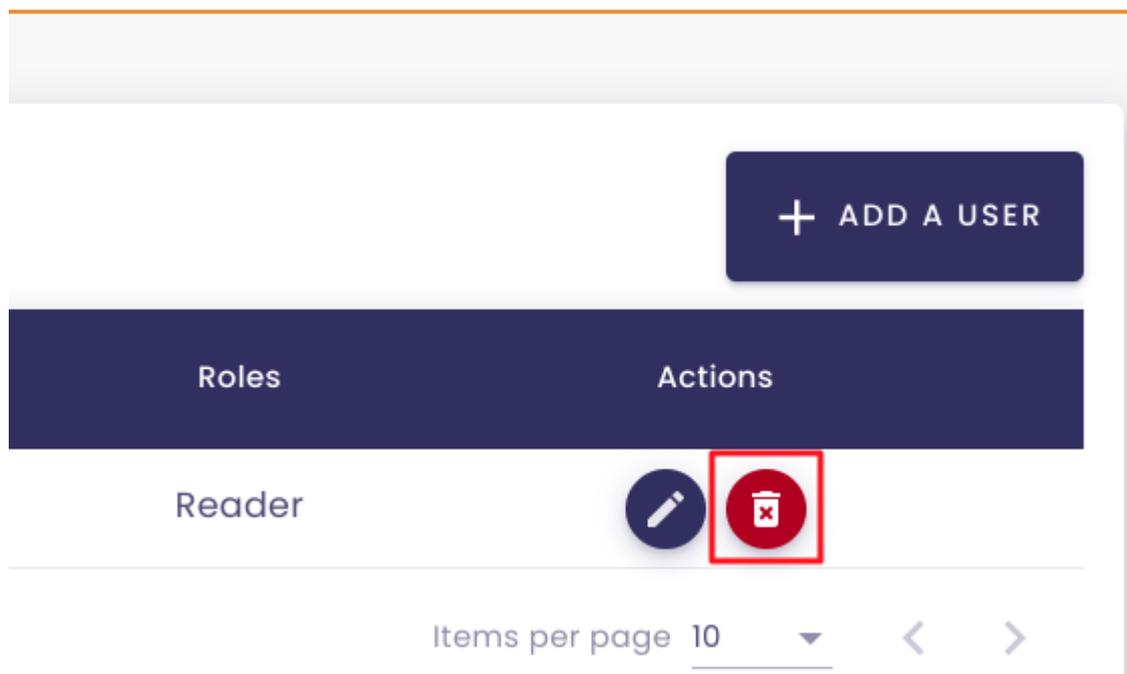
The io-base administration page opens.

Go to the **Administration/Users management** menu.

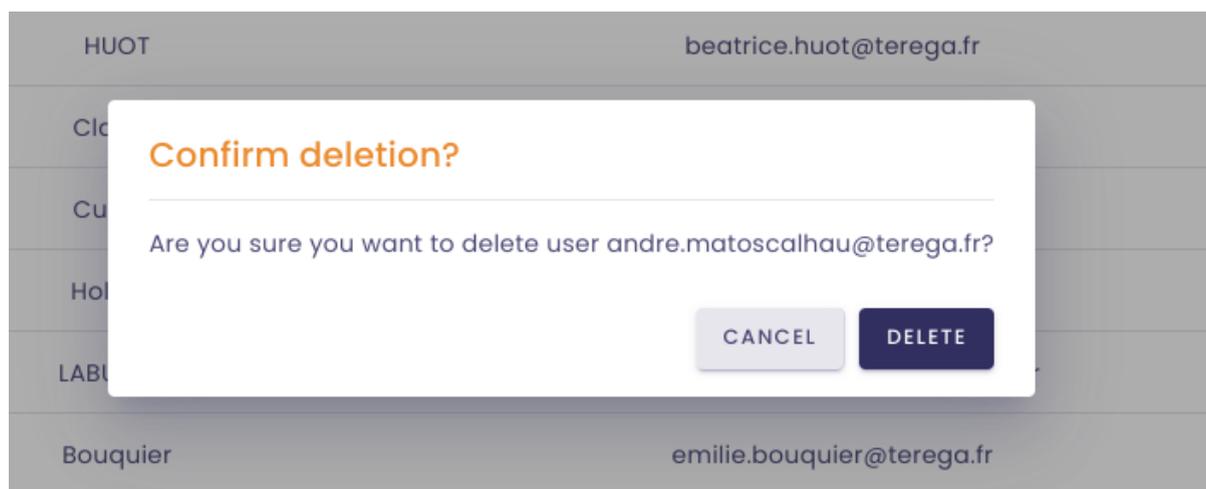


The user listing screen is displayed.

In the **Actions** column, a button allows you to delete a user.



Click on the button. A confirmation message appears.



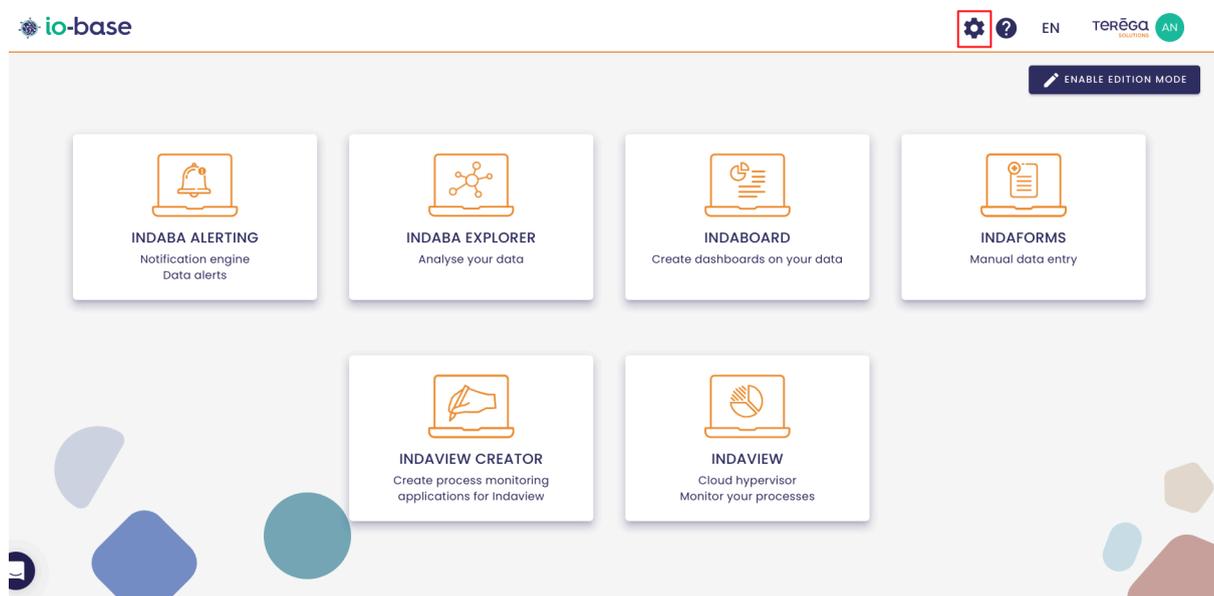
Click on **Delete** to confirm the deletion.

## 10. User groups management

### 10.1 Create a group

**Prerequisite** : This feature is available for users with a functional administrator role.

Login to **Io-base**, and click the button at the top right of your screen, highlighted below :



The Io-base administration page opens.

Go to the **Administration/Access Groups** menu.

ON-CALL

 **On-call management**

ACCESS CONTROL

 **Users management**

 **Access groups**

 **Services & Devices**

MISCELLANEOUS

 **System Configuration**

 **IO-Base Health Status**

A list of the existing groups appears.

Click on **Add group**.

Administration Others EN AN

ADD GROUP

Description	Number of users	Actions
	2	⋮
	23	⋮

The "Add a group" pop-up window opens.

Add a group

Name \* Description

Available users Users of group

Search a user

- Application M2M-indabox-internal +
- Application Maquette M2M-internal-maquette +
- Application M2M-dap-internal +
- André Matos Calhau +
- Aurelien Bardy +
- Béatrice HUOT +
- Bruno Clastre +
- Christophe Cuyala +
- Christophe Holmes +

No user in this group

Items per page 10 < >

CANCEL ADD

Specify the following informations :

- a name (mandatory)



The screenshot shows a web interface for adding a group. The title is "Add a group" in orange. Below the title is a form with a "Name" field, which is highlighted with a red box and contains the text "Documentation". Below the name field is a section titled "Available users" in orange, which includes a search bar with the placeholder text "Search a user".

- a description (optional)

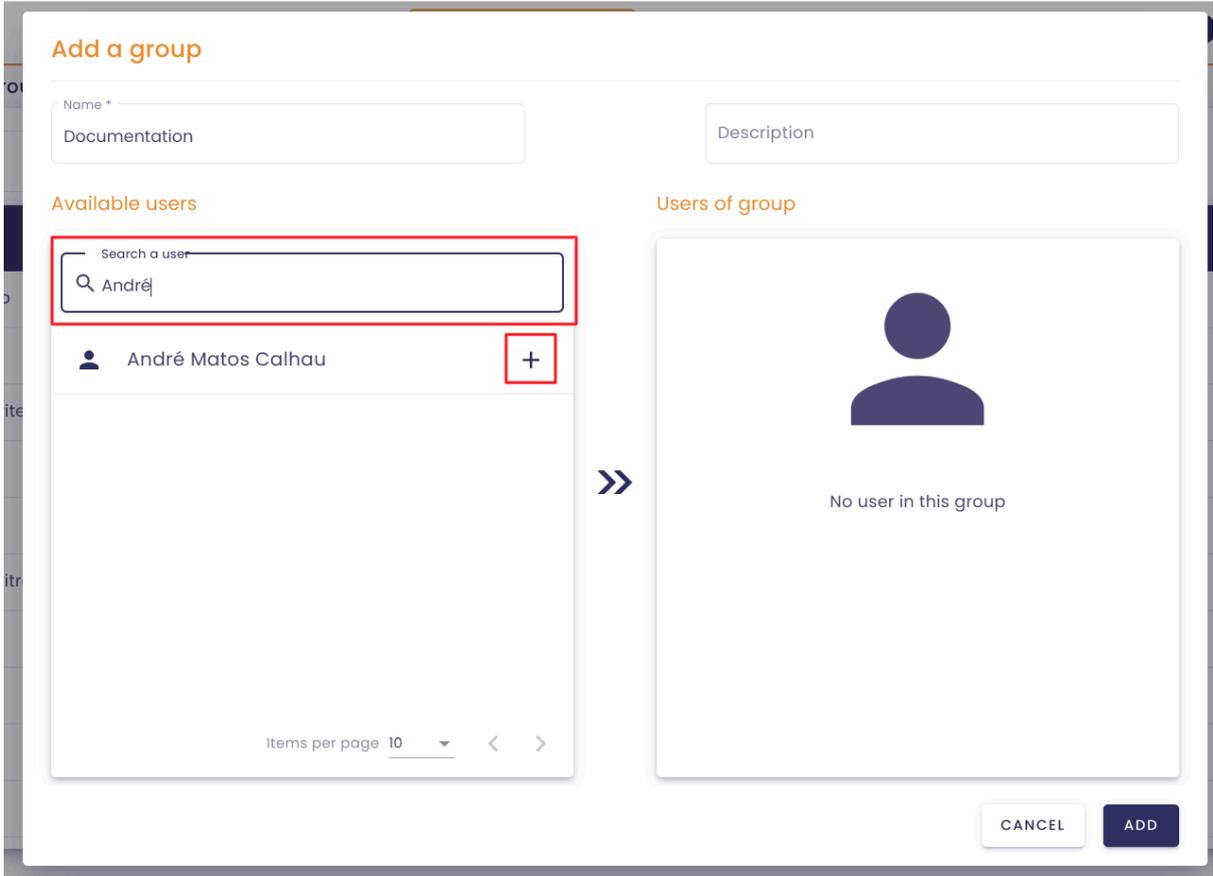


The screenshot shows a text input field for the "Description" field, which contains the text "Documentation.".

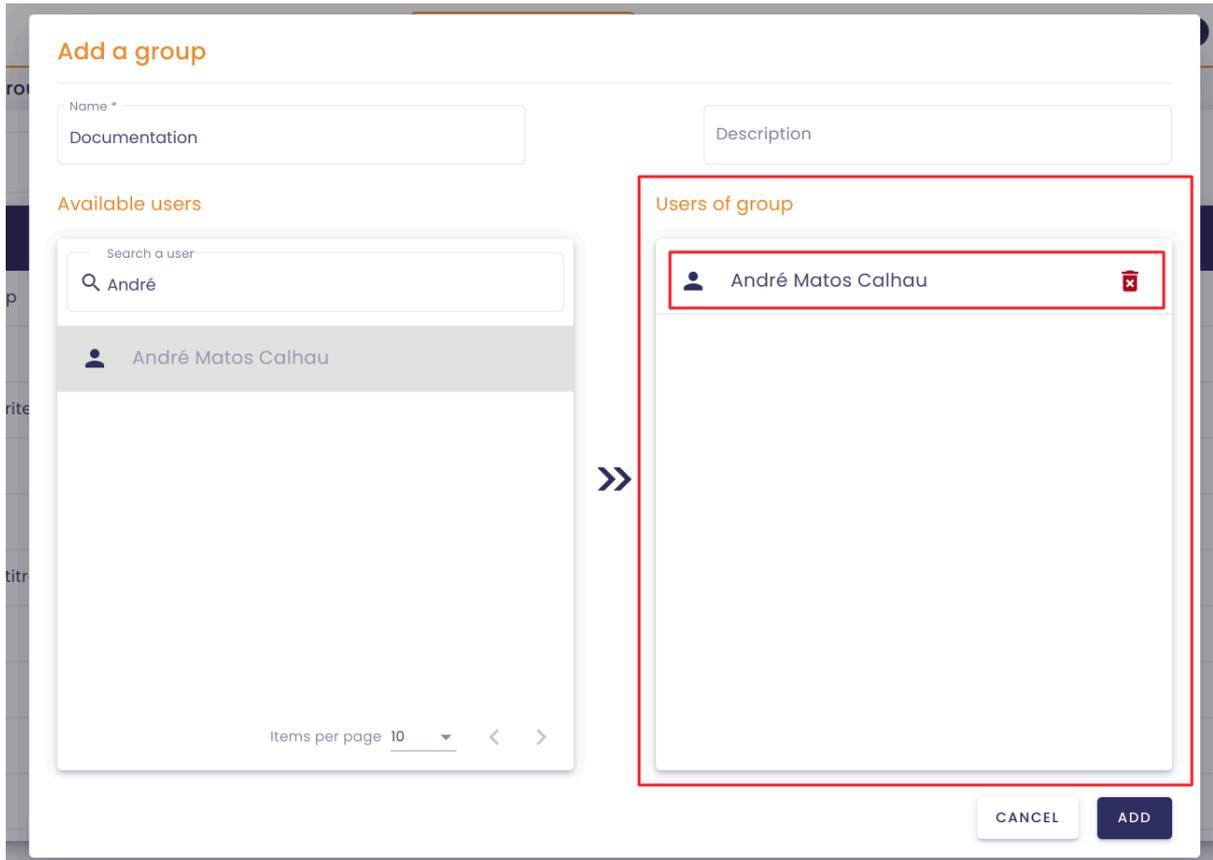
- The list of users associated with the group

The left column allows you to select the user(s) of your choice, by clicking on the “+” button.

**Note :** To find the desired user, a search area is at your disposal.



Once the user is selected, he appears on the right column.

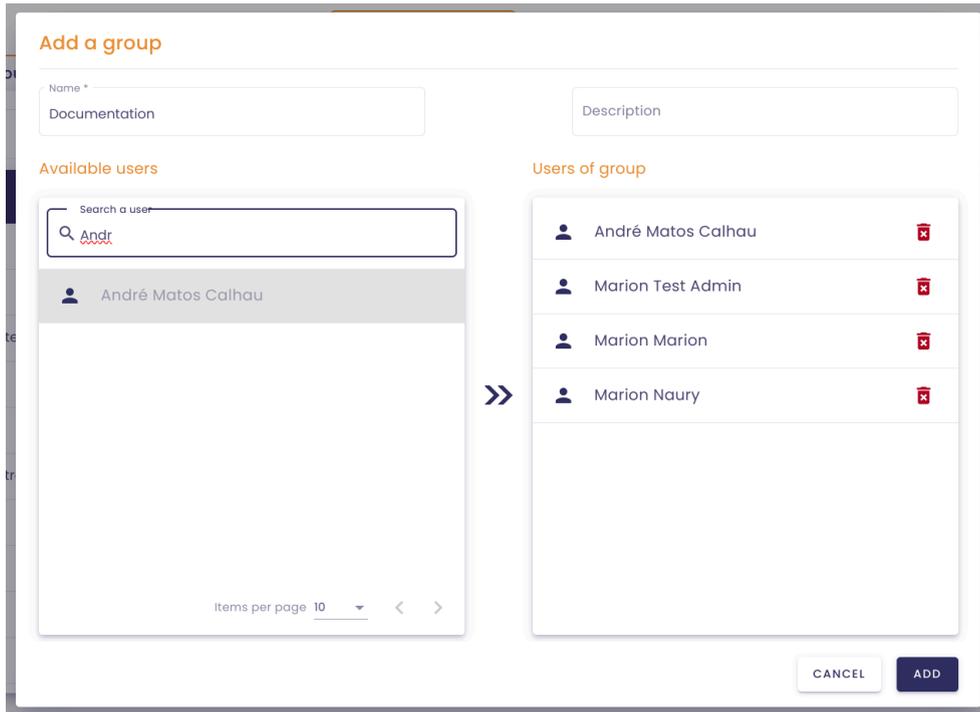


**Note** : to cancel the selection of a user, click on the

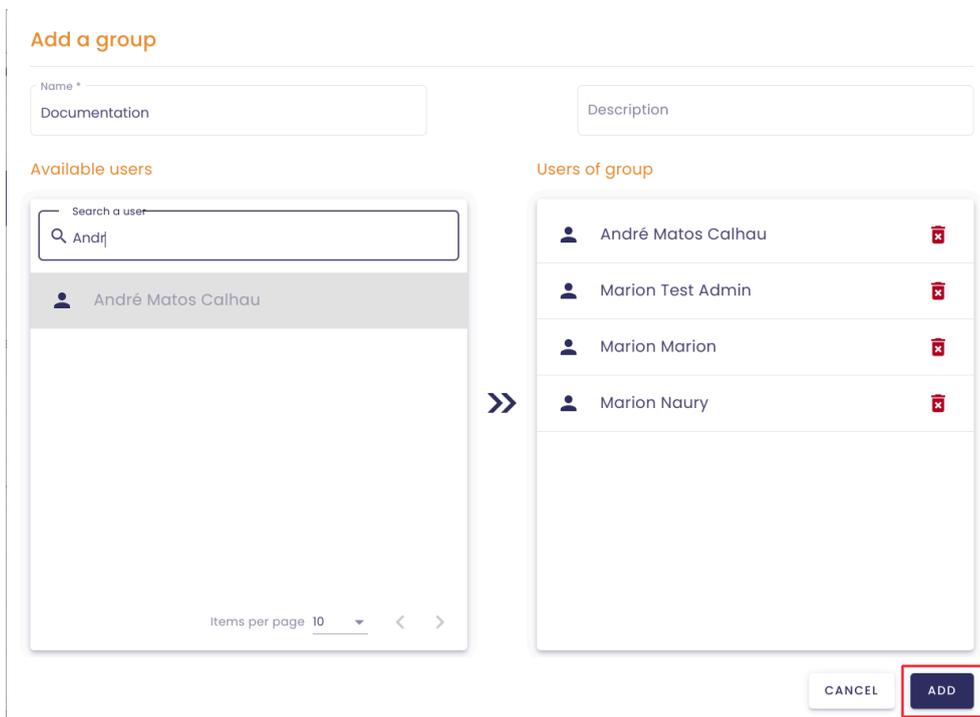


button.

**Note** : You can add as many users as you want.



Once all the users you need are selected, click on **Add**.



A new group is created and appears in the groups list.

Administration > Access groups

Search  ADD GROUP

Name	Description	Number of users	Actions
Documentation		4	⋮

## 10.2 Edit a group

**Prerequisite** : This feature is available for users with a functional administrator role.

Connect to the lo-base portal and access the **Administration/Access Groups** menu.

A list of the existing groups appears.

To edit a group, click on the



button, in the **Actions** column.

Search  ADD GROUP

Name	Description	Number of users	Actions
Default application group		2	⋮
Default user group		16	⋮
Access zone read and write		0	⋮
Accès Ecriture		4	⋮
Authorisation pour mon titre		6	⋮
Documentation	Documentation	4	⋮
Test	tester	4	⋮

Then, click on **Edit**.

Documentation	Documentation	4	⋮
Test	tester		⋮
test majs	desc		⋮
test_dl			⋮
tt			⋮

- Edit
- Delete
- Export
- Import

The **“Edit a group”** window appears.

You can change the name, description and users associated with the group.

The screenshot shows the "Edit a group" interface. At the top, there are two input fields: "Name" with the value "Documentation edit" and "Description" with the value "edit". Below these are two panels: "Available users" on the left and "Users of group" on the right. The "Available users" panel has a search bar with "andr" and a list containing "André Matos Calhau". The "Users of group" panel contains a list with "André Matos Calhau" and "Marion Marion", each with a red trash icon. A double arrow points from the available users to the group users. At the bottom right, there are "CANCEL" and "SAVE" buttons.

Once the modifications are made, click on **Save**.

This image is a close-up of the "Users of group" panel and the "SAVE" button. The panel shows a list with two users: "André Matos Calhau" and "Marion Marion", each with a red trash icon. Below the panel, the "SAVE" button is highlighted with a red box.

The modifications are saved.



Administration > Access groups

Search  
Documentation

ADD GROUP

Name	Description	Number of users	Actions
Documentation edit	edit	2	⋮

## 10.3 Delete a group

**Prerequisite:** This feature is available for users with a functional administrator role.

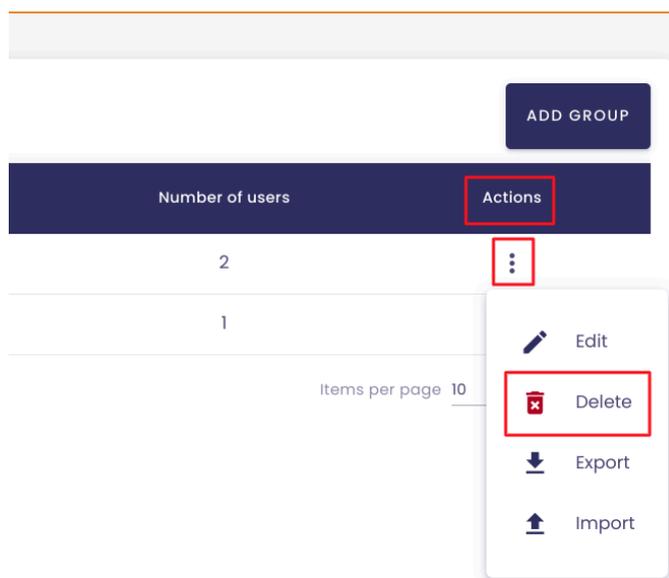
Connect to the Io-base portal and access the **Administration / Groups** menu.

A list of the existing groups appears.

To delete a group, click on the



button, in the **Actions** column.



ADD GROUP

Number of users	Actions
2	⋮
1	⋮

Items per page 10

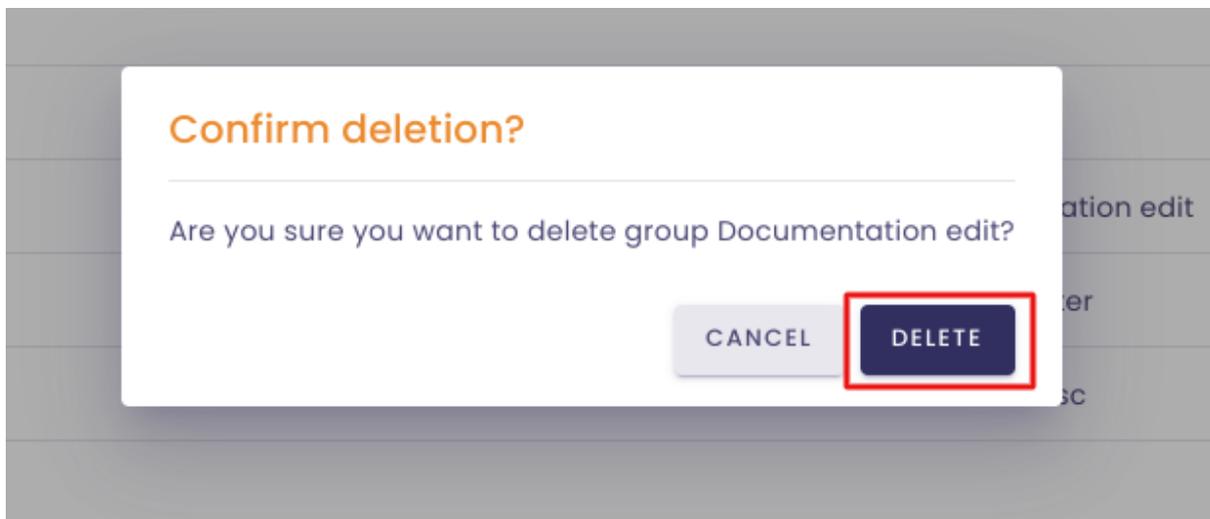
- Edit
- Delete**
- Export
- Import

Then, click on **Delete**.

Documentation edit	Documentation edit	3	
Test	tester		
test majs	desc		
test_dl			
tt			

A confirmation message appears.

To confirm the deletion, click on **Delete**.



The group is deleted and no longer appears in the groups' list.

## 10.4 Import/export groups

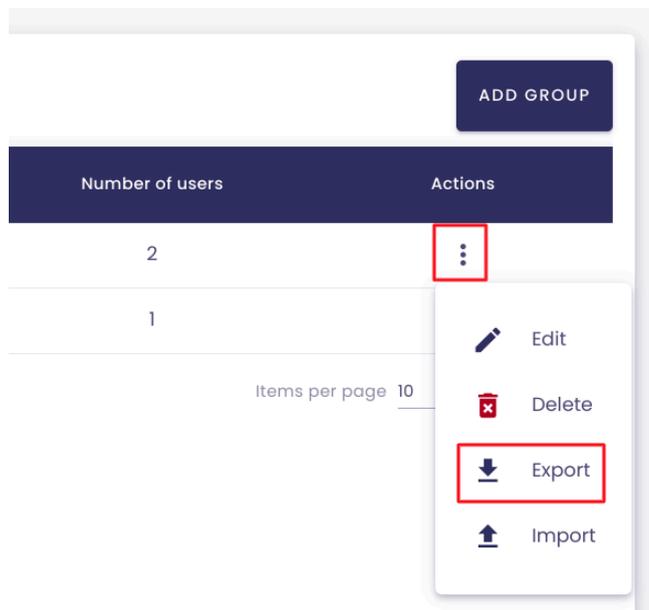
**Prerequisite** : This feature is available for users with a functional administrator role.

### 10.4.1 Export a group

Connect to the lo-base portal and access the **Administration/Access Groups** menu.

You can export the properties of a group in an Excel file.

In the **Actions** column, click on **Export**.



An excel file is generated.

It contains :

- the name of the group

Documentation-2024-01-17.xlsx  
Fichier Modifier Insérer Format Aide

Calibri 11 B I U

f<sup>x</sup>

	A	B	C
1	Name	Description	
2	Documentation	For documentation purposes.	
3			
4			
5			
6			
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9			
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40			

Group Users Applications

- the group's description (optional)



# Documentation-2024-01-17.xlsx

Fichier Modifier Insérer Format Aide Toutes les modifications ont bien

	A	B	C	D	E
1	Name	Description			
2	Documentation	Doc			
3					
4					
5					
6					
7					
8					
9					
10					

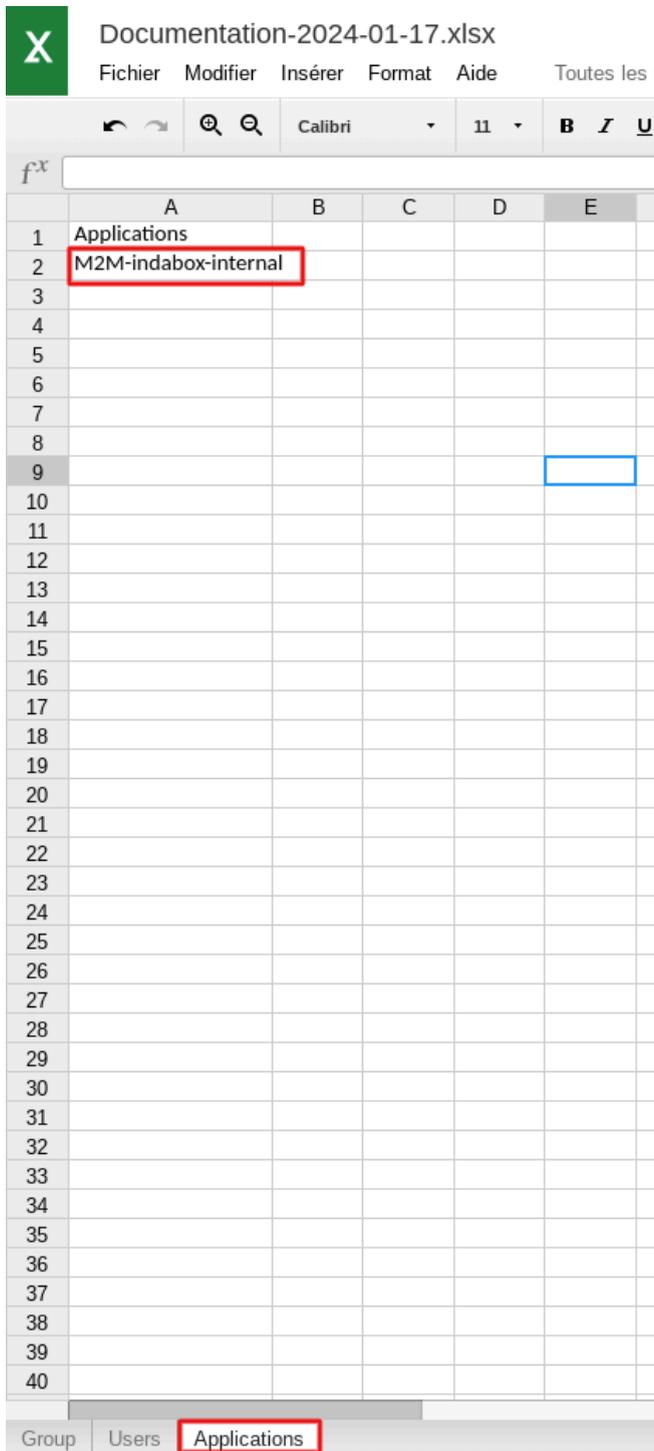
- The users associated with the group (if there are any)

fx

	A	B	C	D	E	F
1	Users					
2	andre.andre@terega.fr					
3	bruno.bruno@terega.fr					
4	xavier.xavier@terega.fr					
5						
6						
7						
8						
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40						

Group Users Applications

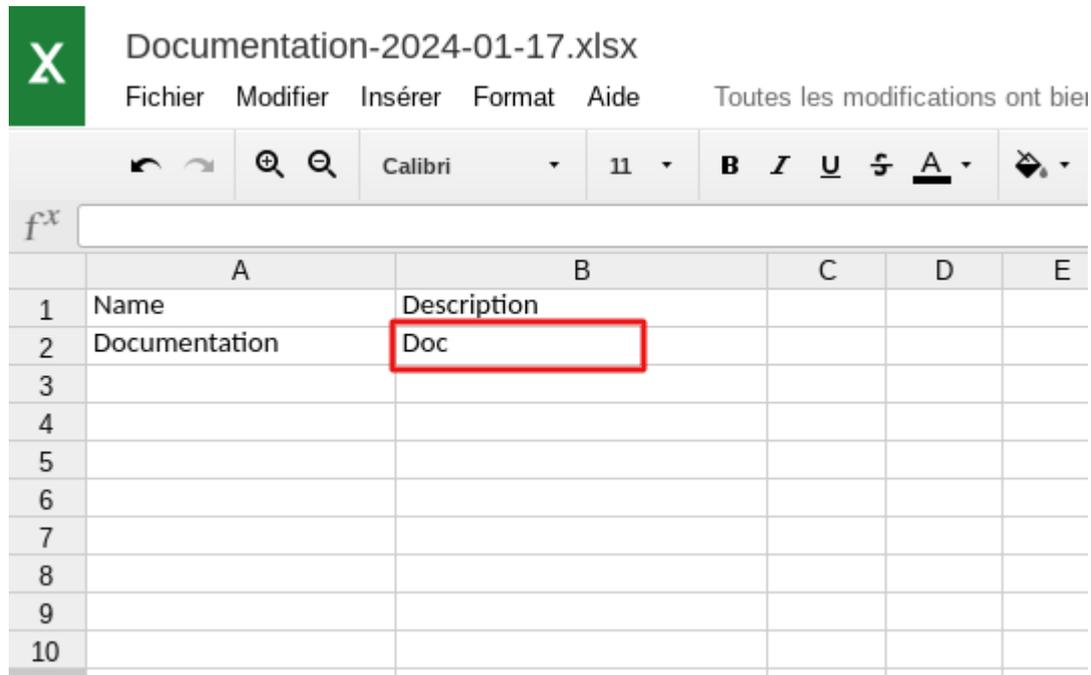
- applications associated with the group (if there are any)



### 10.4.2 Import a group

You can then complete/edit this Excel file and import it to update the group.

You can edit the description of the group :



	A	B	C	D	E
1	Name	Description			
2	Documentation	Doc			
3					
4					
5					
6					
7					
8					
9					
10					

**Note** : You cannot change the name of the group with an import.

You can also add (or remove) users or applications to the group :

To add a user, enter their email address in the '**Users**' sheet :

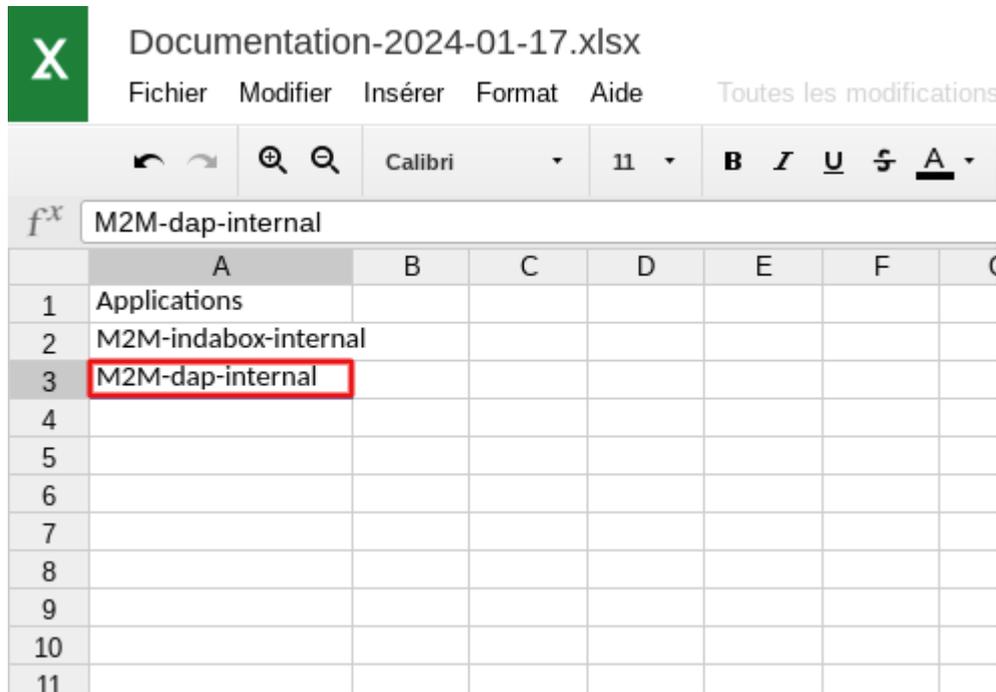
Navigation icons: Undo, Redo, Find, Calibri, 11

fx

	A	B
1	Users	
2	andre.andre@terega.fr	
3	bruno.bruno@terega.fr	
4	xavier.xavier@terega.fr	
5	marion.marion@terega.fr	
6		
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Group: Users Applications

To add an application, enter the **name** of the application in the **Applications** sheet :



**Note** : To remove a user/application from the group, delete the line containing their email address/name.

Once you have made the necessary edits, save your file.

Go back to **lo-base** and access the **Administration/Groups** menu.

In the **Actions** column, click on



then, **Import**.

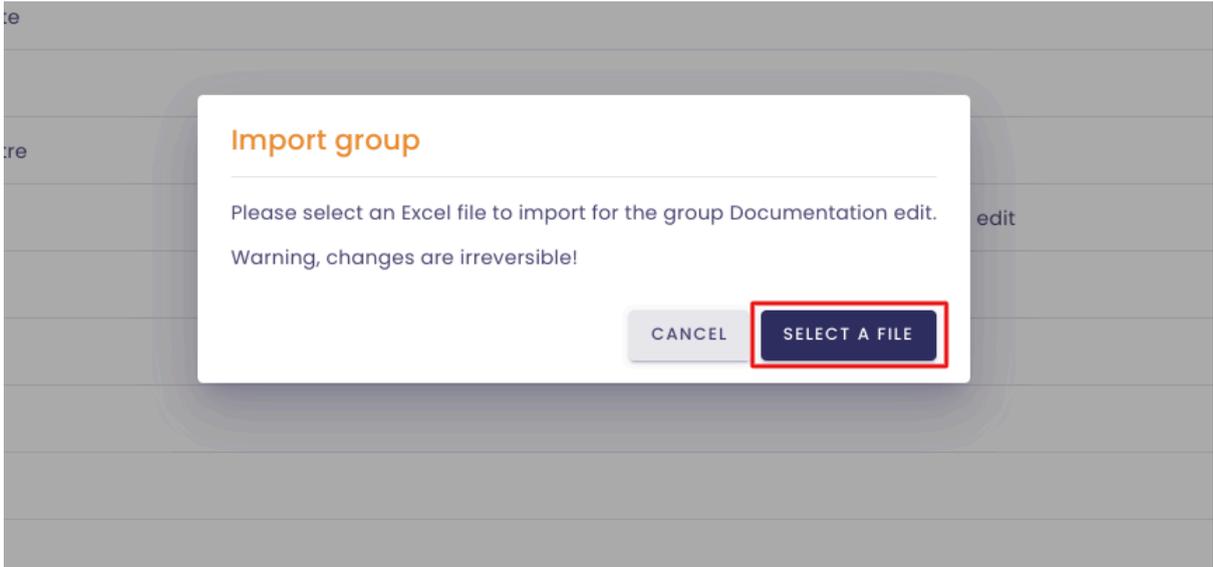
ADD GROUP

Number of users	Actions
2	⋮
1	⋮

Items per page 10

- Edit
- Delete
- Export
- Import

A pop-up window opens, click on **Select a file**.



Select the right Excel file.

The changes are applied to the group.

## Edit a group

Name \*

Description

Available users new imported application Users of group

-  Application M2M-indabox-internal
-  Application Maquette M2M-internal-maquette +
-  Application M2M-dap-internal
-  André Matos Calhau
-  Aurelien Bardy +
-  Bruno Clastre
-  Carla Malo +
-  Christophe Cuyala +
-  Christophe Holmes +

Items per page 10 < >

**>>** new imported user

-  Application M2M-indabox-internal 
-  Application M2M-dap-internal 
-  André Matos Calhau 
-  Bruno Clastre 
-  Marion Marion 
-  Xavierr Xavierr 