io-base
value-added data

TERĒGA
SOLUTIONS

IndaSheet

Excel

Content

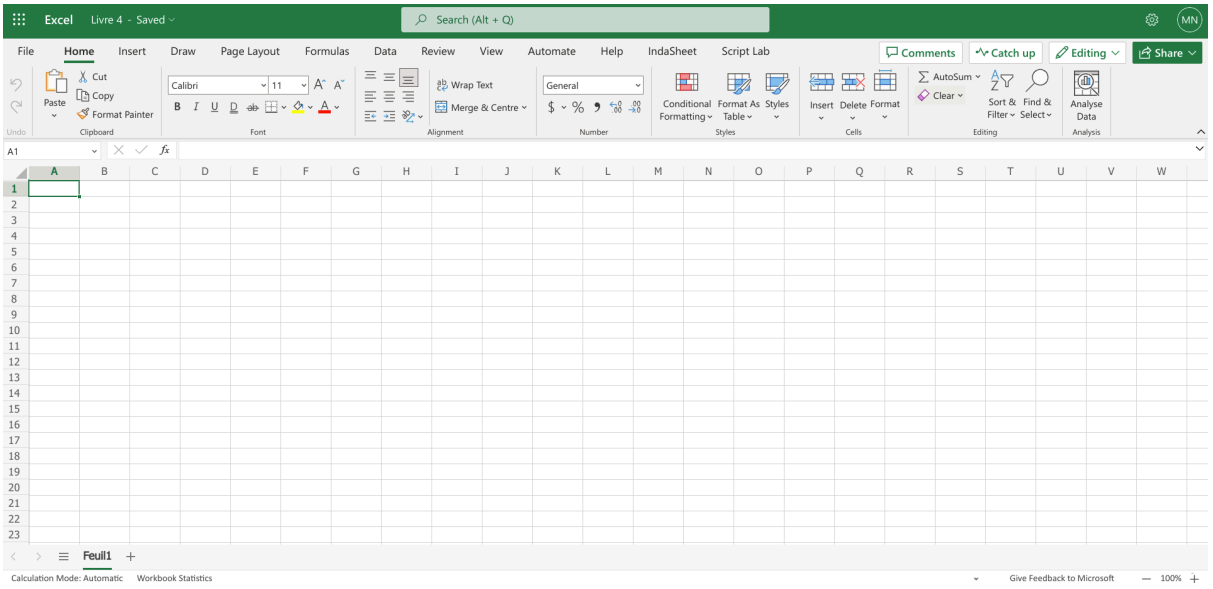
1. Introduction

The IndaSheet add-on module enables you to upload data from Indaba directly into a spreadsheet program.
This document explains how to install IndaSheet on Excel.

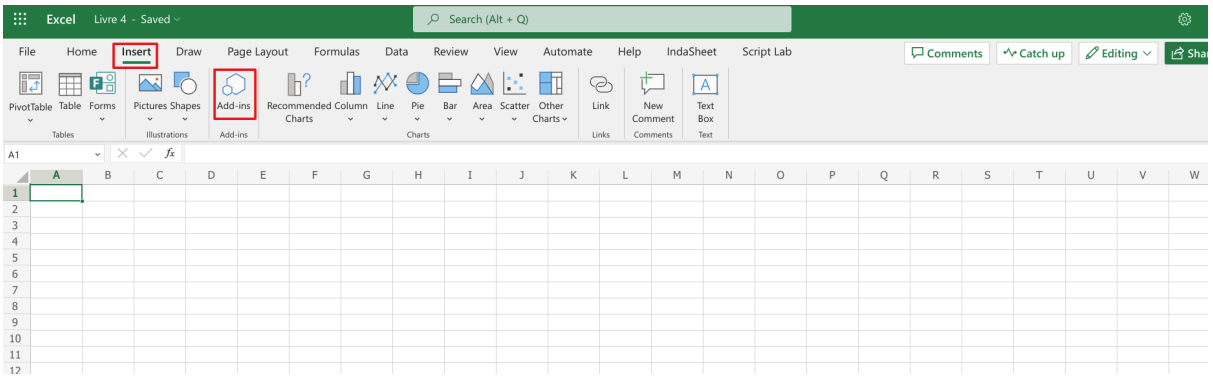
2. Deployment of the Excel module

Prerequisite : To deploy the IndaSheet module in Office Excel 365, you must have the manifest file provided by your administrator.

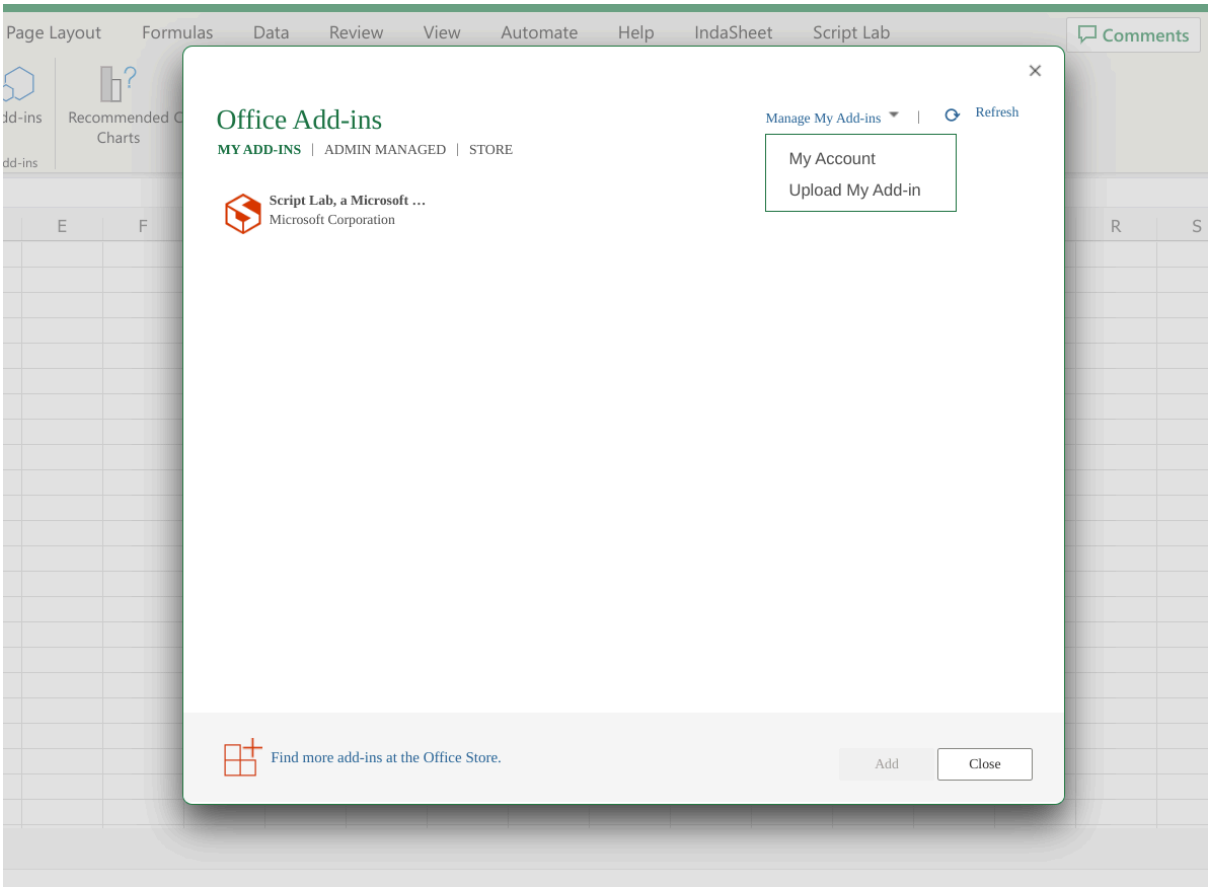
Open an Office Excel 365 file.



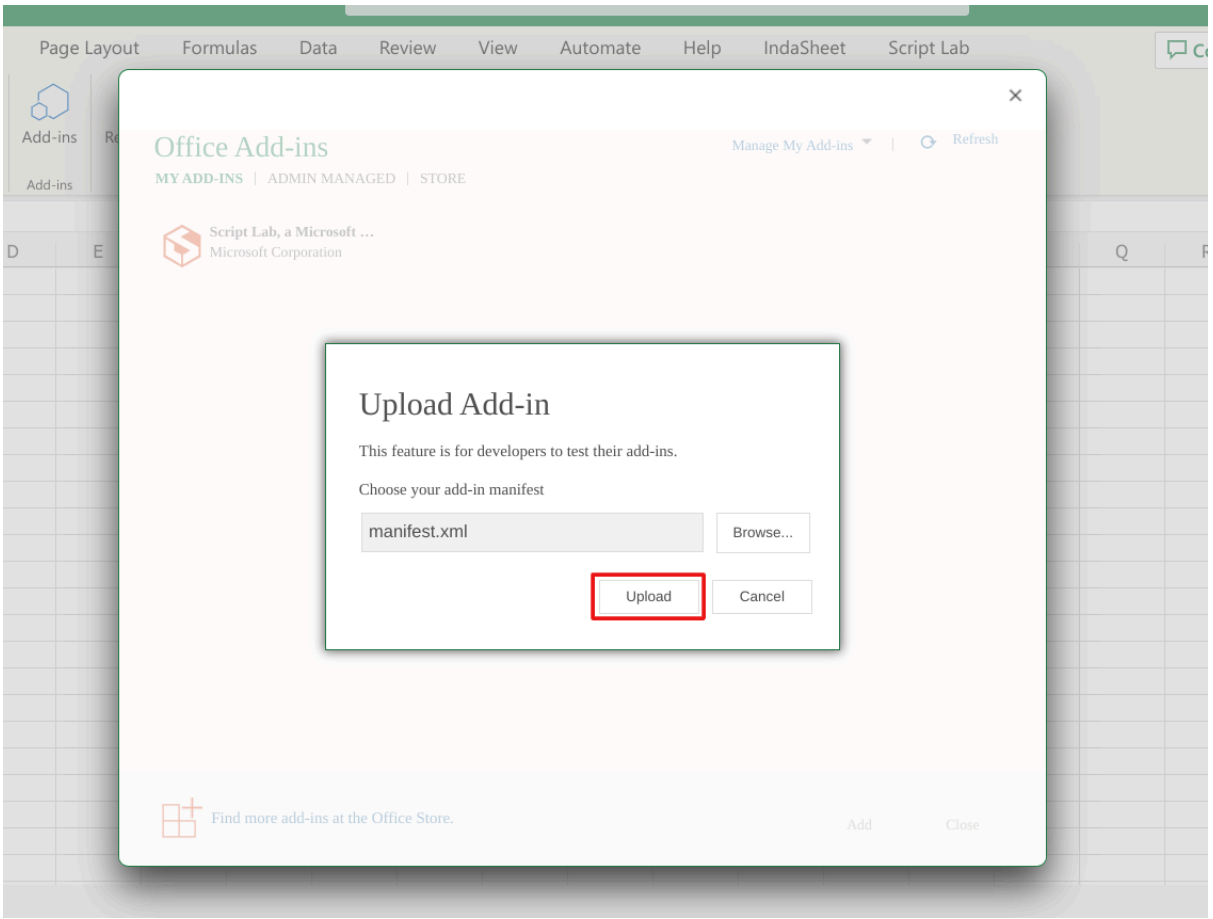
In the ribbon, access the menu **Insert / Add-ins**.



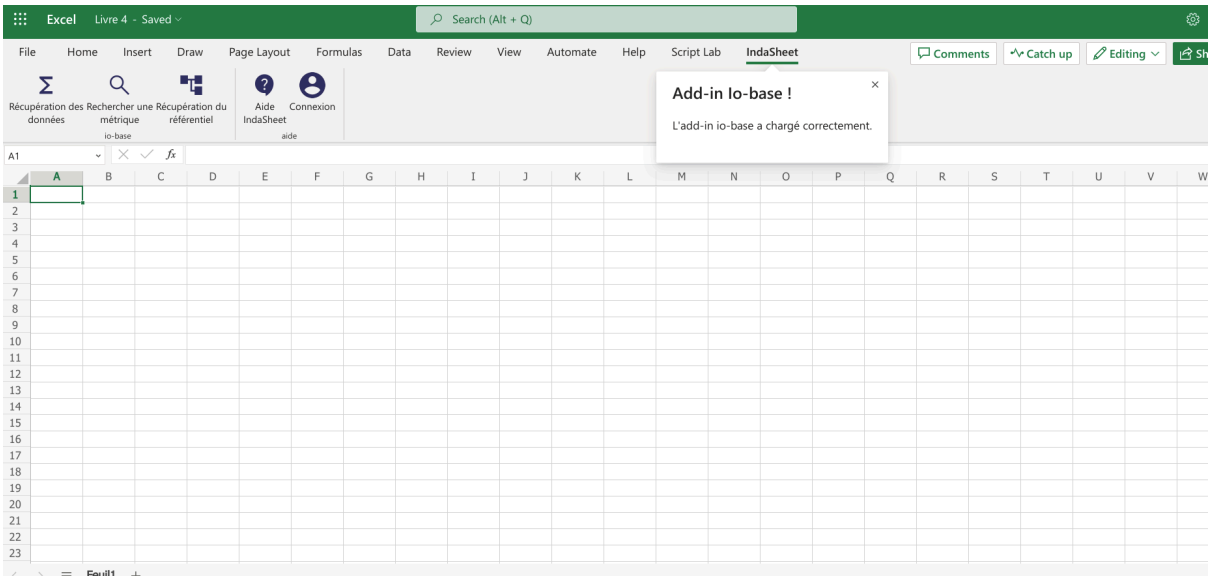
In the top bar, select **Upload my Add-in**.



Select the manifest.xml file, then click on **Upload**.



The **IndaSheet** add-in uploads, and appears in the ribbon.



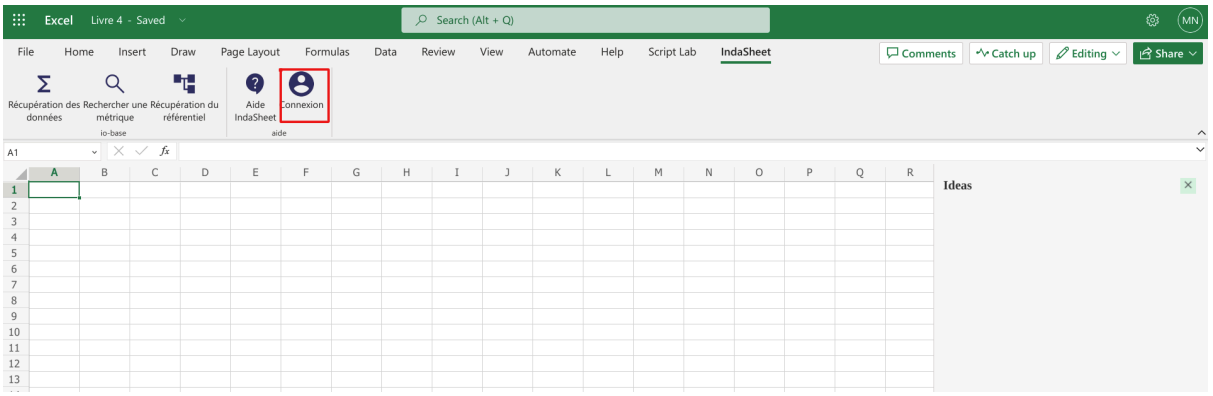
3. Connect to io-base

Prerequisite : having installed the IndaSheet module.

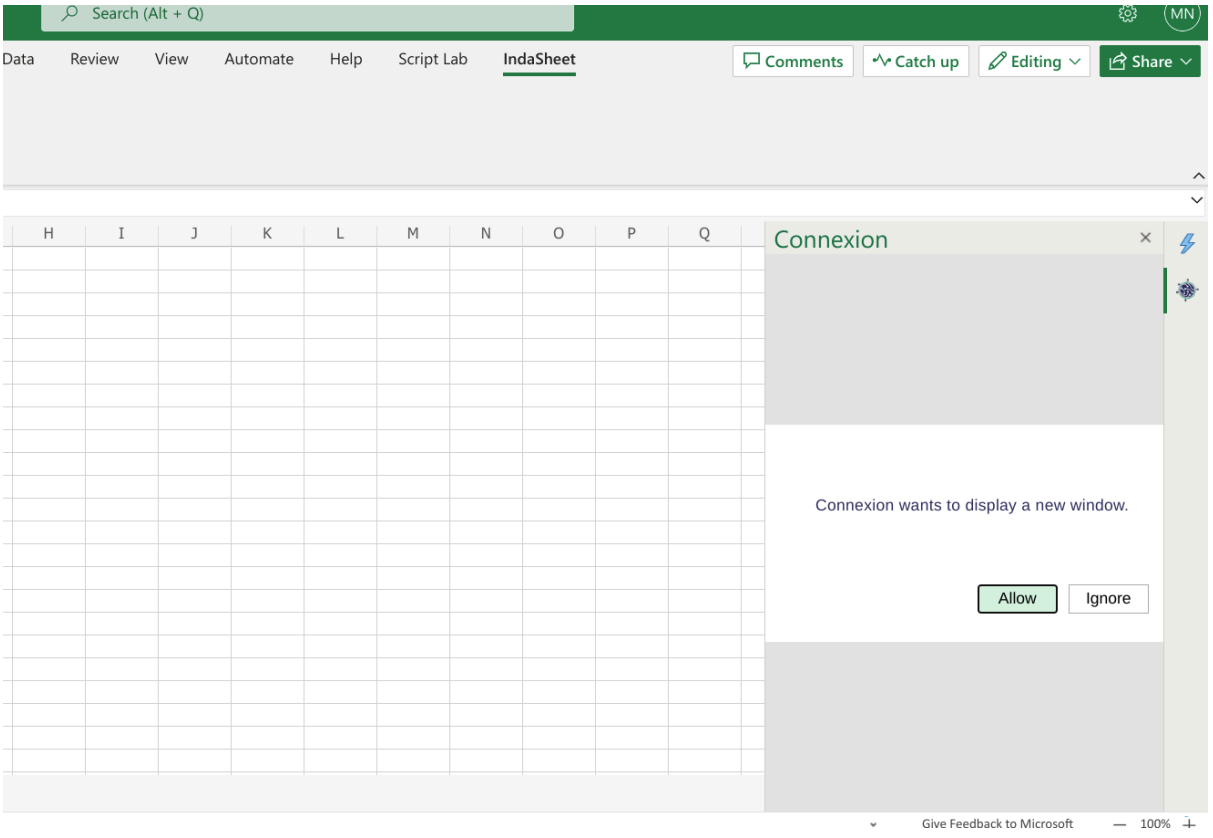
To be able to use the io-base functions in Excel Online, you must first establish the connection of the IndaSheet module with io-base.

Login from Excel Online

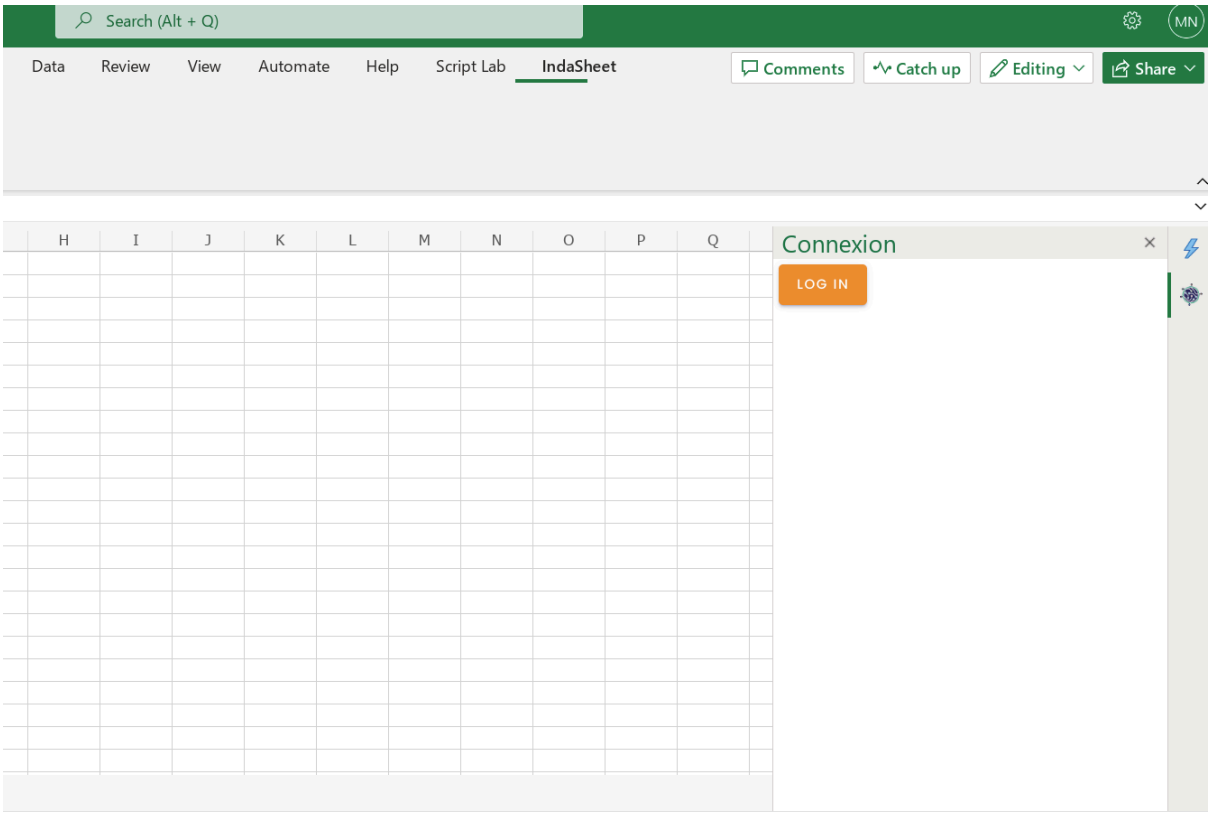
Open an Online Excel file. In the **IndaSheet** tab, click on the **Connect** button.



Note : On first use, an authorization message appears. Click on **Allow**.



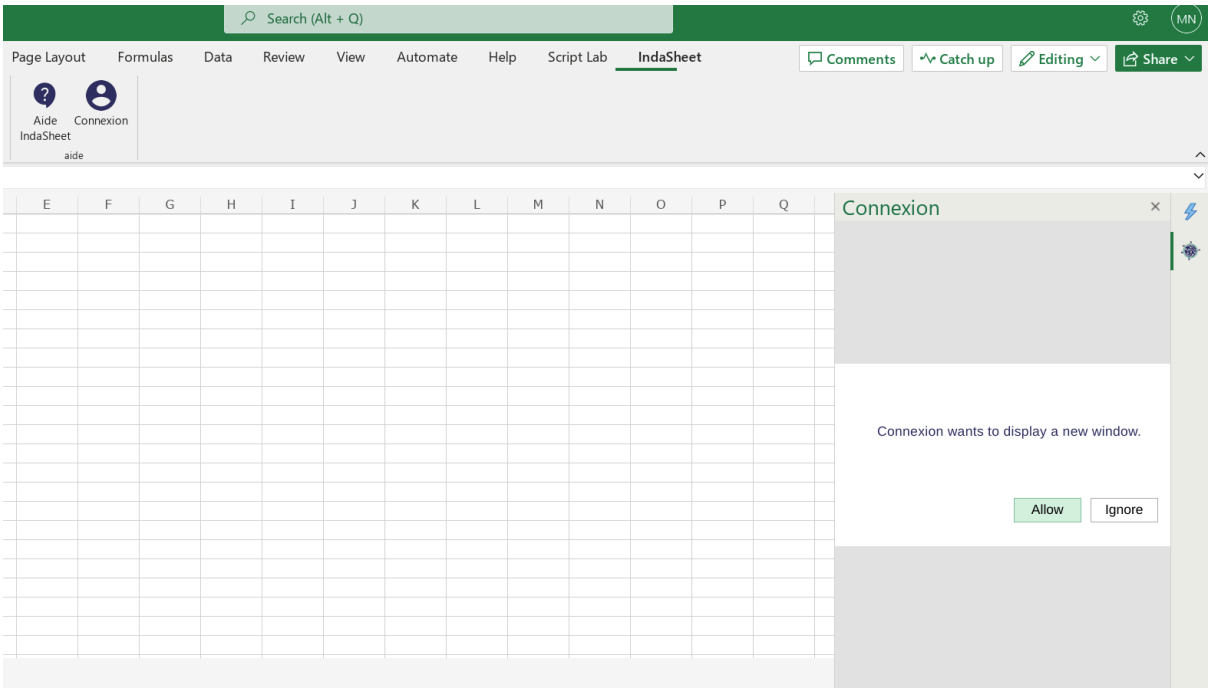
The right-hand menu displays the button for logging in. Click on **Log in**.



Note : Your browser must accept cookies.

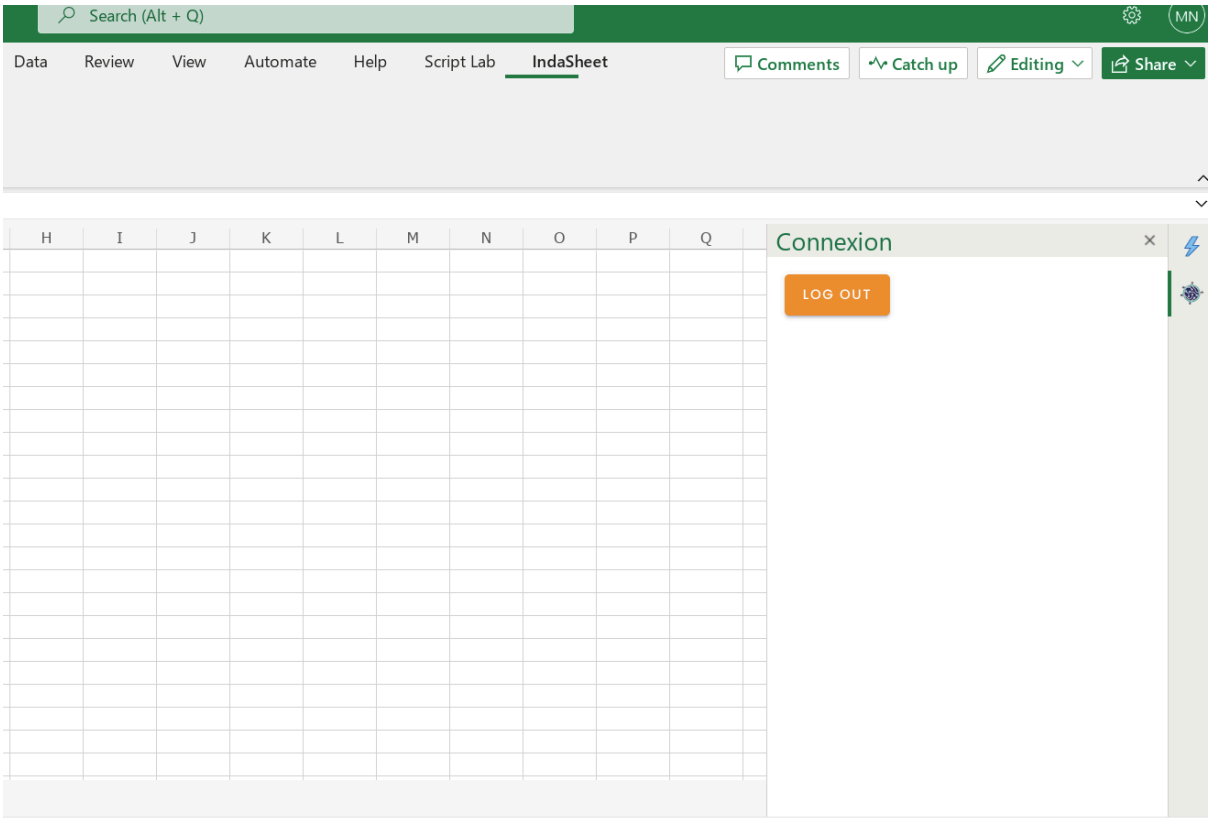
Note : On first use, an authorization message will appear. Click on Allow.

On the confirmation page, click on **Allow**.



Follow the usual io-base authentication screens.

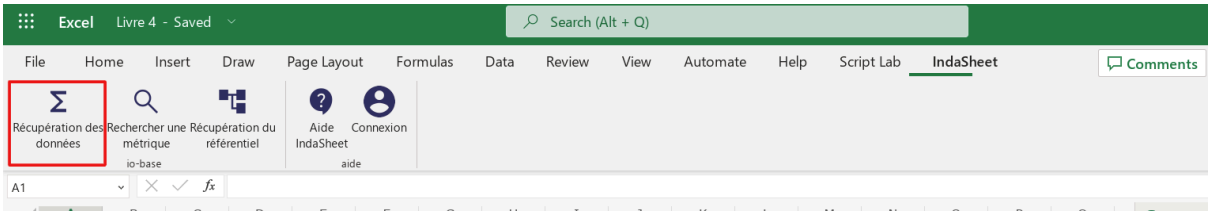
Once the connection is established, the windows close and the Connection menu contains the **Log Out** button.



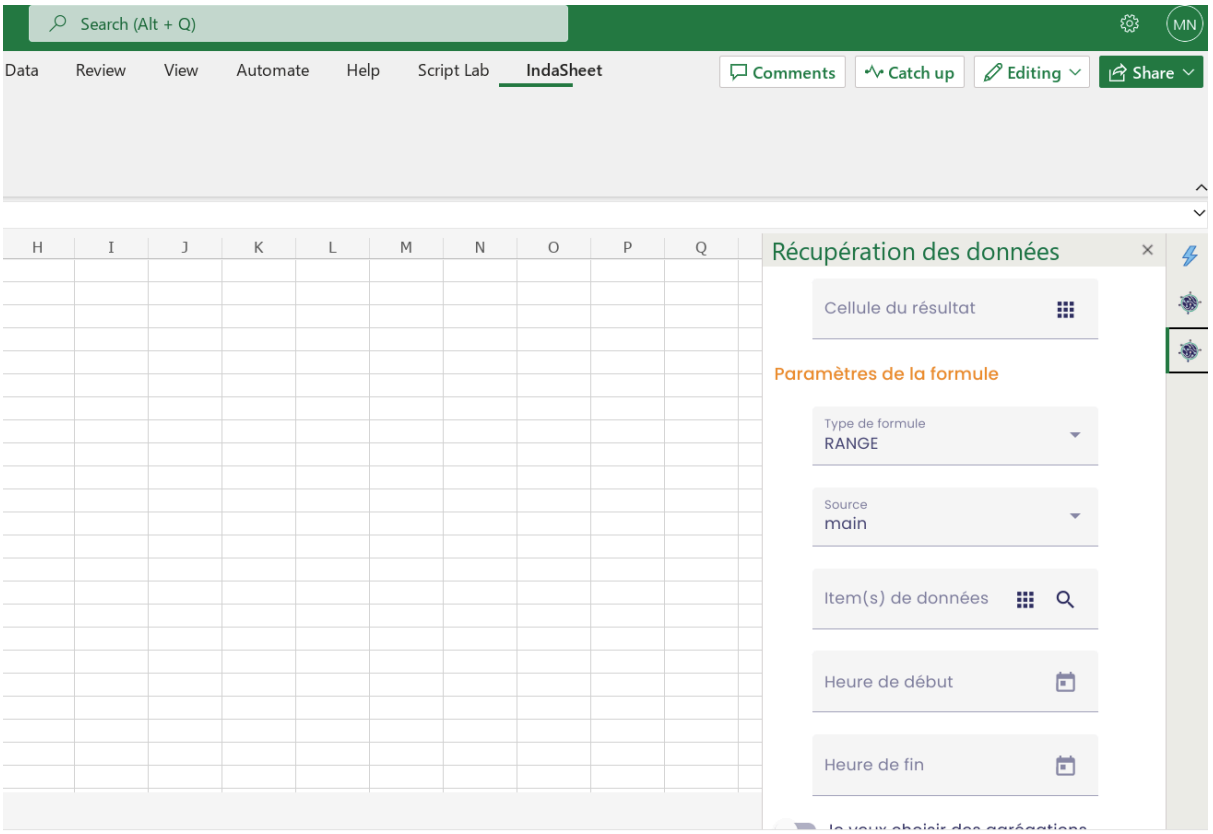
4. Date recovery - Interface

Prerequisite: log in to io-base from the IndaSheet module.

Open the **IndaSheet** tab and click on the **Data Recovery** button.



A ribbon on the right appears. It will allow you to enter the desired parameters, in order to query the io-base database and recover data.



4.1. Possible types of requests

You have the possibility to query the io-base with three different types of queries:

- **RANGE**: retrieve data for a metric between two dates
- **LATEST:** retrieve the last value entered in the database for one or more metrics
- **INSTANT**: retrieve the value entered on a date

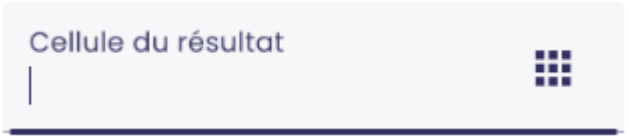
For the RANGE query, it is possible to choose an aggregation method for the data.

The panel on the right will assist you in constructing the formula, and entering it into the chosen cell. The formula will then work like any other formula in an Excel file. It will pull up, from its cell, all the raw data that is contained in the database, according to the defined parameters.

4.2. Construction of a formula

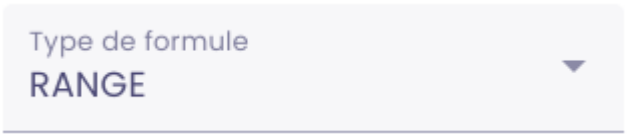
4.2.1. Result cell

The first field, **Result Cell**, is used to define the cell in which the formula will be entered. You must enter the cell reference ("A1" for example) in which the formula will be written (and therefore from which the results will appear). You can also use the grid icon, which will write the active cell in the field.



4.2.2. Parameters of the formula

This section will allow you to define the parameters of the query. First, choose the type of query to run in the **Formula Type** field.

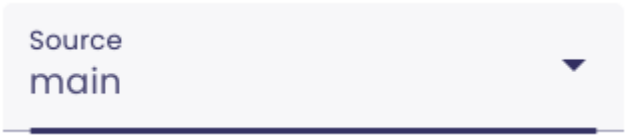


4.2.3. Types of formulas

4.2.3.1. Range formula

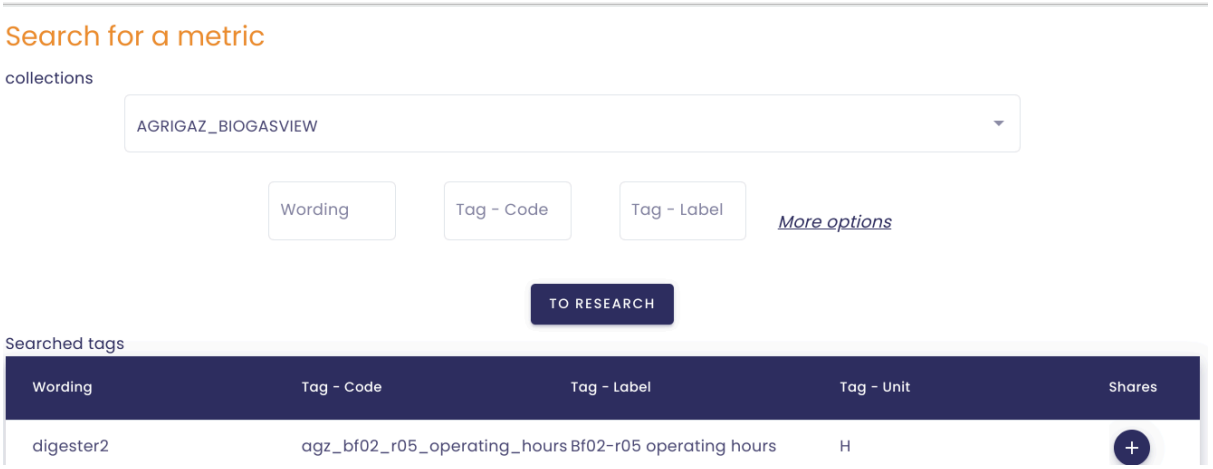
The **RANGE** formula is used to retrieve the values of a metric between two dates.

- **Source**: name of the database to be queried. This field is a drop-down list, which displays all the existing databases. In general, the production data is found in the **prod** database.



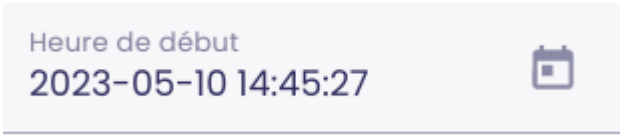
- **Data item(s)**: name of the metric for which data is to be retrieved. If the name of the metric is written in a cell, you can select it by using the grid icon. Otherwise, you can use the magnifying glass icon to display the search window.

Note: A message requesting permission to display the window may appear. For more details on the search window, please refer to the relevant article.

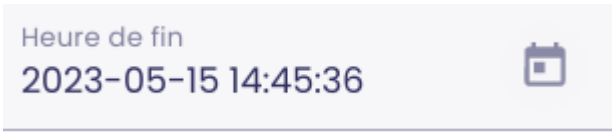


Note: For the **RANGE** function, only one metric can be entered at a time

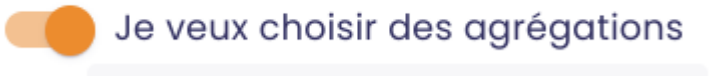
- **Start time**: date and time for the start of the data recovery range. You can enter a value directly, or use the calendar icon to select the desired date and time.
  Note: If you enter a value, it must be in the following format: yyyy/MM/dd, hh:mm:ss



- **End time**: date and time for the end of the data recovery range. You can enter a value directly, or use the calendar icon to select the desired date and time.
  Note: If you enter a value, it must be in the following format: yyyy/MM/dd, hh:mm:ss



- **Aggregations**: you can choose to retrieve raw or aggregated data. To set up the aggregation, you have to activate the button **I want to choose aggregations**.



Once activated, this button allows you to select the desired aggregation from a list.

You can choose between:

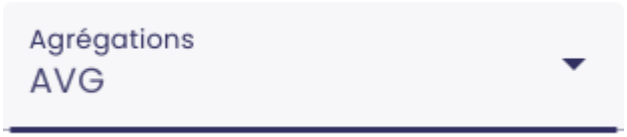
- MIN: minimum value

- MAX: maximum value

- SUM: sum

- AVG : average value

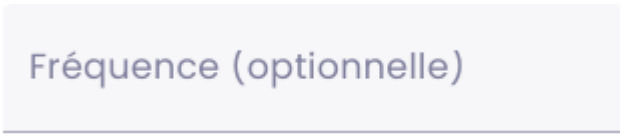
- COUNT : number of values



After the type of aggregation, you have to specify the **Frequency**. This frequency defines the interval in which the aggregation will be applied. For example, if you enter **MIN** for a frequency of **1d**, the query will return the minimum value for each day. You can enter a number of days, hours, minutes and seconds

(0d0h0m0s)

Note: The frequency is optional. If you do not enter a value, then the result will be the aggregation over the whole selected range. There will therefore only be one result value (for example the average value of the whole selected range).



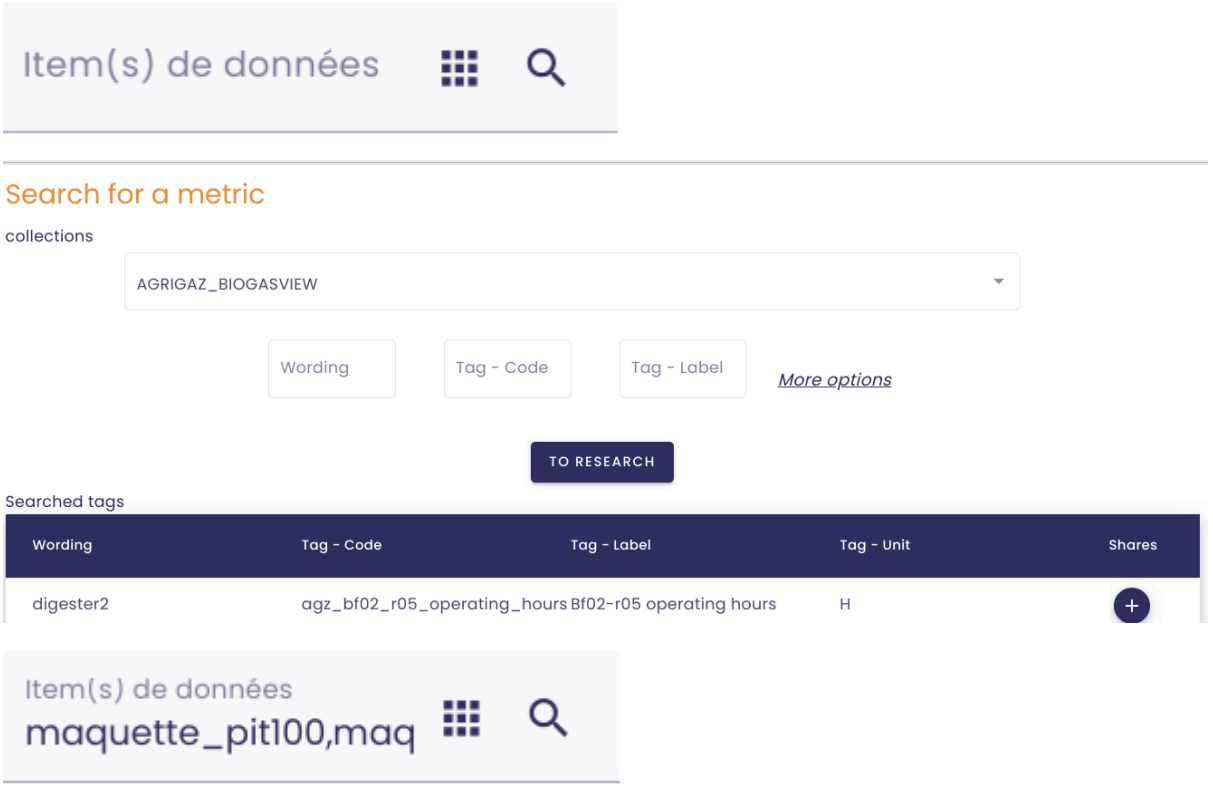
4.2.3.2. Latest formula

The **LATEST** formula will allow the retrieval of the last value registered in the database for one or several metrics

- **Source**: name of the database to be queried. This field is a drop-down list, which displays all the existing databases. In general, the production data is found in the **prod** database.

- **Data item(s)**: name of the metric(s) for which data is to be retrieved. If the name of the metric(s) is/are in a cell, you can select it using the grid icon. Otherwise, you can use the magnifying glass icon to display the search window.

Note: A message requesting permission to display the window may appear. For more details on the search window, please refer to the relevant article.



Note: For the **LATEST** function, it is possible to enter several metrics at the same time, separated by ";".

Note: If multiple metrics are selected, they must all be part of the same Source (same database). Otherwise, separate queries will have to be made.

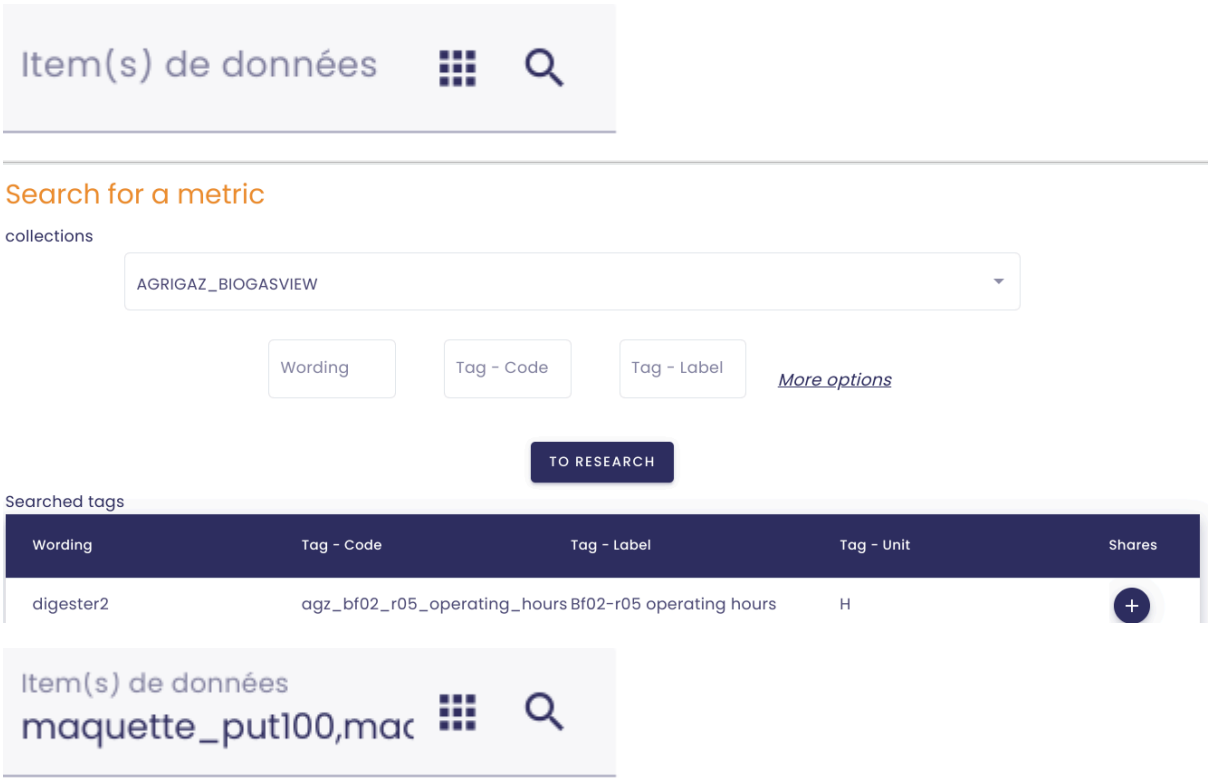
4.2.3.3. Instant formula

The **INSTANT** formula will allow the retrieval of the value entered at a given date.

- **Source**: name of the database to be queried. This field is a drop-down list, which displays all the existing databases. In general, the production data is found in the **prod** database.

- **Data item(s)** : name of the metric(s) for which data is to be retrieved. If the name of the metric(s) is/are in a cell, you can select it using the grid icon. Otherwise, you can use the magnifying glass icon to display the search window.

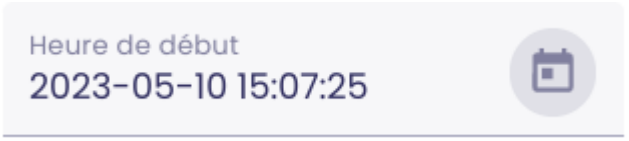
Note: A message requesting permission to display the window may appear. For more details on the search window, please refer to the relevant article.



Note: For the **INSTANT** function, it is possible to enter several metrics at the same time, separated by ";".

Note: If multiple metrics are selected, they must all be part of the same Source (same database). Otherwise, separate queries will have to be made.

- **Start time**: date and time for which you wish to retrieve the value. You can enter a value directly, or use the calendar icon to select the desired date and time.
  Note: If you enter a value, it must be in the following format: yyyy/MM/dd, hh:mm:ss



If no value exists at the exact timestamp selected, the query will retrieve the last value stored in the database just before the selected timestamp.

4.2.4. Display settings

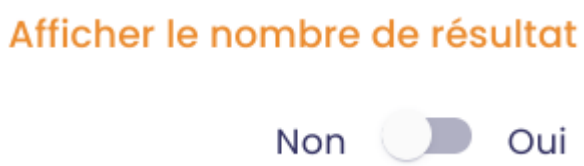
The following fields are used to set up the display of the results.

- **Display**: This button allows you to choose whether you want the results to be displayed, from the result cell, in rows or columns.

- **Timestamp**: Allows you to indicate whether you want the first column of results to contain the timestamps of the points. If you select **Without**, only the values will appear. If you select **With**, the first column will contain the timestamps, and the second the values.

- **Show the tag name**: If you choose **Yes** for this field, the first line will contain the name of the metric. Before the lines containing the results.

- **Display the number of results**: Allows you to display, before the results of the query, the number of results that have been returned.



Once all the fields have been filled in, you can click on **Apply.** The formula is constructed, and it is written to the result cell that is filled in.

The formula is created, and displayed in the selected result cell.

5. Data recovery - Formulas

Pre-requisite: log in to io-base from the IndaSheet module.

The IndaSheet module gives access to 3 new formulas in Excel:

- **IDB_RANGE** : recovery of the data of a metric between two dates
- **IDB_LATEST** : recovery of the last value written in base for one or several metrics
- **IDB_INSTANT** : retrieve the value entered at a date
- **IDB_DATE** : returns a date in ISO format, which can be used in io-base formulas

These formulas can be built using the interface (for more details, please refer to the article on the subject). They can also be entered directly in a cell.

5.1. IDB_Range formula

Signature of the formula

=iobase.IDB_RANGE(datasource;metric;start_date;end_date;aggregation;[interval];[displayInRow];[displayTimestamp];[displayCount];[displayMetric];[precision])

The last 6 parameters are optional. If they are not filled in, the default values are described below.

Details of the parameters

- datasource : STRING : name of the database (in general, the production data is in the prod database)
- metric : STRING : name of the metric
- start_date : STRING : start date of the range. This date must be in "yyyy-MM-ddThh:mm:ssZ" format (iso format).
- end_date : STRING : end date of the range. This date must be in "yyyy-MM-ddThh:mm:ssZ" format (iso format).
- aggregation : STRING : can contain the following values :
    - MIN : minimum value
    - MAX : maximum value
    - SUM : sum
    - AVG : average
    - COUNT : number of values
    - none : no aggregation
- [interval] : STRING : grouping to be applied to the aggregation. The possible values are in number of days (d), hours (h), minutes (m), seconds (s). Example 1d will return a value per day. This parameter is optional, it is only necessary if an aggregation is defined
- [displayInRow]: BOOLEEN: Allows you to define whether the values will be displayed in rows or columns. The possible values are :
    - TRUE: display values in column
    - FALSE: display values in line
    - By default, the values will be displayed in column.

- [displayTimestamp]: BOOLEEN: Allows you to define whether the timestamp should be displayed before the values. The possible values are :
    - TRUE: display the timestamp in the first row (or column as the case may be)
    - FALSE: only the values are displayed
    - By default the timestamp will be displayed.
- [displayCount]: BOOLEEN: Allows you to define whether the number of results returned should be displayed before the values. The possible values are :
    - TRUE: display the number of results before the values
    - FALSE: the number of results is not displayed
      By default, the number of results will not be displayed.
- [displayMetric] : BOOLEEN : Allows to define if the name of the metric should be displayed at the top, before the values. The possible values are :
    - TRUE: display the metric name in the first line, before the results
    - FALSE: the metric name is not displayed
      By default, the name of the metric is displayed
- [precision] : STRING : precision which will be applied for the calculation of the aggregation. Possible values are in number of days (d), hours (h), minutes (m), seconds (s).
  Example :
    - start date: 01/01/2023
    - end date: 31/03/2023
    - Aggregation: AVG
    - Frequency: 1d
    - Precision: 1h
    - The result of the query will be the average per day of the tag. By indicating a precision, we will force the query to make groups to improve the calculation precision. In this case, a first average calculation will be made every hour of the day. Then the average of all these averages will be done to obtain the value for the day. If in precision 1h had been entered, then the daily average would have been obtained by averaging all the hourly values.

      If the parameter is not specified, the same value as the interval will be entered.

Notes

- If an aggregation is selected, but no frequency is specified, then the calculation will be done on all the values in the range. For example, COUNT between two dates with no frequency will return the number of values in the base between the start and end dates
- if an aggregation is selected, but no value on one of the frequency groupings is found, then the value returned is 0.
- for the RANGE function, it is only possible to call one metric at a time

Examples

- =iobase.IDB_RANGE("prod"; B6; A3; B3; "AVG"; "1d"; FALSE; TRUE; FALSE; FALSE)

  With B6 = tag name
  A3 = 2023-01-01T00:01:00Z
  B3 = 2023-04-18T23:59:00Z

This formula will return the daily average value of the tag between 1 January 2023 and 18 April 2024. There will therefore be one value returned per day, displayed in columns. The first column will return the timestamp, and the second the value. The name of the tag and the number of results will not be displayed

2023-01-01T00:00:00+01:00	0
2023-01-02T00:00:00+01:00	0
2023-01-03T00:00:00+01:00	0
2023-01-04T00:00:00+01:00	600,3206043
2023-01-05T00:00:00+01:00	810,4521672
2023-01-06T00:00:00+01:00	898,1301838
2023-01-07T00:00:00+01:00	600,2896787
2023-01-08T00:00:00+01:00	600,3789783
2023-01-09T00:00:00+01:00	480,1776291
2023-01-10T00:00:00+01:00	-0,492512479
2023-01-11T00:00:00+01:00	-0,49943757
2023-01-12T00:00:00+01:00	-0,494618145
2023-01-13T00:00:00+01:00	-0,486430063
2023-01-14T00:00:00+01:00	-0,49760479

- To manage dynamic dates, it is possible to use Excel formulas. For example, a cell can contain the current date at 23:59, and refresh automatically with the following

formula:
=CONCAT(YEAR(NOW());"-";RIGHT(CONCATENER("0";MONTH(NOW()));2);"-";RIGHT(CONCATENER("0";DAY(NOW()));2); "T23:59:00Z")

The IDB_RANGE formula can then be based on this cell, which refreshes itself.

5.2. IDB_Latest formula

Signature of the formula

=iobase.IDB_LATEST(datasource;metric;start_date;end_date;aggregation;[interval];[displayInRow];[displayTimestamp];[displayCount];[displayMetric];[precision])

The last 3 parameters are optional. If they are not filled in, the default values are described below.

Details of the parameters

- datasource : STRING : name of the database (in general, the production data are in the prod database)
- metric : STRING : name of the metric
- [displayInRow] : BOOLEEN : Allows you to define whether the values will be displayed in rows or columns. The possible values are :
    - TRUE: display values in column
    - FALSE: display values in line
      By default, the values will be displayed in column.
- [displayTimestamp]: BOOLEEN: Allows you to define whether the timestamp should be displayed before the values. The possible values are :
    - TRUE: display the timestamp in the first row (or column as the case may be)
    - FALSE: only the values are displayed
      By default the timestamp will be displayed.
- [displayMetric] : BOOLEEN : Allows to define if the name of the metric should be displayed at the top, before the values. The possible values are :
    - TRUE: display the metric name in the first line, before the results

- FALSE: the metric name is not displayed
  By default, the metric name is displayed

Notes

- for the LATEST function, it is possible to call several metrics at the same time. To do this, separate the names of the metrics with ",".
- if several metrics are selected, they must all be part of the same Source (same database). Otherwise, separate queries should be made.

Examples

- =iobase.IDB_LATEST("prod"; "tag1,tag2"; TRUE; TRUE)

  This formula will return the last value in base for the tag1 and tag2 metrics. There will therefore be one value returned per metric, displayed in a row. The first line will return the timestamp, and the second the value. The name of the tag will be displayed.

tag1	tag2
2023-04-18T16:34:28.000+02:00	2023-04-18T16:34:58.000+02:00
09/02/1900 15:36	74,61

5.3. IDB_Instant formula

Signature of the formula

=iobase.IDB_INSTANT(datasource;metric;date;[displayInRow];[displayTimestamp];[displayMetric])

The last 3 parameters are optional. If they are not filled in, the default values are described below.

Details of the parameters

- datasource : STRING : name of the database (in general, the production data are in the prod database)
- metric : STRING : name of the metric
- [displayInRow] : BOOLEEN : Allows you to define whether the values will be displayed in rows or columns. The possible values are :
    - TRUE: display values in column
    - FALSE: display values in line

      By default, the values will be displayed in the column.
- [displayTimestamp]: BOOLEEN: Allows you to define whether the timestamp should be displayed before the values. The possible values are :
    - TRUE: display the timestamp in the first row (or column as the case may be)
    - FALSE: only the values are displayed

      By default the timestamp will be displayed.
- [displayMetric] : BOOLEEN : Allows to define if the name of the metric should be displayed at the top, before the values. The possible values are :
    - TRUE: display the metric name in the first line, before the results
    - FALSE: the metric name is not displayed

      By default, the metric name is displayed

Notes

- For the INSTANT function, it is possible to call several metrics at the same time. To do this, separate the names of the metrics with ",".
- if several metrics are selected, they must all be part of the same Source (same database). Otherwise, separate queries will have to be made
- if no value exists at the exact timestamp selected, the query will retrieve the last value recorded in the database just before the selected timestamp

Examples

- =iobase.IDB_INSTANT("prod"; "tag1,tag2"; "2023-04-11T14:45:43Z";FAUX;VRAI;VRAI)

  This formula will return the value in base just before the timestamp 2023-04-11T14:45:43Z for the tag1 and tag2 metrics. There will therefore be one value returned per metric, displayed in columns. The first column will show the

name of the tag, and the second the value. The number of results will not be displayed.

tag1	2023-04-11T16:41:53+02:00	43,62
tag2	2023-04-11T16:45:43+02:00	80,81

5.4. IDB_Date formula

Signature of the formula

=iobase.IDB_DATE([date])

The parameter is optional. If ever it is not filled, the formula will return the current date and time in the format here.

Detail of the parameters

- [date]: DATE: the date you wish to have in ISO format, for use in other io-base functions.

Examples

- =iobase.IDB_DATE(TODAY()+4)

Returns the current date + 4d

2023-04-25T00:00:00.000+02:00