USERGUIDE

METRON-ENERGY MANAGEMENT

POWERED BY METRON

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"METRON ENERGY MANAGEMENT (JOOL)" is a program that allows the collection, organisation and processing of a large amount of energy-related data in order to derive useful information. All intellectual rights related to the software, its illustrations and documentation are the exclusive property of Dapesco.

Discovering METRON ENERGY MANAGEMENT (JOOL)

1. Introduction

The successor to Emis, METRON ENERGY MANAGEMENT (JOOL) is a powerful energy data processing software that integrates analysis tools, anomaly detection programs, alerts, and a reporting system for energy optimisation.

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METRON ENERGY MANAGEMENT (JOOL) is accessible via a web portal and is a collaborative platform, which allows you to acquire a 360° vision of your energy behaviour to optimise your technical, financial and environmental performance.

METRON ENERGY MANAGEMENT (JOOL) can receive its data from multiple sources:

- Remote sensing data
- Manual data (via web encoding form)
- Invoices
- SAP
- …

Mainly used to monitor consumption data, METRON ENERGY MANAGEMENT (JOOL) can generate a wide range of information in various forms:

- Consumption monitoring graph with comparison to the previous year.
- The energy signature of an installation in relation to the degree days of the period under consideration.
- Consumption budgeting table based on consumption history.
- Generate automated monthly reports on the performance of a client's various sites
- Emission of alarms by e-mail or SMS when a trigger factor is reached (consumption exceeded, interruption of data reception, etc.)
- Assessment of the environmental impact of an installation based on its CO_2 emissions
- …

2. Note on the vocabulary used in METRON ENERGY MANAGEMENT (JOOL)

Many terms are used in METRON ENERGY MANAGEMENT (JOOL) to refer to all sorts of things. To avoid ambiguity, it is important to establish a vocabulary at the outset that will be used throughout this manual, and throughout the use of the software.

Name	Definition
Reference	Each object, whether it is a counter, a user or a spreadsheet, must be uniquely identified in METRON ENERGY MANAGEMENT (JOOL). To do this, each object is given a unique **reference**, which will be used by METRON ENERGY MANAGEMENT (JOOL) to unambiguously identify it. A **reference** must be unique, and may only contain numbers, letters and the underscore character '_', excluding any other special character.
Name	The **name of** an object in METRON ENERGY MANAGEMENT (JOOL) is a more humanly intelligible way of identifying it than the (sometimes unclear) reference. The **name of** the objects does not have to be unique in the DB, which allows to have several meters called "electricity meter" on different buildings for example. **Names** can contain any characters, including special characters.
Temporal context **Context**	When running an analysis in METRON ENERGY MANAGEMENT (JOOL), the **time context** is the period of time to which the analysis relates. A **context** therefore has a start date/time (**from**) and an end date/time (**to**).
Selection	The **selection of** a tool is the collection of entities and/or counters on which it will be executed. It therefore represents the perimeter on which the tool should be executed, in terms of entities (sites or others) and/or counters.
Entity	An **entity** is an element of the tree structure that does not contain its own data flow. A site, a building or a CPE group can be an entity. **Entities** can be linked to each other by kinship or by logical links, and they can be linked to counters by specific links (of type "ENTITY_METER"). By abuse of language, the term "**entity**" is often used to encompass the entities themselves (sites, buildings...) and the count points.
Metering point **Counter**	A **metering point** is an element of the tree structure on which values are measured, be it consumption or otherwise. It can be a physical meter, a temperature sensor, or even a calculated virtual meter. **Counters** can be linked to each other by parentage or by logical links, and they can be linked to their corresponding entities via links of type "ENTITY_METER".

Channel	A **channel is** a part of a metering point that contains a data profile. A **channel** is always included at a metering point but a metering point can have several **channels**, for example a dual time meter that would contain a peak and an off-peak channel. The data profiles stored in the channels can consist of remotely collected data, manually collected data, data from invoices, or purely calculated data from other channels.

Kinship	**Parentage links** between entities are membership links from one entity to another. The parent of an entity is the larger entity that contains the original entity. For example: a "Building" entity can be the parent of several "Floor" entities, each one representing a floor of the building, and each "Floor" can then be the parent of several "Area" entities dividing each of the floors. An entity can only have one parent, but each parent can have several children. In METRON ENERGY MANAGEMENT (JOOL), kinship relationships are limited to relationships between entities themselves or between counters. They are not used to link counters to entities.
Logical links	Links between entities that are not kinship links are called "**Logical Links**". Logical links are categorised into types to enable the relationships between entities to be qualified. For example: a link of type "WEATHER" would make it possible to link an entity to the nearest weather station meter. Another example: the "ENTITY_METER" links connect entities to their associated counters.
Tree structure	The **tree structure is** the structure containing and linking all the entities and count points in a client's database. The **tree structure is** the actual structure, based on the kinship links between entities or counters, and the logical links of any kind that may connect entities and counters to each other.
View	A **view** is an overlay of the tree view, displayed in the selector at the bottom left of the METRON ENERGY MANAGEMENT (JOOL) interface. **Views** allow entities and counters to be visually reorganised to present the client with a structure that is convenient for them. It does not necessarily reflect the real tree structure of the client's database.
Dataset	A **dataset is** a database extract used by administrators, which METRON ENERGY MANAGEMENT (JOOL) can use as a basis for analysis.
Spreadsheet **Worksheet**	Also an administrator's term, the **worksheet** is a table that performs all the calculations necessary for a METRON ENERGY MANAGEMENT (JOOL) analysis. These **worksheets** can be based on the dataset to feed itself with data, or on other preparatory **worksheets**.
Xtab	An **Xtab** is an array of fixed data. It is structurally similar to a worksheet, but the data it contains is not calculated dynamically but stored "hard" in the database. For example: an Xtab could contain a list of electricity consumption tariffs for a customer. One column would show the start date of the tariff and another column would show the actual tariff cost.

Widget	A **Widget is** a basic graphical representation of a METRON ENERGY MANAGEMENT (JOOL) analysis. It can be a graph, a table of results, or simply a text box. A **Widget is** based on the data of a worksheet and puts its data in the desired form for display to the user.
Dashboard	**Dashboards** are composites of several widgets, formatted for display to the user. These **dashboards** can be sent as PDF reports or simply displayed on the screen.
Tool **Analysis**	**Tool**, or **analysis**, is the generic term for an element that can be displayed to a user. This term therefore includes Xtabs, widgets and dashboards.

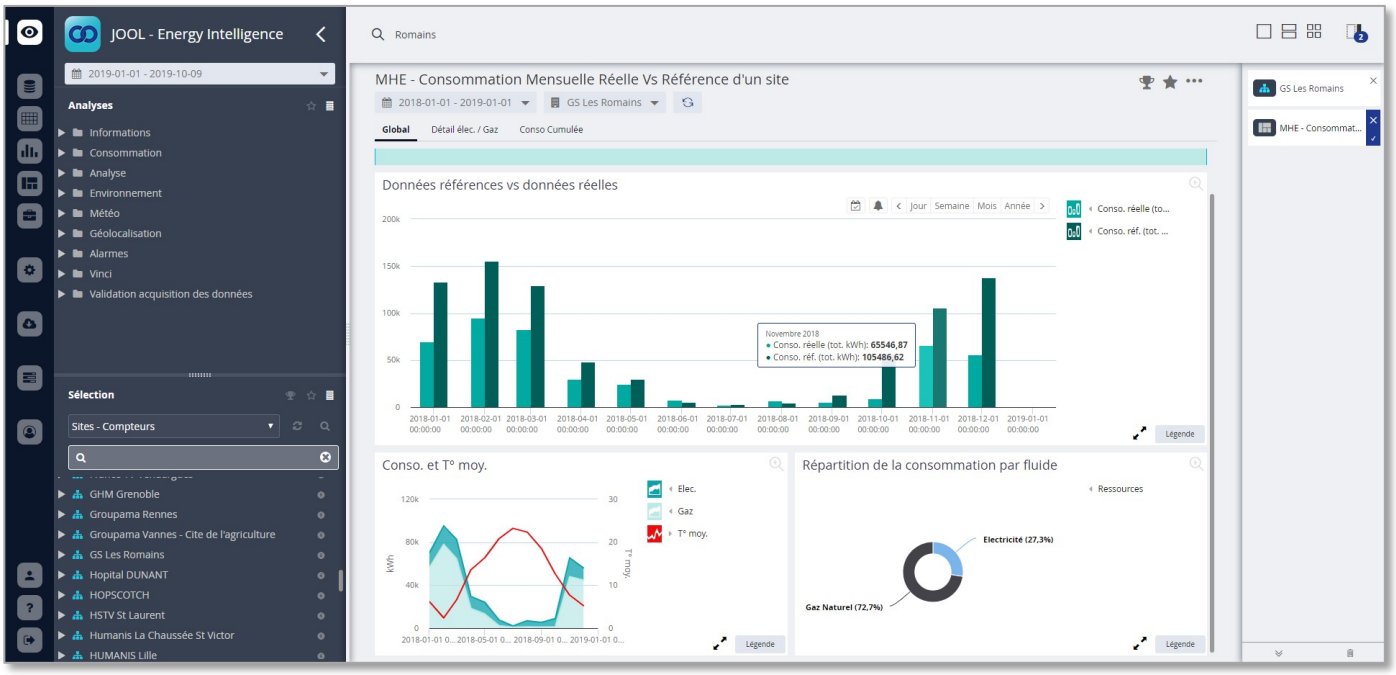
3. How to access METRON ENERGY MANAGEMENT (JOOL)

METRON ENERGY MANAGEMENT (JOOL) is a web application, so access is via a specific URL address per client, accessible via user-specific identifiers.

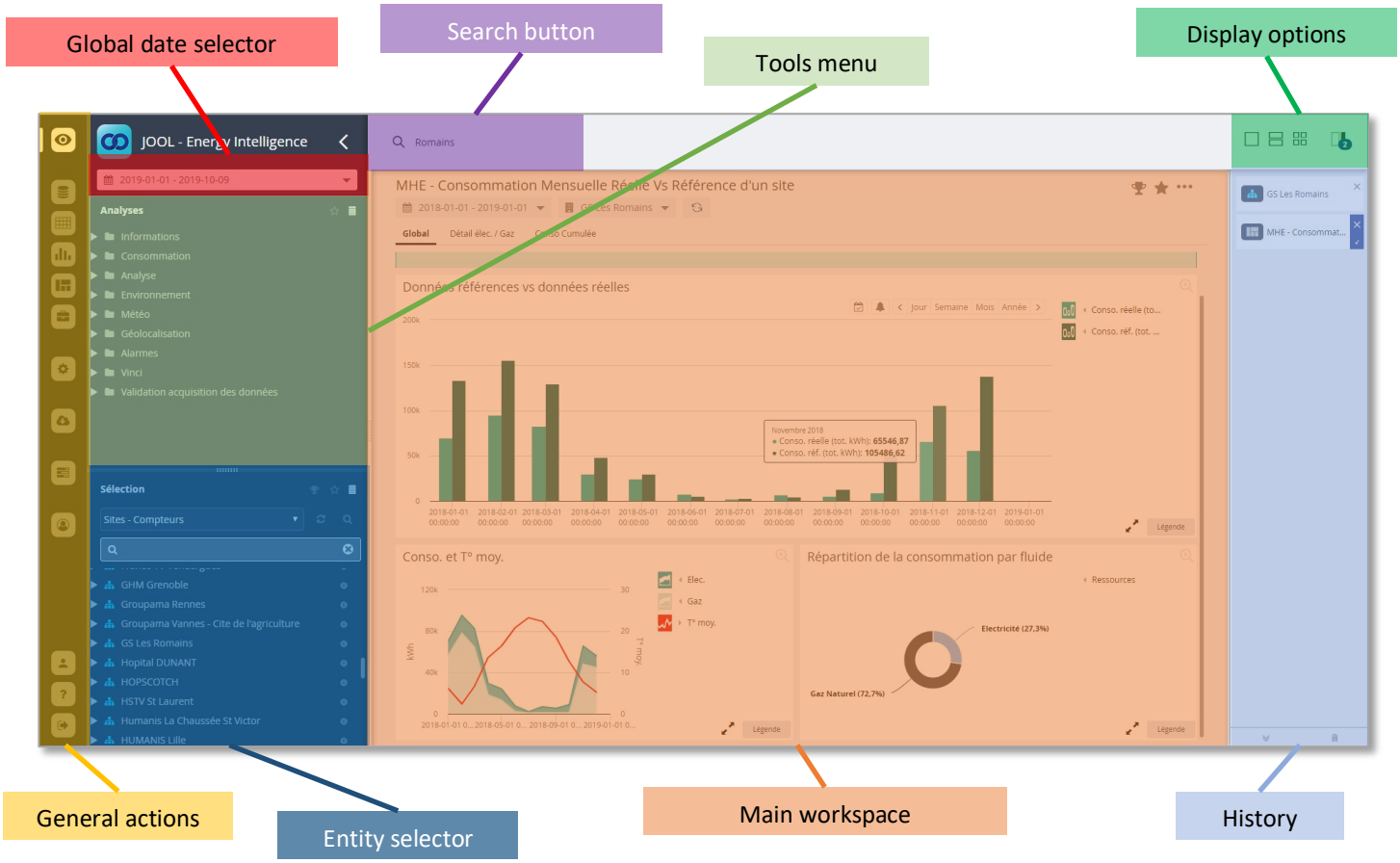
The "remember me on this device" checkbox avoids having to log in again each time you visit. Once in the system, using the logout button will remove this automatic login.

4. What METRON ENERGY MANAGEMENT (JOOL) looks like

The METRON ENERGY MANAGEMENT (JOOL) platform is as follows:



This interface can be broken down into several areas:



- **General Actions**: This bar contains several icons leading to the various levels of METRON ENERGY MANAGEMENT (JOOL) programming available to the user. This is where the user will access the various editors, the import interface, or their user profile.

- **Global date selector**: allows you to select a time context which, unless otherwise specified, will be valid for all tools.

- **Tools menu**: List of tools available to the user, sorted into directories for ease of use.

- **Entity selector**: Allows you to choose the entity(ies) (and/or counter(s)) on which you want to use the tools. These entities/counters are organised in views.

- **Search button**: Opens a field to find an entity or a counter.

- **Main workspace**: The main work area will contain the results of each calculated tool. This area can be divided into 1, 2 or 4 to display one or more tools simultaneously.

- **Display options**: This area contains several buttons that allow you to split the main workspace to display 1, 2 or 4 tools at the same time. A final button allows you to show or hide the "history" pane.

- **History pane**: This area will contain a list of tools that have been opened since the beginning of the user's session.

5. General actions

The general tools icon bar allows you to open the different aspects of the system, such as the viewer mode, the tool editors, the bulk imports...

Not all icons are available to all users, as their rights configured in METRON ENERGY MANAGEMENT (JOOL) define which interfaces each user will have access to.

	**Viewer" mode**: This mode allows the execution of pre-existing tools on the entities selected for a given time context. It also allows the user to view the entity/counter records accessible to the connected user, and to modify them if he/she has the right to do so.
	**DataSet Editor**: This editor allows you to create/modify DataSets that perform extractions from the database, serving as the basis for the tools.
	**WorkSheets Editor**: This editor allows the creation of worksheets, which can be based on DataSets or other Worksheets, or even directly on the DB, to calculate the values that will be used in the tools. This is also where Xtabs, fixed data tables, not dynamically calculated, can be built.
	**Widget Editor**: Based on a worksheet, a widget is a tool for displaying data in a predefined form. Widgets come in a variety of forms, such as graphs, tables, gauges, HTML blocks, etc.

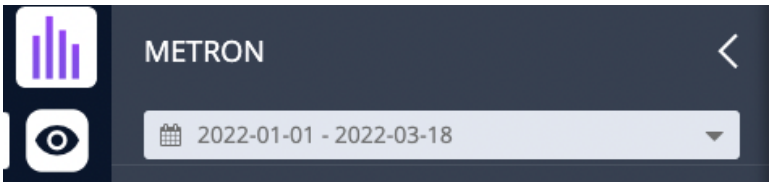
	Each widget will be based on a preparatory worksheet and will display the data in the configured form.
	Dashboard **Editor**: This editor allows you to create composite dashboards, combining several existing widgets into one dashboard.
	**Report Editor**: This HTML editor allows you to build dynamic HTML pages, which can then be integrated into dedicated widgets, or converted to PDF and emailed to a recipient to serve as a regular report, for example.
	**Configuration**: In this interface, which is only accessible to advanced users, there are several configuration interfaces for defining most aspects of METRON ENERGY MANAGEMENT (JOOL). - A configurator that allows you to define the properties and property blocks associated with each type of database object (entities, counters, channels, users, etc.). - An alarm configurator, where you can define the expected behaviour of various alarms applicable to channels. - A type configurator, where you can define the categories (types) available for each object in the database. - A menu builder, to build the METRON ENERGY MANAGEMENT (JOOL) tools menu - A view manager, allowing to define all kinds of views for the entity explorer.
	**Data import** : The bulk data import interface allows you to inject data into METRON ENERGY MANAGEMENT (JOOL), whether it be properties or data profiles.
	**Task Manager**: This is where you can set up automatic reporting, alarm raising, and any other automatic tasks that METRON ENERGY MANAGEMENT (JOOL) can handle.
	**User rights management**: This page allows you to define functions (defining access to METRON ENERGY MANAGEMENT (JOOL) tools and functionalities), scopes (defining access to entities/counters), and to combine them to constitute user rights.
	**My Profile**: This button opens a pop-up containing a list of information about the loggedin user, as well as several options for customising METRON ENERGY MANAGEMENT (JOOL), such as the choice of decimal separator, preferred date format, and the user's time zone.
	**Support**: This button opens a pop-up window showing the various support services to which the user has access (online wiki, ticket management, etc.).
	**Logout**: Logs the user out of METRON ENERGY MANAGEMENT (JOOL), disabling the "remember me" option on the home screen at the same time. Once logged out, you will have to log in again using your login details.

6. Display options

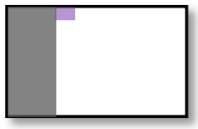
The first 3 buttons allow you to prepare the workspace by splitting it to display 1, 2 or 4 tools simultaneously.

The last button allows you to display or hide the "browsing history" pane, which shows the list of tools already open on the right of the screen.

Similarly, the < symbol at the top left of the page, to the left of the search field, is used to hide the lefthand pane, containing the context, tool and entity selectors.



7. Search button



The search button at the top of the page allows you to search for an entity or counter based on its name or reference.

When you start typing the text you are looking for, METRON ENERGY MANAGEMENT (JOOL) suggests the entities and counters containing this text. The results show the name, icon and reference (in light grey) of each entity/counter corresponding to the search criterion.

Clicking on it then opens the record of the chosen entity, showing all its details and properties.

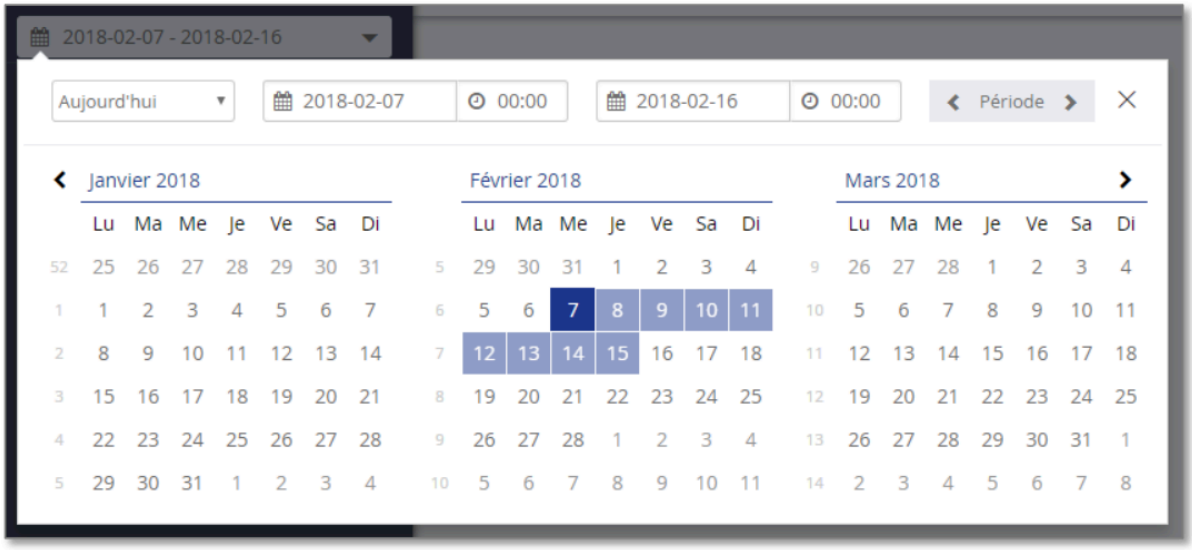
8. Global context selector

This date selector allows the user to select a global time context to work in.
When a tool is run, this is the context that will be passed to it when it is opened.

This global context can then be modified on a case-by-case basis for each tool, if necessary, via the specific context selectors for each tool (see the description of the workspace below).

A. Time context selectors

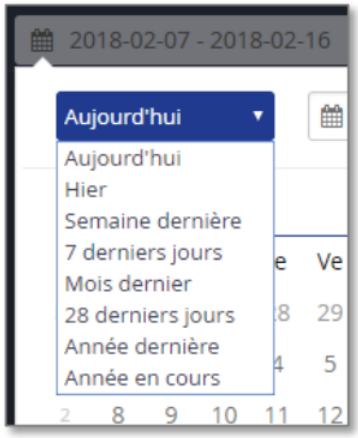
Whether it is the global context selector or those present in each dashboard, the temporal context selectors in METRON ENERGY MANAGEMENT (JOOL) all look like this:



At the top left of the selector there is a drop-down list to select a predefined time context.

These contexts are based on the current date and allow the recovery of yesterday, last week, last year...

This is a quick way to retrieve the most frequently used temporal contexts.



At the top of the selector, there are 4 fields for manually entering the start and end dates and times of the context.

This is the only way to specify the start and end times of the context, as the other methods always round up to the beginning of the selected day.

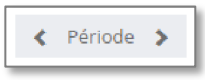
In the rest of the selector is the calendar, displaying 3 months, and allowing a visual selection of the desired context. The first click on a day of the calendar defines the beginning of the context, and a second click will define the end of the context.

Note: The days clicked are included in the context in their entirety. Clicking from 7 to 15 February will therefore generate a context from 7 February 00:00 until **16** February 00:00 (end of day of the 15th).

In the calendars, it is possible to click on the month name to select the whole month, and it is also possible to click on the week number (in grey, to the left of each month), to select the whole week.

The symbols **< and >** on the **far** left and far right of the calendar months allow you to change the months displayed.

Once a period has been selected, it is possible to move to the next or previous similar period using the Period **< and >** buttons at the top right of the selector.



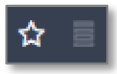
If the current period is a week, these buttons will move to the previous/next week. If the current period is a whole month, they will move to the previous/next month. If it is any period of ***n*** days, the buttons will move to the previous/next period of ***n*** days.

9. Entity/counter selector

In order for the requested analyses to be relevant, they must be told which entity(ies) and/or counter(s) they should focus on. To do this, you must use the global entity selector at the bottom of the grey area on the left of the JOOL interface.

This selector can operate in two modes; the 'favourites' mode which lists the entities and counters that have been marked as favourites by the logged in user, and the 'full' mode which displays the full views, containing the channels to which the user has access.

The star and table buttons at the top right of the selector switch allow you to switch between the two modes.

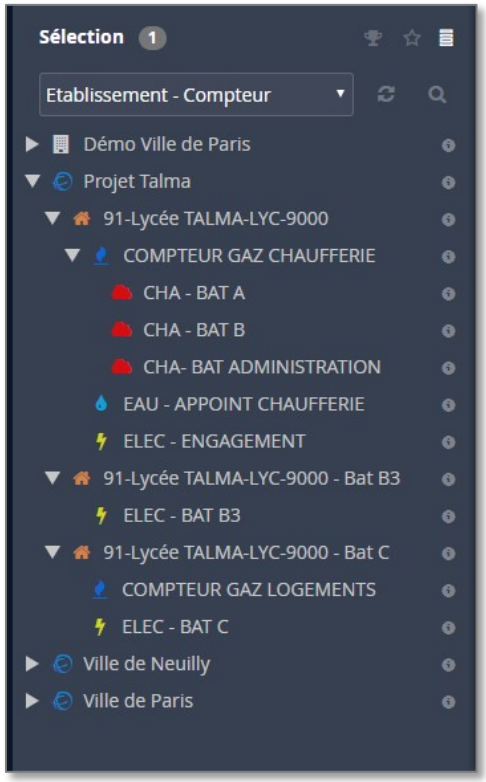


Favourites" mode

Lists only those entities and counters that have been marked as "favourites" for the logged-in user.

Full mode

Resumes the views containing the entities and counters to which the logged-in user has access.



A. Full mode

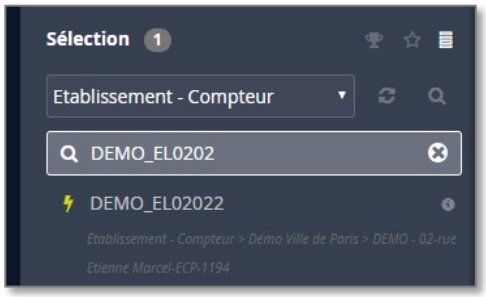
In the "full" mode, entities and counters are organised in views, configurable by METRON ENERGY MANAGEMENT (JOOL) administrators. At the top of this "full" mode, there is a drop-down menu to change the view displayed.

Also in "full" mode, the small cup-shaped button at the top right of the selector allows you to set the currently displayed view as the user's default view. This is the view that will be opened first each time the user logs on.

The button with the two arrows in a circle forces a reload of the displayed view. This can sometimes be useful when changing the definition of views and wanting to update the display.

Finally, the magnifying glass button opens a search field, which will filter the current view to keep only the entities and counters matching the filter.

Below the name of each filter result, a dark grey line will appear, indicating the path to that result in the current view.



B. All modes

For each counter or entity, to the right of its name, there is a small "info" symbol which opens the file for this entity in the main workspace. This sheet will contain all the information related to it and will allow editing it if necessary.

C. Make a global selection

Once the desired entities/counters have been found in the favourites or in the views (possibly via a search), you can then click on their names to make a global selection.

A selected entity will have its name displayed in bold in the selector, and a number will appear to the right of the title at the top of the selector, counting the number of objects in the current global selection.

A single click on the name of an entity will clear the current selection and replace it with the entity in question. A double-click will add the entity to the selection, without removing the other entities already selected.

The selection made here will be a global selection. This is the selection which will be used by default in all tools which will be opened later (as is also the case for the global temporal context). This selection can later be overwritten by a local selection, specific to each analysis (see, in the description of the workspace).

If one or more analyses are open when the global selection is changed, the local selections of each open analysis (displayed in the workspace) will be replaced by the new global selection.

10. Choice of analysis to be displayed

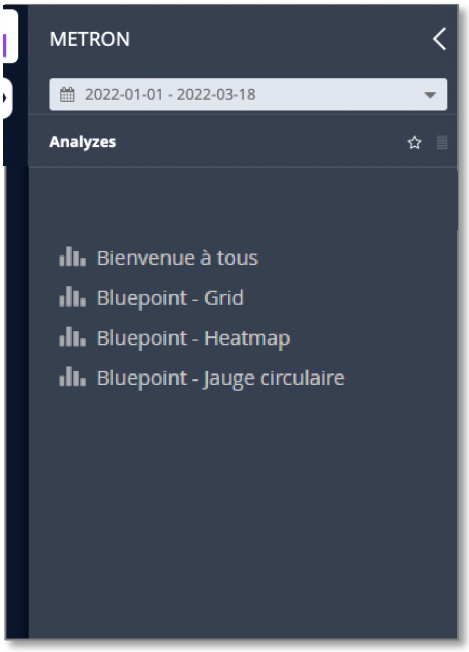
The upper part of the grey area on the left of the METRON ENERGY MANAGEMENT (JOOL) window contains the analysis selector. This is where you can choose which tool to use and which analysis to display in the main working area.

In this analysis menu, one can find dashboards (composites of several widgets), individual widgets or Xtabs (fixed data tables) that the administrator has decided to make available to users.

The small logos at the top right of the area allow the analysis selector to be used in two different modes: the star leads to the "favourites" mode and the table leads to the "full" mode

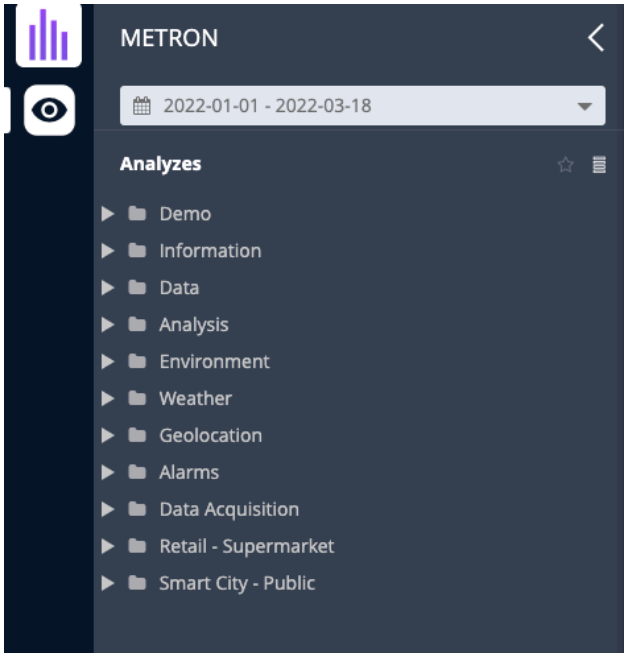
Favourites" mode

Lists only those analyses that have been marked as "favourites" for the logged-in user.



Full mode

Lists all analyses to which the logged-in user has access.
These analyses are grouped in directories whose structure is defined by the METRON ENERGY



Whichever mode you choose, clicking on any of the analyses will run it and display the result in the main work area. If this work area was already occupied, the currently displayed results are minimised in the history pane and replaced by the new results.

If the work area was split to display multiple results, the new analysis pushes the tools already displayed and the oldest is minimised in the history pane (first in first out).

11. Main workspace - Preparation

Most of the METRON ENERGY MANAGEMENT (JOOL) interface is dedicated to the main workspace. This is where the analysis tools are opened, the forms of the entities to be observed, the dashboards...

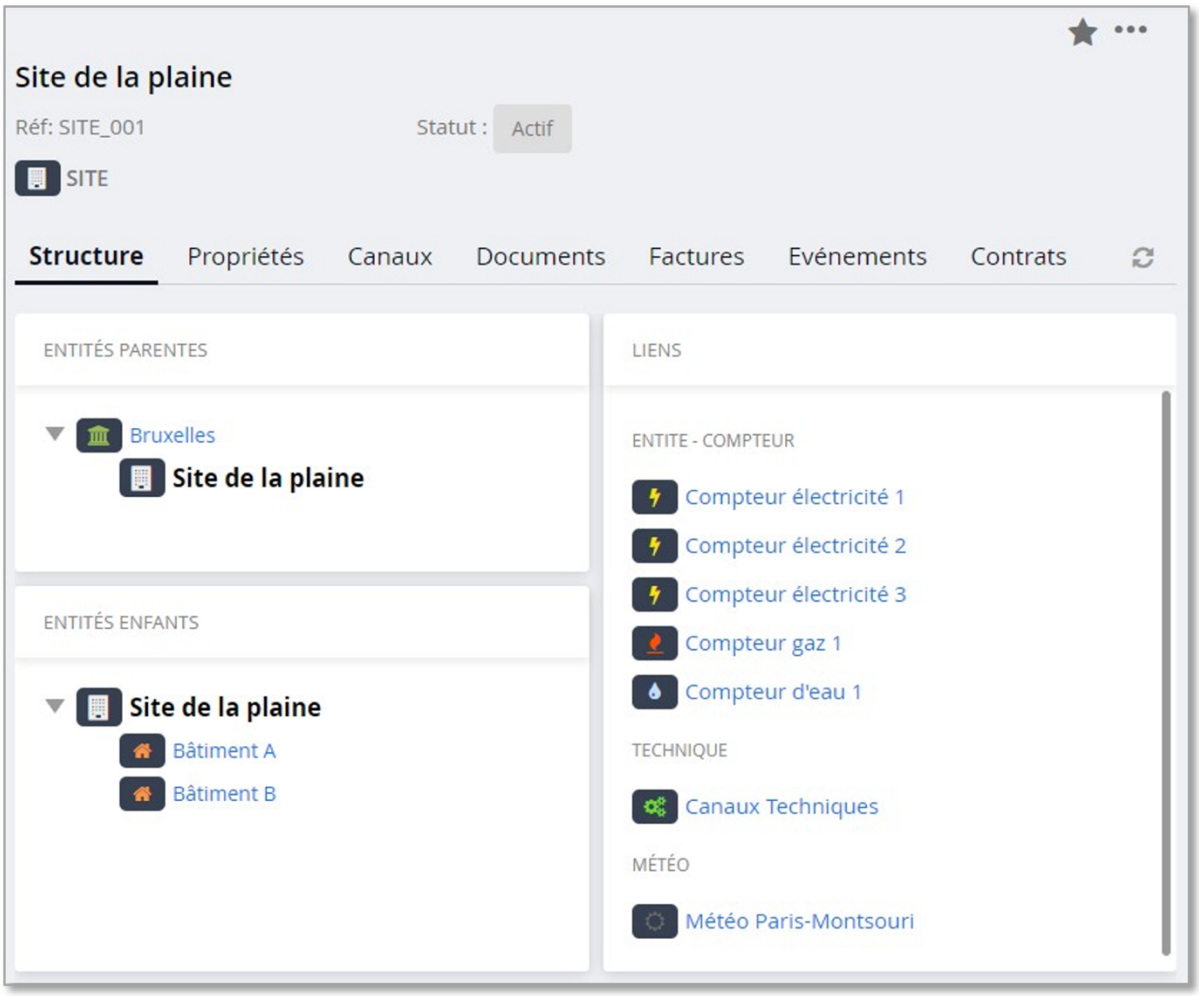
This workspace can hold 1, 2 or 4 components simultaneously, but this requires the display to be prepared using the display options buttons at the top right of the page.

Each time a new tool or file is opened, the new tool will take the place of the first tool displayed, pushing the others in the direction of the reading, possibly ejecting the oldest of the open tools. The latter will then no longer be displayed but can be retrieved from the history pane.

12. Main workspace - Entity sheet

When the "info" button of an entity/counter is clicked in the entity selector, or when a result proposed by the search button is clicked, the record of the chosen element is opened in the main workspace.

A classic form looks like this:



A. General information

In the header of this sheet, you can find the general information associated with it. At the top left, we have its name, then its reference in grey. Just below, we find the icon associated with the entity as well as its type. (Here, it is a "SITE" type, but it could be an "ENTITY", or a "METER" (counter), or any other type predefined in the database)

Next to this, there is a "Status" button to enable or disable an entity/counter as required. The button opens a pop-up to define the inactive periods of the entity/counter, and this status information can then be used in the formulas to exclude inactive meters from consumption balances for example.

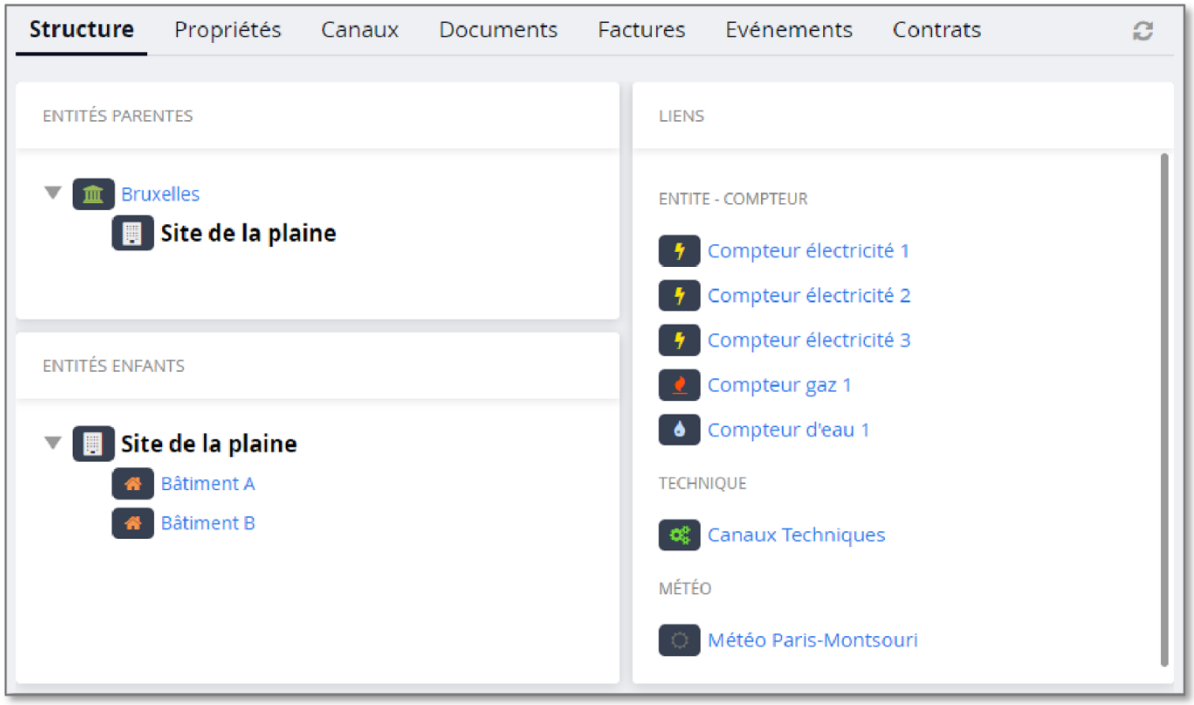
At the top right there are two buttons: 

- The first one in star allows to mark this entity as a favourite (it will then appear in the list of favourites, in the entity selector in favourites mode)

- The button with the small dots opens a list of options to edit, minimize or close the record, or to add the displayed entity/counter to the active selection. Editing is obviously only available to users who have edit rights on the displayed entity.

The rest of the form is divided into several tabs: Structure, Properties, Channels, Documents, Invoices, Events and Contracts.

B. Structure" tab



This tab of the entity sheet allows to visualize the close neighbourhood of our selected entity.

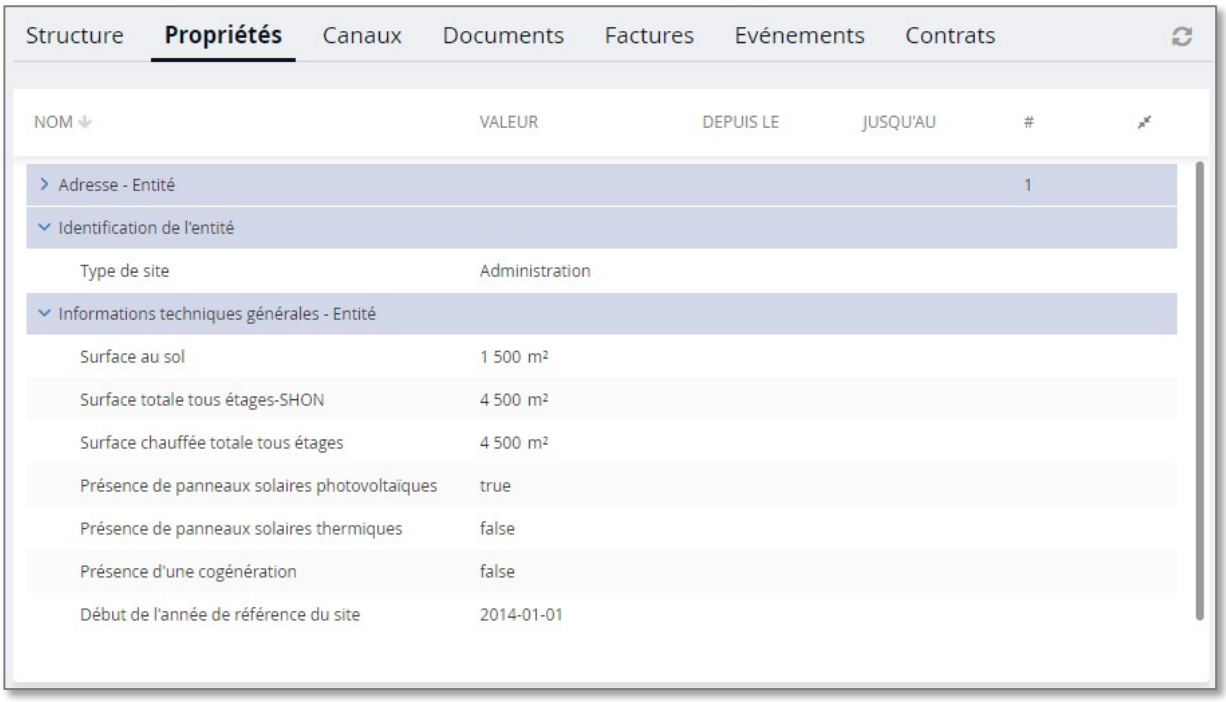
- The top left box shows the ascending relationship of my entity/counter. In the example above, we have an entity "Site de la plaine" which is a child of the entity "Brussels".

- The frame at the bottom left shows the children of the selected entity, organised in a parentage tree. In the example, the "Site de la plaine" has 2 children: "Building A" and "Building B".

- The right-hand frame shows all the other entities/counters linked to my selected entity, sorted according to the type of logical link that unites them. In the example, we find the consumption meters associated with my selected entity, linked via "ENTITY_METER" links, then a technical meter linked via a "TECHNICAL" link and finally the meter of the nearest weather station, linked via a "WEATHER" link.

All the entities/counters visible on the entity sheet can be clicked on to open the corresponding entity/counter sheet, which makes it easy to navigate through the tree structure from one entity/counter to another.

C. Properties" tab



The "Properties" tab gathers all the properties associated with the entity/counter. These properties are organised in blocks, depending on the type of entity considered. Example: the properties available for a site will be different from those of a counter. To facilitate reading, the blocks can be expanded or minimised by simply clicking on the small > or V next to the block name (in the coloured band).

Properties and property blocks are defined and updated by METRON ENERGY MANAGEMENT (JOOL) administrators.

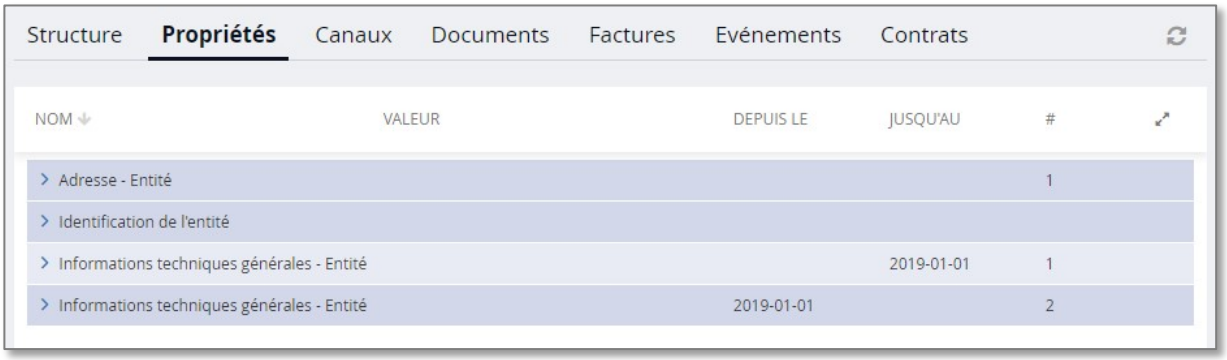
Each property block can be defined as

- **Simple**: a single, permanent value. Example: site identifier.
- **Multiple**: several values valid at the same time. Example: the name of the contact persons.
- **Historicised**: a single set of values, but which can evolve over time. Each instance of these values can then be associated with a start date and an end date of validity. Example: the surface area of a building.

The reference of each property or block of properties can be seen in a tooltip that appears next to the mouse, when hovering over the property (or block) name.

In the case of multiple blocks, an ID will be visible in the "#" column. This ID is used to clearly identify the instance of the property block we are interested in, either for a specific display or to identify it during a massive import.

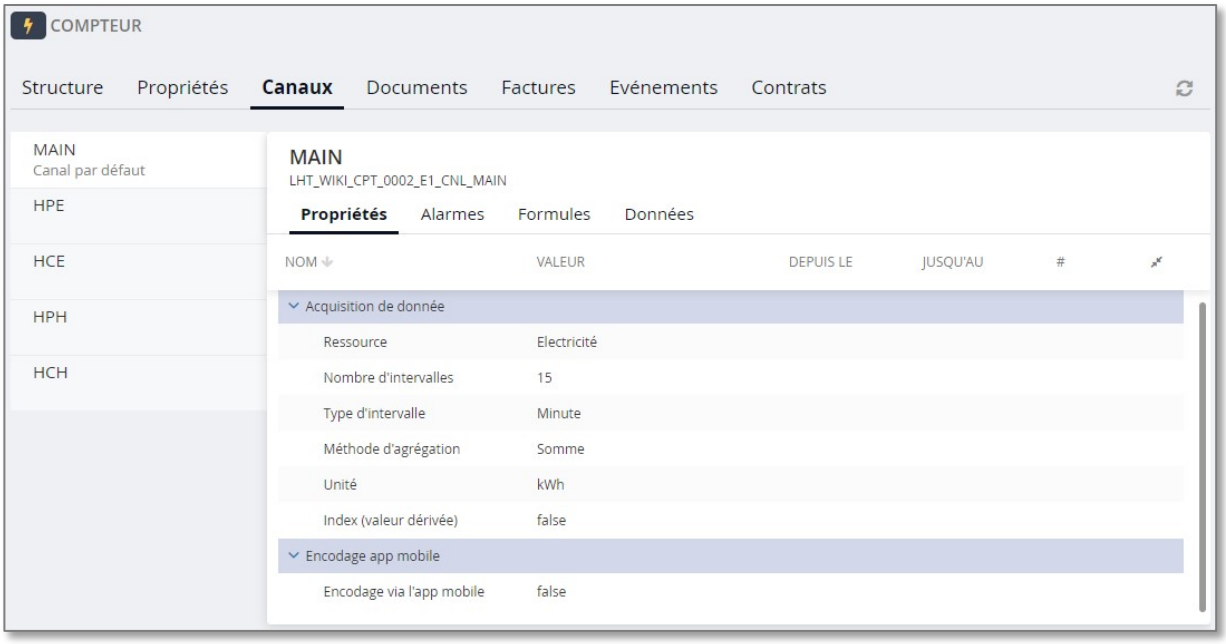
In the case of a historised block, in addition to the ID (used in the same way as for multiple blocks), the "Since" and "To" columns of the record may contain the start and end dates of validity of the block values respectively. If the "Since" column is empty, this implies that the values in the block have always been valid. Similarly, if the "Until" column is empty, the values of the block are valid forever. In case there are several instances of the same historical block (with different validity periods and therefore not overlapping), the past instances of the property block will have a light tint on their header and the current instance of the block will be in the normal colour.



In the example above, the "Address - Entity" block is a multiple block with an ID (1), and the "General Technical Information - Entity" block is a historical block, which has two instances in this record, the first one valid until 1/01/2019, with its pale header, and the second one valid from the same date, with its header in the normal colour.

D. Channels" tab

In the case of a counter record (metering point), the "Channels" tab will list the various source channels making up the counter. In the case of an entity (type SITE, BUILDING...), the tab will remain empty since no data channel is directly linked to it.



On the left-hand side of the interface, the list of channels associated with the meter appears in columns. Each channel is identified by its type (and possibly an optional name), and clicking on one of them will display the details of the properties of this channel in its file on the right-hand side.

One of the source channels is marked as the default channel. This is the one that will be called when the "meter profile" is requested without specifying a specific channel. It will generally contain the overall consumption of the meter, the other channels being either partial consumptions (peak hours, off-peak hours...) or secondary measurements (reactive, A+, A-...).

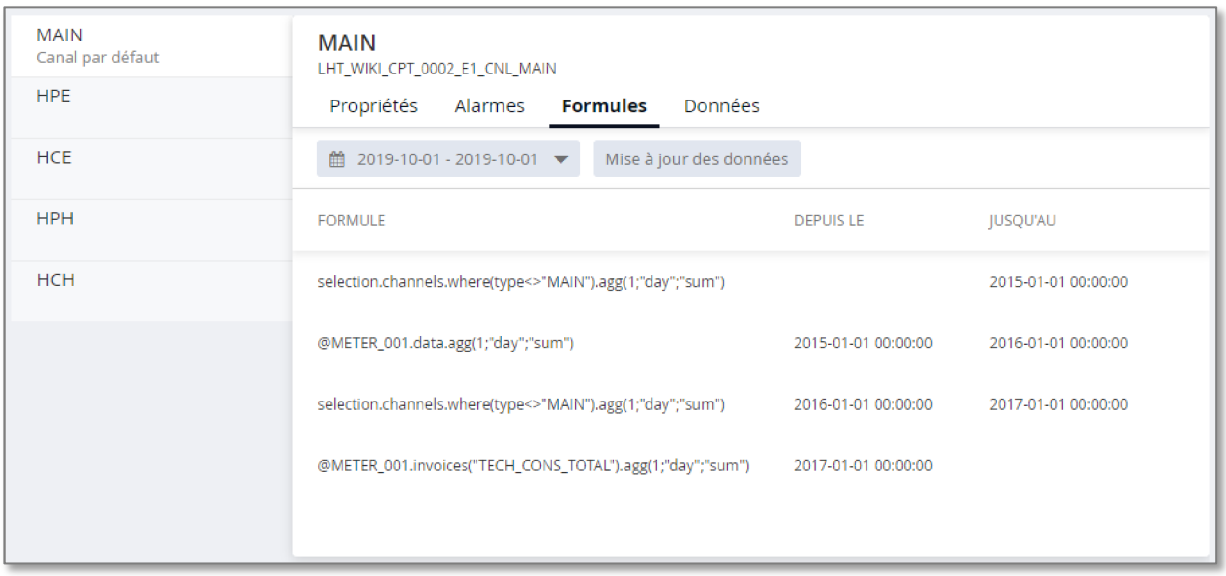
At the top of each channel sheet, you can see the type of channel (MAIN, MODEL, TEMPERATURE, HP, HC, MANUAL, VIRTUAL...) as well as its name (if it has one) and its reference.

On the right-hand side, we see all the properties specifically associated with the selected source channel. The properties are organised in tabs:

- **Properties**: for channel properties. These properties are organised in blocks, single, multiple or historicised, and they are managed exactly like the property blocks of the entities. Example of channel properties: time step, unit, type of resource measured...

- **Alarms**: for specific properties related to the management of alarms on this channel. Again, these properties are organised in blocks, each block corresponding to the configuration properties of a given alarm type. The management is again similar to the entity property blocks. Example of alarm properties: trigger thresholds, types of alarms to be monitored...

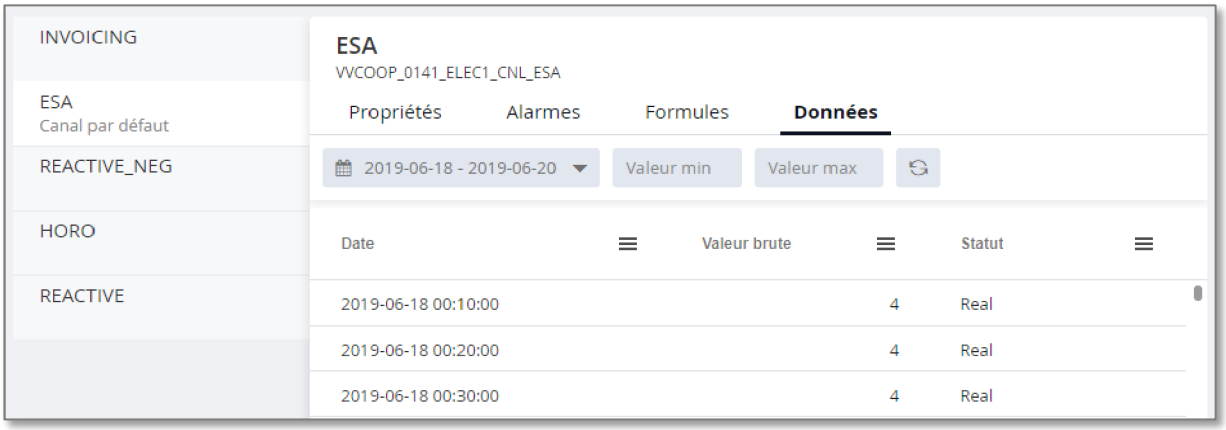
- **Formulas**: the (historical) formula(s), if any. In the case of a calculated virtual channel, the formula indicates how to build up the data profile of the channel concerned, possibly based on the profiles of other channels.



Formulas will be written in METRON ENERGY MANAGEMENT (JOOL) and can use any of the functions available in the syntax. **Note**: the keyword "Selection" used in a channel formula will point to the full counter to which that channel belongs.

At the top of the "Formulas" tab is a context selector and a "Data Update" button. This button allows you to force a restart of the pre-calculation for the channel concerned, within the limits of the chosen time context. This allows an administrator who has made a formula change or data correction to force a recalculation without having to wait for the automatic precalculation task to run automatically.

- **Data**: contains an interface for viewing and correcting channel data.

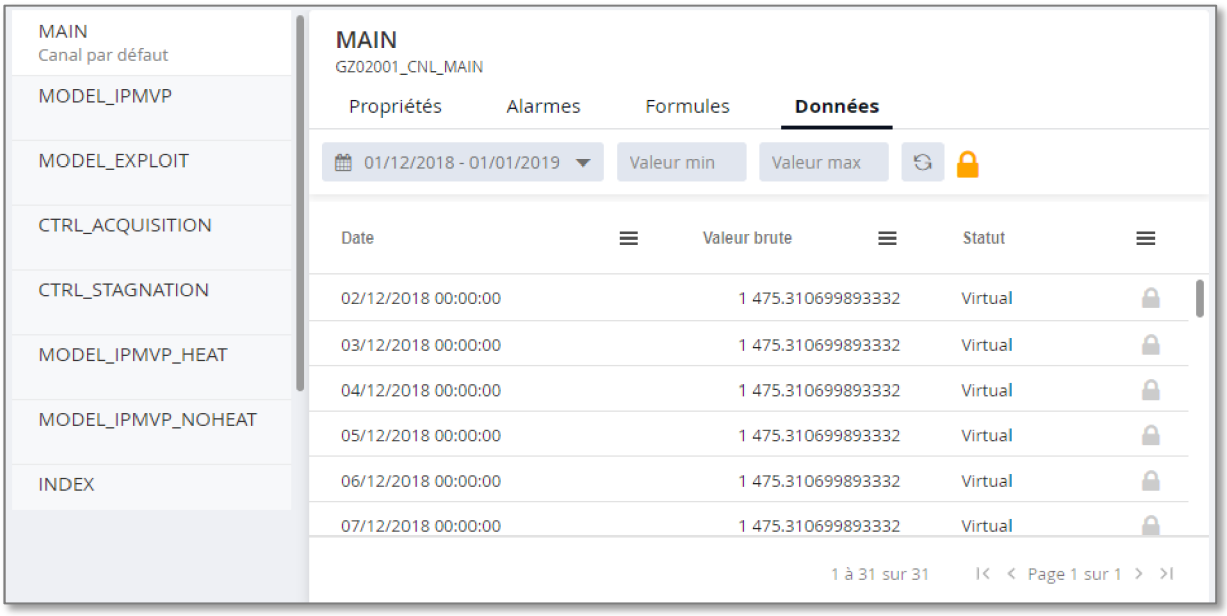


The column "Date" indicates the **END of** the measurement period (a reading is usually available at the end of the time interval it measures), the raw values (directly stored in the DB without numerical modification) are available in the next column, and the column "Status" indicates whether the data is e.g. a direct reading (Real) or a reconstructed data.
At the top of the page, a time context selector allows you to choose which time frame to analyse. The "Min" and "Max" fields allow the search to be filtered, and the "Reload" button (the arrows in a circle) sends the data retrieval request.

At the top of each column, an option button allows you to resize the columns or filter their content.

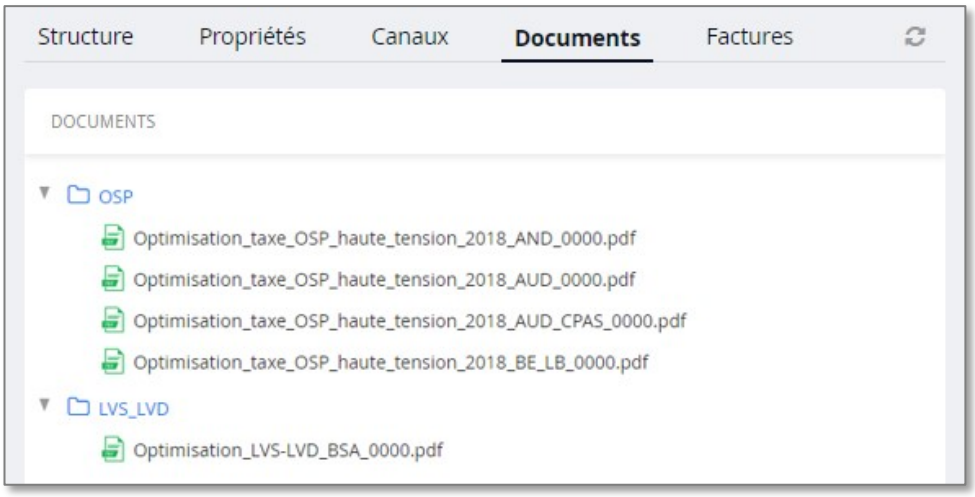
If the user has the rights to do so in METRON ENERGY MANAGEMENT (JOOL), he/she will be able to switch to edit mode and correct the data directly via this interface.

In the case of a calculated channel (containing one or more formulas), and whose values are not free but result from a pre-calculation, a padlock icon will indicate that the data cannot be edited.



E. Documents" tab

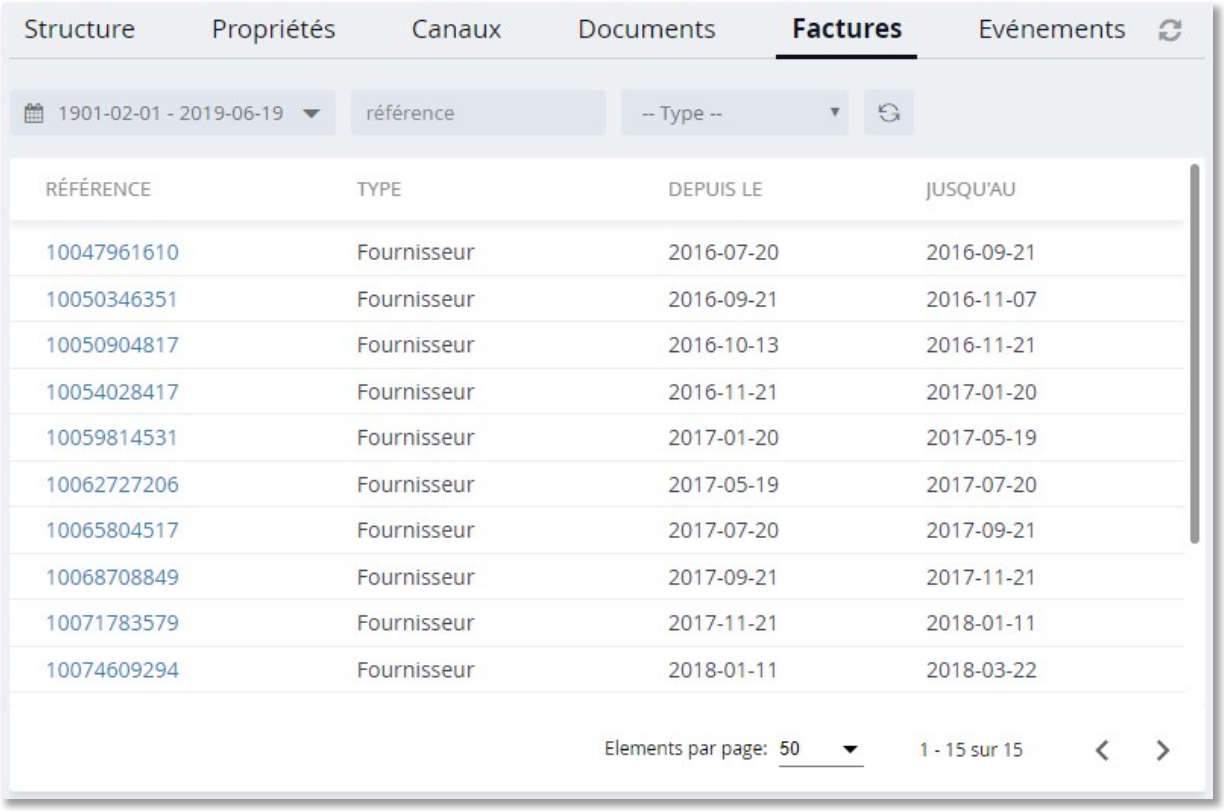
The "Documents" tab lists the files that have been stored on this entity. Files of any format can be stored here, and these can be organised into folders.



Clicking on the name of one of the documents will start its download.

This is also where reports generated by recurring tasks (report submissions) can be stored automatically.

F. Invoices" tab



The "Invoices" tab lists all invoices that have been attached to the selected entity or counter.

At the top of the main display area, there is a date selector allowing you to filter the displayed invoices according to a given time frame. There is also a search field by reference, and a drop-down menu to filter the invoices displayed by type (Supplier, Default, Proforma...)

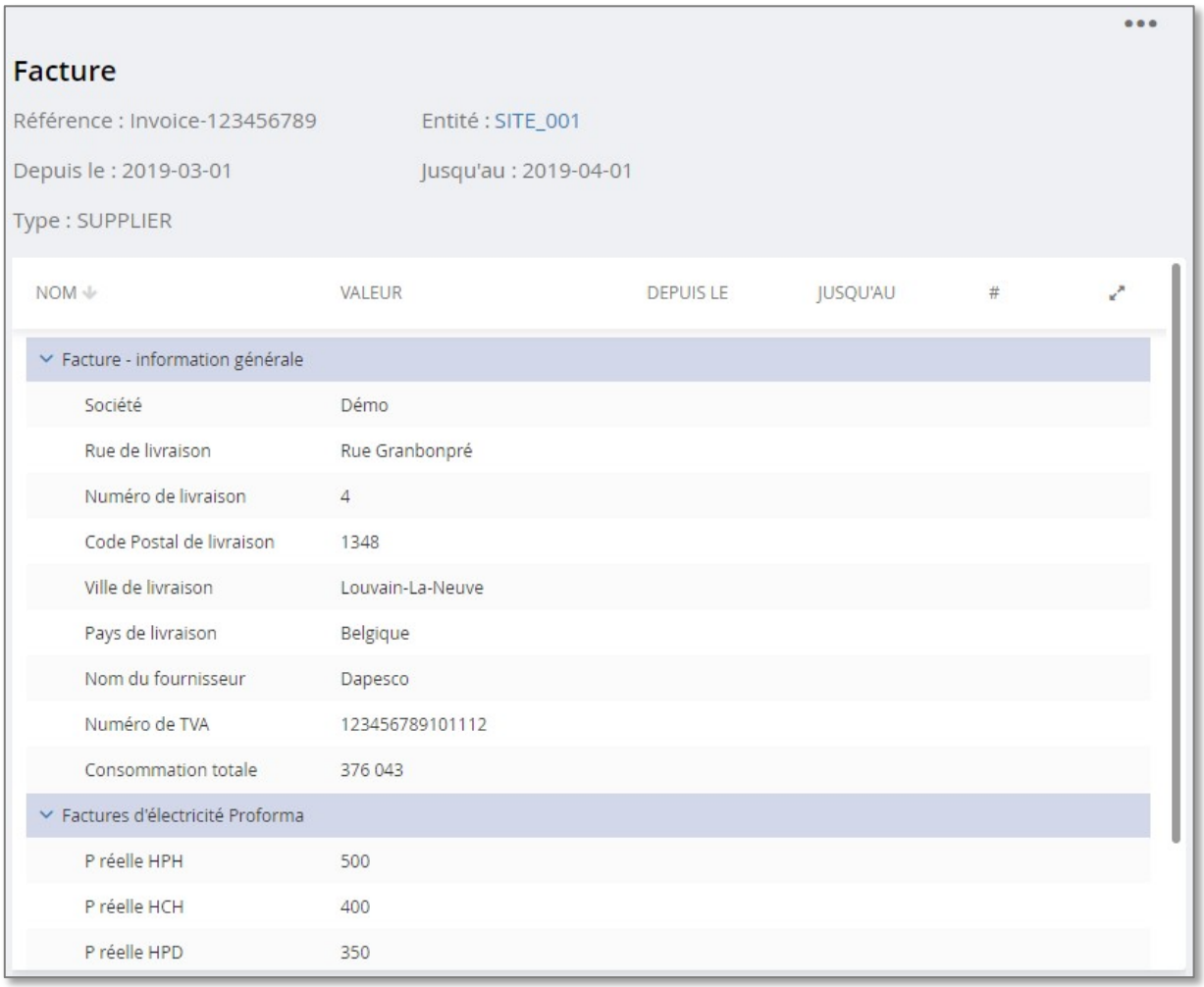
At the bottom of the page, you can choose the number of invoices displayed per result page, and you can change the page if necessary.

The table listing the invoices displays some useful information to identify the invoice you are looking for (id, start and end date of the invoice...), and the first column contains the invoice identifiers in the form of hyperlinks to the invoice page.

Note: When you click on an invoice link, you leave the entity record you were browsing and open the invoice record. The two records will then be present separately in the METRON ENERGY MANAGEMENT (JOOL) browsing history (section on the right of the screen).

Displaying an invoice

An invoice card looks like this:



At the top of the invoice card, you will find its main identification information, such as its reference, the entity to which it is attached (in the form of a hypertext link to return to the record for that entity), its start and end dates, and its type.

Below, we will find all the information associated with the invoice, in the form of properties, arranged once again like the property blocks of the other objects in the database (properties of entities, counters, channels, users...)

At the top right of the page, there is the options button (...), which allows you to go into edit mode and modify the values of the invoice properties (if the user has the corresponding rights), as for all the other properties of the other objects in the database.

G. Events" tab

An event is a temporary property block that can be attached to an entity/counter to notify an unusual circumstance. Within the framework of an analysis of the consumptions of the associated site for

example, the event will come to announce that there are exceptional circumstances, and that that can explain a certain drift of the consumptions compared to the normal.

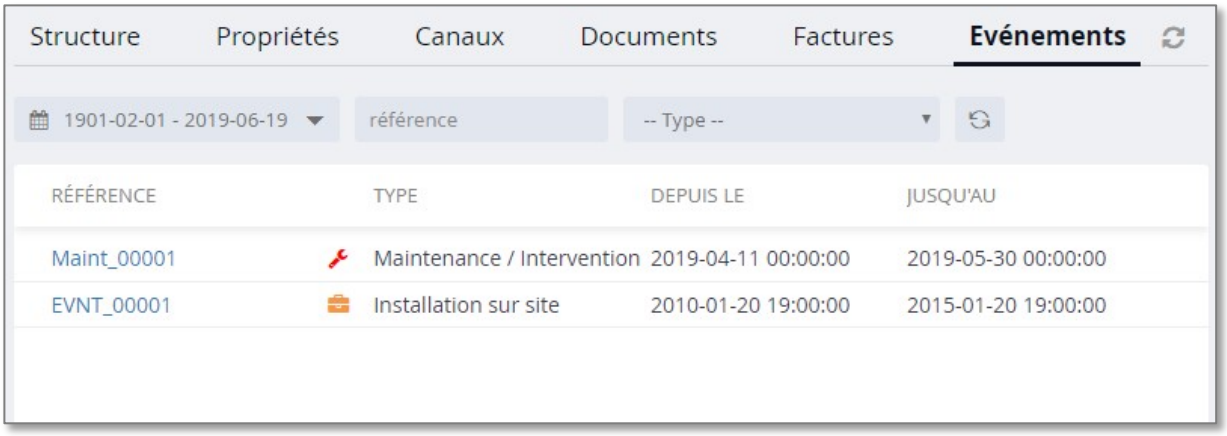
Example of event types:

- **Work**: If work is being carried out on a site, an event can be created to indicate this work. The event will be valid from the start date of the work to its end date, and it can contain a whole series of information relating to the work carried out, such as the name of the person in charge of the site, the exact content of the work, the budget allocated, the expected improvements, etc.

- **Closure**: This type of event may explain drops in consumption during periods when the company is not active.

- **Information** : An event can also have nothing to do with consumption, but simply be used as a means of providing information on certain topics. For example, one could attach to each site a set of events listing the news associated with that site and which would be included in a dashboard, like a newsletter.

On the entity/counter card, the "Events" tab looks like this:



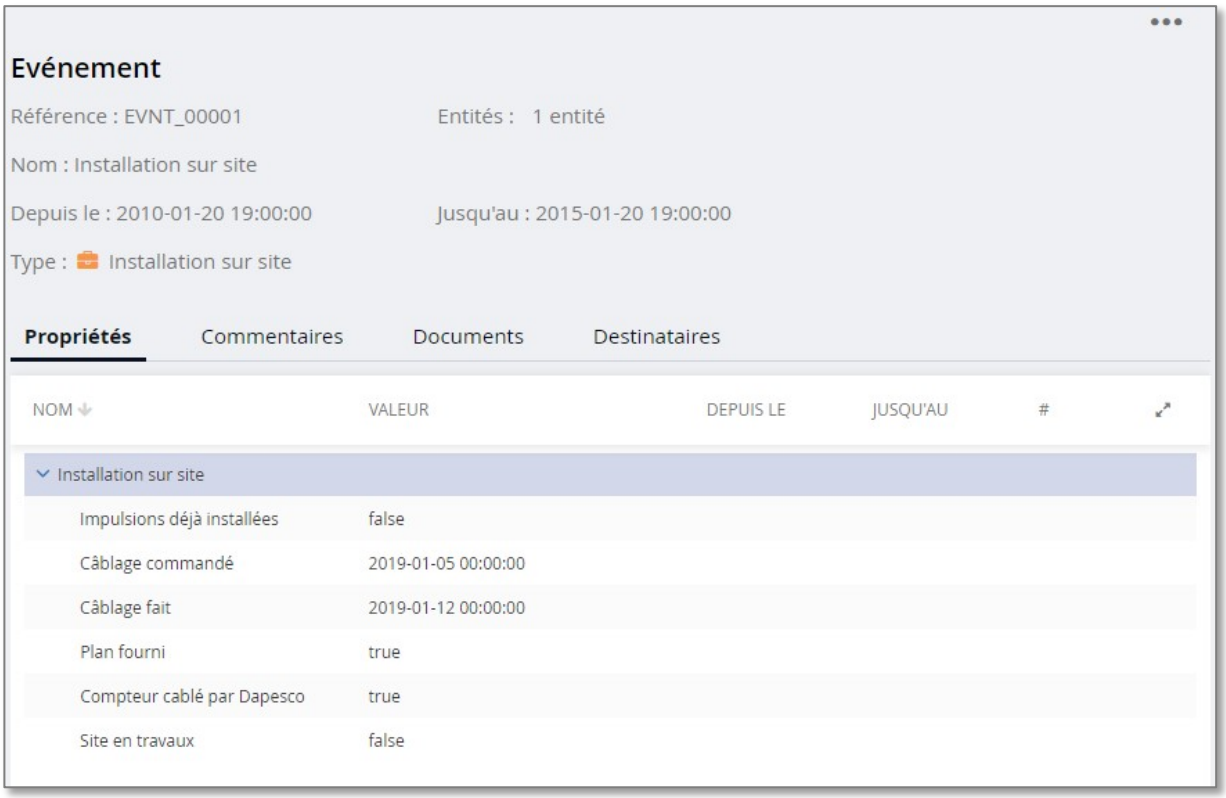
As with the invoices, there is a time selector to filter the events displayed, and a "Reference" field to search for a specific event. There is also a "Type" field allowing you to display only events of a given type, and finally, the "Reload" button (the arrows in a circle) allows you to send the filtered request.

In the table, we find the reference of each event in the form of a clickable link that will open the event file. We can also see the type of each event, associated with an icon and a colour (configured by the administrator when defining the types of events), as well as the start and end dates of the event's validity.

Note: an event may not have an end date (e.g. end date of work still unknown), but it must have a start date.

Displaying an event

When you click on the link of an event in the "Events" tab of an entity/counter, you open the record of this event. This one has the following appearance:



At the top of the event record, you will find its reference, its name, its type, the associated icon, and its start and end dates.

There is also an "Entities" field indicating the number of entities with which the event is associated. By clicking on this number, we obtain the list of entities in question and we can open their files if necessary.

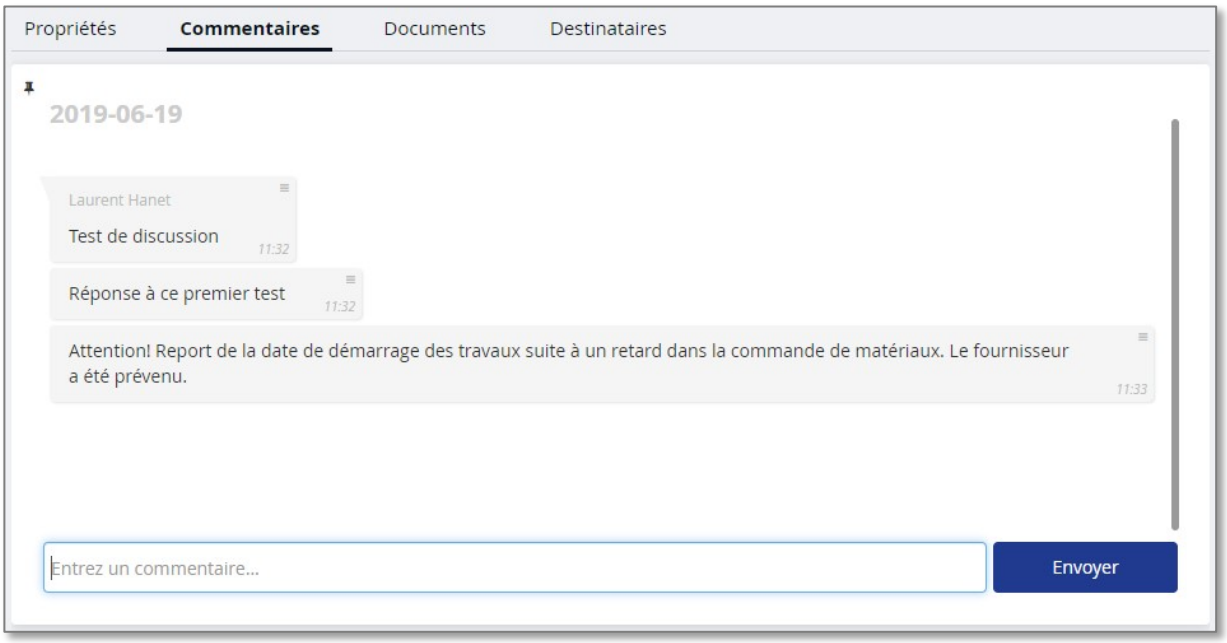
In edit mode, and if the active user has the corresponding rights, he can also add or remove linked entities. Indeed, work can potentially impact several meters on a site... they will then all be linked to the event indicating the work.

The rest of the form is divided into several tabs:

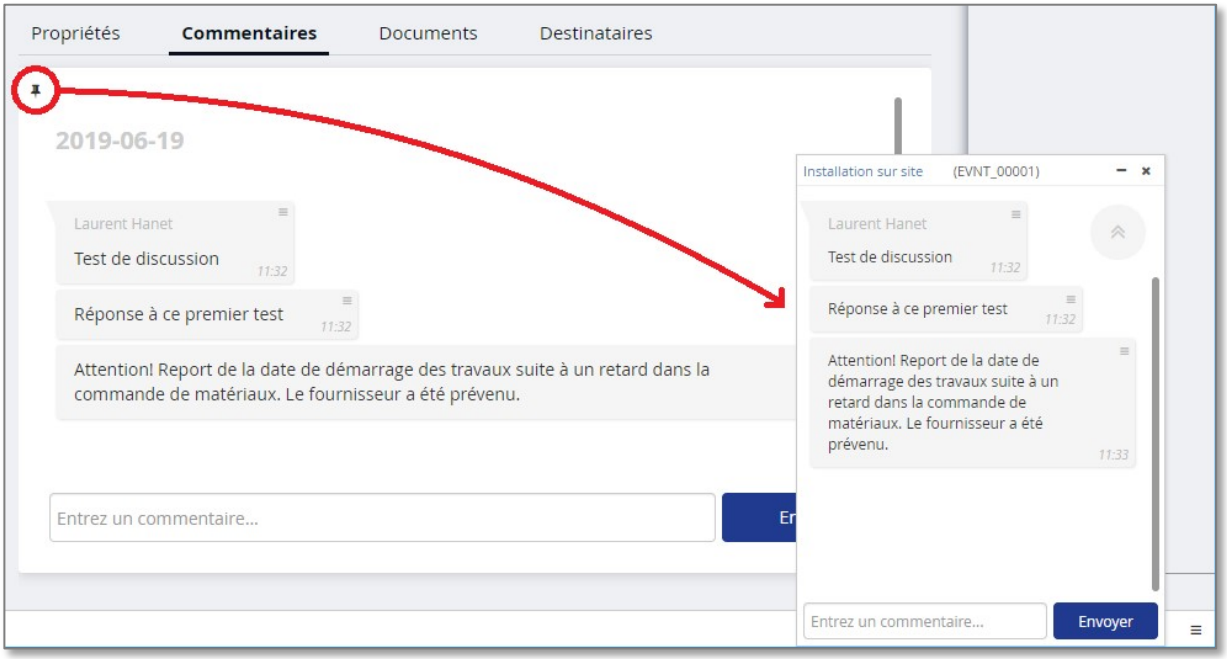
- **Properties**: contains the properties associated with this event. The display is similar to that of the property blocks of other objects such as entities, channels, users...

- **Comments**: This tab shows the thread associated with this event. It shows the comments left by the various participants, by date range, with the name, date and time of each message.

The user who has participated in the thread has access to a button at the top right of the frame of each of his or her messages allowing him or her to modify or delete the message. At the bottom of the page, there is a field for writing a new comment and sending it.



At the top left of the chat window, a small pushpin icon allows you to pin this thread to your interface. This thread will then appear at the bottom right of the METRON ENERGY MANAGEMENT (JOOL) screen, similar to an instant messaging system.



Once the discussion has been pinned to the interface, you can close the event form without losing sight of the discussion. It is possible to minimize the discussion window and recover it with the buttons at the top right of its frame.

In the header of the discussion window, there is also a link that allows you to reopen the event form associated with this discussion at any time.

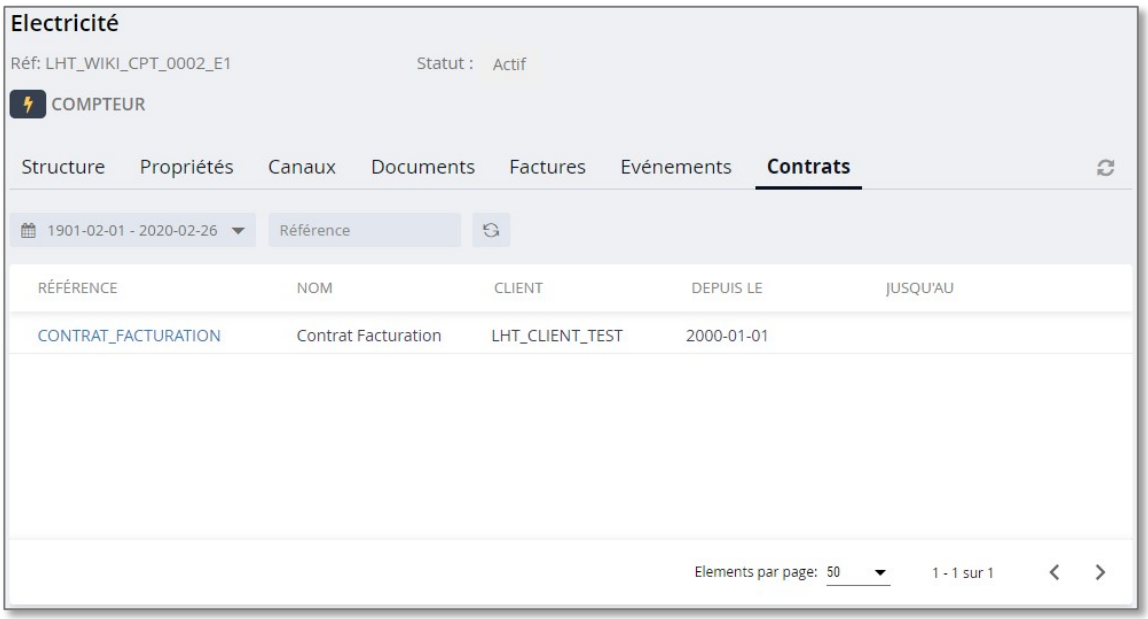
When a thread is pinned to the interface and minimised, its frame will flash to indicate the arrival of any new message in the thread.

- **Documents** : In the same way as for an entity/counter, it is possible to associate documents with a particular event. For example, one could see the photos of a damaged meter, taken by the technician who noticed the damage and created the event directly via the mobile application...

- **Recipients**: By default, any user who is entitled to see an entity/counter is entitled to see the events associated with it. However, at times, it may be appropriate to add someone to the list on an ad hoc basis. The "Recipients" tab allows you to do this, by adding additional recipients for specific events if necessary.

H. Contracts" tab

The "Contracts" tab on an entity/counter record lists the contracts with which the entity/counter is associated. The interface of this tab is very similar to that of the invoice or event tabs.

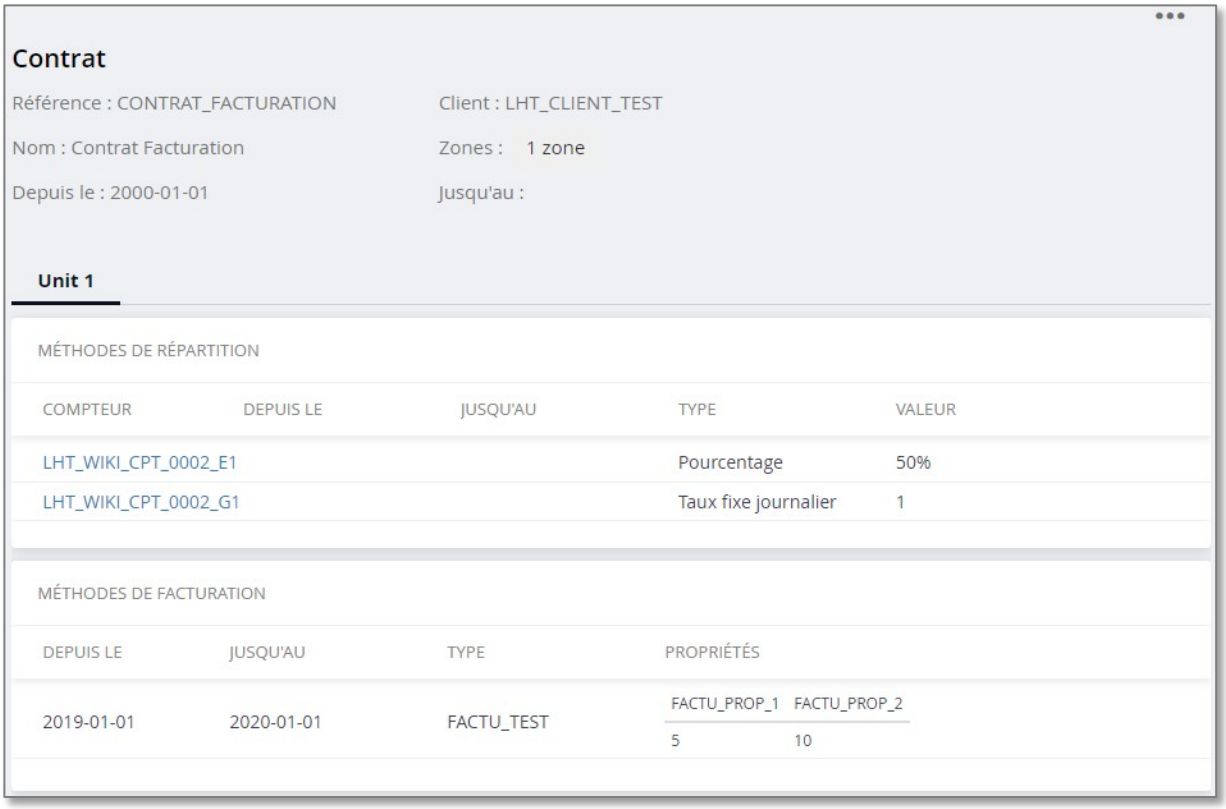


There is a date selector and a reference search field for filtering the displayed contracts, as well as a button to restart a search.

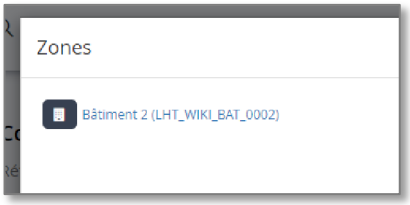
The results are displayed in a table with the contract reference and name, the name of the client concerned, and the start and end dates of the contract. The reference of each contract is a url link to open the associated contract file.

Displaying a contract

When you click on the link of a contract in the "Contracts" tab of an entity/counter, you open the record of this contract. This one has the following appearance:



There is a header with the reference and name of the contract and its start and end dates. There is also an indication of the client to which the contract is linked, and a "Zones" button which opens a pop-up listing the **zones** concerned by the contract, in other words the different entities to which the contract relates.



Example: The contract shown in the example above is for the client "LHT_CLIENT_TEST", and it relates to the zone "Building 2".

In the context of one or more zones, a contract can then be broken down into several **rental units**. A rental unit is a set of meters (belonging to the zones concerned by the contract) which will be treated in a similar way by the contract in terms of allocation methods and billing.

Each rental unit will have a tab on the contract form. In the example, there is only one rental unit, called "Unit 1".

In the tab of each unit, there will then be a box listing the allocation methods, and another listing the billing methods.

As far as the **allocation methods are concerned**, there will be one or more lines for each meter concerned, indicating for each of them whether its consumption is to be allocated totally or partially to the customer linked to the contract. The allocation methods available are :

- Totality: all meter consumption is charged to the customer
- Percentage: a value in % of the meter consumption is assigned to the customer
- Percentage via a property: the proportion of consumption is imputed via a value to be related to a given property. This method allows, for example, to specify that the customer rents 500m² of surface, while the total surface is indicated elsewhere, in a METRON ENERGY MANAGEMENT (JOOL) property. The system will then make the ratio between the rented area (configured in the allocation method) and the total area (indicated in a property) and will attribute this proportion of the meter consumption to the customer.
- Daily Fixed Rate / Monthly Fixed Rate: These methods charge a fixed value per day or month of consumption to the customer.

It should be noted that these allocation methods may have a validity period (limited in practice by the validity of the contract itself), and that several methods may coexist at the same time, for the same meter. Indeed, one could imagine an allocation with a fixed monthly part to which a fixed percentage is added for example. If several allocation methods coexist in this way, the consumption finally allocated will be the sum of all consumptions calculated by each method.

Important: if a user affiliated to a customer logs in, he will see his meters, even those shared by several tenants (several simultaneous contracts distributing consumption), but he will only see for each of his meters the consumption specifically allocated to him by the distribution method concerned. This is the whole principle of this tenant module, the details of which will be covered in a dedicated expert booklet.

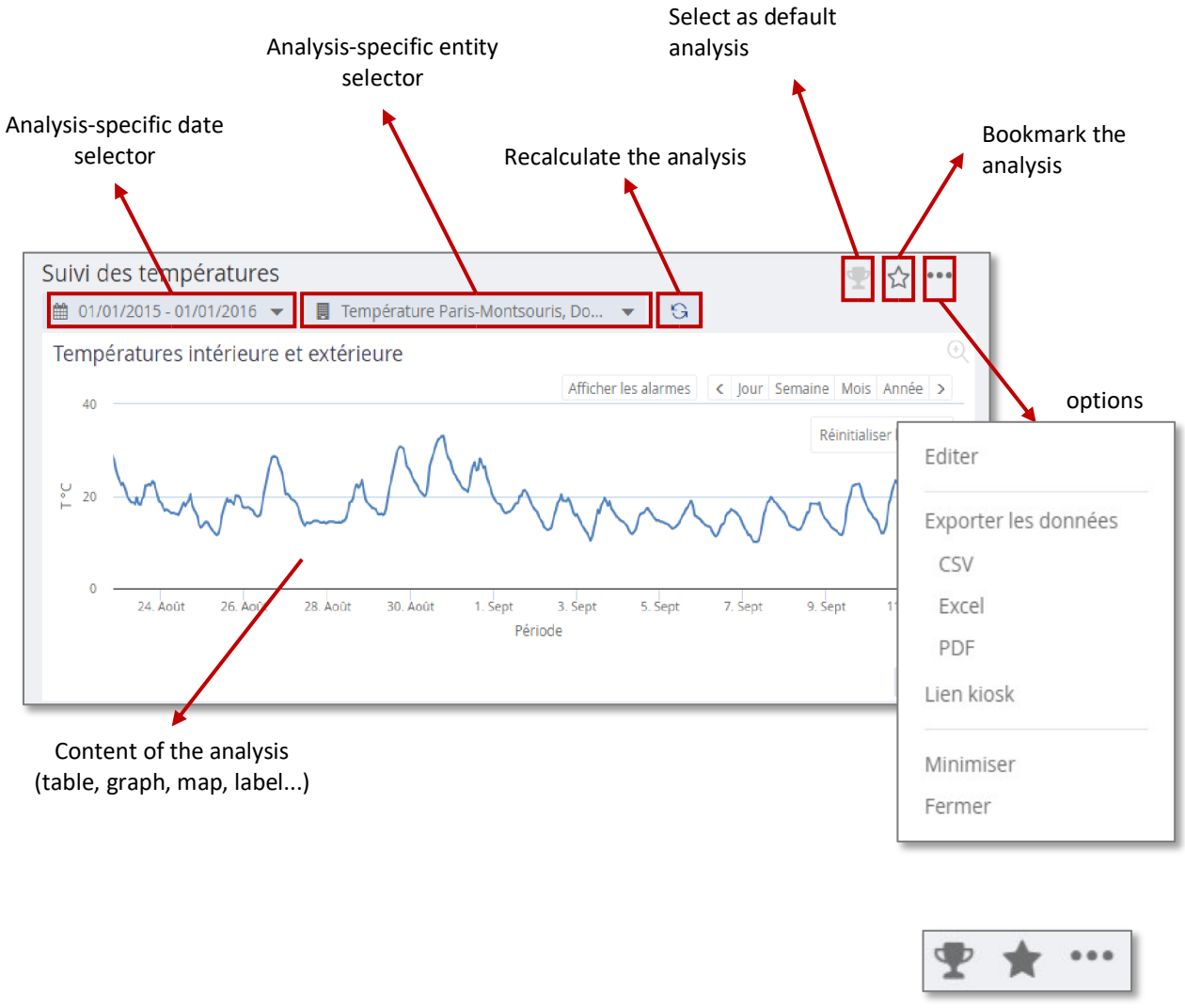
Finally, for **billing methods**, there will be one line per method, with its validity dates, the type of method used and a list of the properties it requires with their configured values. Billing methods must be pre-created by an administrator to be used here, and the relevant properties are an integral part of the method definition.

Important: Billing methods have no direct impact on the information displayed (unlike dispatch methods which filter the data displayed to customer users to show them only their share of consumption for each of their meters), and the values configured here will be accessible for use in datasets and spreadsheets that may be created in the METRON ENERGY MANAGEMENT (JOOL) engine.

13. Main workspace - Analysis results

In addition to entity/counter records, the main workspace can display analysis results from tools available in the menus (dashboards, widgets, XTab).

An analysis result looks like this:



At the top right, the button in the shape of a cup allows you to choose the analysis that will be opened by default on connection. This choice is specific to each user and will be saved in their user preferences. (This choice can also be preconfigured by the database administrator)

The small star allows you to bookmark the analysis, so that you can find it easily. The button with the 3 small dots gives access to several options such as exporting the results of the analysis in various formats (csv, excel, pdf), editing the analysis definition, generating a kiosk link, minimising or closing the analysis.

In the options, the "Edit" button is obviously only accessible to users with editing rights for the type of analysis displayed, and will send to the widget or dashboard editing interface.

The "Kiosk Link" option allows you to generate a direct URL link to the dashboard from outside METRON ENERGY MANAGEMENT (JOOL).

Each analysis also has a specific date selector and entity selector, allowing METRON ENERGY MANAGEMENT (JOOL) to display multiple analyses on different time contexts and channel selections simultaneously.

The date selector is exactly the same as the global context selector, but it only affects the current analysis.

The entity selector allows you to choose/modify the list of entities on which the analysis will focus. A change of selection via this selector will also only impact the current analysis.

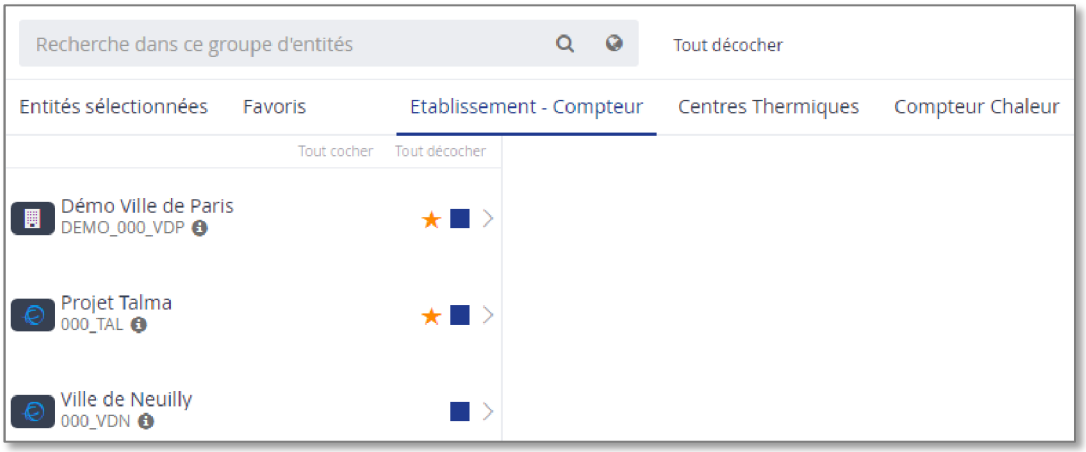
A. Local entity selector

In METRON ENERGY MANAGEMENT (JOOL), each analysis can have its own selection through a specific entity selector.

Remember, using the general tree (or favourite entities) at the bottom left of the METRON ENERGY MANAGEMENT (JOOL) window to change the global selection will change the selections of all the scans displayed (minimised scans are not affected).

As a reminder, a single click on the global entity selector will replace the selections of each displayed analysis with the chosen entity, whereas a double-click will simply add the entity to the current selections.

The entity selector specific to the analyses is in the following form:



It contains a search field to find an entity . The magnifying glass will search the currently displayed view , and the small planet will search the entire database of existing entities/counters.

The general "Uncheck All" button at the top allows you to clear the current selection of entities at once.

Below this search field is a menu bar listing all available views. These views are used to sort the entities/counters in order to be able to find them easily to make a selection. In addition to the available views, there are also fixed lists, which are useful for making up a selection.

- **Selected items**: the list of currently selected entities, for a quick summary, and possibly to easily remove entities from the selection.

- **Favourites**: the list of the logged-in user's favourite entities.

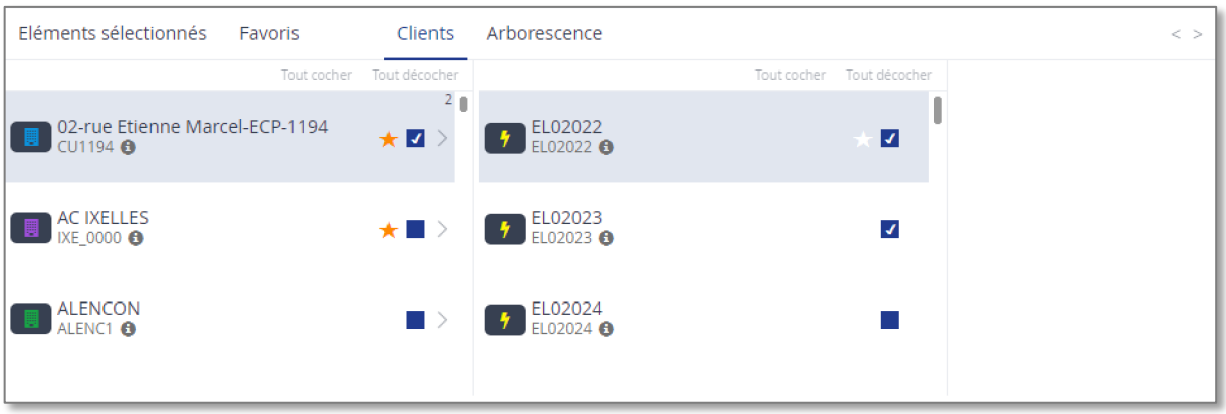
- **Views**: each additional list is a pre-configured view to which the logged-in user has access. These are the same views as those available in the global entity selector at the bottom left of the METRON ENERGY MANAGEMENT (JOOL) window.

Below this banner of views is the chosen view, organised in columns. Each entity is represented by a small block containing its icon, name and reference as well as several buttons.

	Opens the entity's record in the workspace.
	Adds/removes the entity from the list of favourites. If the star is yellow, the entity is in favourites, if it is invisible (grey on hover), it is not in favourites.
	Adds / Removes the entity from the selection specific to the current analysis
	Deploys the next level of the view (children of the entity) in the next column of the entity selector

When you expand the next levels of the view, you get several columns in the selector. The entity in the left-hand column which has been expanded is grayed out for greater visibility, and in the next column, we see its children (in the active view, not necessarily its children in the sense of the real tree structure).

Each column also has "Check All" and "Uncheck All" buttons to select all entities in that column at once or to remove them from the active selection.



Note: deploying a 2nd entity will replace the children of the first entity by those of the new one. It is therefore not possible to display the children of several entities at the same time.
In order not to lose track of the entities already selected, even if they are checked in non-deployed sub-views, a small number appears at the top right of each entity for which sub-entities have been selected.
In the example above, the small "2" at the top right of the first site's box indicates that there are 2 subentities checked in the descendants of this entity, in this case EL02022 and EL02023.

C. Display of tools

Whether a single widget is displayed or a dashboard containing several, each widget can be manipulated by the user according to its type. For example, it will be possible to sort the columns of a widget displaying a table or zoom in on a widget displaying a graph.

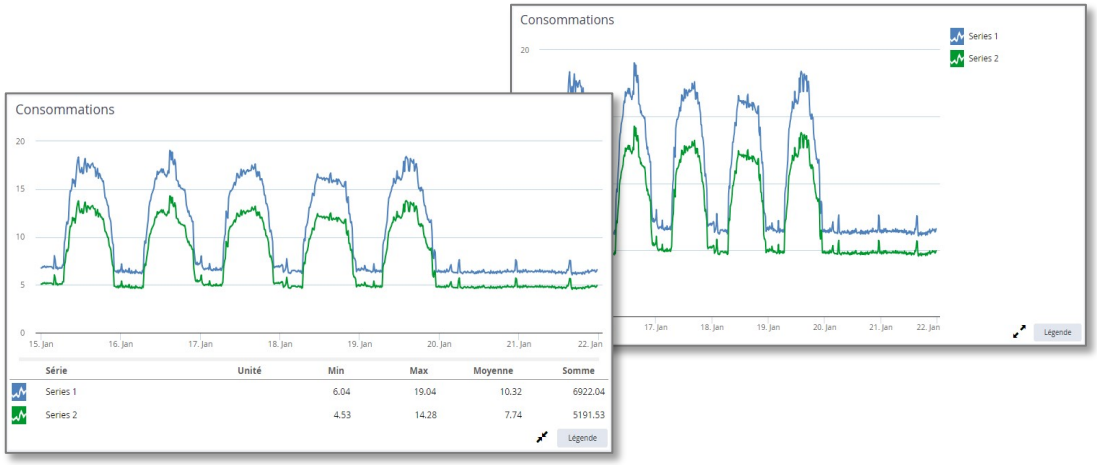
Graphics

The graphs in JOOL are presented in the following frame:

On mouse-over over the curves, a tooltip indicates the point information (date, value).

Legends

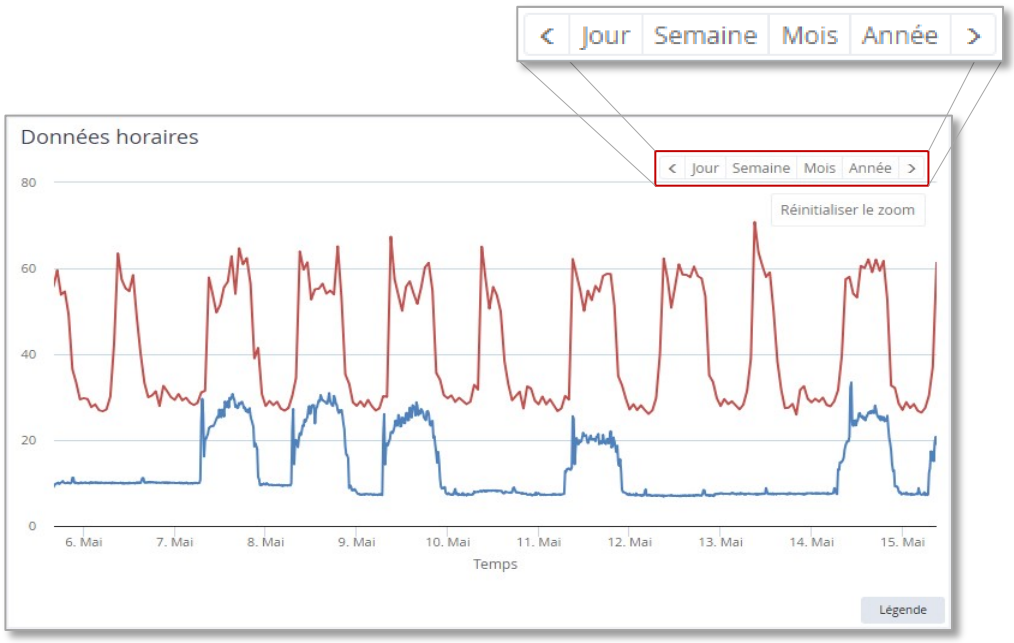
The "Legend" button at the bottom right allows you to display/hide a legend area.



The buttons with two arrows allow you to move the legend from one location to another, either at the bottom or on the right of the graph. The legend at the bottom shows the names of each series and some useful information, such as the unit, minimum and maximum of that series, the average and the sum. On the right-hand side, it keeps only the series names.

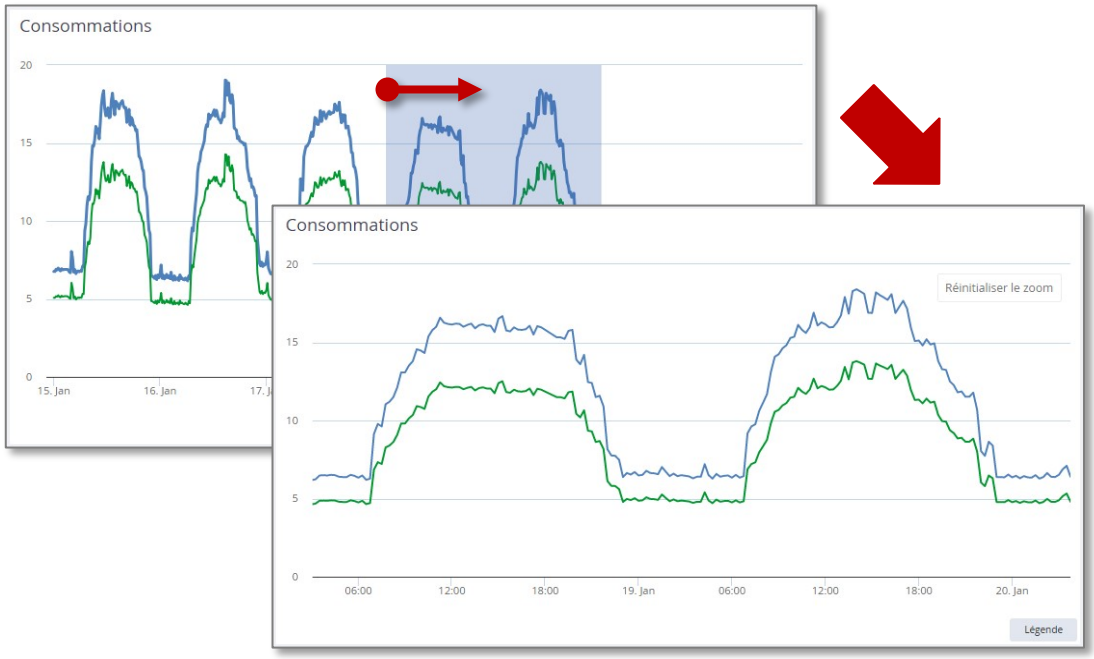
Fixed periods

On the display area of a graph, you can see an area listing time periods. Clicking on a "Day" period will cause the graph to display one day only. The "<" and ">" buttons are then used to move to the previous or next day.



Zoom

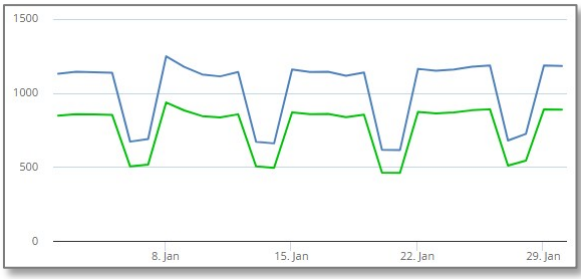
It is also possible to zoom in on the graph. To do this, hold down the left mouse button and stretch an area to zoom in on. Once a graph has been zoomed, a "Reset Zoom" button appears to allow you to return to the initial graph.



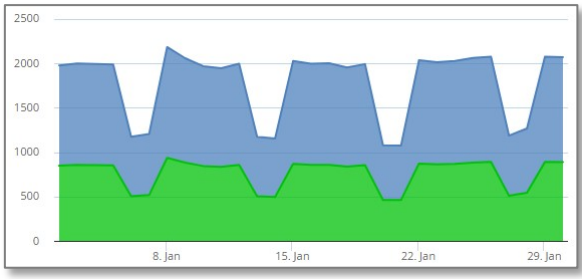
Types of graphs

Each series in a graph can be configured by a METRON ENERGY MANAGEMENT (JOOL) administrator to be displayed with a chosen colour, and shape.

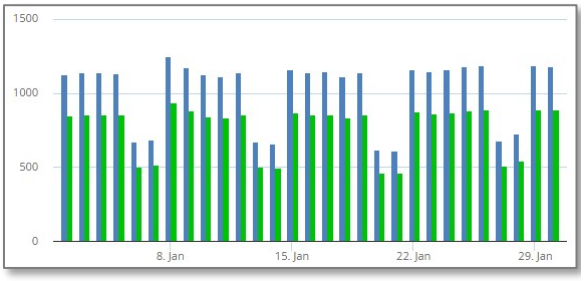
Lines



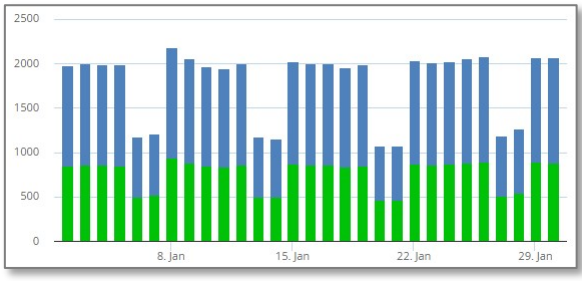
Overlapping lines



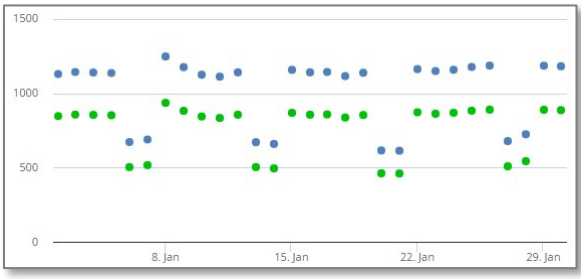
Histograms



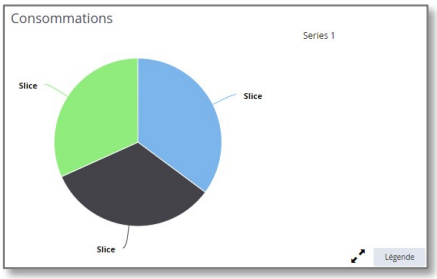
Overlapping histograms



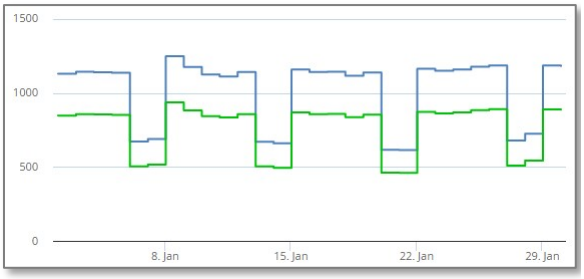
Points



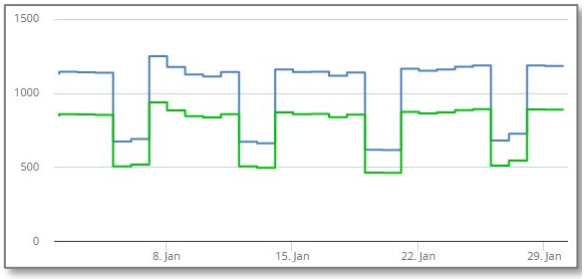
Distribution pie



Stairs



Inverted staircases



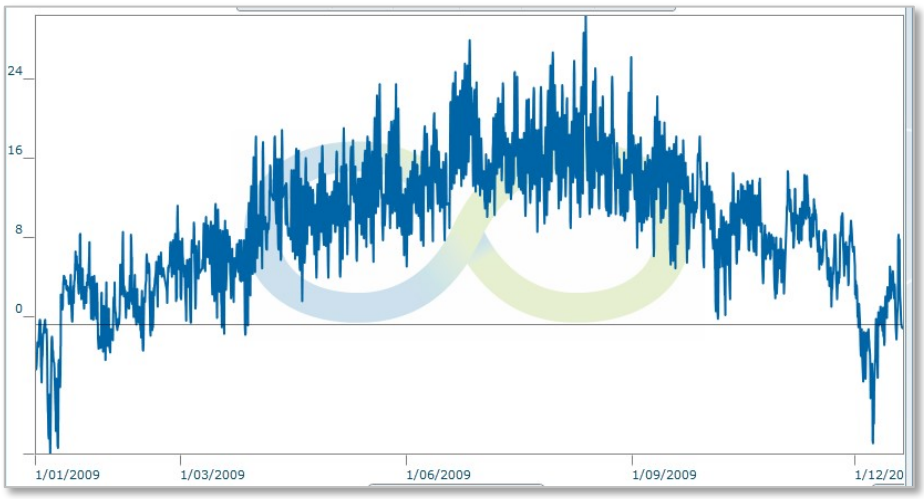
A graph can of course have a histogram series and a line series.

Dynamic line

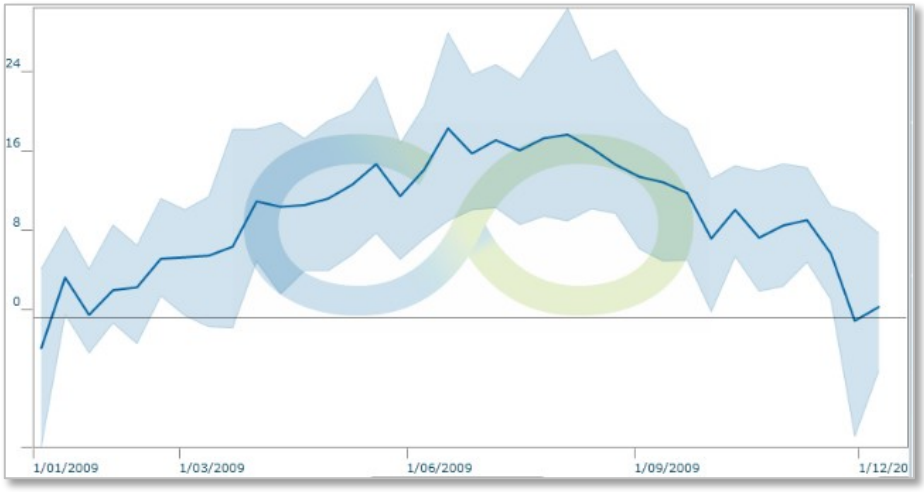
In some cases, the data is very large and not necessarily readable as is. For example, if you display the 10-minute data of a 10-year counter, you will get a very large amount of data, resulting in a blurred area where the dots overlap.

In this kind of situation, the information does not come from the value of each individual piece of data but rather from the evolution of the average of the data and possibly their spread. The "Dynamic Line" type was created for this purpose. The dynamic line aggregates the data over a time step (automatically calculated according to the size of the graph to be displayed) and displays the evolution of the average, and METRON ENERGY MANAGEMENT (JOOL) also displays a brighter area, to materialise the range in which the actual values are included.

Line



Dynamic line

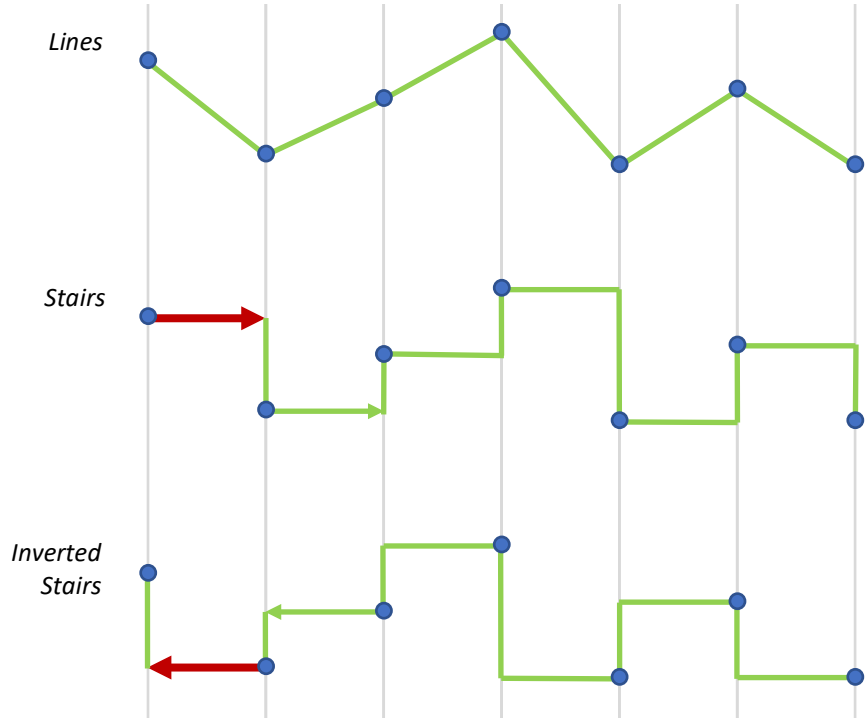


Stairs or inverted stairs

The staircase or inverted staircase display is designed in a similar way. METRON ENERGY MANAGEMENT (JOOL) takes the list of points to be displayed, and draws a horizontal line from each point to the next.

- The **staircase** display stretches the value horizontally to the right. This case is, for example, used for properties, where a value at a given time is considered valid until it is replaced by a new value later.

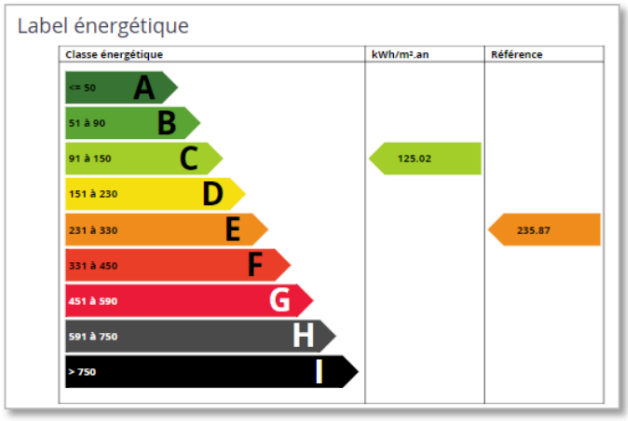
- The **inverted staircase** display stretches it to the left. This case is used for consumptions, where a consumption over a time interval is measured at the end of the interval but therefore represents the consumption over the past time interval.



Labels

Based on the Energy Label principle, these displays can show value classes and related sliders.

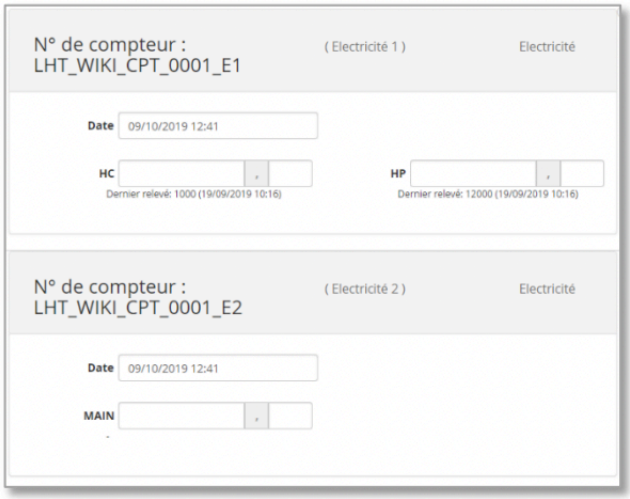
These labels are fully configurable by METRON ENERGY MANAGEMENT (JOOL) administrators, both in terms of class definitions and cursor value calculations, as well as the colours associated with each class.



Forms

The forms are HTML pages, generated by METRON ENERGY MANAGEMENT (JOOL), which can be sent via URL links by email to allow external users to enter meter reading values into METRON ENERGY MANAGEMENT (JOOL).

The general appearance of the form (mainly the header of the counters) can be adapted to some extent by METRON ENERGY MANAGEMENT (JOOL) administrators.



Circular gauges / Performance gauges

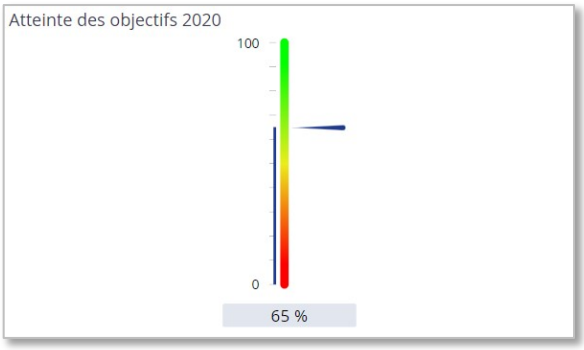
Presented as speedometers, these gauges (2 different graphic types) allow an intuitive visualisation of certain values in relation to a range of normal operating values.

Again, the colours, terminals and display value are configurable by METRON ENERGY MANAGEMENT (JOOL) administrators.

Thermometer gauges

Presented as thermometers, these gauges allow intuitive visualisation of certain values in relation to a range of normal operating values.

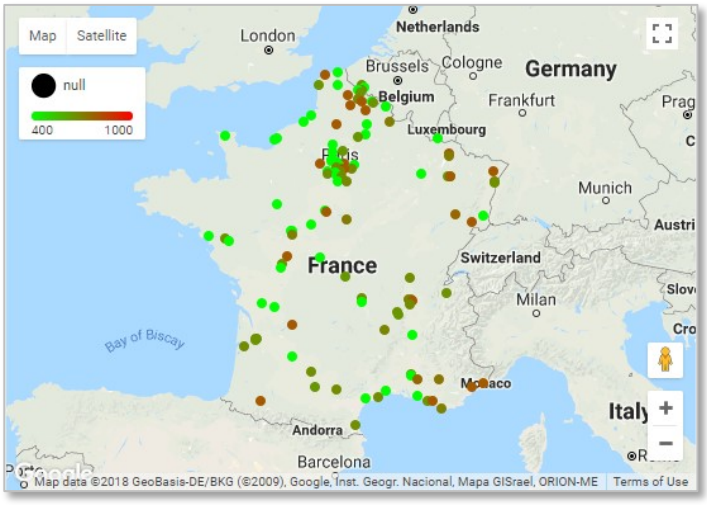
The configuration is similar to the circular gauges and is under the control of the METRON ENERGY MANAGEMENT (JOOL) administrators.



Cards

METRON ENERGY MANAGEMENT (JOOL) can also be used to display a selection of channels on a geographical map, to visualise the progress of an installation project for example, or to quickly check the status of certain parameters deemed relevant by the client.

Points can be positioned on the map by assigning a colour, size and shape.



Generally, colour is used to represent a qualitative value (performance of a site, progress of a project...) whereas size is generally associated with a quantitative value (total consumption, surface of the site, number of inhabitants...).

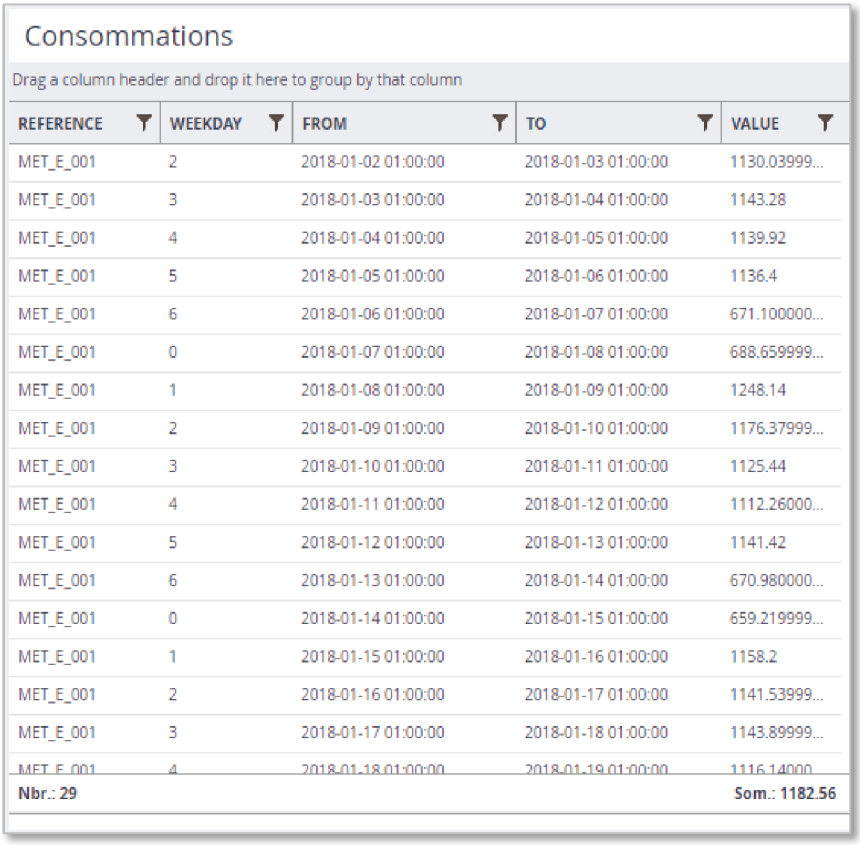
The form can be used to identify the type of site for example.

When hovering, a tooltip displays certain characteristics of the site, chosen by the METRON ENERGY MANAGEMENT (JOOL) administrators.

Data tables (grids)

METRON ENERGY MANAGEMENT (JOOL) can also be used to display tables of data directly. These tables can come from static data stored in the database, or from spreadsheets based on consumption data for example.

A table is presented in the following form:



Consommations

Drag a column header and drop it here to group by that column

REFERENCE	WEEKDAY	FROM	TO	VALUE
MET_E_001	2	2018-01-02 01:00:00	2018-01-03 01:00:00	1130.03999...
MET_E_001	3	2018-01-03 01:00:00	2018-01-04 01:00:00	1143.28
MET_E_001	4	2018-01-04 01:00:00	2018-01-05 01:00:00	1139.92
MET_E_001	5	2018-01-05 01:00:00	2018-01-06 01:00:00	1136.4
MET_E_001	6	2018-01-06 01:00:00	2018-01-07 01:00:00	671.100000...
MET_E_001	0	2018-01-07 01:00:00	2018-01-08 01:00:00	688.659999...
MET_E_001	1	2018-01-08 01:00:00	2018-01-09 01:00:00	1248.14
MET_E_001	2	2018-01-09 01:00:00	2018-01-10 01:00:00	1176.37999...
MET_E_001	3	2018-01-10 01:00:00	2018-01-11 01:00:00	1125.44
MET_E_001	4	2018-01-11 01:00:00	2018-01-12 01:00:00	1112.26000...
MET_E_001	5	2018-01-12 01:00:00	2018-01-13 01:00:00	1141.42
MET_E_001	6	2018-01-13 01:00:00	2018-01-14 01:00:00	670.980000...
MET_E_001	0	2018-01-14 01:00:00	2018-01-15 01:00:00	659.219999...
MET_E_001	1	2018-01-15 01:00:00	2018-01-16 01:00:00	1158.2
MET_E_001	2	2018-01-16 01:00:00	2018-01-17 01:00:00	1141.53999...
MET_E_001	3	2018-01-17 01:00:00	2018-01-18 01:00:00	1143.89999...
MET_E_001	4	2018-01-18 01:00:00	2018-01-19 01:00:00	1116.14000...

Nbr.: 29 Som.: 1182.56

- At the bottom of the table, we can see an aggregation row, containing the aggregated values of the columns for which this has been configured. In the example above, the REFERENCE column is **aggregated** into a **count**, which allows us to see that there are 29 rows in the table, and the VALUE column is **aggregated** into a **sum,** which shows us that the total consumption for the observed period is 1182.56.

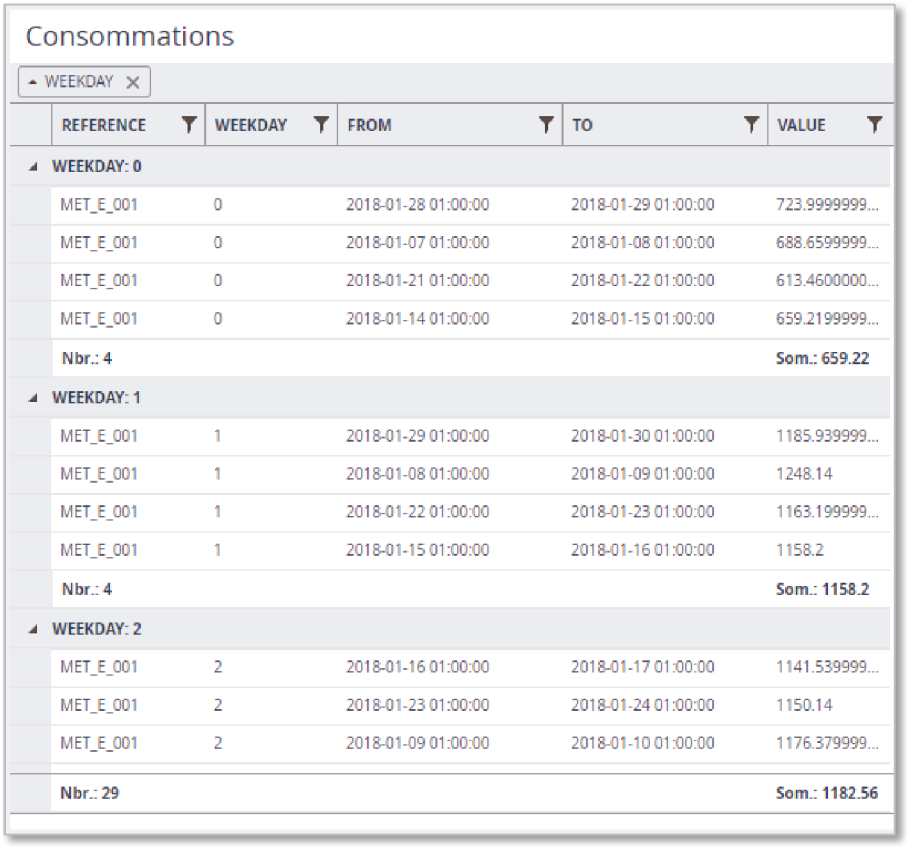
- By dragging and dropping the title of each column, it can be moved to rearrange the order of the columns.

- Clicking on a column header will apply a sort to that column. A further click will force the sorting to be reversed, and a third click will remove the sorting.

- The small symbol to the right of each column heading allows you to apply a filter to display only rows with certain values.

- Finally, a drag & drop of a column heading in the area just above the headings will group the rows of the table based on the value of the chosen column. It is possible to perform several successive groupings. For example, we would have a table with the consumptions of all the meters of a site, and this table would contain a column indicating the resource measured by the meter. Grouping according to this column will result in all the electricity meters being grouped in one section, then all the gas meters and so on.

A grouped table then looks like this:



Consommations

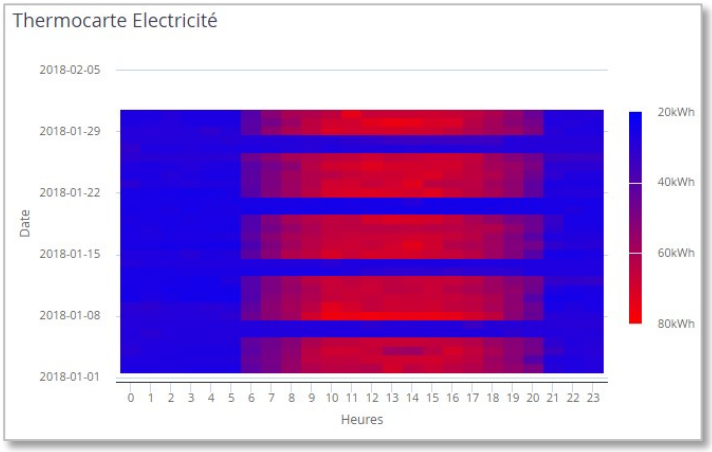
WEEKDAY

REFERENCE	WEEKDAY	FROM	TO	VALUE
WEEKDAY: 0				
MET_E_001	0	2018-01-28 01:00:00	2018-01-29 01:00:00	723.9999999...
MET_E_001	0	2018-01-07 01:00:00	2018-01-08 01:00:00	688.6599999...
MET_E_001	0	2018-01-21 01:00:00	2018-01-22 01:00:00	613.4600000...
MET_E_001	0	2018-01-14 01:00:00	2018-01-15 01:00:00	659.2199999...
Nbr.: 4				**Som.: 659.22**
WEEKDAY: 1				
MET_E_001	1	2018-01-29 01:00:00	2018-01-30 01:00:00	1185.939999...
MET_E_001	1	2018-01-08 01:00:00	2018-01-09 01:00:00	1248.14
MET_E_001	1	2018-01-22 01:00:00	2018-01-23 01:00:00	1163.199999...
MET_E_001	1	2018-01-15 01:00:00	2018-01-16 01:00:00	1158.2
Nbr.: 4				**Som.: 1158.2**
WEEKDAY: 2				
MET_E_001	2	2018-01-16 01:00:00	2018-01-17 01:00:00	1141.539999...
MET_E_001	2	2018-01-23 01:00:00	2018-01-24 01:00:00	1150.14
MET_E_001	2	2018-01-09 01:00:00	2018-01-10 01:00:00	1176.379999...
Nbr.: 29				**Som.: 1182.56**

We have grouped the rows here according to the "WEEKDAY" column, so we have a group of rows per value in this column, and for each group, we find all the rows associated with it, as well as a partial aggregation row carrying out the counts on the group only. The global aggregation line is always found at the very bottom of the table.

In addition to the classic values (numeric, text, date, etc.), the grids can also contain dynamic links to other types of objects (dashboards, invoice sheets, entity sheets, etc.) as well as action buttons allowing, for example, the generation of a credit note from an existing invoice.

Matrix graphs / Thermographs



Matrix graphs, or thermographs, are two-dimensional graphs that allow a value to be viewed at a glance over a given period of time.

This graph places the hours of the day in X and the days of the given period (via the time context) in Y and displays the value to be observed in the graph in a colour gradient.

This kind of graph allows you to spot at a glance any anomalies in the consumption of a meter, for example.

In the graph above given as an example, we can see that 2 days per week have a much lower consumption than the other days. We can also see that consumption is concentrated between 6am and 8pm for an open day.

HTML / URL links

METRON ENERGY MANAGEMENT (JOOL) widgets also allow you to insert HTML code directly into a dashboard.

For this purpose, the "HTML" widget can be given HTML code "augmented" with METRON ENERGY MANAGEMENT (JOOL) code (to embed dynamically calculated values), with all the layouts that HTML allows. How to develop such reports is well beyond the scope of this presentation manual, and will be covered in the manuals for more advanced users.

This widget can also be given a URL to redirect to an external site, allowing a thumbnail from another site to be inserted into a METRON ENERGY MANAGEMENT (JOOL) dashboard. For example, a local weather site could be used as a METRON ENERGY MANAGEMENT (JOOL) widget, or real-time traffic information.

Images

In order to personalise the dashboards and reports for each client, it is sometimes useful to be able to integrate a logo, a banner in the company's colours or even a simple still image for illustration. This is possible via the "Image" widgets.

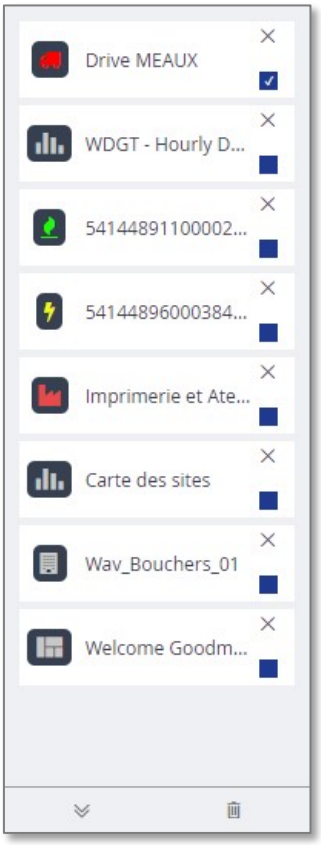
Text box

In the same way, it is also possible to insert in a report or a dashboard, a text zone to note comments, explanations, or any other text that it would be relevant to display.

For this purpose, the "Text box" widget allows you to write and format a text that will be included in the final report.

14. Browsing history pane

This pane on the right-hand side of the screen can be shown or hidden via the corresponding button in the display options.



This area contains a list of tools that have been opened since the start of the logged-in user's session.

Each frame represents a tool or a record. It contains the icon of the entity or tool, as well as its name (a tooltip also contains the full name and reference). There is also a close cross to close the tool or form concerned, and a ticked or unticked box which indicates whether it is currently displayed in the work area or not.

At the very bottom of this history pane are two buttons, the first of which minimises all open tools in the workspace, and the second of which forces all tools (whether displayed in the workspace or not) to be closed.