



# EMC manual

Analysis module

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# 1 Documentation overview

## 1.1 Revision History

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Version	Date	Changes	Chapter	Pages
1	16.08.2009	New document	—	—

## 1.2 Before you begin

### 1.2.1 Copyright

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## 1.2.4 Graphical / typographical conventions

Abbreviation Symbol	Meaning	Usage in this manual
EMC	Energy Monitoring & Controlling	—
—	Drag & drop	Drag & drop
—	Click & drag	Click & drag
	Information	Tip, additional information

## **2 Introduction**

### **2.1 Possible applications**

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Analyses are an integral part of modern energy or operational optimization.

The Analysis module in EMC enables economical weaknesses in customer plants to be quickly and efficiently detected. The user quickly obtains an overview of the data of connected systems in an interactive, dynamic user interface.

### **2.2 Function**

#### **2.2.1 Data series**

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The building automation and control system generates data series from the individual data of the sensors. These data series are selected by the user and processed by the Analysis module.

#### **2.2.2 Data transfer**

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Like all other information, the data needed for analyses is transferred by the software proxy to EMC.

EMC presents data series of different systems, but does not return any data (e.g., additional information). In other words, the communication is unidirectional.

#### **2.2.3 EMC**

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The Analysis module offers direct access to all data series that are available in EMC. In this way, charts and tables in suitable formats can be generated, displayed and exported in different file formats.

This document refers to this specific topic – i.e., to the Analysis module.

### **2.3 User Rights**

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The Analysis module is available to all users.

## **3 Installation**

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The Analysis module is automatically available to all authorized EMC users. The Adobe Flash Player (from Version 9) is required for use of the module.

# 4 Operation

## 4.1 Layout and elements

The Analysis module has a dynamic user interface. Its features include dynamic adjustment to the user's screen resolution.



- 1. Workspace**  
Shows all diagrams and/or tables.
- 2. Node structure**  
Drag & drop a data point from this tree to the workspace to create a diagram or table.
- 3. Views**  
Used to create, edit and apply views.
- 4. Preselection**  
Here you define the reporting period (relative or absolute), the report resolution and the type of diagram used.
- 5. Editing**  
The icons  for editing and  for deleting, as well as the **Export** button enable diagrams and/or tables to be modified and exported after creation.
- 6. Number of working windows**  
Here you choose between 1, 2 or 4 windows with which to work.

### 4.1.1 Workspace

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The **workspace** offers graphical and/or tabular views of data series in windows. A view can be quickly generated by means of dragging and dropping a data point (e.g., a counter) belonging to the node structure and climatic data to one of the preselected working windows.

Different charts/diagrams can be created in a single window in this way. The number of diagrams that can be created in a window is only limited by the factor of clarity for the user.



You can maximize the working window to full screen display by clicking on the "right-pointing arrow" symbol located between the column on the left and the working window. The symbol is designed as a switch – i.e., you can switch back to the normal view from the full screen display at any time by clicking on the "left-pointing arrow" symbol.

The **column width** and **row height** can be adjusted by simply dragging the borders between the working windows. You can move or copy diagrams and tables to any other working window per drag & drop. Diagrams dragged/copied to table working windows are automatically displayed in tabular format (and vice versa).

Buttons for exporting, editing and deleting are found in every working window.

### 4.1.2 Node structure

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A node structure presents the nodes of a plant, subsystem, etc. A node contains data series. Nodes can be used for presentation in chart or tabular form to analyze consumption and other data types (e.g., temperature).

### 4.1.3 Creating / editing views

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You can **create views** for efficient working. You can open the view at any time you want.

With the same functionality, you can **edit views** at any time and save if necessary.

### 4.1.4 Deleting views

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Views are **deleted** by clicking on the Delete symbol  on the right of the name of the view (navigate with the mouse over the name). The deletion takes place after confirming a security query.

### 4.1.5 Preselection

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Here you define a report in advance of its creation. Future reports are then created using these defined settings.

## 4.2 Creating and editing diagrams

### 4.2.1 Creating diagrams

#### Brief instructions

You create a diagram by dragging one or more series or climatic data from the node structure to a display window by click & drop. An window for entering the period, resolution and presentation type of the diagram appears after releasing the left mouse button.

#### Setting default values

You can set default values for creating diagrams in the Preselection area. These default values simplify the creation of similar analyses. When creating a diagram, an input window is displayed in which you can adjust individual values. You can define the period to be absolute or, by enabling the "Relative period" checkbox, select one of the preset periods relative to the analysis time.

#### Step-by-step instructions

In the Tree view area, expand the tree to the node you require.

*To do so, click on the appropriate horizontal arrows pointing to the right ►*

*You can close sections you do not require by clicking on ▼*

If you want to also use climatic data, open the Weather data area.

*To do so, click on the expansion symbol  on the right of the title bar.*

Next, in the Preselection area define the following parameters for the absolute or relative period of future reports:

Absolute period	Relative period
Disable the "Relative period" checkbox: <input type="checkbox"/> Relative period	Enable the "Relative period" checkbox: <input checked="" type="checkbox"/> Relative period
Enter the start and end times of the absolute period:  <i>You can click the calendar icon for easier selection of dates</i> Start Date <input type="text" value="01/04/2009"/>  End Date <input type="text" value="02/28/2009"/>   <i>If dates are missing for the period, EMD issues the error message <code>error: reportEmpty</code>.</i>	Define the relative period:  <i>Click the arrow to obtain a selection of options</i> Periods <input type="text" value="week"/> ▼  <i>EMC provides a selection of relative periods. Please select one (mandatory).</i>
Define the resolution to be used: Resolution <input type="text" value="every 60 mir"/> ▼	Define the resolution to be used: Resolution <input type="text" value="every 60 mir"/> ▼
Define the type of diagram: Diagr. Typ <input type="text" value="Stepped line"/> ▼	Define the type of diagram: Diagr. Typ <input type="text" value="Stepped line"/> ▼

Drag the corresponding node by *drag & drop* to the workspace.

*This causes the "Add Series" dialog to open.*

## "Add Series" dialog

Enter a new name for the report in the Name text field (optional):

Name

Select the basic color for a diagram or table from the Color dropdown list:

Color

Select a predefined value from the Resolution dropdown list to specify the resolution of reports:

Resolution

Define the type of diagram/chart (bar, line, pie, etc.) by selecting one from the "Chart type" dropdown list:

Charttype

**i** If you cannot see the following dialog items, click

*The full dialog is then shown. You can return to the compact view at any time by clicking*

Define the type of reporting period:

- Enable the checkbox for a relative period or
- disable the checkbox for an absolute period

Relative period

**i** This parameter can be predefined in the Preselection area.

Enable the X-axis checkbox to display the X-axis:

X-axis  Show

Optional: If you selected an **absolute period** above: enter the start and end dates and start and end times:

Start Date	<input type="text" value="01/04/2009"/>	<input type="text" value="00:00A"/>	<input type="button" value="+"/>	<input type="button" value="-"/>
End date	<input type="text" value="02/28/2009"/>	<input type="text" value="00:00A"/>	<input type="button" value="+"/>	<input type="button" value="-"/>

**i** For comfortable input of dates and times you can click the corresponding symbols.

Optional: If you selected the **relative period** option above: use the dropdown listbox to select the period.

Periods

Enable the Y-axis checkbox to display the Y-axis:

Y-axis  Show

Define the limit values of the displayed Y-axes in the Minimum and Maximum input boxes:

Minimum	<input type="text" value="0"/>
Maximum	<input type="text" value="0"/>

**i** Please note:

- If multiple charts are used, the setting must be made for each chart
- Set a value of zero for Maximum if EMC is to automatically align the Y-axis according to the highest value

Once all parameters are defined, click the Confirm button.

Confirm

Cancel

The program then starts to create the chart. During this time, a small clock with turning hands is shown .

## 4.2.2 Editing

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To edit a report, click the pencil icon.

The icons  for editing and  for deleting, as well as the  button enable diagrams and/or tables to be modified and exported after creation (refer also to **creating diagrams** above and **editing diagrams** below).

## 4.2.3 Editing diagrams

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### Moving

Existing data series can be moved between windows by drag & drop.

### Copying

A selected series is copied to a new window by drag & drop while holding down the Ctrl key at the same time.

### Changing the number of windows

You can define the number of windows in the bottom right corner of the footer bar. You can do this at any time.

 *The existing diagrams are not lost.*

### Saving diagrams

Analyses can be saved in the Views area on the menu bar on the left by clicking the Add button and entering the name of the view. You can edit existing analyses and save them under the same names or rename them.

### Moving diagrams

You can move an entire diagram by clicking **in the diagram** and dragging while holding down the spacebar.

 *The display and value ranges of all series of the diagram are moved as a consequence of this action.*

### Moving value range

You move the value range of a series by clicking **on the axis** and dragging while holding down the spacebar.

### Zooming in

Click & drag in a diagram while holding down the Shift and Ctrl keys at the same time to draw a selection frame in the diagram. Upon releasing the mouse button, the selected enclosed area of the diagram is magnified. The display and value range of the diagram are adapted accordingly.

### Zooming out

You return to the previous zoom status by clicking on the diagram while holding down the Ctrl and Alt keys.

 Multiple zooming is possible and can also be undone by clicking the appropriate number of times while holding down the Ctrl and Alt keys.

### **Adjusting the period**

Clicking & dragging while holding down the Ctrl key causes the period to be altered as follows:

- If the axis is dragged to the right, the value range is expanded
- If the axis is dragged to the left, the value range is reduced.
- Which of the two end points remains fixed in position depends on which side (starting from the middle of the axis) the operations are performed.

### **Changing the resolution**

Clicking in a **diagram** while holding down the **shift** key sets the resolution of all series to a shorter analysis period.

Clicking one of the **axes** while holding down the **shift** key sets the resolution of the associated series to a shorter analysis period.

Clicking in a **diagram** while holding down the **shift** and **Alt** keys sets the resolution of all charts to a longer analysis period.

Clicking one of the **axes** while holding down the **shift** and **Alt** keys sets the resolution of the associated series to a longer analysis period.

### **Stacking series**

To create a diagram with the total values from graphs and charts, drag a counter, alarm or a temperature table to the diagram from the node structure tree. You can also drag the legend of an existing diagram to the legend of the target diagram. The diagram automatically adopts the start date, end date and resolution of the target diagrams.

Series that are stacked must have either the type "bar", "line" or "stepped line", and must have the same resolution. The period and the resolution are automatically adopted from the target series.

### **Ruler**

Clicking in a diagram creates a ruler, which you can drag over the diagram while holding down the mouse button. The data of the intersections of the ruler and series are displayed in the legend of the corresponding diagram.

### **Number of windows**

In the option field "No. of windows", click the option 1, 2 or 4.

You can arrange the windows horizontally and/or vertically by clicking and dragging from the areas between the windows.

**i** Please note the following: all rows and/or columns are changed as a result of this action.

### **Exporting**

You can export diagrams and their associated data using the Export button. The graphic formats JPEG and PNG as well as the table format CSV are provided for exporting diagrams.



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