SIEMENS

powermanager

V3.5

Help

E50417-H1076-C550-A7

NOTE

For your own safety, observe the warnings and safety instructions contained in this document, if available.

Disclaimer of Liability

Subject to changes and errors. The information given in this document only contains general descriptions and/or performance features which may not always specifically reflect those described, or which may undergo modification in the course of further development of the products. The requested performance features are binding only when they are expressly agreed upon in the concluded contract.

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Preface

Purpose of the Manual

Target Audience

Scope

Technical Support

If you have any further questions regarding , do not hesitate to contact your local Siemens representative.
Assistance with queries regarding is also available on the following Internet site:

Training Courses

Further training material is available on the following Internet site:

Notes on Safety

This manual is not a complete index of all safety measures required for operation of the equipment (module or device). However, it comprises important information that must be followed for personal safety, as well as to avoid material damage. Information is highlighted and illustrated as follows according to the degree of danger:

WARNING

WARNING means that death or severe injury **may** result if the measures specified are not taken.

✧ Comply with all instructions, in order to avoid death or severe injuries.

CAUTION

CAUTION means that medium-severe or slight injuries **can** occur if the specified measures are not taken.

✧ Comply with all instructions, in order to avoid moderate or minor injuries.

NOTE

Important information about the product, product handling or a certain section of the documentation which must be given particular attention.

Security Information

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, systems, machines and networks.

In order to protect the plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens' products and solutions only form one element of such a concept.

Customer is responsible to prevent unauthorized access to its plants, systems, machines and networks. Systems, machines and components should only be connected to the enterprise network or the internet if and to the extent necessary and with appropriate security measures (for example, use of firewalls and network segmentation) in place.

Additionally, Siemens' guidance on appropriate security measures should be taken into account. For more information about industrial security, please visit *http://www.siemens.com/industrialsecurity*.

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends to apply product updates as soon as available and to always use the latest product versions. Use of product versions that are no longer supported, and failure to apply latest updates may increase customer's exposure to cyber threats.

To stay informed about product updates, subscribe to the Siemens Industrial Security RSS Feed under *http://www.siemens.com/industrialsecurity*.

Table of Contents

1 Help on Help

1.1 Description

After you install powermanager, you can view the powermanager online help in CHM format.

1.2 CHM Help

The Help consists of 3 windows (frames):

Display of Topics

The individual pages are displayed on the right-hand side. For more information, see *1.3 Typography*.
There are linked pages with explanations for the subchapters for the main chapter.

3 Tabs on the Left-Hand Side

- **Contents**: Tree-structured overview of the contents. Folders marked with a **+** contain subdirectories or individual pages. If you prefer help in a logical, book-like form, click from top to bottom through the directory or use the browse sequences (see sequential topics).
- **Search**: Here you can perform full-text searches. Enter the term you want to search for in the **Type in the word(s) to search for** field. If the word exists, an appropriate page is displayed. Click **Options > Search Highlights On** to highlight the search terms. The search terms are sorted by frequency of occurrence. You can also alphabetically sort the topics by clicking the table header of the display.
  Initially, activate **Search titles only** in the check box below. Only when the required result is not found, click **Match similar words**. You can also use wildcards such as ***** (for any number of characters) or **?** (for one character). You can restrict your search result by using terms in quotation marks (for example, Insert config).
- **Favorites**: Here you can use **Add** to add the current page to your favorites. Select **Remove** to remove the page again or **Display** or double-click to display the pages.

Sequential Order of Topics

A window where the topic pages of the chapter in question are displayed is found above the topic. The current page is always marked blue. You can use the Previous and Next arrows to go to the previous or next page within the chapter. You can select the main chapters of the documentation from the list box under the navigation arrows.
You can therefore read adjacent chapters and sections of chapters in sequential order as in a book.

The Icon Bar

The icon bar largely corresponds to the Internet standard:

- **Hide**: Hides the left pane with the tabs. Select **Display** to display it again.
- **Find**: Displays the location of your page in the contents.
  This command is important for navigation. You can continue scrolling from the displayed location of the contents.
- **Back, Forward**: Jumps to the pages in the order of display.
- **Cancel**: Stops the page from loading.
- **Refresh**: Updates the page.
- **Start page**: Takes you back to the start page of the help.
- **Print**: Prints the displayed page.
- **Options**: A menu of the previously listed buttons, Internet options, and print options can be set here.

1.3 Typography

The following font types are used in this online help:

NOTE

The background of the text is highlighted. This option is available only with Windows.

Commands (for example, command line) use the following font:

WCCILdata -snd 2

Examples (for example CTRL scripts) use the following font:

```
main ()
{
...
}
```

File names within a paragraph use the following font:

`config`

Buttons, names, or menu options use the following font:

Cancel

NOTE

Contains useful tips, as well as, further information.

2 Installation

2.1 Prerequisites for powermanager

2.1.1 Hardware Requirements

Hardware requirements depend on the size and dynamics of the projects. A large number of statistical data-point functions (for example, compression of readings, and A/C) have a negative impact on start time and capacity, and must be considered.

The following items have a decisive effect on the hardware requirements:

- Respective computer (for example, UI client only)
- Number of managers running
- number of managers linked (for example, user interfaces)
- External software running

In general, a high capacity of memory and CPU power improve the overall performance of the powermanager projects.

NOTE

Hard disk storage capacity refers to the powermanager installation only and to the space required to start a minimum project (without going into the **Emergency mode**). For larger projects, recording historical data, alert archives, log files, and others, you must calculate the possibility for more storage capacity.

The size of the swap file must be 1 or 2 times the size of the working memory (RAM) and should not be floating. This file is hidden under Windows to store the program components and data files that were swapped out because of very low working memory. A similar size should be used for the **/swap** partition of a Linux system.

Depending on the planned usage, powermanager supports a wide range of input devices (for example, mouse, keyboard, touchscreen, and trackball).

For controlling a development system (image creation, scripting, configuration, and so on), it is highly recommended to use a mouse with at least 2 buttons and a standard keyboard.

Network Requirements

When setting up the hardware for powermanager project, perform benchmark tests before installing powermanager to avoid problems due to insufficient hardware performance (perform the tests when using redundant systems).

Network Connection

The network connection between the servers and clients must be at least 100 MBit. A fast connection between the servers in redundant system is necessary. Additionally, a time synchronization is required within the network.

Performance Test of the Copy Process

In redundant systems, database files are copied during the recovery. Therefore, a sufficient read and write performance must be guaranteed. To check if the network can handle the workload, you must check the transfer rate.

Measure the time of the following processes:

- Copy large files (for example, HDB-datasets > 500 MB) from one system to another.
- Copy the same files to the local disk to test the local disk performance without network overhead.

The transfer rate in a standard system must be 50 MB/s to 100 MB/s.

Use of Multi-Core Processors

The CPU development of the last few years has increasingly brought real multi-core processors in the market which are able to run multiple processes at the same time. Thus, the achievable total performance could be significantly increased.

Intel has done this with the Core2Duo/Core2Quad models and the new i3/i5/i7 series, and AMD with the Athlon/Phenom(II) X2/X3/X4 models.

By design, powermanager is realized in a single-threaded way which means that a powermanager manager uses only one of these threads (also known as HW strands). The most important and the most claimed managers of a powermanager project are the Eventmanager and the Data manager, wherein each one of them claims only one thread. According to the case mentioned, only 2 of the 128 available threads are used, wherein, the system at full load on the Event/Data manager uses only 1/64 of the total CPU performance.

Starting from one core (with one thread) up to 4 cores (each with one thread), powermanager achieves an increasingly better performance. In case of further cores, the performance gain per additional core/thread is relatively low. In addition, powermanager benefits from a higher clock rate of the CPU. For example, 4 cores each with one thread (= 4 threads) clocked with 3 GHz, powermanager uses much better than 8 cores with 8 threads (= 64 threads) clocked with 1 GHz.

Minimum Hardware Requirements (Local System)

The following hardware requirements are for a small project without a high level of dynamics and with one or no user interface. The enumerated hardware components correlate with each of the following configurations, only the difference in the specification is mentioned.

The following recommendations describe the minimum hardware configuration that is required for powermanager in specific use cases:

- powermanager General:
  The minimal recommended hardware for using powermanager
- Development System:
  Development workstation for creating new powermanager projects
- Small Server:
  Server configuration for a small powermanager system
- Large Scale System Server:
  Server configuration for large plant projects
- Remote Client:
  Minimal hardware recommendation for remote user interface clients

NOTE

A personal computer with x86_64 architecture is required.

Additional information that should be considered for planning your powermanager system:

- Siemens SIMATIC Nanobox PCs
- Network requirements
- Use of multi-core processors

Minimum Recommendation (powermanager General)

Hardware Component	Specifications
Processor	Intel Atom Dual Core 1.6 GHz (or equivalent)
RAM	2 GB
Hard disk	HDD with 5 GB free disk space
Graphics	Resolution: 1024 x 768 pixels

Hardware Component	Specifications
Network adaptor	10/100 MBit/s
USB interface	For the licensing of powermanager with a hardware dongle, a free USB port is required.

Minimum Recommendation - Remote Client

Hardware Component	Specifications
Processor	Intel Atom Dual Core 1.6 GHz or equivalent
RAM	2 GB RAM
Hard disk	HDD with 5 GB free disk space
Graphics	Resolution: 1280 x 1024 pixels
Network adaptor	10/100 MBit/s

Minimum Recommendation - Small Server and Large Scale System Server

NOTE

With an additional server, the PC load can be reduced. The system configuration is based on the default system settings (number of polled and archived datapoints).

Table 2-1 Small - 20 devices (Number of servers: 1)

Server Hardware	Hardware Component	Specifications
	Processor	Intel i5/i7 /Xeon Quad Core with 2.4 GHz or equivalent
	RAM	8 GB
	Hard disk space for installation	10 GB free disk space
	Hard disk space for archive 5 years (default settings)	15 GB
	Graphics	Resolution: 1280 x 1024 pixels
	Network adaptor	1 GBit/s
Configuration	Polling time for Instantaneous values	1 s
	Polling time for Energy values	10 s
	Driver Smoothing	No
Conditions	Maximum number of data-points	200000

Table 2-2 Small - 50 devices (Number of servers: 1)

Server Hardware	Hardware Component	Specifications
	Processor	Intel i5/i7 /Xeon Quad Core with 2.4 GHz or equivalent
	RAM	8 GB
	Hard disk space for installation	10 GB free disk space
	Hard disk space for archive 5 years (Default settings)	30 GB
	Graphics	Resolution: 1280 x 1024 pixels
	Network adaptor	1 GBit/s

Configuration	Polling time for Instantaneous values	1 s
	Polling time for Energy values	10 s
	Driver Smoothing	No
Conditions	Maximum number of data-points	200000

Table 2-3 Small - 100 devices (Number of servers: 1)

Server Hardware	Hardware Component	Specifications
	Processor	Intel i5/i7 /Xeon Quad Core with 2.4 GHz or equivalent
	RAM	8 GB
	Hard disk space for installation	10 GB free disk space
	Hard disk space for archive 5 years (Default settings)	50 GB
	Graphics	Resolution: 1280 x 1024 pixels
	Network adaptor	1 GBit/s
Configuration	Polling time for Instantaneous values	1 s
	Polling time for Energy values	10 s
	Driver Smoothing	No
Conditions	Maximum number of data-points	200000

Table 2-4 Medium - 200 devices (Number of servers: 1)

Server Hardware	Hardware Component	Specifications
	Processor	Intel i5/i7 /Xeon Quad Core with 2.4 GHz or equivalent
	RAM	8 GB
	Hard disk space for installation	10 GB free disk space
	Hard disk space for archive 5 years (Default settings)	100 GB
	Graphics	Resolution: 1280 x 1023 pixels
	Network adaptor	1 GBit/s
Configuration	Polling time for Instantaneous values	2 s
	Polling time for Energy values	10 s
	Driver Smoothing	No
Conditions	Maximum number of data-points	200000

Table 2-5 Large - 500 devices (Number of servers: 1)

Server Hardware	Hardware Component	Specifications
	Processor	Intel i7/Xeon Quad Core with 3 GHz or equivalent
	RAM	16 GB
	Hard disk space for installation	10 GB free disk space
	Hard disk space for archive 5 years (Default settings)	250 GB
	Graphics	Resolution: 1280 x 1024 pixels
	Network adaptor	2 x 1 GBit/s
Configuration	Polling time for Instantaneous values	5 s
	Polling time for Energy values	20 s
	Driver Smoothing	1 %
Conditions	Maximum number of data-points	200000 Import address reduction should be performed for all devices.

Table 2-6 Very Large - 1000 devices (Number of servers: 1)

Server Hardware	Hardware Component	Specifications
	Processor	Intel i7/Xeon Quad Core with 3 GHz or equivalent
	RAM	16 GB
	Hard disk space for installation	10 GB free disk space
	Hard disk space for archive 5 years (Default settings)	500 GB
	Graphics	Resolution: 1280 x 1024 pixels
	Network adaptor	2 x 1 GBit/s
Configuration	Polling time for Instantaneous values	10 s
	Polling time for Energy values	20 s
	Driver Smoothing	1 %
Conditions	Maximum number of data-points	200000 Import address reduction should be performed for all devices.

2.1.2 Software Requirements

Operating Systems

powermanager supports the following Siemens AG tested specifications list configurations.

Operating System	**Version Supported**
Windows 7	Ultimate/Enterprise/Professional with SP1 (64-bit)
Windows 10	CB Version 1703 64-bit, LTSB Version 1607 64-bit, Enterprise/Professional (64-bit)
Windows Server 2012 R2	Server 2012 R2 (64-bit)
Windows Server 2008 R2	Server 2008 R2 (64-bit)
Windows Server 2016	Server 2016 (64-bit)

Operating System	Version Supported
VMware	• Workstation Pro (supported with all operating systems that are listed in the table) • ESXi Version 6.0/6.5 (supported with all operating systems that are stated above) • vSphere Cluster (HA) with ESXi 6.0 and ESXi 6.5

NOTE

Install the TCP/IP protocol on the platforms, because managers use TCP protocol to communicate in the powermanager.

For more information on **vSphere HA Cluster**, refer to the **Extended** help.

Name Resolution

Working name resolution is required for powermanager. If the name resolution does not work, a process is momentarily blocked.

Ensure that the mapping of IP addresses to computer names and the mapping of computer names to IP addresses works properly (this is also valid for computers in the network, where a remote user interface is running).

Use an entry in the **hosts** file (which contains the mappings of IP addresses to host names) or use a DNS server that allows forward (using a domain name to find an IP address) and reverse (using an IP address to find a domain name) search.

The **host** file is located in:

`<SystemRoot>\system32\drivers\etc`

NOTE

The same host names in different domains are not supported in powermanager. Use the function **getHostname()** to view the host name without domain.

VMware Workstation

To ensure the integrity and operation of the powermanager application, the powermanager systems running on VMware follow certain hints:

- powermanager must be properly shutdown before a virtual machine is stopped.
- An **online backup (snapshot)** of a virtual machine is not supported.
- A snapshot of a virtual machine cannot be restored.
- The clock of the virtual machine must never make an unexpected jump (forward or backward) while powermanager is running.
- Redundant powermanager systems must run on physical redundant hardware and network configurations.
- powermanager must not run on a virtual machine for safety critical systems.

Office Packages and Excel

powermanager supports the following Excel versions for reporting tasks:

- Excel 2013 (32-bit)
- Excel 2016 (32-bit/64-bit)
- Excel 365

NOTE

Excel is used only in advanced reports and not in the **Reports** view.

Antivirus

Antivirus software decreases the system performance.

2.1.3 Add-ons

Reporting

Hardware Component	Specifications
Processor	Intel Pentium III 400 MHz processor (or equivalent)
RAM	256 MB
Hard disk	300 MB
Graphics	VGA with at least 1024x768 pixels and 256 colors (or more)
CD-ROM drive	Required for installation
Network Adaptor	Required to connect to other powermanager systems or remote workstations
Monitor	
2-button mouse with trackball	
Keyboard	

Infoserver

NOTE

If the Infoserver database is running on the same computer as powermanager (not recommended except for Access and higher data rates), consider these additional requirements into account when selecting the hardware.

The Infoserver can send values to the following relational database systems:

Database	Specifications
Microsoft Access	Access 97 SR 2, Access 2000, Access 2002, Access 2003
Microsoft SQL Server	
MySQL	Version 4.0
Oracle	10, 11

2.2 Windows

2.2.1 Installing Siemens Automation License Manager (ALM)

ALM is installed during the installation of powermanager.

NOTE

If a lower version of ALM is found on the system during installation, it will be upgraded to the latest version.

ALM V6.0 SP3 manages the license keys for operating powermanager.
You can operate powermanager based on the conditions of use of the installed license.

2.2.2 Installing powermanager

Installation Prerequisites

Ensure that the following prerequisites are met before you start the powermanager installation.

Minimum Hardware and Software Requirements

The minimum hardware and software requirements for installing powermanager are available in **readme.pdf**.

Microsoft Excel

Ensure that Microsoft Excel is installed on the system for viewing reports.
The minimum required Microsoft Excel version is available in **readme.pdf**.

Windows Group Membership

All powermanager users must be members of the Microsoft Windows users group **Power Users**.

Administration Rights

You must have administrator rights on the system where the powermanager is installed.

No Spaces in Path Name

There should not be any spaces in the path name.

Installation Steps

Upgrading powermanager:

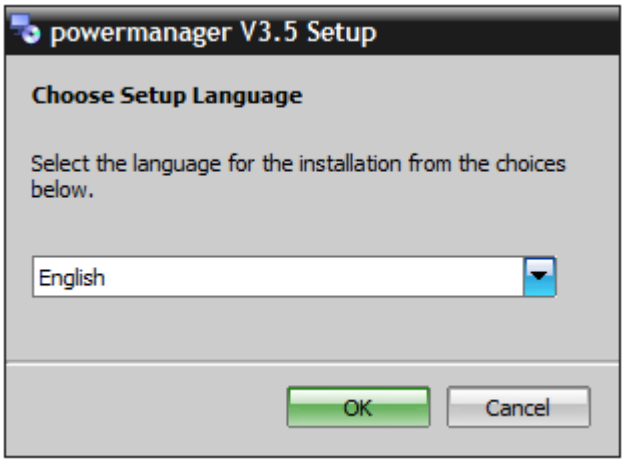
- If the previous version of powermanager is found on the system during installation of powermanager V3.5, it will be upgraded to latest version automatically.

To install powermanager, proceed as follows:

✧ Close all active applications before you start powermanager installation.

✧ Insert the installation disk in the DVD.

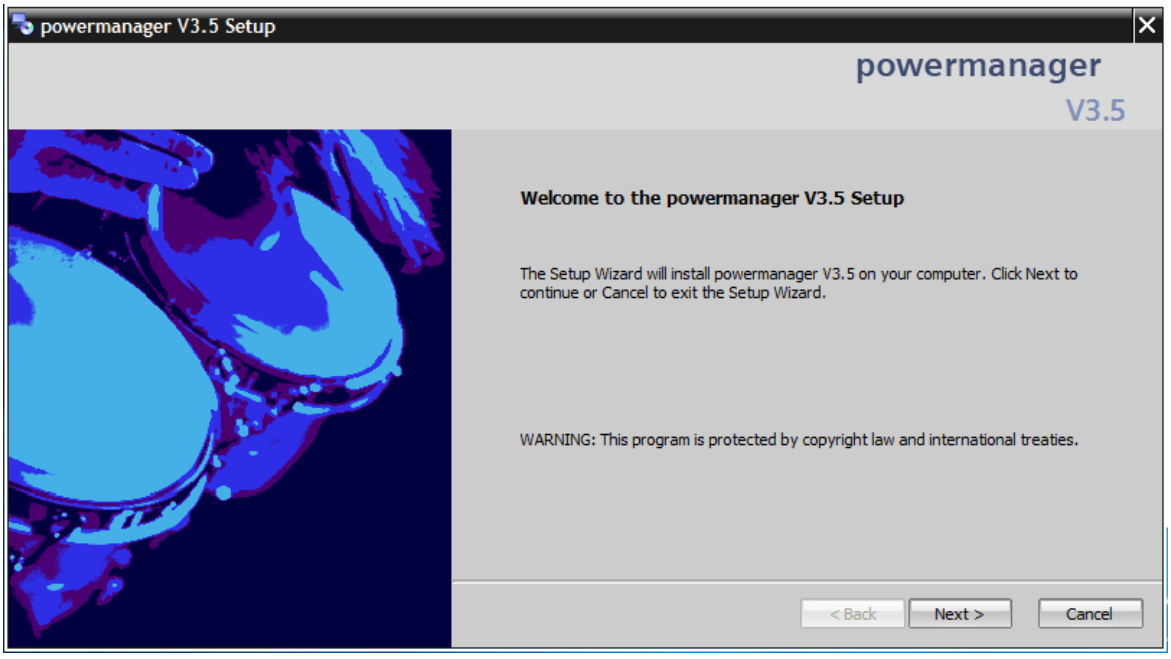
✧ Open the DVD drive and double-click the **Setup.exe** file.
The **powermanager V3.5 Setup** window appears to select the language.



[sc_pm_setup1, 3, en_US]

✧ Select the desired language and click **OK**.

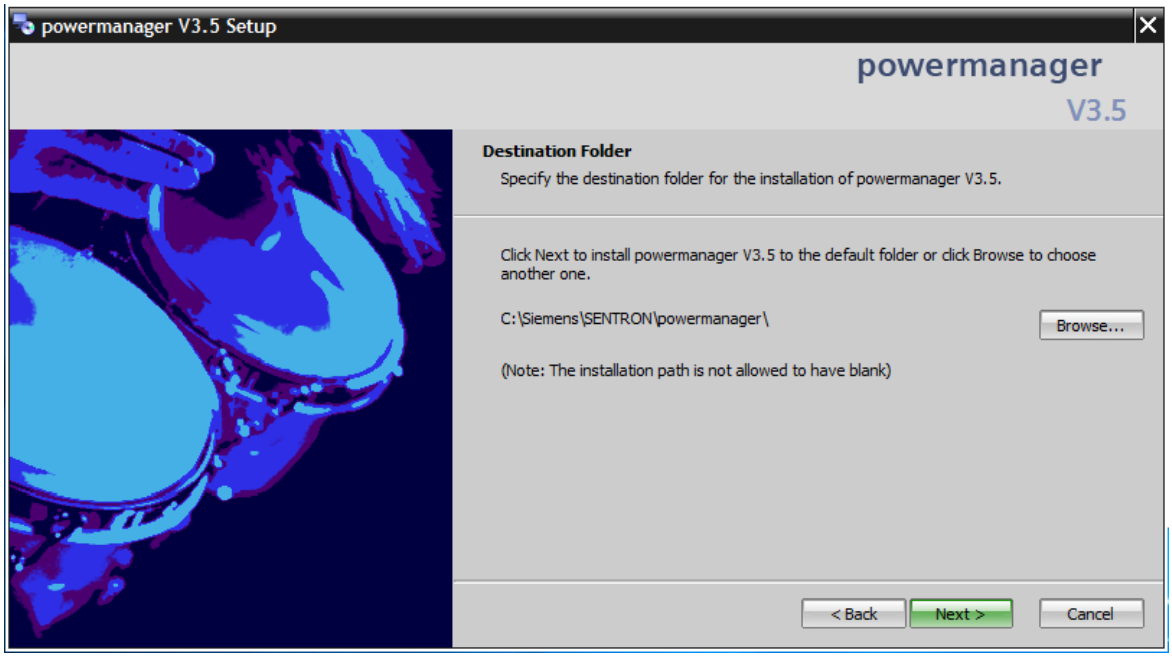
The **powermanager V3.5 Setup** wizard appears.



[sc_pm_setup2, 3, en_US]

✧ Click **Next >**.

The **powermanager V3.5 Setup** screen appears displaying the default destination path for installation.

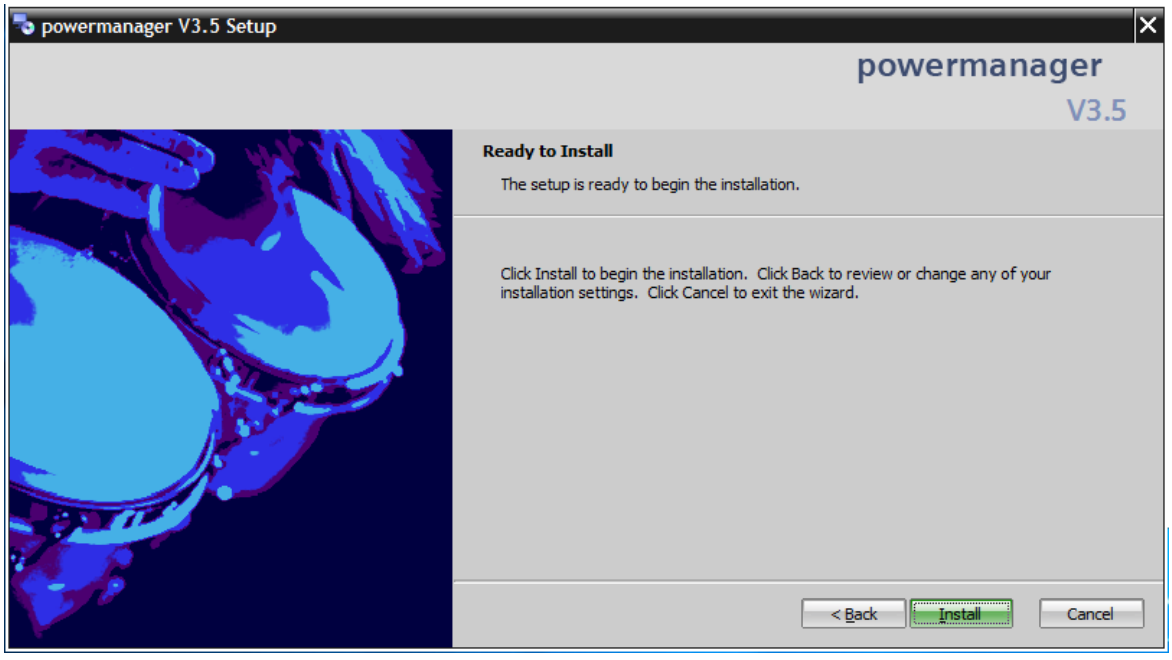


[sc_pm_setup3, 3, en_US]

✧ To change the installation path, click **Browse...**, select the desired path in the **Browse For Folder** window, and click **OK**.

✧ Click **Next >**.

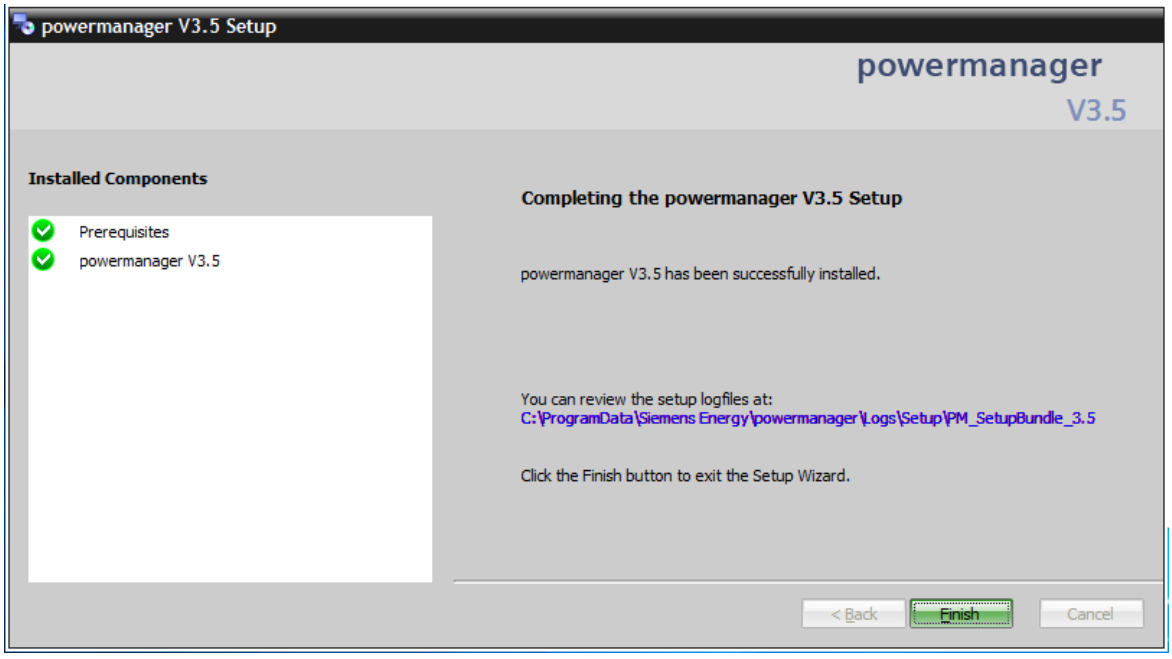
The **Ready to Install** screen is displayed.



[sc_pm_setup4, 3, en_US]

✧ Click **Install**.

The **powermanager V3.5 Setup** screen appears displaying the installation status.



[sc_pm_setup5, 3, en_US]

✧ Click **Finish**.

If the powermanager installation is successful, the following path is created in the Start menu: **Start > All Programs > SENTRON > powermanager V3.5**.

NOTE

As part of the powermanager installation, the powermanager installer creates a certificate in the computer name and places it under the certificate store of the local computer. If you want to create your own certificate, refer to the SSL certificated section of extended help.

2.2.3 Silent Installation

Silent installation is an unattended installation via the command prompt. It is performed by running the Setup.exe with the following parameters:

- Source
- Language
- Reboot
- Installation Directory path

If the previous version of powermanager is found on the system during installation of powermanager V3.5, it will be upgraded to latest version automatically.

Running Setup.exe

To execute the Setup file:

✧ Execute the **Setup.exe** by using either of the following commands:
<Source>\Setup.exe /si /L <lang ID> or **<Source>\Setup.exe -si /L <lang ID>**
where:
<Source> indicates the location at which the **Setup** folder is copied on the local computer.
L <lang ID> indicates the language ID that is passed as a command line argument for the language parameter.The IDs for English and German language are 1033 and 1031 respectively.
INSTALLDIR=<installation path> Installation location, default value: **%SystemDrive%\Siemens\SENTRON\powermanager**
For example, **E:\Setup\Setup.exe /si /L 1031 INSTALLDIR="D:\Sentron"**.
The system restarts automatically to complete the installation.
If you want to avoid the restarting of the system, enter **/noreboot** as a command line argument. Restart the system manually to complete the installation.

NOTE

The command line argument **si** is case-sensitive.
powermanager is localized as per the language ID. If the language parameter is not passed, English is the localized language by default.
If the command is executed with wrong command line arguments, the installer starts in the user-interactive mode.
Installation path should not include backslash (\) at the end of the command.
The notification icon  and the respective notifications in the taskbar display the installation progress of the powermanager application.

✧ Verify the installation in the log files generated at:
%programdata%\Siemens Energy\powermanager\Logs\Setup

NOTE

During the installation of powermanager, if any of the installation prerequisites is not met, the installation is aborted. Also, the prerequisite that was not met is displayed in the log file.

2.2.4 Transferring the License Keys

The license keys are included on the USB drive supplied with the installation disk. Additionally, you receive multiple USB drives, each containing different license keys for optional or expansion packages.

Transferring the Licenses

To transfer the license key to the system where powermanager is installed.

✧ Insert the USB drive in the USB port of the system.

✧ Click **Start > All Programs > Siemens Automation > Automation License Manager**.
ALM opens.

✧ In the ALM window, click **View > Management**.

✧ Select and copy the required license keys from the USB drive.

✧ Paste the license key in the system.

The required license keys become available on the powermanager system.

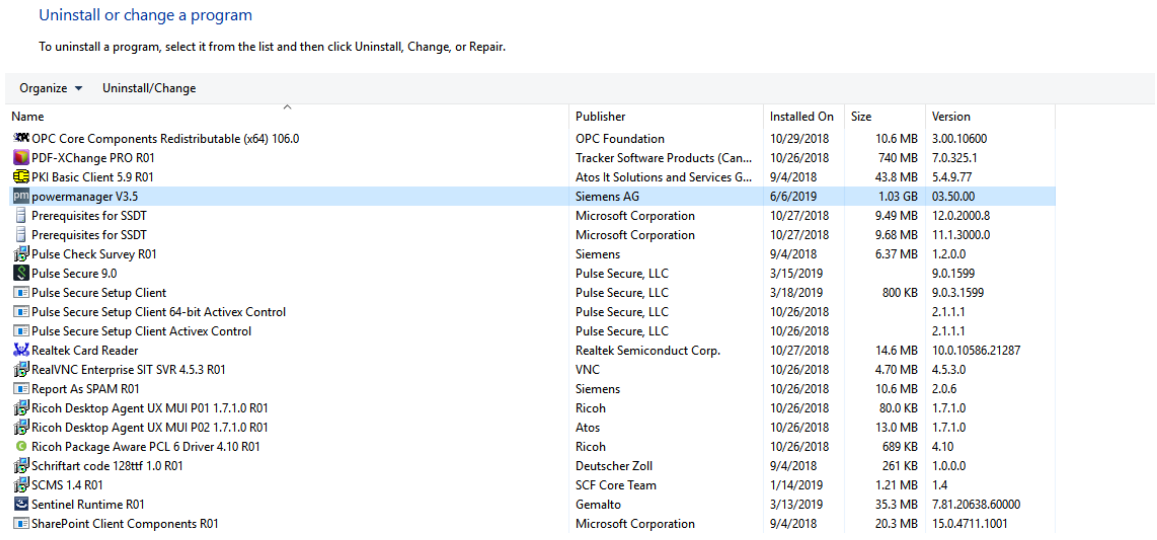
2.2.5 Uninstalling powermanager

You can uninstall powermanager in the following three ways:

- Using the powermanager setup file and selecting the Remove option.
- Using the Windows start menu location of powermanager. Click **Start > All Programs > SENTRON > powermanager V3.5 > Uninstall** to start powermanager uninstallation.
- Using the **Uninstall or change a programs** dialog from the Control Panel in Windows.

NOTE

Do not delete the powermanager installation directory to uninstall powermanager.



[sc_pm_uninstall_pm, 3, en_US]

Figure 2-1 Control Panel - Programs and Features

To access the **Uninstall or change a programs** dialog, click **Start > Control Panel**. In the Control Panel, click **Uninstall a program**.

In the **Programs and Features** dialog, select the powermanager installation, and select **Uninstall/Change** from the context menu..

Ensure that only the following files are deleted:

- Empty folders that did not exist before the installation
- Registry items that did not exist before the installation
- Items in the start menu that did not exist before the installation
- Files that did not exist before the installation, apart from directories `log/`, `bin/`, `config/`, `install/`, and the shield file in the powermanager installation

  Delete these files explicitly.
- Entire directory structure for the powermanager installation up to the first not empty directory

After uninstalling powermanager, the following directories and registry items will be available:

- Registry and directories of powermanager projects

  Uninstall these from the console before you uninstall powermanager.
- Registry-Key: `HKEY_LOCAL _MACHINE/SOFTWARE/Siemens AG/powermanager`

- Shared DLLs installed by other applications
  They are visible under
  `HKEY_LOCAL _MACHINE/SOFTWARE/Microsoft/Windows/CurrentVersion/SharedDLLs.`

NOTE

Additional program components (for example, ALM and powermanager Web client) are not uninstalled with the uninstallation of powermanager. Uninstall these additional components separately in the **Add or Remove Programs** dialog from the Control Panel in Windows.

Uninstallation of Patches

Uninstall powermanager completely to uninstall all the patches. You cannot uninstall patches individually.

2.2.6 Silent Uninstallation

Silent uninstallation is an unattended uninstallation via the command prompt.

Silent Uninstallation

To uninstall powermanager via command prompt, proceed as follows:

✧ Navigate to the installation directory and open the **Setup** folder.
  For example: **C:\Siemens\SENTRON\powermanager\Setup**

✧ Execute the Setup.exe with the following parameters:
  C:\Siemens\SENTRON\powermanager\Setup\Setup.exe /arp /sx

powermanager is removed successfully.

NOTE

The notification icon  and the respective notifications in the taskbar display the uninstallation progress of the powermanager application.

2.3 Licensing

2.3.1 Automation License Manager (ALM)

powermanager is fully functional only with a valid license. The Automation License Manager (ALM) is required to install the license on the system.

The licenses are supplied on a USB drive. Copy the licenses to disk using the ALM interface or operate them directly with the USB drive.

Refer to the Automation License Manager Help for the range of functions, and details on how to link the license.

NOTE

The TRIAL version of the powermanager contains a test license that is valid for 60 days. powermanager automatically shuts down 30 mins after the 60 days free license period.

If a valid license is installed and detected via the ALM, powermanager continues to work without runtime restriction.

2.3.2 License Packages

NOTE

Check the log file if you receive a warning of the following nature when starting the user interface: *WCCOAui (..), ..., SYS, FATAL,...*.

The log file contains information about the nature of the problem, for example, client licenses are unavailable.

Licenses

The following licenses are available for powermanager:

License	Range of Functions (Validity)
3ZS2711-0CC30-0YA7	Trial version
3ZS2711-0CC30-0YA0	Basic package
3ZS2 711-0CC30-0YD0	Device pack (20)
3ZS2712-0CC30-0YD0	Device pack (50)
3ZS2713-0CC30-0YD0	Device pack (100)
3ZS2714-0CC30-0YD0	Device pack (200)
3ZS2715-0CC30-0YD0	Device pack (500)
3ZS2716-0CC30-0YD0	Device pack (1000)
3ZS2711-0CC30-0YE0	LEAN upgrade to device package (10)
3ZS2712-0CC30-0YE0	STANDARD upgrade to device package (50)
3ZS2713-0CC30-0YE0	ADVANCED upgrade to device package (100)
3ZS2714-0CC30-0YE0	MAXIMUM upgrade to device package (200)
3ZS2710-3CC0-00YD0	Client (5)
3ZS2710-2CC20-0YH0	Expert
3ZS2 718-1CC00-0YH0	Distributed Systems (2)
3ZS2 718-2CC00-0YH0	Distributed Systems (5)
3ZS2 718-3CC00-0YH0	Distributed Systems (10)

3 Application

3.1 Overview

System Overview

powermanager is used to acquire, monitor, evaluate, represent, and archive measuring values of the measuring devices 7KT PAC1200, PAC1500, PAC1600, 7KM PAC2200, PAC3100, PAC3200, PAC3200T, PAC4200, power quality devices 7KM PAC5100, PAC5200, SICAM P850/855 and the circuit breakers 3VA, 3VA27, 3VL, 3WL, 3WL10, and any Modbus TCP enabled measuring devices.

powermanager has the following functions to perform the mentioned tasks:

- Tree view of the system (project tree)
- Measured value display with predefined user views
- Alarm management
- Demand curve
- Reporting, integrated report engine with predefined report templates, like Energy analysis or Cost Center report and individual reports based on EXCEL.
- Load monitoring
- Reaction plans
- Power peak analysis
- Support for distributed systems
- Archiving system
- Key Performance Indicators (KPI)
- User management

You can enhance powermanager at any time and tailor it to your requirements.

Possible expansions include:

- Increased number of devices.
- Increased number of client applications.
- Expert option package: Graphical representation of plants with predefined graphics objects for all measuring devices and switches, as well as its own script language.

Device Integration

7KT PAC1200

The 7KT PAC1200 multi-channel current-measuring system supplements the product range of the power monitoring system. It provides a low-cost solution for the transparent representation of energy consumption and also enables the resulting costs to be displayed. The current values themselves are measured by means of sensors that are fitted above the miniature circuit breakers. The simple cost center allocation enables maximum transparency over the entire application.

The 7KT PAC1200 multi-channel current-measuring system monitors and displays the energy consumption of up to 96 outgoing feeders. You can configure 12 sensor bars for a maximum number of 8 times (always 8 bars with the respective combination). Up to eight different selectable consumption sources can be compared with each other. The system can be scaled to individual needs and application scenarios. The individual sensors can be named individually and compared with each other. The system can be configured flexibly as the number of Sensor bars can be varied.

For more information, refer to the PAC1200 manual.

7KT PAC1500

The 7KT PAC1500 is an E-counter for measuring consumption values in three-phase systems. This unit registers exported or imported energy and it stores active and reactive energy.

The device has a pulse output (S0), and so it is designed for two tariff measurements. Communication modules can be interfaced via the integrated optical interface (IrDA).

7KT PAC1600

The 7KT PAC1600 is a family of E-counters for measuring consumption values in three-phase systems. This unit registers exported or imported energy and it stores active and reactive energy.

The following variants are available for PAC1600:

- 7KT PAC1651
- 7KT PAC1652
- 7KT PAC1661
- 7KT PAC1662
- 7KT PAC1665
- 7KT PAC1666
- 7KT PAC1682

7KM PAC3100

The 7KM PAC3100 is a power monitoring device for displaying basic electrical variables and energy acquisition values (counters) in low-voltage power distribution. It performs single-phase, two-phase, and three-phase measurement and can be used in three-wire or four-wire TN, TT, and IT systems.

The minimum supported firmware version for 7KM PAC3100 is 1.0. You can use the gateway functionality of the PAC4200 to connect the device to powermanager. You can also use any Modbus gateway to establish the connection.

With the help of the basic measured variables (for example, voltage, currents, energy values), extensive evaluations can already be undertaken in the powermanager.

For more information, refer to the PAC3100 manual.

7KM PAC3200

The 7KM PAC3200 is a power monitoring device for displaying all the relevant line parameters. It collects all the basic measured variables and the extended measured variables (for example, THD). Limit values are available for line monitoring. It performs single-phase, two-phase, or three-phase measurement and can be used in two-wire, three-wire, or four-wire TN, TT, and IT systems. The 7KM PAC3200 with multi-range power supply can thus be connected direct in every low-voltage system up to a line voltage of 690 V.

Connect 7KM PAC3200 power monitoring device to powermanager through the integral Ethernet interface using Modbus TCP.

In addition to the measured value display, powermanager supports the following device functionality:

- Synchronization of the period
- Support for the digital inputs in the different modes
- Option for resetting the counters and the min/max values
- Evaluation of the status bytes and generation of the relevant messages

For more information, refer to the PAC3200 manual.

NOTE

For more information on the special features of the digital inputs, see *8.2.3 Inputs and Outputs*.

7KM PAC3200T

The 7KM PAC3200T is a power monitoring device for displaying all the relevant line parameters. It collects all the basic measured variables and the extended measured variables (for example, THD). Limiting values are available for line monitoring. The 7KM PAC3200T performs 1-phase, 2-phase, or 3-phase measurement and can be used in 2-wire, 3-wire, or 4-wire TN, TT, and IT systems. The 7KM PAC3200T with multi-range power supply can thus be connected directly in every low-voltage system up to a line voltage of 690 V.

Connect the 7KM PAC3200T power monitoring device to powermanager through the integral Ethernet interface using Modbus TCP.

In addition to the measured value display, powermanager supports the following device functionality:

- Synchronization of the period
- Support for the digital inputs in the different modes
- Option for resetting the counters and the min/max values
- Evaluation of the status bytes and generation of the relevant messages

For more information, refer to the PAC3200T manual.

NOTE

For more information on the special features of the digital inputs, see *8.2.3 Inputs and Outputs*.

7KM PAC4200

7KM PAC4200 is a power monitoring device for displaying, storing, and monitoring all relevant line parameters in low-voltage power distribution. Compared to 7KM PAC3200, the 7KM PAC4200 has extended measuring functions (> 800 measured variables), an integral memory for buffering the load profile and events, as well as, gateway functionality. It performs single-phase, two-phase, or three-phase measurement and can be used in two-wire, three-wire, or four-wire TN, TT, and IT systems.

The minimum supported firmware version for 7KM PAC4200 is V1.2. Connect the 7KM PAC4200 power monitoring device to powermanager through the integral Ethernet interface using Modbus TCP.

NOTE

On creation of a new PAC4200 device with firmware version 2.1.1 or above, it is recommended to restart the project so that all the properties of the devices could be polled.

You can connect any Modbus enabled measuring devices to powermanager through the Ethernet or gateway using the RS485 interface.

Along with the measured value display, powermanager supports the following device functionality:

- Reading out the device memory (load profile)
- Gateway functionality
- Graphical display of harmonics
- Time synchronization
- Support for the digital inputs in the different modes
- Option for resetting the counters and the min/max values

- Evaluation of the status bytes and generation of the relevant messages
- Support for the two optional external DI/DO modules

For more information, refer to the PAC4200 manual.

NOTE

For more information on the special features of the digital inputs, see *8.2.3 Inputs and Outputs*.

NOTE

Load profile data is displayed in the powermanager only if the time difference between the PAC device and the PC lies within specific tolerances. Synchronize the times between the PC and the device if load profile data is not collected.

PAC2200

The PAC2200 is a power monitoring device for displaying all the relevant line parameters. It collects all the basic measured variables and the extended measured variables (for example, THD). Limit values are available for line monitoring. It performs single-phase, two-phase, or three-phase measurement and can be used in two-wire, three-wire, or four-wire TN, TT, and IT systems. The PAC2200 with multi-range power supply can thus be connected directly to every low-voltage system up to a line voltage of 690 V. Connect the PAC2200 power monitoring device to powermanager through the integral Ethernet interface using Modbus TCP.
In addition to the measured-value display, powermanager supports the following device functionalities:

- Synchronization of the period
- Support for the digital inputs in the different modes
- Option for resetting the counters and the min/max values
- Evaluation of the status bytes and generation of the relevant messages

3VA27

The 3VA27 molded case circuit breaker is a current-limiting circuit breaker with IEC certification and is an addition to the existing 3VA IEC portfolio.
Current-limiting molded case circuit breakers are defined as:

- Circuit breaker that, within a specified range of current, prevents the let-through current from reaching the prospective peak value and which limits the let-through energy (I2t) to a value less than the let-through energy of a half-cycle wave of the symmetrical prospective current.

These are the positive characteristics of a protection device that is most frequently used on the outgoing side and that, like the 3VA27 molded case circuit breaker, is dynamically selective and current limiting in the event of a fault. **Current limiting** means that the peak value of the prospective impulse short-circuit current Ip is limited to a smaller let-through current iD. Effective current limitation means that the circuit breakers and busbar trunking systems can be constructed more compactly. In the event of a short-circuit, the molded case circuit breaker substantially reduces the magnitude of the let-through currents, wherein, it reduces the load reaching downstream equipment (less thermal load, lower dynamic forces). The let-through energy is also significantly reduced. 3VA molded case circuit breakers are designed to be current limiting. It has the following characteristics:

- Frame size 1600 A with a rated current In of 800 A to 1600 A
- Choice of 2 designs:
  - As a toggle operating mechanism (for example, as an additional manual operating mechanism).
  - As a stored energy spring mechanism for integration of internal spring charging motors (external dimensions are not affected by this). Optionally available either as a fixed-mounted version or as a withdrawable version. An especially high Icu value (up to 110 kA @ 415 V) and an Icw value (up to 20 kA 1s).

PAC5100/PAC5200 and SICAM P850/P855 multifunctional devices

The PAC5100/PAC5200 and SICAM P850/P855 multifunctional devices are used to collect, display and transmit measured electrical variables according to IEC 61000-4-30 Power Quality (PQ) standard.
The PAC5100/PAC5200 and P850/P855 devices record the following measured variables:

- Alternating voltage and alternating current
- Unbalanced alternating voltage and alternating current
- Active, reactive, and apparent power
- Active, reactive, and apparent energy
- Power frequency
- Phase angle
- Power factor and active power factor
- Total Harmonic Distortion (THD) of alternating voltage and alternating current
- Harmonics of alternating voltage and alternating current
- Flicker according to IEC 61000-4-15 standard (only PAC5200 and SICAM P855)

Connect the PAC5100/PAC5200 or P850/P855 multifunctional devices to powermanager via Ethernet interface.
Fault records for PAC5200 and P855 devices are displayed in the **Web** tab on the base panel. Use the SIGRA plug-in or COMTRADE viewer to view the fault records. For more information, refer to *6.1.10 Web*.
For more information, refer to the PAC5100/PAC5200 manual and SICAM P850/P855 manual.

3VL (with COM21)

3VL are molded-case circuit breakers. They can acquire and forward status information, warning messages, tripping information, and threshold-value violations (for example, overcurrent).
Connect the 3VL molded-case circuit breakers to powermanager via the gateway functionality of the PAC4200. You can use any other gateway to establish the connection.
The current circuit-breaker status is also displayed in the powermanager as well as the measured values. The circuit breaker can be switched with the relevant authorization.
There are three switching functions:

- ON - Select **ON** when the circuit breaker status is **OFF**.
- OFF - Select **OFF** when the circuit breaker status is **ON**.
- RESET - Select **RESET** when the circuit breaker status is **TRIPPED**.

For more information, refer to the 3VL system manual.

NOTE

powermanager does not detect the specific circuit breaker version and the available measured values automatically. In the device engineering for the circuit breaker, select the measured values that are available in your circuit breaker. For this purpose, activate the check box for **Address**, and if necessary, set archiving on the **Configuration** tab.

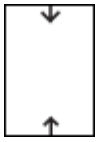
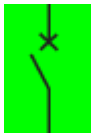
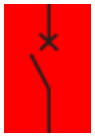
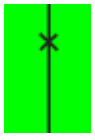
State Symbols of the Molded-case Circuit Breaker

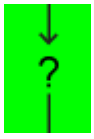
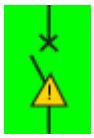
Different states of the molded-case circuit breaker are represented as a circuit-breaker symbol. The state symbol of the molded-case circuit breaker indicates the position of the molded-case circuit breaker in the frame. You can see whether the molded-case circuit breaker is open or closed. The background color designates the status of the relevant message.

Table 3-1 Colored background of the molded-case circuit breaker symbol for designating the status of messages

Color	Message Status	Meaning
Green	Green	No messages pending.
Yellow	Yellow	At least one warning message or one threshold warning is pending.
Red	Red	At least one trip message is currently pending.
White	White	No information available about the existence of messages.

Table 3-2 State symbols of the molded-case circuit breaker:

State Symbol without Guide Frame	Description of the State
	The circuit breaker is not available.
	The circuit breaker is opened. At the moment, neither tripping nor warning or setpoint messages are present.
	The circuit breaker is opened. At the moment, a tripping message is present.
	The circuit breaker is opened. At the moment, at least one warning or setpoint message is present.
	The circuit breaker is closed. At the moment, neither tripping nor warning or setpoint messages are present.
	The circuit breaker is closed. At the moment, a tripping message is present.

State Symbol without Guide Frame	Description of the State
	The circuit breaker is closed. At the moment, at least one warning or setpoint message is present.
	It is unknown, if the circuit breaker is closed or opened. At the moment, neither tripping nor warning or setpoint messages are present.
	It is unknown, if the circuit breaker is closed or opened. At the moment, a tripping message is present.
	It is unknown, if the circuit breaker is closed or opened. At the moment at least one warning or setpoint message present.
	The circuit breaker has tripped. At the moment, neither tripping nor warning or setpoint messages are present.
	The circuit breaker has tripped. At the moment, a tripping message is present.
	The circuit breaker has tripped. At the moment, at least one warning or setpoint message is present.
offline	The molded-case circuit breaker is offline.

3VA molded-case circuit breakers

Connect the 3VA molded-case circuit breakers to powermanager via COM800 gateway.

The 3VA series is designed for use in applications with higher technical requirements and a rated current of up to 630 A.

In addition to an increased switching capacity of up to 150 kA, these MCCBs come with an electronic trip unit (ETU), and an integration capability for metering and communication functions.

The current-limiting contact system furthermore ensures a very high switching capacity. ETUs guarantee reliable overload protection, short-term delayed or instantaneous tripping in case of a short-circuit, neutral conductor protection, and fault protection against ground.

Mobile test devices allow the checking and parameterization of ETU functions in MCCBs on site.

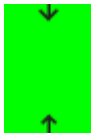
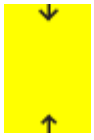
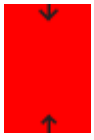
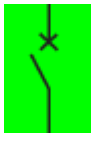
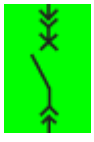
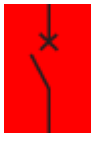
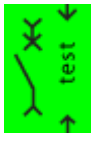
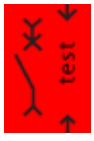
State symbols of the molded-case circuit breaker

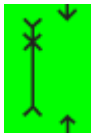
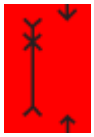
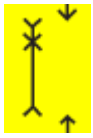
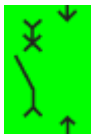
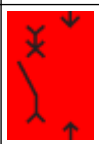
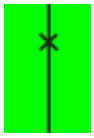
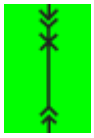
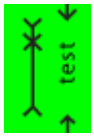
Different states of the molded-case circuit breaker are represented as a circuit-breaker symbol. The state symbol of the molded-case circuit breaker indicates the position of the molded-case circuit breaker in the frame. You can see whether the molded-case circuit breaker is open or closed. The background color designates the status of the relevant message.

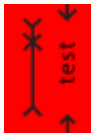
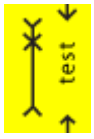
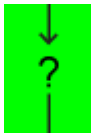
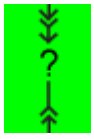
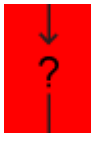
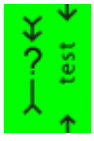
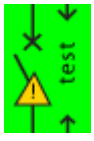
Table 3-3 Colored background of the molded-case circuit breaker symbol for designating the status of messages:

Color	Message Status	Meaning
Green	Green	No messages pending
Yellow	Yellow	At least one warning message or one threshold warning is pending
Red	Red	At least one trip message is currently pending
White	White	No information available about the existence of messages

Table 3-4 State symbols of the molded-case circuit breaker:

State Symbol without Guide Frame	State Symbol with Guide frame	Description of the State
		The circuit breaker is not available. **Note**: At the moment, neither tripping nor warning or setpoint messages are pending.
		The circuit breaker is not available. **Note**: At the moment, at least one warning or setpoint message is pending.
		The circuit breaker is not available. **Note**: At the moment, a tripping message is pending.
		The circuit breaker is opened. At the moment, neither tripping nor warning or setpoint messages are present.
		The circuit breaker is opened. At the moment, a tripping message is present.
		The circuit breaker is opened. At the moment, at least one warning or setpoint message is present.
		The circuit breaker is opened. At the moment, neither tripping nor warning or setpoint messages are present.
		The circuit breaker is opened. At the moment, a tripping message is present.
		The circuit breaker is opened. At the moment, at least one warning or setpoint message is present.

State Symbol without Guide Frame	State Symbol with Guide frame	Description of the State
		The circuit breaker is in the disconnected position.
		The circuit breaker is in disconnected position. The circuit breaker is closed. At the moment there are neither tripping nor warning or setpoint messages present.
		The circuit breaker is in disconnected position. The circuit breaker is closed. At the moment a tripping message is present.
		The circuit breaker is in disconnected position. The circuit breaker is closed. At the moment, at least one warning or setpoint message is present.
		The circuit breaker is in disconnected position. The circuit breaker is opened. At the moment, neither tripping nor warning or setpoint messages are present.
		The circuit breaker is in disconnected position. The circuit breaker is opened. At the moment, a tripping message is present.
		The circuit breaker is in disconnected position. The circuit breaker is opened. At the moment, is at least one warning or setpoint message is present.
		The circuit breaker is closed. At the moment, neither tripping nor warning or setpoint messages are present.
		The circuit breaker is closed. At the moment, a tripping message is present.
		The circuit breaker is closed. At the moment, at least one warning or setpoint message is present.
		The circuit breaker is closed. At the moment, neither tripping nor warning or setpoint messages are present.

State Symbol without Guide Frame	State Symbol with Guide frame	Description of the State
		The circuit breaker is closed. At the moment, a tripping message is present.
		The circuit breaker is closed. At the moment, at least one warning or setpoint message is present.
		It is unknown, if the circuit breaker is closed or opened. At the moment, neither tripping nor warning or setpoint messages are present.
		It is unknown, if the circuit breaker is closed or opened. At the moment, a tripping message is present.
		It is unknown, if the circuit breaker is closed or opened. At the moment, at least one warning or setpoint message is present.
		It is unknown, if the circuit breaker is closed or opened. At the moment, neither tripping nor warning or setpoint messages are present.
		It is unknown, if the circuit breaker is closed or opened. At the moment, a tripping message is present.
		It is unknown, if the circuit breaker is closed or opened. At the moment, at least one warning or setpoint message is present.
		The circuit breaker is in test position and has tripped. At the moment, neither tripping nor warning or setpoint messages are present.
		The circuit breaker is in test position and has tripped. At the moment a tripping message is present.
		The circuit breaker has tripped. At the moment, at least one warning or setpoint message is present.
offline	offline	The circuit breaker is in test position and has tripped. At the moment, at least one warning or setpoint message is present.

3WL (with COM16)

3WL are air circuit breakers. They can transfer important information to the software to carry out diagnostics management, fault management, maintenance management, and cost center management.

Connect the 3WL air circuit breakers to powermanager via the gateway functionality of the PAC4200. You can use any other gateway to establish the connection.

The circuit breaker status is displayed in powermanager and the measured values and can be switched with the appropriate authorization.

There are two switching functions:

- ON - Select **ON** when the circuit breaker status is **OFF** or **TRIPPED**.
- OFF - Select **OFF** when the circuit breaker status is **ON**.

For more information, refer to the 3WL/3VL system manual.

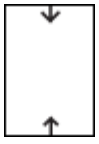
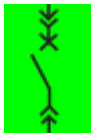
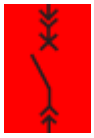
State symbols of the molded-case circuit breaker

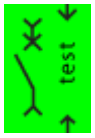
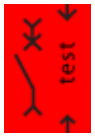
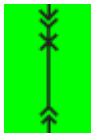
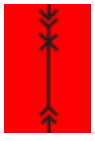
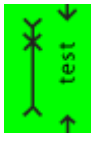
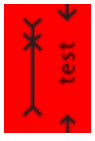
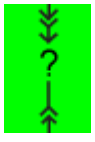
Different states of the molded-case circuit breaker are represented as a circuit-breaker symbol. The state symbol of the molded-case circuit breaker indicates the position of the molded-case circuit breaker in the frame. You can see whether the molded-case circuit breaker is open or closed. The background color designates the status of the relevant message.

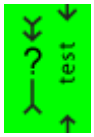
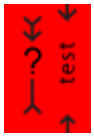
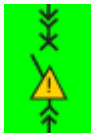
Table 3-5 Colored background of the molded-case circuit breaker symbol for designating the status of messages:

Color	Message Status	Meaning
Green	Green	No messages pending
Yellow	Yellow	At least one warning message or one threshold warning is pending
Red	Red	At least one trip message is currently pending
White	White	No information available about the existence of messages

Table 3-6 State symbols of the molded-case circuit breaker:

State Symbol with Guide Frame	Description of the State
	The circuit breaker is not available.
	The molded-case circuit breaker is in the connected position and open. At the moment, neither trip messages nor warning messages or threshold messages are pending.
	The molded-case circuit breaker is in the connected position and open. A trip message is pending.
	The molded-case circuit breaker is in the connected position and open. At least one warning message or one threshold warning is pending.

State Symbol with Guide Frame	Description of the State
	The circuit breaker is in test position and opened. At the moment, neither tripping nor warning or setpoint messages are present.
	The circuit breaker is in test position and opened. At the moment, a tripping message is present.
	The circuit breaker is in test position and opened. At the moment, at least one warning or setpoint message is present.
	The circuit breaker is in disconnected position.
	The circuit breaker is in connected position and closed. At the moment, there are neither tripping nor warning or setpoint messages present.
	The circuit breaker is in connected position and closed. At the moment, a tripping message is present.
	The circuit breaker is in connected position and closed. At the moment, at least one warning or setpoint message is present.
	The circuit breaker is in the test position and closed. At the moment, neither trip messages nor warning messages or threshold messages are pending.
	The circuit breaker is in the test position and closed. A trip message is pending.
	The circuit breaker is in the test position and closed. At least one warning message or one threshold warning is pending.
	The circuit breaker is in connected position. It is unknown whether the switch is closed or opened. At the moment, neither tripping nor warning or setpoint messages are present.

State Symbol with Guide Frame	Description of the State
	The circuit breaker is in connected position. It is unknown whether the switch is closed or opened. At the moment, a tripping message is present.
	The molded-case circuit breaker is in the connected position. It is not known whether the molded-case circuit breaker is open or closed. At least one warning message or one threshold warning is pending.
	The circuit breaker is in test position. It is unknown whether the switch is closed or opened. At the moment, neither tripping nor warning or setpoint messages are present.
	The circuit breaker is in test position. It is unknown whether the switch is closed or opened. At the moment, a tripping message is present.
	The circuit breaker is in test position. It is unknown whether the switch is closed or opened. At the moment, at least one warning or setpoint message is present.
	The circuit breaker is in test position and has tripped. At the moment there are neither tripping nor warning or setpoint messages present.
	The circuit breaker is in test position and has tripped. At the moment, a tripping message is present.
	The circuit breaker is in test position and has tripped. At the moment, at least one warning or setpoint message is present.
offline	The molded-case circuit breaker is offline.

3WL10

The air circuit breaker is an integral part of an economically efficient power distribution system that is designed to protect personnel and material assets. The 3WL10 air circuit breaker is an IEC circuit breaker (3WL1) with frame size 0 (3WL10) and is an addition to the existing 3WL1 IEC portfolio.

The 3WL10 air circuit breaker meets the following requirements:

- High breaking capacity
- Selective protective response
- Integrated metering function with internal voltage tap and expansion module MF Basic/MF Advanced (with electronic trip units of the 6-series)
- Connection to a fieldbus communication system or Ethernet-based IP communication (with electronic trip units of the 6-series)

Generic Modbus Devices

You can connect any Modbus-enabled measuring device directly to powermanager via Ethernet (Modbus TCP) or gateway (7KM PAC4200) and RS485 interface. For these devices, you can configure up to 50 measured variables and 10 status information items.

DANGER

Use of generic switches:

If ignored, it results in death or serious injury.

✧ Lock the circuit breaker against undesired/unauthorized operation and against the **Tripped** status. There is no software locking mechanism for the circuit breaker.

3.2 SEM3

3.2.1 Overview

The new Siemens Embedded Micro Metering Module (SEM3) is a modular metering solution for energy monitoring, data analysis, and sub billing applications. The flexible design allows for low, medium, and high density metering requirements to be met efficiently and economically using only a few standardized components integrated into Siemens Panelboard and Switchboard products.

The SEM3 system is made up of the following components and options:

- Controller
- Meter modules
- Meter racks
- Current transformers (CT)
- Communication cables

For more information about SEM3, refer to the respective SEM3 manuals.

3.2.2 Creating SEM3 Device Type

To work with the respective SEM3 devices, you must create the SEM3 device type.

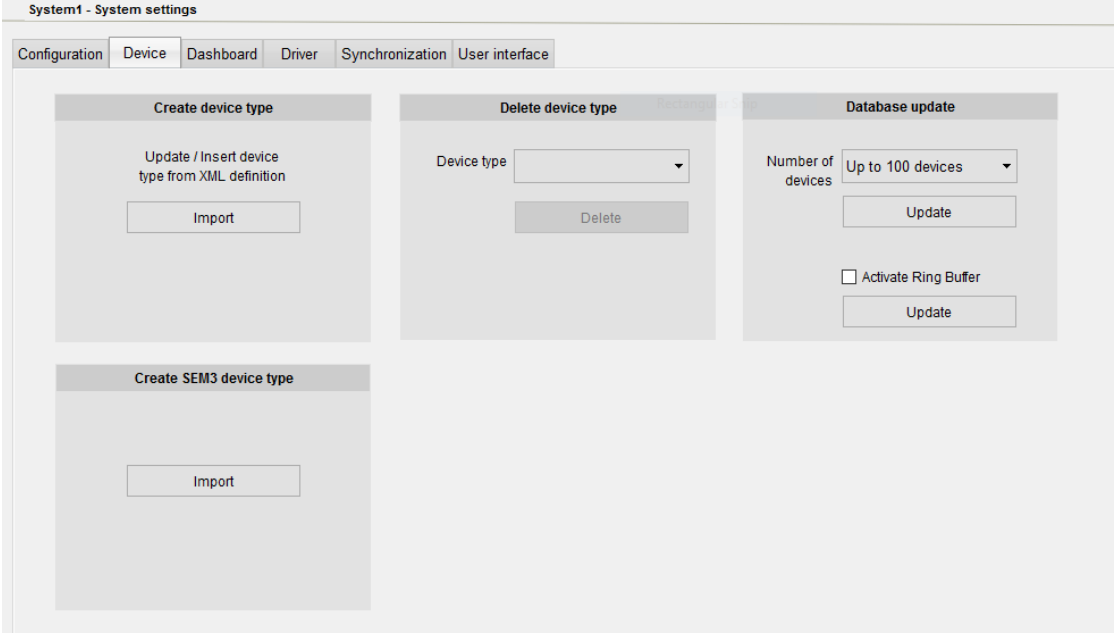
To create the SEM3 device type, proceed as follows:

✧ In the project tree view, right-click the project tree root.

✧ In the context menu, click **System settings**.

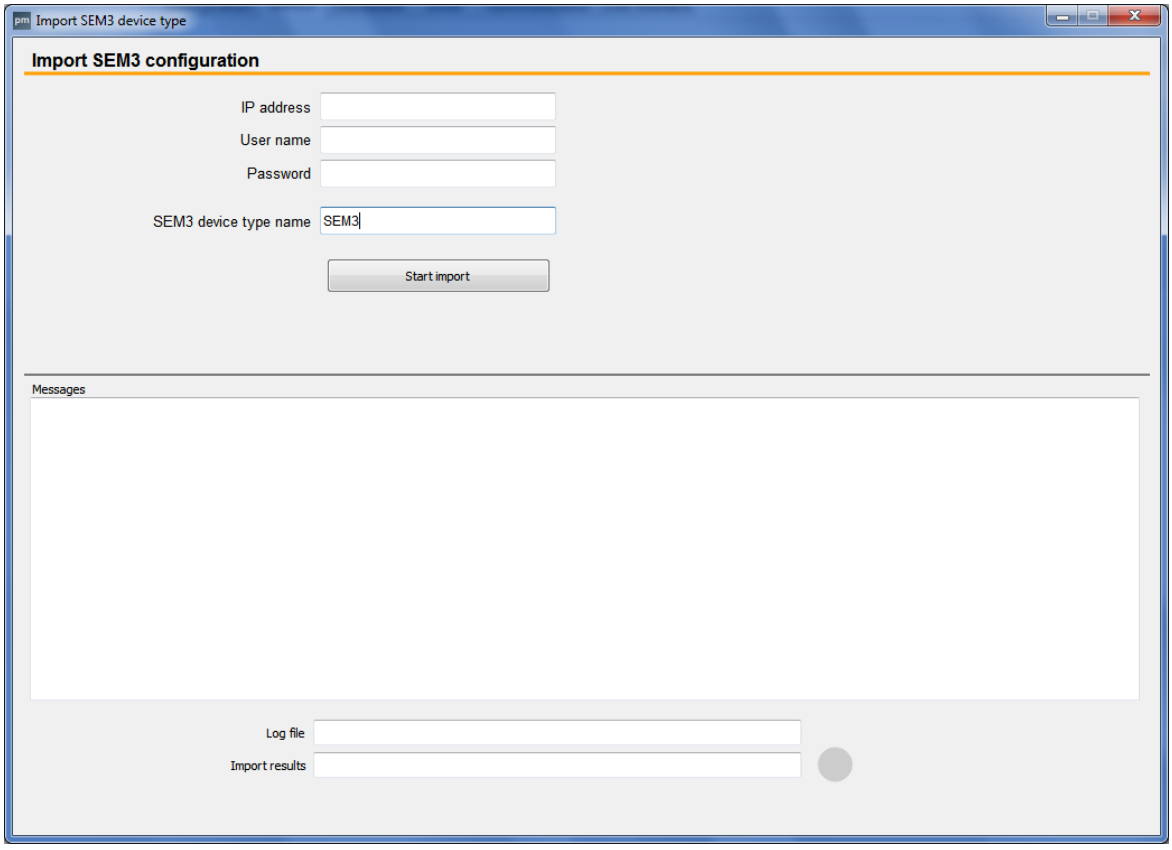
The **System settings** page opens.

✧ Click the **Device** tab.

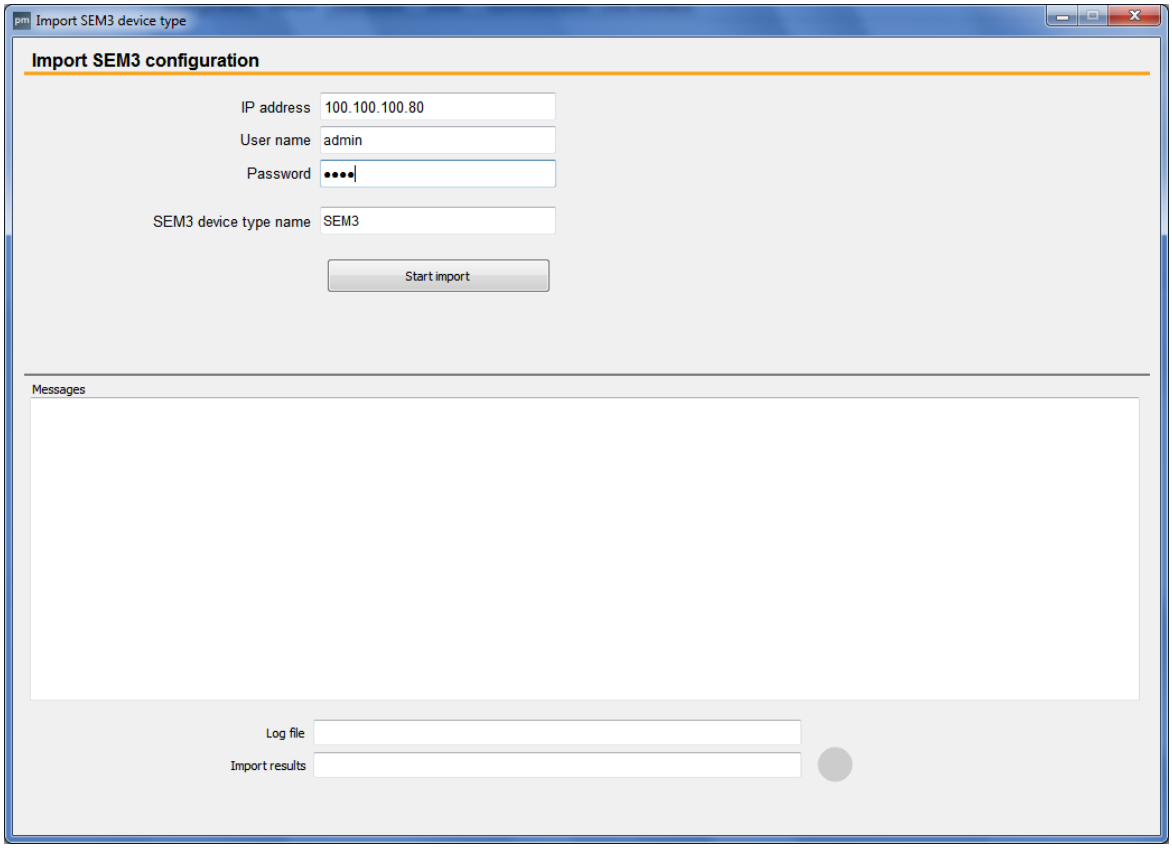


✧ In the **Device** tab, under **Create SEM3 device type**, click **Import**.

The **Import SEM3 device type** window opens.



✧ Enter the valid **IP address**, **SEM3 device type name**, **User name**, and **Password**.



[sc_pm_importsem3_values, 1, en_US]

✧ Click **Start import**.

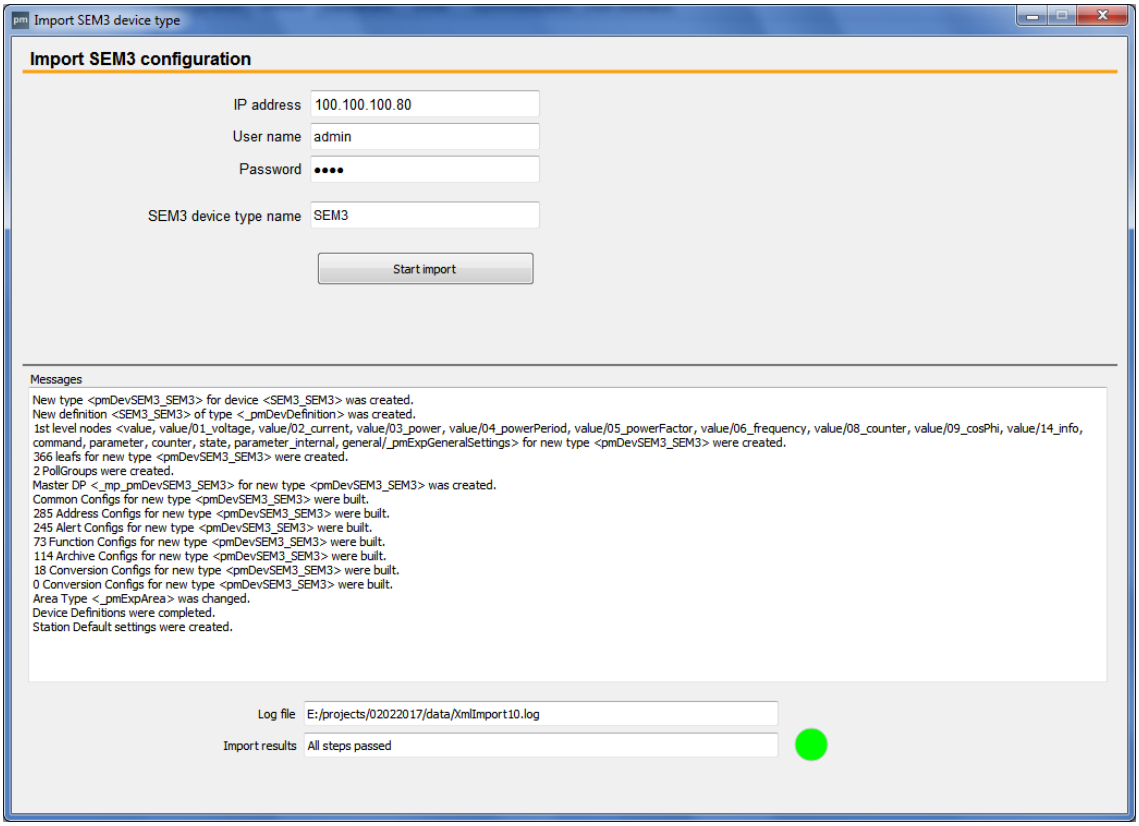
powermanager starts creating the SEM3 device type and after creation, the **Import results** field shows the following message:

All steps passed.

Additionally, a green circle is displayed next to the **Import results** field.

NOTE

In case of any error message, you must resolve the issue and try to import the file again.



✧ Close the **Import SEM3 device type** window.

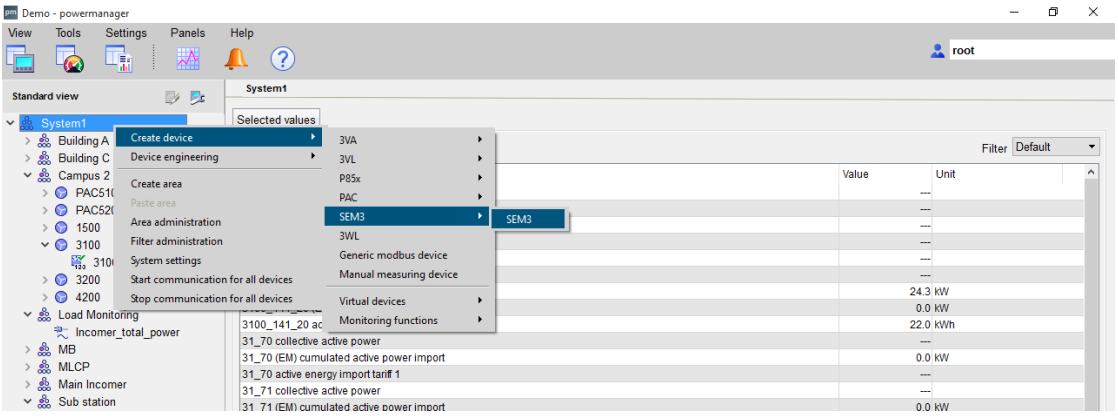
After successful creation of the SEM3 device type, the newly created device type is visible in the **Create device** context menu.

3.2.3 Creating the SEM3 Device

To create an SEM3 device, proceed as follows:

✧ Right-click the area or sector in which you want to create the device.

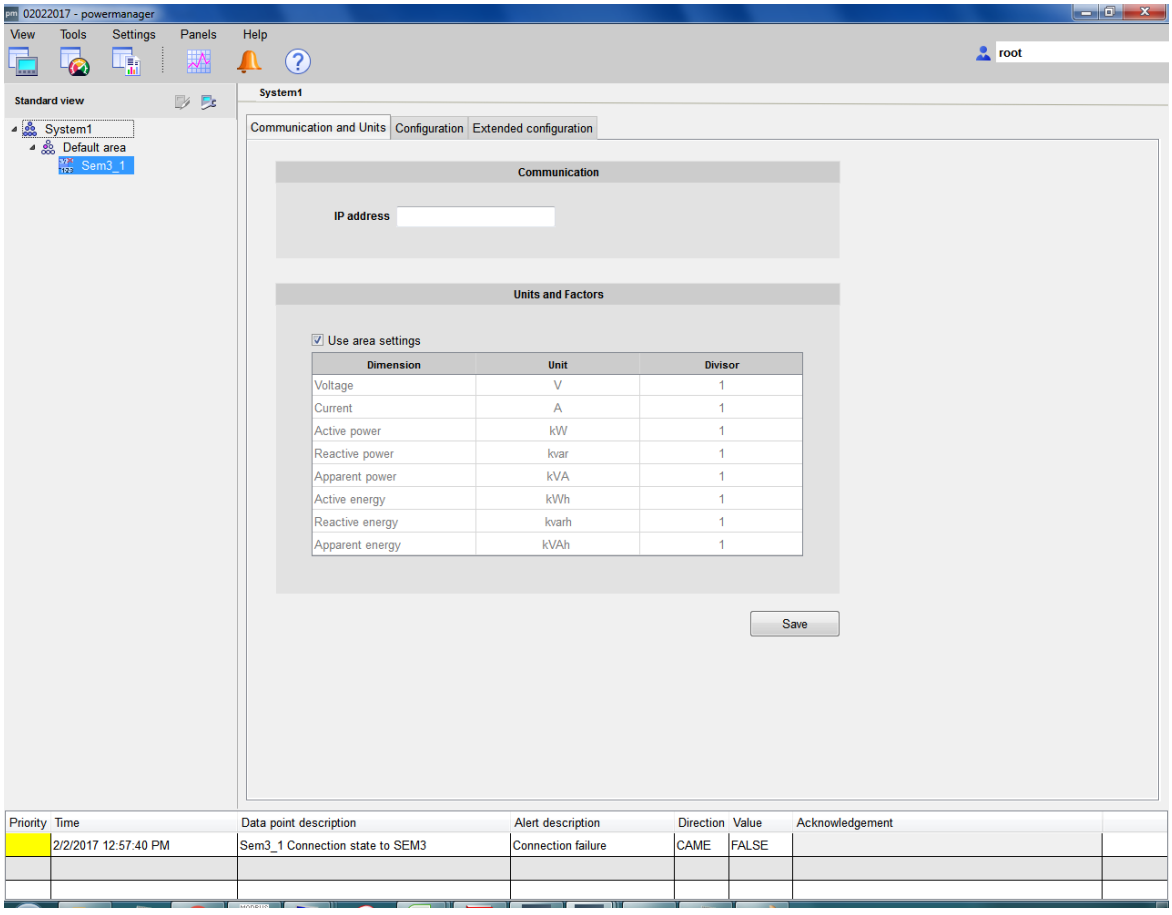
✧ Click **Create device** > **SEM3** > **SEM3**.



✧ Assign a name to the device.

✧ Click **Create**.

Wait until the powermanager creates the device. Creation of the new device takes some time depending on the device type and on the project size. The new device is now displayed in the project tree. By default, the **Communication and units** tab is opened.

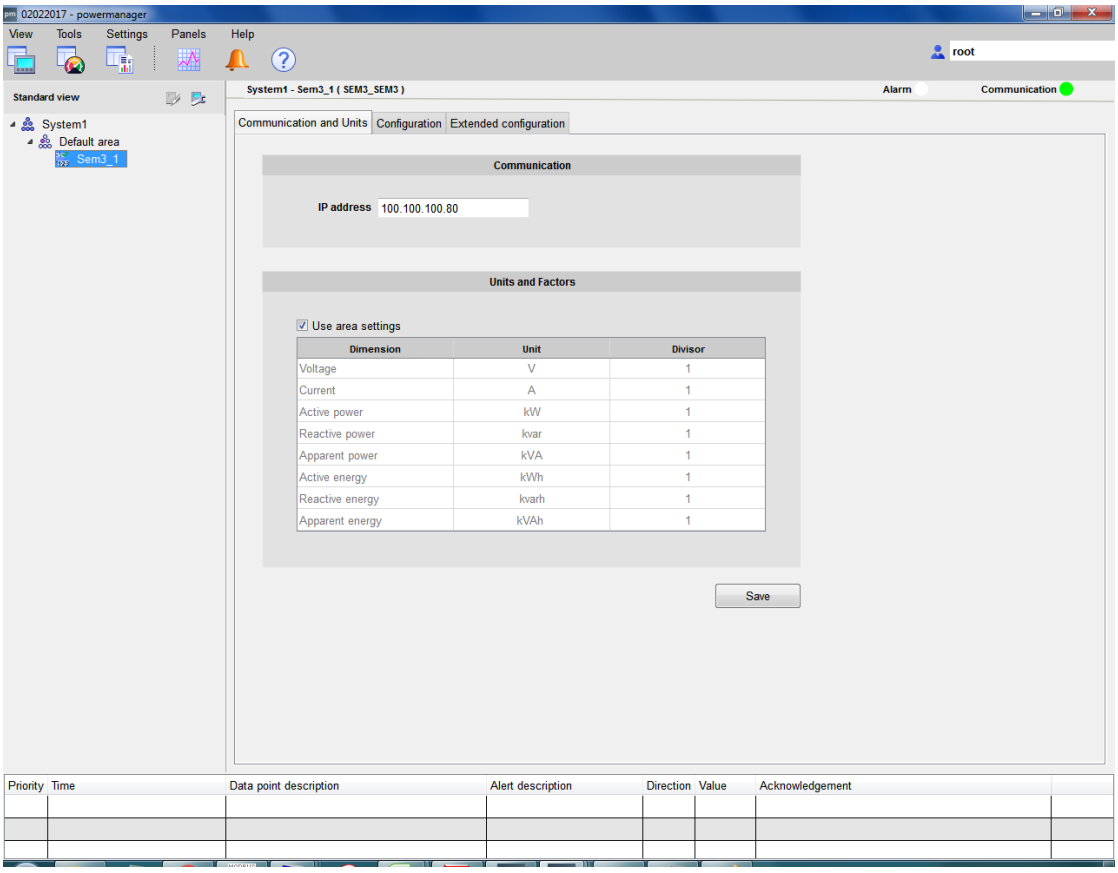


✧ Enter the IP address in the **Communication** area.

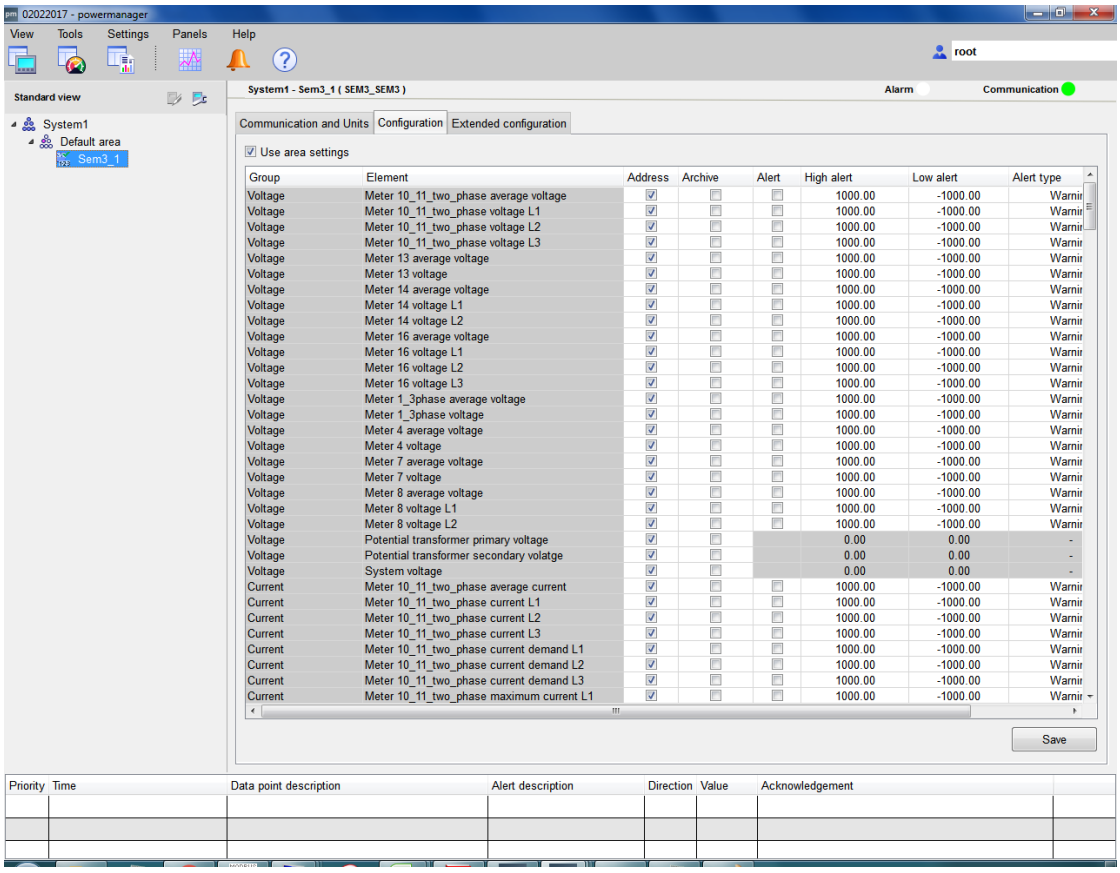
✧ Set the parameters in the **Units and Factors** area if necessary.

✧ Click **Save**.

✧ Right-click **SEM3** > **Communication** > **Start communication** to start the communication with the device.



✧ Select the *8.2.1.3 Configuration Tab*.

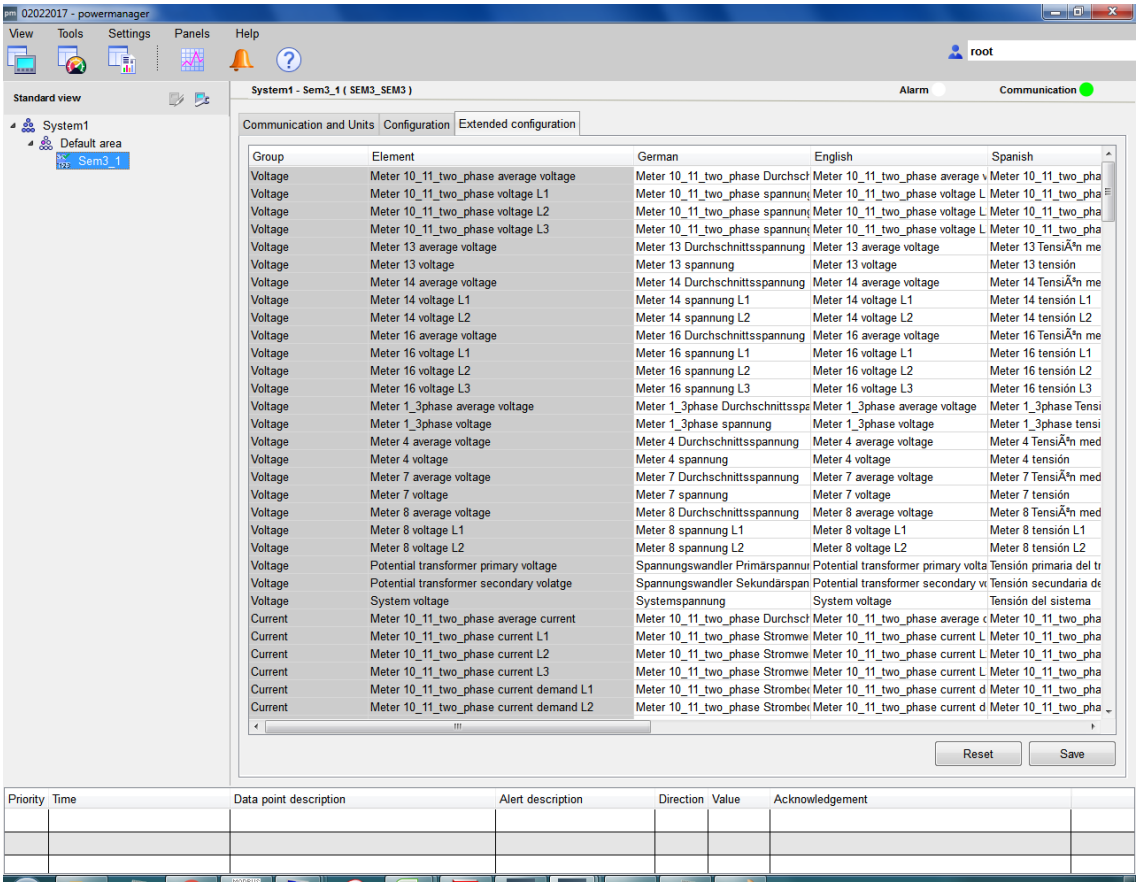


✧ Configure the data points in the **Configuration** tab.

✧ Select the *8.2.1.5 Extended Configuration Tab*.

NOTE

You can change the names of the measured variables for all the languages supported by the powermanager. The **Element** column shows the modified names.



✧ Click **Save**.

✧ Right-click the SEM3 device and select **Start communication** in the context menu to start the communication with the device.

Additionally, a green circle is displayed next to the **Communication** field indicating successful communication.

3.2.4 Monitoring Online Values

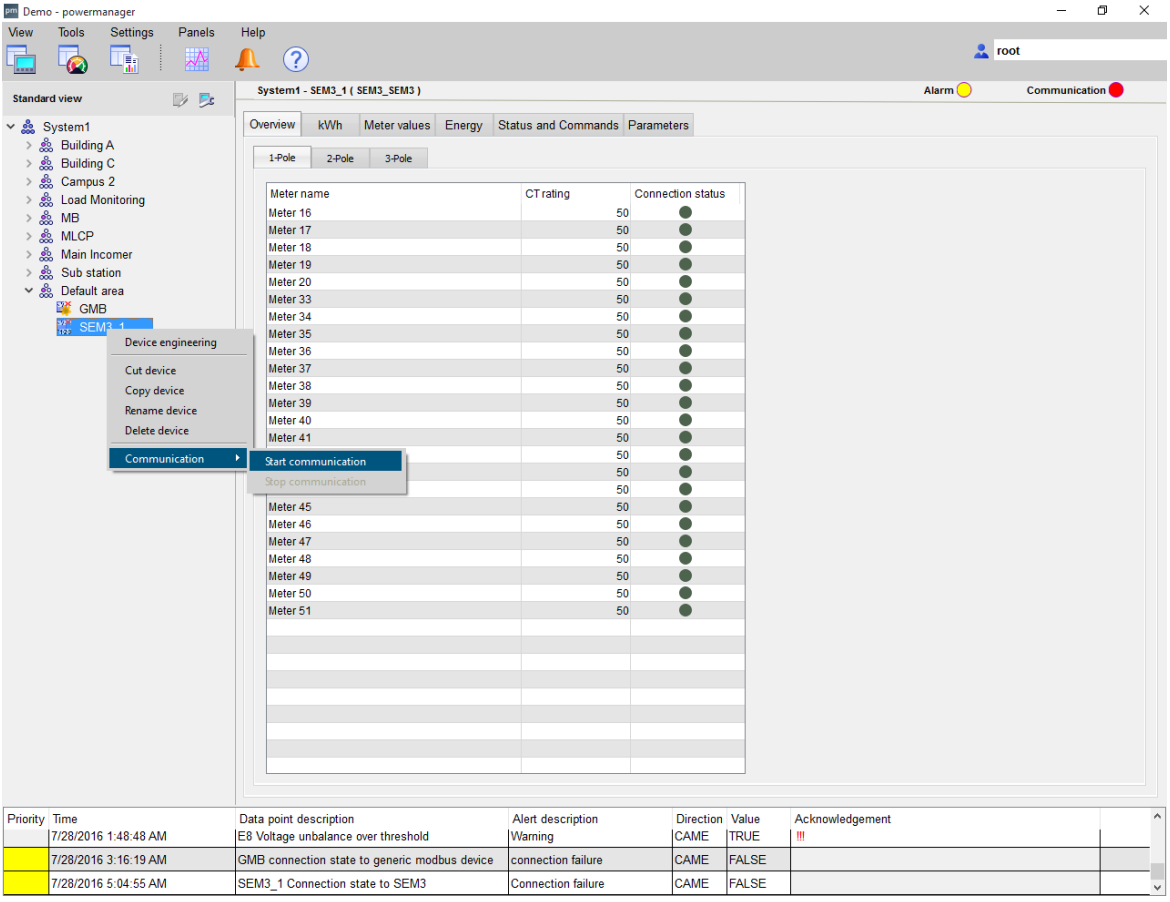
It is possible to access the SEM3 device in the system tree and to monitor the online values in a similar way to the existing devices in the powermanager application. The runtime view displays the following tabs for monitoring online values:

- Overview
- kWh
- Meter values
- Energy
- Status and Commands
- Parameters

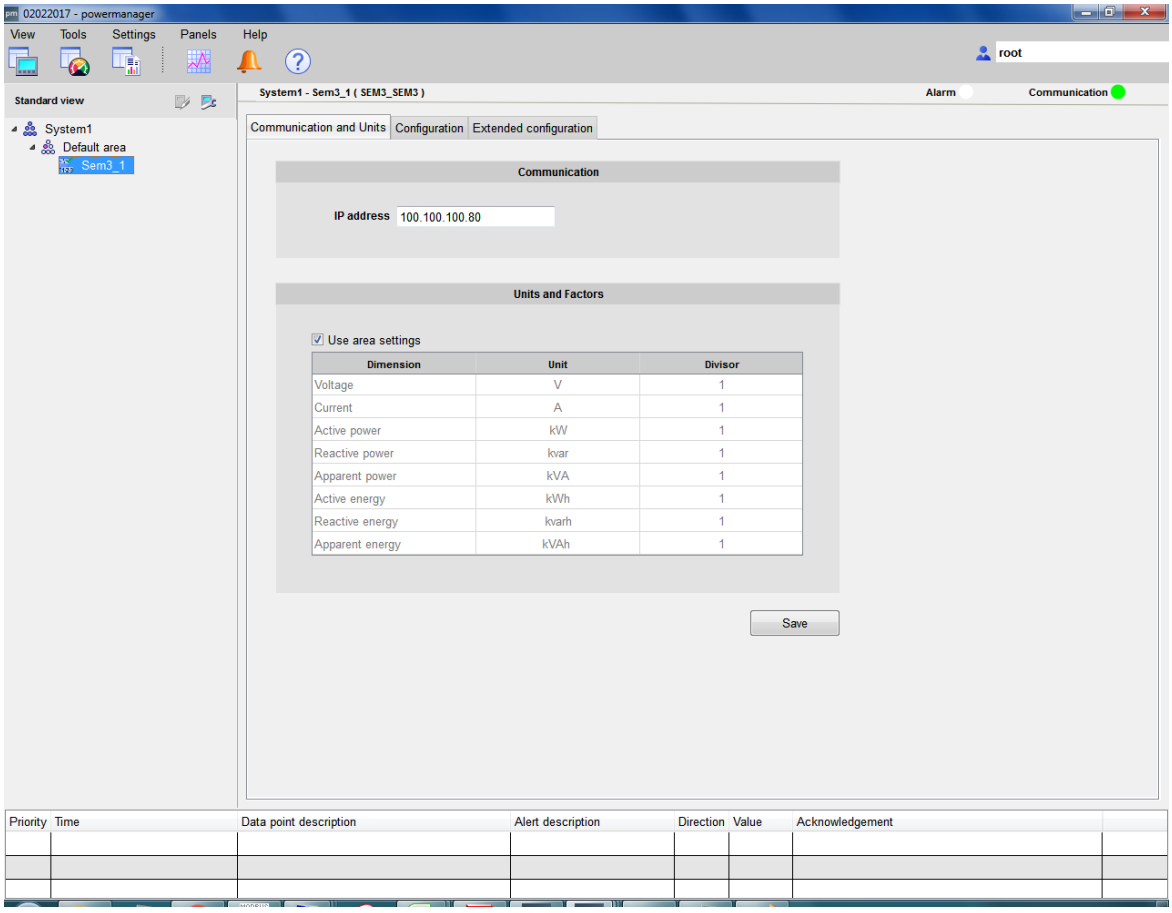
Start Communication

Right-click **SEM3** and select **Communication** > **Start communication** in the context menu to start the communication with the device.

Additionally, a green circle is displayed next to the **Communication** field indicating successful communication.

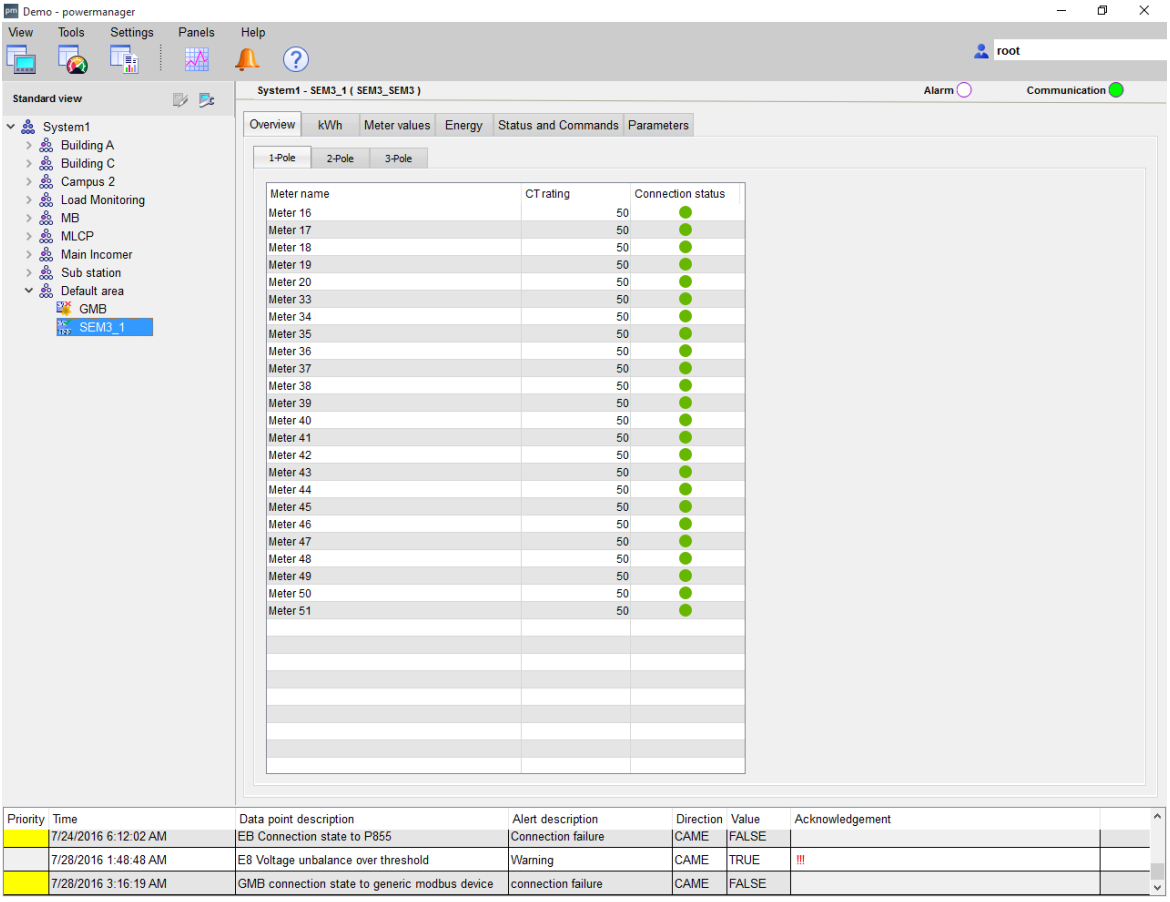


[sc_pm_startcomm, 1, en_US]



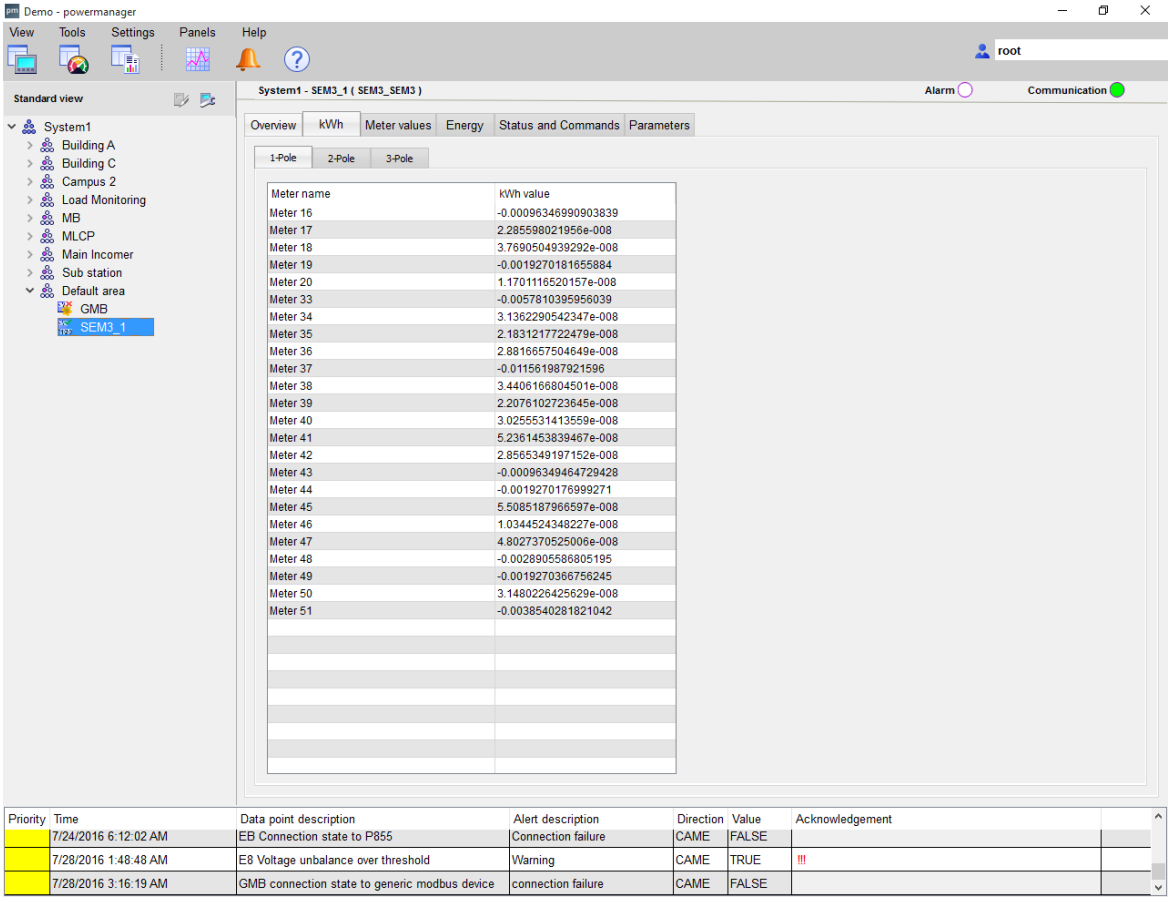
[sc_pm_comm_unit_connected, 1, en_US]

Overview



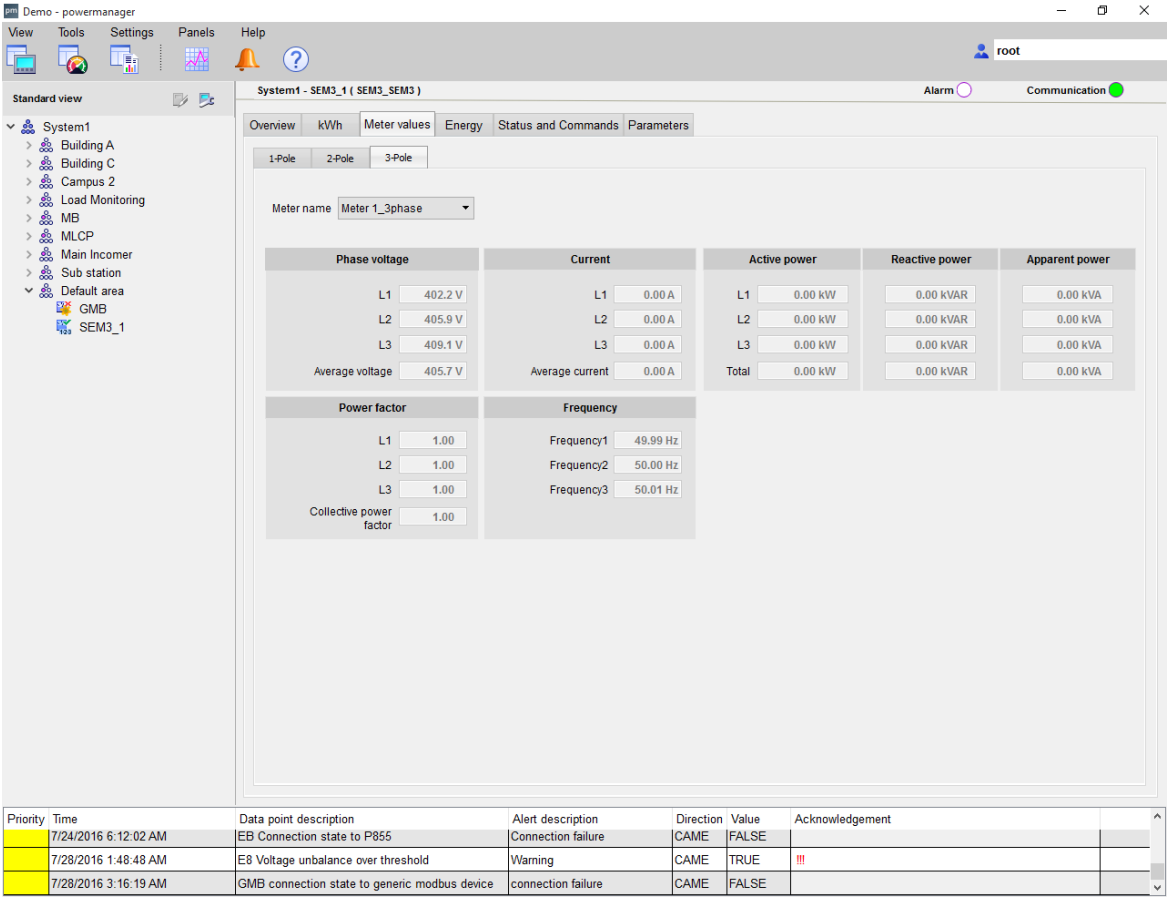
This tab displays the **Meter name**, **CT Rating**, and **Connection status** of the meters with respect to the different phases of the device.

kWh



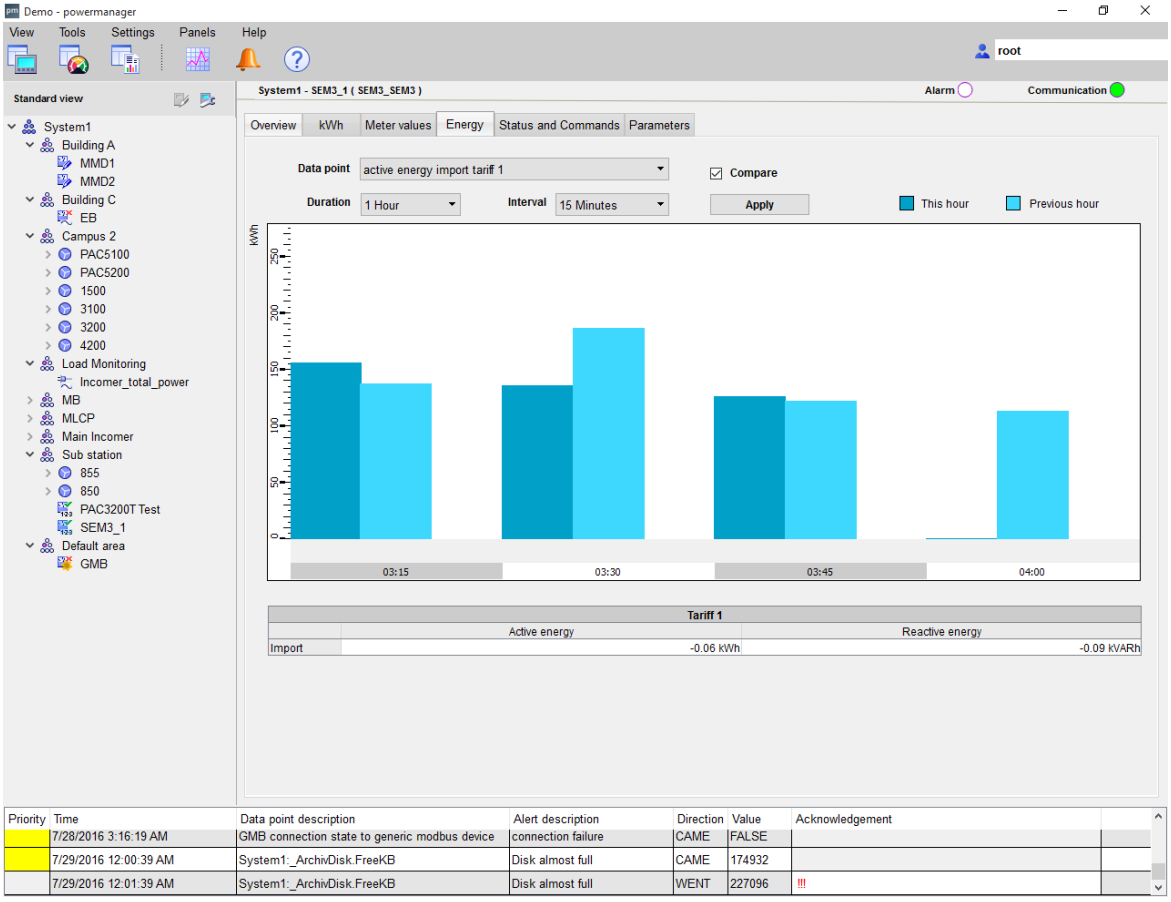
This tab displays the energy-consumption details of the respective meters.

Meter Values



This tab displays the online monitoring values of the meters. The meter values are categorized according to the phases (1-Pole, 2-Pole, and 3-Pole).

Energy



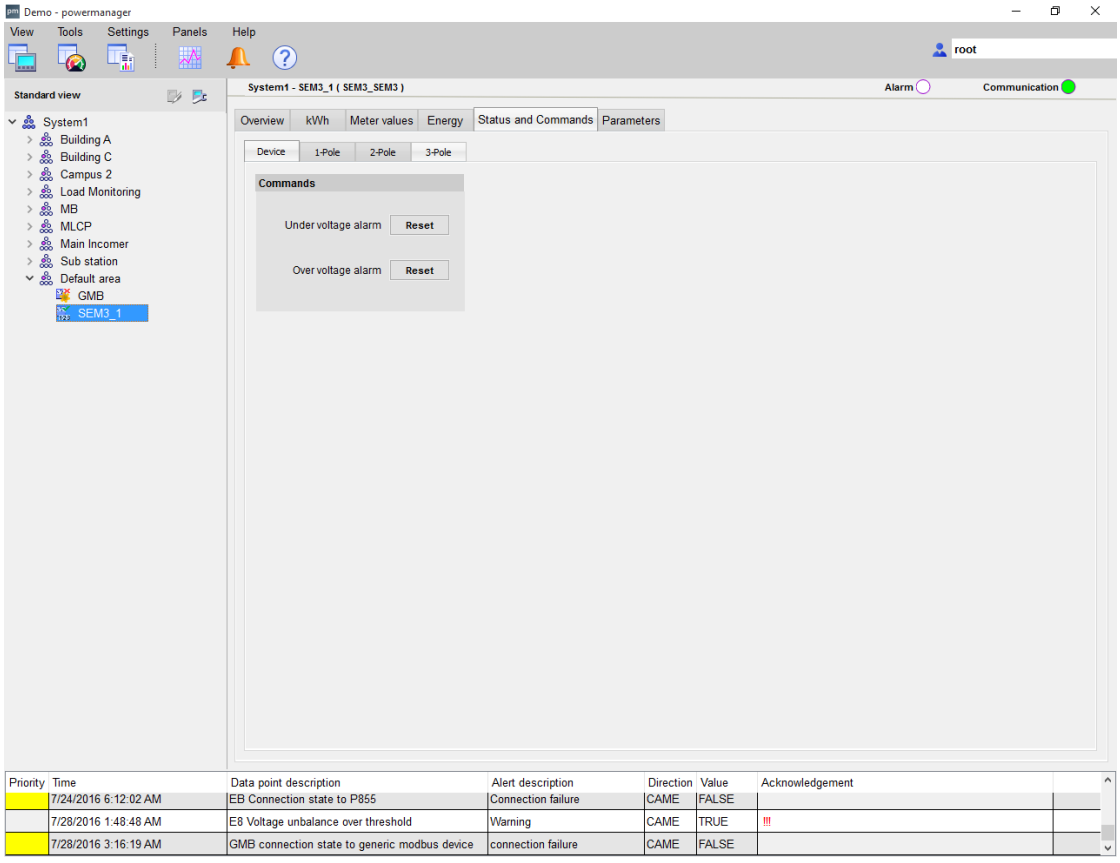
This tab displays the energy-consumption details. This tab enables you to compare the energy consumption between 2 different time ranges.

For more information, see *6.1.7 Energy*.

Status and Commands

This tab enables you to send commands to the connected devices at a device level and at a meter level.

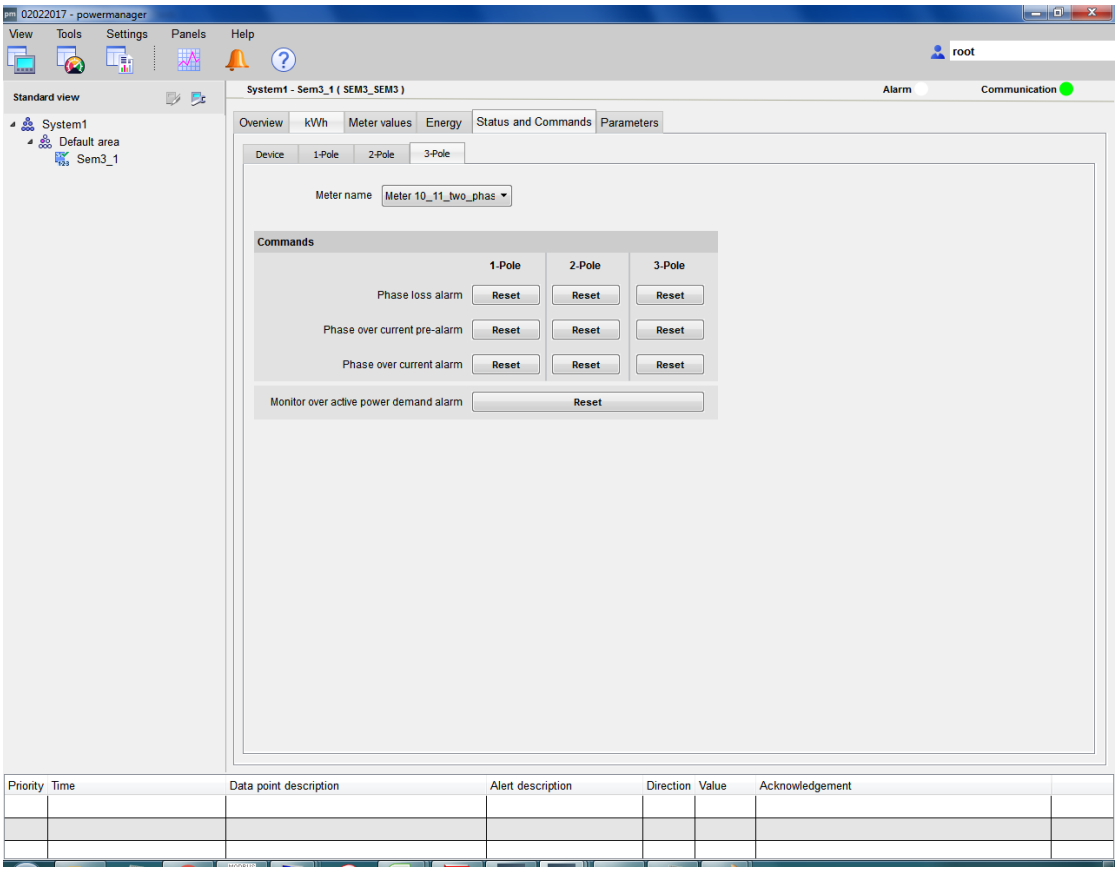
- **Device-level Commands**



[sc_pm_sem3_status_commands, 1, en_US]

You can reset the command for **Under voltage alarm** and **Over voltage alarm**.

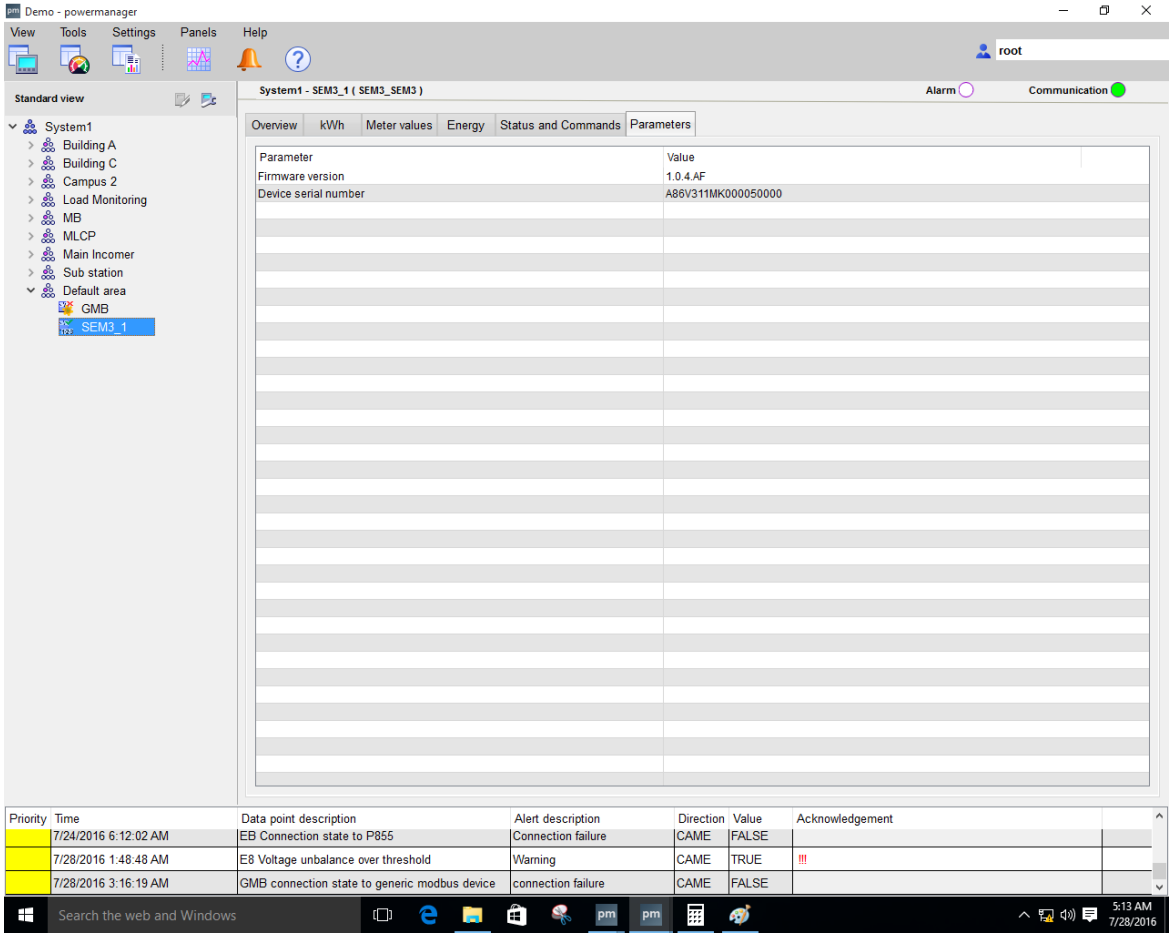
- **Meter-level Commands**



You can reset the commands for the following alarms under the tabs **1-Pole**, **2-Pole**, and **3-Pole**:

– Phase loss alarm
– Phase over current pre-alarm
– Phase over current alarm
– Monitor over kw demand alarm

Parameters



This tab displays the **Firmware version** and **Device serial number**.

4 User Interface

4.1 Overview

[sc_pm_dashboard, 1, en_US]

Standard Interface Dialogs

Select a device, a sector, or an area in the project tree to view the associated data.
Depending on the device type, the following tabs are available:

- Dashboard
- Overview
- Selected values
- Harmonics
- Energy
- Trend
- Operations
- Web
- Parameters

NOTE

For more information, see *6.1.1 Tabs in Standard View*.

Alerts

This area allows you to acknowledge alerts.
To acknowledge an alert:

- Right-click the alert you want to acknowledge.
- Click **Acknowledge**.

NOTE

You can also acknowledge the alerts and warnings in the alert screen. Click  to open the alert screen.

4.2 Menu Bar

View

Standard	Opens the **Standard view**. For more information refer to *6.1.1 Tabs in Standard View*.
KPI	Opens the **KPI view**. For more information refer to *6.2.1 Overview*.
Input	Opens the **Input view**. For more information refer to *6.3.1 Overview*.
Reaction plan	Opens the **Reaction plan view**. For more information refer to *6.4.1 Overview of Reaction Plans*.
Reports	Opens the advanced **Reports view**. For more information refer to *6.5.1.1 Report View*.

Tools

Trends	Opens the **Trends** dialog. For more information refer to *6.1.8 Trend*.
Alerts	Opens the **Alerts** dialog. For more information refer to *7.2 Alert Classes*.
Advanced Report	Opens the excel **Report**. For more information refer to *7.3.2.1 Overview powermanager Excel Report*.
Topology export	Opens the **Topology export** dialog. For more information, refer to *7.4.1 Overview of Topology Export*.
Power peak analysis	Opens the **Power peaks** dialog. For more information refer to *7.5.1 Overview of Power Peak Analysis*.
Mass parameterization	Opens the **Mass parameterization** dialog. For more information refer to *7.6 Mass Parameterization*.
Graphics editor	Opens the **Graphics editor** dialog. For more information refer to *8.9.1 Range of Functions*.

Settings

System management	Opens the **System management** window. For more information, refer to *7.3.14.2 Starting powermanager Excel Report*.
Mail configuration	Opens the **Mail configuration** dialog. For more information, refer to *8.3 Configuring E-Mail Server Settings*.
E-mailing list	Opens the **E-mailing list** dialog. For more information, refer to *8.4 E-mailing List*.
OPC server configuration	Opens the **OPC server configuration** dialog. For more information, refer to *8.5 OPC Server Configuration*.

Panels

Start panel	Takes you back to the start panel (Standard view).
. . .	New panel, takes you to a blank panel.

Help

powermanager help	Opens the powermanager online help.
Memory/Disk resources	The Memory/Disk resources dialog opens. The **Disc space** tab displays the status of the disk space of the system. The **RAM space** tab displays the status of the RAM space of the system.
License information	Opens the **License information** dialog, it displays the number of device licenses available and used.
Support & Service	Opens the powermanager support website.
About	Opens the **About** dialog. It displays the current version of powermanager.

4.3 Functions on the Tool Bar

 **Standard view**	In this view, devices can be created and configured. It also displays all the created devices.
 **KPI view**	In this view, the KPIs can be created and configured. It also displays all the created KPIs.
 **Report view**	In this view the report templates can be created and configured. Reports can be created out of the configured templates. You can also view all the created report templates and reports.
 **Variable trend**	In this view, the variations in the values of a device over a specific time range can be represented. A trend can contain any number of hierarchical areas for representing curves, with scales and legends. Value-over-time and value-over-value representations are also possible.
 **Alert screen**	In this view, the alerts and events are displayed in the form of a table. You can sort and filter alerts for display.
 **Online Help**	Opens the powermanager Online Help.

The new icons can be added to the tool bar.
To add new icons to the tool bar:

- Right-click the tree root.
- Select **System settings**.
  The system settings section opens.
- Select the **User interface** tab.
- In the **Language settings** section, select the languages for which you want the icon to be enabled.
- In the **Toolbar settings** section, select the number of **Additional toolbar buttons** you want to add, from the drop-down list.
- Click **Save**.
   will be added to the toolbar.
- Right-click  , to assign a panel for the newly created icon.
  The **Reference parametrization** dialog opens.
- Select a panel from the **Please select a panel** section.
- Click **OK**.
  The panel is assigned to the selected panel.

NOTE

Expert license is required to add additional tool bar buttons.

5 Working with Projects

5.1 Creating a New Project

A new project can be created by using **powermanager: Project Administrator**.

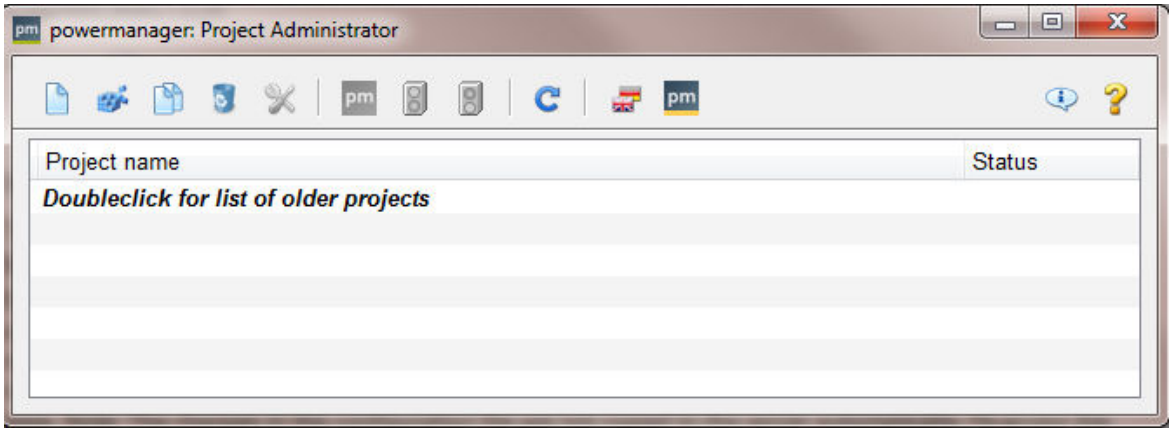
NOTE

The name of the powermanager project must not contain any spaces.

Creating a New Project

To create a project:

✧ Click **Start > All Programs > SENTRON > powermanager V3.4 > Project Administration**.
The **powermanager: Project Administrator** window opens.



[sc_pm_admin, 1, en_US]

✧ Click .
The **New project** dialog opens.

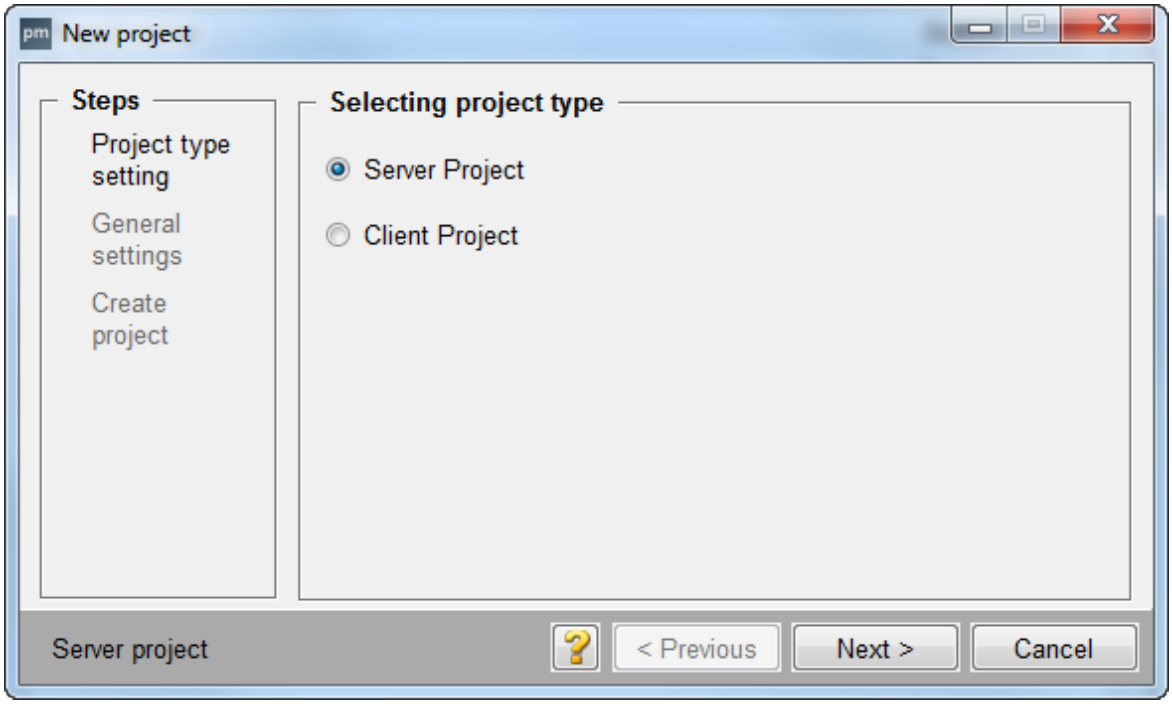
Step 1: Project type settings

There are two types of projects, which can be created:

Server project: A server project contains all managers on the same machine.

Client project: Client project is associated with a remote user interface. The remote project is connected to another project on a server. The remote project is created and started on the **client**. On the client, a directory structure and config file are automatically created (copied from the sever). In case of a configuration UI, only configuration and log files are created and where as for visualization UI, all parts are created except the database. Note: The changes in the configuration file are not copied to the server automatically. To access the panels on the server, the project path has to be shared. The sever project can be selected in the **New project** panel (see figure below). Note: The non-executable projects cannot be selected. The project administration panel of the client allows you to view the status of the project (running, stopped, and so on).

✧ Select a project type from the **Selecting project type** section.



[sc_SelectProjType, 1, en_US]

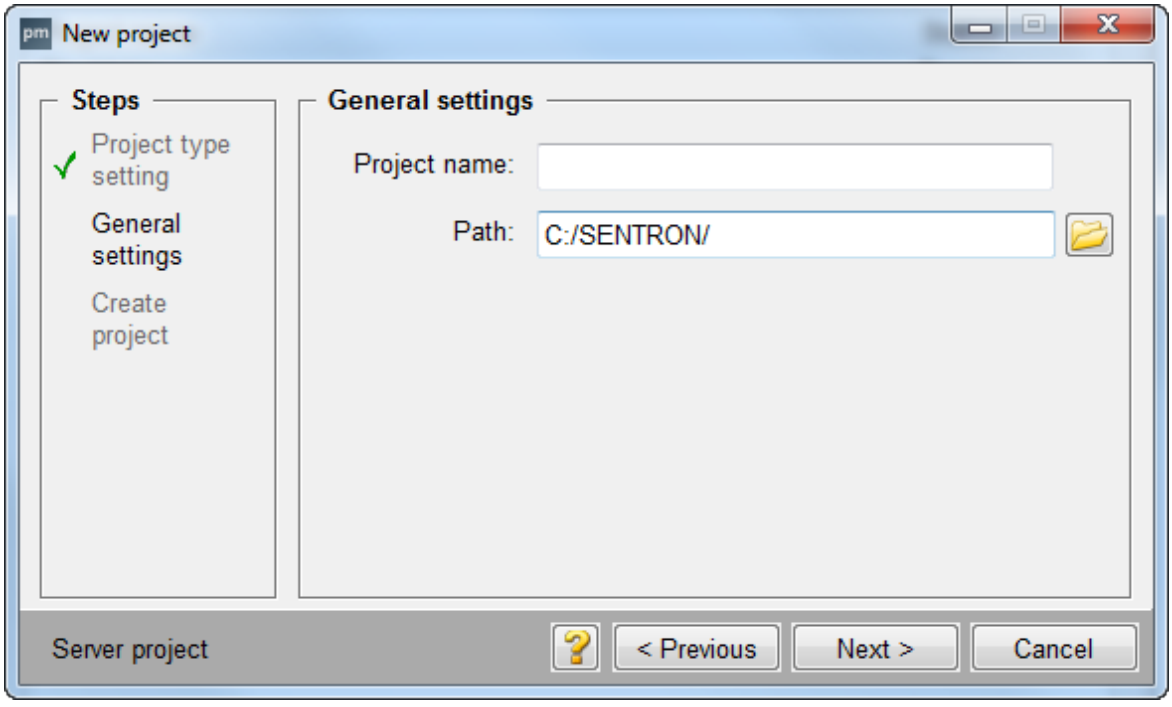
✧ Click **Next**.

Step 2: General settings

✧ In the **General settings** section, enter a unique **Project name**.

✧ Click to, open the **Choose a Folder** dialog.

In the **Choose a Folder** dialog, browse to the folder where you want to save the new project.

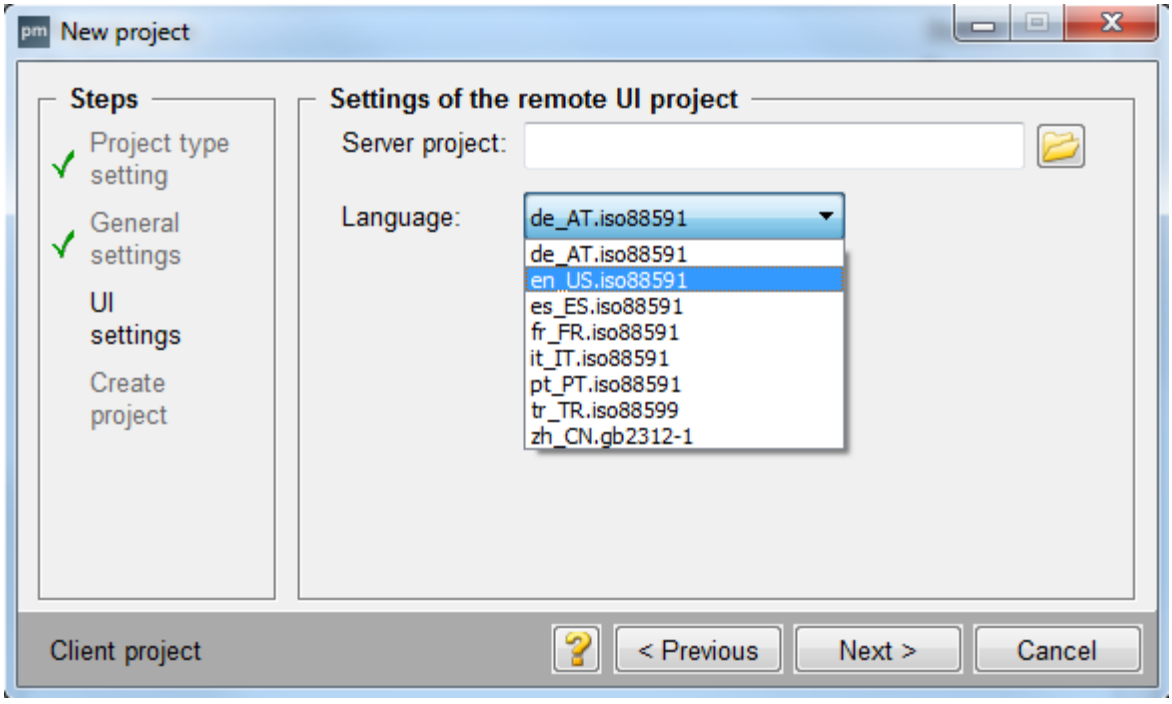


[sc_GeneralSettings, 1, en_US]

✧ Click **Next**.

Step 3: UI settings

This step is only applicable if you have selected **Client project** in the **Project type setting** step.



[sc_ServerProj, 1, en_US]

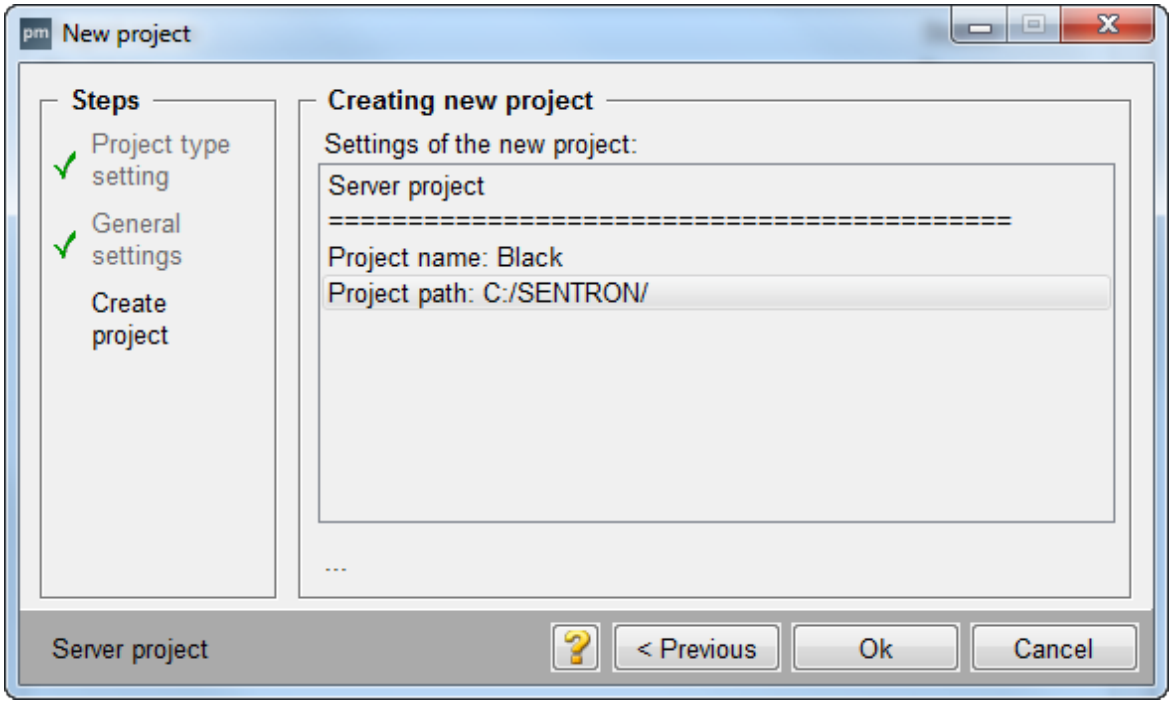
✧ Click  to browse to a location where a server project already exists.

✧ Select the **Language** of the project.

✧ Click **Next**.

Step 4: Create project

The **Creating new project** section displays the settings of the new project.



[sc_CreatingNewProj, 1, en_US]

✧ Click **Ok**, to create the project.
The **Information** dialog opens to confirm the creation of the project.

✧ Click **Ok**.

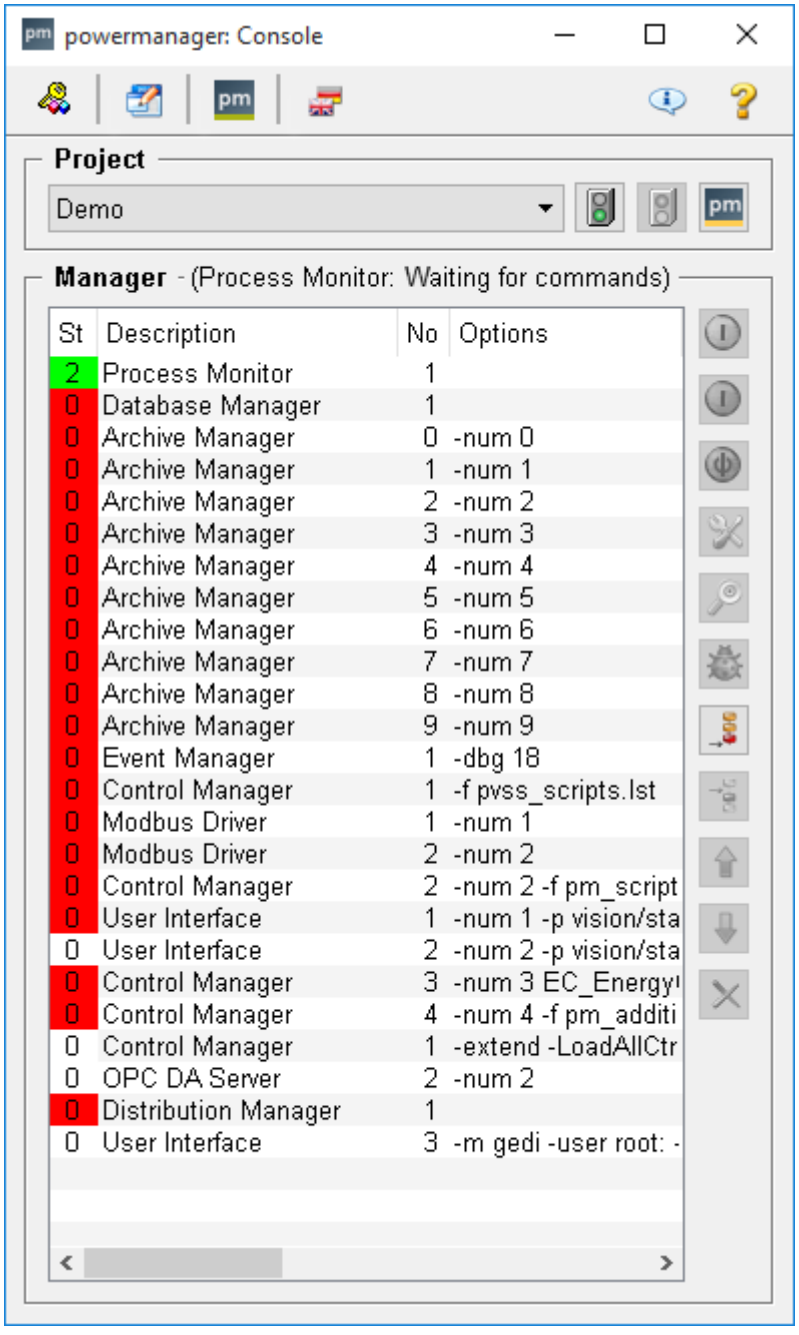
The project is created and it is available for selection in the powermanager console.

5.2 Starting the Project via Console

To start the **powermanager V3.5** project:

✧ Click **Start** > **All Programs** > **SENTRON** > **powermanager V3.5** > **Console** to open the powermanager console.

The **powermanager: Console** window is opened.



[sc_pm_console, 1, en_US]

The **powermanager: Console** window lists the processes that powermanager uses.

The **St** column indicates the status of each process.

0 (Red) - Process is stopped.

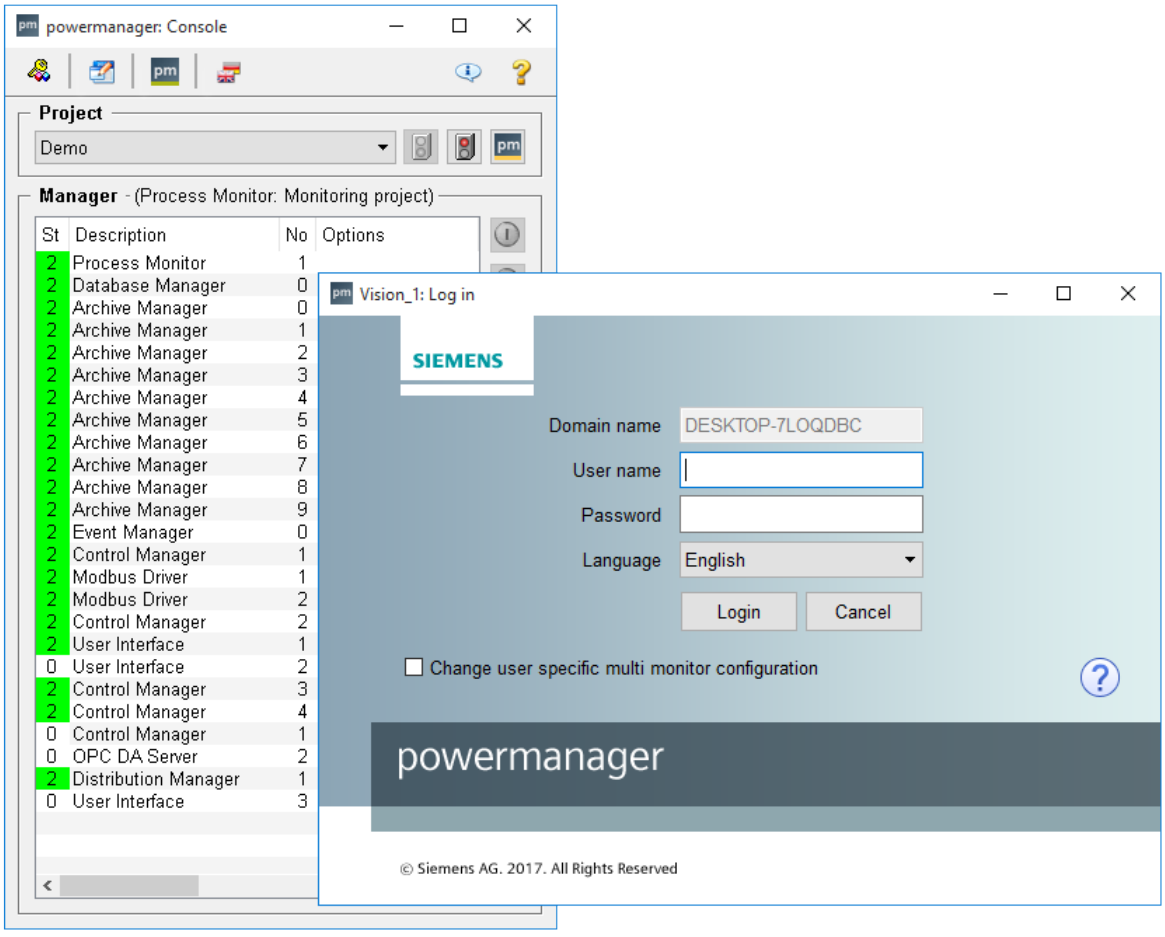
1 (Yellow) - Process started.

2 (Green) - Process started and is currently running.

✧ Select the powermanager project you want to start from the **Project** list box.

✧ Click  to start the project.

After all the processes in the selected project is started, the project **Log in** window is displayed.



[sc_pm_basepanel, 1, en_US]

✧ Enter **root** in the **User name** field.
Leave the **Password** field blank.
Select the language from the **Language** list box.

✧ Click **Login**.
The **Base Panel** window is displayed.

NOTE

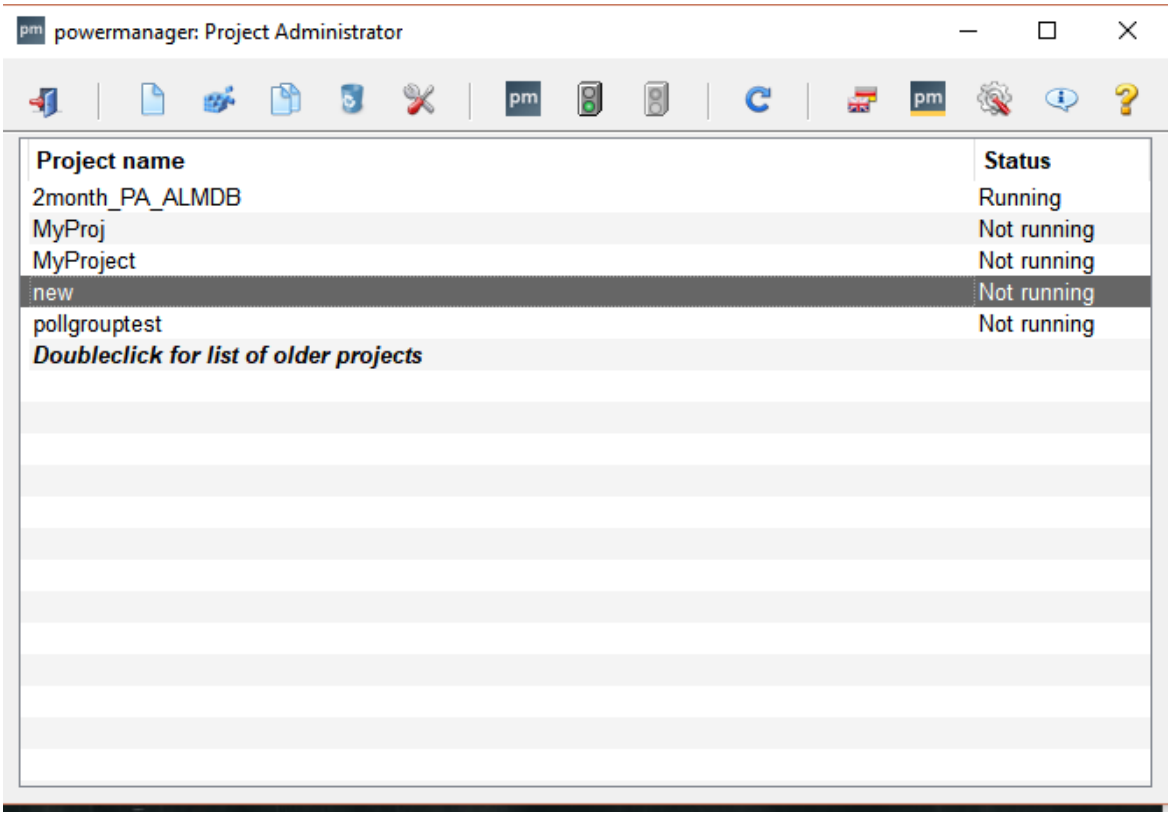
When powermanager is installed, the root user account has no password assigned to it. If required, assign a password to the root user.

The processes visible in the powermanager console are background processes. Opening or closing the powermanager console has no effect on the state of the process. Data acquisition continues to run even when the console is closed.

After starting the project, you can add devices in the project tree.

Starting a Project as a Service

✧ Click **Start** > **All Programs** > **SENTRON** > **powermanager V3.5** > **Project Administration**.
The **powermanager: Project Administrator** window opens.



[sc_pm_startpro, 1, en_US]

✧ Select the project to be started and click to run the project as a service.
A desktop shortcut is created for the selected project and the project is started.

✧ Double-click the shortcut to run the powermanager application.

NOTE

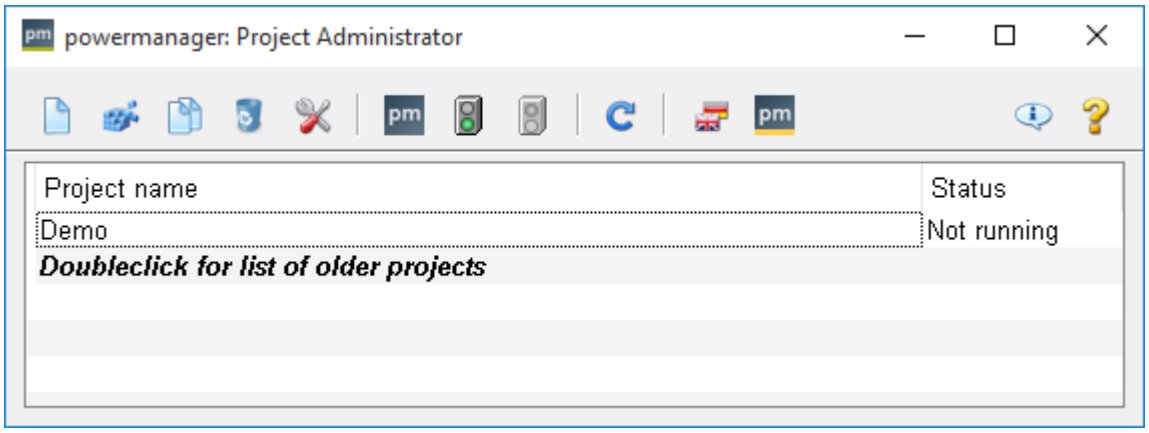
When the project is deleted, the corresponding shortcut is deleted.

5.3 Starting a Project via Project Administration

To start the **powermanager V3.5** project:

✧ Click **Start > All Programs > SENTRON > powermanager V3.5 > Project Administration**.

The **powermanager: Project Administration** window opens.



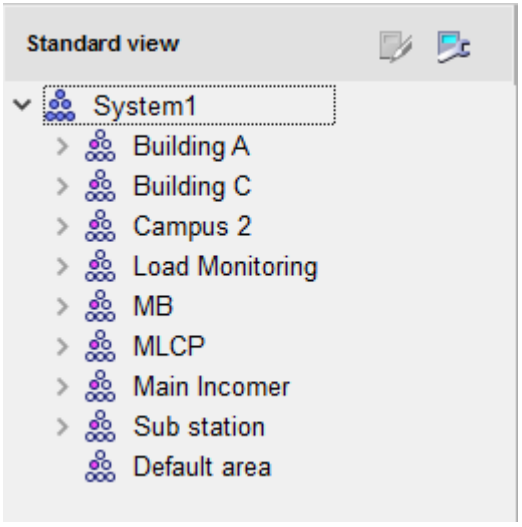
[sc_pm_pm_admin, 1, en_US]

✧ Click  to start the project.

5.4 Project Operations

Areas

You can divide the project tree root into different areas based on your requirements.



[sc_pm_projecttree, 1, en_US]

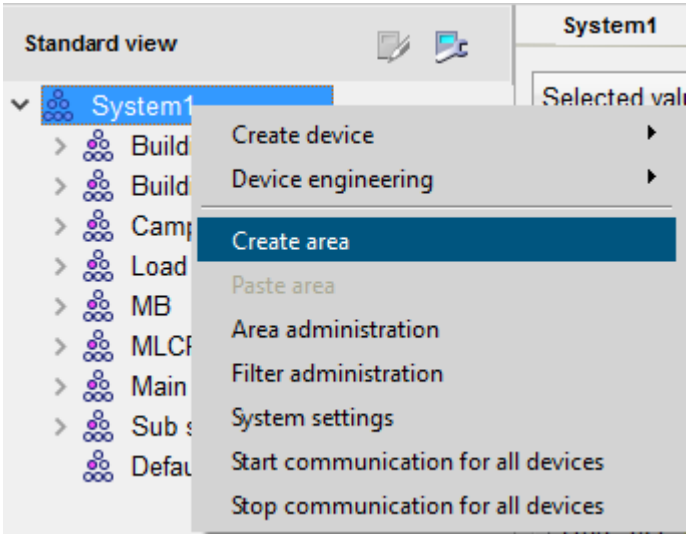
The "no area" Area

You can accommodate the devices that cannot be assigned clearly to an area for No area. A device created in the project tree root is automatically moved to the **no area** .

Creating an Area

To create an area:

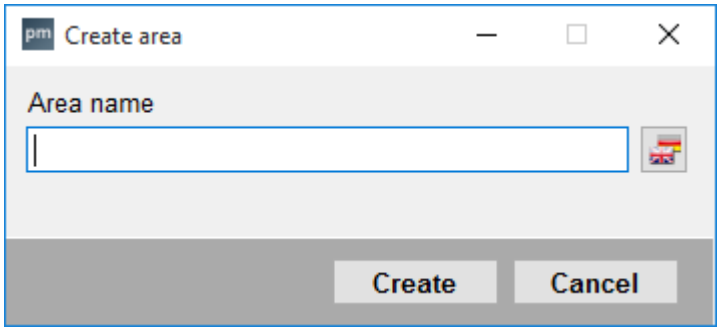
✧ Right-click the project tree node.



[sc_pm_createarea, 1, en_US]

✧ Click **Create area**.

The **Create area** dialog is displayed.



[sc_pm_create_area, 1, en_US]

✧ Assign a unique name to the new area.

NOTE

Only the following characters are allowed in the naming of a area/sector/device:

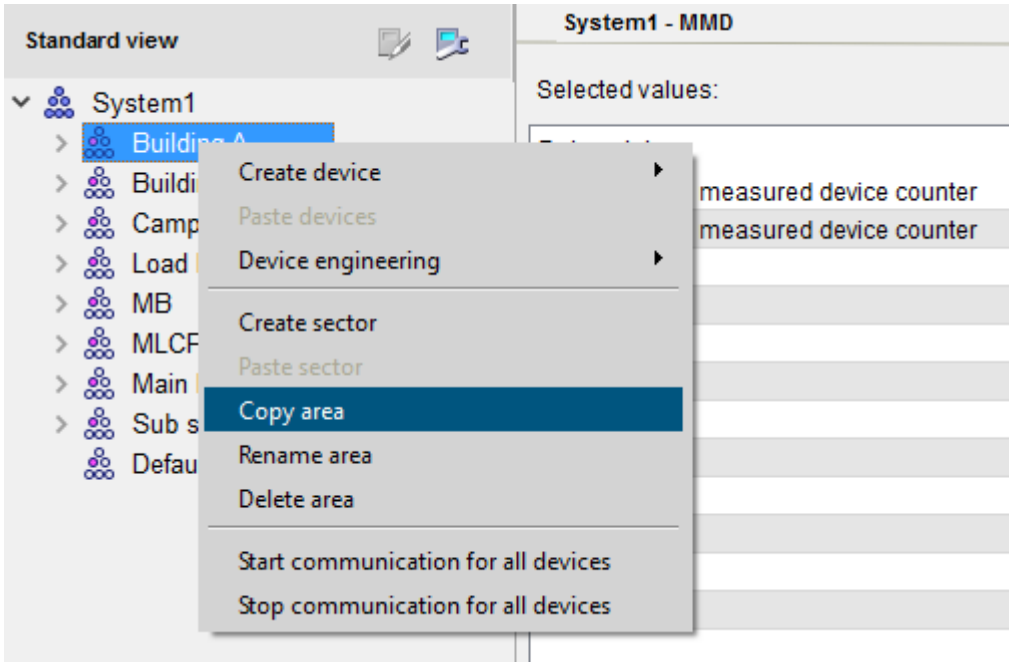
- A-Z, , , ' ', '-','_'
- a-z
- 0-9
- (Space)
- - (Hyphen)
- _ (Underscore)

The new area is visible in the project tree.

Copying an Area

To copy an area:

✧ Right-click the area which you want to copy.



[sc_pm_copyarea, 1, en_US]

✧ Click **Copy area** from the context menu.

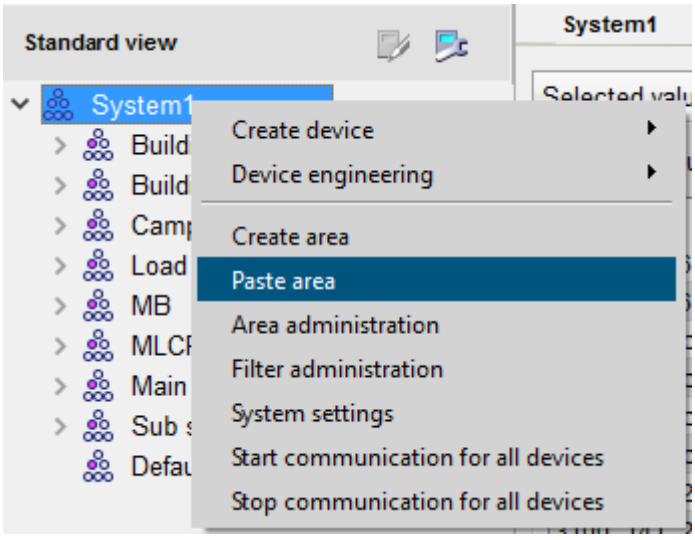
NOTE

Copy area is not supported on distributed systems.
A copied area can be pasted only at the system level.
Only one area can be copied at a time.
No Area cannot be copied.
Copied area is not available for paste if either the UI language or the user is changed.

Pasting an Area

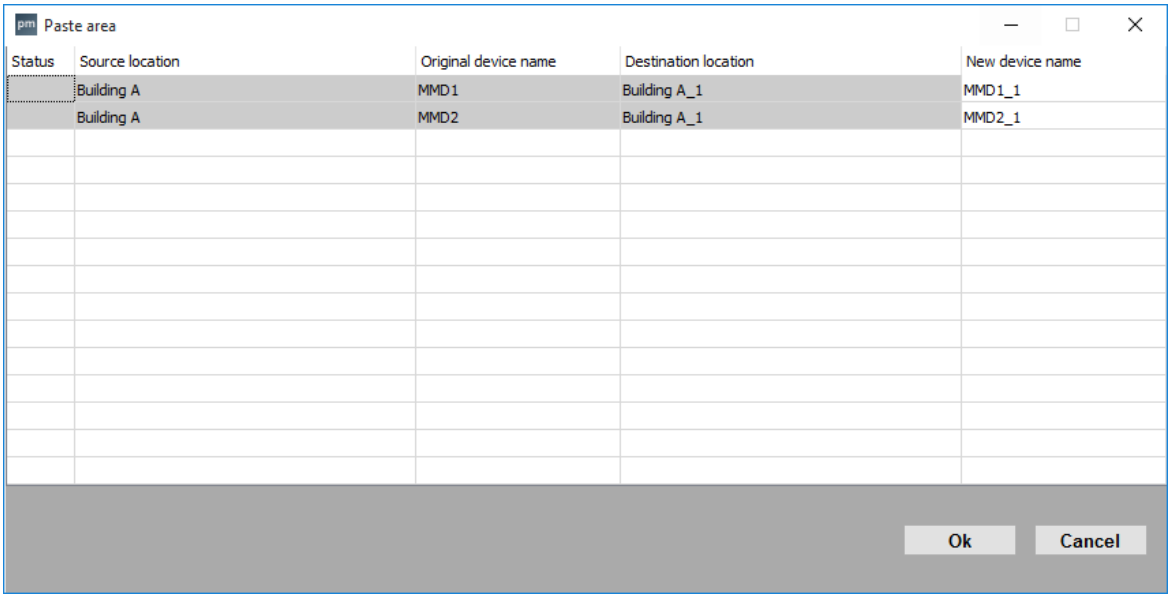
To paste the area:

✧ Right-click the system.



[sc_pm_pastearea, 1, en_US]

✧ Click **Paste area** form the context menu.
The **Paste area** dialog is displayed.



[sc_pm_paste_area, 1, en_US]

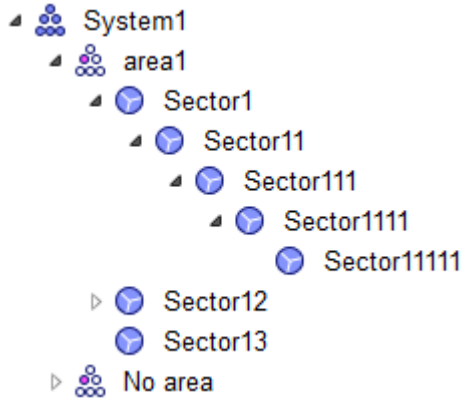
By default when you paste devices/sector/area, **_1** is added as a suffix to the name of the devices. This is done to give a unique name to all the copied devices. This name can be changed manually in the **New device name** column.

Table 5-1 Paste Devices Dialog

Name	Description
Status	Indicates if the new name is unique or not.
Source location	Shows the location from where the device/area/sector is copied from.
Original device name	Shows the original name of the device/area/sector.
Destination location	Shows the location where the device/area/sector is being pasted to.
New device name	Used to give a new name to the pasted devices.

Sectors

An area can be divided into sectors and sectors can be sub-divided into other sectors. You can create up to 5 levels of sectors.



[sc_Sectors, 2, en_US]

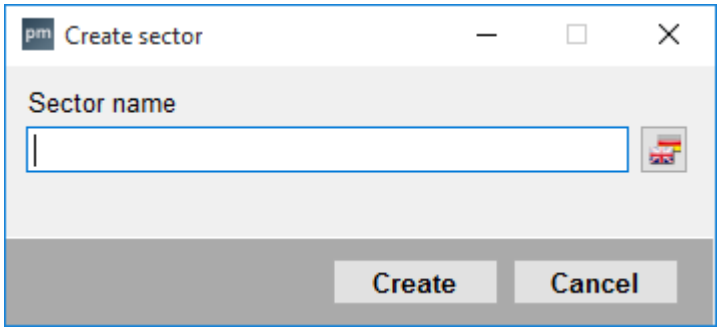
Creating a Sector

To create a sector:

✧ Right-click the area or sector for which you want to create the sector.

✧ Click **New Sector**.

The **Create sector** dialog is displayed.



[sc_pm_createsector, 1, en_US]

✧ Assign a name for the new sector.

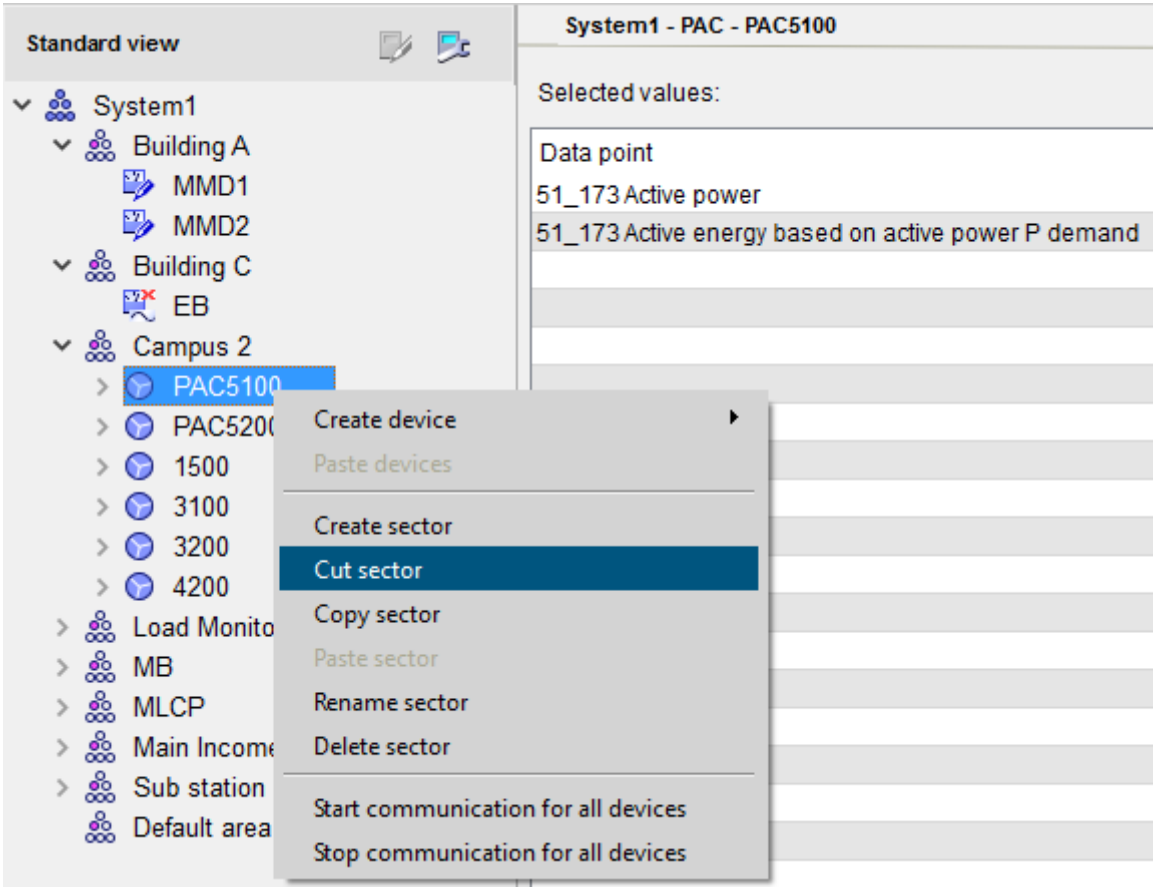
✧ Click **Create**.

The sector is displayed in the project tree.

Cutting a Sector

To cut a sector:

✧ Right-click the required sector from the selected area.



[sc_pm_cutarea, 1, en_US]

✧ Click **Cut sector** from the context menu option.

Copying a Sector

To copy a sector:

✧ Right-click the sector that you want to copy.

✧ Click **Copy sector** from the context menu option.

NOTE

Copy sector is not supported on distributed systems.
Only one sector can be copied at a time.
Copied area is not available for paste either, if the UI language or the user is changed.

Pasting a Sector

To paste the sector:

✧ Right-click the area/sector in which you want to paste the copied sector.

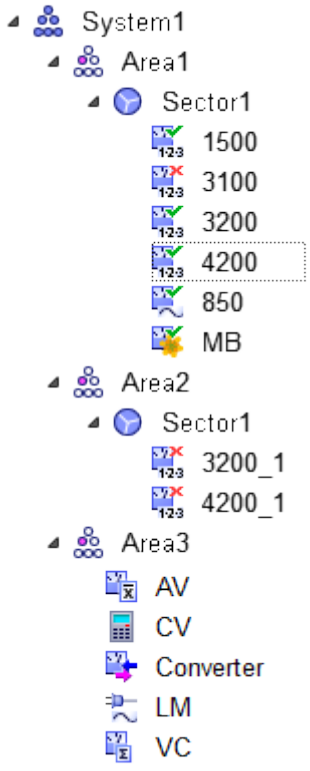
✧ Click **Paste sector** from the context menu option.

NOTE

A sector can be pasted under the same area in which it is already available.
A sector cannot be pasted under itself.
A sector cannot be pasted into **No Area**.

Devices

You can create devices in an area or a sector.



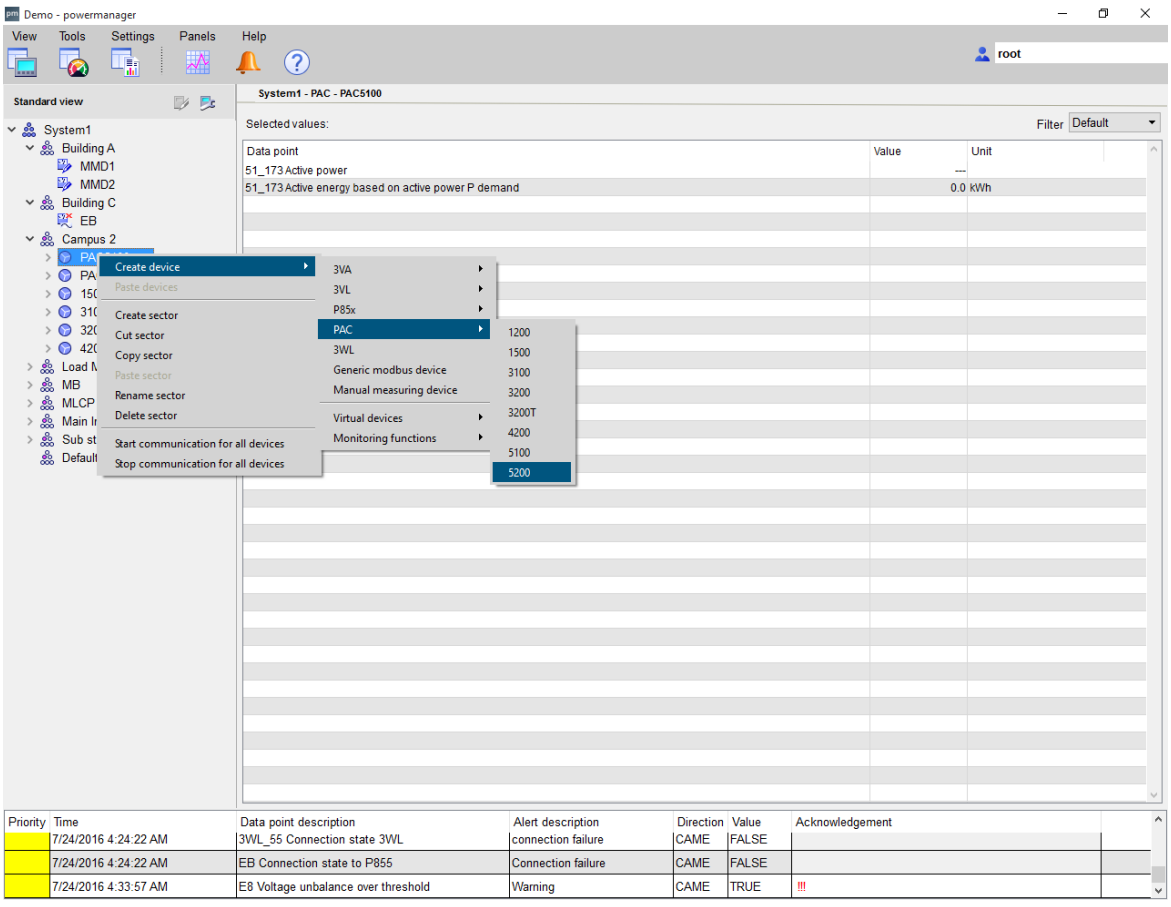
[sc_Devices, 2, en_US]

Creating a Device

To create a device:

✧ Right-click the area or sector in which you want to create the device.

✧ Click **create device**.



[sc_pm_createdevice, 1, en_US]

✧ Click the device type.

The **Create new device** dialog opens.

✧ Assign a name to the device.

✧ Click **Create**.

Wait until powermanager creates the device.

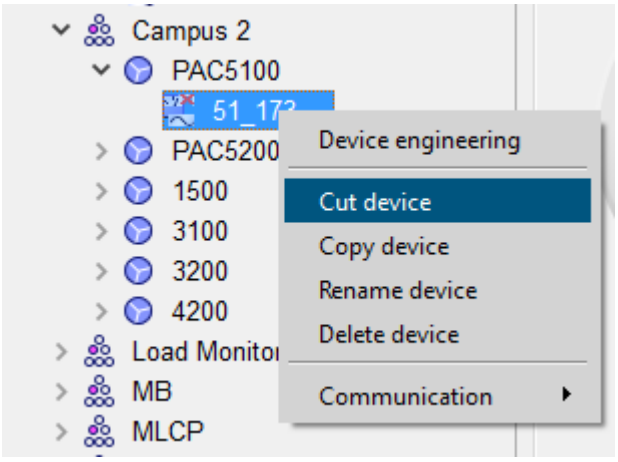
Creation of the new device takes some time depending on the device type and the project size.

The new device is now displayed in the project tree.

Cutting a Device

To cut the devices:

✧ Select the devices that you want to cut from project tree.



[sc_pm_cut_device, 1, en_US]

✧ Right-click the selected devices and select **Cut devices** from the context menu.

NOTE

THe cut operation can be performed only on the same type of entity, for example, you cannot cut a device and a sector at the same time.

Copying Devices

To copy the devices:

✧ Select the devices that you want to copy from project tree.

✧ Right-click the selected devices and select **Copy devices** from the context menu.

NOTE

Copy device is not supported on distributed systems.

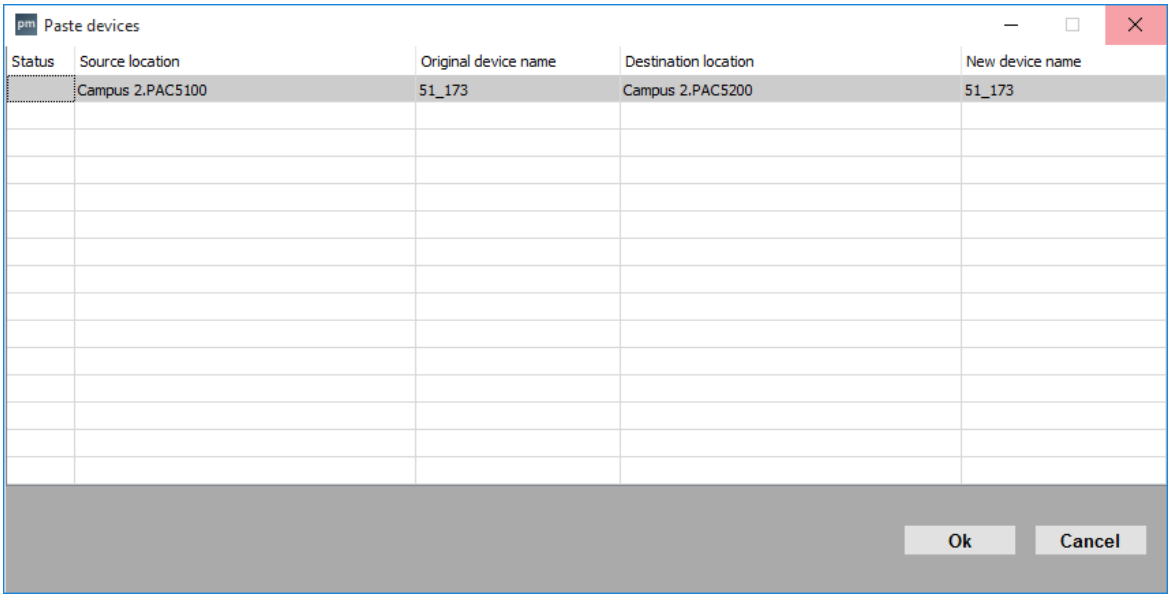
Copied area is not available for paste if the UI language or the user is changed.

Pasting Devices

To paste the devices:

✧ Right-click the area or sector in which you want to paste the copied devices.

✧ Select **Paste devices** from the context menu.
The **Paste devices** dialog opens.



[sc_pm_pastedevice, 1, en_US]

NOTE

A device can be pasted into any area/sector including the same sector/area in which it is already present.

Communication

You can view the communication status from the icon beside the device:

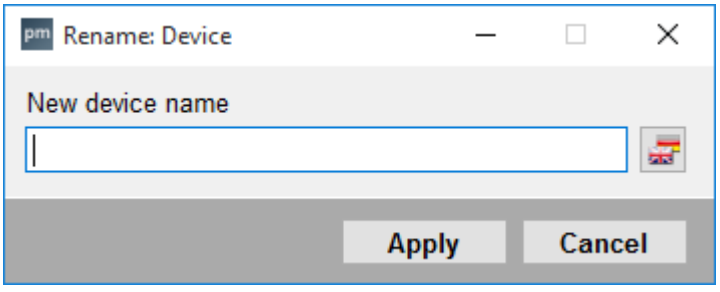
- - Device connected (communication active)
- - Device not connected (communication inactive)

Renaming a Device/Sector/Area

To rename a device/sector/area:

✧ Right-click the device/sector/area which you want to rename.

✧ Click **Rename device/sector/area** from the context menu.
The **Rename: Device/Sector/Area** dialog opens.



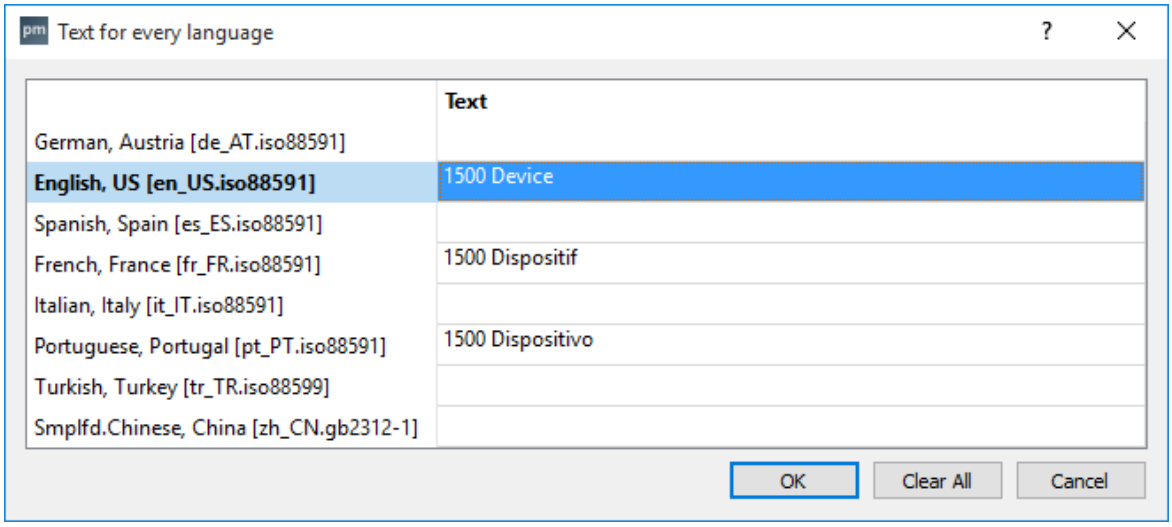
[sc_pm_renamedevice, 1, en_US]

✧ Enter a **New device name**.

You can change the device name according to the language by using the **Text for every language** dialog.

✧ Click  .

The **Text for every language** dialog opens.



[sc_pm_language, 1, en_US]

✧ Enter the desired name in the **Text** column for the device for the required languages.

The device name entered for each language will be displayed according to the language selected in the UI.

✧ Click **Ok**, to confirm.

✧ Click **Apply**.

Table 5-2 Device Shortcut Menu

Menu Items	Description
Device engineering	See *8.2.1.5 Extended Configuration Tab*.
Cut device	Click **Cut device** to cut the selected device.
Copy device	Click **Copy device** to copy the selected device.
Rename device	Click **Rename device** to rename the selected device.
Delete device	Click **Delete device** to delete the selected device.
Start communication	Click **Start communication** to start communication between the software and the device. If communication is already in progress between the software and the device, this option will not be disabled.
Stop communication	Click **Stop communication** to stop communication between the software and the device. If communication is already stopped between the software and the device, this option will not be disabled.

Table 5-3 Sector Shortcut Menu

Menu Items	Description
Create device	Click **Create device** to create a device in the sector.
Paste devices	Click **Paste devices** to paste the copied devices into the sector.
Create sector	Click **Create sector** to create a sector in the sector.
Cut sector	Click **Cut sector** to cut the selected sector.
Copy sector	Click **Copy sector** to copy the selected sector.
Paste sector	Click **Paste sector** to paste the copied sector into the area/sector.
Rename sector	Click **Rename sector** to rename the selected sector.

Menu Items	Description
Delete sector	Click **Delete sector** to delete the selected sector.
Start communication for all devices	Click **Start communication for all devices** to start communication between the software and all the devices present in the sector. If communication is already in progress between the software and the devices, this option will not be disabled.
Stop communication for all devices	Click **Stop communication for all devices** to stop communication between the software and all the devices present in the sector. If communication is already stopped between the software and the devices, this option will not be disabled.

Table 5-4 Area Shortcut Menu

Menu Items	Description
Create device	Click **Create device** to create a device in the area.
Paste devices	Click **Paste devices** to paste the copied devices into the sector.
Device engineering	See *8.2.1.5 Extended Configuration Tab*.
Create sector	Click **Create sector** to create a sector in the sector.
Paste sector	Click **Paste sector** to paste the copied sector into the area/sector.
Copy area	Click **Copy area** to copy the selected area.
Rename area	Click **Rename area** to rename the selected area.
Delete area	Click **Delete area** to delete the selected area.
Start communication for all devices	Click **Start communication for all devices** to start communication between the software and all the devices present in the area. If communication is already in progress between the software and the devices, this option will not be disabled.
Stop communication for all devices	Click **Stop communication for all devices** to stop communication between the software and all the devices present in the area. If communication is already stopped between the software and the devices, this option will not be disabled.

Table 5-5 System Shortcut Menu

Menu Items	Description
Create device	Click **Create device** to create a device in the system. The new device is added in the **no area** area.
Device engineering	See *8.2.1.5 Extended Configuration Tab*.
Create area	Click **Create area** to create a new area.
Paste area	Click **Paste area** to paste a copied area into the system.
Area administration	Click **Area administration** to get an overview of the available areas. You can see which devices in the individual areas have their own area settings. You can also create new areas.
Filter administration	Click **Filter administration** to create individual filters for measured value display in the **Selected Values** tab. For more information, see *8.2.9.1 Overview of Filter Administration*.
System settings	Click **System settings** to modify the settings for the project. For more information, see *8.1.1 Configuring Project Settings*.
Start communication for all devices	Click **Start communication for all devices** to start communication between the software and all the devices. If communication is already in progress between the software and the devices, this option will not be disabled.
Stop communication for all devices	Click **Stop communication for all devices** to stop communication between the software and all the devices. If communication is already stopped between the software and the devices, this option will not be disabled.

5.5 Upgrading and Updating a Project

Upgrading a Project

NOTE

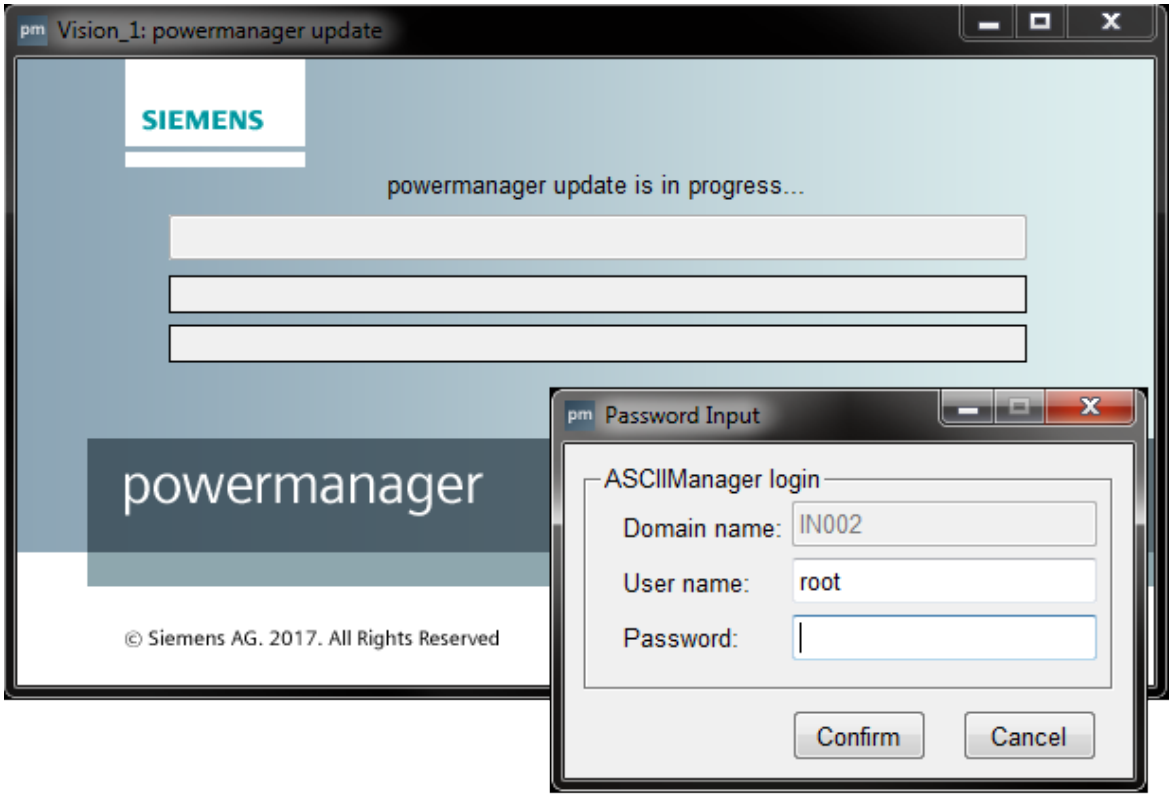
Ensure that you back up the project before upgrading.

Install powermanager V3.5 on the system and upgrade the project in 2 steps.

Step 1

- ✧ Click **Start > All Programs > SENTRON > powermanager V3.5 > Project Administration** to launch powermanager Project Administration.
- ✧ Double-click **Doubleclick for list of older projects**.
  The **Project Adminstrator** window is displayed.
  This window lists all the previous projects from powermanager V3.4 and earlier, which are not yet upgraded.
- ✧ Select the project you want to upgrade and click .

The **Upgrade project** window opens.



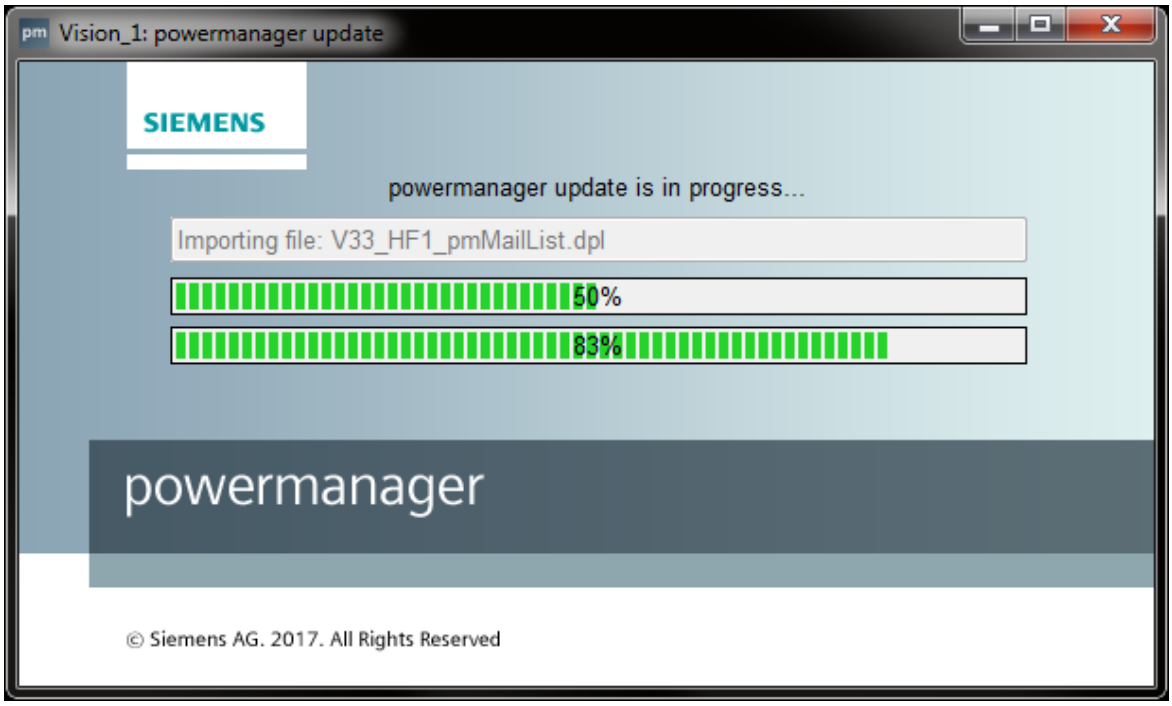
[sc_pm_update_confirm, 1, en_US]

- ✧ Enter the **User name** and **Password**.
- ✧ Click **Confirm**.
  powermanager upgrades the project.

Step 2

✧ Start the upgraded project with powermanager V3.5.

An older version of a project is automatically updated to the latest version, when it is started in powermanager V3.5.



[sc_pm_update, 1, en_US]

NOTE

If the update fails, restart powermanager to update the project.

6 Views

6.1 Standard View

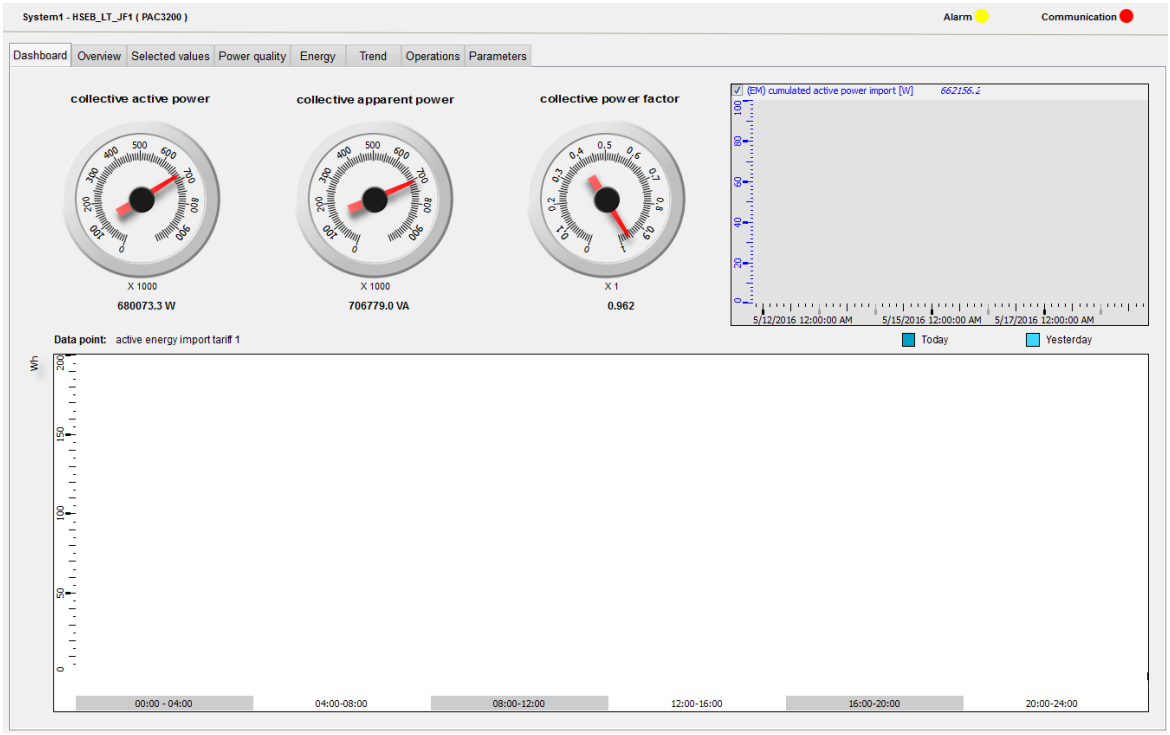
6.1.1 Tabs in Standard View

The Standard view contains the following tabs:

- Dashboard
- Overview
- Selected values
- Power quality
- Harmonics
- Energy
- Trend
- Operations
- Web
- Parameters

6.1.2 Dashboard

The **Dashboard** tab displays the values of the data points, which are configured in the **Dashboard configuration** tab corresponding to the selected device.

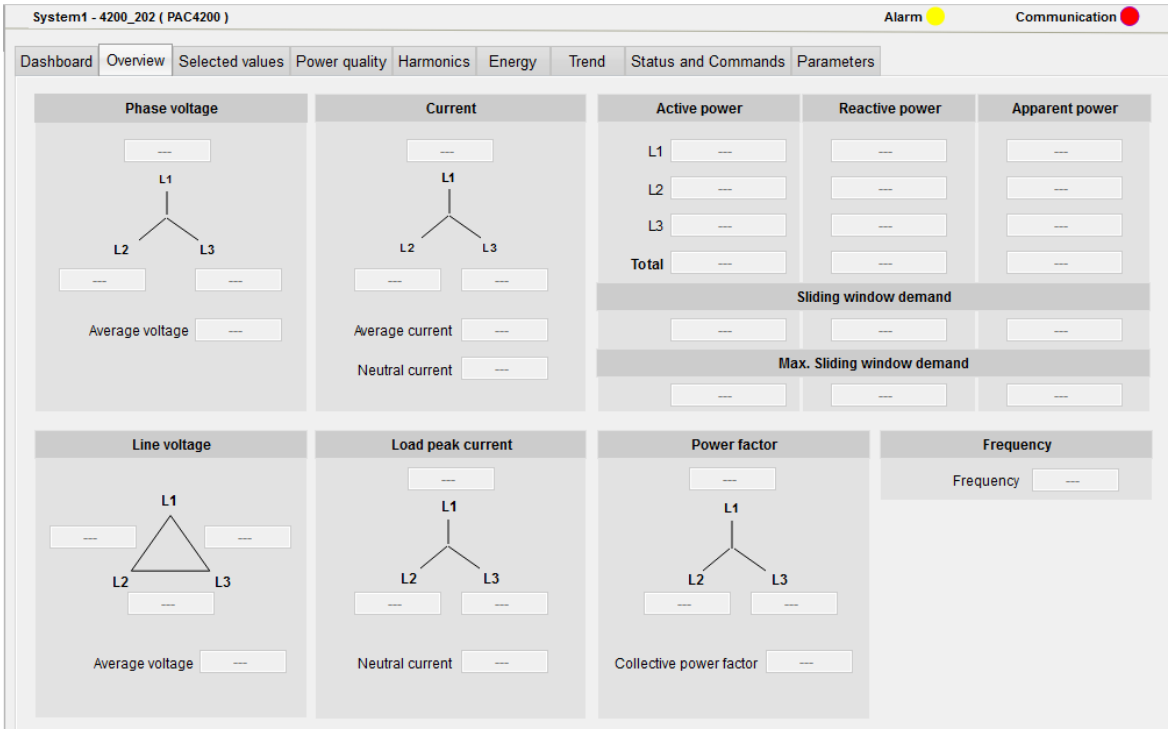


[sc_Dashboard, 1, en_US]

6.1.3 Overview

The **Overview** tab is available for all devices except virtual devices. This tab displays the summary of different data point values measured by the devices.

The color next to **Alarm** field displays the current status of the alarm. The color next to the **Communication** field shows the communication status between the device and powermanager.



[sc_pm_4200_overviewtab, 1, en_US]

Figure 6-1 Overview Tab

6.1.4 Selected Values

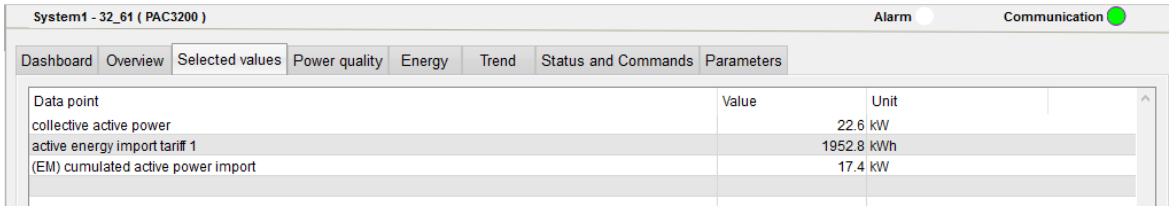
The **selected values** tab lists all preselected measured variables with description, current measured value, and defined unit.

You can preselect the measured values in the **Display** column of the **Configuration** tab in the Device Engineering view.

NOTE

By default, the values for the following items are displayed in the **Selected values** tab.

- Collective active power
- Active energy import tariff
- (EM) cumulated active power import



[sc_pm_selected_values, 1, en_US]

Figure 6-2 Selected Values Tab

The parameters for **Selected values** tab are set on the device or on the device type (inheritance). You can create filters in the system.

If a measured value is highlighted in red, it indicates that the address is deactivated in the configuration.

To add additional measured values:

- Right-click a system, an area, or a device.
- Select **Device engineering** and click the device or device type.
- Select the measured values for the device or device type.
- Select **Display**.
- Click **Save**.

NOTE

When selecting at area level or system level, select the device type from the shortcut menu.

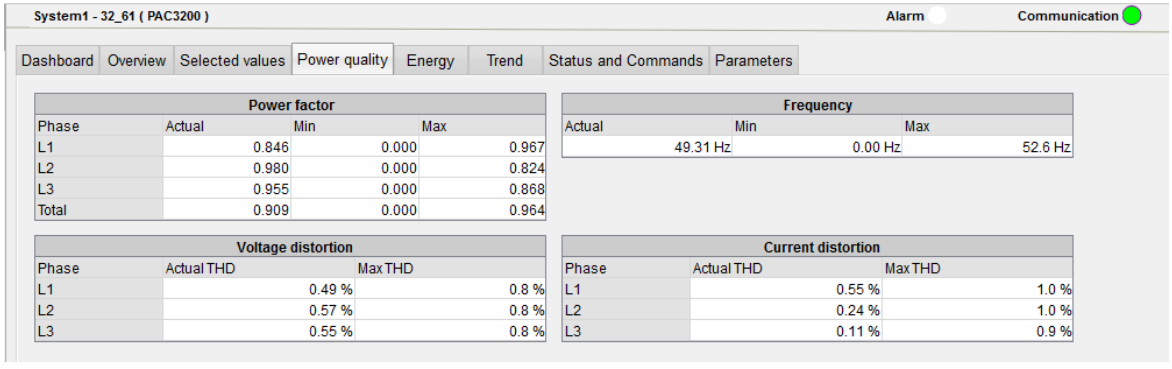
Area level: Inheritance of the list by all devices of the selected device type within the area.

System level: Inheritance of the list by all devices of the selected device type within the station.

6.1.5 Power Quality

The **Power quality** tab is available only for the PAC3200/3200T/4200/5100/5200 and P850/P855. This tab displays actual, minimum, and maximum values of the power factor and frequency.

This tab also displays the actual and maximum distortion in the voltage and current values.

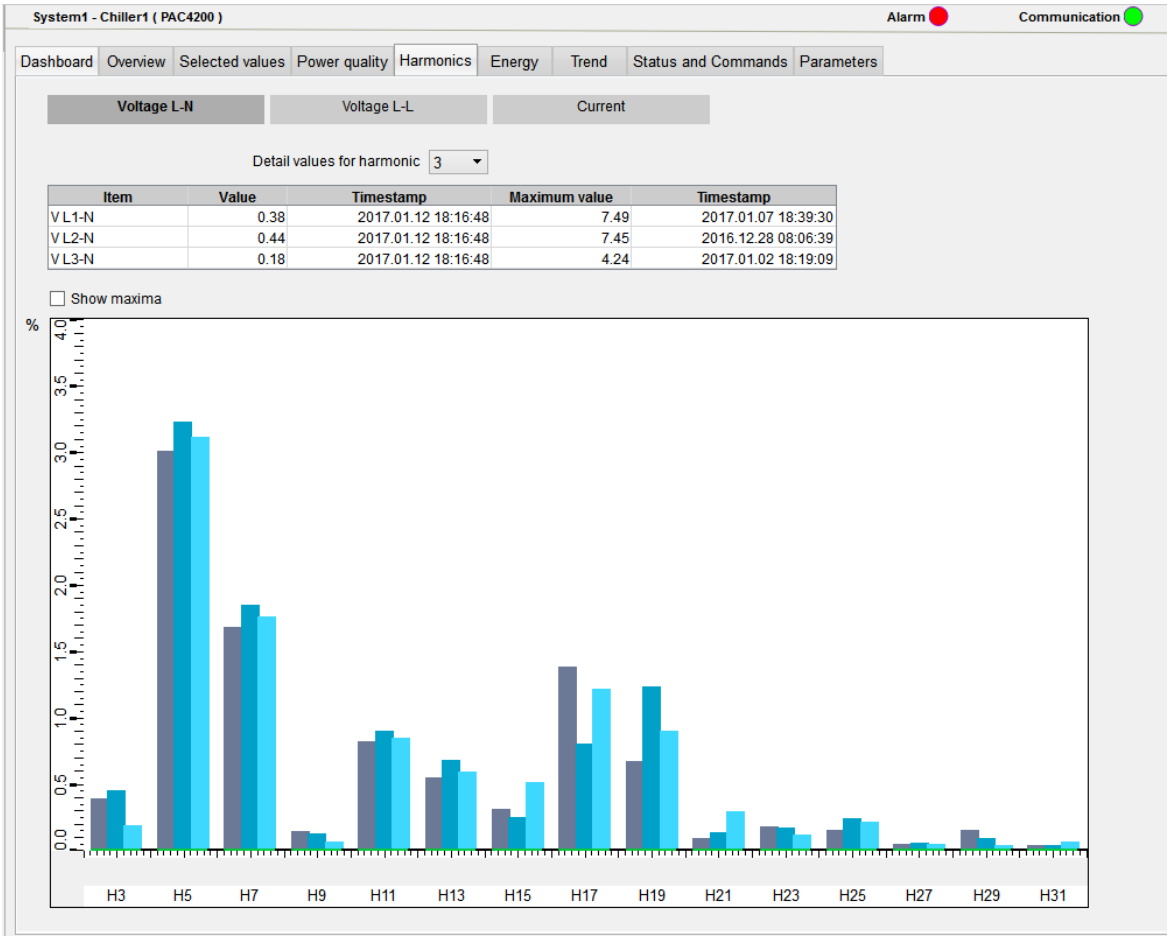


[sc_pm_powerquality, 1, en_US]

Figure 6-3 Power Quality Tab

6.1.6 Harmonics

The values of the harmonics are displayed in a bar chart. This tab is only available for the 3WL, P855, P850, PAC1600 (1681/1682), PAC4200, PAC5100, and PAC5200 devices.



[sc_pm_harmonics, 1, en_US]

Figure 6-4 Harmonics Tab

Select any one of the following values to display the data:

- **Voltage L-N**: Harmonics voltage l-n (in %).
- **Voltage L-L**: Harmonics voltage l-l (in %).
- **Current**: Harmonics current I (in A).

Select a harmonic to view the detailed values (including time stamp) of the harmonic. The bar chart shows the harmonic proportions related to the basic oscillation up to the 17th or 31st harmonic.

By default, you see the instantaneous values of the harmonics. Click **show maxima** to view the maximum values of the harmonics.

6.1.7 Energy

The **Energy** tab displays the energy consumption details. This tab enables you to compare the energy consumption between two different time periods.

To compare the energy consumption between two different time periods:

✧ Select a **Data point**, from the drop-down list.

✧ Select an **Interval**, from the drop-down list.

✧ Select an **Duration**, from the drop-down list.

✧ Select the **Compare** option.

✧ Click **Apply**, to compare the energy consumption between two selected time periods.
The comparision is displayed in the form of a graph.

6.1.8 Trend

The **Trend** tab is available for all devices.

This tab is similar to the **Trend** window.

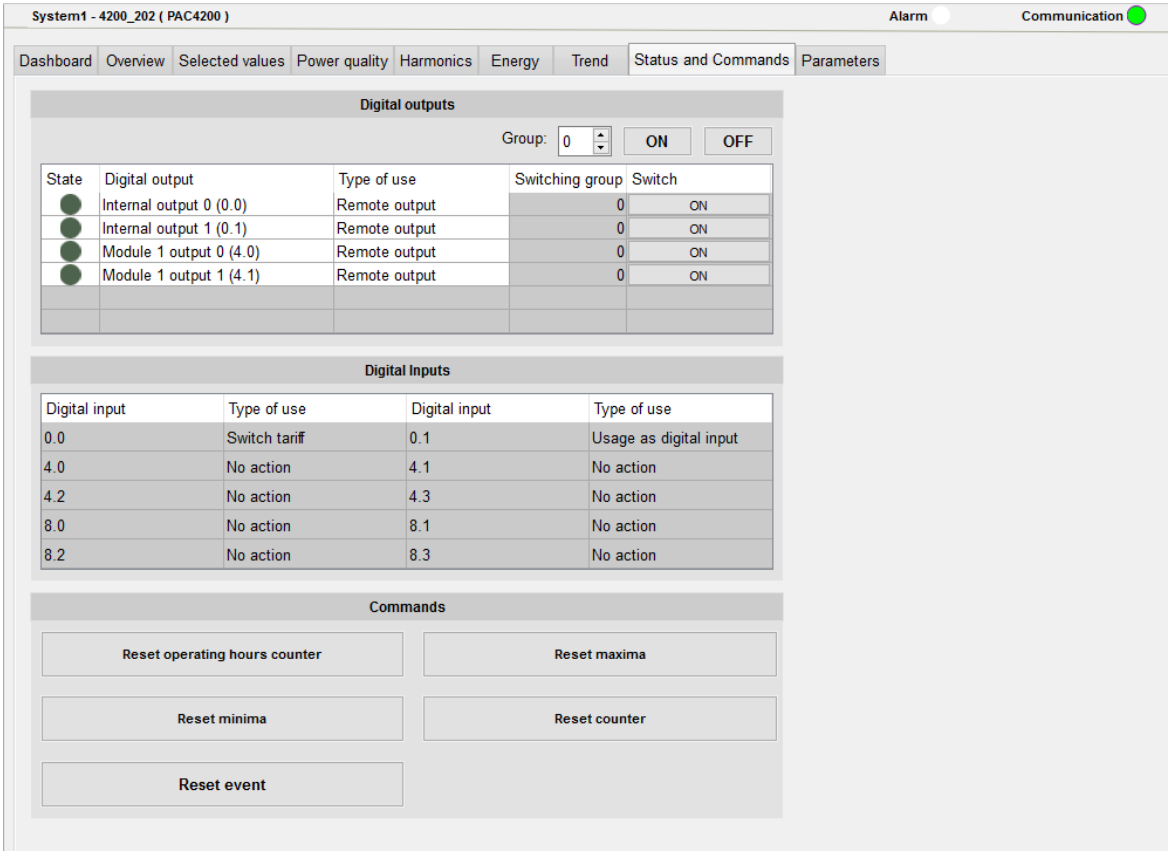
The **Trend** tab displays **Voltage**, **Current**, **Power**, **Power interval**, **Power factor**, **THD**, and **Custom**. The custom graph is configured in the **Trend configuration** tab.

For more information on trending in powermanager, see *7.1.1 Overview*.

6.1.9 Status and Commands

The **Status and Commands** tab consists of 3 sections **Digital outputs**, **Digital inputs**, and **Commands** for measuring devices. The **State** of the breaker is displayed for circuit breakers.

Status and Commands Tab



[sc_pm_status_commands, 1, en_US]

Figure 6-5 Status and Commands Tab

You can switch the digital outputs of the PAC3200, PAC3200T, and PAC4200 devices on the **Digital outputs** section. For this purpose, configure the digital outputs as remote output in the device.

A lamp icon indicates the switching state:

Icon	State
	Signal of the digital output is high (1).
	Signal of the digital output is low (0).

Use the button to the right of the lamp icon to switch on or off the digital output.

Digital Inputs

This section displays the digital input and its type of use.

Commands

The **commands** section contains buttons that can be used to change device settings during runtime.
The commands can only be transferred if password protection is switched off on the device.
The following commands are available:

PAC1665	• Reset energy counter • Reset work hour counter • Reset maximum demand values
PAC1682/1661	• Reset energy counter • Reset work hour counter • Reset maximum demand values • Reset maximum/minimum
PAC2200	• Acknowledge diagnostics • Reset counter
PAC3100	• Acknowledge diagnostics • Reset maxima • Reset minima • Reset counter
PAC3200/PAC3200T	• Acknowledge diagnostics • Reset maxima • Reset minima • Reset counter
PAC4200	• Reset operating hours counter • Reset maxima • Reset minima • Reset counter • Reset event
3VL/3WL	• Breaker ON • Breaker OFF In addition to the circuit breakers, a symbol indicates the current status.
3VA	• Reset min/max

6.1.10 Web

The **Web** tab is only visible for the PAC1200/PAC2200/PAC3200T, PAC5100/PAC5200, and P850/P855 devices. This tab displays the Web interface for the PAC5100/PAC5200 and P850/P855 device connected to powermanager.

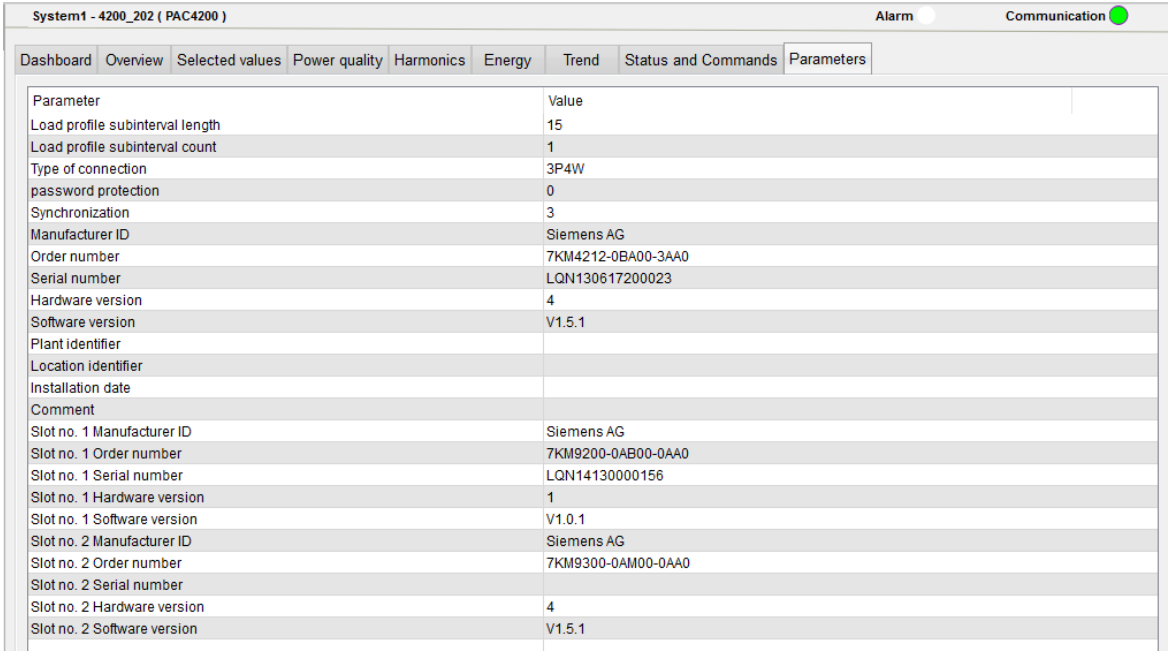
Use the COMTRADE viewer to view the saved fault records. The COMTRADE view is installed in the following location:

C:\Program Files (x86)\Siemens\Energy\ComtradeViewer\V4_58

For more information about the individual tabs, refer to the respective manuals for PAC1200/PAC2200/ PAC3200T, PAC5100/PAC5200, and SICAM P850/P855.

6.1.11 Parameters

Parameters tab displays the device information. This includes manufacturer, firmware version, module information, and so on.



Parameter	Value
Load profile subinterval length	15
Load profile subinterval count	1
Type of connection	3P4W
password protection	0
Synchronization	3
Manufacturer ID	Siemens AG
Order number	7KM4212-0BA00-3AA0
Serial number	LQN130617200023
Hardware version	4
Software version	V1.5.1
Plant identifier	
Location identifier	
Installation date	
Comment	
Slot no. 1 Manufacturer ID	Siemens AG
Slot no. 1 Order number	7KM9200-0AB00-0AA0
Slot no. 1 Serial number	LQN14130000156
Slot no. 1 Hardware version	1
Slot no. 1 Software version	V1.0.1
Slot no. 2 Manufacturer ID	Siemens AG
Slot no. 2 Order number	7KM9300-0AM00-0AA0
Slot no. 2 Serial number	
Slot no. 2 Hardware version	4
Slot no. 2 Software version	V1.5.1

[sc_pm_parameters, 1, en_US]

Figure 6-6 Parameters Tab Display

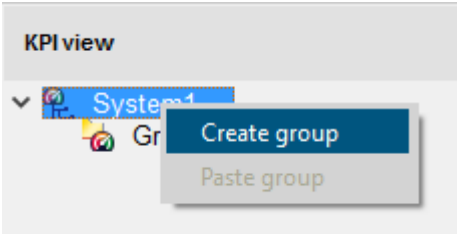
6.2 KPI

6.2.1 Overview

In this view, you can generate the Key Performance Indicators (KPI) of any building or industry. The view consists of a tree where you can add KPIs. KPIs can be calculated according to time ranges like day, week, month, and year.

A cluster of KPIs forms a group. Group1 is available by default. A maximum of 9 KPIs can be created in a group.

Creating a Group



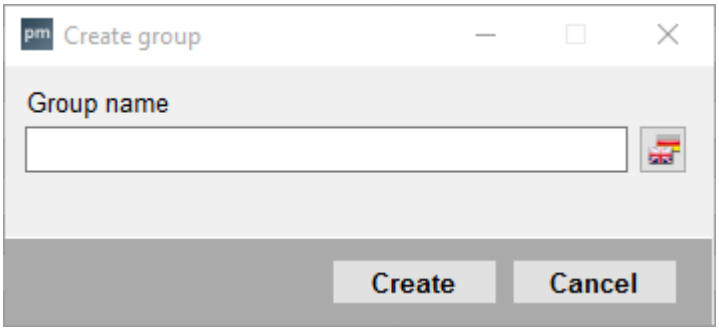
[sc_pm_creategroup_kpiview, 1, en_US]

To create a group:

✧ Right-click the tree root.

✧ Click **Create group**.

The **Create group** dialog is displayed.



[sc_pm_create_group, 1, en_US]

✧ Enter a **Group name**.

✧ Click **Create**.
The created group is displayed in the project tree.
For more information on naming a node in the project tree, refer to *5.1 Creating a New Project*.

Copying a Group

✧ Right-click the group.

✧ Click **Copy group**.
The copied group can be used for pasting later.

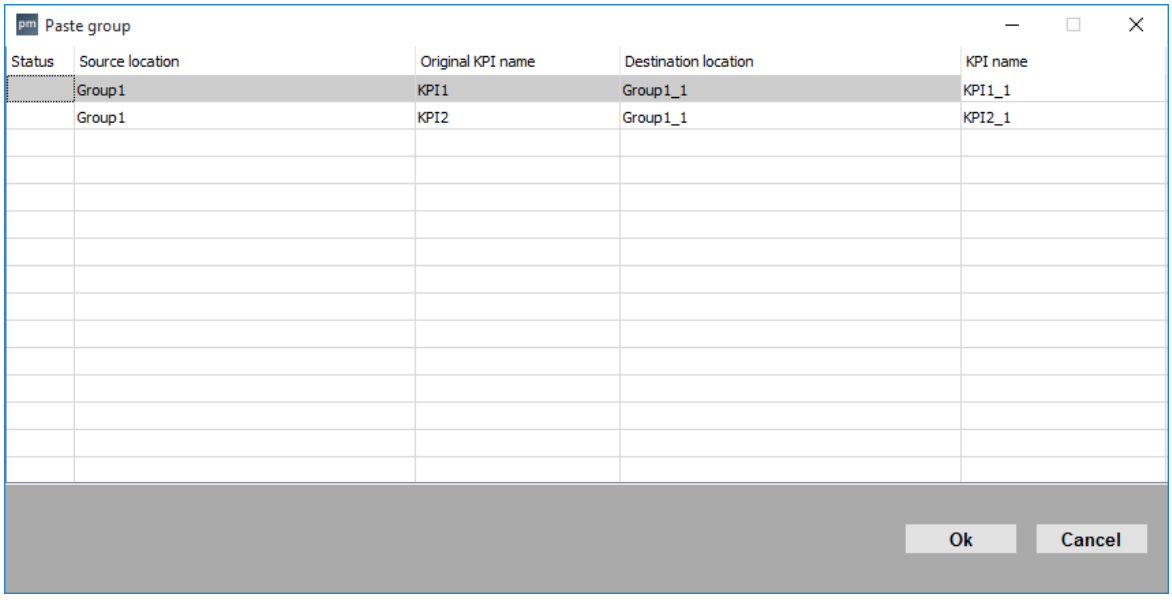
Pasting a Group

A previously copied or cut group can be pasted in the tree root.

✧ Right-click the tree root.

✧ Click **Paste group**.

The **Paste group** dialog is displayed.



[sc_pm_paste, 1, en_US]

- ✧ You can enter a **New KPI name**.
- ✧ Click **OK**.
  The pasted group is displayed in the project tree.

Renaming a Group

- ✧ Right-click a group.
- ✧ Click **Rename group**.

The **Rename group** dialog is displayed.

- ✧ Enter a **New group name**.
- ✧ Click **Apply** to confirm.
  The group name is changed.

Deleting a Group

- ✧ Right-click a group.
- ✧ Click **Delete group**.
  The **Delete group** dialog is displayed.
- ✧ Click **Yes**, to delete the group.

Pasting a KPI

- ✧ Right-click the group, where you want to paste the KPI.
- ✧ Click **Paste KPI**.
  The **Paste KPI** dialog is displayed.
- ✧ You can enter a **New KPI name**.
- ✧ Click **OK** to confirm.
  The KPI is displayed under the group in the project tree.

Editing the KPI configuration

- ✧ Right-click a KPI.
- ✧ Click **KPI engineering**.
  The KPI configuration is displayed.
- ✧ Make the required changes to the configuration.

✧ Click **Save** to apply the changes made.

Cutting a KPI

✧ Right-click a KPI.

✧ Click **Cut KPI**.
The KPI will be removed from the group once it is pasted into another group.

Copying a KPI

✧ Right-click a KPI.

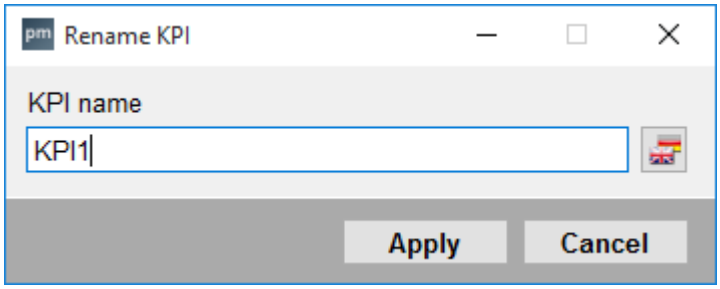
✧ Click **Copy KPI**.
The copied KPI can be pasted into another group.

Renaming a KPI

✧ Right-click a KPI.

✧ Click **Rename KPI**.

The **Rename KPI** dialog is displayed.



[sc_pm_renamekpi, 1, en_US]

✧ Enter a **New KPI name**.

✧ Click **Apply**, to confirm.
The KPI name is changed in the project tree.

Deleting a KPI

✧ Right-click a KPI.

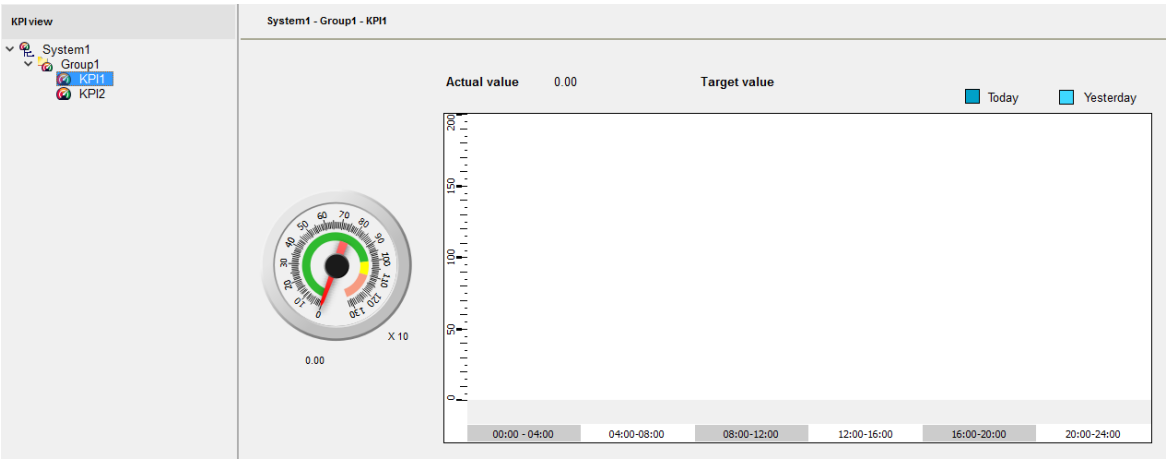
✧ Click **Delete KPI**.
The Information dialog is displayed.

✧ Click **Yes**, to confirm.
The KPI will be deleted from the project tree.

Creating a KPI

To create a KPI:

✧ Right-click a group from the tree.



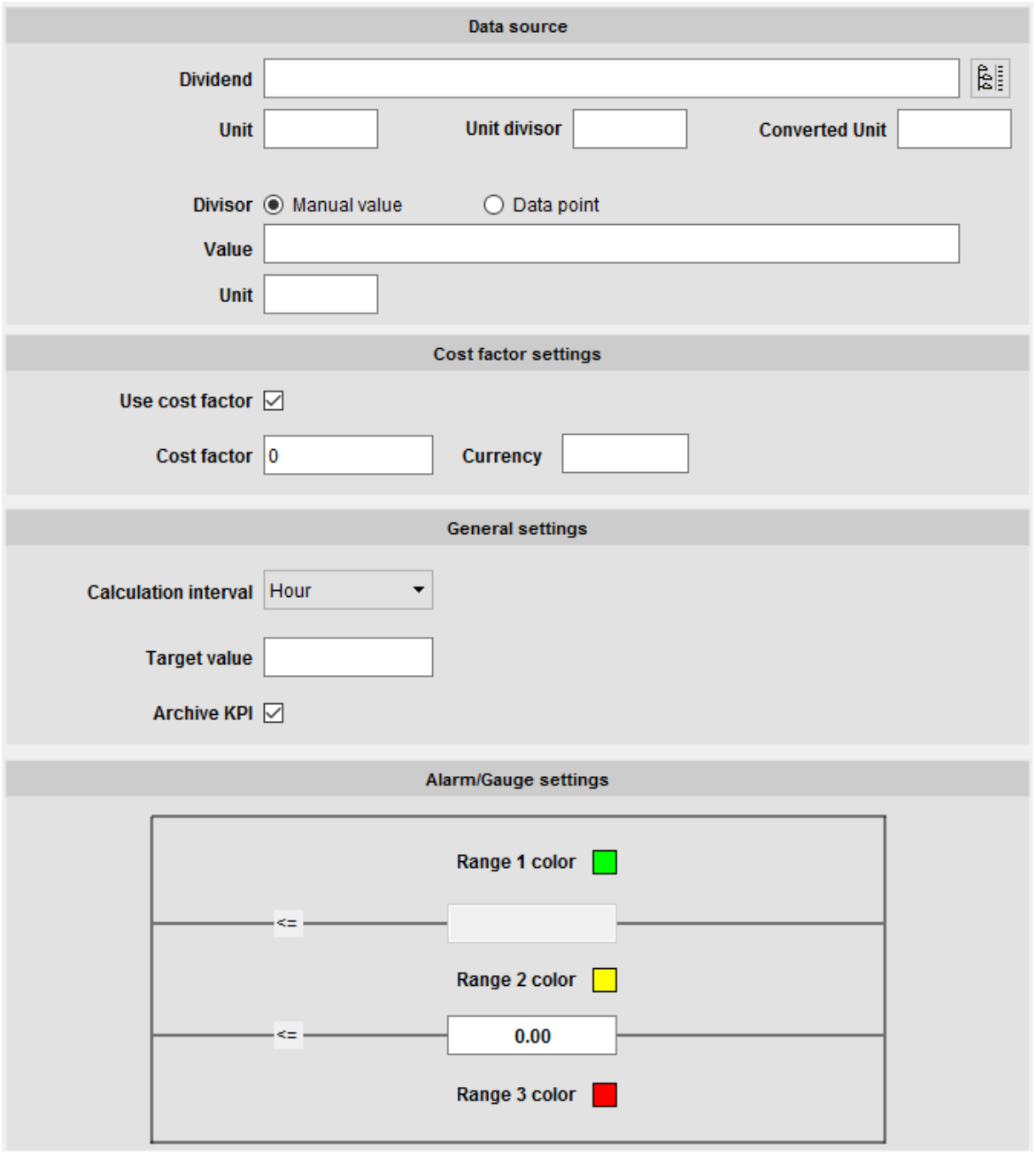
[sc_pm_kpi, 1, en_US]

✧ Select **Create KPI**.
The **Create new KPI** dialog is displayed.

✧ Enter a unique **New KPI name**.

✧ Click **Create**.

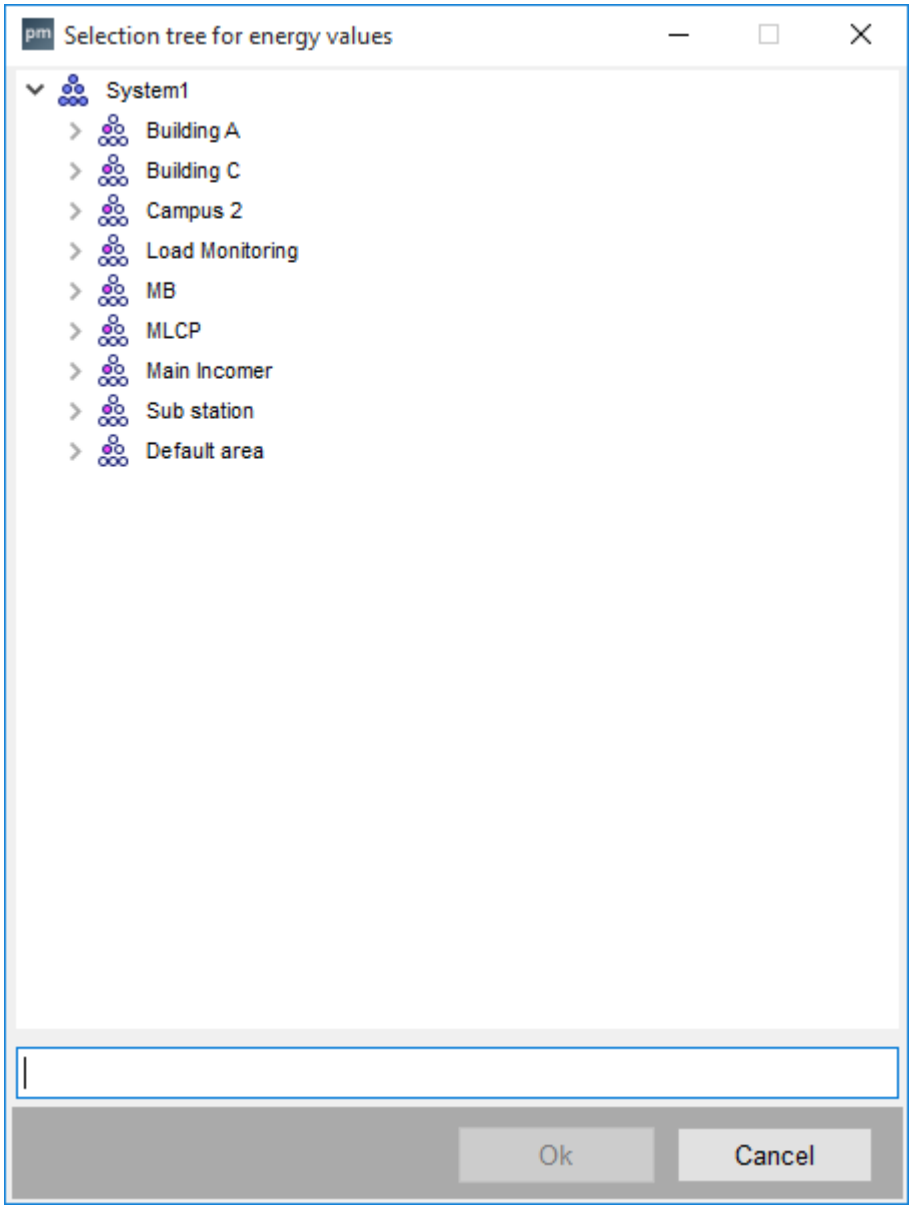
The KPI is displayed in the project tree and the **KPI engineering** view is displayed.



[sc_pm_data_source, 1, en_US]

✧ In the **Data source** section, click  .

The **Selection tree for energy values** dialog is displayed.



[sc_pm_sel_tree, 1, en_US]

✧ Select the required data point.

✧ Click **OK**.
The selected **Dividend** is displayed.
The **Units** are displayed according to the data point selected.
You can enter a **Unit divisor** and **Converted Unit** for the Dividend.
For example, if the data point **Active energy import** is selected and its **Unit** is **kWh**. You can enter 1000 as the **Unit divisor** and **MWh** as the **Converted unit**. This converts 1000 kWh to 1 kMWh.

NOTE

If you do not enter any value for **Unit divisor** and **Converted Unit**, by default, the value **1** is taken as **Unit divisor** and **Unit** is taken as **Converted Unit**.

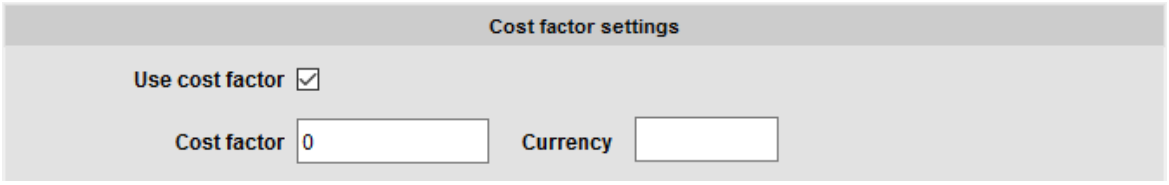
✧ Select **Manual value** or **Data point** for the **Divisor**.

✧ If you select **Manual value**, you will have to enter a **Value** and **Unit** for the KPI calculation.

- or -

✧ If you select **Data point**, the default value (1) is taken and if the selected data point is not a counter value, the instantaneous value is used for the KPI calculation.

The unit is displayed according to the selected value.



[sc_pm_cost_factor, 1, en_US]

✧ In the **Cost factor settings** section, if you select the option **Use cost factor**, you will have to enter a **Cost factor** for the KPI calculation.

✧ Enter a **Currency** associated with the cost factor.

[sc_pm_general_settings, 1, en_US]

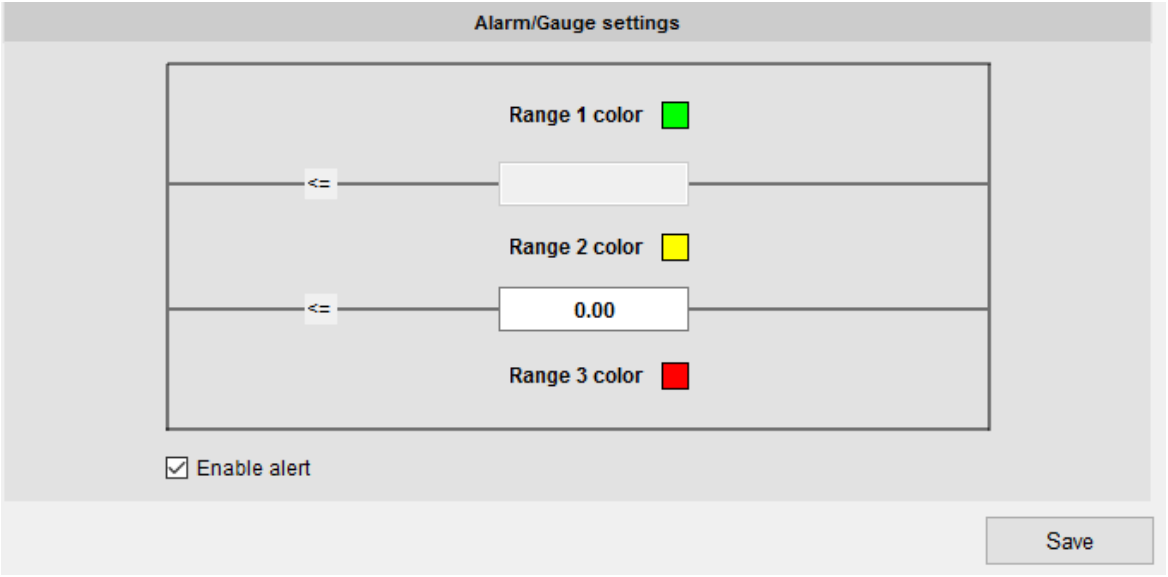
✧ In the **General settings** section, select a **Calculation interval** from the drop down menu.
According to the selected interval, the KPI will be calculated every hour, day, week, month, or year.

✧ Enter a **Target value**.
The target value acts as a reference value for the KPI.

NOTE

The target value is not used for any KPI calculations, but is used in configuring the range associated with the KPI.

✧ Select **Archive KPI**, if you want to archive the KPI calculation results, if not clear it.



[sc_pm_alarmsettings, 1, en_US]

In the **Alarm/Gauge settings** section, you can set a range at which you will get an alarm.
These ranges are indicated by three colors:

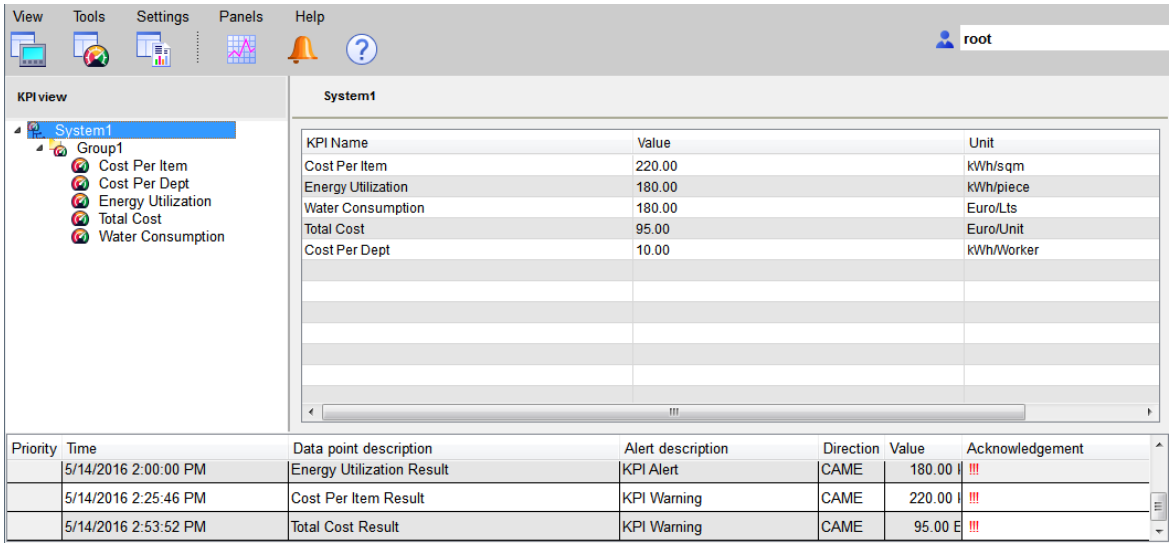
- Green: The color green indicates the good threshold value range.
- Yellow: The color yellow indicates the warning threshold value range.
- Red: The color red indicates the out of threshold value range.

✧ Select **Enable alert** to get an alert when the KPI value is in the red range or above the red range. You can clear the **Enable alert** to turn off alerts.

✧ Click **Save**, to save the KPI configuration.

✧ Select the newly created KPI from the KPI tree, its gauge, and bar chart will be displayed.
The gauge is displayed with values, units, and ranges.
If a KPI group is selected from the KPI tree, all its gauges are displayed.

KPI System View



This view lists all the configured KPIs.

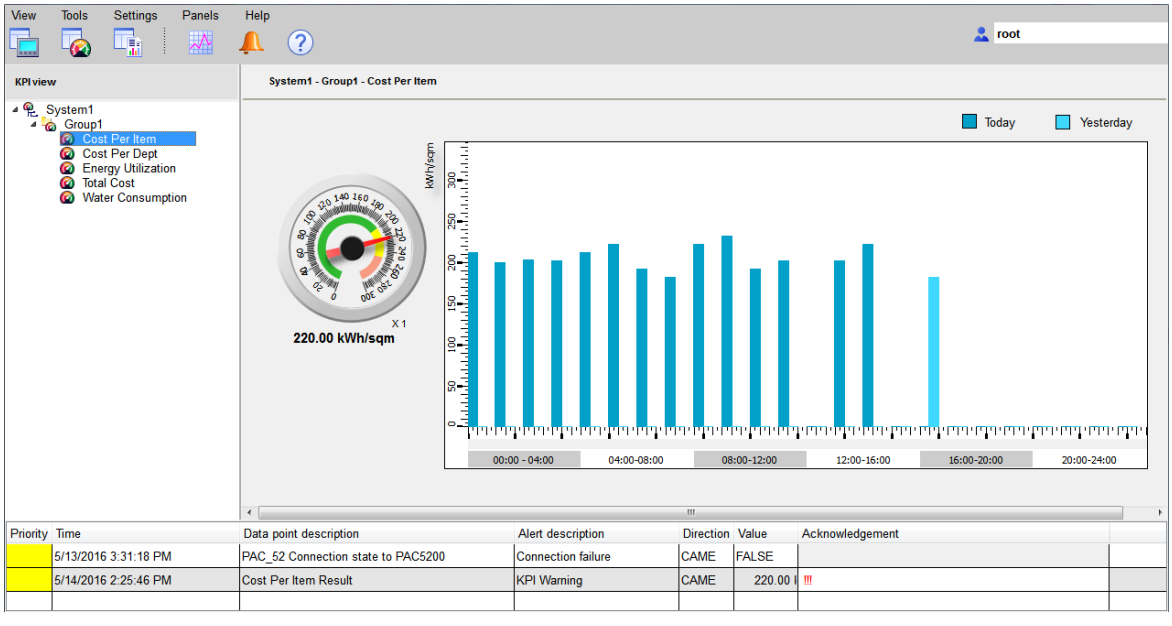
KPI Group View

[sc_KPI_Group_View, 1, en_US]

This view displays all the KPIs in the selected group in the form of gauges. A maximum of 9 KPIs can be displayed.

- Click **More**, to display the runtime view of the KPI.

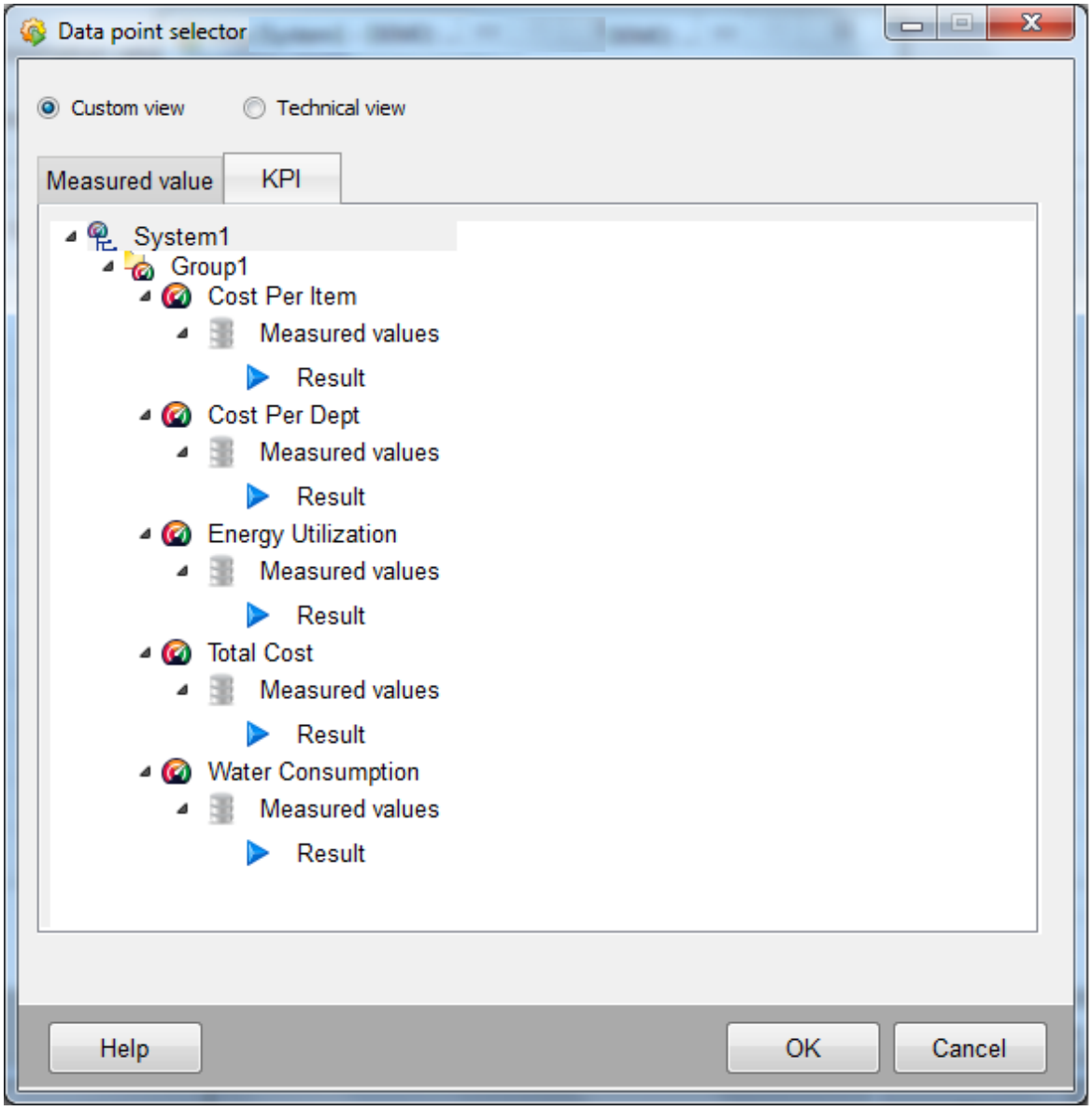
KPI Runtime View



[sc_KPI_View, 1, en_US]

This view displays the selected KPIs bar chart and gauge.

KPI Data Point Selector



[sc_KPI_Data_pt_Selector, 1, en_US]

The KPI data point selector is used to select data points via KPI measuring groups.

6.3 Input View

6.3.1 Overview

The **Input** view enables you to add measured values for the manual measuring devices.
In the menu bar, click **View > Input** to switch to input mode.

NOTE

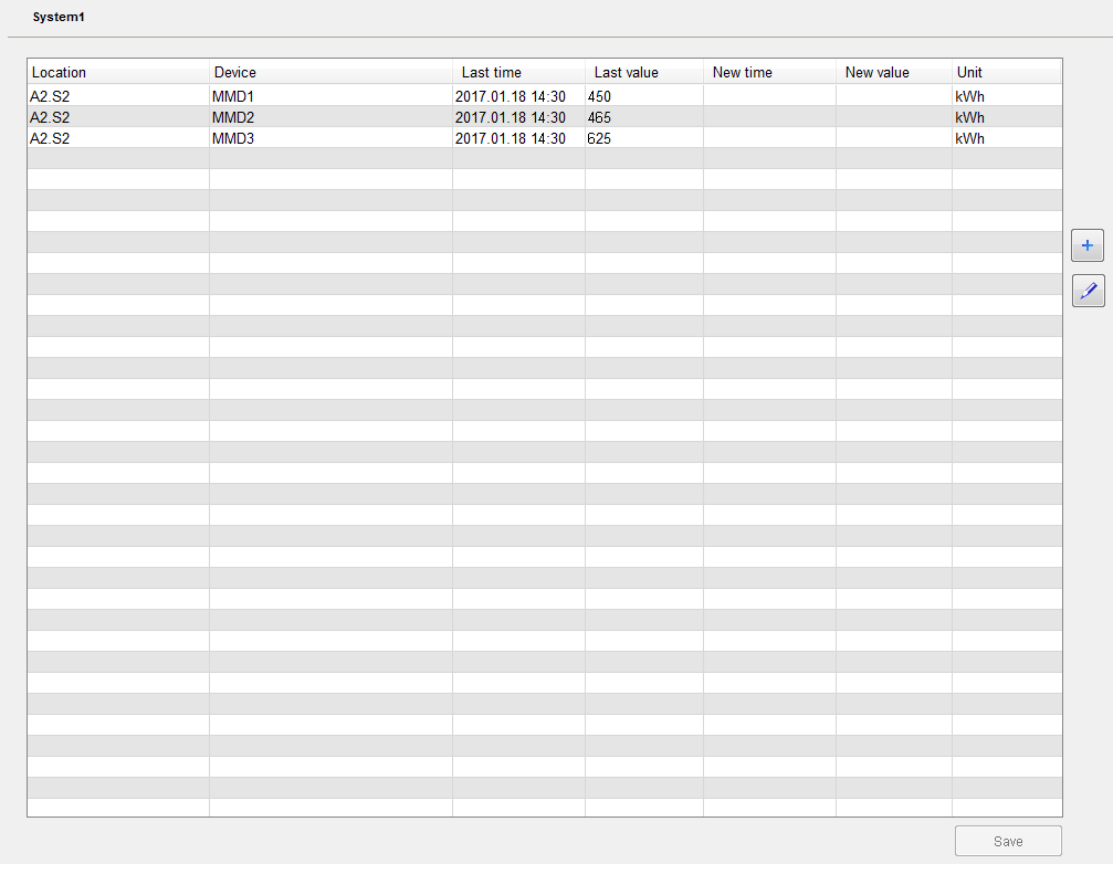
In the **Input** view, only the manual measuring devices are visible at the sector, area, and project tree root level.

The sector, area, and project tree root level display:

- The list of manual measuring devices.
- The latest measured value entered for each device and the timestamp associated with the measured value.

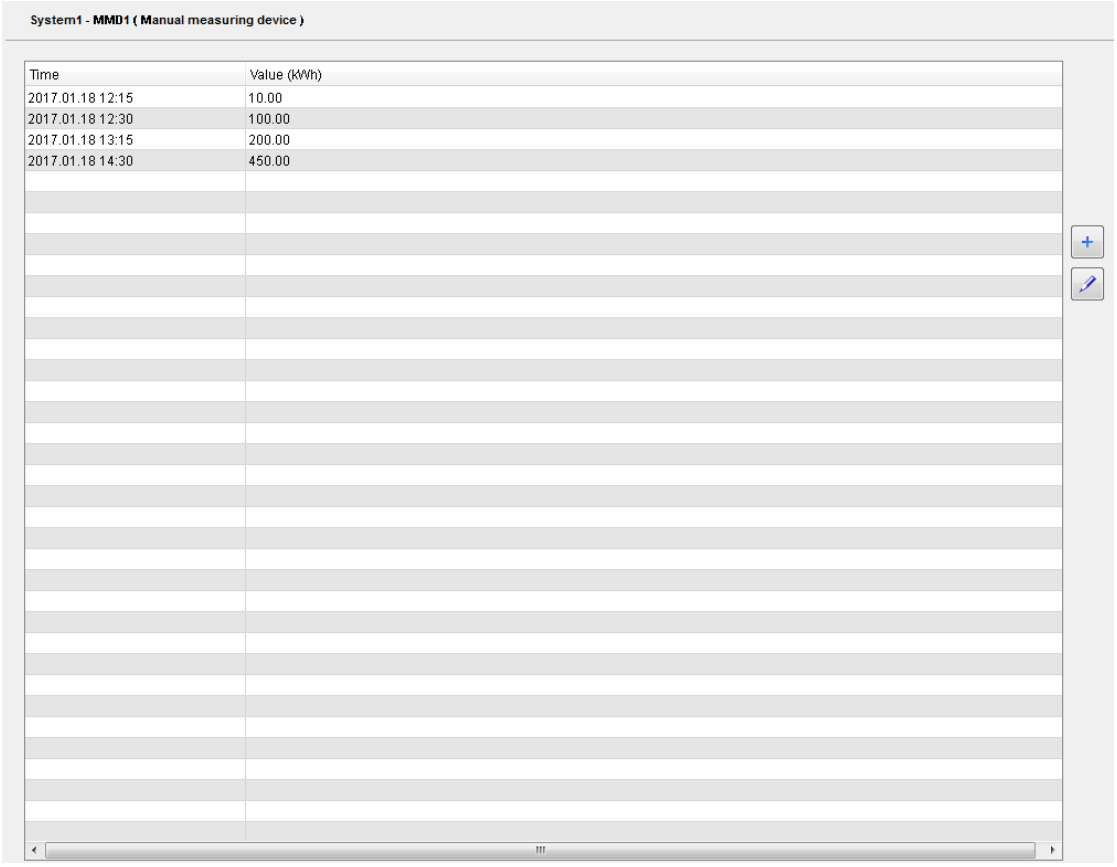
To enter a measured value for a device:

✧ Click on the project tree root, an area, or a sector to view the list of available manual measuring devices.



- or -

✧ Click the device to see the list of previous 50 measured values.

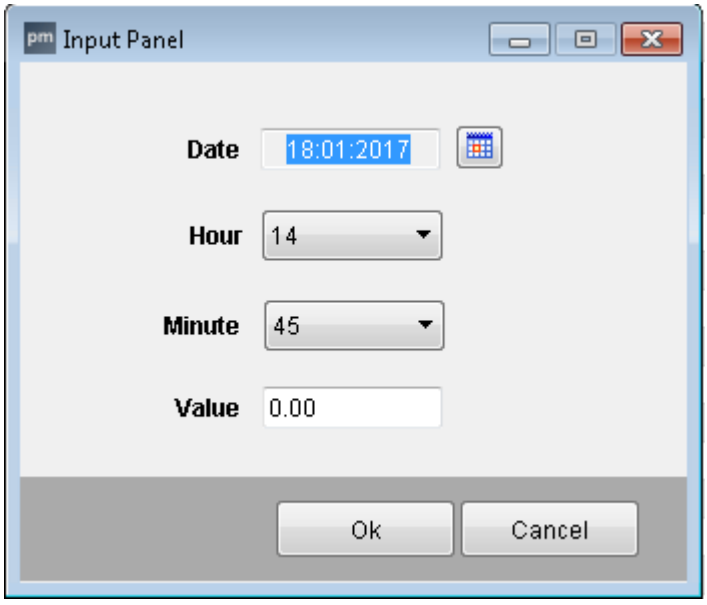


✧ At the sector, area, or project tree root level, double-click the device name in the table for which you want to add the measured value.

- or -

✧ Click + on the right-side of the table.

The **Input panel** window opens.



[sc_pm_inputpanel, 1, en_US]

✧ In the Input measured value window, enter the following details:
Date: The date on which the measured value was recorded.
Hour: The hour of the day when the measured value was recorded.
Minute: The quarter of the hour when the measured value was recorded.
Value: The measured value of the device.

NOTE

- The date and time entered in the **Input panel** dialog must be between the date and time of creation of the device and the current date and time.
- If the overflow limit set for the device is 0, then ensure that the measured value that you enter is higher than the measured value entered for the previous timestamps.

✧ Click **OK**. The measured value is added to the device.
The updated time and value are now visible under **<last time>** and **<last value>** columns respectively.

NOTE

After you add the measured value, the time and value entered is visible under **<new time>** and **<new value>** columns respectively.

✧ Click  on the right-side of the table, to edit the input **Value**.
The **Input panel** dialog opens.

6.4 Reaction Plans

6.4.1 Overview of Reaction Plans

Automated Switching of Digital Outputs

powermanager switches the digital outputs of the interfaced devices automatically. Automation requires configuration of so-called reaction plans.

Target, Function, and Source

A reaction plan consists of three parts:

- **Target**
  The target of a reaction plan is a digital output. On the device, configure the output as **Remote output** to enable switching.
- **Function**
  The function denotes the type of triggering.
  The switching operation can be triggered as follows:
  - Digital input of a device
  - Alert of a measured value
  - Switching bit of a load monitoring device
- **Source**
  Any datapoint element (DPE) that provides the selected function serves as the source.
  Together, the function and the source are the switching condition.

Assigning the Target and Condition

Prepare a separate reaction plan to switch a digital output automatically.
A maximum of one condition can be assigned to one target. However, you can assign a single condition to multiple targets.

Validity

The system checks the validity of the source and target when a reaction plan is configured.
The reaction plan is not checked during the runtime. Later changes in the system lead to incorrect parameterization. When you reopen the configuration view for reaction plans, messages pointing out such arising parameterization errors are displayed.

6.4.2 Opening and Closing Reaction Plans

Opening Reaction Plans

To open reaction plans:

✧ In the menu bar, click **View** > **Reaction plan**, to open the reaction plans.

✧ In the project tree, click an area, a sector, or a device to view all the digital outputs in that object.
Root: Displays digital outputs of all devices in the system.
Area: Displays digital outputs of all devices in the selected area.
Sector: Displays digital outputs of all devices in the selected sector.
Device: Displays digital outputs of the selected device.

✧ In the tool bar, click  to return to the Standard view.

6.4.3 Configuring Reaction Plans

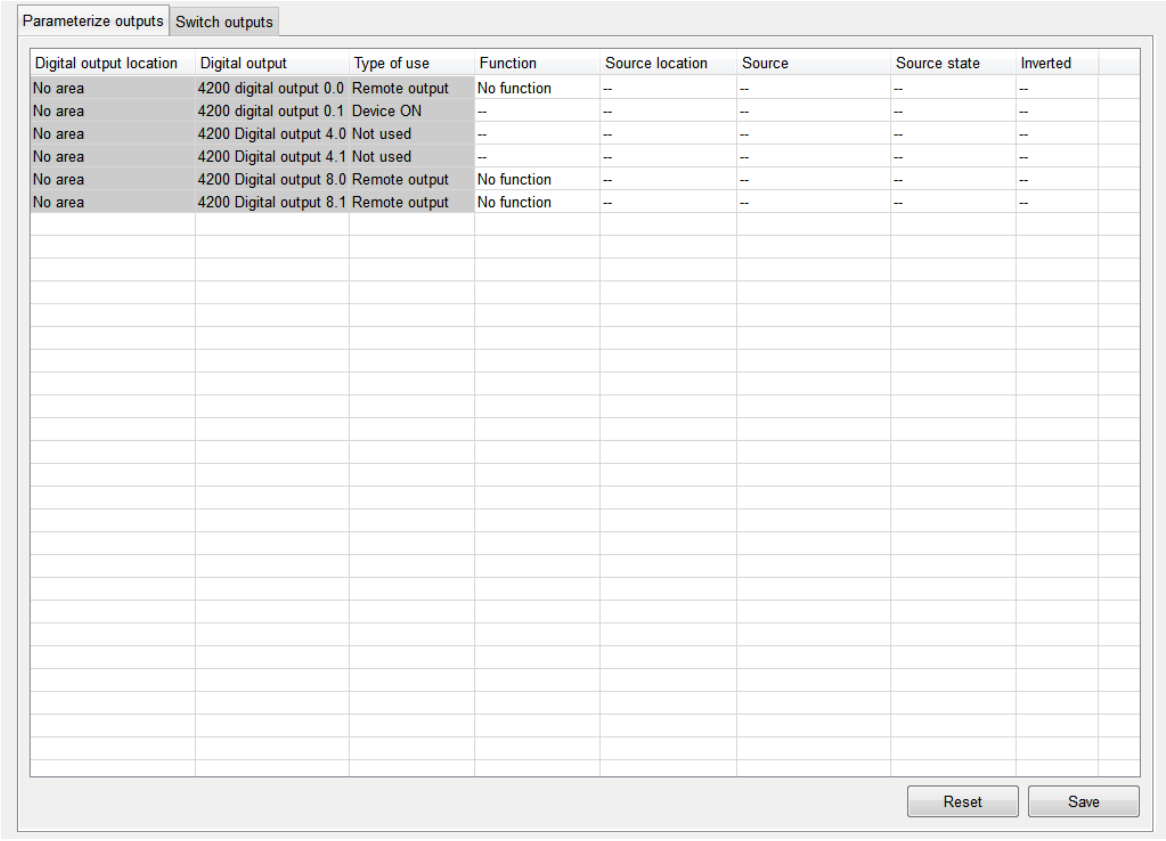
The reaction plans are listed in tables in 2 tabs:

Parameterize outputs tab

This tab shows:

- Assignment of the target, function, and source
- Switching status of the source

The status of the source can be inverted with a switching command.



[sc_ParameterizeOutputs_tab, 2, en_US]

Figure 6-7 Parameterize Outputs

Switching outputs tab

This tab shows the switching status of the target.

You can force the switching of the digital output using a switching command.

Scope

The reaction plans table lists the existing digital outputs. Additionally, incorrectly parameterized, deactivated, or reaction plans that can still be configured are visible.

The scope is limited to the level selected in the project tree. All digital outputs existing in the system are listed when the project tree root is selected.

A digital output only appears once in the list. Therefore, you can assign only one condition to one output.

Sorting

When you open the reaction plans table, all the columns are automatically sorted in ascending order based on the digital outputs, that is, the first two columns: output area.sector(s) and Output.

Sorting is possible for all columns.

Click the column header to sort the table in descending order. Click once again to sort the table in ascending order.

Active Reaction Plan

A reaction plan is created and active in the runtime system when a function and a source are assigned to a digital output.

The **Function** column provides the following functions:

- Digital input
- Alert
- Load monitoring

Select a source whenever you select a function. The system opens a corresponding selection window. A function can be reassigned at any time. The source for a selected function can be changed later.

An existing reaction plan is deactivated by selecting the **No function** function.

The columns for sources that are not assigned are blank.

Remote Output Prerequisite

The **Type of use** column shows the type of use of the digital output that has been set on the device, either directly or with configuration software.

Digital outputs can only be parameterized if they have been configured as a Remote output. The **Function** column only offers functions for selection if this prerequisite is met. Otherwise, the **Function** and **Source** columns are blank.

Nonexecutable Parameterization

A configured reaction plan becomes nonexecutable if the type of use of the digital output is modified later, either directly on the device or via the powerconfig configuration software. In this case, a different value is visible in the table instead of the Remote output type of use.

The system uses color coding to identify reaction plans that have become nonexecutable. The existing assignment of the target, function, and source is retained.

Color	Error class	Meaning
Red	1	The output is configured as **Rotation**. It cannot be switched.
Yellow	2	An alert is selected as the source, but the associated alert handling is not activated. The alert cannot arrive, and so the reaction plan is not executed.
Grey	3	The address of the source or of the target is deactivated. In this case, the system does not register the changes or the switching command is not forwarded to the device.

Executing the Reaction Plan

Switching commands are executed until the reaction plan is deleted. The "No function" function cancels assignment of the source.

The output remains in its last known state if communication with the source is interrupted. The output status changes accordingly as soon as communication with the source is established again and its status changes.

The digital output remains in its last known state if communication with the digital output is interrupted. The output status changes accordingly as soon as communication with the output is established again and the status of the source changes.

Logical Inversion

In the **Inverted** column, you can invert the switching state. Inverting the switching state also inverts the output status.

6.4.4 Tabs in Reaction Plans

6.4.4.1 Parameterize Outputs Tab

The columns of the **Parameterize outputs** tab are sorted according to Targets, Functions, and Sources.
The **Parameterize outputs** tab has the following columns:

- **Digital output location** and **Digital output**
  These columns display the digital output of the device that is attached in the designated area and sector of the project tree.
- **Type of use**
  This column displays the configured type of use of the digital output. Configuration of a reaction plan requires the **Remote output** type of use.
- **Function**
  This column is used to set the trigger for the switching operation of the digital output.
  You can set one of the following triggers:
  - Digital input of the device
  - Alert of a measured value
  - Switching bit of a load monitor
    Click the table cell to open a list box. You can select the trigger types from this list.
    Click on a list entry to open the corresponding dialog for selection of the source.
- **Source location** and **Source**
  These columns display the datapoint element attached in the designated area and sector of the project tree. This provides the selected function.
  Click a cell to open a selection window.
- **Source state**
  This column displays whether the source is switched on or off.
- **Inverted**
  You can invert the switching state using this column.
  If this column is set to YES, then logical inversion is switched on.
  If this column is set to NO, then logical inversion is switched off.

6.4.4.2 Switch Outputs Tab

The **Switch outputs** tab shows the switching status of the digital output. You can change the switching status using a switching command.
The **Switch outputs** tab has the following columns:

- **Digital Output location** and **Digital output**
  These columns display the digital output of the device that is attached in the designated area and sector of the project tree.
- **Switching group**
  This column displays the switch group.
- **Type of use**
  This column displays the configured type of use of the digital output. Configuration of a reaction plan requires the Remote output type of use.

- **State**
  This column displays the switching state of the digital output.
  If the switching state is OFF, then the digital output is low.
  If the switching state is ON, then the digital output is high.
- **Switch**
  This column displays the command for switching the digital output.
  Change the command to OFF to switch the signal of the digital output to low.
  Change the command to ON to switch the signal of the digital output to high.
  Based on the change in the switching status in this column, the values in the Status columns are updated.

6.4.5 Selecting a Source

Digital Input Function

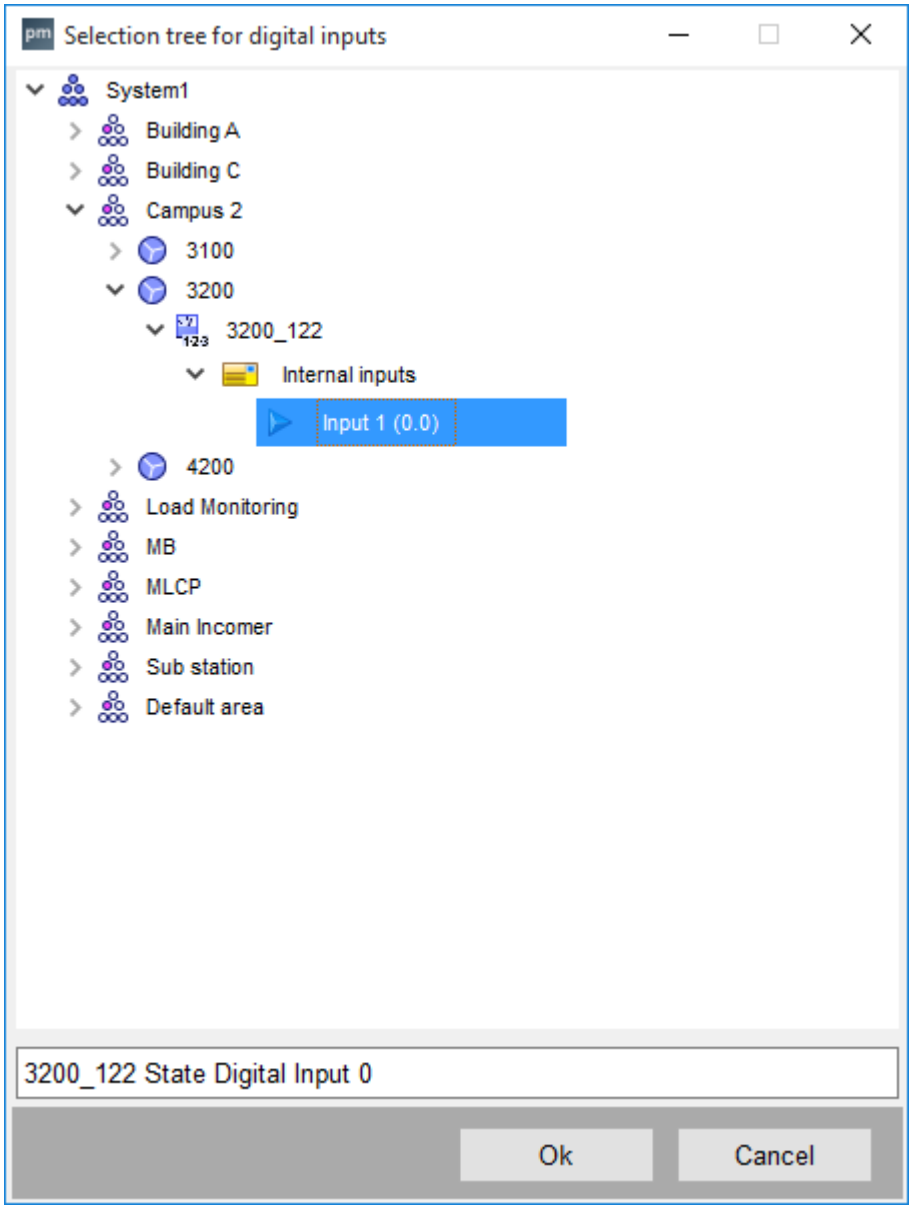
The Digital input function forwards the status of the digital input to the digital output:

- The digital output switches to the ON status if the digital input switches to the ON status.
- The digital output switches to the OFF status if the digital input switches to the OFF status.

Digital inputs of all devices in the source system are offered as a binary input, regardless of their parameterization:

- PAC2200: 1 digital input and 1 digital output
- PAC4200: At least two digital inputs. Up to 10 digital inputs if 2 DI/DO modules are fitted.
- PAC3200/PAC3200T: 1 digital input
- PAC3100: 2 digital inputs
- Generic Modbus device: 10 digital inputs

A filtered view of the project tree serves to select the source. Click **Digital input** value in the **Function** column to open the **Selection tree for digital inputs** dialog.



[sc_pm_dig_input, 1, en_US]

Figure 6-8 Selection Tree for Digital Inputs

Click **OK** button to transfer the selected source to the table of reaction plans and closes the dialog. Click **Cancel** to cancel selection.

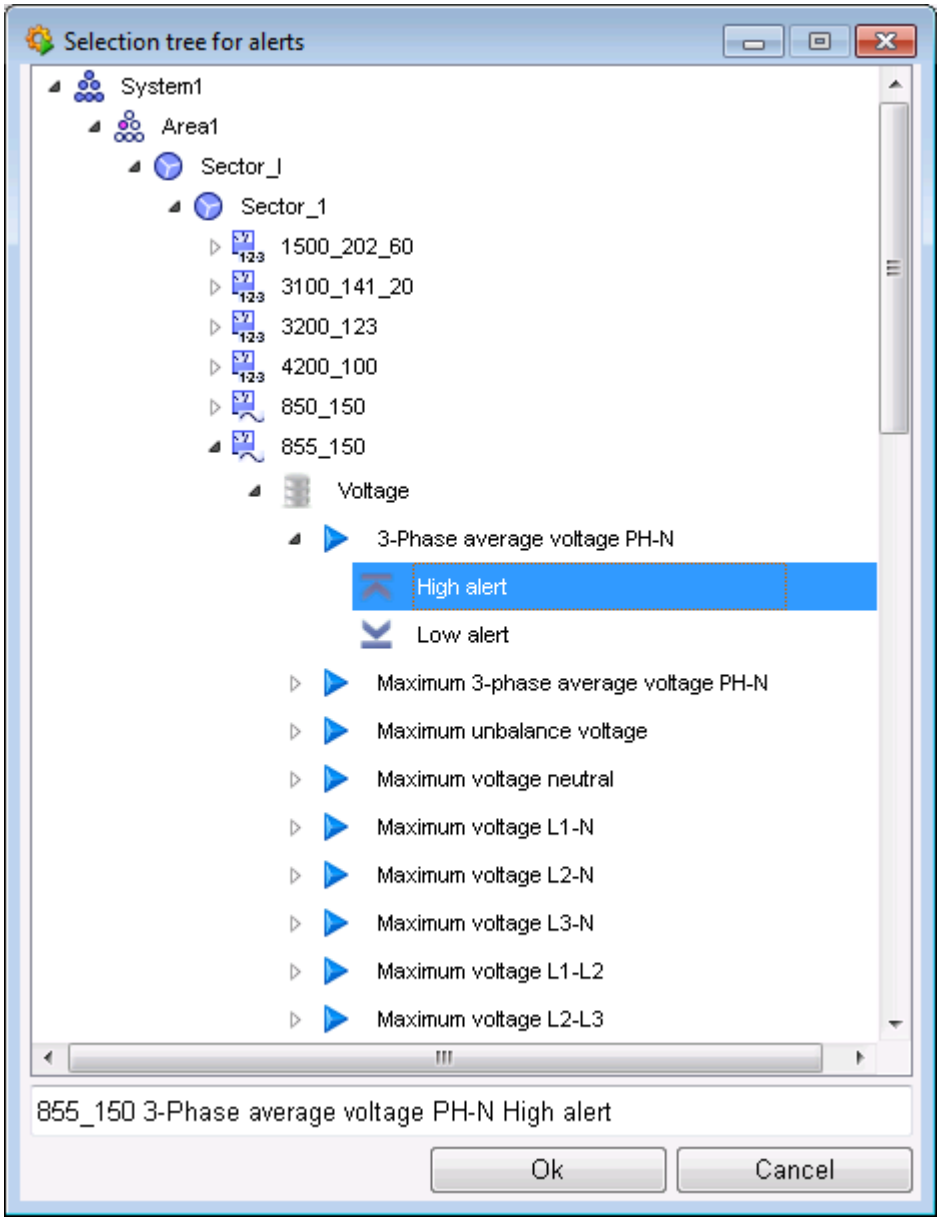
Selection Tree for Alert

Depending on the alert triggered by a specific event, the Alert function switches the digital output.

You can select the high and low limits of the analog values that have an alert configuration, regardless of whether the alert itself is activated.

Alerts that are not activated are shown in gray in the list of reaction plans. They do not trigger a reaction plan.

Use a filtered view of the project tree to select the source. Click the **Alert value** in the **Function** column to open the **Selection tree for alerts** window.



[sc_SelectionTree_Alerts, 2, en_US]

Figure 6-9 Selection Tree for Alerts Window

Click **OK** to transfer the selected source to the reactions plan table and close the window.

Selection Tree for Load Monitoring

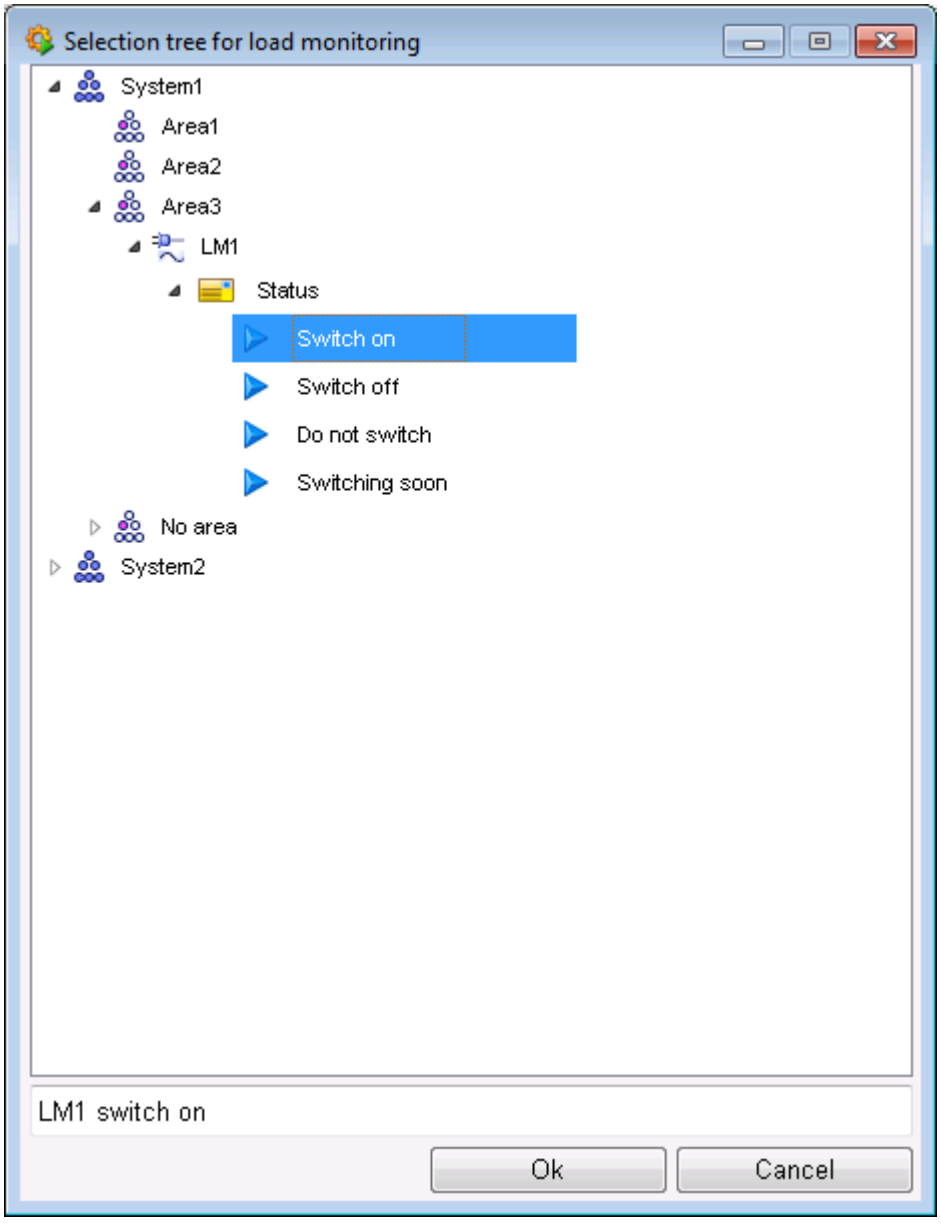
The Load monitoring function switches the digital output depending on the switching recommendation of the assigned load monitor.

The following switching bits represent the switching recommendation:

- **switchNo**
  The SwitchNo bit is set when the correction power is within the configured limit curve.
- **switchOff**
  The switchOff bit is set when load has to be deactivated to avoid exceeding the setpoint in the tariff interval and the correction power lies outside the limit curve.

- **switchOn**
  The switchOn bit is set when load is connected without exceeding the setpoint in the tariff interval and the correction power lies within the limit curve.

Use a filtered view of the project tree to select the load monitoring function and switching bits. Click the Load monitoring value in the **Function** column to open the **Selection tree for load monitoring** window.



[sc_SelectionTree_LM, 2, en_US]

Figure 6-10 Selection Tree for Load Monitoring Window

6.4.6 Saving the Configuration

Click **Save**, to save the configurations made in database.
If the configuration contains errors, a dialog appears with a warning.

6.4.7 Restoring the Configuration

Click **Reset**, to restore the last save configuration in the tables.

6.4.8 Deleting Devices

Before deleting a device from the system, check whether any of its elements is used as a source or target in a reaction plan.

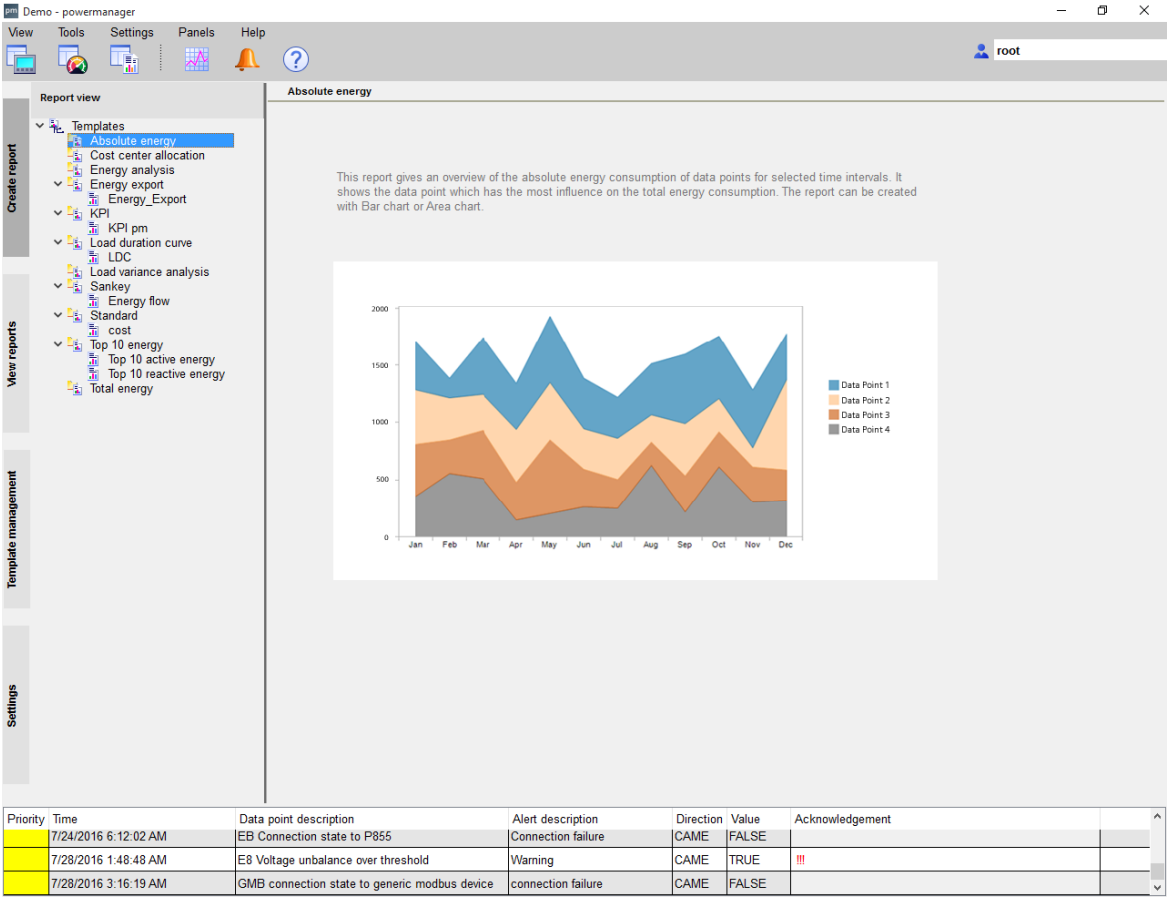
If an element is being used, then the system displays a message with instructions to resolve the issue.

You cannot delete the device until the corresponding reaction plans have been deleted.

6.5 Data Evaluation - Basic Report

6.5.1 Basic Report

6.5.1.1 Report View



[sc_pm_reportview, 1, en_US]

The Report view is used to create, view, and configure reports and report templates. It consists of 4 tabs, Create report, View report, Template management, and Schedule.

The reports created can be saved to an external server via a web client.

NOTE

Report license is not required for working with Report view.

6.5.1.2 Tabs in Report View

Create report

The Create report tab displays all the available report templates in the form of a template tree. Each report template can be configured to create a different report. Reports can be scheduled to be created in regular intervals of time.

View reports

The View reports tab displays the type, file name, and the last modified time of all the created reports.

Template management

The Template management tab displays the following types of report templates, which can be created:
Types of Reports, which can be created:

- Absolute energy
- Cost center allocation
- Energy analysis
- Energy export
- KPI
- Load duration curve
- Load variance analysis
- Sankey
- Standard
- Top 10 energy
- Total energy

Settings

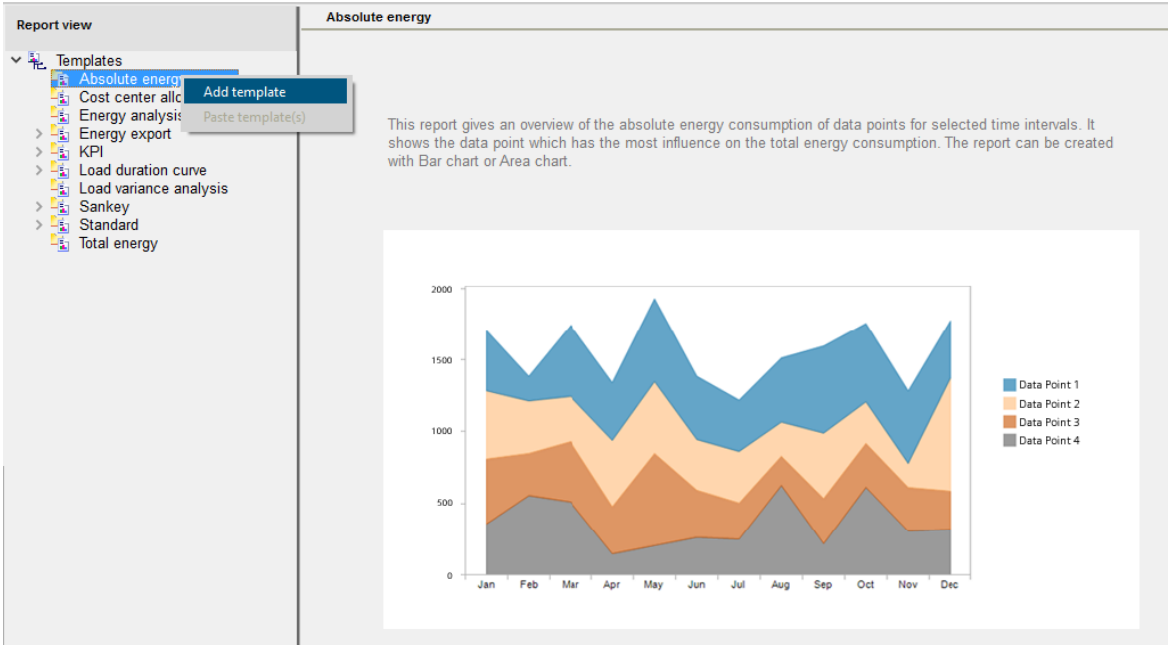
The Settings tab is used to configure the medium configuration, cost center configuration, and display the schedule of the reports to be generated.

6.5.2 Creating Report Templates and Reports

6.5.2.1 Creating a Report Template

✧ In the **Report** view, select the **Template management** tab.

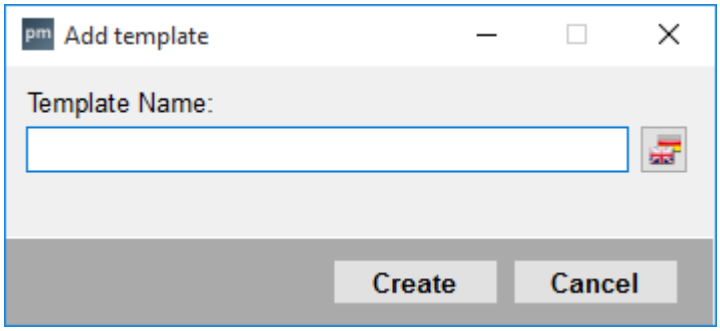
✧ Right-click a node from the template tree.



[sc_pm_add_template, 1, en_US]

✧ Select **Add template**.

The **Add template** dialog is displayed.



[sc_pm_createtemplate, 1, en_US]

✧ Enter a **Template name**.

✧ Click **Create**.
The newly created template is added under the corresponding node and its configuration is displayed.

NOTE

Report scheduling is not possible in a client project.

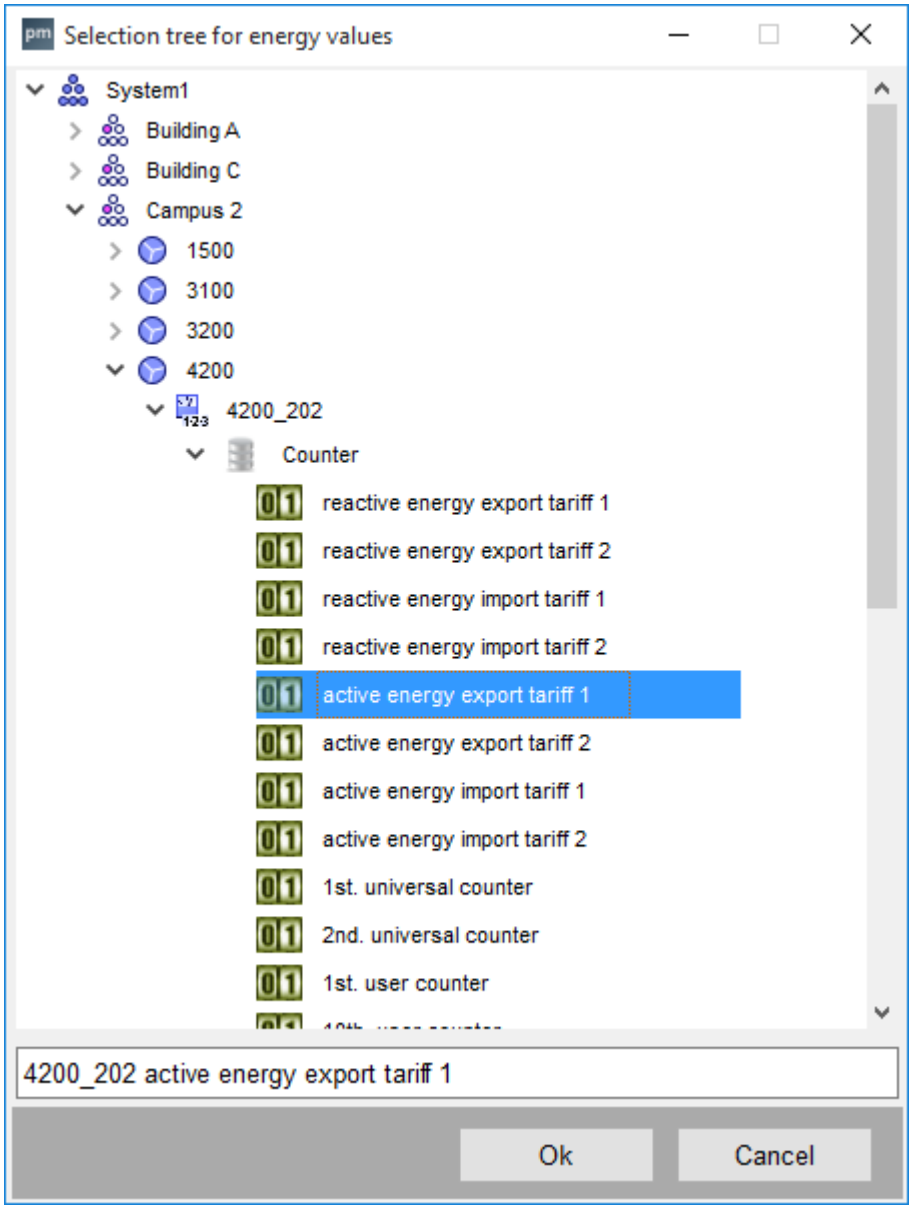
6.5.2.2 Absolute Energy

This report gives an overview of the absolute energy consumption of the data points for the selected time intervals. It shows the data point which has the most influence on the total energy consumption. The report can be created with a bar chart or an area chart.

Creating an Absolute Energy Report Template

✧ Click  to add a data point.

The **Selection tree for energy values** dialog is displayed.

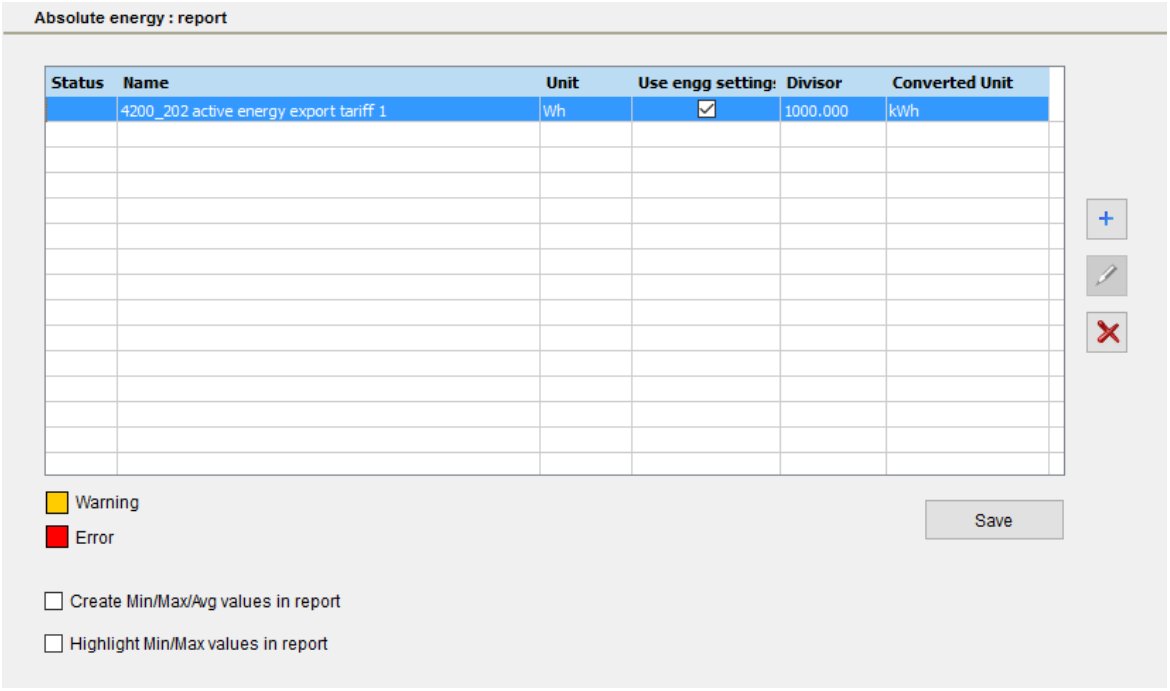


[sc_pm_selectiontree, 1, en_US]

✧ Select a data point from the tree.

✧ Click **OK**.

The data point is added to the list.



[sc_pm_absoluteenergy, 1, en_US]

You can add, delete, or edit data points using the respective buttons.

You can deselect the **Use engg settings** option in the **Use engg settings** column. This enables you to change the **Divisor** and **Converted Unit** values for each data point in the corresponding column.

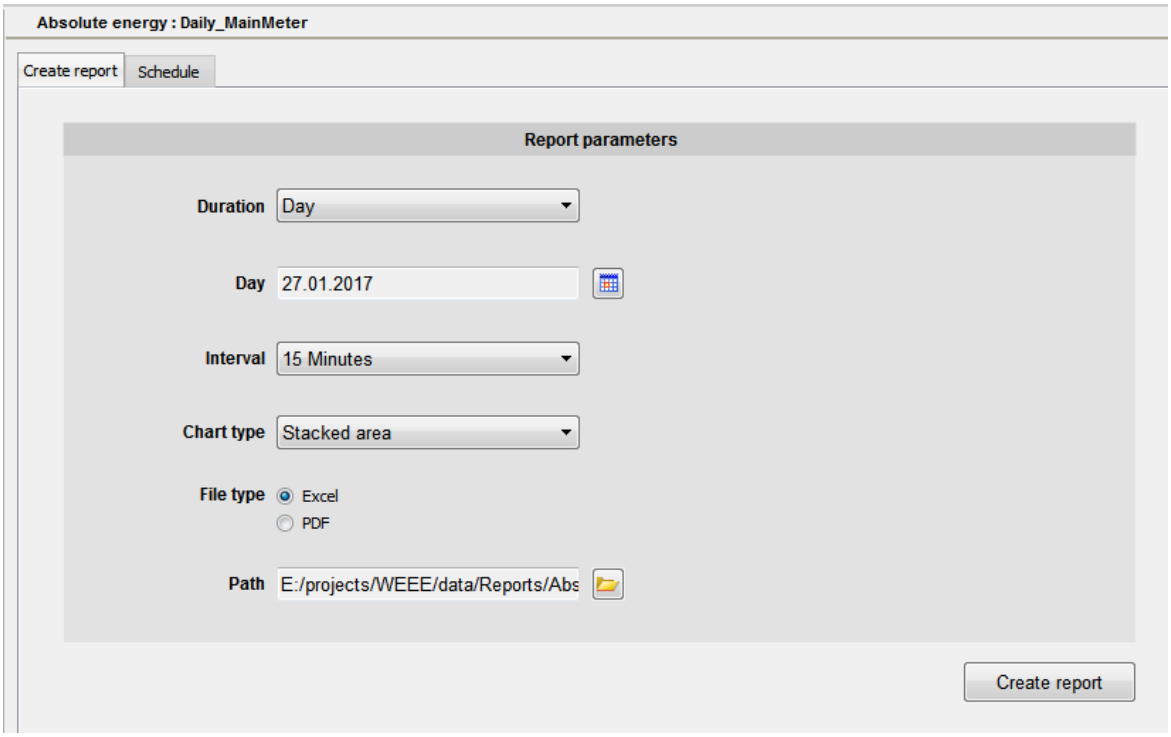
- ✧ To delete a data point from the list, select a data point.
- ✧ Click  to delete the data point from the list.

  You can select **Create Min/Max/Avg** values option to view the minimum, maximum, and average values in the report. These values will be displayed in the form of a graph.

  You can also select **Highlight Min/Max** value option to highlight the minimum and maximum values in the report.
- ✧ Click **Save**, to save the template.

Creating an Absolute Energy Report

- ✧ In the **Report** view, select the **Create report** tab.



[sc_pm_absolute_energy_Create_rep, 1, en_US]

- ✧ Select the required absolute energy template from the template tree.
  The **Create report** tab is displayed in the **Absolute energy** section.
- ✧ Select a value for **Duration**.
  The report values will be displayed based on the duration selected.
- ✧ Click  select a period.
- ✧ Select an interval accordingly.
  The report values will be generated at the selected interval.
  For example, if you select the interval as 15 mins then report values are generated for every 15 mins.
- ✧ Select a **Chart type**.
  The report values can be represented in the form of a stacked area, stacked bar, or bar chart.
- ✧ Select the **File type**, either **Excel** or **Pdf**.
- ✧ Select a **Path** by clicking  .
  The **Choose a File** dialog is displayed.

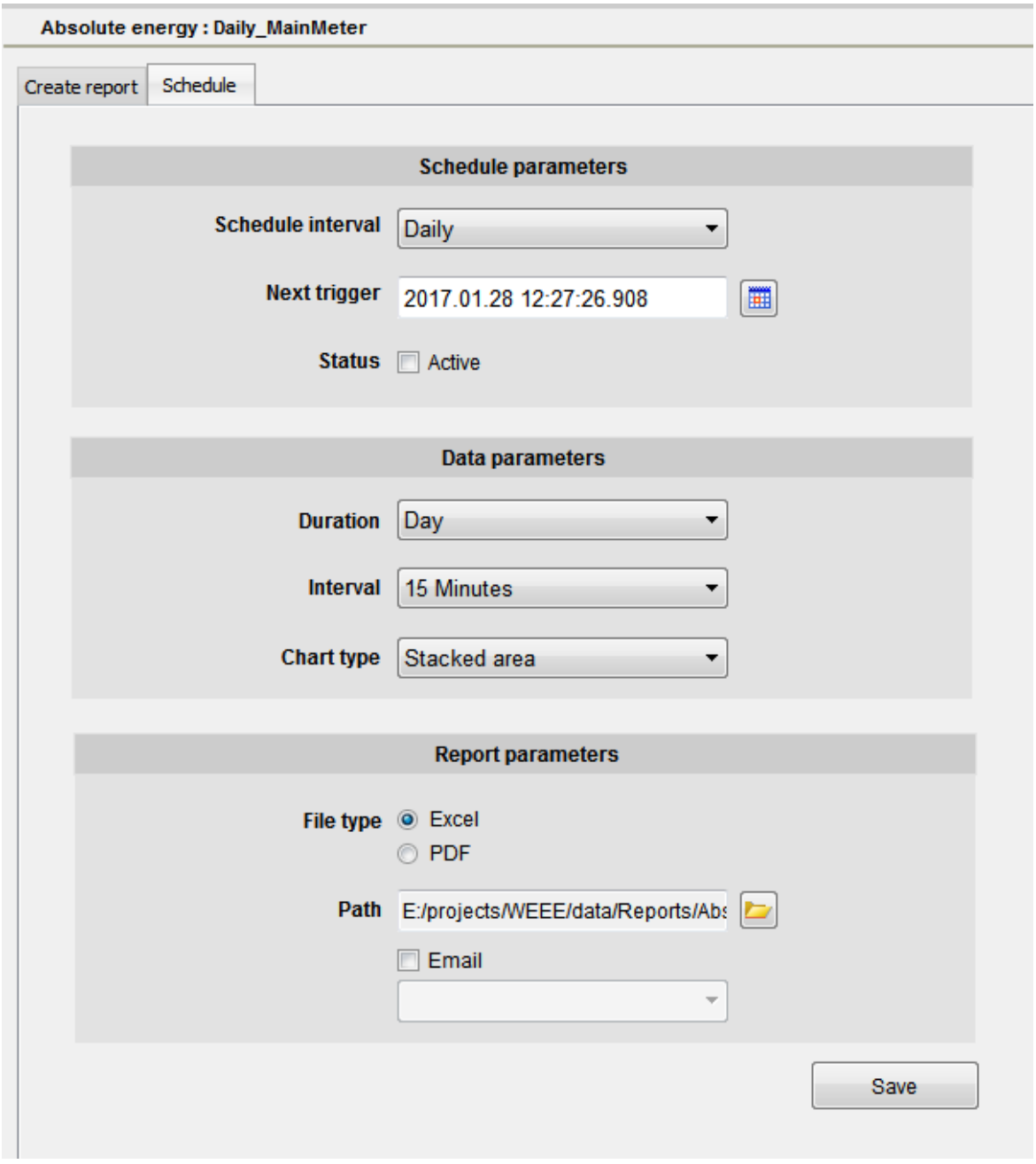
NOTE

If the default path is changed, the created report will not be listed in the **View reports** tab list.

- ✧ Enter a **File name**.
- ✧ Click **Save**, to save the file name.
- ✧ Click **Create report**, to create the report in the selected path.

To schedule the creation of the report at regular intervals:

- ✧ Select the **Schedule** tab.



[sc_pm_absolute_energy_Sche, 1, en_US]

- ✧ In the **Schedule parameters** section, select a **Schedule interval**.
- ✧ Click and select the **Next trigger**.
  The next report will be generated on the displayed time.
- ✧ Select the **Status** as **Active**, if you want the report to be generated.
- ✧ In the **Data parameters** section, select the value for **Duration**.
- ✧ Select an **Interval** accordingly.
- ✧ Select a **Chart type**.

The data parameters report is generated according to the schedule parameters configuration.

- ✧ In the **Report parameters** section, select a **File type**, either **Excel** or **PDF**.

✧ Select a path by clicking  .

The **Choose a Folder** dialog is displayed.

✧ Click **Select Folder**.

The selected folder path will be displayed.

✧ You can select the **Email** option to Email the report.

Click **Save** to schedule the creation of the report.

For more information on how to configure an Email ID, refer to *8.3 Configuring E-Mail Server Settings*.

6.5.2.3 Cost Center Allocation

The cost center report calculates the total energy consumption and costs for different mediums associated with each cost center. The report can be used for internal cost allocation by any company.

Creating an Cost Center Allocation Report Template

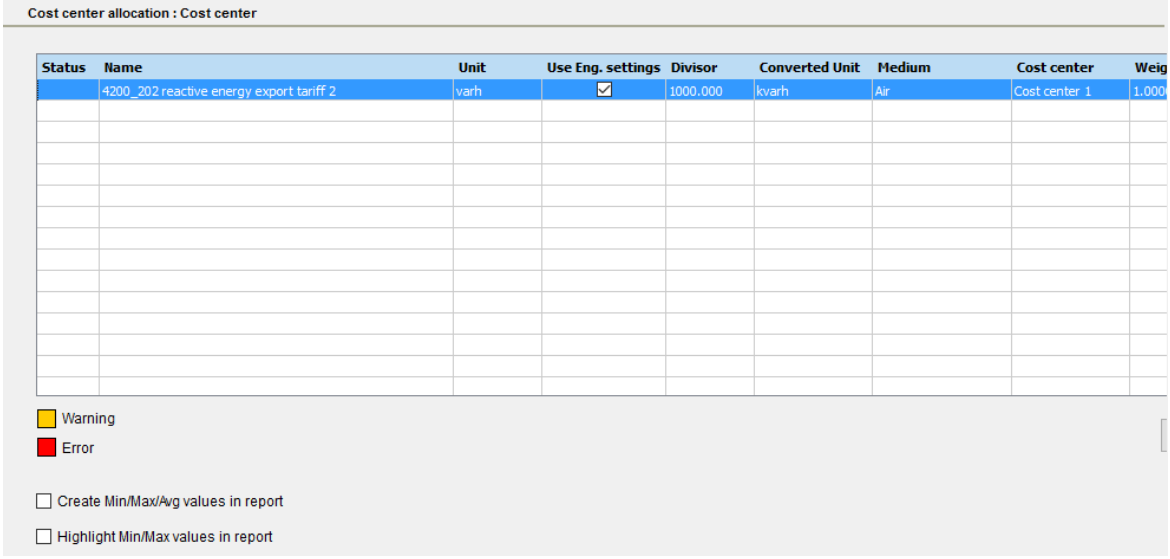
✧ Click  to add a data point.

The **Selection tree for energy values** dialog is displayed.

✧ Select a data point in the tree.

✧ Click **OK**.

The data point is added to the list.



[sc_pm_costcenter, 1, en_US]

You can add, delete, or edit data points using the respective buttons.

You can deselect the **Use engg settings** option in the **Use engg settings** column. This enables you to change the **Divisor** and **Converted Unit** values for each data point in the corresponding column. You can change the **Medium**, **Cost center**, and **Weighting factor** column values. The weighting factor is the proportional assignment of the counted consumption values for the selected cost center, expressed as a decimal factor.

For more information on medium, refer to *6.5.3 Settings Tab*.

✧ To delete a data point from the list, select a data point.

✧ Click  to delete the data point from the list.

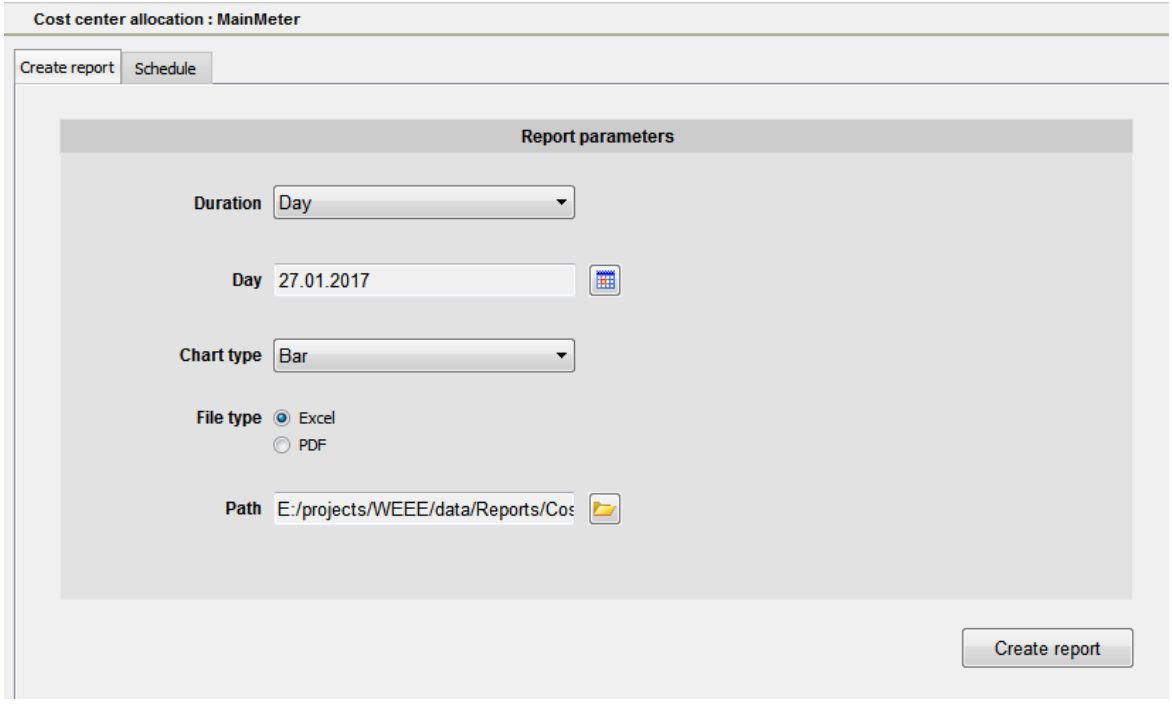
You can select **Create Min/Max/Avg** values option to view the minimum, maximum, and average values in the report. These values will be displayed in the form of a graph.

You can also select **Highlight Min/Max** value option to highlight the minimum and maximum values in the report.

✧ Click **Save**, to save the template.

Creating an Cost Center Allocation Report

✧ In the **Report** view, select the **Create report** tab.



[sc_pm_cost_center_create_rep, 1, en_US]

✧ Select the required cost center allocation template from the template tree.
The **Create report** tab is displayed in the **Cost Center Allocation** section.

✧ Select the value for **Duration**.
The report values will be displayed based on the duration selected.

✧ Click  to select a period.

✧ Select an interval accordingly.
The report values will be generated at the selected interval.
For example, if you select the interval as 15 mins then report values are generated for every 15 mins.

✧ Select a **Chart type**.
The report values can be represented in the form of a bar or pie chart.

✧ Select the **File type**, either **Excel** or **Pdf**.

✧ Select a **Path** by clicking  .
The **Choose a File** dialog is displayed.

NOTE

If the default path is changed, the created report will not be listed in the **View reports** tab list.

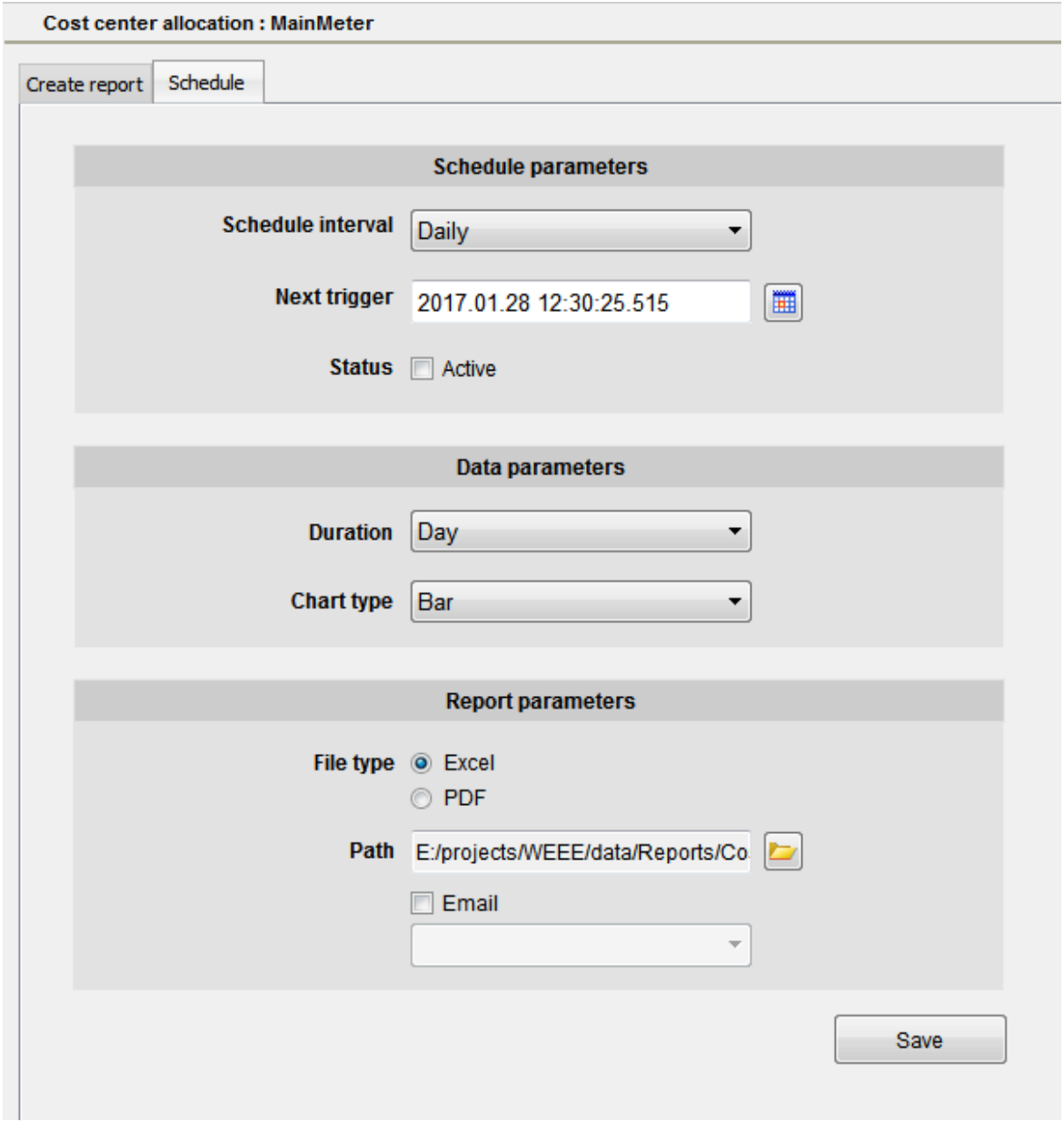
✧ Enter a **File name**.

✧ Click **Save**, to save the file name.

✧ Click **Create report** to create the report in the selected path.

To schedule the creation of the report at regular intervals:

✧ Select the **Schedule** tab.



[sc_pm_cost_center_Sche, 1, en_US]

✧ In the **Schedule parameters** section, select a **Schedule interval**.

✧ Click  and select the **Next trigger**.

The next report will be generated on the displayed time.

✧ Select the **Status** as **Active**, if you want the report to be generated.

In the **Data parameters** section,

✧ Select the value for **Duration**.

✧ Select a **Chart type**.

The data parameters report is generated according to the schedule parameters configuration.

✧ In the **Report parameters** section, select a **File type**, either **Excel** or **PDF**.

✧ Select a **Path** by clicking  .

The **Choose a Folder** dialog is displayed.

✧ Click **Select Folder**.

The selected folder path will be displayed.

✧ You can select the **Email** option to Email the report

Click **Save** to schedule the creation of the report.

For more information on how to configure an Email ID, refer to *8.3 Configuring E-Mail Server Settings*.

6.5.2.4 Energy Analysis

This report analyses the energy consumption and the corresponding power demand value for a time period of a year. It gives an overview of the power demand curves for the year and each month. Also the report shows the energy consumption value of each month and the corresponding power demand peak value. Two years can also be compared.

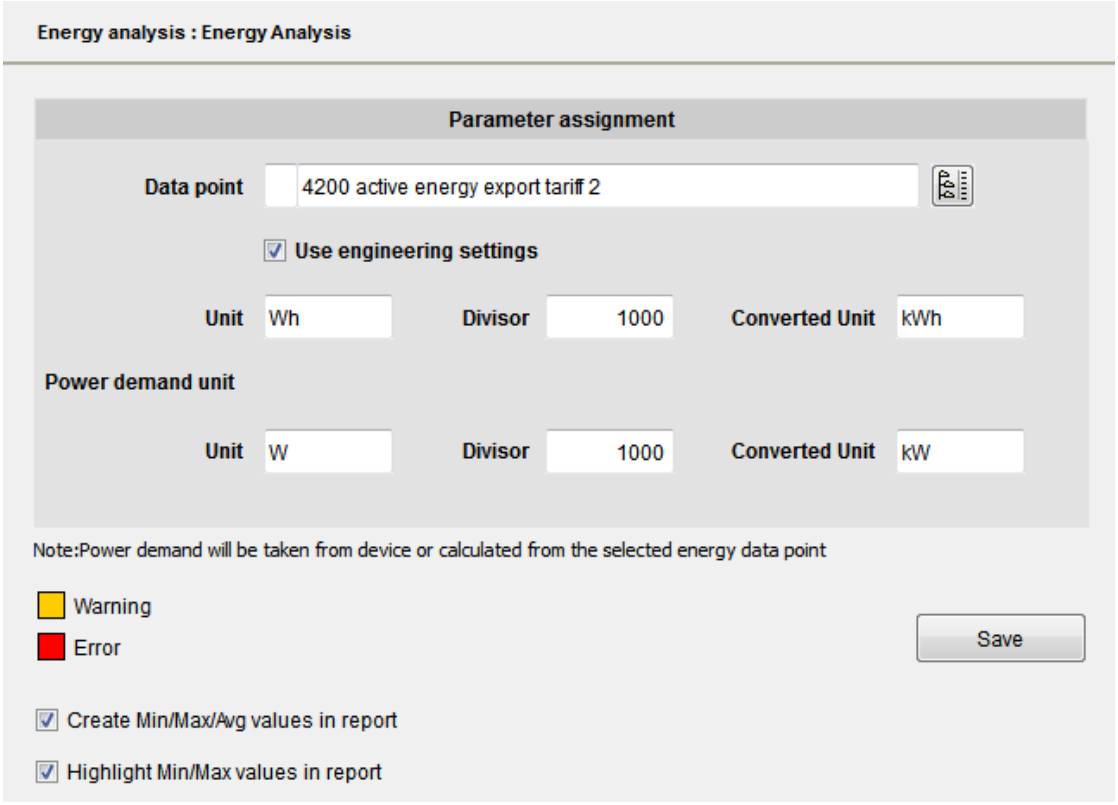
Creating an Energy Analysis Report Template

✧ Click  to add a data point.

The **Selection tree for energy values** dialog is displayed.

✧ Select a data point from the tree.

✧ Click **OK**.
The data point is added to the list.



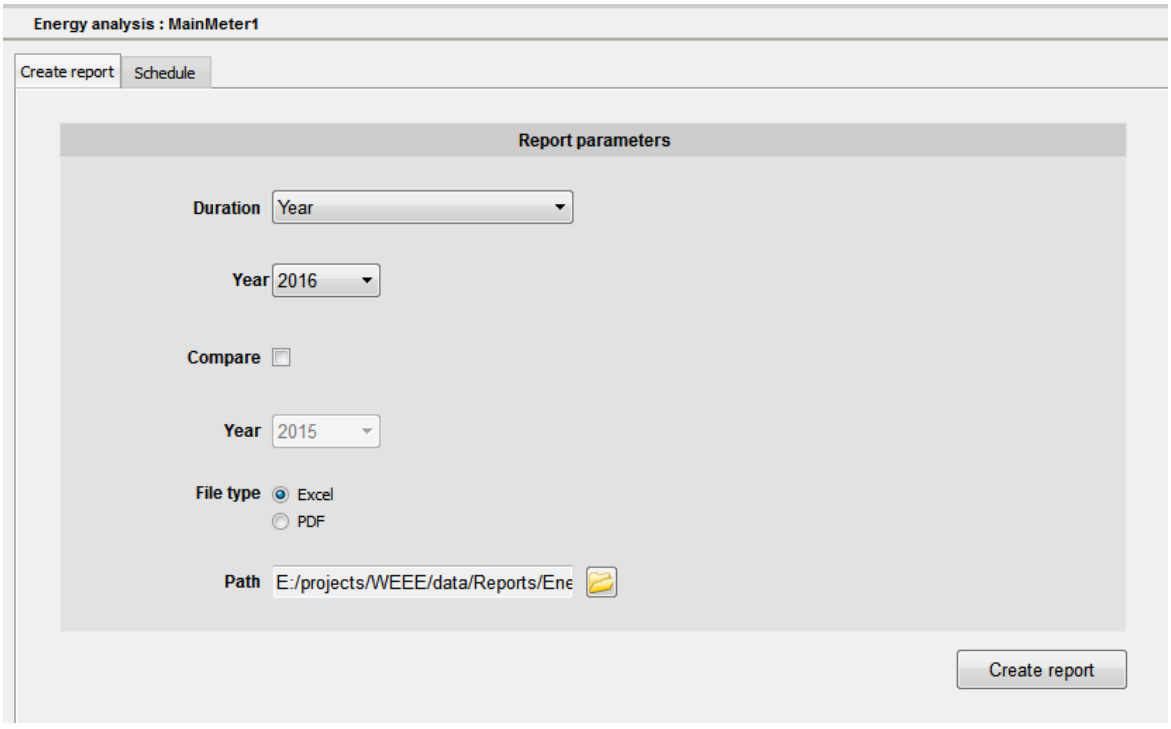
You can deselect the **Use engineer settings** option. This enables you to change the **Divisor** and **Converted Unit** values for each data point in the corresponding column.
To delete a data point from the list:

✧ Select a data point from the list.
You can select **Create Min/Max/Avg** values option to view the minimum, maximum, and average values in the report. These values will be displayed in the form of a graph.
You can also select **Highlight Min/Max** value option to highlight the minimum and maximum values in the report.

✧ Click **Save** to save the template.

Creating an Energy Analysis Report

✧ In the **Report** view, select the **Create report** tab.



[sc_pm_Energy_Analysis_Create_Rep, 1, en_US]

- ✧ Select the required Energy Analysis template from the template tree.
  The **Create report** tab is displayed in the **Energy Analysis** section.
- ✧ Select the value for **Duration**.
  The report values will be based on the duration selected.
- ✧ Click  select a period.
- ✧ Select **Compare**.
- ✧ Click  select a period.
  The data point values between two selected periods will be compared and a report will be generated.
- ✧ Select the **File type**, either **Excel** or **Pdf**.
- ✧ Select a **Path** by clicking  .
  The **Choose a File** dialog is displayed.

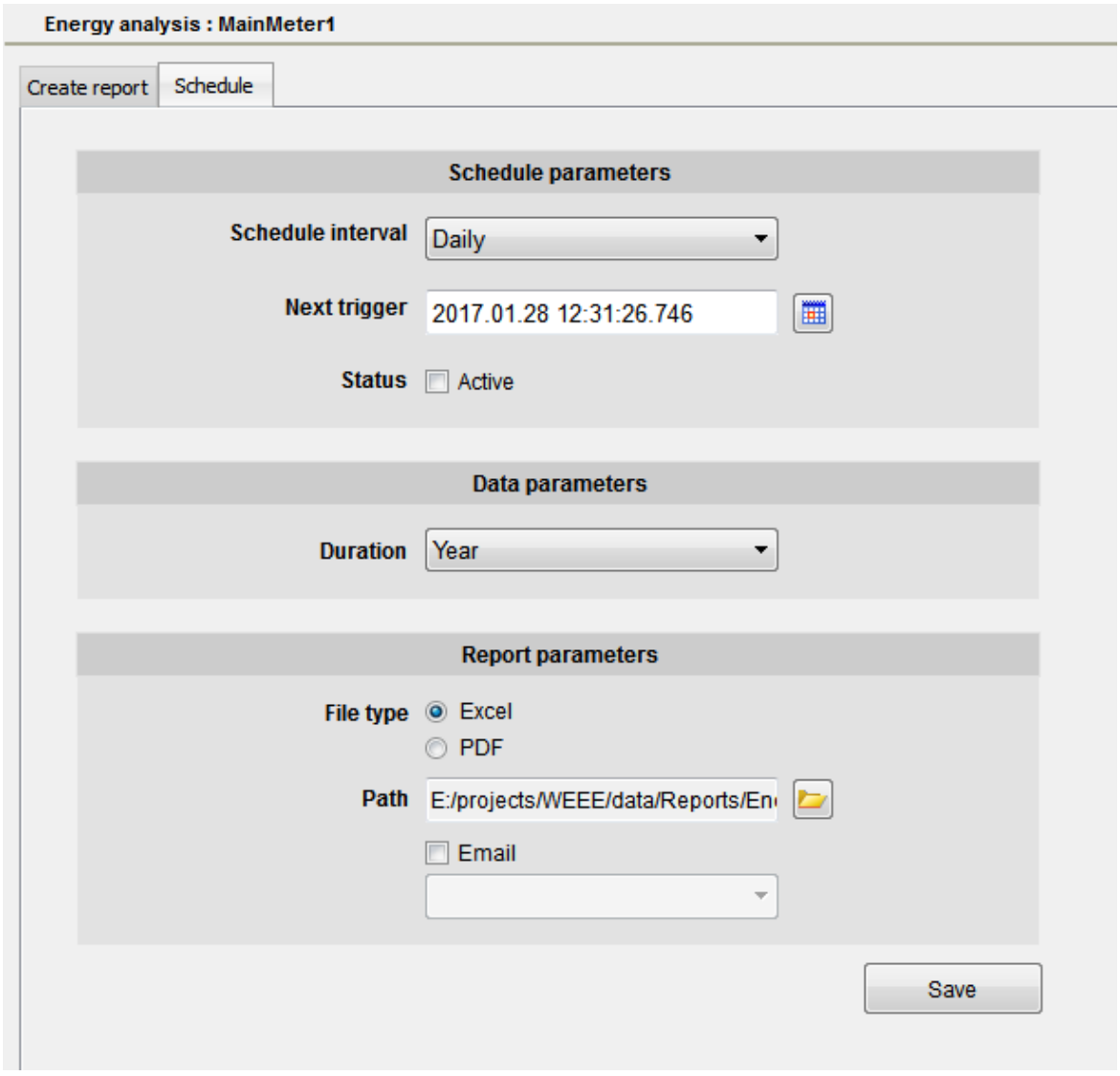
NOTE

If the default path is changed, the created report will not be listed in the **View reports** tab list.

- ✧ Enter a **File name**.
- ✧ Click **Save**, to save the file name.
- ✧ Click **Create report**, to create the report in the selected path.

To schedule the creation of the report at regular intervals:

- ✧ Select the **Schedule** tab.



[sc_pm_Energy_Analysis_Sche, 1, en_US]

- ✧ In the **Schedule parameters** section, select a **Schedule interval**.
- ✧ Click and select the **Next trigger**.
  The next report will be generated on the displayed time.
- ✧ Select the **Status** as **Active**, if you want the report to be generated.
- ✧ In the **Data parameters** section, select the value for **Duration**.
- ✧ Select an interval accordingly.
- ✧ Select a **Chart type**.
  The data parameters report is generated according to the schedule parameters configuration.

In the **Report parameters** section,

- ✧ Select a **File type**, either **Excel** or **PDF**.
- ✧ Select a **Path** by clicking .
  The **Choose a Folder** dialog is displayed.

✧ Click **Select Folder**.
The selected folder path will be displayed.

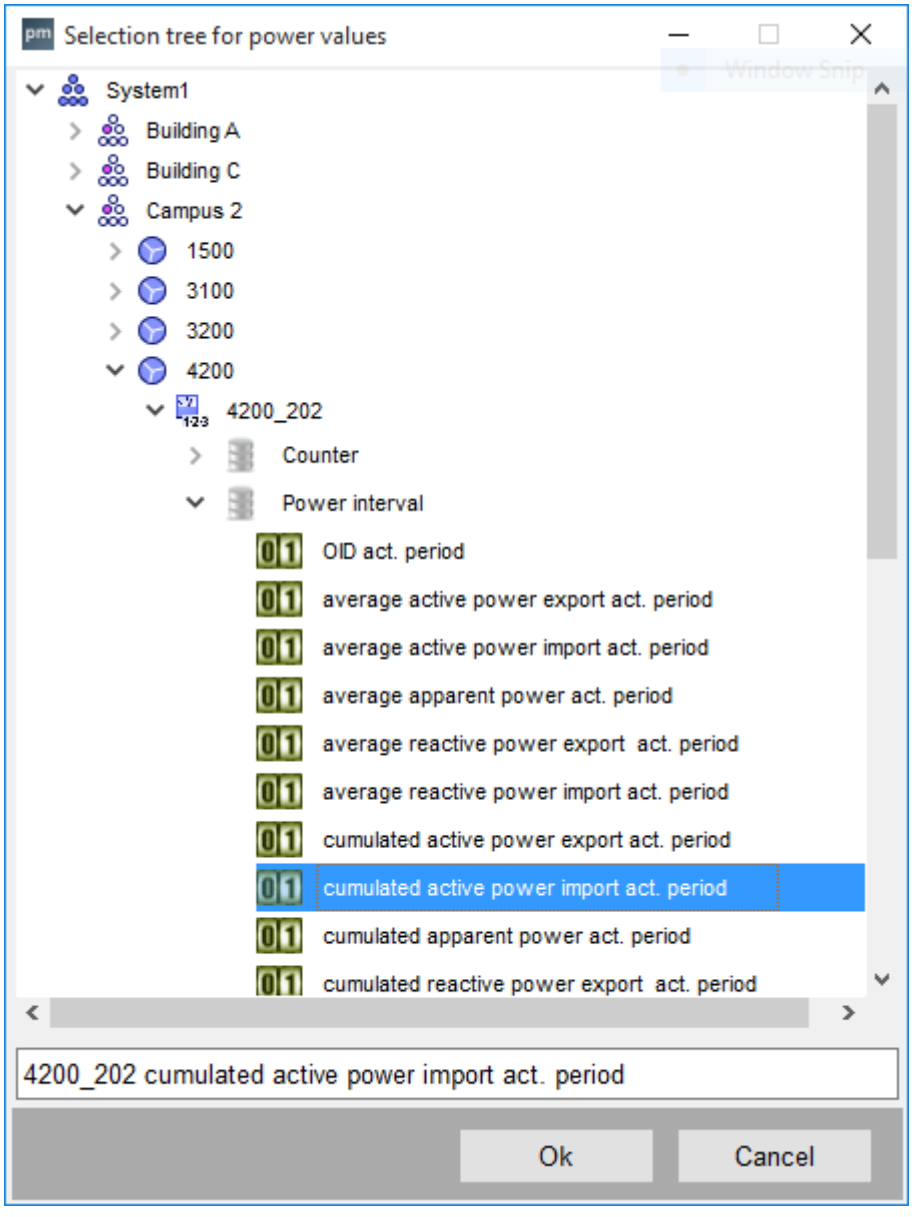
✧ You can select the **Email** option to Email the report.
Click **Save** to schedule the creation of the report.
For more information on how to configure an Email ID, refer to *8.3 Configuring E-Mail Server Settings*.

6.5.2.5 Energy Export

The Energy export report is available for exporting energy and power demand values with an interval of 15 min. This report displays all the values of the selected data points for a selected time range in the table.

Creating an Energy Export Template

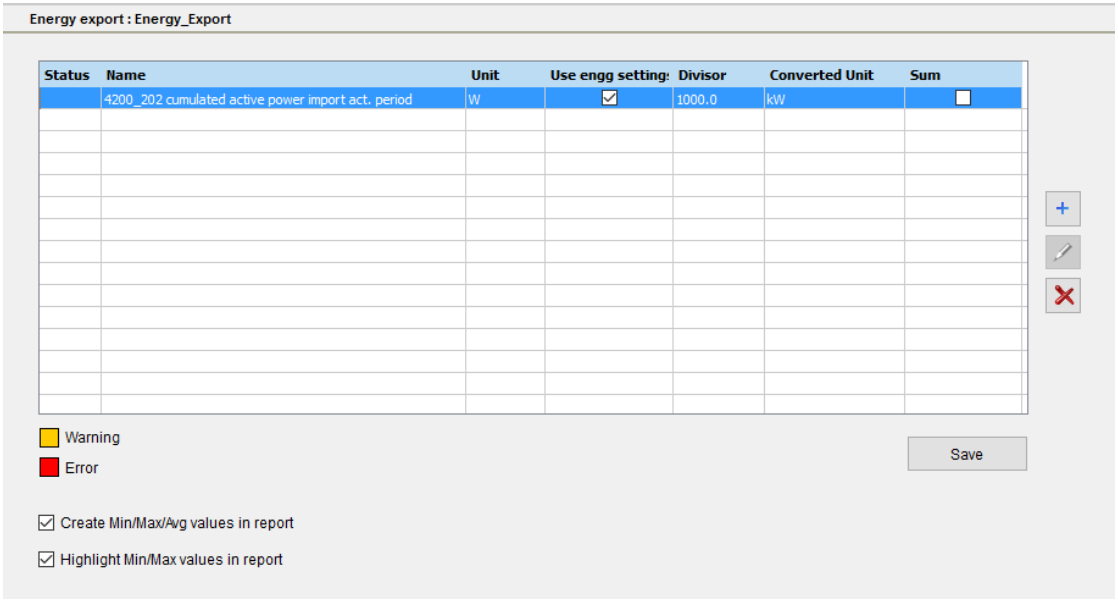
✧ Click  to add a data point.
The **Selection tree for energy values** dialog is displayed.



[sc_pm_selectiontree_ee, 1, en_US]

✧ Select a data point from the tree.

✧ Click **OK**.
The data point is added to the list.



You can add, delete, or edit data points using the respective buttons.
You can deselect the **Use engg settings** option in the **Use engg settings** column. This enables you to change the **Divisor** and **Converted Unit** values for each data point in the corresponding column.
To delete a data point from the list, proceed as follows:

✧ Select a data point in the list.

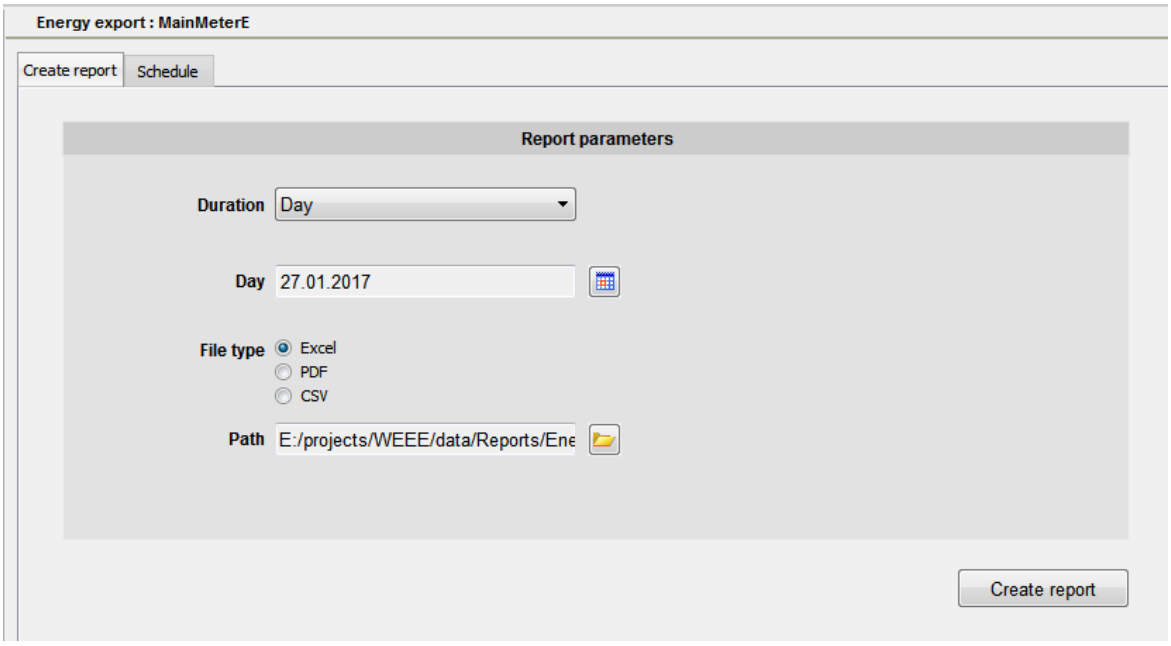
✧ Click  to delete the data point from the list.

You can select the **Create Min/Max/Avg values in a report** option to view the minimum, maximum, and average values in the report. These values will be displayed in the form of a graph.
You can also select the **Highlight Min/Max values in a report** option to highlight the minimum and maximum values in the report.

✧ Click **Save** to save the template.

Creating an Absolute Energy Report

✧ In the **Report** view, select the required energy export template from the template tree.
The **Create report** tab is displayed in the **Energy export** section.



[sc_pm_ee_createreport, 1, en_US]

✧ Select a value for the **Duration**.
The report values will be displayed based on the duration selected.

✧ Click  to select a period.

NOTE

By default, the interval is set as 15 min. It indicates that the report values are generated for every 15 min.

✧ Select the **File type**, either **Excel**, **PDF**, or **CSV**.

✧ Select a **Path** by clicking  .
The **Choose a File** dialog is displayed.

NOTE

If you change the default path, the created report will not be listed in the **View reports** tab list.

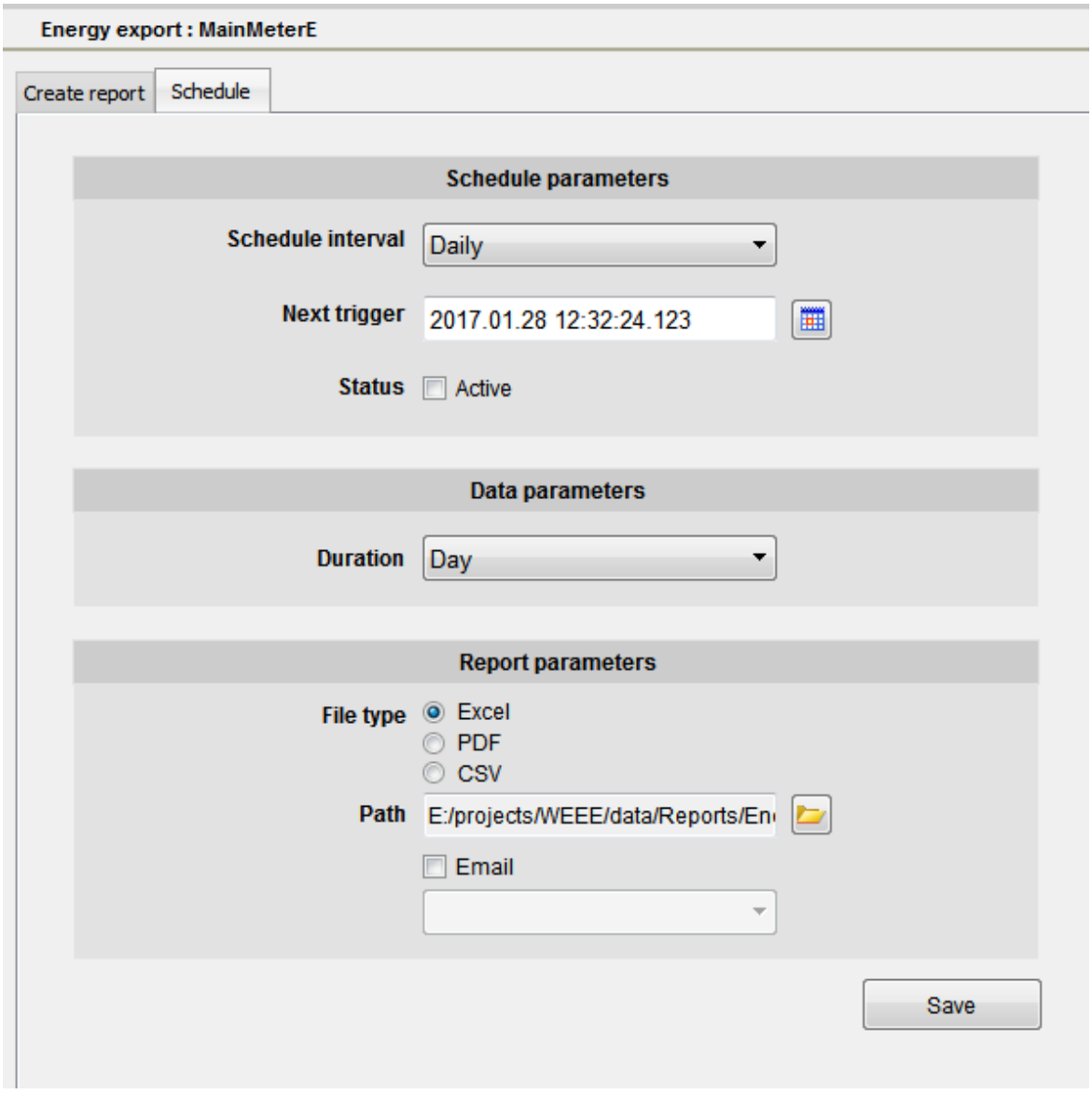
✧ Enter a **File name**.

✧ Click **Save** to save the file name.

✧ Click **Create report** to create the report in the selected path.

To schedule the creation of the report at regular intervals, proceed as follows:

✧ Select the **Schedule** tab.



[sc_pm_ee_schedule, 1, en_US]

- ✧ In the **Schedule parameters** section, select a **Schedule interval**.
- ✧ Click and select the **Next trigger**.
  The next report will be generated on the selected time.
- ✧ Select the **Status** as **Active**, if you want the report to be generated.
- ✧ In the **Data parameters** section, select the value for **Duration**.

The data parameters report is generated according to the schedule parameters configuration.

- ✧ In the **Report parameters** section, select a **File type**, either **Excel**, **PDF**, or **CSV**.
- ✧ Select a **Path** by clicking .
  The **Choose a Folder** dialog is displayed.
- ✧ Click **Select Folder**.
  The selected folder path will be displayed.

✧ You can select the **Email** option to e-mail the report.
Click **Save** to schedule the creation of the report.
For more information on how to configure an e-mail ID, refer to *8.3 Configuring E-Mail Server Settings*.

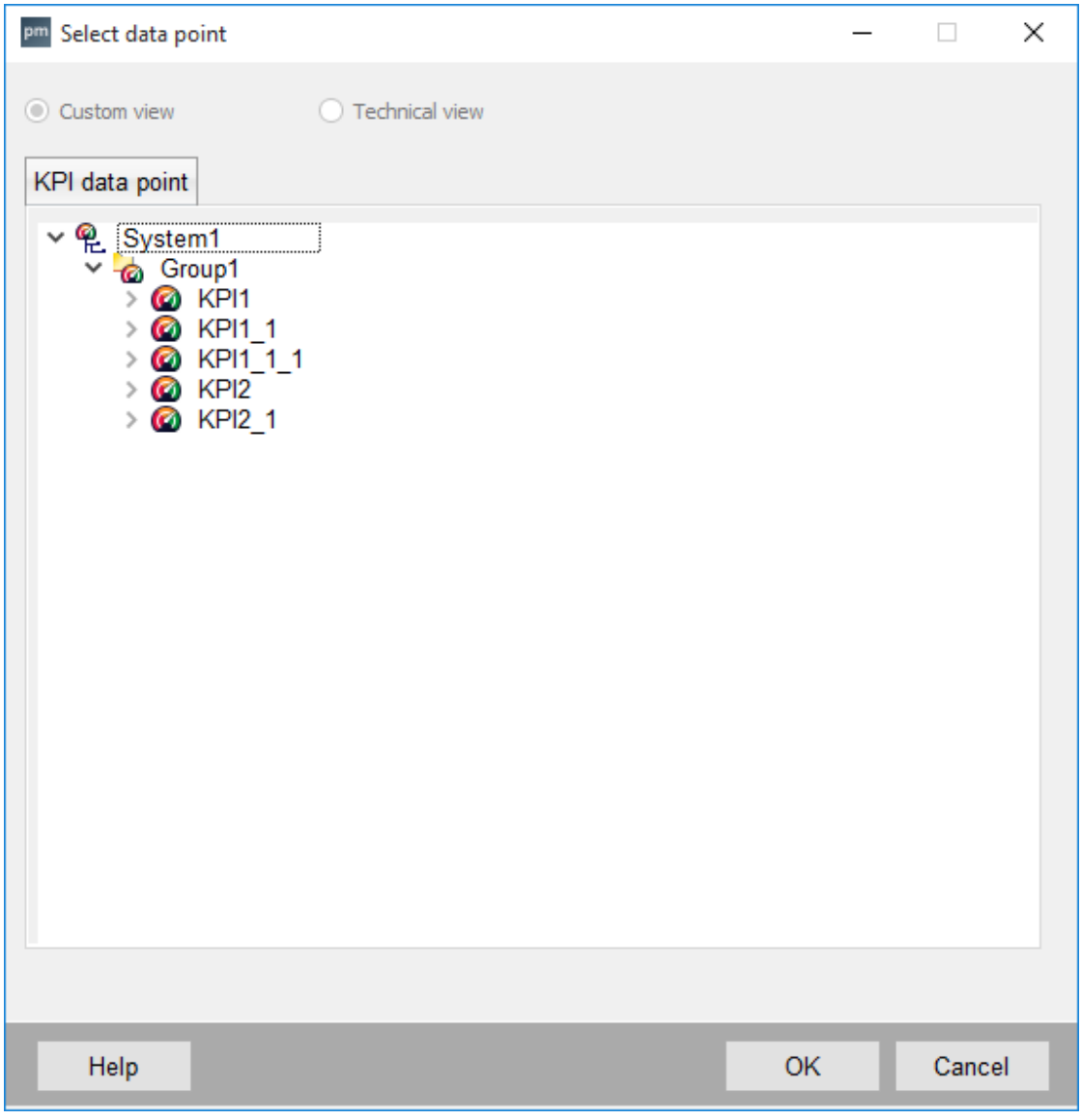
6.5.2.6 Key Performance Indicator (KPI)

This report displays the values of the KPI data points for a selected time range in a table and a bar chart.

Creating a KPI Template

✧ Click  to add a data point.

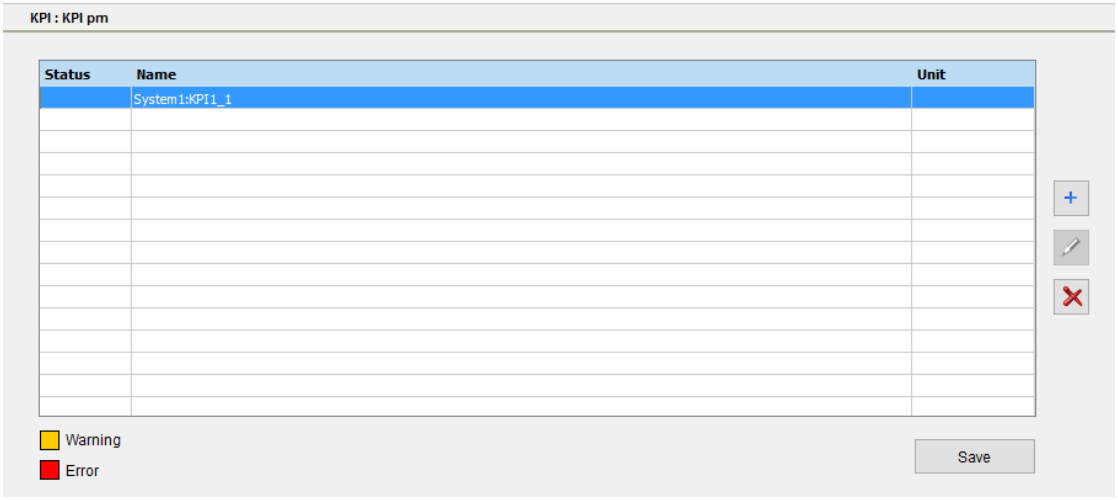
The **Select data point** dialog is displayed.
You can select the required KPI data points via the **KPI data point** tab.



To select the data points via the **KPI data point** tab:

✧ Select the required data point from the selection tree.

✧ Click **OK**, to add the data point to the data-points list.



You can add, delete, or edit data points by using the respective buttons.
To delete a data point from the list, proceed as follows:

✧ Select a data point from the list.

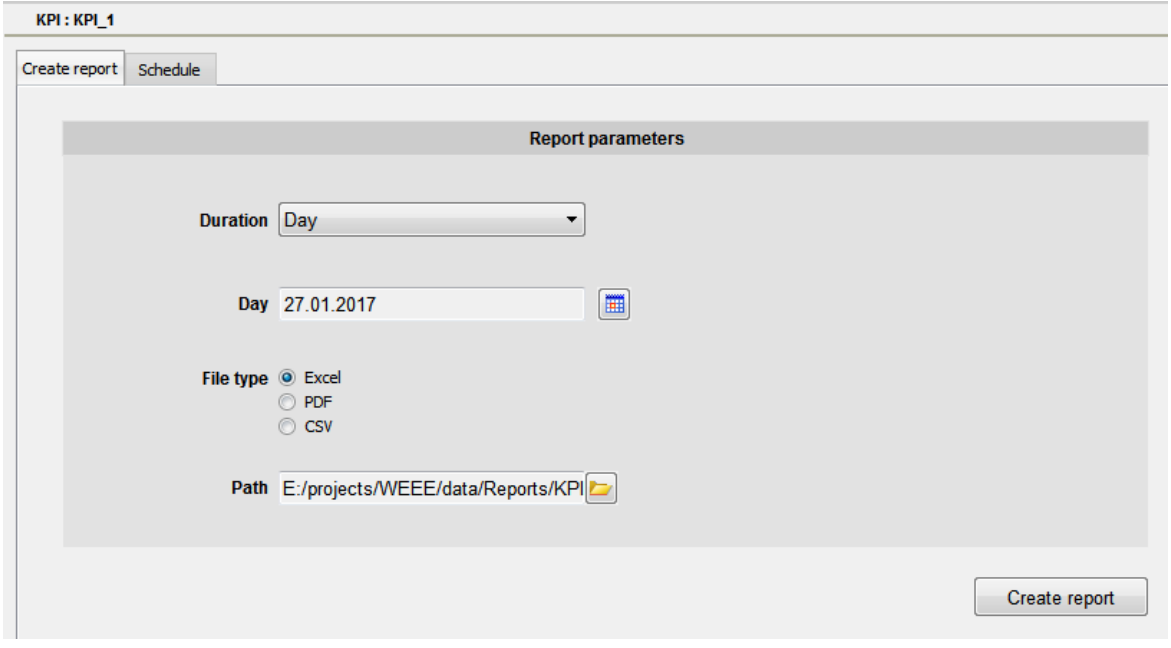
✧ Click  to delete the data point from the list.

✧ Click **Save** to save the template.

Creating a KPI Report

✧ In the **Report** view, select the required KPI template from the template tree.

The **Create report** tab is displayed in the **KPI** section.



[sc_pm_createreport, 1, en_US]

✧ Select the value for **Duration**.
The report values will be based on the duration selected.

- ✧ Click  to select a period.
- ✧ Select the **File type**, either **Excel**, **PDF**, or **CSV**.
- ✧ Select a **Path** by clicking  .
  The **Choose a File** dialog is displayed.

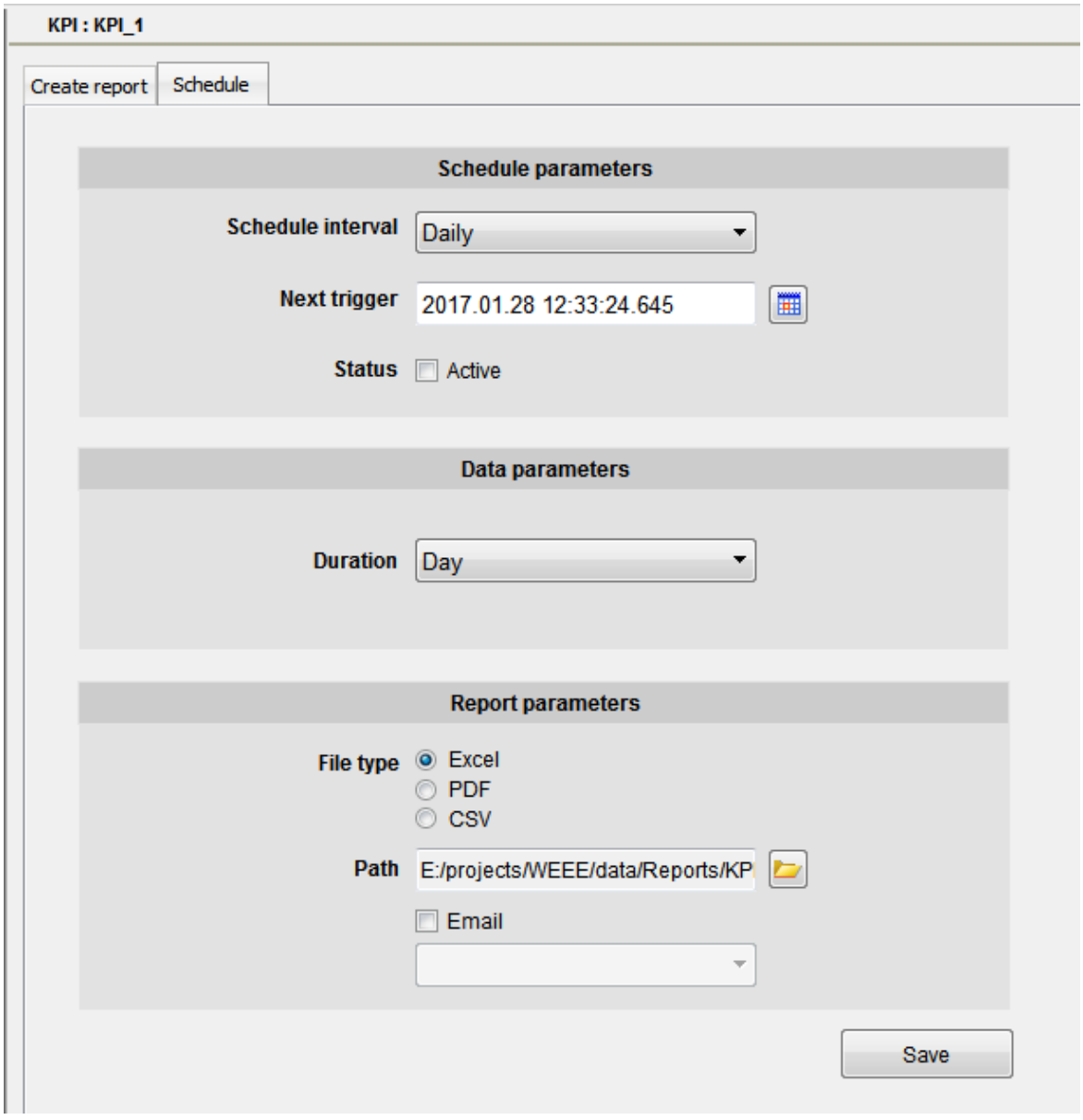
NOTE

If you change the default path, the created report will not be listed in the **View reports** tab list.

- ✧ Enter a **File name**.
- ✧ Click **Save** to save the file name.
- ✧ Click **Create report** to create the report in the selected path.

To schedule the creation of the report at regular intervals, proceed as follows:

- ✧ Select the **Schedule** tab.



[sc_pm_kpischedule, 1, en_US]

✧ In the **Schedule parameters** section, select a **Schedule interval**.

✧ Click and select the **Next trigger**.
The next report will be generated for the displayed time.

✧ if you want the report to be generated, select the **Status** as **Active**.

In the **Data parameters** section, select the value for **Duration**.

✧ In the **Report parameters** section, select a **File type**, either **Excel**, **PDF**, or **CSV**.

✧ Select a **Path** by clicking .
The **Choose a Folder** dialog is displayed.

✧ Click **Select Folder**.
The selected folder path will be displayed.

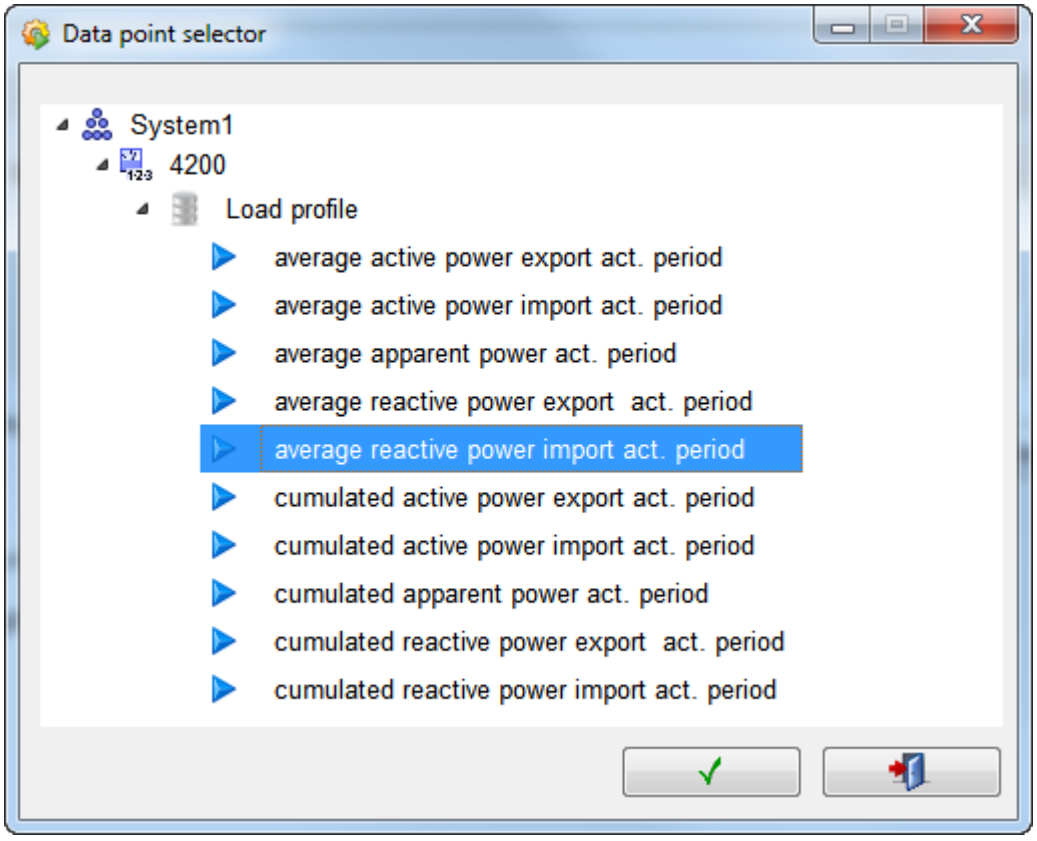
✧ You can select the **Email** option to mail the report.

✧ Click **Save** to schedule the creation of the report.
For more information on how to configure an Email ID, refer to *8.3 Configuring E-Mail Server Settings*.

6.5.2.7 Load Duration Curve

This report displays the power demand values and the duration of each power demand value used in the selected time period. It displays a detailed view of the 50 highest power demand values of the selected time interval and also and analysis of these values over the day.

Creating an Load Duration Curve Report Template



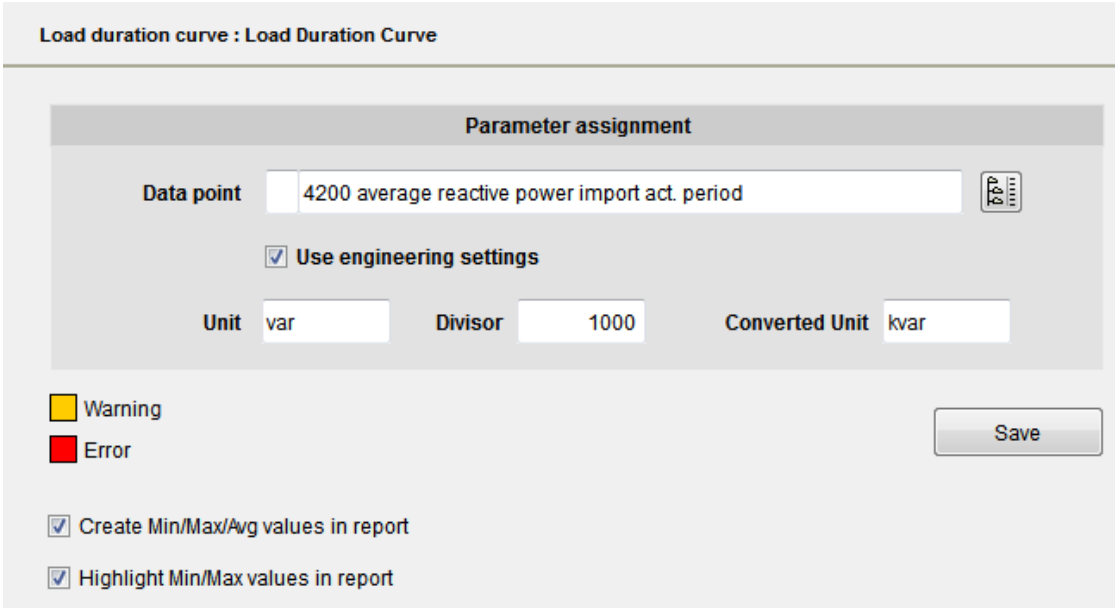
[sc_Load_Duration_Curve_Data_pt_Selection, 1, en_US]

✧ Click  to add a power period data point.
The **Data point selector for energy values** dialog is displayed.

✧ Select a power period data point from the tree.

✧ Click  .

The name of the selected data point is displayed in the **Data point** field.



You can deselect the **Use engineering settings**, it enables you to change the **Unit**, **Divisor**, and **Converted Unit** values.

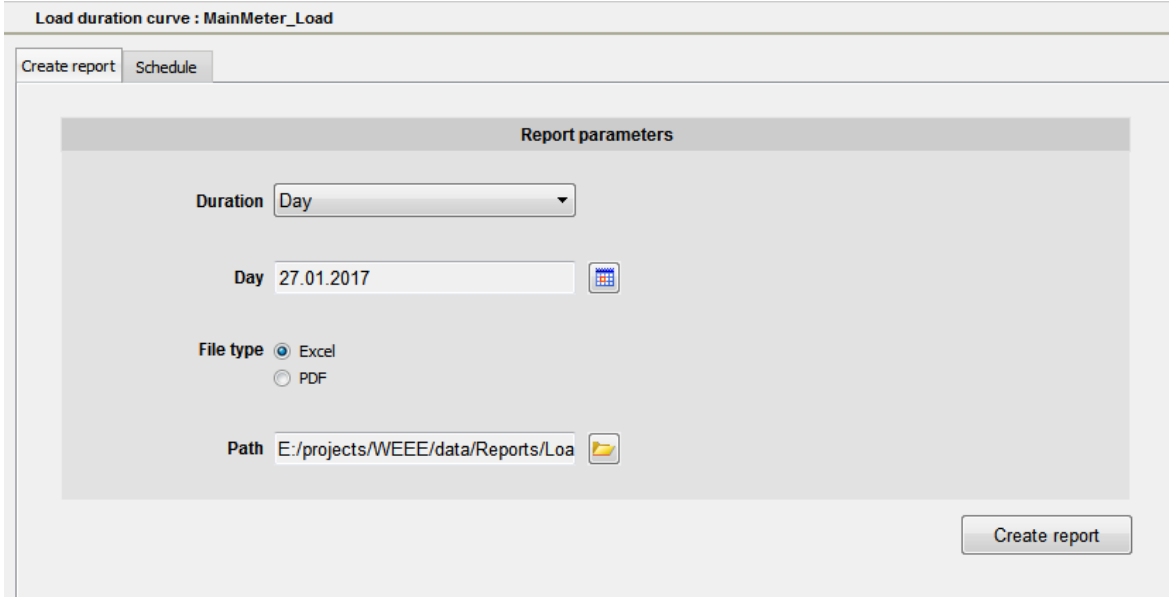
You can select **Create Min/Max/Avg** values option to view the minimum, maximum, and average values in the report. These values will be displayed in the form of a graph.

You can also select **Highlight Min/Max** value option to highlight the minimum and maximum values in the report.

✧ Click **Save**, to save the template.

Creating an Load Duration Curve Report

✧ In the **Report** view, select the **Create report** tab.



[sc_pm_Load_Duration_Curve_Create_Report, 1, en_US]

- ✧ Select the required Load Duration Curve template from the template tree.
  The **Create report** tab is displayed in the **Load Duration Curve** section.
- ✧ Select the value for **Duration**.
  The report values will be based on the duration selected.
- ✧ Click  select a period.
- ✧ Select **File type**, either **Excel** or **Pdf**.
- ✧ Select a **Path** by clicking  .
  The **Choose a File** dialog is displayed.

NOTE

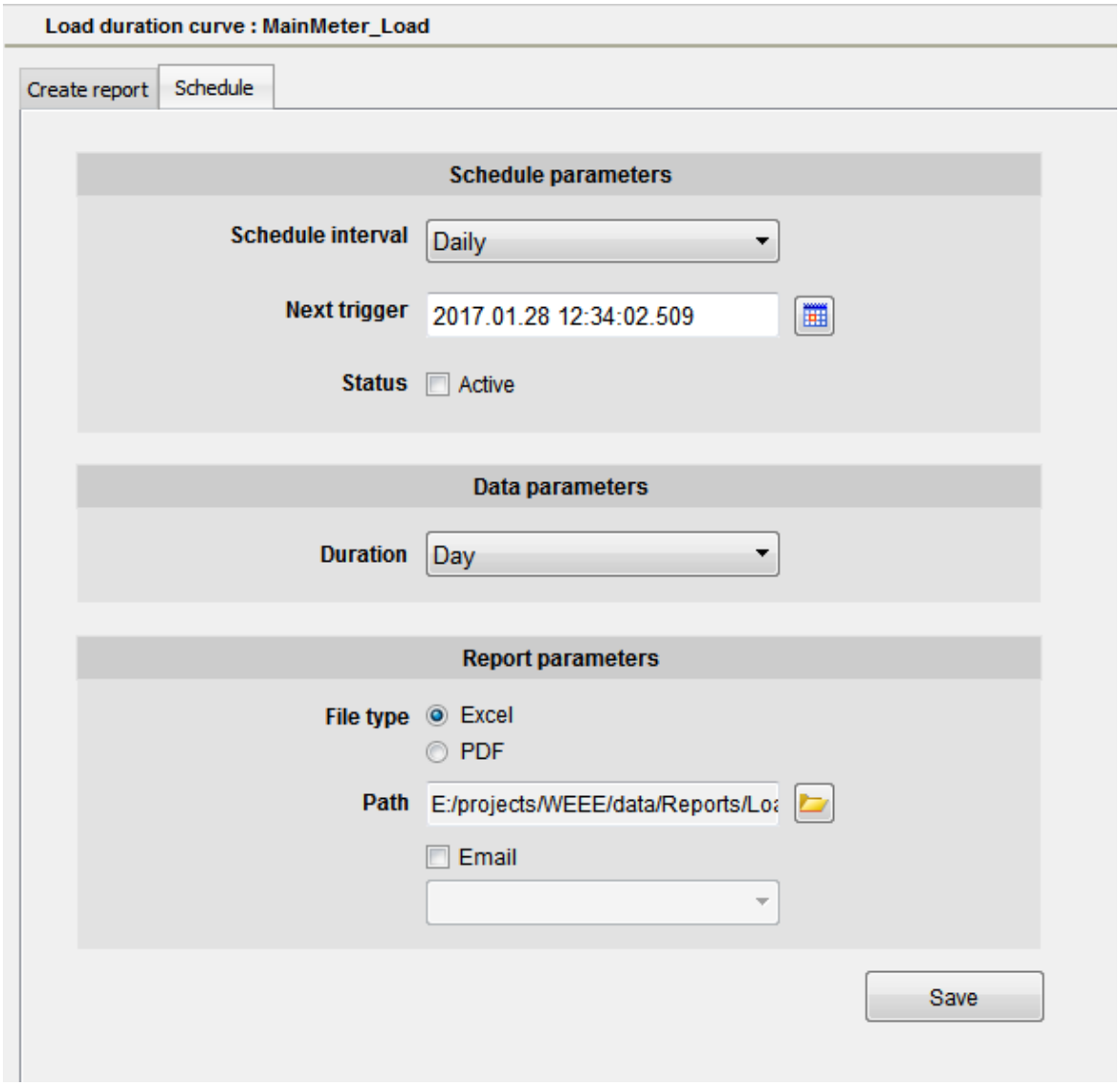
If the default path is changed, the created report will not be listed in the **View reports** tab list.

- ✧ Enter a **File name**.
- ✧ Click **Save**, to save the file name.
- ✧ Click **Create report**, to create the report in the selected path.

To schedule the creation of the report at regular intervals:

- ✧ Select the **Schedule** tab.

In the **Schedule parameters** section,



[sc_pm_Load_Duration_Curve_Sche, 1, en_US]

- ✧ Select a **Schedule interval**.
- ✧ Click and select the **Next trigger**.
  The next report will be generated on the displayed time.
- ✧ Select the **Status** as **Active**, if you want the report to be generated.

In the **Data parameters** section,

- ✧ Select the value for **Duration**.
  The data parameters report is generated according to the schedule parameters configuration.
- ✧ In the **Report parameters** section, select a **File type**, either **Excel** or **PDF**.
- ✧ Select a **Path** by clicking .
  The **Choose a Folder** dialog is displayed.
- ✧ Click **Select Folder**.
  The selected folder path will be displayed.

✧ You can select the **Email** option to e-mail report.
Click **Save**, to schedule the creation of the report.
For more information on how to configure an Email ID, refer to *8.3 Configuring E-Mail Server Settings*.

6.5.2.8 Load Variance Analysis

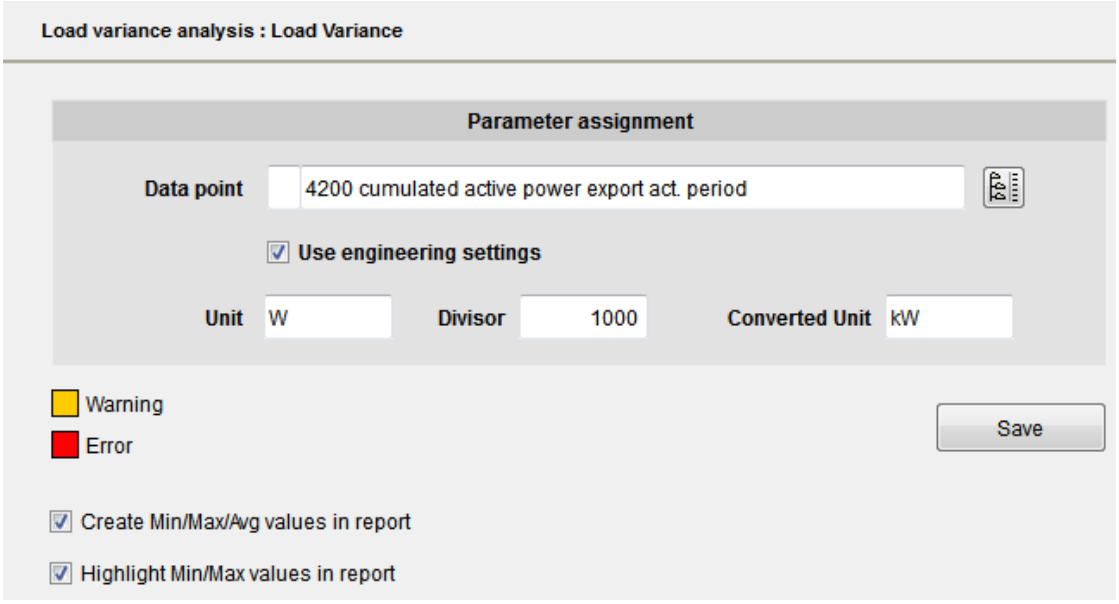
This report shows the power demand values for the selected time period and shows the range of the power demand values for each time. Based on this you will see how wide the variance of the load for a certain time period.

Creating an Load Variance Analysis Report Template

✧ Click  to add a power period data point.
The **Data point selector for energy values** dialog is displayed.

✧ Select a power period data point from the tree.

✧ Click  .
The name of the selected data point is displayed in the **Data point** field.

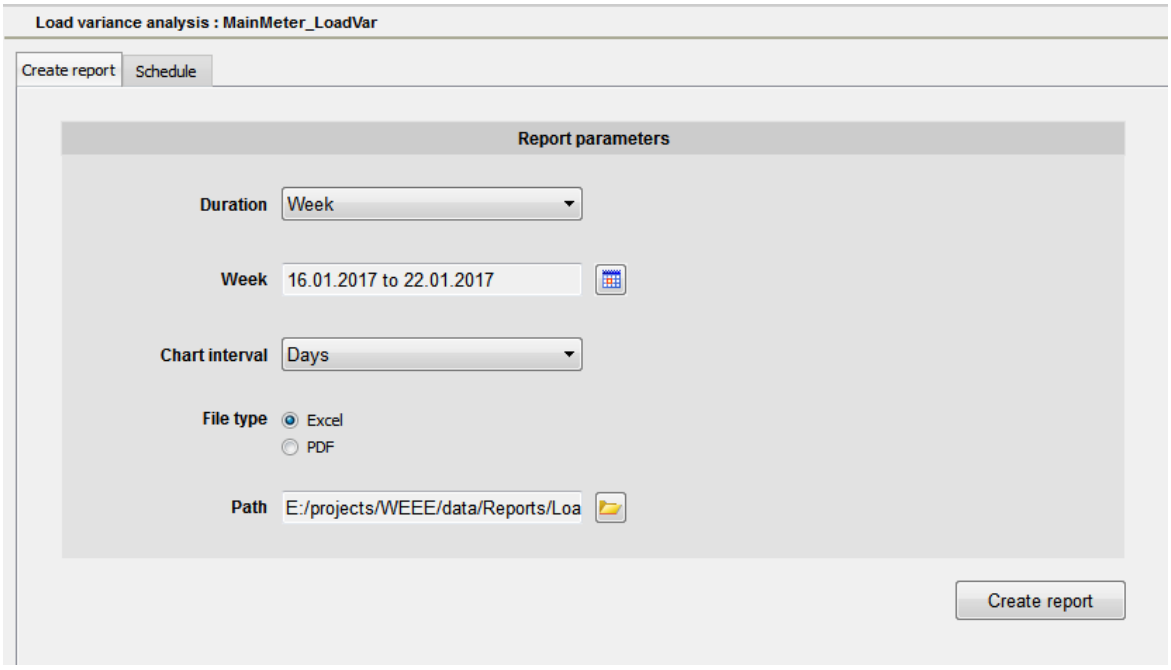


You can deselect the **Use engineering settings**, it enables you to change the **Divisor** and **Converted Unit** values.
You can select **Create Min/Max/Avg** values option to view the minimum, maximum, and average values in the report. These values will be displayed in the form of a graph.
You can also select **Highlight Min/Max** value option to highlight the minimum and maximum values in the report.

✧ Click **Save**, to save the template.

Creating an Load Variance Analysis Report

✧ In the **Report** view, select the **Create report** tab.



[sc_pm_Load_Variance_Cre_Rep, 1, en_US]

- ✧ Select the required Load Variance Analysis template from the template tree.
  The **Create report** tab is displayed in the **Load Variance Analysis** section.
- ✧ Select the value for **Duration**.
  The report values will be based on the duration selected.
- ✧ Click  select a period.
- ✧ Select an interval accordingly.
  The report values will be generated at every interval.
- ✧ Select a **Chart interval**.
  For example: If Days is selected, the report values will be generated every day.
- ✧ Select **File type**, either **Excel** or **Pdf**.
- ✧ Select a **Path** by clicking  .
  The **Choose a File** dialog is displayed.

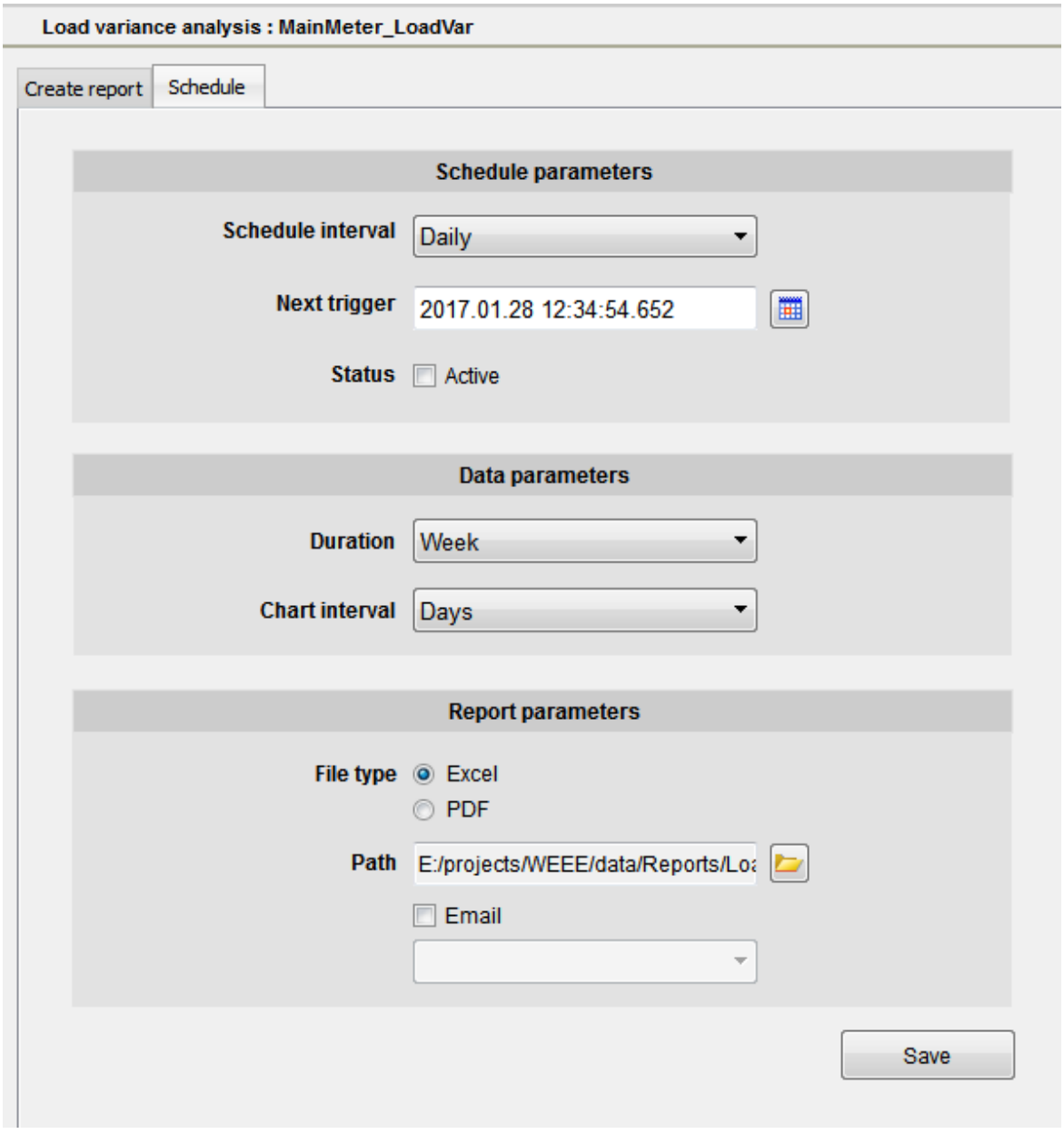
NOTE

If the default path is changed, the created report will not be listed in the **View reports** tab list.

- ✧ Enter a **File name**.
- ✧ Click **Save**, to save the file name.
- ✧ Click **Create report**, to create the report in the selected path.

To schedule the creation of the report at regular intervals:

- ✧ Select the **Schedule** tab.



[sc_pm_Load_Variance_sche, 1, en_US]

- ✧ In the **Schedule parameters** section, select a **Schedule interval**.
- ✧ Click and select the **Next trigger**.
  The next report will be generated on the displayed time.
- ✧ Select the **Status** as **Active**, if you want the report to be generated.

In the **Data parameters** section,

- ✧ Select the value for **Duration**.
- ✧ Select a **Chart interval**.
  The data parameters report is generated according to the schedule parameters configuration.
- ✧ In the **Report parameters** section, select a **File type**, either **Excel** or **PDF**.

✧ Select a **Path** by clicking  .

The **Choose a Folder** dialog is displayed.

✧ Click **Select Folder**.

The selected folder path will be displayed.

✧ You can select the **Email** option to e-mail the report.

Click **Save** to schedule the creation of the report.

For more information on how to configure an Email ID, refer to *8.3 Configuring E-Mail Server Settings*.

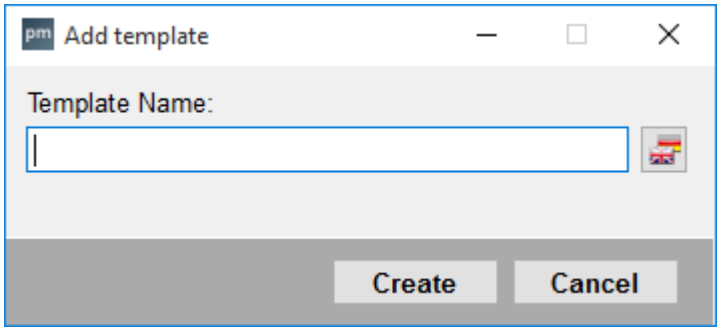
6.5.2.9 Sankey

This report gives an overview of the energy consumption of the data points for the selected time intervals. You can view the total energy consumption at each level in terms of percentage.

Creating a Sankey Report Template

✧ Select the option **Add template** in the context menu for **Sankey**.

The **Add template** dialog is displayed.



[sc_pm_addtemplate, 1, en_US]

✧ Enter the **Template name**.

NOTE

You can change the template name according to the language by using the **Text for every language** dialog.

✧ Click  .

The **Text for every language** dialog opens.

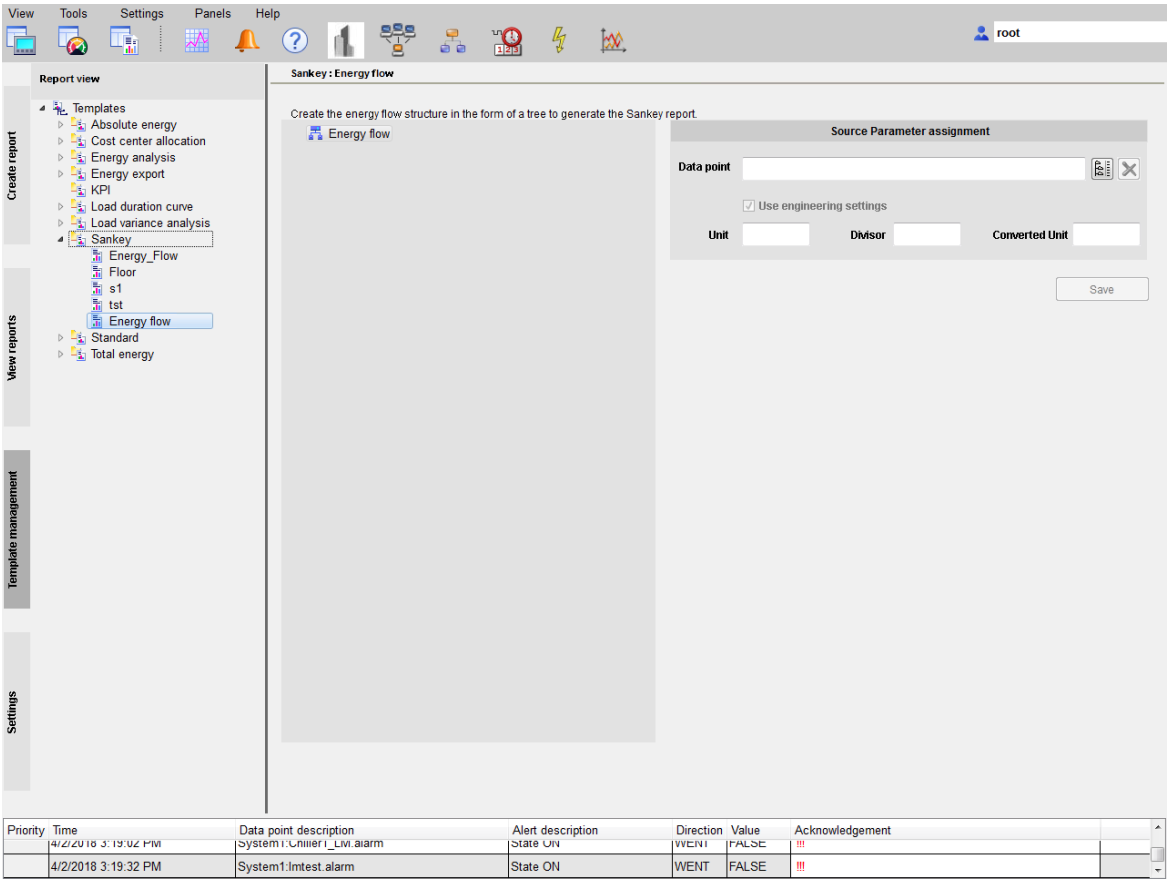
✧ In the **Text** column, enter the desired name for the template in the required languages.

The template name entered for each language will be displayed according to the language selected in the UI.

✧ Click **Ok** to confirm.

✧ Click **Create**.

The template is created and the **Source Parameter assignment** area is displayed in the UI.



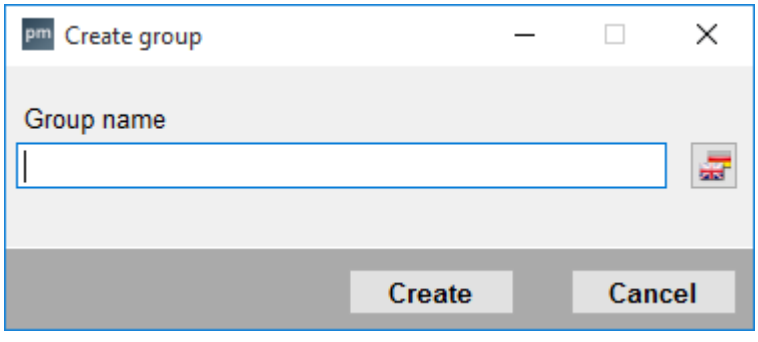
[sc_pm_sankey_template, 2, en_US]

NOTE

The **Source Parameter assignment** area allows you to assign the data points to calculate and view the energy leakage at template level in the generated report. If you do not assign any data point, energy leakage information is not displayed in the report. Click  to delete the data point.

✧ Right-click the template name and select **Create group**.

The **Create group** dialog is displayed.



[sc_pm_creategroup, 1, en_US]

✧ Enter the **Group name**.

NOTE

You can create multiple groups or elements with the same name.

✧ Click  .

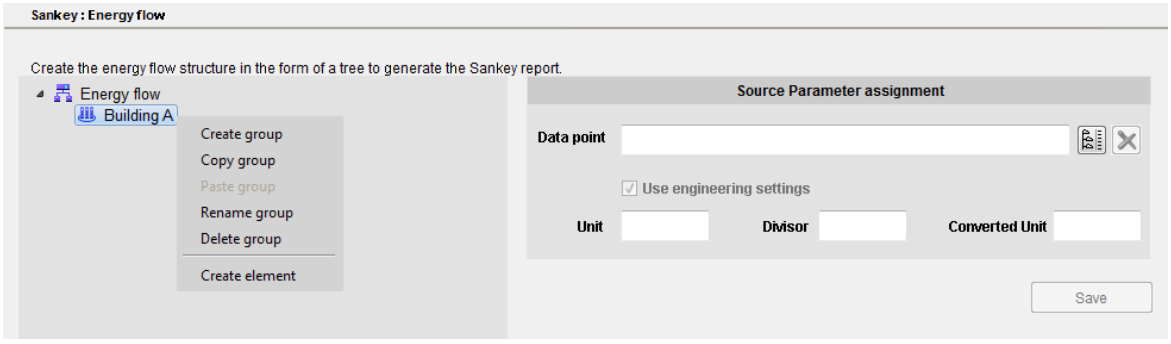
The **Text for every language** dialog opens.

✧ In the **Text** column, enter the desired name for the group in the required languages.

The group name entered for each language will be displayed according to the language selected in the UI.

✧ Click **Create**.

The group is created and the **Source Parameter assignment** area is displayed in the UI. You can create elements or groups under a group using the context menu options. You can also copy and paste a group via the context menu options.



[sc_pm_group_context, 2, en_US]

NOTE

The **Source Parameter assignment** area allows you to assign the data points to calculate and view the energy leakage at the group level in the generated report. If you do not assign any data point, energy leakage information is not displayed in the report. Click  to delete the data point.

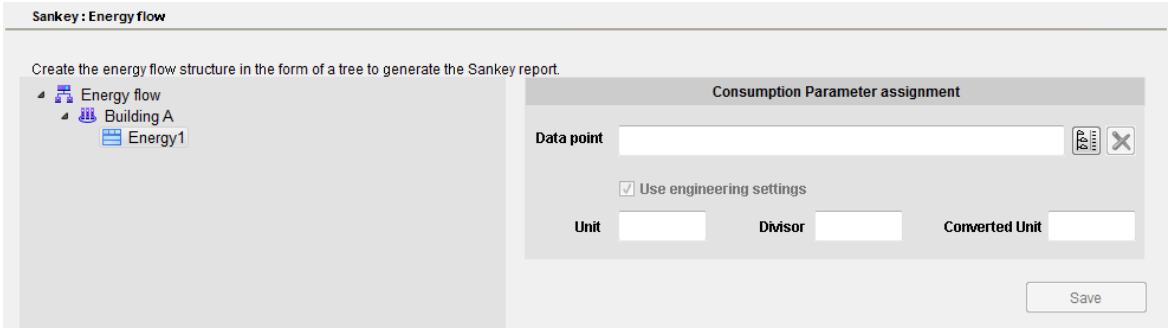
✧ Select **Create element**.

The **Create new element** dialog is displayed.

✧ Enter the new element name.

✧ Click **Create**.

The element is created and the **Consumption Parameter assignment** area is displayed in the UI.



[sc_pm_element, 2, en_US]

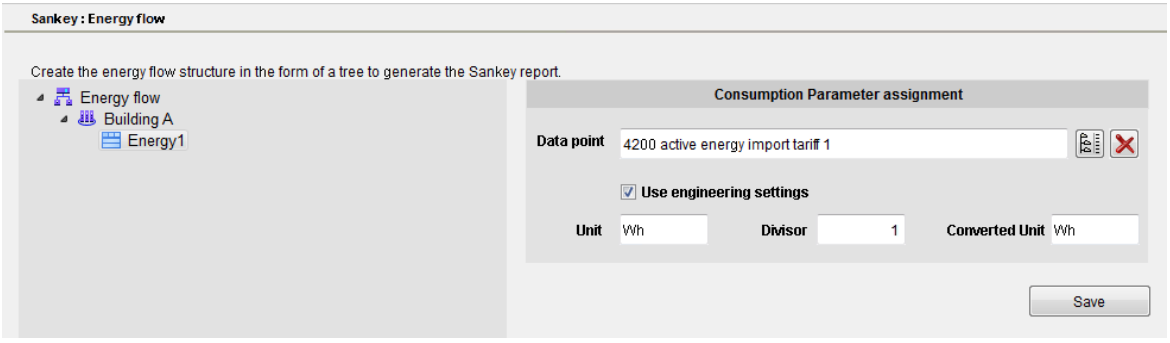
✧ Click  to add a data point.

The **Selection tree for energy values** dialog is displayed.

✧ Select a data point from the tree.

✧ Click **OK**.

The data point is added and displayed in the **Data point** text field.



[sc_pm_selection_tree, 2, en_US]

You can deselect the **Use engineering settings** option in the **Consumption Parameter assignment** area. This enables you to change the **Divisor** and **Converted Unit** values for each data point.

✧ Click **Save** to save the template.

A confirmation prompt appears to confirm the selection of new settings.

NOTE

You can add and save only the energy data points. The units of all the data points created in a **Sankey** tree must be the same.

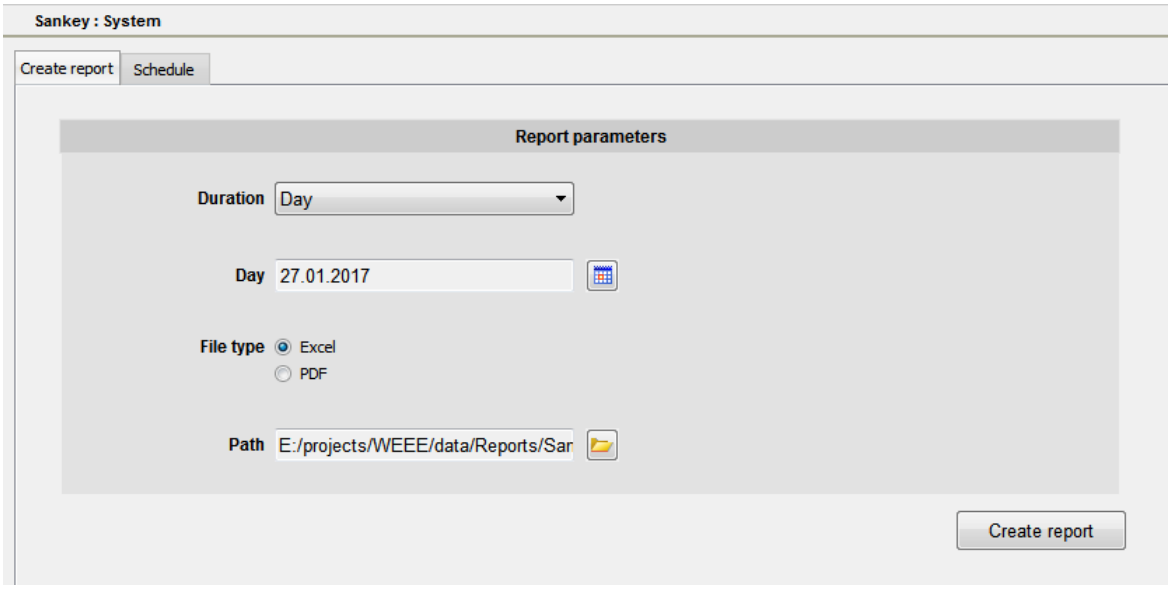
✧ Click **Yes**.

The template is created with the selected energy data point.

Creating a Sankey Report

✧ In the **Report view**, select the required Sankey template displayed under the **Sankey** node.

The **Create report** tab is displayed in the **Sankey** section.



[sc_pm_createreport_sankey, 1, en_US]

- ✧ Select a value for **Duration**.
  The report values will be displayed based on the duration selected.
- ✧ Click  to select a period.
- ✧ Select an interval accordingly.
  The report values will be generated at the selected interval.
  For example, if you select the interval as 15 min, then report values are generated for every 15 mins.
- ✧ Select the **File type**, either **Excel** or **PDF**.
- ✧ Select a **Path** by clicking  .
  The **Choose a File** dialog is displayed.

NOTE

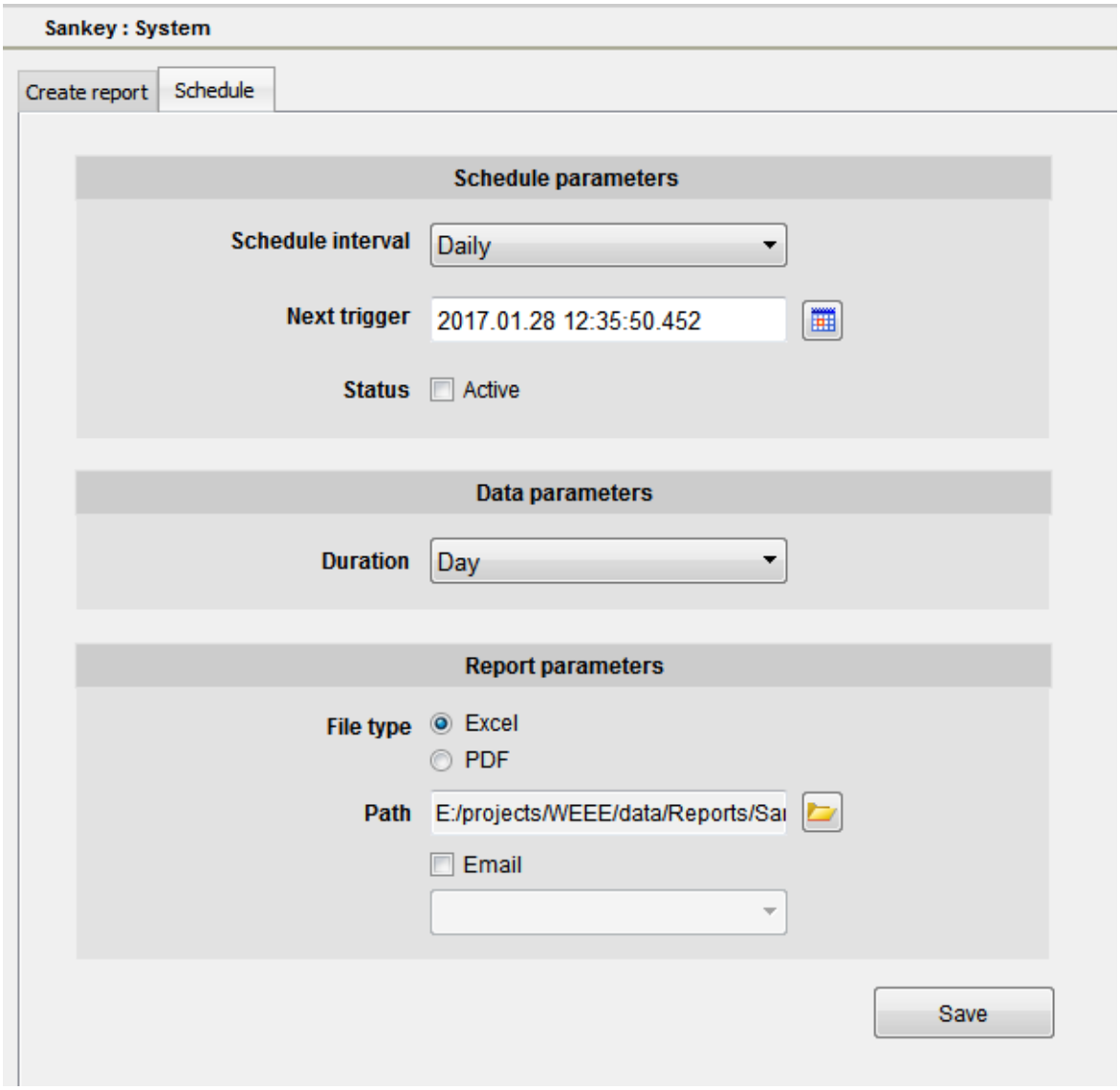
If you change the default path, the created report will not be listed in the **View reports** tab list.

- ✧ Enter a **File name**.
- ✧ Click **Save** to save the file name.
- ✧ Click **Create report** to create the report in the selected path.

To schedule the creation of the report at regular intervals, proceed as follows:

- ✧ Select the **Schedule** tab.

The **Schedule** tab details are displayed in the UI:



[sc_pm_schedule_sankey, 1, en_US]

- ✧ In the **Schedule parameters** section, select the **Schedule interval**
- ✧ Click and select the **Next trigger**.
  The next report will be generated on the displayed time.
- ✧ If you want to generate the report, select the **Status** as **Active**.
- ✧ In the **Data parameters** section, select the value for **Duration**.

The data parameters report is generated according to the schedule parameters configuration.

- ✧ In the **Report parameters** section, select a **File type**, either **Excel** or **PDF**.
- ✧ Select a path by clicking .
  The **Choose a Folder** dialog is displayed.
- ✧ Click **Select Folder**.
  The selected folder path will be displayed.

✧ You can select the **Email** option to e-mail the report.
Click **Save** to schedule the creation of the report.
For more information on how to configure an Email ID, refer to *8.3 Configuring E-Mail Server Settings*.

6.5.2.10 Standard

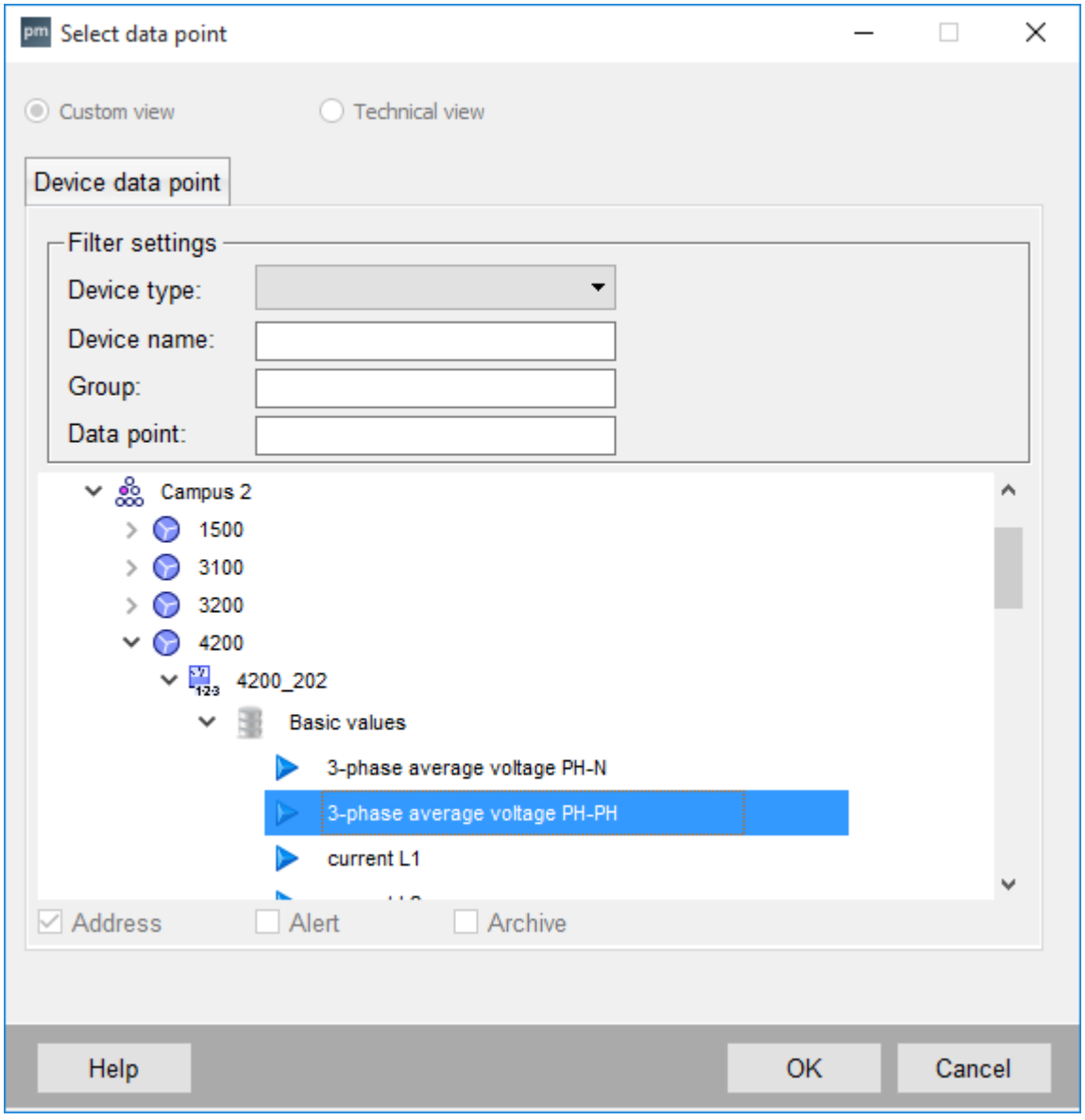
This report can be used for any measuring values that is archived. This report displays all the values of the selected data points for a selected time period in a table.

NOTE

A standard template can be exported and used in advanced reports.

Creating an Standard Report Template

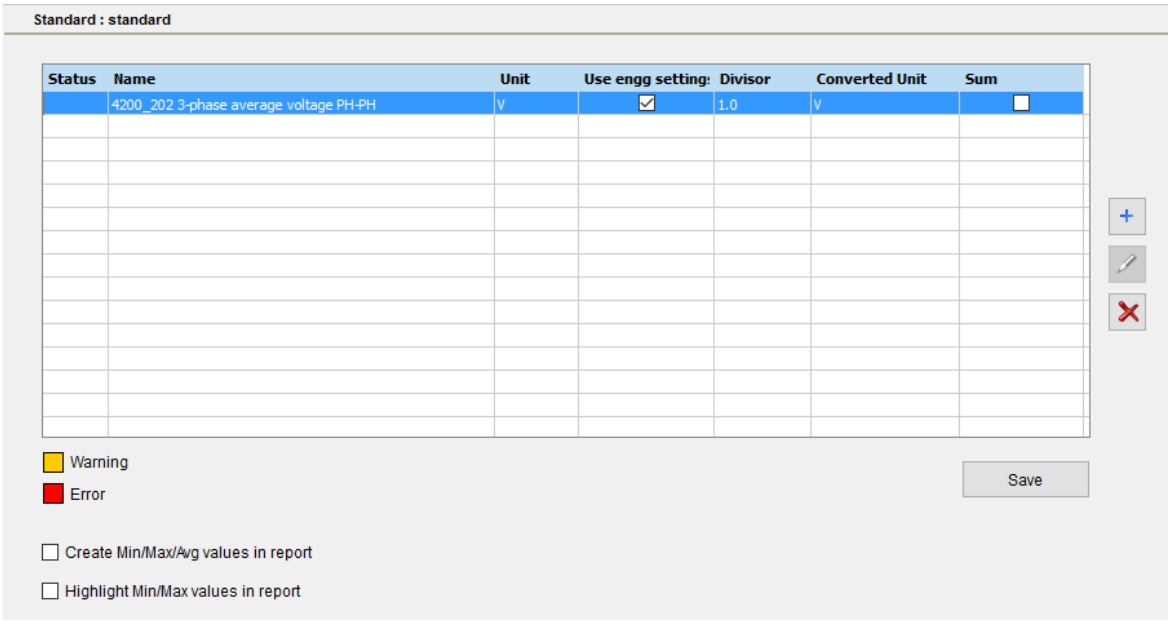
✧ Click  to add a data point.
The **Data point selector** dialog is displayed.
You can select the required data points via the **Measured value** tab or the **KPI** tab.
To select data points via the **Measured value** tab:



[sc_pm_selectdp, 1, en_US]

- ✧ In the **Filter settings** section, select the required **Device type** from the drop-down list.
- ✧ Enter the **Device name**.
- ✧ Enter which **Group** it belongs to.
- ✧ Enter the required **Measured value**.
- ✧ Select the required data point from the selection tree.
- ✧ Click **OK**, to add the data point to the data point list.

You can add multiple data points above or below the selected data point in the list by using  or  .



[sc_pm_datapoint, 1, en_US]

You can add, delete, or edit data points by using the respective buttons.

You can deselect the **Use engg settings** option in the **Use engg settings** column. This enables you to change the **Divisor** and **Converted Unit** values for each data point in the corresponding column. To generate a sum of the values for the selected data point in the report, you can select the **Sum** option in the **Sum** column.

- ✧ To delete a data point from the list, select a data point.
- ✧ Click  to delete the data point from the list.

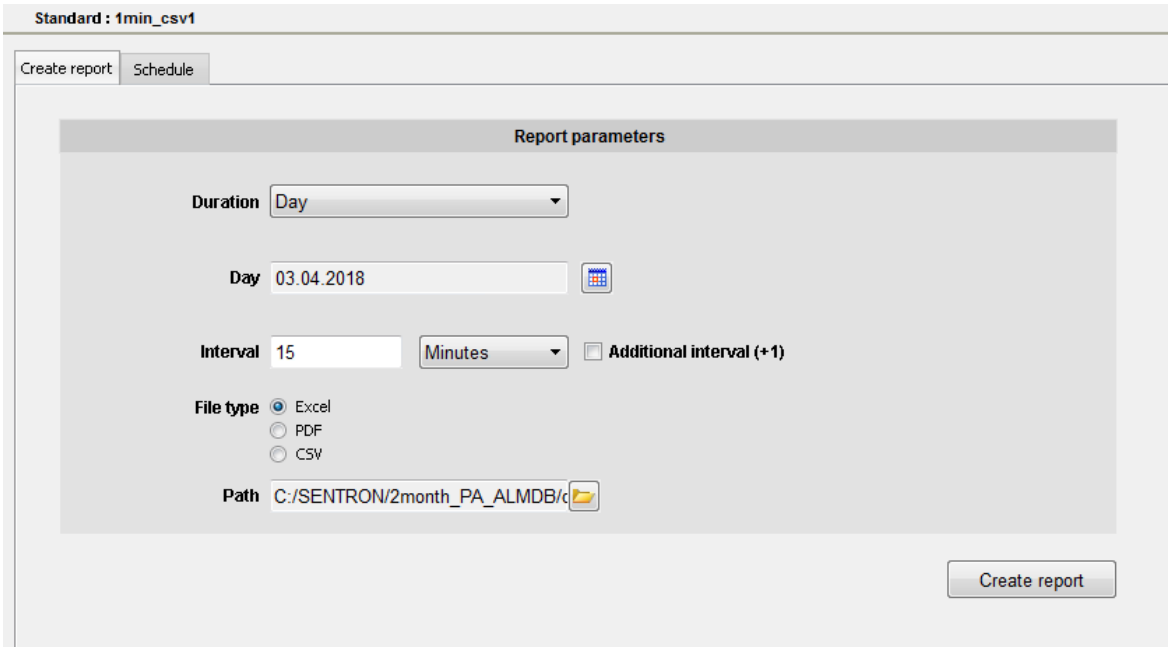
  You can select **Create Min/Max/Avg** values option to view the minimum, maximum, and average values in the report. These values will be displayed in the form of a graph.

  You can also select **Highlight Min/Max** value option to highlight the minimum and maximum values in the report.
- ✧ Click **Save**, to save the template.

Creating an Standard Report

- ✧ In the **Report** view, select the **Create report** tab.
- ✧ Select the required Standard template from the template tree.

The **Create report** tab is displayed in the **Standard** section.



[sc_pm_std_createrep, 2, en_US]

✧ Select the value for **Duration**.
The report values will be based on the duration selected.

✧ Click  to select a period.

✧ Select an interval accordingly.
The report values will be generated at the selected interval.
For example, if you select the interval as 15 mins then report values are generated for every 15 mins.
On selecting the check box **Additional interval (+1)**, the report values are generated with an additional interval along with the existing intervals.

✧ Select a **File type**, either **Excel**, **PDF**, or **CSV**.

NOTE

When you update the project from an older version to the latest version, the CSV export templates and the corresponding schedules will be displayed under the standard reports.

✧ Select a **Path** by clicking  .
The **Choose a File** dialog is displayed.

NOTE

If the default path is changed, the created report will not be listed in the **View reports** tab list.

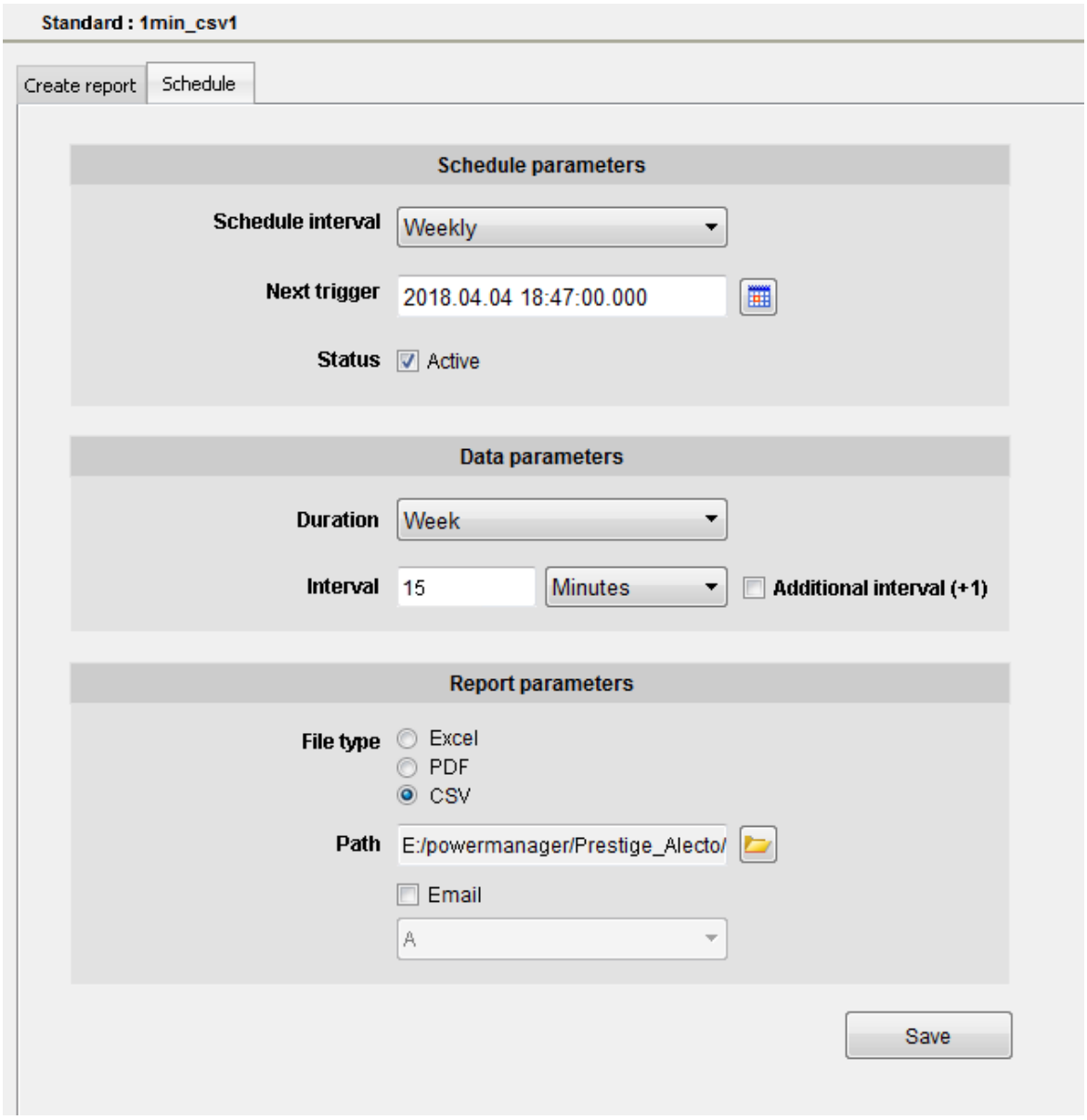
✧ Enter a **File name**.

✧ Click **Save**, to save the file name.

✧ Click **Create report**, to create the report in the selected path.

To schedule the creation of the report at regular intervals:

✧ Select the **Schedule** tab.



[sc_pm_std_createsch, 2, en_US]

- ✧ In the **Schedule parameters** section, select a **Schedule interval**.
- ✧ Click  and select the **Next trigger**.

  The next report will be generated for the displayed time.
- ✧ Select the **Status** as **Active**, if you want the report to be generated.
- ✧ In the **Data parameters** section, select the value for **Duration**.
- ✧ Select an **Interval** accordingly.

  On selecting the check box **Additional interval (+1)**, the report values are generated with an additional interval along with the existing intervals.

  The data parameters report is generated according to the schedule parameters configuration.
- ✧ In the **Report parameters** section, select a **File type**, either **Excel** or **PDF**.

✧ Select a **Path** by clicking .

The **Choose a Folder** dialog is displayed.

✧ Click **Select Folder**.

The selected folder path will be displayed.

✧ You can select the **Email** option to e-mail the report.

Click **Save** to schedule the creation of the report.

For more information on how to configure an Email ID, refer to *8.3 Configuring E-Mail Server Settings*.

6.5.2.11 Top 10 Energy

The Top 10 energy report displays the details of the top 10 consumers of the active energy and reactive energy across the powermanager system.

NOTE

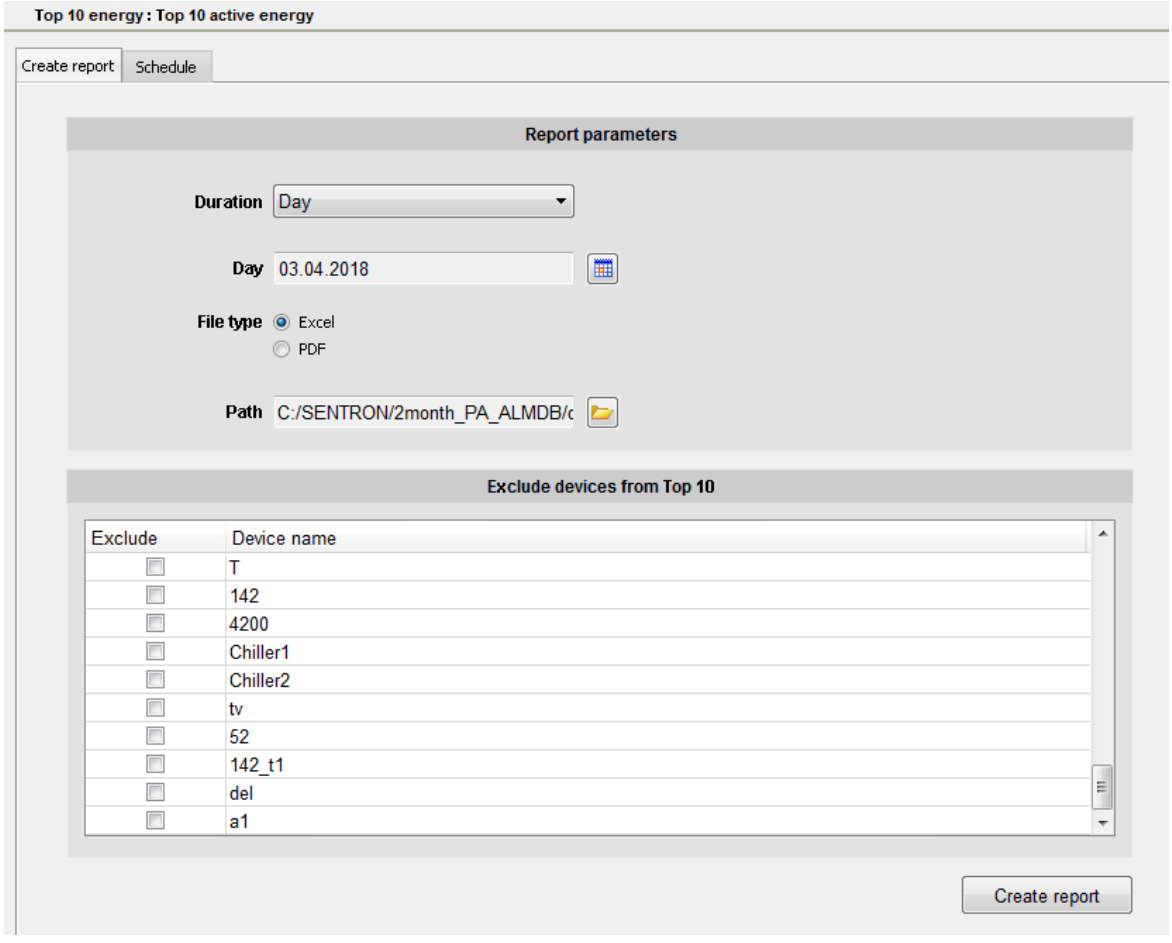
By default, all the devices with the respective data points are considered for calculation of energy values. Separate configuration of data points is not required.

Creating a Top 10 Active Energy Report

✧ In the **Report** view, click **Top 10 energy** > **Top 10 active energy**.

The **Top 10 active energy** report view is displayed.

✧ Select the **Create report** tab.



[sc_pm_top10_ae, 2, en_US]

- ✧ Select the value for **Duration**.
  The report values will be based on the duration selected.
- ✧ Click  to select a period.
- ✧ Select a **File type**, either **Excel** or **PDF**.
- ✧ Select the checkbox option in the **Exclude** column for the respective device under the **Exclude devices from Top 10** area to exclude the device from the **Top 10 active energy** report.
- ✧ Select a **Path** by clicking  .
  The **Choose a File** dialog is displayed.

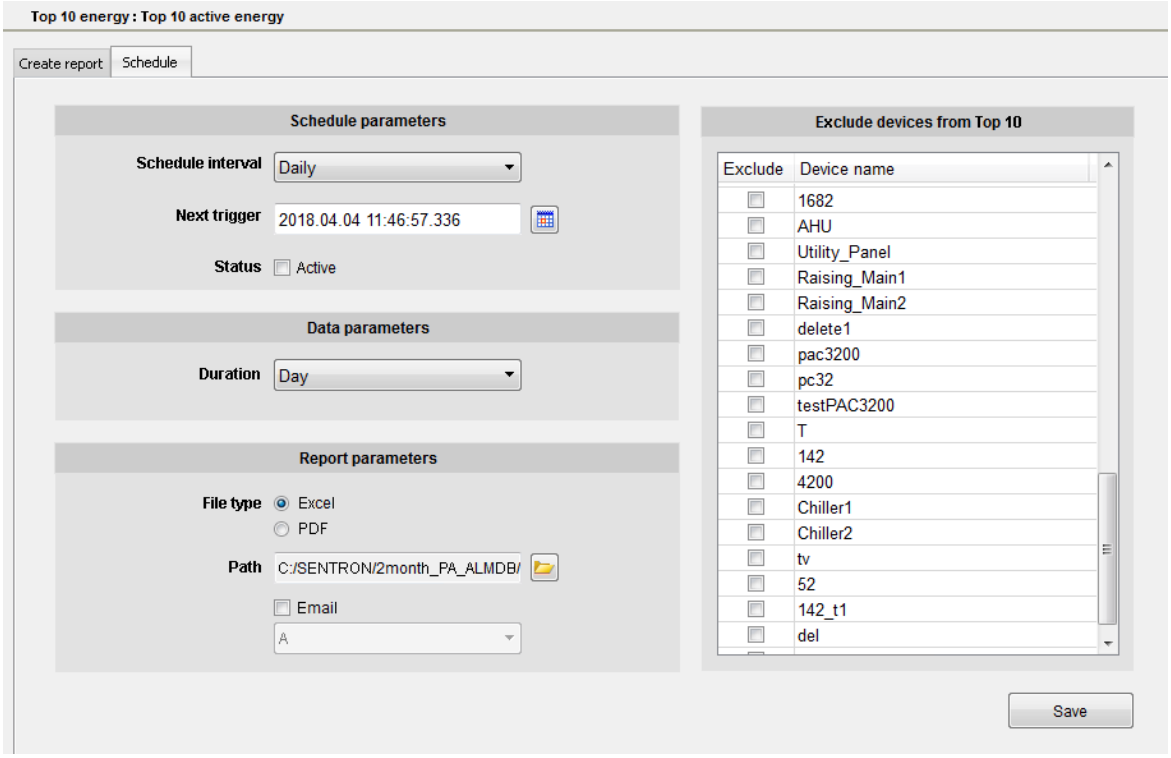
NOTE

If you change the default path, the created report will not be listed in the **View reports** tab list.

- ✧ Enter a **File name**.
- ✧ Click **Save** to save the file name.
- ✧ Click **Create report** to create the report in the selected path.

To schedule the creation of the report at regular intervals, proceed as follows:

- ✧ Select the **Schedule** tab.



[sc_pm_top10_ae_schedule, 2, en_US]

- ✧ In the **Schedule parameters** section, select a **Schedule interval**.
- ✧ Click  and select the **Next trigger**.
  The next report will be generated for the displayed time.
- ✧ If you want the report to be generated, select the **Status** as **Active**.

✧ In the **Data parameters** section, select the value for **Duration**.

The data parameters report is generated according to the schedule parameters configuration.

✧ In the **Report parameters** section, select a **File type**, either **Excel** or **PDF**.

✧ Select a **Path** by clicking click .

The **Choose a Folder** dialog is displayed.

✧ Click **Select Folder**.

The selected folder path will be displayed.

✧ You can select the **Email** option to e-mail the report.

✧ Select the checkbox option in the **Exclude** column for the respective device under the **Exclude devices from Top 10** area to exclude the device from the **Top 10 active energy** report.

✧ Click **Save** to schedule the creation of the report.

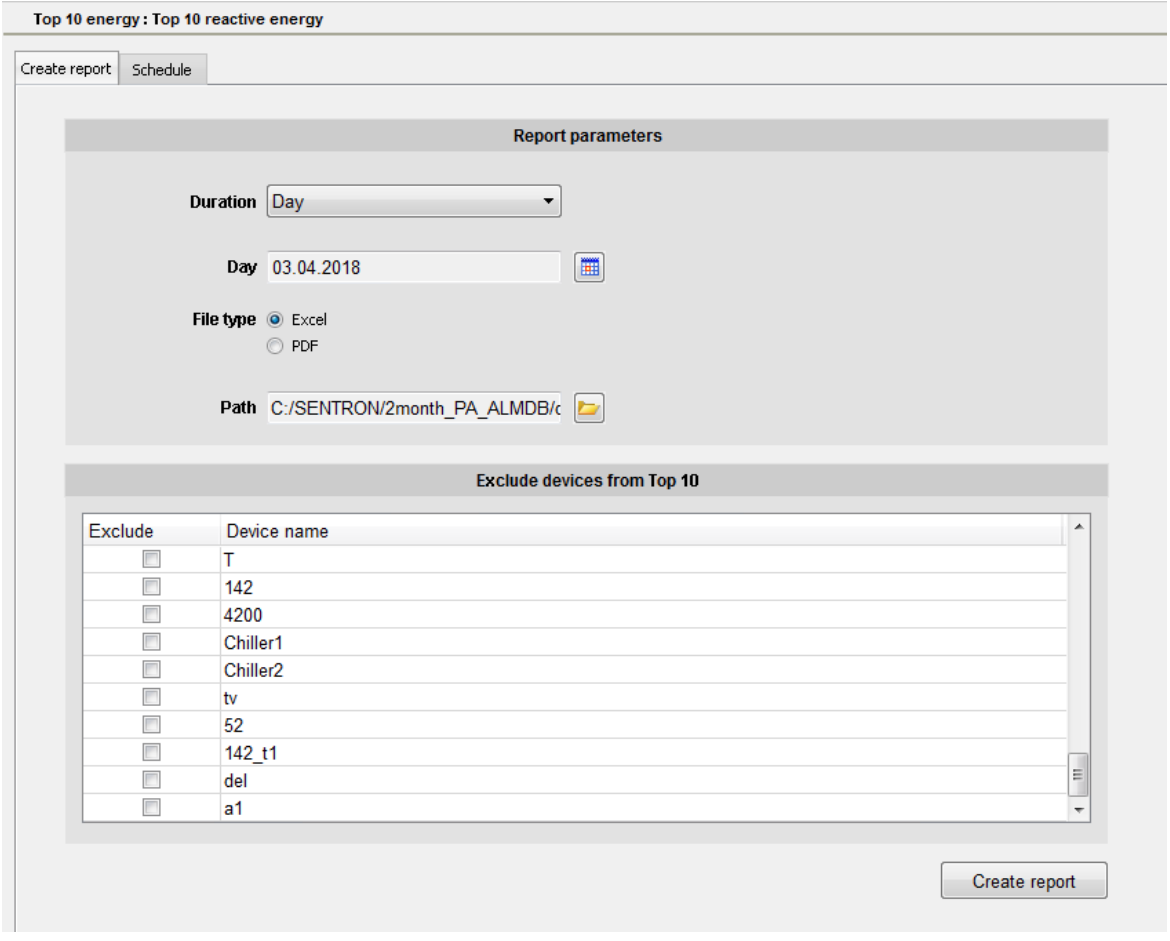
For more information on how to configure an Email ID, refer to *8.3 Configuring E-Mail Server Settings*.

Creating a Top 10 Reactive Energy Report

✧ In the **Report** view, click **Top 10 energy** > **Top 10 reactive energy**.

The **Top 10 reactive energy** report view is displayed.

✧ Select the **Create report** tab.



[sc_pm_top10_re, 2, en_US]

✧ Select the value for **Duration**.

The report values will be based on the duration selected.

- ✧ Click  to select a period.
- ✧ Select a **File type**, either **Excel** or **PDF**.
- ✧ Select the checkbox option in the **Exclude** column for the respective device under the **Exclude devices from Top 10** area to exclude the device from the **Top 10 reactive energy** report.
- ✧ Select a **Path** by clicking  .
  The **Choose a File** dialog is displayed.

NOTE

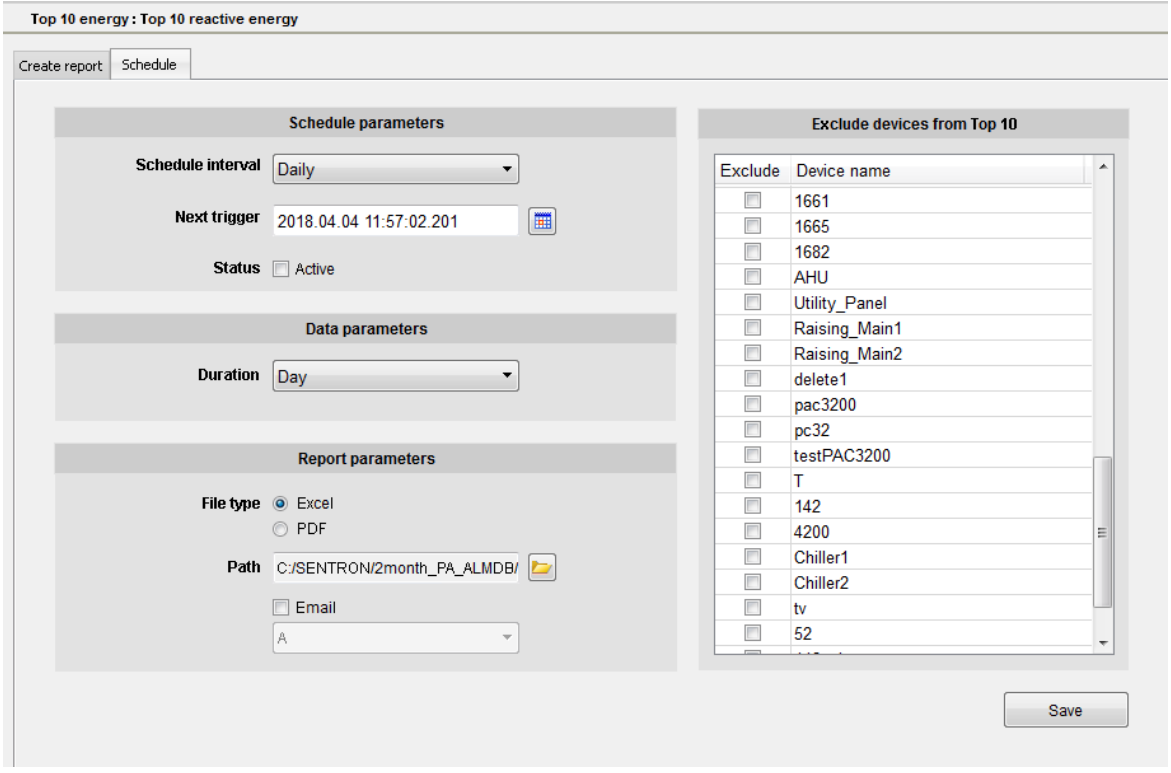
If you change the default path, the created report will not be listed in the **View reports** tab list.

- ✧ Enter a **File name**.
- ✧ Click **Save**, to save the file name.
- ✧ Click **Create report**, to create the report in the selected path.

To schedule the creation of the report at regular intervals:

- ✧ Select the **Schedule** tab.

In the **Schedule parameters** section, select a **Schedule interval**.



[sc_pm_top10_re_schedule, 2, en_US]

- ✧ Click  and select the **Next trigger**.
  The next report will be generated for the displayed time.
- ✧ If you want to generate the report, select the **Status** as **Active**.
- ✧ In the **Data parameters** section, select the value for **Duration**.

The data parameters report is generated according to the schedule parameters configuration.

- ✧ In the **Report parameters** section, select a **File type**, either **Excel** or **PDF**.
- ✧ Select a **Path** by clicking  .
  The **Choose a Folder** dialog is displayed.
- ✧ Click **Select Folder**.
  The selected folder path will be displayed.
- ✧ You can select the **Email** option to e-mail the report.
- ✧ Select the checkbox option in the **Exclude** column for the respective device under the **Exclude devices from Top 10** area to exclude the device from the **Top 10 reactive energy** report.
- ✧ Click **Save** to schedule the creation of the report.
  For more information on how to configure an Email ID, refer to *8.3 Configuring E-Mail Server Settings*.

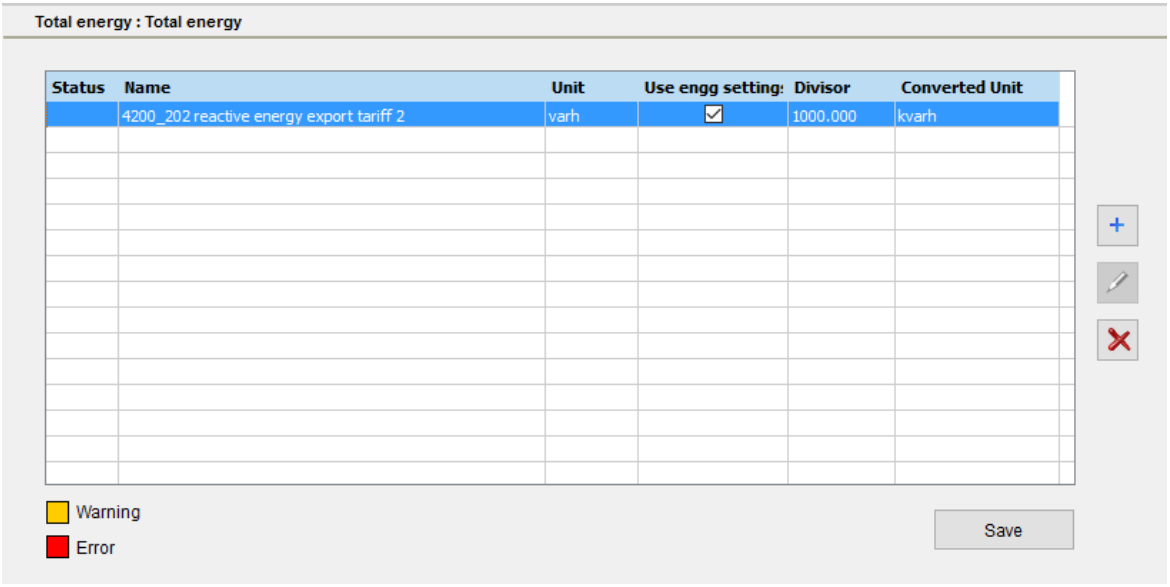
6.5.2.12 Total Energy

This report displays the total energy consumption of a selected data point for the selected time period. The report can be created with a bar chart or a pie chart.

Creating an Total Energy Report Template

- ✧ Click  to add a data point.
  The **Selection tree for energy values** dialog is displayed.
- ✧ Select a data point from the tree.
- ✧ Click **OK**.

The data point is added to the list.



[sc_pm_totalenergy, 1, en_US]

You can add, delete, or edit data points using the respective buttons.

You can deselect the **User engg settings** option in the **Use engg settings** column. This enables you to change the **Divisor** and **Converted Unit** values for each data point in the corresponding column.

- ✧ To delete a data point from the list, select a data point.
- ✧ Click  to delete the data point from the list.

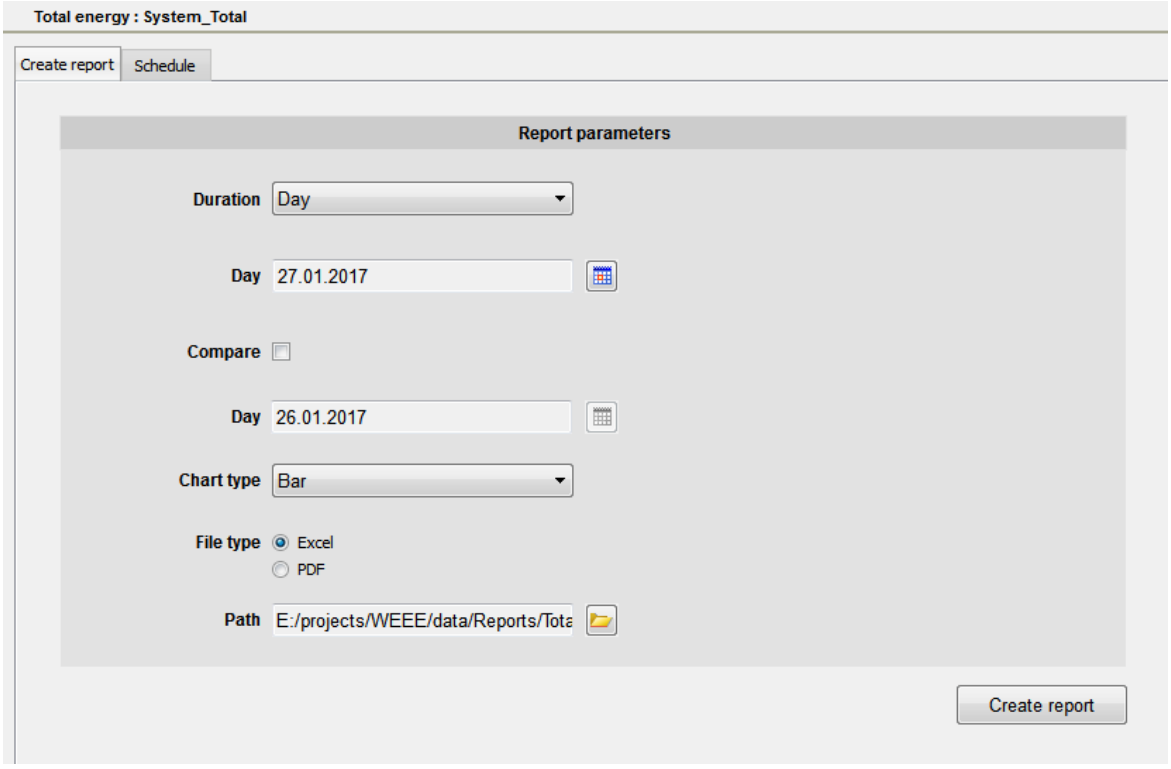
✧ Click **Save**, to save the template.

Creating an Total Energy Report

✧ In the **Report** view, select the **Create report** tab.

✧ Select the required Total Energy template from the template tree.

The **Create report** tab is displayed in the **Total Energy** section.



[sc_pm_te_cr, 1, en_US]

✧ Select the value for **Duration**.
The report values will be based on the duration selected.

✧ Click  select a period.

✧ Select **Compare**.

✧ Click  select a period.
The data point values between two selected periods will be compared and a report will be generated.

✧ Select a **Chart type**.
The report values will be represented in the form of the chart type selected.

✧ Select **File type**, either **Excel** or **Pdf**.

✧ Select a **Path** by clicking  .
The **Choose a File** dialog is displayed.

NOTE

If the default path is changed, the created report will not be listed in the **View reports** tab list.

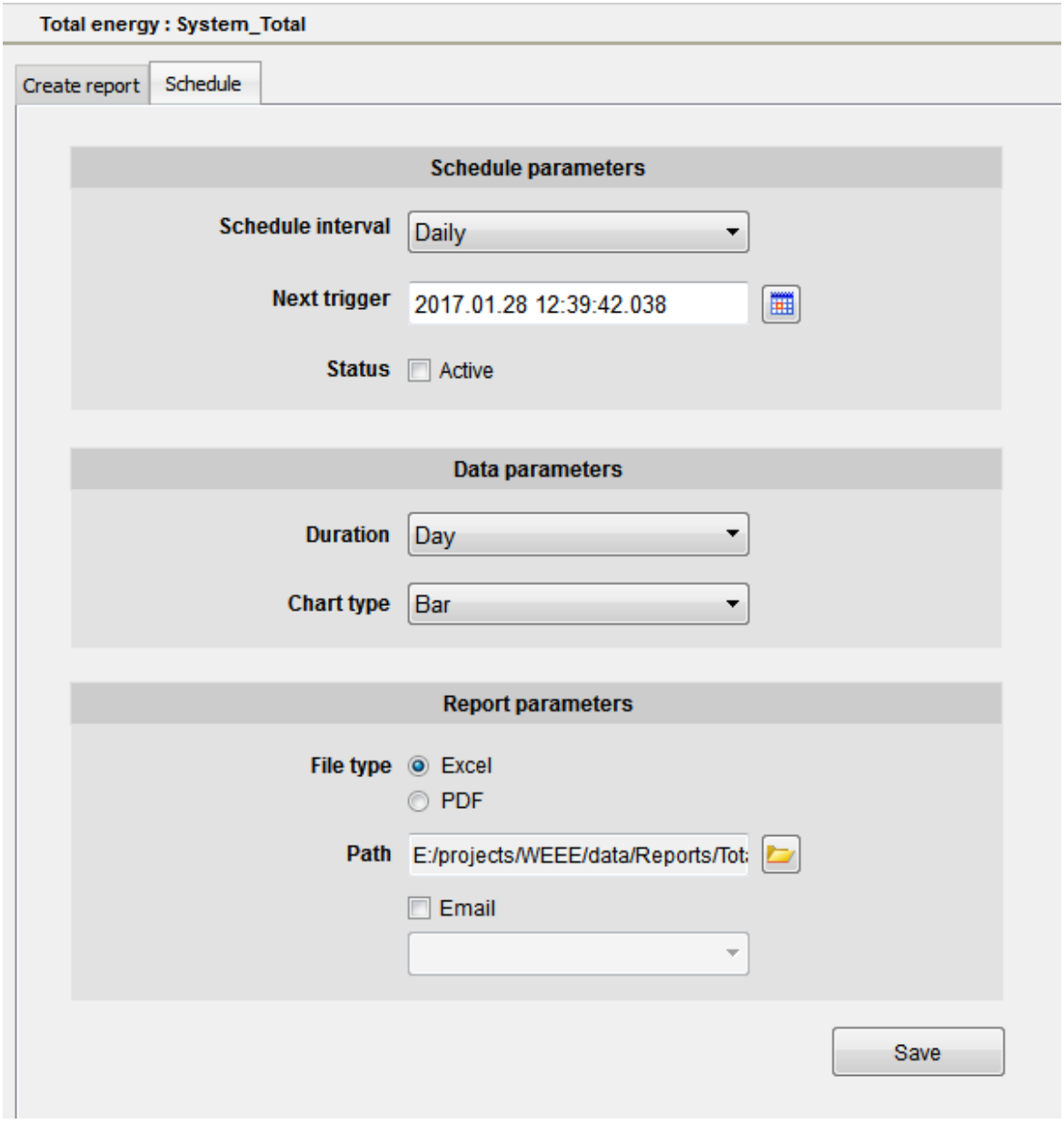
✧ Enter a **File name**.

✧ Click **Save**, to save the file name.

✧ Click **Create report**, to create the report in the selected path.

To schedule the creation of the report at regular intervals:

✧ Select the **Schedule** tab.



[sc_pm_te_cs, 1, en_US]

✧ In the **Schedule parameters** section, select a **Schedule interval**.

✧ Click and select the **Next trigger**.
The next report will be generated on the displayed time.

✧ Select the **Status** as **Active**, if you want the report to be generated.

✧ In the **Data parameters** section, select the value for **Duration**.

- ✧ Select a **Chart type**.
  The data parameters report is generated according to the schedule parameters configuration.
- ✧ In the **Report parameters** section, select a **File type**, either **Excel** or **PDF**.
- ✧ Select a **Path** by clicking  .
  The **Choose a Folder** dialog is displayed.
- ✧ Click **Select Folder**.
  The selected folder path will be displayed.
- ✧ You can select the **Email** option to e-mail the report.
  Click **Save** to schedule the creation of the report.
  For more information on how to configure an Email ID, refer to *8.3 Configuring E-Mail Server Settings*.

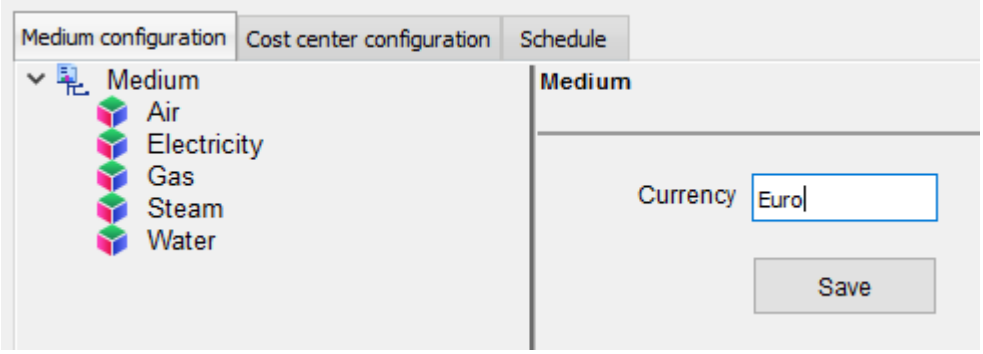
6.5.3 Settings Tab

The **Settings** tab consists of Medium configuration, Cost center configuration, and Schedule tabs.

Medium Configuration Tab

The **Medium configuration** tab allows you to set tariffs for the different mediums that are used.
A sub tariff set is a charged price that refers to one media unit (kWh, m³) and which applies to one specific period of time.
To set the currency to calculate the cost of the mediums used:

- ✧ In the **Settings** tab, click **Medium configuration** tab.



[sc_pm_mediumconfig, 1, en_US]

- ✧ Enter the **Currency**.
- ✧ Click **Save**, to confirm the currency to be used.

To add a new medium:

- ✧ Right-click **Medium**.
- ✧ Select **Create medium**.
  The **Create medium** dialog is displayed.
- ✧ Enter a **Name** for the medium.
- ✧ Click **Create**.
  The medium is added to the medium tree and the settings section is displayed.

To rename a medium:

- ✧ Right-click a medium.

✧ Select **Rename medium**.
The **Rename medium** dialog is displayed.

✧ Enter a new **Name** for the medium.

✧ Click **Apply**.
The medium is renamed.

To delete a medium:

✧ Right-click a medium.

✧ Select **Delete medium**.
The **Information** dialog is displayed.

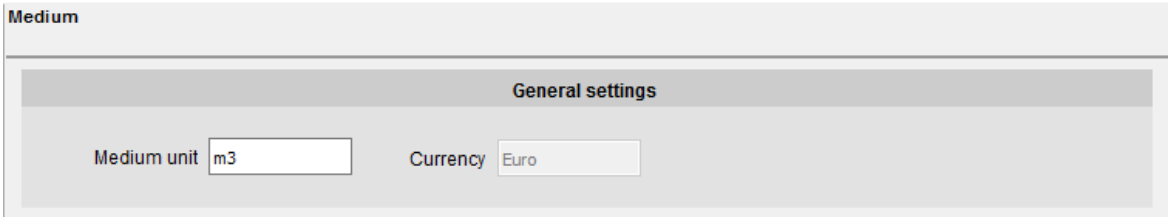
✧ Click **Yes**, to delete the medium.

The 5 default mediums which can be configured are **Air**, **Electricity**, **Gas**, **Steam**, and **Water**.
The tariff settings for each medium is similar.

To set the tariffs:

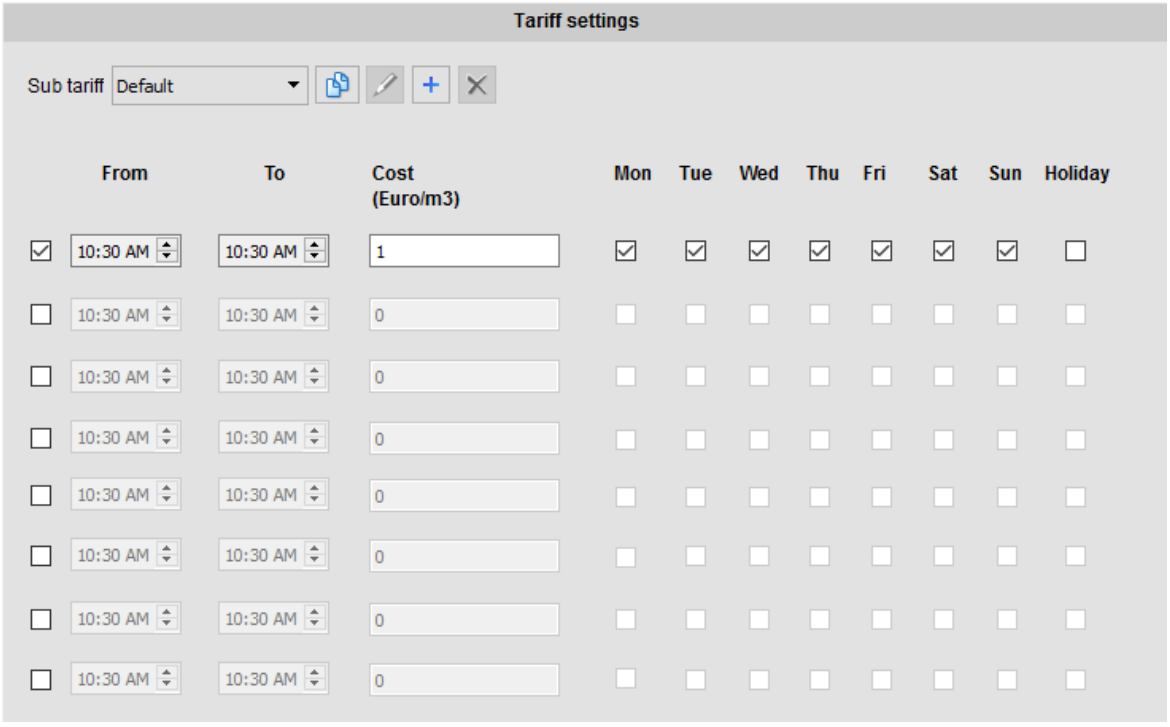
✧ Select the required medium to be configured from the medium tree.

The **General settings** section displays the **Medium unit** and **Currency** used.



[sc_pm_generalsettings, 1, en_US]

✧ In the **Tariff settings** section, select a **Sub Tariff** from the drop-down list.



[sc_pm_tariffsettings, 1, en_US]

✧ Set the **From** time, **To** time, currency/unit (example: Euro/m^3), and the days of the weeks for which the tariff is applicable.

NOTE

The **From** time and **To** time is not applicable for the default sub tariff.

✧ Select the **Holiday** option if you want to apply the tariff for the holidays too.
The system ensures that there is no time overlap or errors. You receive an error message if the total daily period deviates from the 24-hour day, or the defined weekdays do not result in a 7-day week.

✧ Click to copy the sub tariff.
The **Duplicate sub tariff** dialog is displayed.

✧ Enter a **New name for the sub tariff** and click **Apply**.
A duplicate of the selected sub tariff is created.
The system shows an error if the validity range of 2 sub tariff sets overlap.

✧ Click to set a period.
The **Calendar** is displayed.

✧ Set the **Valid from** date and click **OK**.

✧ Set the **Valid to** date and click **OK**.
The duplicated sub tariff will be valid only in between the selected period.

✧ Select **Apply every year**, to set the sub tariff for every year.

✧ Click to rename the selected sub tariff.
The **Rename sub tariff** dialog is displayed.

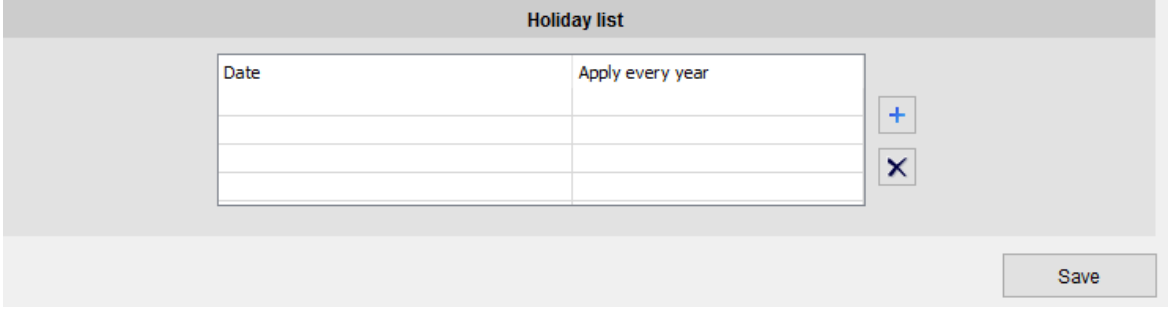
✧ Enter the value for **New name for the sub tariff** and click **Apply**.
The sub tariff is renamed.

✧ Click to add a new sub tariff.
The **Add sub tariff** dialog is displayed.

✧ Enter a **New name for sub traiff**.

✧ Click **Apply**, to rename the sub tariff.
The new sub tariff is added to the **Sub tariff** drop-down list and its settings are displayed.

✧ Click to delete the selected sub tariff.

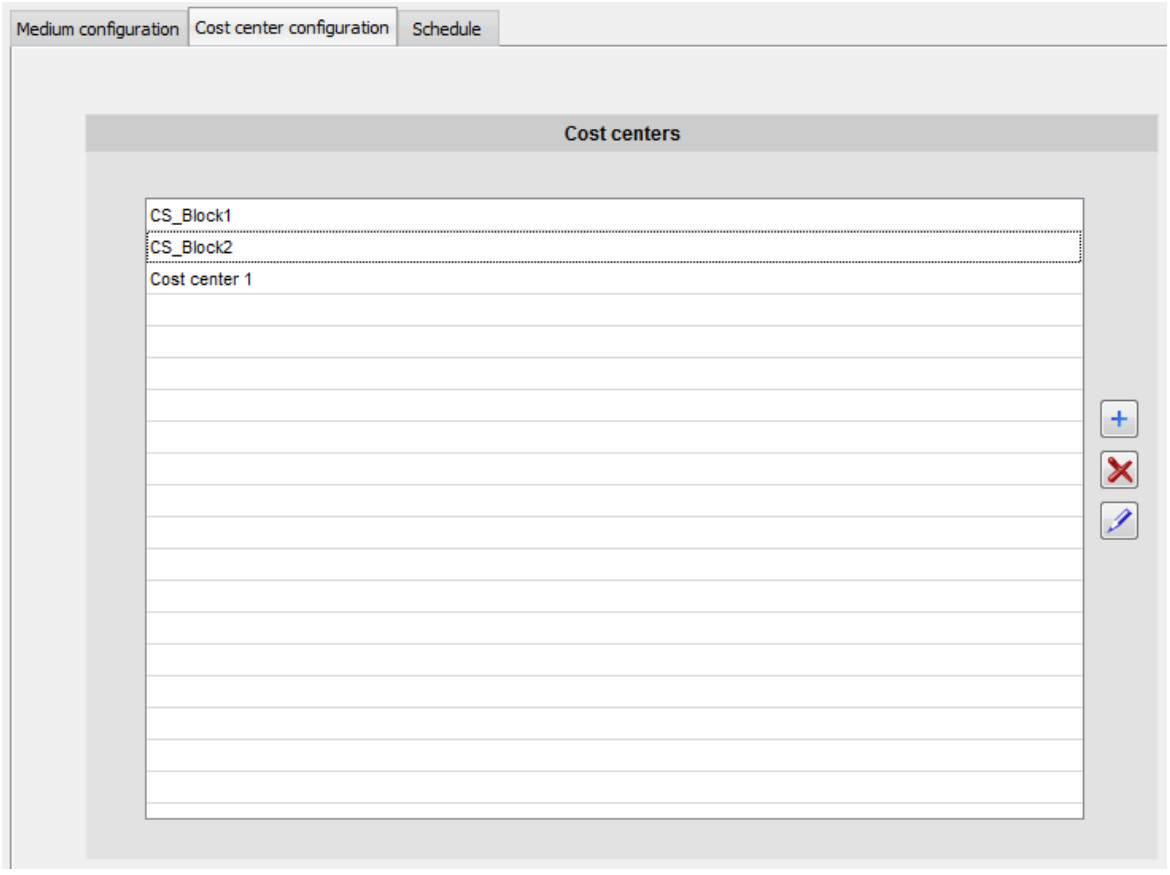


[sc_pm_holidaylist, 1, en_US]

- In the **Holiday list** section, click .
  The **Calendar** is displayed.
- Select a day and click **OK**.
  The date will be added to the date list.
- Select the option in the **Apply every year** column, to apply the selected date as holiday every year.
- Click **Save**, to save the created sub tariffs.

Cost center configuration tab

The **Cost center configuration** tab consists of the **Cost centers** list.

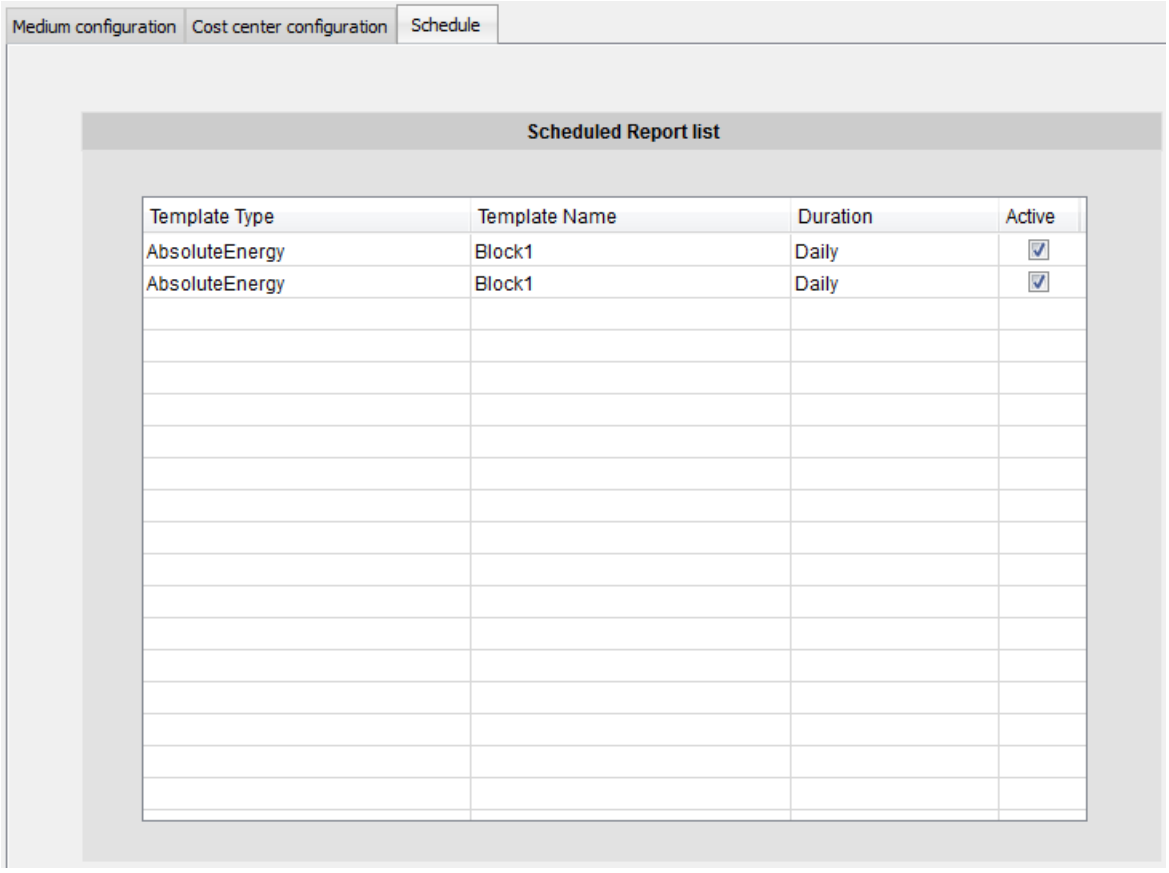


[sc_Cost_Cent_Config, 1, en_US]

- Click .
  The **Add cost center** dialog is displayed.
- Enter a **Name** for the cost center and click **Apply**.
  The cost center will added to the **Cost centers** list. This cost center can be used to create reports.
- Click to delete the selected cost center.
- Click to rename the selected cost center.
  The **Rename cost center** dialog is displayed.
- Enter a new **Name** for the cost center and click **Apply**.

Schedule tab

The **Schedule** tab consists of the **Scheduled Report list**.
This list displays the reports which are scheduled for creation.



[sc_Schedule_Set_Tab, 1, en_US]

✧ It displays the type of report that is to be created (**Template type**), the name of the report (**Template name**), the period of the report (**Duration**), and whether it is **Active** or not.

7 Tools

7.1 Trends

7.1.1 Overview

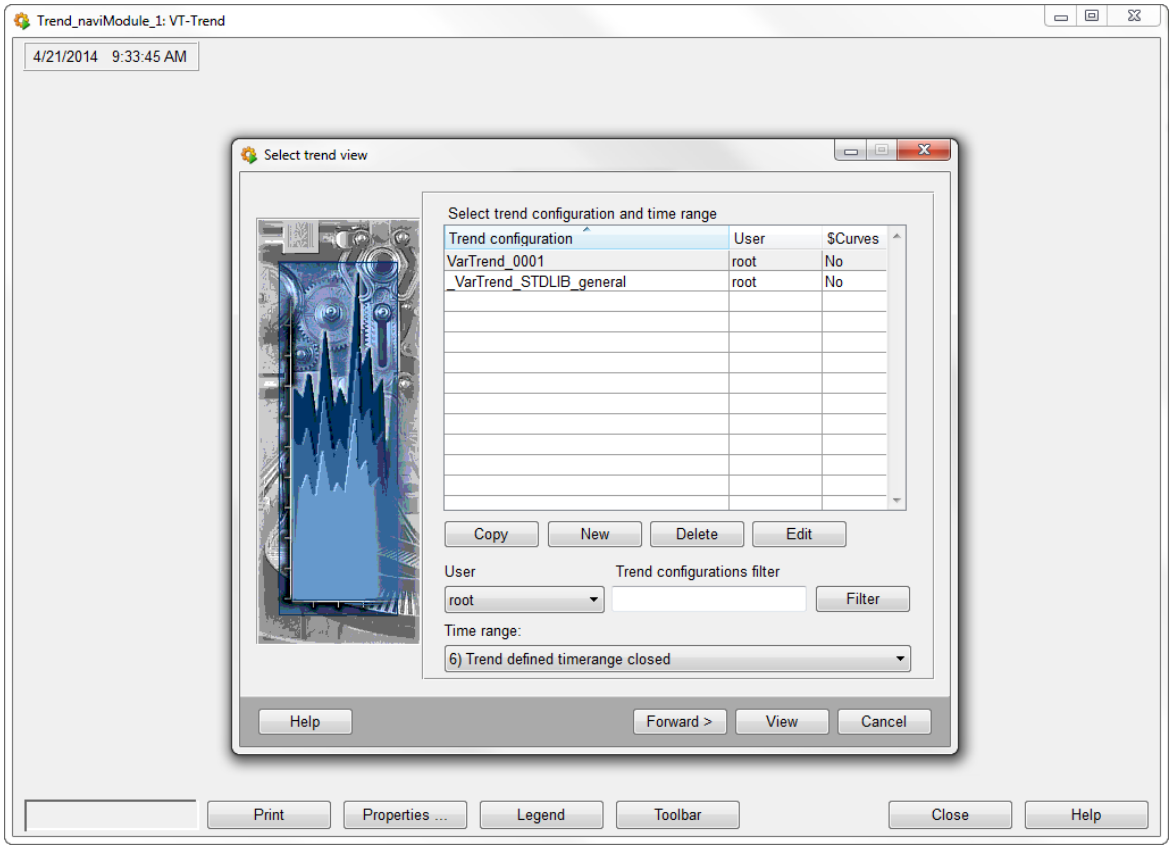
Trends allow you to represent the variations in the values of a device over a specific time range. A trend can contain any number of hierarchically arranged areas for representing curves, with scales and legends. Value-over-time and value-over-value representations are both possible here.

7.1.2 Creating a Trend View

To create a trend view:

✧ Click  in tool bar.

An empty **Trend** window and the **Select Trend View** dialog open.



[sc_SelectTrendView_Dialog, 1, en_US]

Figure 7-1 Select Trend View Dialog

NOTE

If the **Select Trend View** dialog does not open, click **Properties...** in the **Trend** window to open the dialog.

✧ On the **Select Trend View** dialog, click **New**.

✧ Assign a name to the new trend and click **OK.**

The new trend view is created and is visible in the **Select trend configuration and time range** list on the **Select Trend View** dialog.

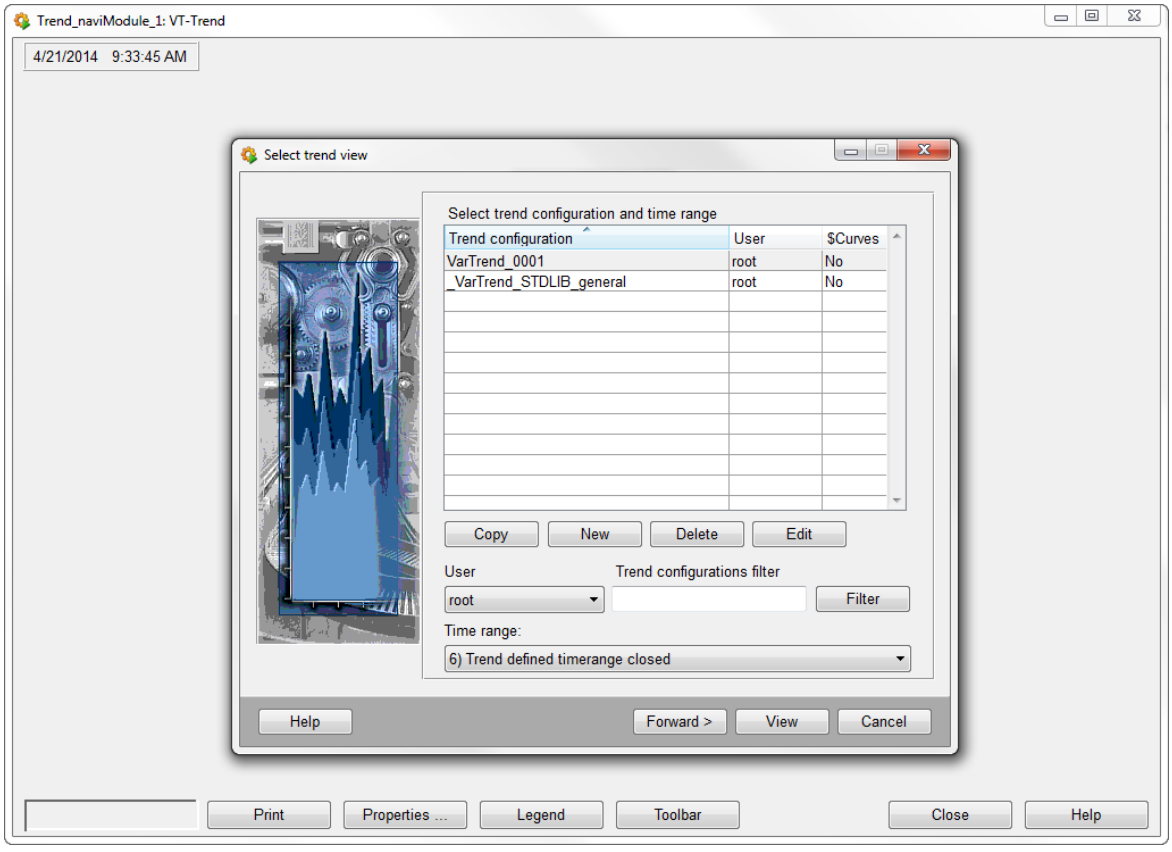
✧ Close the **Select Trend View** dialog and start the configuration of the new trend view.

7.1.3 Configuring Trend View

To configure a trend view:

✧ Click  in the tool bar.

An empty **Trend** window and the **Select Trend View** dialog open.



[sc_SelectTrendView_Dialog, 1, en_US]

Figure 7-2 Select Trend View Dialog

✧ From the **Select trend configuration and time range** list on the **Select Trend View** dialog, select the trend view that you want to edit.

✧ Click **Edit**.

The **Trend Configuration Editor** window opens.

In the **Trend Configuration Editor** window, select the datapoint and define the time range.

For more information, see *7.1.4 Selecting a Datapoint*.

✧ Click **OK** to close the **Trend Configuration Editor** window.

✧ In the **Select Trend View** window, select the time limitation from the **Time Range** list box.

There are two types of time ranges available to complement the time ranges selected from the Trend Configuration Editor:

Open: The values for these time ranges come from the database. Additionally, new values are added to these time ranges online.

Closed: The values for these time ranges come exclusively from the database.

✧ Click **View** if the time range is closed.

- or -

✧ Click **Forward** if time range is open.
In this scenario, define the Start time and End time for the time range.
Click **View**.

The trend window shows the configured trend view.
The trend retains all its configurations if it is used again.

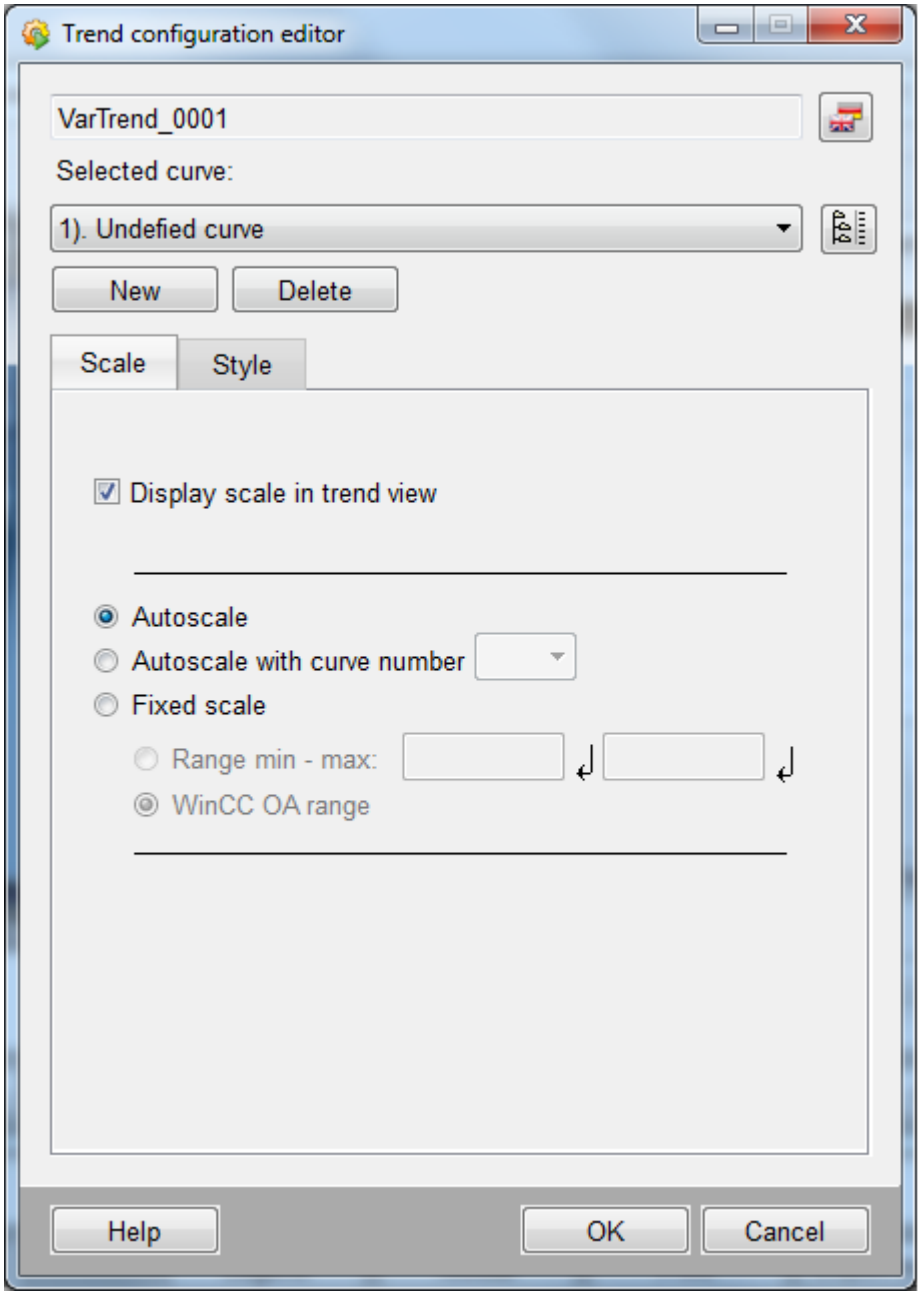
NOTE

The trend view allows visual comparison of individual trends. You can add or remove datapoints from the trend view to modify the results. For more information, see *7.1.4 Selecting a Datapoint*.

7.1.4 Selecting a Datapoint

Selecting a Datapoint Using Trend Configuration Editor Window

Select the datapoints for the trend view from the **Trend Configuration Editor** window.
You can accommodate one or more datapoints in the view. Visual comparison of individual trends is thus possible. A maximum of 16 datapoints can be represented in one trend.



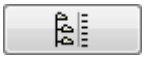
[sc_TrendConfigEditor_Window, 2, en_US]

Figure 7-3 Trend Configuration Editor Window

To select datapoints for a trend view:

- ✧ From the **Selected Curve** list box, select **Undefined Curve**.

  - or -

- ✧ If **Undefined Curve** entry is not available in the list box, click **New** to create an entry.
- ✧ Click  to assign a datapoint to the curve.

  The **dpSelector** window opens.

✧ Select the datapoint in the **dpSelector** window, and click **OK**.
The new datapoint name is displayed in the **Select datapoint with datapoint selector** and **Selected Curve** field.
You can further customize the trend view on the **Scale** and **Style** tabs on the **Trend Configuration Editor** window.

✧ Click **OK**.

The datapoint is added to the trend view. The trend is displayed for the defined time range.

7.1.5 Displaying the Trend View

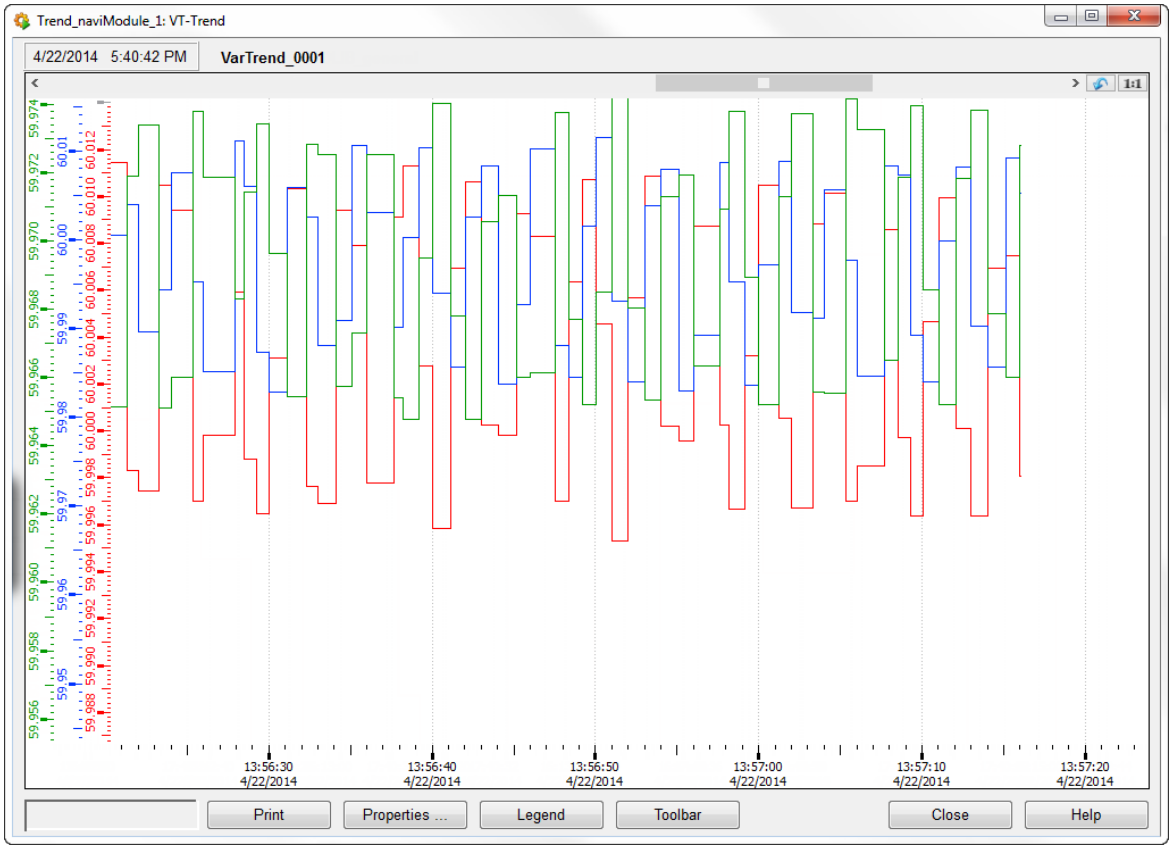
Opening a Trend View

Click  from the tool bar to open the **Trends** window.

- If the **Trends** window was last closed using the  button or the **ALT + F4** command, it opens the last closed trend view.
- If the **Trends** window was last closed using the **Close** button on the window, it opens an empty trend view along with the **Select Trend View** dialog.
  You can open a trend view from this dialog.

You can open an existing trend view.

Viewing the Trend Window



[sc_TrendView_Window, 1, en_US]
Figure 7-4 Trend View

- Click the graphic to open the **Trend Ruler Values** window.
- Use the scroll wheel to zoom in and out of the trend view.
- Click **Legend** to open the header area. The header area lists the datapoints, which enables displaying and hiding of the curves.

7.2 Alert Classes

In device engineering, you can configure an alert class for each alert.

Configuration

Group	Element	Display	Address	Archive	Alert	High alert	Low alert	Alert class	Unit
Voltage	amplitude unbalance voltage	☐	☑	☐	☑	1000.00	-1000.00	warning	%
Voltage	3-phase average voltage PH-N	☐	☑	☐	☑	1000.00	-1000.00	warning	V
Voltage	3-phase average voltage PH-PH	☐	☑	☐	☑	1000.00	-1000.00	warning	V
Voltage	max. 3-phase average voltage PH-N	☐	☑	☐	☑	1000.00	-1000.00	warning	V
Voltage	max. 3-phase average voltage PH-PH	☐	☑	☐	☑	1000.00	-1000.00	warning	V
Voltage	max. voltage L1-N	☐	☑	☐	☐	1000.00	-1000.00	warning	V
Voltage	max. sliding window demand voltage L1-N	☐	☑	☐	☐	1000.00	-1000.00	warning	V
Voltage	max. voltage L2-N	☐	☑	☐	☐	1000.00	-1000.00	warning	V
Voltage	max. sliding window demand voltage L2-N	☐	☑	☐	☐	1000.00	-1000.00	warning	V
Voltage	max. voltage L3-N	☐	☑	☐	☐	1000.00	-1000.00	warning	V

[sc_AlertClasses, 1, en_US]

Figure 7-5 Alert Classes

High and low limits of measured values always belong to the same alert class.

You can select the alert class from a list box.

The following types of alert classes are available:

List box in device engineering	Alert class (DPE)	Color	Type of acknowledgement
Warning not acknowledgeable	Warning does not require acknowledgement	Yellow	Cannot be acknowledged
Warning	Warning requires acknowledgement	Yellow	CAME or WENT requires acknowledgement
Alert not acknowledgeable	Alert does not require acknowledgement	Red	Cannot be acknowledged
Alert	Warning requires acknowledgement	Red	CAME or WENT requires acknowledgement

Priority	Time	Data point description	Alert description	Direction	Value	Acknowledgement
	3/10/2016 5:29:52 PM	1500 Device connection state PAC 1500	Connection failure	CAME	FALSE	
	3/10/2016 5:57:25 PM	4200 example connection state to PAC4200	connection failure	CAME	FALSE	

[sc_Alarms, 2, en_US]

Figure 7-6 Base Panel's Alert Area

- The abbreviations are displayed in the first column of the alert area.
- The priority of the alert is displayed in the second column of the alert area.
- **Cannot be acknowledged**: The alert area can only be in the **CAME** or **no alert** state. The normal state is only achieved by a value change. Acknowledgement is not possible.
- **CAME or WENT required acknowledgement**: Each alert range can be in one of the following states.
  - came/unacknowledged
  - came/acknowledged
  - went/unacknowledged
  - No alert

    The normal state is only achieved by a value change and acknowledging the alert. However, for acknowledging the alert, acknowledge either the **came** alert in the **came/unacknowledged** state or the **went** alert in the **went/unacknowledged** state.

Alert Coding

Color	Cycle	Meaning
Yellow	Flashing rapidly	Pending, unacknowledged warning
Yellow	Flashing slowly	No longer pending, unacknowledged warning
Yellow	Uninterrupted	Pending, acknowledged warning
Red	Flashing rapidly	Pending, unacknowledged alert
Red	Flashing slowly	No longer pending, unacknowledged alert
Red	Uninterrupted	Pending, acknowledged alert

7.3 Data Evaluation - Advanced Report

7.3.1 Overview of Data Evaluation

powermanager Excel Report is an Excel application that provides access to process data, and support for simple generation of reports based on this data.

You can define further compression levels over and above those present in the powermanager database in Excel for special cases. Once report templates are created, you can share them for use with different time ranges (daily report, monthly report).

7.3.2 powermanager Report

7.3.2.1 Overview powermanager Excel Report

Use powermanager Excel Report as a report generator.

To create a report for a defined period, the system accesses the template and fills it with data from the powermanager process database.

Automatic report creation is time-driven and does not require user intervention.

The following report types are available for selection:

- Energy report
- Cost center report
- Comparison report (measuring point/measured value)
- Duration curve report

You can generate a report in the following three ways:

- Manual
- Semiautomatic
- Fully automatic

7.3.2.2 Opening the powermanager Report

To open the powermanager report window:

✧ In the menu bar, click **Tools** > **Report** in the Icon Line.

Microsoft Excel opens in the **powermanager Report** window.

The default file name of the Microsoft Excel file in powermanager report window is **`Report.xls`**.

7.3.2.3 powermanager Report

The powermanager report window consists of the following components:

Component	Description
Template	
New	Click **New** to create a report template.
Open	Click **Open** to open an existing template for editing.
Reports	
New	Click **New** to create a report based on an existing template.
Open	Click **Open** to open an existing report.
Quick Selection	The **Quick Selection** area enables semiautomatic report creation based on a template and saved information about the report type and the report period. Click **Create report** to create and open a report with the previously selected entry in the **Quick Selection** area.

Additional Menu Titles

The menu bar of the powermanager report window contains three additional menu titles:

- Report
- Template
- Reports

The menu titles contain the additional Excel commands that you need for working with the powermanager report generator.
The menu titles are available in all Excel windows that you open from the start window.
The menus are only available if you open an Excel template from the powermanager report window.

7.3.2.4 Returning to the powermanager Report Window

To return to the **`Report.xls`** window when multiple windows are open:

- Click the **View** tab, and click **Switch Windows > Report.xls**.

7.3.2.5 Closing powermanager Report

To close the powermanager report window:

✧ Save and close all the open report windows except **`Report.xls`**.

✧ Close **`Report.xls`**.

NOTE

If you try to close Report.xls without closing all the other report windows, you get the following message:
`The project cannot be terminated as project files are still open!`

7.3.2.6 Menus in powermanager Excel Report

The Report Menu

Menu Command	Description
Update Templates	Update the templates to the latest Excel Report versions.
Quick Selection	Configure display of the **Quick selection** area on the powermanager report homepage (**`Report.xls`**).
Schedule	Set the times for automatic creation of reports and the subsequent report printing and saving actions.
Mailing List	Create a list of recipients for sending the reports by e-mail. The finished report can be sent either automatically with a schedule or manually.
Password	Enter a password to configure the Excel Report.
Info	An information window containing the current version information, links to the powermanager homepage and the Siemens AG contact addresses.

The Configuration Submenu

Enter a password to configure the Excel Report.

Menu Command	Description
Change Password	Assign a new password.
Options	Configure operating options. For example, communication, password assignment, and so on.
Archive Structure	Read the archive structure file.
Basic Values	Select the time values and the interval on which one report type is based.

Menu Command	Description
Report Types	Define the connection between the datapoint types or names (represented by the basic values) and their archive values for each type of report.
Status Bits	Assign display formats depending on powermanager status bits (for example, identifying invalid values as crossed through).
Tariff Sets	Create new tariff sets and edit or delete existing ones.
Cost Centers	Create new cost centers based on a tariff set and edit or delete existing ones.
Media	Create new media and edit or delete existing ones.

The Template Menu

Menu Command	Description
New	Create a template based on a master template. The **Report format** dialog opens. By default, the master template is selected in the **Format** box.
Open	The **Select a file** dialog opens. To edit a template, select a template file in the dialog.
Configure	The **Report types** dialog opens.
Add spreadsheet	Add a spreadsheet or another template.
Delete spreadsheet	Delete a marked sheet.
Insert Measured Value	Select a data source or a datapoint to insert at the marked location (column or row assignment for datapoints).
Modify DP	Update the datapoint assignment for a column (or row).
SQL Wizard	Dialog-based compilation of an SQL query (only active when using the SQL template).

The Reports Menu

Menu Command	Description
New	Create a report using a template along with details of the time range (period).
Open	The **Select a file** dialog opens. To edit a report file, select it in the dialog.
Send mail	powermanager e-mails an existing report which is open. The information is taken from the mailing list and is made available for selection.
Save as HTML	Save an open report as an HTML page.

7.3.3 Data Evaluation

7.3.3.1 Report Types

Energy Report

The energy report is available for exporting power demand values.

Cost Center Report

The cost center report calculates the demand and the costs of several media in one report.

It also supports manual unit conversion. This unit conversion allows you to enter a denominator.

Calculating the Costs

Costs are calculated for every medium within one cost center as soon as a measuring point is assigned to the medium within the cost center. Depending on the report type, the report queries all demand values of the measuring point within the query period (for example, all hourly values of one day).

For calculation, the respective tariff is determined for each demand value and the costs for each demand value are calculated based on the demand value, the weighting, and the tariff. To determine the associated tariff,

the associated tariff rate is first determined using the cost center assigned to the demand value and the assigned medium.

Determine the associated subtariff rate using the validity of the subtariff rate and the time stamp of the demand value. The tariff within the subtariff rate then also results from the time stamp of the demand value.

The following values are calculated based on these single costs and single demand values:

- Total costs of one medium in one cost center
- Total demand of one medium in one cost center
- Total costs of one medium across all cost centers
- Total demand of one medium across all cost centers
- Total costs of one cost center

Tabular Display of the Cost Center Report

You can use the tabular display of the cost center report on several media. If a medium is not used in a cost center, the costs and demand are displayed as a blank line.

The total costs of a cost center result from the sum of the costs for each medium. The values of the costs are added up without checking the unit or the currency of the single costs. The currency of the costs of the first medium in the table appear in the heading of the total costs.

Chart Display of the Cost Center Report

You can use the chart display of the cost center report with several media. All media with demand and costs are displayed for each cost center.

To improve clarity, the chart is split into two single charts if there are 10 or more media per cost center. One chart shows the demand, while the other shows the correlating costs. If the cost center for demand and costs is the same, the bars on the charts show the same color. As different media are displayed for the Demand chart, the unit is also displayed in the graphic next to the value. In the Costs chart, however, only the costs without the unit are displayed on the left-hand axis.

Report Template for Comparing Demand Measurements (Measuring Point Comparison)

Use the measuring point comparison to add up the energy demand values of different measuring points over a time and compare them in a bar chart.

The report template consists of two table sheets. The first table sheet contains a report belonging to the standard report type. Insert any counted values into the template. The unit pertaining to the first measuring point is displayed in the chart display. The unit is not checked. A denominator and a unit can be specified for unit conversion. All values are divided with the denominator before they are displayed in the chart. The manually assigned unit then substitutes the unit of the measuring points in the chart display.

There is a bar chart on the second table sheet. This chart is preconfigured so that it shows the sum of the single values of each measured value as a bar. The values queried in the event of a query from the database are determined via the report types. When defining the report type, it is possible to select between 15-minutes, hourly, and daily values. The Data entry in the report type definition is evaluated in this case.

Comparing Measured Values Over Different Time Periods (Measuring Point Comparison)

Use the Comparison Report template to compare several measured values over different periods of time.

You can cancel and select the count values for the comparison. Only the first 10 counted values are considered when creating a chart. The values queried in the event of a query from the database are determined via the report types. You can select between 15-minutes, hourly, and daily values. The Data entry in the report type definition is evaluated in this case.

Duration Curve Report

A sorted duration curve is a chart in which the power demand of a load is displayed as a function of the usage time of this power. In powermanager V3.4, use the **`ContinuousLine.xltm`** report template to create such a sorted duration curve. The power demand value is taken as the basic value for calculating a duration curve. Therefore, enter the measured value in a defined cell in the template. It is entered manually or via a data entry

dialog in which, after selecting a device, you are offered its power demand values. The dialog offers only power demand values whose time stamp is at the start of the calculation interval. The query period selected when making the query defines the time range of the query. You can save the template any number of times under a different name.

7.3.3.2 Evaluating Data

Ensure that the following prerequisites are met before you start evaluating data:

- The powermanager Excel report is open.
- A medium is created.
- A tariff set is created.
- A cost center report is created.

To evaluate data:

✧ Create a template.

✧ Insert datapoints in the template.

✧ Save the template in the following location:
`\proj_path\data\xls_report\Template\`

NOTE

Save the template in XLTM format.

✧ Use the new template to create a report.

✧ Save the report in the following location:
`\proj_path\data\xls_report\Report\`

NOTE

Save the report in XLSM format.

The data is evaluated.

Additional Options

- Set up a quick selection.
- Create a schedule.
- After generating the report, you can also create a chart with values selected from the retrieved values with the aid of the Chart Wizard under MS Excel.

7.3.4 Media

7.3.4.1 Overview of Media

The label and unit define a medium.
Use a medium to define the tariff set.

7.3.4.2 Creating a Medium

To create a medium:

✧ Open the powermanager report window.

✧ Click the **Add-Ins** tab, and click **Report > Configuration > Media**.

- ✧ In the **Password** dialog, enter the password as **erAdmin** and click **OK**.
  The **Medium** window opens.
- ✧ In the Medium window, click  .
  The **Media** dialog opens.
- ✧ In the **Media** dialog, enter the name and unit of the medium in the respective fields.
- ✧ Click **OK**.

A medium is created. The medium is available for selection when defining a tariff set.

7.3.4.3 Deleting a Medium

Before deleting a medium, ensure that it is not in use in a tariff set.

- ✧ Click the **Add-Ins** tab, and click **Report > Configuration > Media**.
  The **Password** dialog opens.
- ✧ Enter the valid password and click **OK**.
  The **Media** dialog opens.
- ✧ In the **Media** dialog, click the medium you want to delete.
- ✧ Click  .
  If a tariff set is using the medium, the following message is displayed: *Medium is still in use in tariff set: <tariff set name>*.
- ✧ Click **OK** to confirm.
- ✧ Click **OK** to close the **Media** dialog.
- ✧ Assign a new medium to the tariff set.
- ✧ Repeat the operation until the medium is deleted.

The medium is deleted.

7.3.5 Tariff Sets

7.3.5.1 Overview of Tariff Sets

A (sub)tariff set is a charged price that refers to one media unit (kWh, m³) and which applies to one specific period of time.

In order to define a valid tariff for a specific day of the week at a specific time, parameterize the tariff sets in Excel Report.

You can assign only one medium for each tariff set.

You can define up to 12 tariffs for each tariff set. The tariffs are numbered from **Tariff 1** to **Tariff 12**. The time of the day and the price charged for each unit are defined in each tariff.

You cannot delete or change the time range of the **Default** subtariff set. This subtariff rate is valid whenever no other subtariff rate is defined. The validity periods of the individual subtariff sets must not overlap.

A tariff set is not bound to a specific template, but is available for general use.

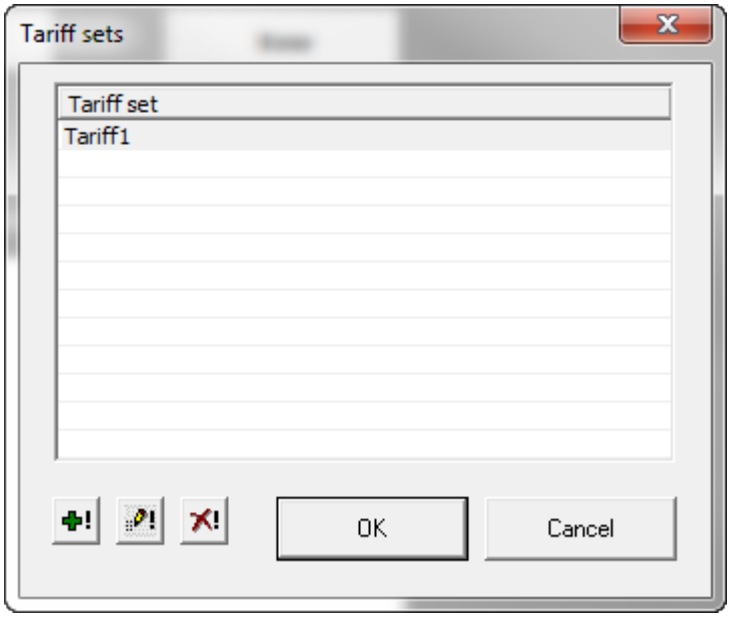
7.3.5.2 Creating a Tariff Set

Before creating a tariff set, ensure that you create at least one medium.

To create a tariff set:

- ✧ Open the powermanager report window.
- ✧ Click the **Add-Ins** tab, and click **Report > Configuration > Tariff Sets**.

✧ In the **Password** dialog, enter the password as **erAdmin** and click **OK**.
The **Tariff sets** window opens.



[sc_TariffSets_Window, 1, en_US]
Figure 7-7 Tariff Sets Window

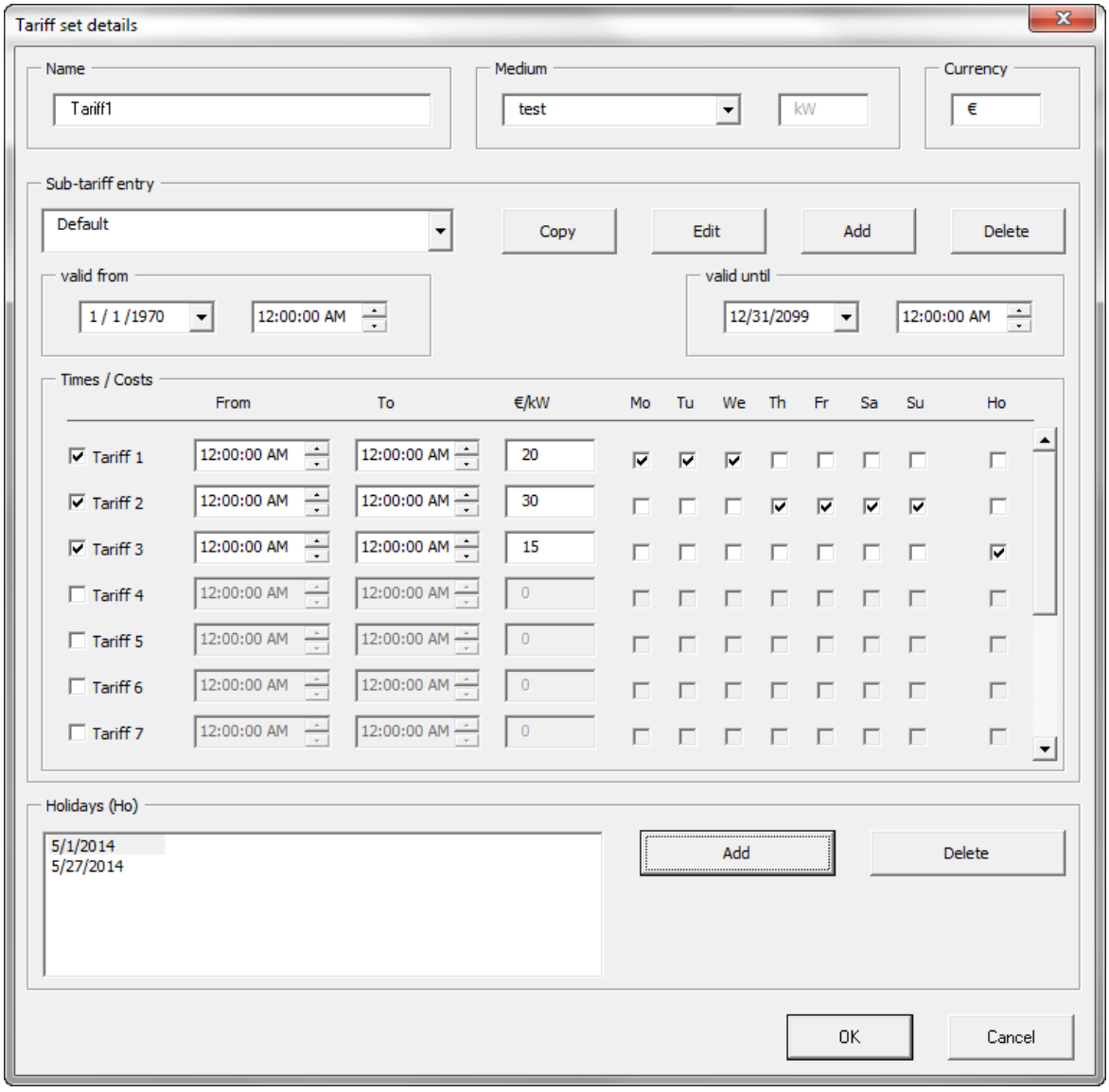
✧ In the **Tariff sets** window, click  .
The **Tariff set Details** window opens.

✧ Enter the tariff data in the **Tariff set Details** window.
For the description of all the fields in the **Tariff set Details** window, see Tariff set Details Window.

✧ Click **OK**.

Tariff set Details Window

You can define 12 tariffs per subtariff set. The tariffs are numbered from **Tariff 1** through **Tariff 12.**



[sc_TariffSetsDetails_Window, 1, en_US]

Figure 7-8 Tariff Set Details

The **Tariff sets Details** window contains the following fields:

- **Name**
  Name of the tariff set.
- **Medium**
  Material or energy type with an assigned unit that is priced in the tariff.
- **Currency**
  Currency of cost recording.

- **Sub-tariff Set**
  All data within the **Sub-tariff set** area refers to the currently selected subtariff set.
  You can see the existing subtariff sets in the list box in this area.
  The **Sub-tariff set** area has the following components:
  - **Copy**
    Click **Copy** to create a copy of the currently open subtariff set.
  - **Edit**
    Click **Edit** to change the name of the subtariff set.
  - **Delete**
    Click **Delete** to delete the subtariff set.
    powermanager does not prompt you for confirmation after you click **Delete**.
  - **Valid from**, **Valid to**
    The time range for which the subtariff set is valid.
    The system shows an error if the validity range of two subtariff sets overlap.
    The set the validity of the subtariff set to one day, set the validity from 00:00:00 h to 23:59:59 h.
- **Times/Costs**
  Under the **Times/Costs** area, select a tariff to activate it.
  Specify the following information for each tariff that you select:
  - Specify the validity period for the tariff.
    The validity period must be exact to the hour. If you specify the period in minutes or seconds, then powermanager rejects the validity period.
    By default, the validity period is set from 00:00:00 to 00:00:00, indicating a validity of a full day.
  - Price for the consumption time.
  - The days of the weeks for which the tariff is applicable.
    Select the **Ho** option if you want to apply the tariff to the holidays too.
    The system ensures that there are no time overlaps or errors. You receive an error message if the total daily period deviates from the 24-hour day or the defined weekdays do not result in a 7-day week.
- **Holidays (Ho)**
  You can list the public holidays in the **Holidays** box.
  For more information, see Defining Holidays in the following section.

Defining Holidays

To define the holidays for the period that is recorded in the cost center report:

✧ In the **Holidays (Ho)** area, click **Add**.
The **Insert Date** dialog opens.

✧ In the **Insert Date** dialog, enter the date of the holiday.

✧ Click **OK**.

The specified date is added to the list of holidays.

Creating a Sub-tariff Set

To create a subtariff set:

✧ Click **Add** to create a subtariff set.
The **Sub-tariff entry** dialog opens.

✧ In the **Name** field, enter a valid name for the subtariff.

✧ Click **OK**.

✧ In the **Sub-tariff entry** area, enter the start and end date of the subtariff validity period.

The subtariff set is created.

7.3.5.3 Deleting a Tariff Set

Delete a tariff set only if it is not assigned to a cost center.

If you delete a tariff set that is assigned to some cost center, then the cost center configuration becomes invalid.

To delete a tariff set:

✧ Open the powermanager report window.

✧ Click the **Add-Ins** tab, and click **Report > Configuration > Tariff Sets**.

✧ In the **Password** dialog, enter the password as **erAdmin** and click **OK**.
The **Tariff sets** window opens.

✧ In the **Tariff sets** window, select the tariff set that you want to delete and click .

✧ Click **OK** on the confirmation message.

7.3.6 Cost Centers

7.3.6.1 Overview of Cost Centers

A cost center is not bound to a specific template, but is available for general use.

You can assign one tariff set to any number of cost centers.

You can assign one cost center to a maximum of 10 tariff sets.

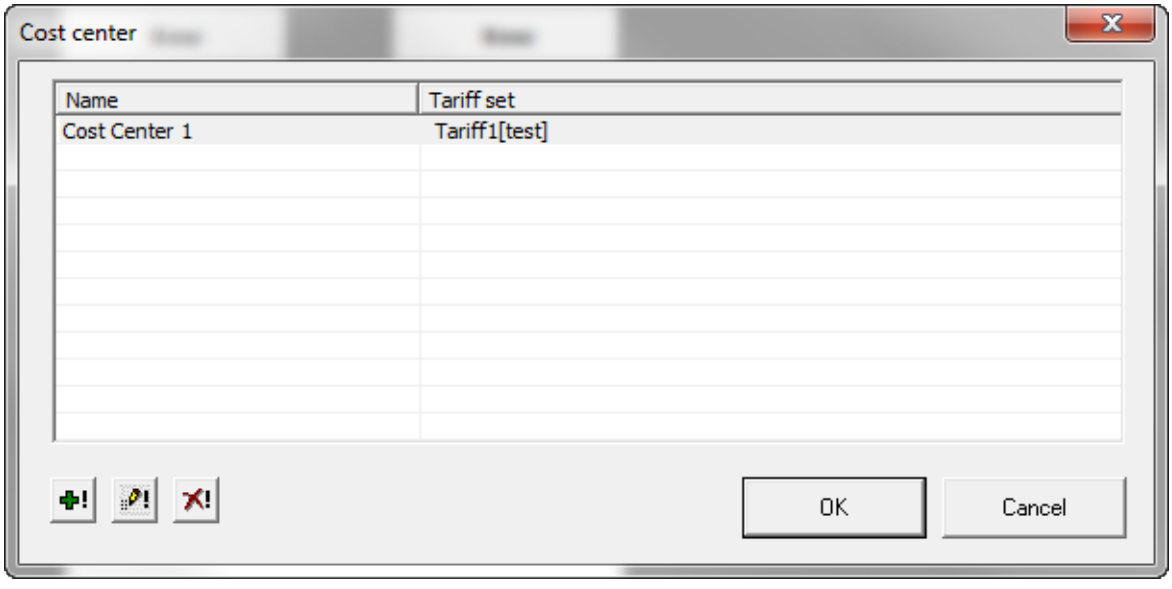
7.3.6.2 Creating a Cost Center

To create a cost center:

✧ Open the powermanager report window.

✧ Click the **Add-Ins** tab, and click **Report > Configuration > Cost Centers**.

✧ In the **Password** dialog, enter the password as **erAdmin** and click **OK**.
The **Cost Center** window opens.



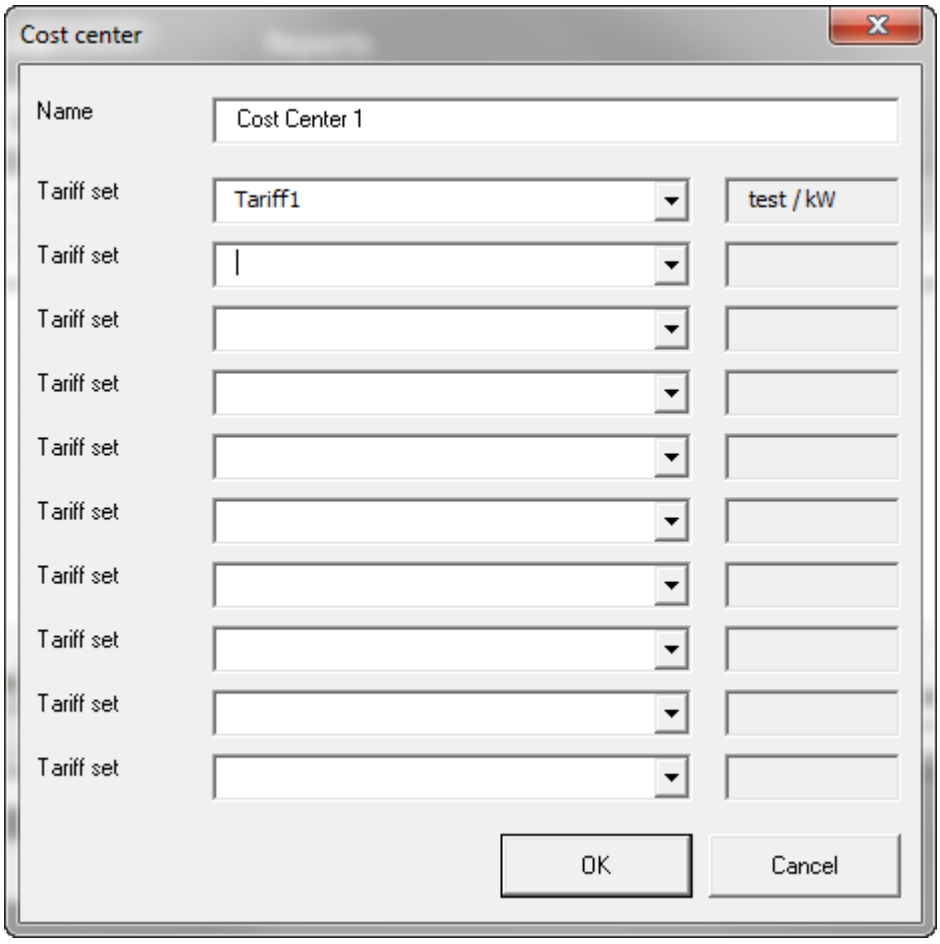
[sc_CostCenters_Window, 1, en_US]

Figure 7-9 Cost Center Window

✧ In the Cost Center window, click  .

The **Cost Center** dialog opens.

If there are no tariff sets defined, powermanager does not open the **Cost Center** dialog and shows an error message.



[sc_CostCenterDialog, 1, en_US]

Figure 7-10 Cost Center Dialog

✧ Enter the following information in the **Cost Center** dialog:

Name: The cost center name.

Ensure that the cost center has a unique name.

Tariff set: You can assign up to 10 tariff sets to one cost center.

Select the tariff sets from the list box.

✧ Click **OK**.

7.3.6.3 Deleting a Cost Center

NOTE

Only delete a cost center if it is not used in a template.

The delete command deletes the cost center immediately without prompting for confirmation. Templates that access the deleted cost center will no longer function.

To delete a cost center:

✧ Open the powermanager report window.

✧ Click the **Add-Ins** tab, and click **Report > Configuration > Cost Centers**.

✧ In the **Password** dialog, enter the password as **erAdmin** and click **OK**.
The **Cost Center** window opens.

✧ In the **Cost Center** window, select the cost center that you want to delete.

✧ Click  to delete the selected cost center.

7.3.7 Templates

7.3.7.1 Overview of Templates

The predefined powermanager standard report templates are Excel templates. Enter the operating data in these Excel templates to customize them according to your specifications.
The templates serve as samples for the reports.
The created templates are stored in Excel. Template files have the **XLTM** extension and are stored in the default templates directory of the reports. The templates dialog automatically displays the correct path.

Report Format

The report generator uses the term **format** to describe the type of report, for example, Cost center report. From the technical perspective, the format encompasses the underlying standard template and all the automatic mechanisms set up for data selection and representation.

7.3.7.2 Creating a Template

Prerequisites

Before creating a template, ensure that the following prerequisites are met:

- The master template of the selected report type is available.
- At least one tariff set is defined on creation of the default cost center report.
- At least one cost center is defined on creation of the default cost center report.

To create a template:

✧ Click **New** under **Template** area.

- or -

✧ Click the **Add-Ins** tab, and click **Template > New**.

✧ In the **Report format** window, select the report format.

✧ Click **OK**.
The **Report types** window opens.

✧ Select one or more report types.
For more information, see Report Types in the following section.

✧ Click **OK**.
Excel opens the standard template of the selected report format.

✧ Add the required datapoints to the template.

✧ Click  to save the template.

- or -

✧

For Microsoft Excel 2007, click  , and click **File > Save**.

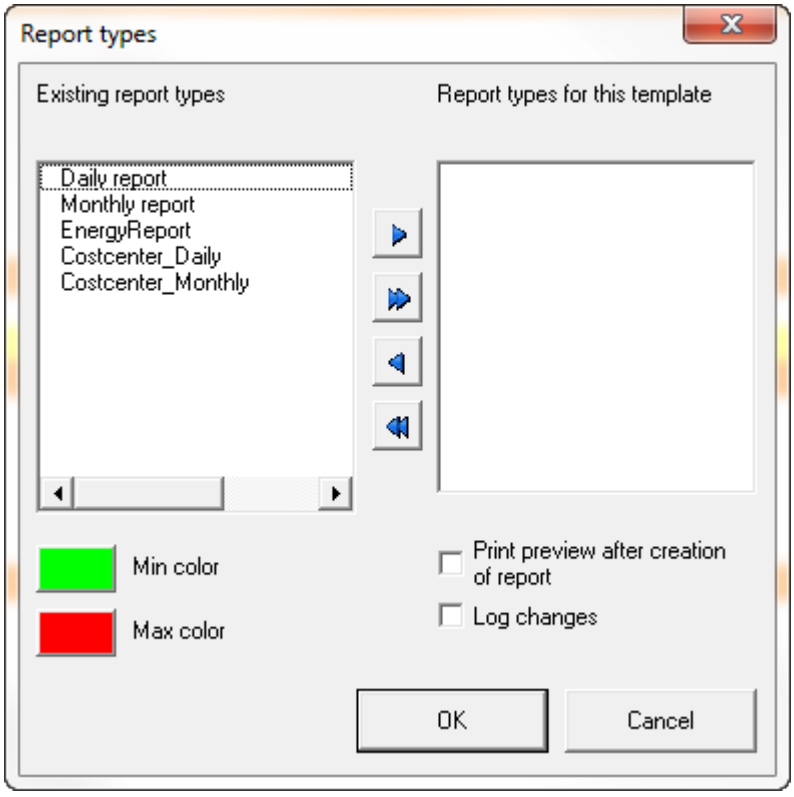
For Microsoft Excel 2010/2013, click the **File** tab and then click **Save**.

Ensure that you do not use the **Save As** option to save the template as this procedure saves the template as an Excel table.

NOTE

Ensure that the name of the template does not end with a number.

Report Types Dialog



[sc_ReportTypes, 1, en_US]

Figure 7-11 Report Types Dialog

- **Existing report types**
  The **Existing report types** box lists all the existing report types.
- **Report types for this template**
  The **Report types for this template** box list all the report types that are used when creating a report.
- Use the **<** and **>** buttons to move individual report types from one box to another.
- Use the **<<** and **>>** buttons to move all the available report types from one box to another.
- The **Min color** and **Max color** boxes define the color coding of the extreme values in the report. Click the buttons to change the color.

7.3.7.3 Opening a Template

To open an existing template:

- ✧ In the start window of the report generator, click **Open** in the **Template** area.

  - or -

- ✧ Click the **Add-Ins** tab, and click **Template > Open**.
  The **Template** option in the menu bar is available in all windows that you open from the report generator window.
- ✧ Open the required template.

7.3.7.4 Editing a Template

To edit an existing template:

- ✧ Click **Open** under **Template** area.

  - or -

- ✧ Click the **Add-Ins** tab, and click **Template > Open**.
  The **Select a file** window opens.
- ✧ Select and open the template that you want to edit.
- ✧ In the **Report format** window, select the report format.
- ✧ Click **OK**.
  The **Report types** window opens.
- ✧ Select one or more report types.
  For more information on report types, see *7.3.8.8 Configuring the Report Type*.
- ✧ Click **OK**.
  Excel opens the standard template of the selected report format.
- ✧ Add the required datapoints to the template. For more information on adding datapoints, see *7.3.9.1 Overview of Datapoints*.
- ✧ Click  to save the template.

  - or -

- ✧ For Microsoft Excel 2007, click  , and click **File > Save**.
  For Microsoft Excel 2010/2013, click the **File** tab and then click **Save**.
  Ensure that you do not use the **Save As** option to save the template as this procedure saves the template as an Excel table.

NOTE

Ensure that the name of the template does not end with a number.

7.3.7.5 Updating Templates

In order to use templates created in an older version of Excel Report in the latest version, adapt these templates suitably.

NOTE

You can only update the templates located in the `Template` directory.

To update a template, select the template and click **Report > Update templates**.

NOTE

Update templates by making changes to the configuration. This concerns changes to the basic values, the report types, and the format templates of the status bits.

7.3.7.6 Conducting SQL Queries

For powermanager Report 3.2 and above, you can execute SQL queries with the Excel Report and display the result as a report.

An SQL master template **SQL query** exists for this purpose.

NOTE

You cannot use aliases for SQL queries with Excel Report. You can, however, use aliases for direct queries via the History Database (HDB).

NOTE

Do not use the SQL Wizard to query datapoints of a distributed system. Only values of the local system are adopted. You cannot add the datapoints of a distributed system to the list of the selected datapoints.

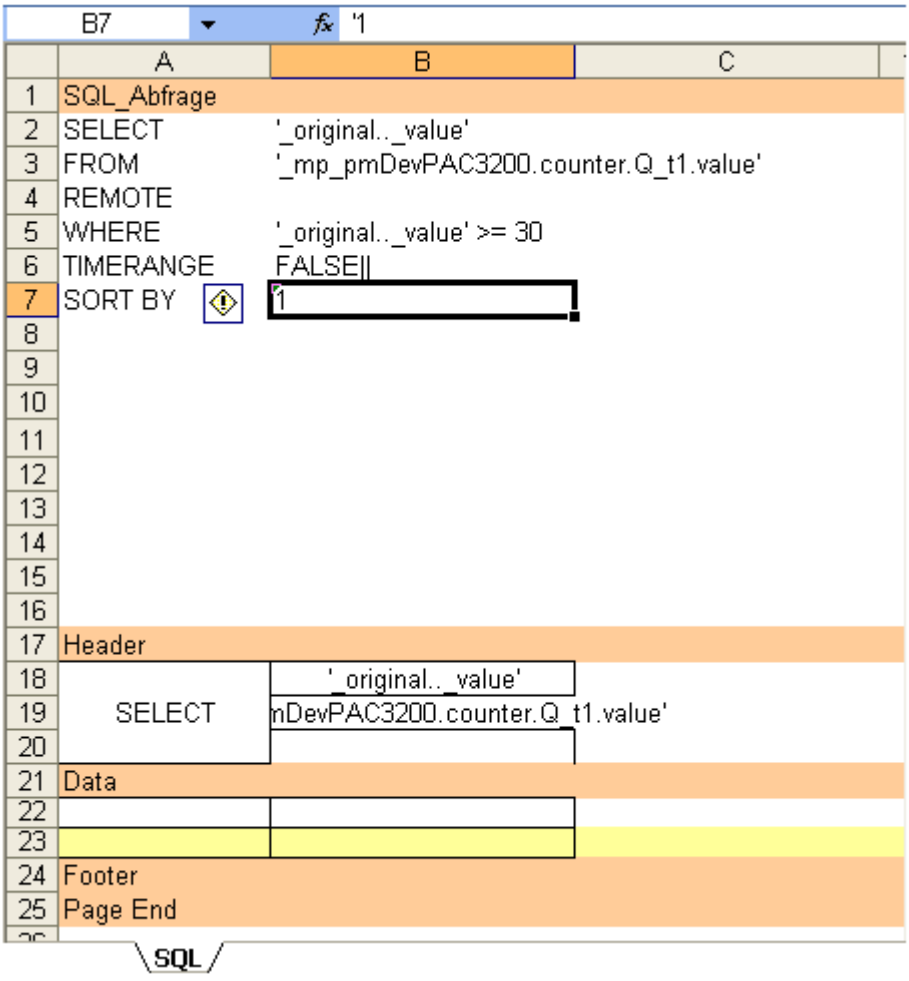
- ✧ Open the **SQL query** template.
- ✧ Click the **Add-Ins** tab, and click **Template > SQL Wizard**.
  The **Values/alerts** dialog opens.
- ✧ In the **Values/alerts** dialog, select the **Values** option and click **Forward**.
  The **SELECT** dialog opens.
- ✧ Select an entry from the source list.
- ✧ Click **>** to transfer the selected value to the target list.
  The selected value is displayed in the target list.
- ✧ Click **Forward**.
  The **FROM** dialog opens.
- ✧ In the **Datapoint type** list box, select the datapoint type.
- ✧ In the **Datapoint** list box, select the datapoint.
- ✧ In the **Datapoint type** list box, select the datapoint type.
- ✧ Click **>** to transfer the selected values to the elements list.
  The string composed of the selected entries is displayed in the list.
- ✧ Click **Forward**.
  The **WHERE** dialog opens.
- ✧ Select an operator from the **Operators** list box.
- ✧ Select an option from the **Options** list box.
- ✧ Select a keyword from the **Keyword** list box.
- ✧ Select a value from the **Value** list box.
- ✧ Click **>** to transfer the selected values to the elements list.
  The string composed of the selected entries is displayed in the list.
- ✧ Click **Forward**.
  The **TIMERANGE** dialog opens.
- ✧ Click **Forward**.
  The **SORT** dialog opens.

✧ Select **DP element** option in the **SORT** dialog.

✧ Select the value to sort in the list box.

✧ Click **Finished**.

SQL query is carried out. The SQL query is filled with the queried values.
Save the SQL query in the Report directory.



[sc_SQL_Queries, 1, en_US]

Figure 7-12 SQL Query Report Template with Measured Value Inserted Via SQL Wizard

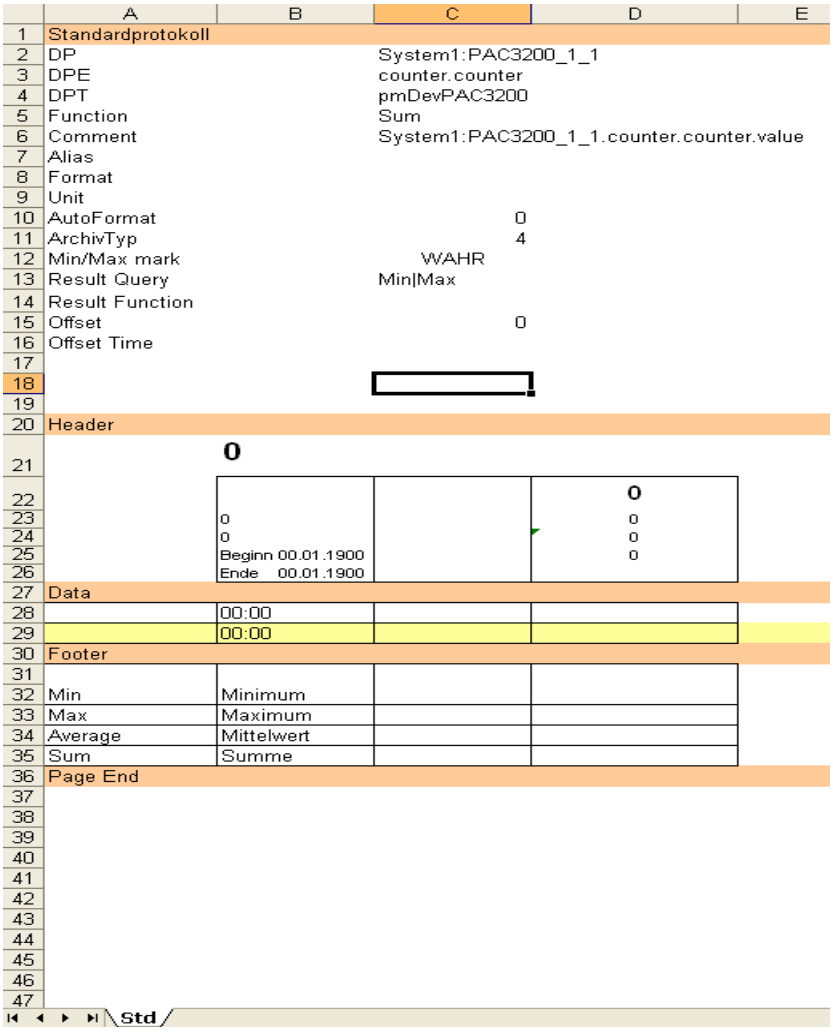
7.3.7.7 Overview of Template Structure

A template is structured into four different areas demarcated by orange rows or columns.
The template consists of the following areas:

- Default Settings (containing the report type, for example, standard report)
- Header
- Data
- Page End or Footer

NOTE

Do not delete or modify the keywords (in the standard report in column **A**, in the ATV report and operating report: row '1'), and the orange-colored rows assigned for the area demarcations.



	A	B	C	D	E
1	Standardprotokoll				
2	DP		System1:PAC3200_1_1		
3	DPE		counter.counter		
4	DPT		pmDevPAC3200		
5	Function		Sum		
6	Comment		System1:PAC3200_1_1.counter.counter.value		
7	Alias				
8	Format				
9	Unit				
10	AutoFormat			0	
11	ArchivTyp			4	
12	Min/Max mark		WAHR		
13	Result Query		Min|Max		
14	Result Function				
15	Offset			0	
16	Offset Time				
17					
18					
19					
20	Header				
21		0			
22				0	
23		0		0	
24		0		0	
25		Beginn 00.01.1900		0	
26		Ende 00.01.1900			
27	Data				
28		00:00			
29		00:00			
30	Footer				
31					
32	Min	Minimum			
33	Max	Maximum			
34	Average	Mittelwert			
35	Sum	Summe			
36	Page End				
37					
38					
39					
40					
41					
42					
43					
44					
45					
46					
47					

Std

[sc_StandardTemplate_Example, 1, en_US]

Figure 7-13 Example: Standard Template

7.3.7.8 The Template Areas

Default Settings

The information on each of the datapoints is saved in the **Default Settings** area.

This section is not visible in completed report.

NOTE

Do not add or delete rows in this area. Only experienced users should edit these rows if necessary when creating a template.

Header and Footer

The header and footer areas are designed using the functions of MS Excel.

To repeat the header and footer on every sheet of an excel report:

✧ On the menu bar, click **Page Setup**.
The **Page setup** dialog opens.

✧ Select the **Table** tab.

✧ In the **Rows to repeat at top** field, enter the repetition rows.

✧ Click **OK**.

Keywords

To display the statistics functions, enter keywords in the header and footer areas.
In a default report, the associated values of each datapoint are entered in the column **A**.
Use the following keywords:

Min, Max, MinTime, MaxTime, Number, Sum, Integral0, Integral1, SumNumber, Average, Average1, Time0, Time1, Changes, Changes01, Changes10, StartValue, EndValue, and Difference

powermanager Functions in Excel

You can use several keywords for labeling the finished report in the header and footer areas or in other areas outside the actual data area. You can choose to access the report information in all templates by German or English names (erProtokollTyp = erReportType).
The keywords are used like functions in Excel.
The following keywords are available for the data area:

powermanager Function in Excel	English	Description
erProtokollTyp	erReportType	Name of the report type.
erVon	erFrom	Start time of the query.
erBis	erTo	End time of the query.
erIntervall	erInterval	Time interval between the individual values.
erIntervallEinheit	erIntervalUnit	Units for the time interval between the individual values.
erPeriode	erPeriod	Time period covered by the report query.
erPeriodeEinheit	erPeriodUnit	Units for the time period covered by the report query

Requirements

The applicable cells are formatted in the matching display format.

Example

For this formula:	Cell formatting required: Format_Cell_Numbers
Formula erFrom	Date _ '4.7.97 13:30'

Data

The **Data** area is defined using one or more rows, which contain the individual values for the datapoints over time. These rows are used cyclically in the report layout. For example, if the set parameter creates a template in which one white row, one green row, and one yellow row are displayed in its three-row data area, in the final report, this color sequence are repeated cyclically as many times as is necessary to display all the rows of values.

NOTE

In the template for a daily report containing hourly values, you do not need to allocate 24 rows in the data area. powermanager Report 3.x automatically fits in the necessary number of rows when the report is created.

You can customize the formatting. Insert formulas in columns where no datapoint is defined. You can also compile mixed queries across several systems in one joint report.
Reports are protected with sheet protection by default. Therefore, subsequent changes to individual cells cannot be made.
To exclude individual cells from sheet protection:

✧ On the menu bar, click **Format > Cells**.
The **Format Cells** window opens.

✧ On the **Protection** tab, deselect the **Locked** option.

✧ Click **OK**.

7.3.7.9 Using Keywords for Headers and Footers

Special placeholders are reserved for the headers and footers of the page layout. You can replace these placeholders with the parameters of the query when a report is generated.

Control Variable	Description
[Reporttype]	Name of the time range covered by the query (for example, Daily report).
[From]	Start date/time of the query in internal time format.
[From Date]	Start date of query.
[From Time]	Start time of query.
[To]	End date/time of the query in internal time format.
[To Date]	End date of query.
[To Time]	End time of query.
[Interval]	Time interval between the individual values.
[Period]	Period of time covered by the report query.

To insert a placeholder in a header or footer:

✧ Click the **View** tab and click **Page Layout**.

✧ Click on the header area.
The **Design** tab opens.

✧ Insert a placeholder in the header area.

✧ To insert a placeholder in the footer area, on the **Design** tab, click **Go to Footer**.

7.3.8 Reports

7.3.8.1 Overview of Reports

A report contains the data exported from a database for a specific time period.

Report Types

Predefined report types are available for selection in the templates.

7.3.8.2 Creating a Report

Prerequisites

Ensure that the following prerequisites are met before you start creating a report:

- There is at least one template in the system.
- The template is closed.

To create a report:

✧ Click **New** under **Report** area.

- or -

✧ Click the **Add-Ins** tab, and click **Reports > New**.
The **Reports** option in the menu bar is available in all windows that you open from the report generator window.

✧ In the dialog that opens, select the template for the report.

✧ In the **Time period for the report** window, specify the report type and time range for the report.
Depending on the selected report type, the system assigns a default time range to the report.
You can modify this time range to suit your requirements.

✧ Click **OK**.
The report generator creates the report. The report opens in a new window in Excel.

✧ 
For Microsoft Excel 2007, click , and click **File > Save**.
For Microsoft Excel 2010/2013, click the **File** tab and then click **Save**.
For more information on saving reports, see Saving a Report.

7.3.8.3 Saving a Report

Standard Storage System

The powermanager standard storage system is uniform for all users.
The default storage location for all the generated reports is:
`<Project_name>\data\xls_report\Report\`
When you save a report for the first time, the system creates a subdirectory under the preceding path. The name of the subdirectory is the same as that of the report type.
For example, if you select the daily report type for a report, then the report is saved in the following path:
`<Project_name>\data\xls_report\Report\Daily report`
Subsequent save commands open the designated folder for the report.

Any Storage Locations

Additionally, you can save reports in any folders independent of the default storage path.

File Name

The powermanager report generator names the reports based on the following format:

- **`<template_name>\YYYYMMDD.xlsm`**

Here, YYYY, MM, and DD stand for year, month, and day respectively. The date displayed is the generation date of the report.

7.3.8.4 Opening a Report

To open an existing report:

✧ Click **Open** under **Report** area.

- or -

✧ Click the **Add-Ins** tab, and click **Reports > Open**.
The **Reports** option in the menu bar is available in all windows that you open from the report generator window.
The **Select a file** dialog opens.

✧ In the **Select a file** dialog, navigate to the relevant subdirectory and select the report that you want to open.

✧ Click **Open**.

7.3.8.5 Quick Selection – Semiautomatic Report Creation

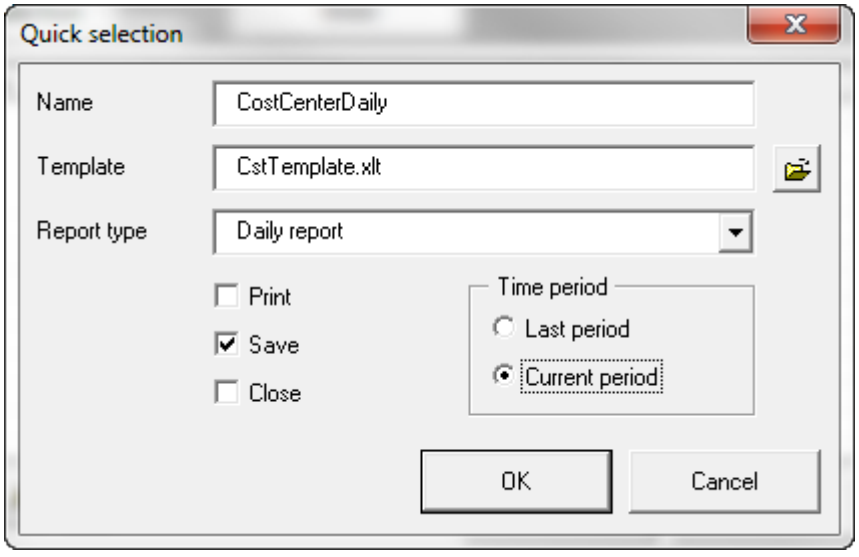
Use the quick selection feature to automate the report creation partially.
Initiate the report generation.
The system defines the template, report type, and report period.

Creating a Quick Selection

A quick selection saves the information on the template, report type, and report period for reuse.
To create a quick selection:

✧ Click the **Add-Ins** tab, and click **Report > Quick Selection**.
The **Quick Selection** window opens.

✧ In the **Quick Selection** window, click  .
The **Quick Selection** dialog opens.



[sc_QuickSelection_Dialog, 1, en_US]
Figure 7-14 Quick Selection

✧ Enter the following information in the **Quick Selection** dialog:
Label: Quick selection name
Template: Default template that is applied to the reports generated using this quick selection
Report Type: Default report type that is applied to the reports generated using this quick selection
If the template does not contain the selected report type, the report generator sends the following error message: *No report types defined in the template*.
In this case, include the report type in the template before creating the quick selection or select another report type.
Print: Select this option to send the report to the default printer selected assigned to the system. If you select this option, the system does not prompt for confirmation.
Save: Select this option to save the report without being prompted for confirmation.
For more information on saving reports, see Saving a Report.
Close: Select this option if you do not want to view the report after creation. The report is saved in the selected location.
Time period: Under Time period, select **Last period** if you want to generate report for the previous month or previous day.
Select **Current period** if you want to generate the report for the current month or current day.

✧ Click **OK**.

The quick selection template is available for selection in the **Quick Selection** field of the powermanager report window.

7.3.8.6 Creating a Report Using Quick Selection

The **Quick Selection** field in the home window of the report generator lists all available templates for quick selection.

For more information on creating a new quick selection template, see Creating a Quick Selection in the preceding section.

To create a report using quick selection:

✧ In the **Quick Selection** field, double-click the template you want to use.

- or -

✧ Select a quick selection template and click **Create report**.

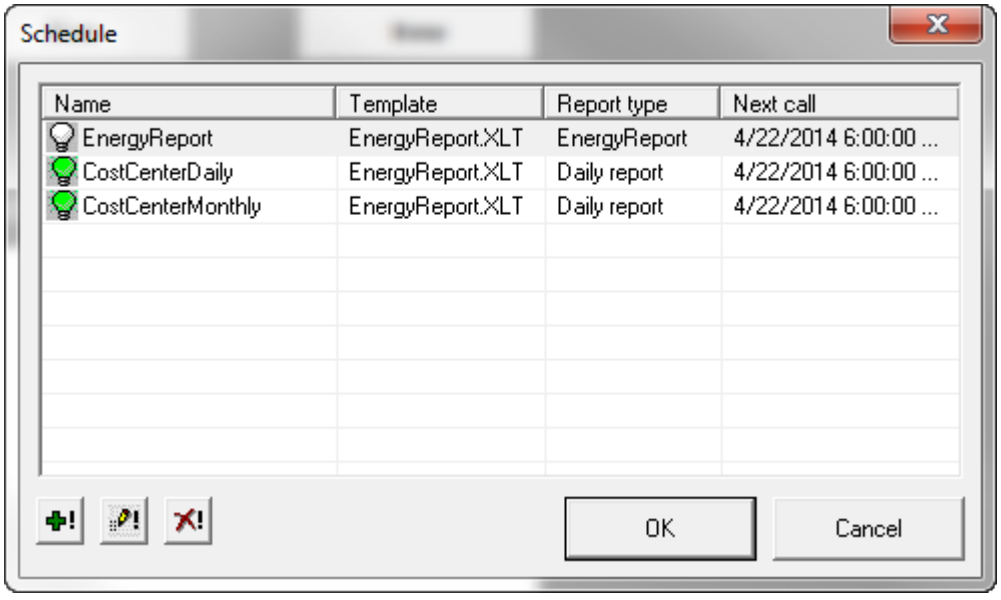
The report generator creates the report without prompting for confirmation. Depending on the quick selection settings, the report is saved, printed, or displayed in the Excel window.

7.3.8.7 Schedule – Automatic Report Creation

You can automate report generation using the Schedule feature. An active schedule creates reports periodically. For example, every morning, the daily report for the previous day, and so on.

Viewing the List of Active Schedules

Click the **Add-Ins** tab, and click **Report > Schedule** to view the list of active schedules in the **Schedule** window.



[sc_ScheduleWindow, 1, en_US]

Figure 7-15 Schedule Window

The lamp icon that precedes the schedule name indicates the status of the schedule:

- Green lamp: Schedule is active
  Reports are created based on the time range given in the schedule.
- White lamp: Schedule is switched off
- Yellow lamp: Schedule is skipped because the report was still running
- Red lamp: An error occurred during report creation

Creating a Schedule

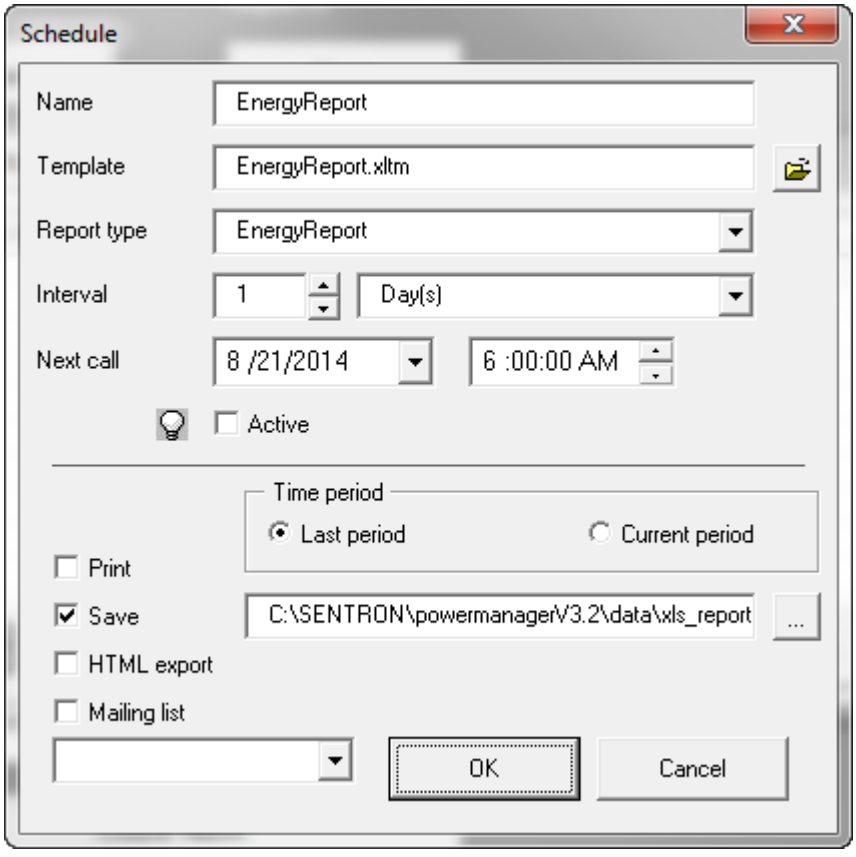
Ensure that the following prerequisites are met before you create a schedule:

- Setup a permanently running computer for cyclic and automatic report generation. This computer must be a server computer and not a workstation computer.

To create a schedule:

✧ Click the **Add-Ins** tab, and click **Report > Schedule**.
The **Schedule** window opens.

✧ In the **Quick Selection** window, click  .
The **Schedule** dialog opens.



[sc_ScheduleDialog, 2, en_US]
Figure 7-16 Schedule Dialog

✧ Enter the following information in the **Schedule** dialog:

Label: Schedule name

Template: Default template that is applied to the reports generated using the schedule

Report Type: Default report type that is applied to the reports generated using the schedule

If the template does not contain the selected report type, the report generator sends the following error message:

No report types defined in the template.

In this case, include the report type in the template before creating the schedule or select another report type.

Interval: Interval between each report generation

For example, select **1 month(s)** to generate the report monthly.

Next call: Date and time when the report generation starts at the end of each interval

Active: Select **Active** if you want start the schedule immediately after creation.

Print: Select this option to send the report to the default printer selected assigned to the system. If you select this option, the system does not prompt for confirmation.

Save: Select this option to save the report without being prompted for confirmation.

For more information on saving reports, see Saving a Report.

HTML export: Select this option if you want to save the report in the HTML format.

The HTML report is saved in the folder:

Mailing list: Select this option if you want to e-mail the report to a particular mailing list immediately after the report creation.

After you select this option, select the mailing list from the list box below.

In the powermanager report window, click **Report > Mailing list** to create a mailing list.

`<project_name>\data\xls_report\html\`

Time period: Under Time period, select **Last period** if you want to generate report for the previous month or previous day.

Select **Current period** if you want to generate the report for the current month or current day.

Specify the path to save the report.

✧ Click **OK** to close the **Schedule** dialog.

The new schedule is listed in the **Schedule** window.

✧ Click **OK** to close the **Schedule** window.

NOTE

You can also create reports for historical data.

If you want to generate reports for historical data, set the **next run** option for the date from which you want the data. For instance, you can generate all the daily reports for the past week.

If powermanager Report is not running at the time of the next report generation, the reports that are still outstanding are automatically generated, when you confirm the same, the next time you start powermanager report.

7.3.8.8 Configuring the Report Type

The report type defines the interval and the period of the data export. For example, cumulation of the data in 15-minute intervals throughout the day.

You can configure which of the existing report types are used for the current template.

Once a template is created you can use it for a daily report of hourly values as well as for a monthly report of daily values.

NOTE

If the archive structure is changed, then the update these changes in the template. Thus, new datapoints for DP types that exist can be adopted immediately in the template without updating.

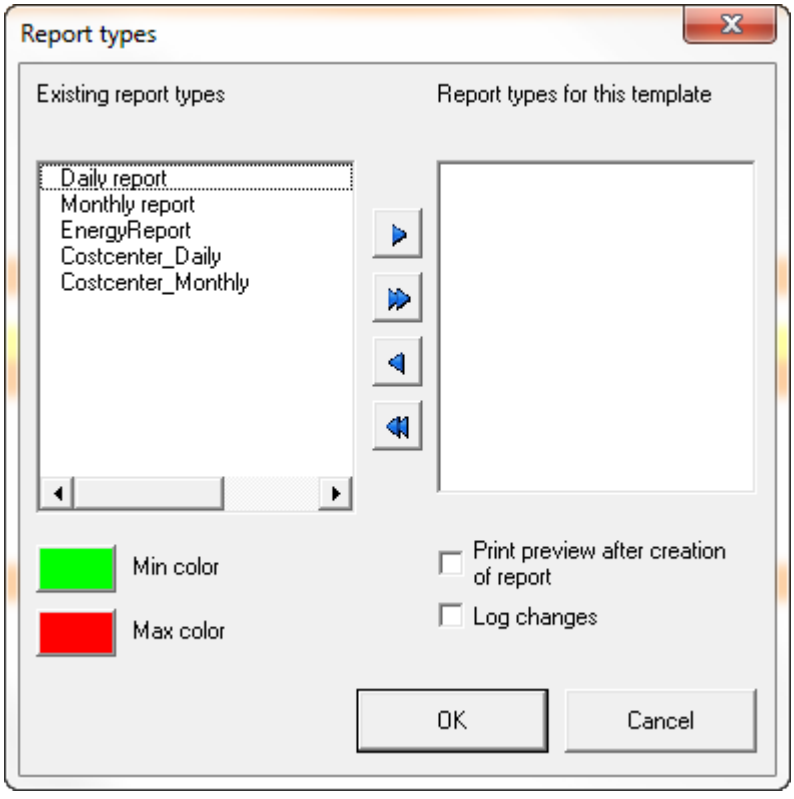
✧ Click the **Add-Ins** tab, and click **Template > Configure**.
The **Report Type** dialog opens.

✧ Select the report types from the Existing report types list.

✧ To transfer the selected report types to the Report types for this template list, click **>** button.
The selected templates are displayed in the right-hand list box.

✧ Click **OK**.

Report Types Window



[sc_ReportTypes, 1, en_US]
Figure 7-17 Report Types Window

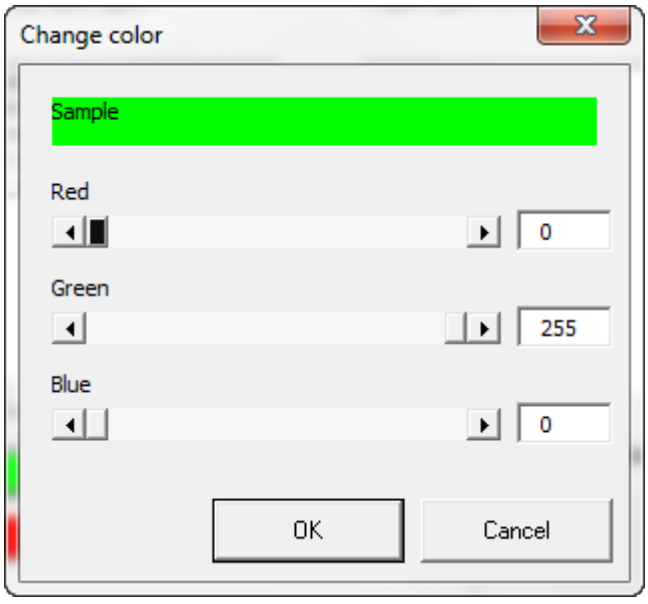
- **Existing report types**
  The Existing report types box lists all the existing report types.
- **Report types for this template**
  The Report types for this template box lists all the report types that are used when creating a report.
- Use the **<** and **>** buttons to move individual report types from one box to another.
- Use the **<<** and **>>** buttons to move all the available report types from one box to another.
- **Min color**
  Min color defines the color for display of the minimum value for each column in the report.
  The default color is green.
- **Max color**
  Max color defines the color for display of the maximum value for each column in the report.
  The default color is red.
- **Print preview after creation of report**
  Select this option to open the print preview automatically after report creation.

- **Track changes**
  Select this option to archive and insert the report changes in an automatically created report sheet.

To change the color for Min/Max color buttons:

✧ Click the **Min color** or **Max color** button.
The **Change color** dialog opens.

✧ Enter the RGB value in the respective text box.
You can also move the sliders pertaining to each color.
The color selection preview is shown in the top area.



[sc_ChangeColor, 1, en_US]
Figure 7-18 Change Color Dialog

✧ Click **OK**.

To parameterize the highlighting settings of the changes:

✧ Click the **Review** tab and click **Track Changes > Highlight Changes**.
The **Highlight Changes** dialog opens.

✧ Select the **List changes on a new sheet** option.

NOTE

The individual sheets are no longer be protected against changes (the sheet protection is activated when the changes are not tracked).

7.3.8.9 Canceling Report Protection

By default, sheet protection for reports is always activated, meaning that the values are read-only. Sheet protection is protected with your report password. To deactivate sheet protection for individual columns, click **Format > Cell > Protection tab > Locked**.

7.3.9 Datapoints

7.3.9.1 Overview of Datapoints

A datapoint encompasses the value that a measuring point of the system supplies.

Use the Insert datapoint operation to define the values assigned to powermanager process variable in a column.
The procedure is similar for all templates:

- You define the control data of a datapoint in a dialog.
- The dialog makes the possible data available for selection in list boxes.
- The report generator applies the data from the dialog to the Excel template.

7.3.9.2 Inserting a Measured Value into a Template

NOTE

In powermanager, the datapoint types supported by the following device types are made available to you: PAC1200, PAC1500, PAC1600, PAC2200, PAC3100, PAC3200, PAC3200T, PAC4200, PAC5100, PAC5200, P850, P855, generic Modbus device, virtual counter, 3WL, 3WL10, 3VL, 3VA, and 3VA27.

Additionally, you can manually insert datapoints for devices that cannot be directly integrated with powermanager.

Prerequisites

Ensure that the following prerequisites are met:

- There is at least one template in the system.
- The device type is supported.

To insert datapoints in a template:

✧ Create the first datapoint in column **C** of the Excel template.
Mark any cell or any cell area in column **C**.

✧ Click the **Add-Ins** tab, and click **Template > Insert DP**.
The **Measured Value** window opens.

✧ In the **Measured Value** window, enter the necessary information.

✧ Click **OK**.
Excel applies the data from the **Measure Value** window to column **C** of the template.

✧ Enter datapoints description under the header row to improve readability.
If you use Change DP, the boxes are automatically filled with the measuring point designation from the datapoint name.

✧ Insert further datapoints in column **D**, **E**, and so on.

NOTE

The datapoints available for selection are filtered.
Click **Report > Configuration > Options** to reach the filter settings.
Click the **Add-Ins** tab, and click **Report > Configuration > Options** to reach the filter settings.
On the **Datapoint selection** tab, define the datapoints which appear in the selection.

7.3.9.3 Deleting a Datapoint from a Template

To delete a datapoint from a template:

✧ Select the datapoint you want to delete.

✧ Press **DELETE** on the keyboard.

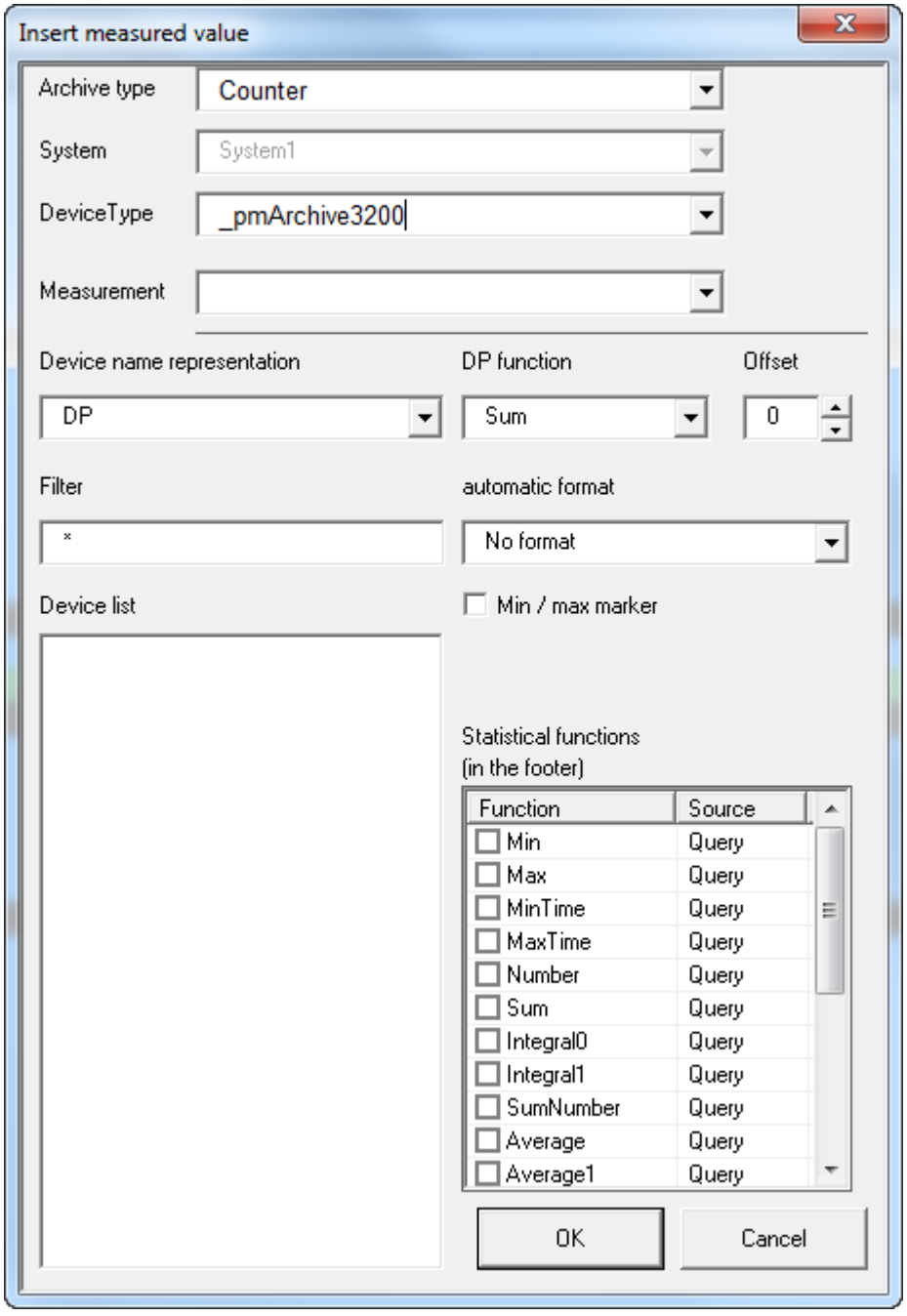
7.3.9.4 Editing Data of a Datapoint

To edit a datapoint:

- ✧ Select the datapoint you want to edit.
- ✧ Click the **Add-Ins** tab, and click **Template > Modify DP**.
  The **Measure Value** window opens.
- ✧ In the **Measure Value** window, edit the required information.
- ✧ Click **OK**.

Excel applies the updated data from the **Measure Value** window to the template.

7.3.9.5 Datapoints in the Cost Center Report



[sc_InsertMeasureValue_Window, 1, en_US]

The **Insert Measured Value** window for Cost Center report contains the following fields:

- **Archive type**
  The Counter value is selected by default in the **Archive Type** list box. It limits the list of measured values to the consumption values.
- **System**
  In a single system installation of powermanager, **System1** is selected by default. You cannot change this value.
  In a distributed system installation of powermanager, select any one of the distributed systems.
- **Device Type**
  From the **Device Type** list box, select the device type of the device that supplies the data. This device is also called the datapoint type (DPT).
  The **Device** list box at the bottom of the table lists the devices associated with the selected device type.
- **Measured Value**
  From the **Measured Value** list box, select the measured value that the selected device supplies. This measured value is also called the datapoint element (DPE).
  Its availability depends on the selected device type. The table in the following section lists the counters.
- **Device name representation**
  In the **Device name representation** list box, select the name and additional information for the device which appears in the **Device** list box.
  The **Device name representation** list box has the following options:
  - **DP/Technical name**
    The device is listed under its internal device name. The name of the root precedes the device name. For example, System1:PAC4200_Anlage.
  - **Alias**
    The device is listed under its alias.
    Devices without assigned aliases do not appear in the list.
  - **Custom name**
    The device is listed under its internal name.
    The name of the selected datapoint element and the suffix value are appended to the device name. For example, PAC4200_Anlage.counter.W_t1.value.
- **Filter**
  Use the filter feature to limit the number of devices in the **Device** list box to a subset.
- **Cost Center**
  From the **Cost Center** list box, select the cost center to which the counter demand values are assigned.
- **Medium**
  From the **Medium** list box, select the medium that is assigned to the cost center via the tariff set.
  If several media are assigned to the selected cost center, the list box offers the media for selection.
- **Change unit in the report**
  The **Change unit in the report** box shows the unit of the selected medium.
- **Unit of the datapoint**
  The **Unit of the datapoint** box shows the unit of the datapoint.
- **Denominator**
  The **Denominator** box determines the conversion ratio for both the units. By default, the value in the denominator box is 1.
  Example
  To convert from watt hours to kilowatt hours, enter the denominator value as 1000.

- **Weighting (0-1)**
  Proportional assignment of the counted consumption values for the selected cost center, expressed as a decimal factor.
  For example, the value 0.2 corresponds to a proportional share of 20 %.
- **Device list**
  The **Device** list box lists all devices created in the system that correspond to the selected device type and the filter criterion. Select the desired device.

Energy Counters and Universal Counters

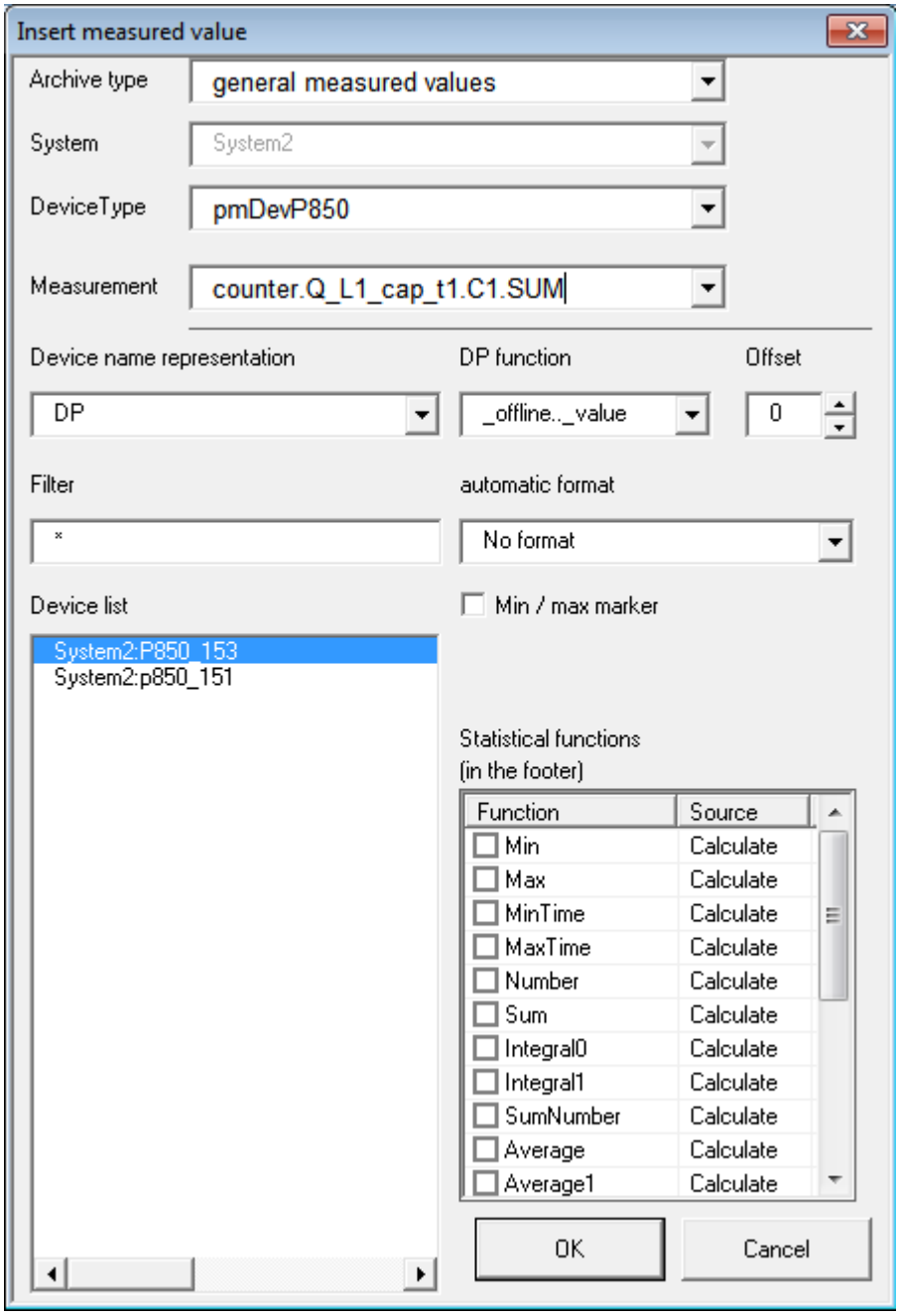
Table 7-1 Energy Counters and Universal Counters

Counter/ device type	counter.W_t1 Active energy on-peak tariff	counter.W_t2 Active energy off-peak tariff	counter.Q_t1 Reactive energy on-peak tariff	counter.Q_t2 Reactive energy off-peak tariff	counter.counter Universal counter	counter.counter_2 Second universal counter of the PAC4200	counter.user_counter_1 counter.user_counter_2 ... counter.user_counter_10 10 pulse counters of the PAC4200
Generic Modbus Device					X[1]		
PAC 1200	X		X				
PAC 1500	X	X	X	X			
PAC 1600	X		X				
PAC 2200	X	X	X	X	X		
PAC 3100	X		X				
PAC 3200	X		X		X		
PAC 3200 T	X		X		X		
PAC 4200	X	X	X	X	X	X	X
PAC 5100	X						
PAC 5200	X						
Virtual Counter					X		
P850	X						
P855	X						
3VA ETU5	X		X				
3VA ETU8	X		X				
3WL	X		X				
3WL 10	X		X				

7.3.9.6 Datapoints in the EnergyReport

The EnergyReport is a cost center report without assignment of costs.
You can select further data types in addition to the consumption meters.

1 5 universal counters



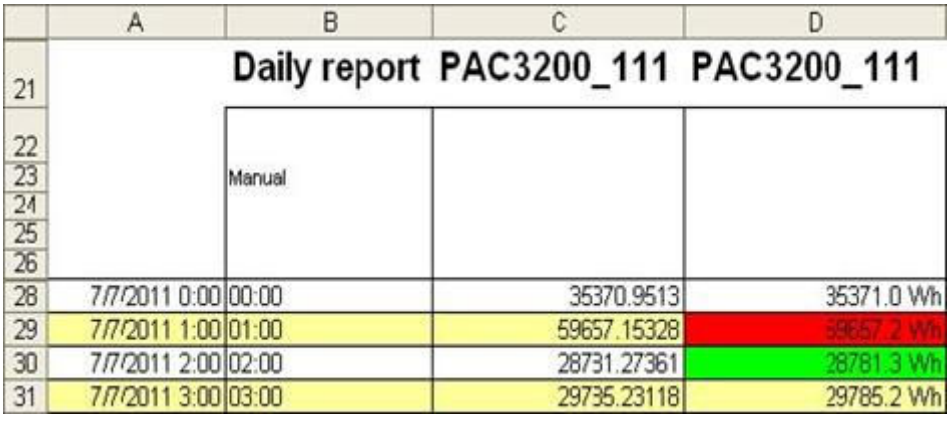
[sc_InsertMeasuredValueWindow, 1, en_US]

Figure 7-19 Insert Measured Value Window

The **Insert Measured Values** window has the following fields:

- **Archive type**
  Select one of the following options from the **Archive type** list box:
  - **Counter**
    Select this option to limit the list of measured values to the consumption values.
  - **HDB directly**
    Select this option to limit the list of measured values to the general measured values.
    Select the **HDB directly** option for the energy report to select power demand values.

- **DP function**
  The **DP function** field has a predefined value.
- **Offset**
  Adjust the value in the **Offset** box for the **Measured value comparison** report.
  For other reports, do not change the predefined value **0**.
- **Automatic formatting**
  Select any one of the following options from the **Automatic formatting** list box to format the raw data in the report output:
  - **No formatting**: Select this option if you do not want to format the exported data.
  - **Only format**: Select this option to assign values up to a fixed number of decimal places.
  - **Format and unit**: Select this option to assign values to a fixed number of decimal places. The unit of the measured variable is also displayed.



	A	B	C	D
21		Daily report	PAC3200_111	PAC3200_111
22				
23		Manual		
24				
25				
26				
28	7/7/2011 0:00	00:00	35370.9513	35371.0 Wh
29	7/7/2011 1:00	01:00	59657.15328	59657.2 Wh
30	7/7/2011 2:00	02:00	28731.27361	28781.3 Wh
31	7/7/2011 3:00	03:00	29735.23118	29785.2 Wh

[sc_DailyReport, 1, en_US]

- **Min / max marker**
  Select this option to highlight the minimum and maximum values in the report.
- **Statistical functions**
  You can print the minimum value, maximum value, average of all values, or sum of all values in the footers of the reports.
  The default report templates are prepared only for these four functions.

7.3.10 Mailing List

7.3.10.1 Overview of Mailing List

For powermanager Report version 2.0 and above, you can send reports by e-mail.
The finished report can either be sent automatically using a fixed schedule or manually.

7.3.10.2 Creating a Mailing List

The subject and the recipient are specified in the mailing list.
To create a mailing list:

✧ Click the **Add-Ins** tab, and click **Report > Mailing List**.

- or -

✧ In the **Cost centers** window, click  .

The **Mailing list** dialog opens.

✧ Enter the message in the **Mailing list** window.

- ✧ In the **Label** field, enter the name of the recipient or a recipient group.

  - or -

- ✧ Click  to open the **Find address** dialog.

  Select one or more recipients and click **OK**.
- ✧ Enter the subject for the mail in the **Subject** field.
- ✧ Click **OK**.

7.3.10.3 Sending an E-mail Manually

Ensure that the following prerequisites are met before you send an e-mail:

- A mailing list is created.
- A report is open.

- ✧ Click the **Add-Ins** tab, and click **Reports > Send Mail**.
  The **Send mail** dialog opens.
- ✧ In the **Send mail** dialog, select a recipient from the **To** list box.
- ✧ Click **OK**.

7.3.10.4 Sending an E-mail Using a Schedule

Ensure that you have at least one mailing list created before you set a schedule for sending an e-mail.

- ✧ Click the **Add-Ins** tab, and click **Report > Schedule**.
  The **Schedule** window opens.
- ✧ In the **Schedule** window, select a schedule.
- ✧ Click **Edit entry**.
  The **Schedule** dialog opens.
- ✧ Select the **Mailing list** option.

When saved according to the schedule, the report is also sent as a mail to a defined mailing list.

7.3.11 HTML Pages

7.3.11.1 Overview of HTML Pages

In powermanager Report version 2.0 and above, you can generate finished reports as HTML pages using the Schedule option.
You can also manually generate an HTML page from an opened report. You can publish the HTML pages on a Web server or for similar purposes.

NOTE

You can only generate HTML pages with Report if you are using MS Excel 2013/2016.

7.3.11.2 Creating a Base Directory

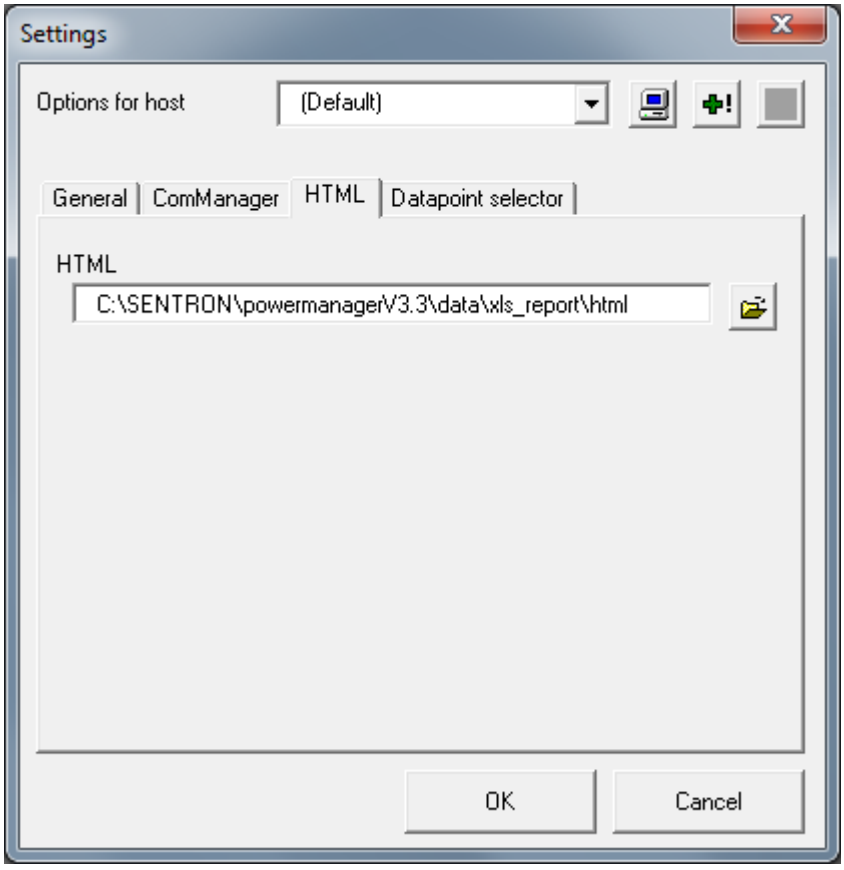
To create a base directory:

- ✧ Click the **Add-Ins** tab, and click **Report > Configuration > Options**.
  The **Password** dialog opens.
- ✧ In the **Password** dialog, specify the password.

✧ Click **OK**.
The **Settings** dialog opens.

✧ In the **Settings** dialog, click the **HTML** tab.

✧ In the **HTML** field, specify the directory path to store the HTML pages.
The default path is `C:\Siemens\SENTRON\powermanagerV3.4\data\xls_report`.
The report is placed in a subdirectory depending on the report type.



[sc_Create_BaseDir, 3, en_US]
Figure 7-20 Creating File Path for HTML Pages

✧ Click **OK**.

7.3.11.3 Creating an HTML Page

Prerequisites

Ensure that the following prerequisites are met before you create an HTML page for the report:

- Open the report which you want to convert to an HTML page.
- Select the base directory.

Procedure

Click the **Add-Ins** tab, and click **Report > Save as HTML** to save the report in HTML format.

7.3.11.4 Creating an HTML Page Using Schedule

Ensure that you create a base directory before you create the HTML page.
To create an HTML page using schedule:

✧ Click the **Add-Ins** tab, and click **Report > Schedule**.
The **Schedule** window opens.

✧ In the **Schedule** window, select a schedule.

✧ Click the edit icon.
The **Schedule** dialog opens.

✧ In the **Schedule** dialog, select the **HTML export** option.

The report is saved in the default path as an HTML page.

7.3.11.5 Publishing Reports on the Internet

powermanager Excel Report 3.x lets you publish reports through Web servers. Either the Siemens AG powermanager HTTP server can be used for this, or any other Web server can handle publication.

Layout of an Internet Report

In HTML, a report is displayed in a logical sequence with tabs: first the table, then the diagram, and, if applicable, further analysis tables.

To publish a report on the Internet:

✧ Click the **Add-Ins** tab, and click **Report > Save as HTML** to save the report in HTML format.

✧ Publish the result file with the **.htm** extension on your Web server.

7.3.12 Use Cases

7.3.12.1 Creating a Cost Center Report

Prerequisites

Ensure that the following prerequisites are met before you create a cost center report:

- powermanager Excel Report is open.
- Medium is created
- Tariff set is created
- Cost center report is created

Creating a Template

To create a template:

✧ In the powermanager report window, under the **Template** area, click **New**.
The **Report format** dialog opens.

✧ In the **Report format** dialog, select the **Cost center report** template from the **Format** list box.
The **Report types** dialog opens.

✧ In the **Report types** dialog, select the required report type. Excel opens the cost center report template of the selected report format.

Using a Template

✧ Create the first datapoint in column **C** of the Excel template.
Mark any cell or any cell area in column **C**.

✧ Click the **Add-Ins** tab, and click **Template > Insert DP**.
The **Measured Value** window opens.

✧ In the **Measured Value** window, select the datapoint type.

✧ In the **Measured value** list box, select the datapoint element for the counter of the device type.

- ✧ In the **Device list** area, select the device that provides the demand values.
- ✧ In the **Cost center** list box, select the cost center to which the counted demand values are assigned.
- ✧ Enter a conversion factor if the values in **Unit in report** and **Unit of DP** differ.
- ✧ Enter a weighting (0-1) as a decimal factor that specifies the proportionate assignment of the counted demand values for the selected cost center. A share of 0.2 corresponds to a share of 20 %.
- ✧ Click **OK**.
- ✧ Click **OK**.
  Excel applies the data from the **Measure Value** window to column **C** of the template.
- ✧ Insert further datapoints in column D, E, and so on.
- ✧ Save the template under `proj_path/data/xls_report/Template` with the **.xltm** extension.

Creating a Report

- ✧ Create a report using the previously created template and by entering the time range.
- ✧ In the **Time range for report types** dialog, select **Costcenter_daily**.
- ✧ Enter the time range for the new report.
- ✧ Save the report under `proj_path/data/xls_report/Report` with the **.xlsm** extension.

7.3.13 System Requirements

7.3.13.1 System Requirements

Operating system, Excel, and ADO	Windows 7, Windows Server 2008/2012 R2, Windows Server 2016, and Windows 10 Excel 2013, Excel 2016 (activate macros and ActiveX manually)
Network	TCP/IP capable LAN, for templates with file access

You must be a member of the **Main user** group (this is also valid for powermanager, not only for the Excel Report).

7.3.13.2 Technical Requirements Prior to Installing powermanager Excel Report

Ensure that the following conditions are met before you install powermanager Excel report:

- ✧ Microsoft Excel 2007/2010/2013 is installed.
- ✧ MDAC 2.7 (ADO) is installed.
  The ADO 2.6 option is not available as an extra option. The Microsoft Sub installation MDAC 2.7 is run if you want to use a feature and it is not installed.
- ✧ Use of the History database (WCCOAvalarch).
- ✧ A report licence is required to use Excel Report.
- ✧ Run the regsvr32 command for the following files:

```
C:\WinNT\system32> regsvr32 SubTimer.dll
C:\WinNT\system32> regsvr32 MSCOMCTL.OCX
C:\WinNT\system32> regsvr32 MSCOMCT2.OCX
```

  The files with the **.dep** extension contain information on the files needed by the respective ActiveX control.
  Files or documents with such an extension can be opened or processed using the Visual Basic Setup Wizard program. Registration is not possible.
  Alternatively, you can also run the batch file under `\\reportRegEdit\reportReg.bat` on the installation disk.

NOTE

Under Windows 2008/2012, it is not possible to register the **`subtimer.dll`** file. In this case, the file **`MSVBVM50.DLL`** is missing. Download the file from the Microsoft site *http://support.microsoft.com/kb/180071/*.

NOTE

Activate macros in Excel. Share the whole project (project directory) with both write and read permissions.

NOTE

If you use statistical functions and have specified the **Always start calculation at** time on the Synchronization tab of the datapoint function, the start time for the report has to be the same as the **Always start calculation at** time of the DP function.

7.3.13.3 Adding a New Language to the Excel Report

To add a new language to the excel report:

- ✧ Start the powermanager project.
- ✧ Start the Excel report.
- ✧ Click the **Home** tab, and click **Format > Hide & Unhide > Unhide Sheet**.
  The **Unhide** dialog opens.
- ✧ In the **Unhide** dialog, select the **Texts** sheet.
- ✧ Click **OK**.
- ✧ Add a new column.
- ✧ Translate the texts.
- ✧ Hide the **Texts** sheet.
- ✧ Save the report.

	A	B	C	D
1	**ResID**	**Resource**	**Deutsch**	**English**
2	1000	**PR Menue**	powerrate Reports	powerrate Reports
3	1134	//Sheet names for Excel	Kostenstellen-Bericht Diagramm	Cost center report diagram
4	1135		Kostenstellen-Bericht Tabelle	Cost center report table
5	1200	//dlgTariffsets X	Tarifsätze verwalten	Manage tariff sets
6	1201		Bitte einen Namen eingeben!	Please enter a name!
7	1202		Die Eingabe für die Einheit ist nicht korrel	The entry for the unit is not correct! Both
8	1203	X	Es wurden Feiertage ausgewählt, aber ke	Holidays have been selected but not defi
9	1204		Falsche Kostenangabe für den Tarif	Wrong costs specification for the tariff

[sc_AddNewLanguage, 1, en_US]

Figure 7-21 Report.xls

7.3.13.4 Settings for Continuous Operation

To avoid excessive memory utilization by Excel Report:

- ✧ Configure the macro settings so that you do not have to confirm the use of macros when starting the Excel Report.
- ✧ Configure Scheduled tasks on the Windows Control Panel:
  1. Task for starting the Excel Report.
  2. Task for stopping the Excel Report via the following scripts:
  Name: kill_excel.sh:

```
#************************** kill_pvss2 ***********************

#* kills the running Excel-Report

#*

#****************************************************************

GetExcelID()

{

set -- $( tlist | grep -i " EXCEL.EXE" | cut -d " " -f1 )

echo $1

}

#****************************************************************

#* MAIN

#****************************************************************

set -x

pid=$( GetExcelID )

echo MAIN $ pid

kill $ pid
```

and

Name: kill_excel.cmd:

```
@ bash kill_excel.sh
```

NOTE

When you configure the tasks, the directory where the tasks are executed must the same directory where the data (Excel Report, scripts) is located.

Configure the tasks so that they are executed cyclically, for example, once a week. Select the times so that they do not overlap with the times of automatic report calls.

7.3.14 Installing powermanager Excel Report

7.3.14.1 Automatic Installation

powermanager Excel Report is installed automatically.

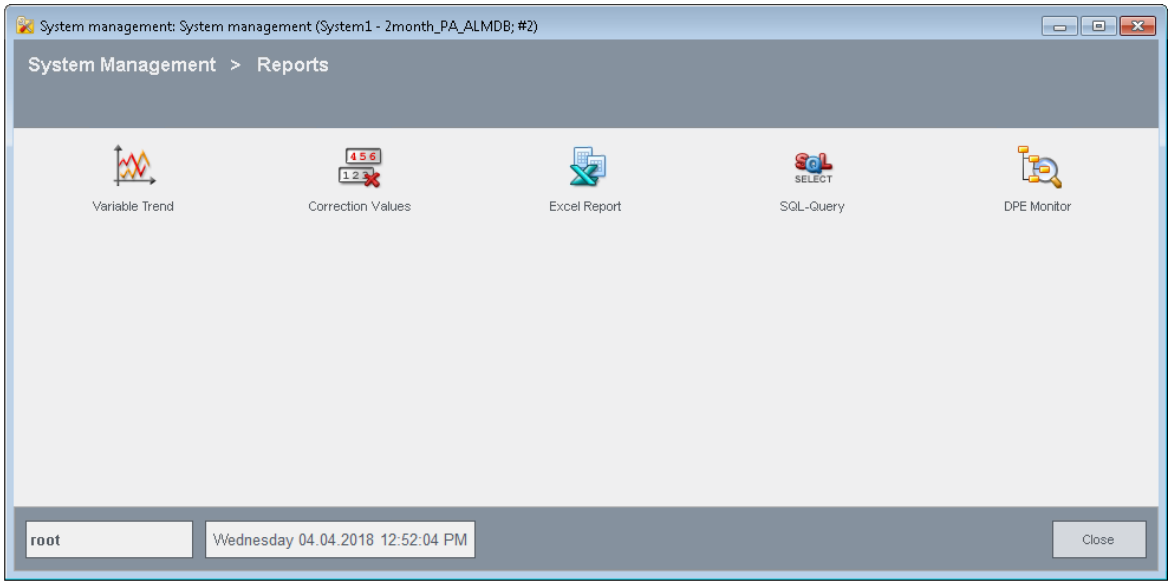
7.3.14.2 Starting powermanager Excel Report

To start the powermanager Excel Report:

- ✧ On the **System Management** panel, click the **Reports** tab.
- ✧ Click **Excel Report**.

  - or -

- ✧ In the menu bar click **Tools > Advanced report**.



[sc_ReportTab_SyMgmt, 2, en_US]

Figure 7-22 Launching Excel Report from the System Management Panel

7.3.14.3 Installing a powermanager Excel Report Client Computer

Setting up the Computer Link Between Client and Server

The following example demonstrates, with specific reference to the Excel Report, how to establish a connection from a client to a server to create reports. This section is relevant only if you do not want to run powermanager Report on the powermanager server.

Example

The network contains two computers, a server and a client.

Use the server to:

- Install powermanager (along with Data Manager and Event Manager)
- Set up the powermanager project.
- Install the powermanager Excel Report (optional).

You can start the Excel Report by default on the server because everything runs locally on the server.

Use the client to:

- Install the powermanager Excel Report as the UI client.
- Set up all the necessary powermanager components, except the project. The components are installed automatically for the UI client installation option.

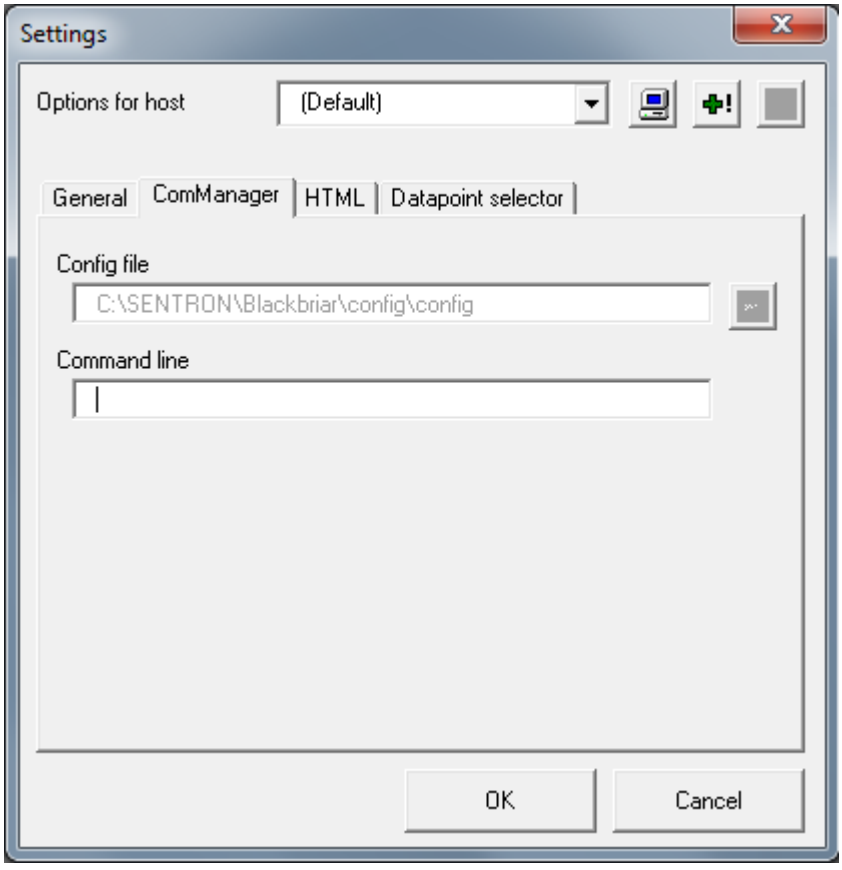
Setting up COM Manager on the Server for the Server

To set up COM Manager on the server for the server:

✧ Open **Report.xls** on the server.

✧ Click the **Add-Ins** tab, and click **Report > Configuration > Options**.
The **Settings** dialog opens.

✧ Select **Default** in the **Options for host** list box.
The **ComManager** tab displays the default config file address.



[sc_ComManagerTab_Default, 3, en_US]
Figure 7-23 Configuring COM Manager for Server Computer

Configuring a Network Drive Connection

✧ Configure a network drive connection on the client to the server computer.
For example, assign the drive letter **F:** for the computer name **`eiwnt066`**.

Configuring the Client Host

To configure the client host:

✧ Create a config file in the **`config`** directory.

✧ Adapt the project path in the config file.
`proj_path = "F:/<proj_path>/<Project_name>"`

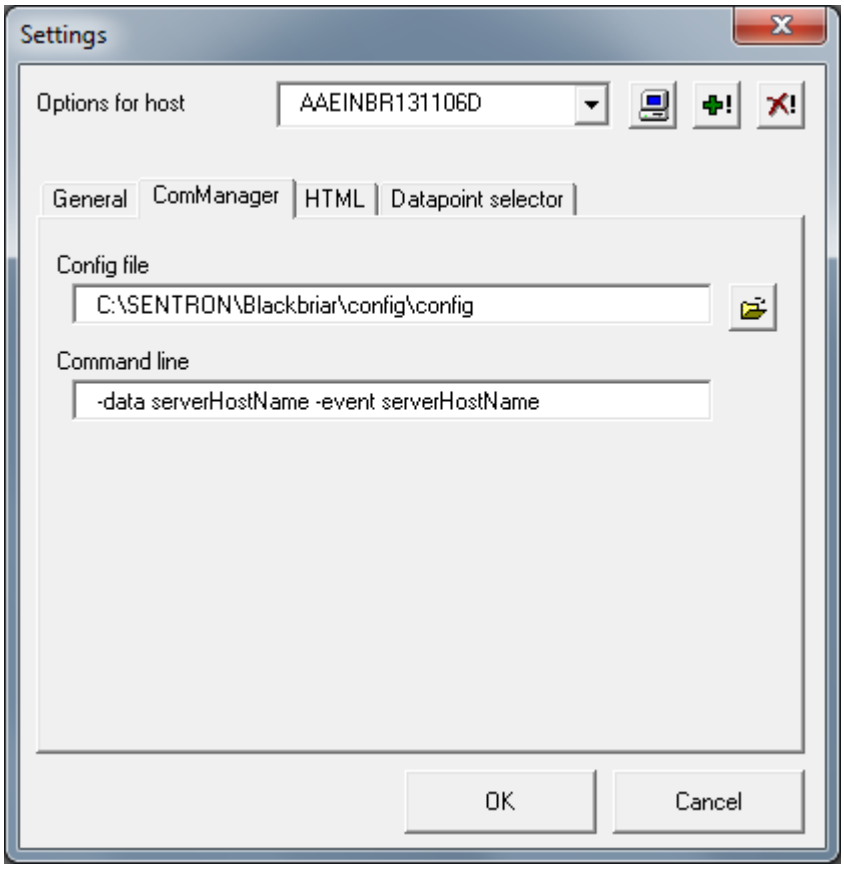
✧ Select **Options** in the **Report - Configuration** menu.
The **Settings** dialog opens.

✧ Click **Create**.
The **Host name** dialog opens.

✧ Enter the host name.

✧ Enter the data and event manager in the config file.
data = "server computer name"
event = "server computer name"

Client host is configured.
Create new reports on the client computer using powermanager Excel Report (Report.xls).



[sc_ComManager_ClientHost, 3, en_US]
Figure 7-24 Setting Up the COM Manager for the Client Using Example Entries

7.3.15 Configuring powermanager Excel Report

To access all the settings that must be specified once at the time when a project is set up:

- Click the **Add-Ins** tab, and click **Report > Configuration**.

The settings are protected by a password.

Operator Controls

The buttons used in the parameterization dialogs are described below:

Button	Description of Functions
	Create an entry.
	Edit an existing entry.
	Delete an existing entry.
	Display the name of the computer you are working on.
	Open or import an existing file.
	Select a data record.
	Retrieve values from powermanager.
	Arrange the elements of a list.

Password

NOTE

To ensure protection of data, replace the default password (erAdmin) with your own password after you start the application for the first time.

NOTE

The settings for Report can only be made once you have entered a password.

NOTE

If, after enabling **Save password** you forget to turn off this access to Report, these Report settings are not protected, although you must enter the password again after restarting powermanager Report.

All configuration settings are password protected.

Use password protection to protect reporting settings from access by inexperienced users. Obtain further information directly from your powermanager supplier.

If you have entered the correct password, click **OK** to confirm the password. Else, the **OK** button is deactivated. After you successfully enter the password, you do not need to specify it again until the next time you start the report.

Saving the Password

After you enter the valid password, click **Report > Password** and select the **Save password** option.

If the icon is visible along side the **Save Password** option, then the password is enabled. Click the entry to block the configuration. The icon changes to  and you log off.

Applicability of the Password

The password applies to the following areas:

- Configuration of report. The default password is **erAdmin**. You can modify the password.
- Sheet protection for normal reports. The default password is **erAdmin**. This password is different from the report configuration password. You can modify the password.

- Protection of the release for reports with the **Track changes** option. The default password is **erAdmin**. This password is different from the report configuration password and the sheet protection password. You cannot modify the password for existing reports.
- Protection of the whole report file using a fixed password for released reports (contact the Siemens AG product center regarding the password). Use this password to open a report when the Excel Report is not running and does not play any other role.
- The source code.

Change Password

To change the password:

- Click the **Add-Ins** tab, and click **Report > Configuration > Change password**.
  The **Change password** dialog opens.
- Enter the current password in the **Old password** field.
- Enter the new password in the **New password** field.
- Enter the modified password again.
- Click **OK**.

NOTE

The password is not specific to any user and is also used for sheet protection of all reports created.

Options

Use the **Options** menu to define general settings and specifications regarding communication between the COM manager and powermanager (TCP/IP).

Click the **Add-Ins** tab, and click **Report > Configuration > Options** to open the **Settings** dialog.

The **Options** menu is present in the **Settings** dialog.

The settings are defined for each computer. The Default setting applies to all computers for which no specific setting is defined. Excel Report defines the correct computer name.

In the **Options for the host** list box, select the computer that serves as the host for timing control. The settings then apply to the current host.

Click  to add a new computer.

Click  to display the name of the computer in use.

Click  to delete an existing computer name with the associated settings. You cannot delete the default settings.

Tab	Settings	Notes
General	Host for schedule	Select a host for timing control. Use only one computer for timing control for the whole powermanager project.
	Language	Select the language in which powermanager Report (menu items and dialogs of the Report AddIn) is displayed. All other menus and dialogs in MS Excel are displayed in the installation language of Excel. Comments and descriptions for powermanager are shown in the language in which the datapoint list is written in powermanager. You can switch the language for powermanager Report online. By default, powermanager Report uses the language set in Excel.
	Password for reports	Enter a password to protect the sheets of all new reports in the text box. The password can differ from the configuration password.
	Automatic logout	When you select the option box, a **minute(s)** field is additionally displayed in the dialog. In the **minute(s)** field, enter the automatic logout time in minutes.
	Day changeover point	Enter the day changeover point. When you generate a new report, synchronize the time periods to the day changeover point set here. Use the value query icon to read the day changeover point set in powermanager (***type: _config, datapoint element: _config.StartHour***). The value read is displayed in the associated field.
	Reset Excel Report	Click **Reset Excel Report** to reset the current settings to the default initial settings. You lose all your customized settings for tariffs, cost centers, and so on.
ComManager	Config file	Enter the path to the config file. The selected Config file determines what powermanager project the COM manager connects to. Select the file from within the entire network using the File Browser (file selection window).
	Command line	Enter further parameters in the **Command line** field. Example of a command line entry: • **data datahostname** • **event eventhostname**
HTML	HTML	Specify a path where new reports are saved as HTML files by default. In Report Versions 2.0 and above (with Excel version 2000 and above), you can generate finished reports automatically as HTML pages using the Schedule option. You can also generate an HTML page manually from an opened report.

Tab	Settings	Notes
Datapoint selection	Extended functions	Use the **Extended functions** option to define whether the extended functions are available for selection in the **Insert measured value** dialog.
	Old datapoint types	Use the **Old datapoint types** dialog to parameterize which datapoint types (device types) are offered for selection when selecting measured values. All datapoint types not yet selected are displayed in area 1.
	New datapoint types	Datapoint types selected for display are moved to area 2.

NOTE

It is recommended that you stick to one language for all parameter settings (especially, for importing the archive structure and the datapoint list).

As data and event are not entered in the powermanager config file by default, specify the paths to Data Manager and Event Manager in the command line during client installations.

If powermanager data is accessed simultaneously by separate Report installations, the ID of each computer involved must be unique. The number of different IDs depends on the powermanager license.

Importing the Archive Structure

The archive structure file (AC datapoint types) is created from the main AC parameterization panel in powermanager.

The archive structure contains the datapoint types used in powermanager together with their elements (if present), the associated compression levels, the intervals, and the associated datapoint functions (compression rules).

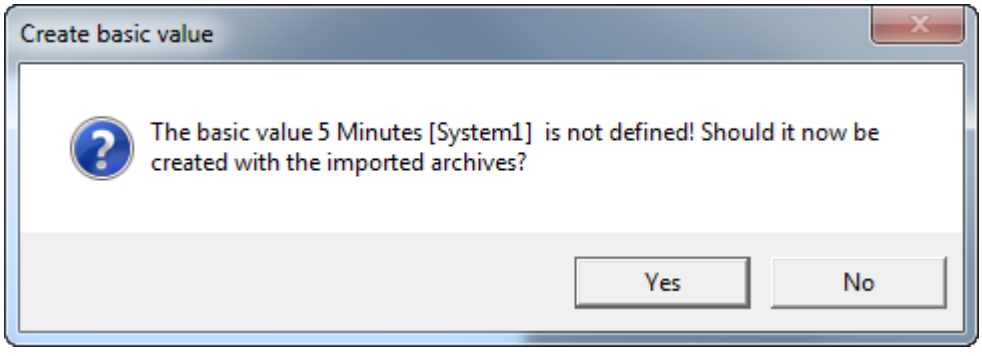
Click **Report > Configuration > Archive Structure** to import the archive structure.

Click the **Add-Ins** tab, and click **Report > Configuration > Archive structure** to import the archive structure.

A File Browser opens. Select the required file from all the files in the network. The default directory in which powermanager saves the file is `<proj_path>/data/xls_report`.

New or modified archive structures (datapoint types) are adopted in Excel Report and confirmed with a message.

If new datapoint types are adopted in the database, basic values and report types are created automatically for the default intervals 5 minutes, hour, day, and month. The names are based on the language currently set in powermanager Report.



[sc_CreateBasicValue_Message, 1, en_US]

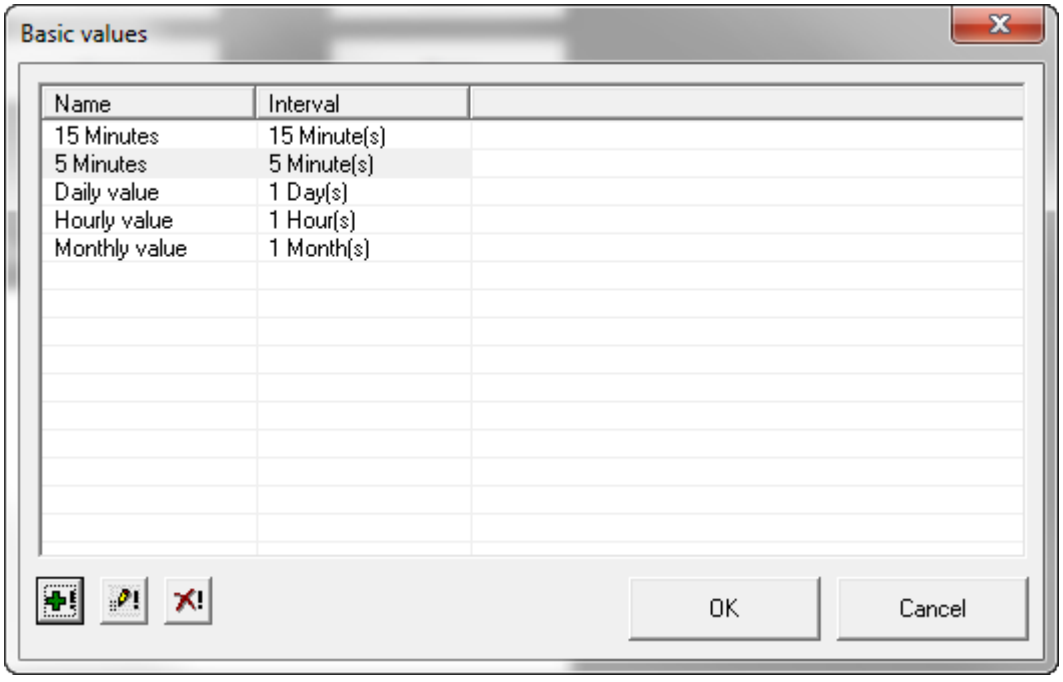
Figure 7-25 Creating a Basic Value

Basic Values

From the various compression structures of different datapoint types, those elements that contain similarly compressed data, for example, hourly values or daily values, are collected together into a group of basic values. You can select any name for these basic values.

All the compression levels for the standard intervals of interest are derived automatically from the archive structure. powermanager creates the automatically generated basic values when the structure file is imported. The basic values simply require confirmation by the parameter setter.

Do not change the basic values. The following screenshot is an example of all basic values defined for a project.

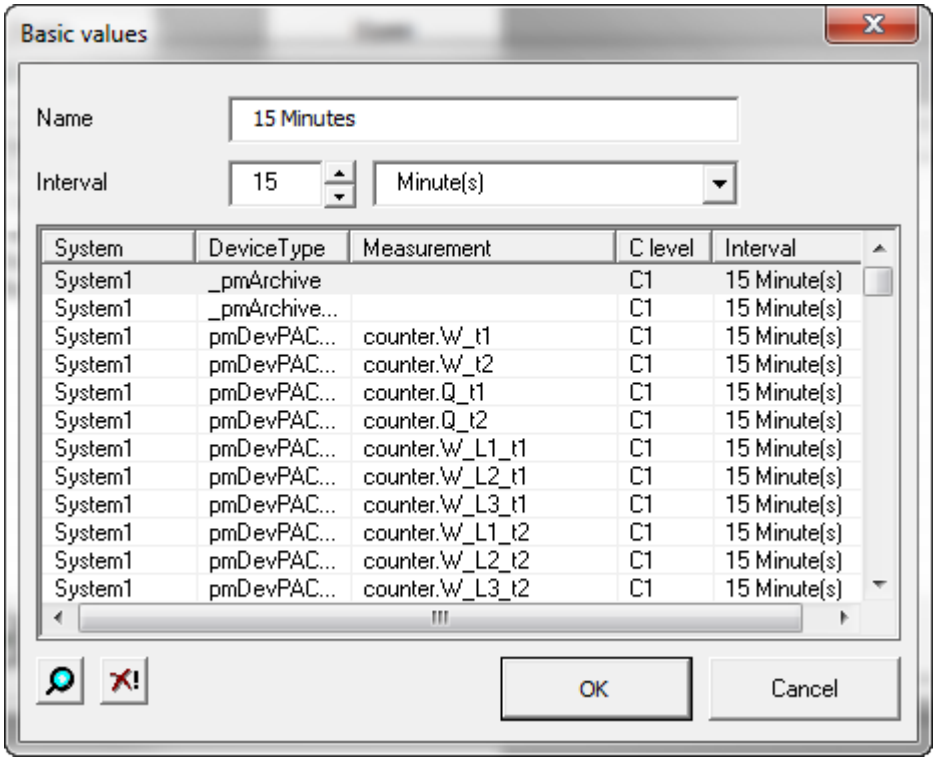


[sc_BasicValues_Window, 1, en_US]

Figure 7-26 Basic Values

The following basic value parameterization window is used for editing or creating an entry.

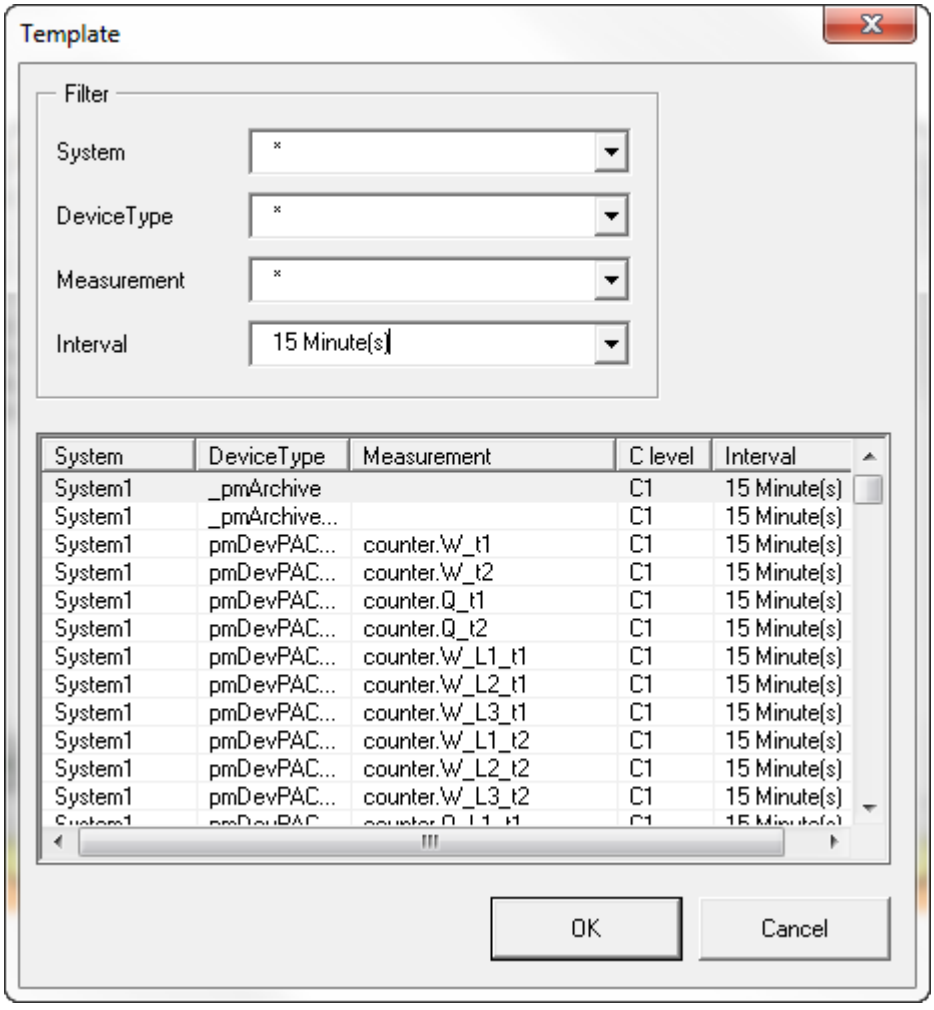
In case of distributed systems, you can select between several systems.



[sc_BasicValue_Parameterization, 1, en_US]

Figure 7-27 Basic Value Parameterization

Use the magnifying glass to select other data records to assign to the basic value that is open for editing.
Use the **Interval** as a filter criterion for selecting the archives and as a default value for the period (result) or the interval (data) for the report types.



[sc_Template_Window, 1, en_US]

Figure 7-28 Selecting Data Records

Define the filter settings in the top window section. These settings affect the lower part of the display.

The datapoint element within a datapoint type is defined in the **DPE** column beside the datapoint type. In the adjacent columns, the selected compression level and associated interval are displayed.

Special Case: Groups with Different Archiving Intervals

You can group archives of different datapoint types into a basic value with different memory intervals. For example, it is possible to display a laboratory value entered once a day in the same daily report as hourly recorded measured values by using the same laboratory value for each hourly value (for example, a sum of a day divides to a 1/24th).

On the other hand, you can display measured values and count values in a weekly report as a four-hourly mean value (or sum value), even though the values are archived half-hourly.

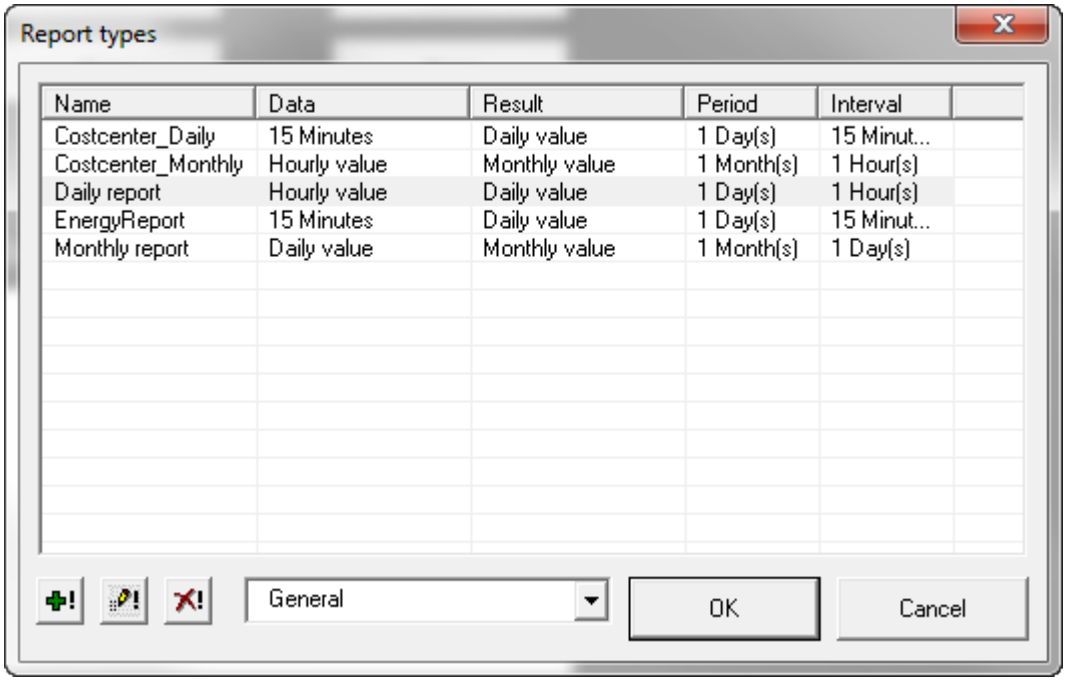
The only requirement is that the ratio of the converted values to the archived values is an integer, and that a common synchronization time is found for them. Since the required calculation of the values is performed in Excel, only the functions Min, Max, Sum, and SumNumber (arithmetic mean) return valid results.

Report Types

The report type establishes the connection between the datapoint names (represented by the basic values) and their archive values.

Similar to basic values, you can also derive the report types automatically from the archive structure for the standard intervals of interest. Therefore, it is not necessary to make any changes to the report types.

The following image shows a list of parameterized report types.



[sc_ReportTypes_Window, 1, en_US]

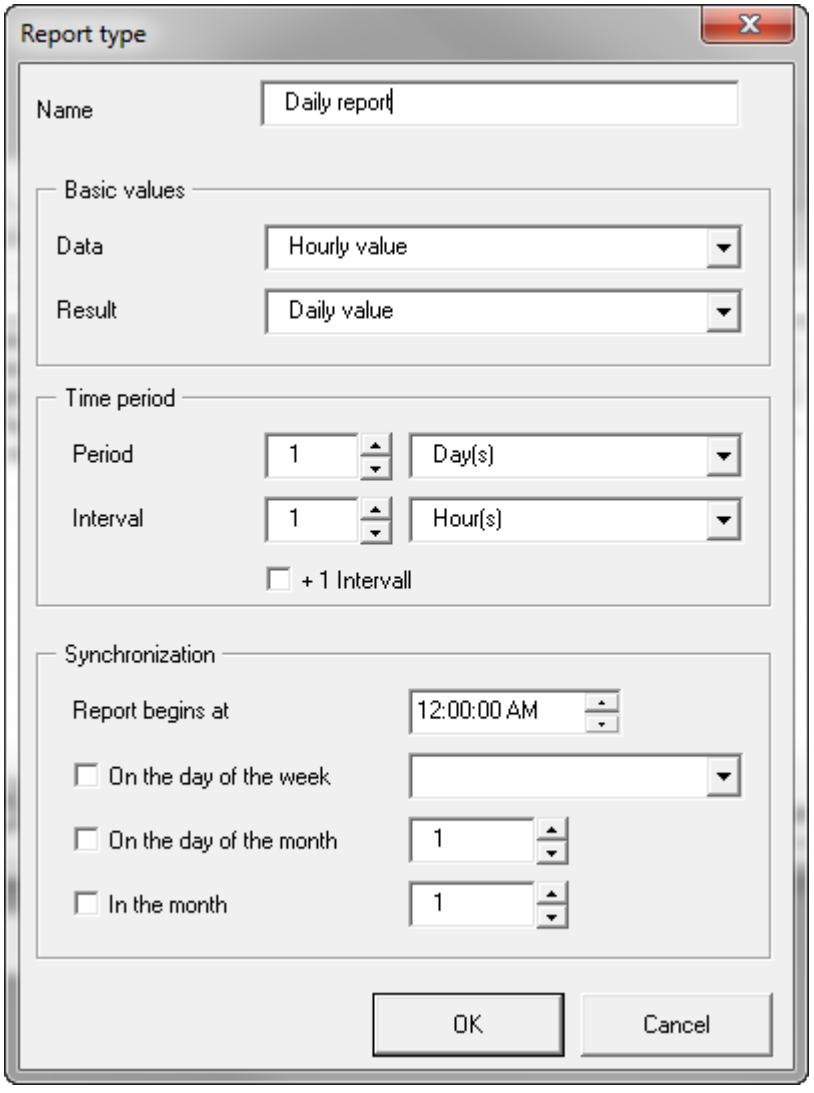
Figure 7-29 Report Types

The settings of the basic values are subdivided into a data and a result area.

The period that is set represents the time period displayed in this report. Each data record is displayed at a time interval derived using the interval for a time period.

Use the synchronization settings to offset the start time for the report. For example, if a day changeover point is set to 06:00 hours and you open a daily report with a period of one day and an interval of one hour, the first value is entered at 06:00 hours and the last for 05:00 hours of the following day.

Settings	**Notes**
Name	Enter a name for the report format.
Data	Select the interval period.
Result	Select the periodic querying of the report.
Period	Select the report creation period.
Interval	Select the interval. The Interval is used as a filter criterion for selecting the archives and as a default value for the period (result) or the interval (durations) for the report types.
Report begins at	Specify the time of triggering the report creation repetition interval.
On the day of the week	Select a day of the week.
On the day of the month	Select a day of the month.
In a month	Select a month.



[sc_ReportTypes_Parameterization, 1, en_US]

Figure 7-30 Parameterization of the Report Type

Special Case: Report Covering Several Periods

You can create reports that extend over several periods. The results are always expected for a datapoint at the start of the time period, and are not retrieved over the full period. Therefore, at the template creation stage, ensure that the results (values from the footer or result area in column-oriented reports) are not retrieved from powermanager, but are calculated from the retrieved data held in powermanager Report.

Special Case: Report with Parameterized Interval

The basic values need not necessarily be based on the time ranges from the powermanager archive but you can parameterize the display. For example, an **hourly values** basic value is specified for the data area that, while it contains real values, does not contain hourly values but 30-minute values instead. However, the report would then be defined here to display a value only for every other hour. This value is set in the **Interval** field.

Status Bits

For every value entered in the powermanager database, a 64-bit data word is saved containing the status bits that represent the saved value. The information contained in the status bits ranges from flagging up invalid values, through identification of range violations, right up to labeling of correction values.

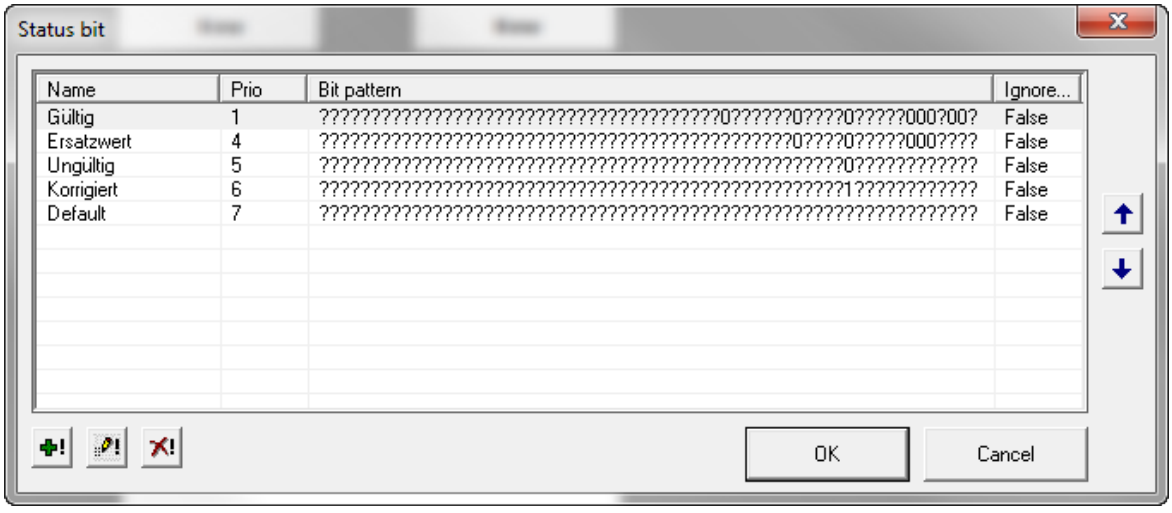
Use the status bits to format the values in a report. Simplify the status bits to avoid having to handle all theoretically possible status bit combinations (2^64). Excel recognizes the 64 status bits mapped onto 5 different status designations (valid, substitutional, invalid, corrected, default) by a bit-wise comparison of the status bits with a bit pattern. If a match is found, the relevant cell is formatted according to the identified status. The actual formatting corresponds to the Excel standard. For example, invalid values or correction values are highlighted in a suitable way in the Excel reports.

The status bits in the standard version are predefined. Do not change the status bits. You can rearrange these status settings or add new ones to them.

The following figure lists the defined status bits with their meaning. When evaluating the data, the bit pattern list is worked through from top to bottom until the first match is found. This formatting is then applied to the row. Place those bit patterns expected to occur most frequently (for example, valid) as close to the top of the list as possible.

A **0** in the bit pattern indicates that the bit is not set. A **1** indicates that the bit is set. A question mark labels irrelevant status bits. This indicates that the bits are irrelevant to the comparison whether these bits are 0 or 1.

The **Ignore values** column indicates whether a value identified for this status is included in the statistical function, or whether it is ignored (applies to calculations in MS Excel).

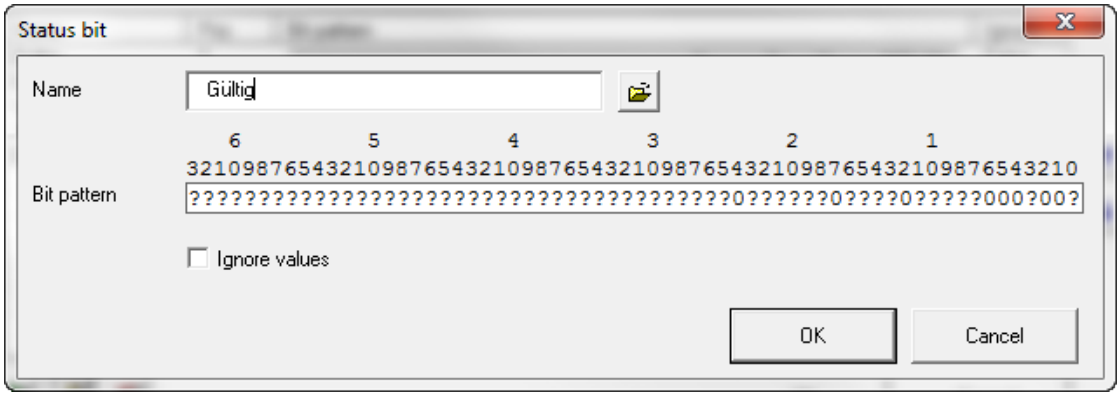


[sc_StatusBits_Window, 1, en_US]

Figure 7-31 Display of Defined Status Bits

New entries or changes in the list are handled as follows:

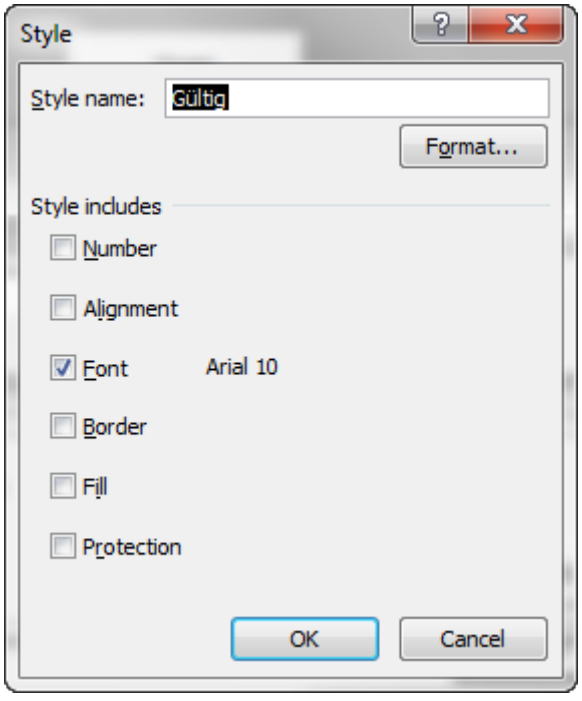
- Click  to assign formatting to the selected status designation.



[sc_StatusBits_Parameterization, 1, en_US]

Figure 7-32 Parameterizing a Status Bit

- Click an individual element in the comparison bit-pattern to change the value in the sequence **?-1-0**.



[sc_StatusBits_Format, 1, en_US]

Figure 7-33 Defining a Format

- Select the **Ignore values** option to include the value whose status matches this bit pattern in the statistical calculations in Excel. The format template is saved in the Report (Report.xls).

  After changing this format template, update each template.

  To update the template, click the **Add-Ins** tab, and click **Report > Update templates**.

NOTE

Only the templates located in the **`Template`** directory are updated.

Tariff Sets

For information on tariff sets, see *7.3.5.1 Overview of Tariff Sets*.

Cost Centers

For information on cost centers, see *7.3.6.1 Overview of Cost Centers*.

Media

For information on media, see *7.3.4.1 Overview of Media*.

7.3.16 Configuring the Microsoft Excel Macro Security Level

The security concept of Microsoft Excel enables you to decide whether to run the macros or not. For interruption-free operation of the powermanager report generator, set the security level to **low**.

To configure the Microsoft Excel macro security level:

✧ For Excel 2007, click  **> Excel Options**.

For Excel 2013/2016, click the **File** tab, and then click **Options**.
The **Excel Options** window opens.

✧ In the **Excel Options** window, click **Trust Center**.
The **Trust Center** page opens.

✧ On the **Trust Center** page, click **Trust Center Settings...**.
The **Trust Center** window opens.

✧ In the **Trust Center** window, click **Macro Settings**.

✧ On the **Macro Settings** page, select **Enable all macros**.

✧ Click **OK** to close the **Trust Center** window.

✧ Click **OK** to close the **Excel Options** window.

7.4 Export

7.4.1 Overview of Topology Export

✧ To open the Topology export, click **Tools** > **Topology export**.
The **Topology export** dialog opens.

✧ Click  .
The **Choose a File** dialog opens.

✧ Enter a **File name**.

✧ Click **Save**, to save the CSV file.
To enable importing of the device data using the mass parameterization feature, ensure that you name the CSV file with the prefix **PM_**.
For example, **PM_Example.csv**.
For more information on mass parameterization, see *7.6 Mass Parameterization*.

7.5 Power Peak Analysis

7.5.1 Overview of Power Peak Analysis

powermanager contains a report generator for determination of power peaks within a specified time range.
You can evaluate the following values using the report generator:

- Power demand values of the PAC device types. The time stamp of the power demand values is at the start of the period.
- Parameterized power demand values of generic Modbus devices.

Report

You receive the result of analysis in the form of a tabular report in the **csv** file format. You can open, print, and edit the report file with Microsoft Excel.
powermanager issues the report in the language that you set.

Number of Peaks to Display :	5		
Time Preselection	from	until	
	04/01/2011 00:00	04/21/2011 14:26:00 AM	

Measuring Point :			
PAC3200_111 (EM) cumulated active power import			
Limit			
30.000 kW			
Value	from	until	
41.951 kW	06.04.2011 15:00	06.04.2011 15:15	
40.153 kW	18.04.2011 13:30	18.04.2011 14:30	
47.135 kW	18.04.2011 14:45	20.04.2011 12:45	
39.398 kW	20.04.2011 13:00	21.04.2011 09:15	
40.704 kW	21.04.2011 09:30	21.04.2011 12:45	
	more violations available (in sum 1)		

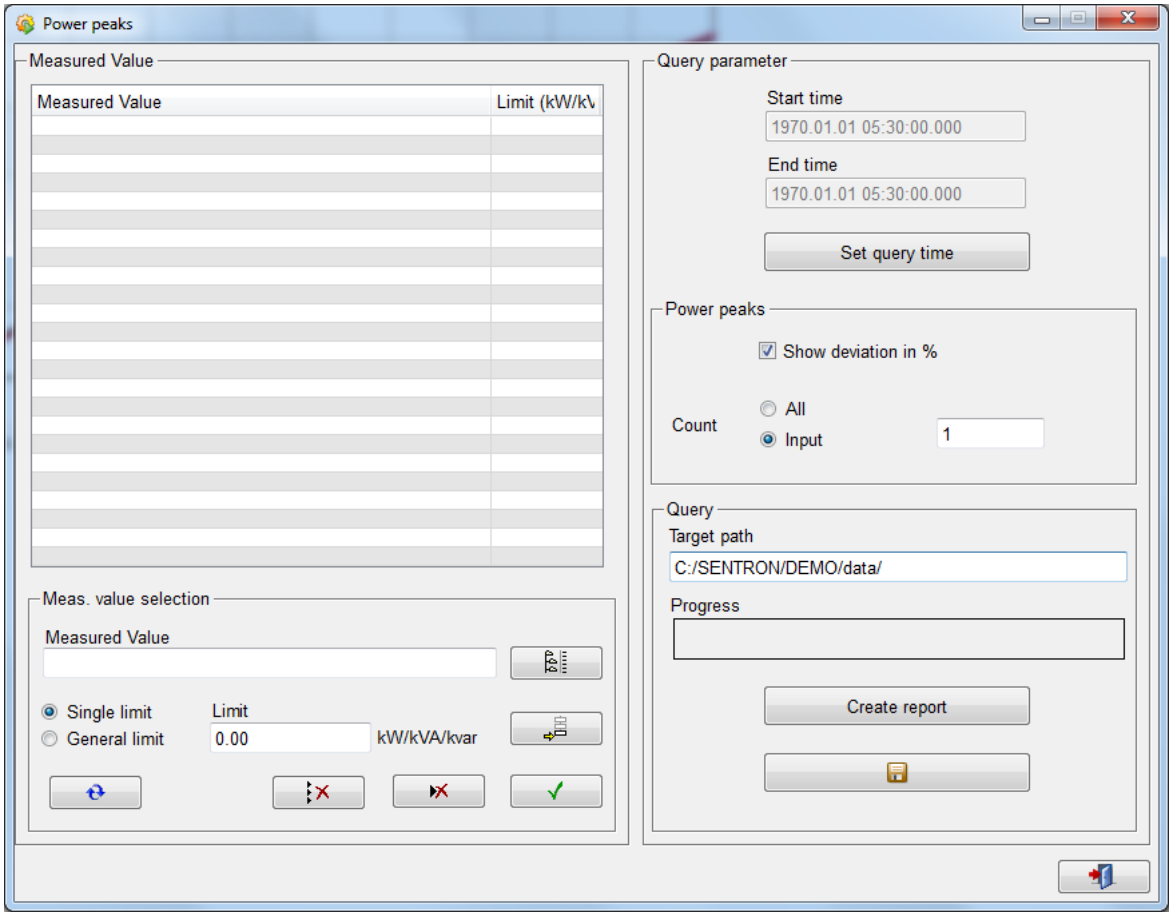
[sc_Powerpeak_Report, 1, en_US]
Figure 7-34 Power Peak Analysis Report

7.5.2 Opening the Power Peaks Window

To open the **Power Peaks** window:

✧ In the menu bar click **Tools > Power peak analysis**.

The **Power Peaks** window opens and displays the last saved configuration.



[sc_Powerpeaks_Window, 2, en_US]

Figure 7-35 Power Peaks Window

7.5.3 Creating a Report

To create a report:

- ✧ Open the **Power Peaks** window.
- ✧ Modify the configuration data to suit your requirements.
- ✧ In the **Target Path** field, specify the directory where you want to save the report.
- ✧ Click **Create Report** to start the report creation.
  Wait until the progress bar goes up to 100 % and then goes back to 0 %.
  Save the modified configuration if you wish to keep it.

7.5.4 Configuring Power Peaks

Scope

Configuring power peak analysis comprises:

- Selecting datapoints
- Defining the limit of the datapoint
- Narrowing down the query period

- Displaying power peaks in the report
- Report file name and path

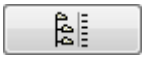
Selecting Datapoints

The **Measured values** table lists the datapoints that are included in the analysis and are printed in the report.
The **Meas. Value Selection** area under the **Measured value** table provides the following functions for editing the table entries:

- Including datapoints in the **Measured value** table.
- Deleting a datapoint from the **Measured value** table.
- Changing the limit of a datapoint or limits of all datapoints.

Including a Datapoint in the Measured Value Table

To include a datapoint in the **Measured values** table:

✧ Click  to open the **Value Selection** dialog.

✧ In the **Value Selection** dialog, select the required datapoint from the selection tree.

✧ Click  .

✧ Specify the threshold of the datapoint in the **Limit** field.
Violation of the threshold is considered to be a power peak.

✧ Select **Single Limit** option.

✧ Click  .

The datapoint with its assigned threshold is now visible in the Measured Value table.

Deleting a Datapoint from the Measured Value Table

NOTE

The system deletes the selected datapoint without prompting for confirmation.

To delete a datapoint from the Measured value table:

✧ Select the datapoint that you want to delete.

✧ Click  to delete the selected datapoint.

Deleting All Datapoints from the Measured Value Table

NOTE

The system deletes the selected datapoint without prompting for confirmation.

To delete all datapoints from the Measured value table:

✧ Click  to delete all datapoints from the Measured value table.

Editing a Datapoint from the Measured Value Table

To edit a datapoint from the Measured value table:

✧ Select the datapoint that you want to edit.
The data for the selected datapoint becomes visible in the **Meas. Value Selection** area.

✧ Make the required changes to the datapoint details.

✧ Select **Single Limit** option.

✧ Click  to save the changes.

Editing Single/General Limit

Selecting the **Single Limit** or **General Limit** option changes the behavior of the  button.

✧ Select the **Single Limit** option to transfer the current values of the Measured value and Limit fields to the Measured value table while retaining the existing entries in the table.

- or -

✧ Select the **General Limit** option to transfer the current values of the Measured value and Limit fields to the Measured value table and overwriting the thresholds of the existing entries with the new threshold value.

NOTE

To cancel this step, reedit all limits already parameterized.

Query Period

The **Start time** and **End time** fields in the **Query parameters** area narrow down the query period.
A number of previously defined calendar periods are available for selection.
Open intervals:

- Today
- This week
- This month
- This year

Closed intervals:

- Yesterday
- Last week
- Last month
- Last year
- Last 24 hours
- Last 3 days

Any periods:

- Any day
- Any period

A selected previously defined period can be modified to suit requirements.
To define a query period:

✧ Click **Set query time**.

✧ Select one of the previously defined periods in the dialog.

- or -

✧ Define an individual period in the **Start time** and **End time** fields.

✧ Click  to save the changes.

Displaying Power Peaks in the Report

To display the power peaks in the report:

✧ Select **Show percentage deviation**.
The system calculates and prints the percentage deviation of the power peak from the parameterized limit value.

✧ In the **Number** area, the **All** option is selected by default. Keep this option selected if you want to display all the power peaks per measuring point in the report.

- or -

✧ Select **Input** if you want to display a set number of power peaks per measuring point in the report.
Specify the limit in the field beside the **Input** option.
If the number of power peaks exceed the set value, then an annotation is inserted in the report.

Report Filename and Path

Filename

powermanager generates the power peak analysis report in the **csv** file format.
The format of the file name is:
Peak_Data_<YYYY>_<MM>_<DD>_<HH>_<MM>_<SS>.csv
Here, <YYYY>, <MM>, and <DD> denote year, month, and date respectively. They indicate the date when the report generation started.
<HH>, <MM>, and <SS> denote the hour, minute, and second respectively. They indicate the time when the report generation started.

Directory

To select the directory where the report is saved:

✧ Specify the directory in the **Target path** field.
By default, the **Target path** field contains the address of the last set directory.
If you want to save the report to other directory, overwrite the path to suit your requirements.
The lowermost directory must end with a directory delimiter. For example, **../data/** instead of **../data**.

Default Directory

If the specified directory does not exist, powermanager saves the report in the default directory.
The `\data` directory underneath the project directory is the default directory.
The default directory is set by default when the application is installed.
Any directory deviating from the default directory is stored on the client system and not throughout the system.

7.5.5 Saving the Power Peaks Configuration

NOTE

Unsaved configuration changes are lost when you close the **Power Peaks** window.

✧ Click  to save the power peaks configuration.

7.5.6 Calculating Power Peaks

Scope

powermanager calculates power peaks based on archived data.

A power peak consists of one or more periods. It begins with the end period of the first measured value that exceeds the defined threshold and ends with the end period of the last measured value that exceeds the defined threshold.

To determine the end of the period, the period length at the time of the period start is determined and is added to it. If several measured values exceed the limit in succession, the highest violation within the time range is specified as the power peak. The end period of the value is always specified in the report as the time for a measured value.

Percentage Deviation

The percentage deviation from the limit is calculated based on:

((Value of the highest violation) – (Limit)) / (Limit) * 100

The percentage deviation is rounded to integral percentages without decimal places.

Example of Percentage Deviation

Consider a scenario where the defined limit is 2 kW and the query period is from:

01.01.2010 10:00 to ***01.01.2010 11:00***

Table 7-2 Measured Values

Time stamp (period start)	Time range [min]	Value [W]
01.01.2010 10:00 h	15	1957
01.01.2010 10:15 h	15	2110
01.01.2010 10:30 h	15	2215
01.01.2010 10:45 h	15	2013
01.01.2010 11:00 h	15	957

Based on the values in the preceding table, the following violations have occurred:

01.01.2010 10:30 h to 01.01.2010 11:00 h

Value: 2215 W

Therefore, the percentage of deviation is:

(2215 W – 2000 W) / (2000 W) * 100 % = 11 %

7.5.7 Closing the Power Peak Window

To close the **Power Peaks** window:

✧ Click  to save the configuration changes.

✧ Click  to close the **Power Peaks** window.

NOTE

Unsaved configuration changes are lost when you close the **Power Peaks** window.

7.6 Mass Parameterization

Overview

You can automate creation of new devices in the project tree. To do this, create a **csv** file in the project data directory.

Example

Consider that you want to create the following devices in an automated fashion:

- Two PAC4200 devices with the names MyPAC4200_1 and MyPAC4200_2
- One PAC3100 device with the name MyPAC3100_1 via Slot1 of the gateway MyPAC4200_2
- One PAC3100 device with the name MyPAC3100_2 via the standard gateway

To create the **csv** file:

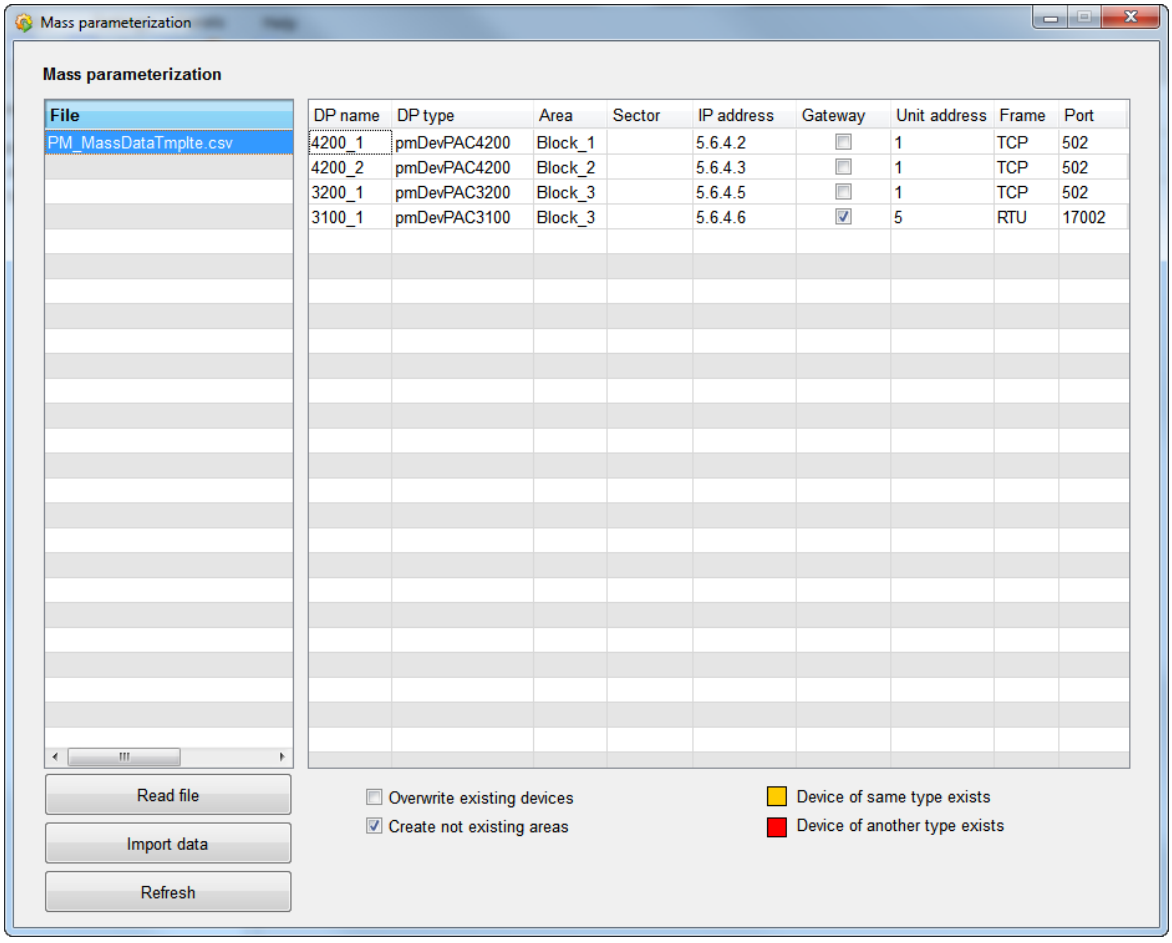
- The format of the command to create the above devices in automated fashion is:
  DP name;DP type;area;sector;IP address;gateway;unit_address;frame;port
  Here,
  - **DP name** is the internal device name.
  - **DP type** is the device type.
    Following device types are available in powermanager:
    - pmDev3VAETU5
    - pmDev3VAETU8
    - pmDev3VA27
    - pmDev3VLCOM21
    - pmDev3WL (3WL)
    - pmDev3WL10 (3WL)
    - pmDevPAC1200, pmDevPAC1500, pmDevPAC1600, pmDevPAC2200, pmDevPAC3100, pmDevPAC3200, pmDevPAC3200T, pmDevPAC4200, pmDevPAC5100, pmDevPAC5200
    - pmDevMB (generic Modbus device)
    - pmDevP850, pmDevP855 (SICAM P85x devices)
    - pmDevManualMeasuringDevice
  - **Area** is the area name in the project tree.
  - **Sector** is the sector name in the project tree.
    Only 1 sector level is supported.
  - **IP address** is the IP address of the system.
  - **Gateway** has a value range of TRUE or FALSE.
    Following gateways can be defined:
    - Modbus-TCP: FALSE
    - Modbus-RTU: TRUE
  - **Unit_Address** is the address of the unit in the subnetworked Modbus network.
    - Modbus-TCP: 0 (no relevance)
    - Modbus-RTU: 1 - 247
  - **Frame** is defined as ***[tcp; rtu]***
  - Following **ports** are available:
    - Modbus-TCP: 502
    - Modbus-RTU – Slot1 : 17002 (7KM PAC4200, RS 485 bus is connected to slot "MOD1")
    - Modbus-RTU – Slot2 : 17003 (7KM PAC4200, RS 485 bus is connected to slot "MOD2")
    - Modbus-RTU – standard gateway: 502
- Therefore, for the above example, the following entries must be made in the **csv** file:
  MyPAC4200_1;pmDevPAC4200;area_4;sector_2;192.168.219.214;FALSE;0;tcp;502
  MyPAC4200_2;pmDevPAC4200;area_4;sector_2;192.168.219.215;FALSE;0;tcp;502
  MyPAC3100_1;pmDevPAC3100;area_4;sector_2;192.168.219.215;TRUE;1;rtu;17002
  MyPAC3100_2;pmDevPAC3100;area_4;sector_2;192.168.219.214;TRUE;1;rtu;502

NOTE

- Select **tcp** as a frame for a device you want to operate over the standard gateway.
- A predefined sample file **PM_MassDataTmplte.csv** is present in the data directory of the demo project.

User Interface

In the menu bar, click **Tools > Mass parameterization** to access the mass parameterization display.



[sc_MassParameterization, 3, en_US]

Figure 7-36 Mass Parameterization View

The mass parameterization view contains the following components:

- **File**
  The **File** table in the left panel lists all the **csv** files that are created in the data directory of the current project.
- **Read file**
  Select a file from the file table and click **read file** to see the data of the file in the right panel.
  - If a device with an identical name and device type exists in the project tree, the device is highlighted in **Yellow**.
  - If a device with an identical name and a different device type exists in the project tree, the device is highlighted in **Red**.

- **Import data**
  Click **Import data** to import the data of the selected file.

You can also overwrite existing devices or create areas that do not exist.

8 Settings and Configurations

8.1 Project Settings

8.1.1 Configuring Project Settings

The **System settings** page enables you to change the project settings. It enables you to change the project configuration and change device configuration.

To open the **System settings** page, right-click the project tree root and click **System settings**.

System settings page has the following tabs:

- **Configuration**

  The **Configuration** tab displays the version number of the project. Additionally, it contains the following options:

  – In the **General** section,

    No archive smoothing

    Select this option to disable smoothing of the measured values, but it will increase the memory utilization in the database.

    UL standard

    Select this option to represent the measured values in accordance with UL standard. The default standard used is IEC standard.

  – In the **Default value in case communication stops** section,

    Default device value

    Select this option to assign a default value to any device in the project if the communication between the device and powermanager stops.

    If you select this option, define the default value in the **Default value** box.

    The default values will not be assigned for energy and power period values.

    Set as invalid value for report

    Select this option if you want to highlight the devices that use the default values in the report.

  – **Report settings**

    Password

    erAdmin is the default password for basic reports. Use this field to customize the password for all basic reports. It is recommended that you change the password.

- **Device**

  The **Device** tab contains the following options:

  – **Create Device**

    Use this option to create a new device type.

    For more information, see *8.1.3 Creating New Device Type*.

  – **Delete device**

    Use this option to delete any of the manually created device types.

    To delete a device type, select the device type from the **Device type** drop-down list, and click **Delete**.

  – **Update database for**

    Use this option to set the database size for the current project.

    To set the database size for the current database, select the maximum number of devices from the drop-down list and click **Update**.

8.1.2 Optimizing Performance

Overview

powermanager offers the following options to improve the performance of the system:

- Smoothing supplied data
- Extending polling times
- Reducing active addresses

Smoothing Supplied Data

Smoothing is used to reduce the amount of communication and the volume of data stored in the system.

powermanager can smooth the data supplied by the devices in the driver before it is processed further in the control system.

Value-dependent Smoothing with Relative Threshold Value

powermanager performs value-dependent smoothing with a relative threshold (specified in [%]).

A value is only smoothed if the difference between value arriving in the driver and the last value transferred to the Event Manager is less than the relative threshold.

No smoothing takes place if the difference between the consecutive values exceeds the relative threshold value.

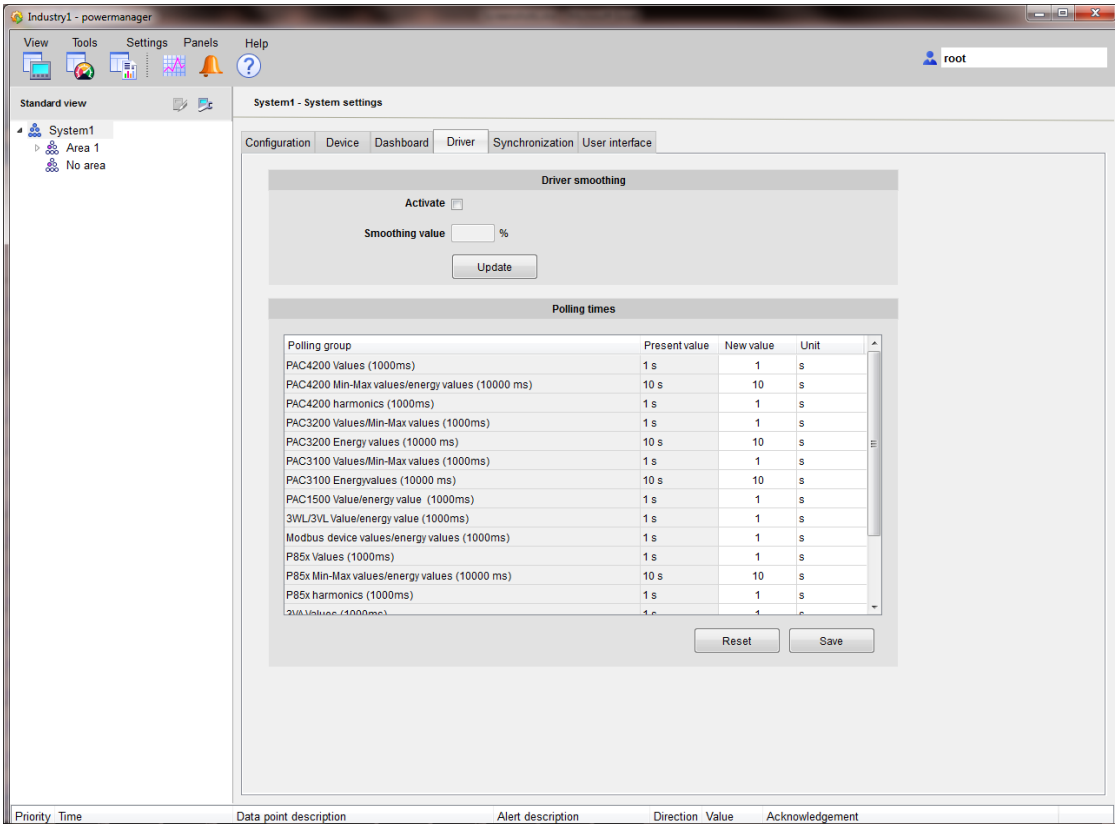
Value Range

Meaningful threshold values lie in the range from 0 % to 5 %.

Smoothing Supplied Data

To smooth the supplied data:

- Right-click the project tree root.
- In the context menu, click **System settings** and select the **Driver** tab to view the driver settings.



[sc_DriverSettings, 3, en_US]

- In the Driver settings view, enter the relative threshold percentage in the **%** field next to the **change smoothing** button.
  The recommended relative threshold range is from 0 through 5 %.
- Click **change smoothing** to start the smoothing process.

Extending Polling Times

Depending on the measured value type, measured values are read (polled) by powermanager at different times. The communication load is reduced when the polling times are increased.
To change the polling times:

- In the **Polling times** table, under the **New value** column define the updated polling time.
- Under the **Unit** column, select the unit for each polling group from the drop-down list.
- Click **Save** to confirm the changes.
  Click **Reset** to reset all the changes.

NOTE

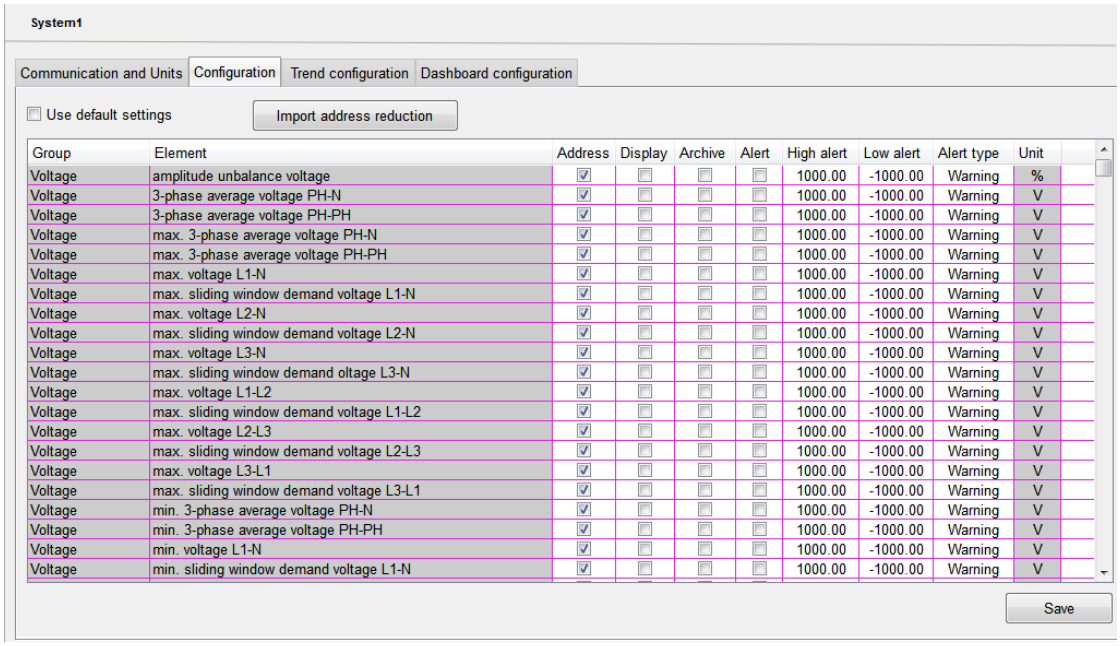
Ensure that the polling time assigned to each group is between 100 ms to 900 s.

Reducing Addresses

You can reduce the number of active addresses to optimize the performance of powermanager. You can reduce the addresses for the PAC1200, PAC3200, PAC3200T, PAC4200, PAC5200, P855, and P850 devices using a semi-automated process. For PAC1500 and PAC3100, the scope of addresses is already reduced by default.

To reduce the addresses:

- Right-click the project tree root.
- From the context menu, click **device engineering > PAC3200/PAC3200T/PAC4200**.
- Go to the **Configuration** tab.



[sc_Reducing_Addresses, 2, en_US]

- On the **Configuration** tab, deselect the **Use default settings** option.
- To reduce address of a device, under the **Address** column, deselect the checkbox corresponding to the device.
- Save the above configuration.

Result

The reduced scope of addresses affects:

- Newly created devices
- Devices with the **Use area settings** option activated

Restoring the Original Address Configuration

To restore the original address configuration, activate the **Use default settings** option and save the change.

8.1.3 Creating New Device Type

The XML import feature enables you to add new device types to powermanager.

Prerequisites

Before importing the XML file to powermanager, create the XML file with valid device information.

You can create a new XML file using the following method:

- A sample XML file, **ImportSample.xml**, is present in the following location:
  <drive_letter>:\Siemens\SENTRON\powermanager\powermanagerLib\data\Xml_Import
  where, <drive_letter> is the drive letter of the directory where powermanager is installed.
  This location also contains the XML schema **PM_Import.xsd**.
  Open the XML file and enter the valid device information. Save the file in the same location.

To import the XML file:

✧ In the project tree view, right-click the project tree root.

✧ On the context menu, click **System settings**.
The **System settings** page opens.

✧ Click the **Device** tab.

✧ On the **Device** tab, under **Create device**, click **Import**.
The **XML_Import** window opens.

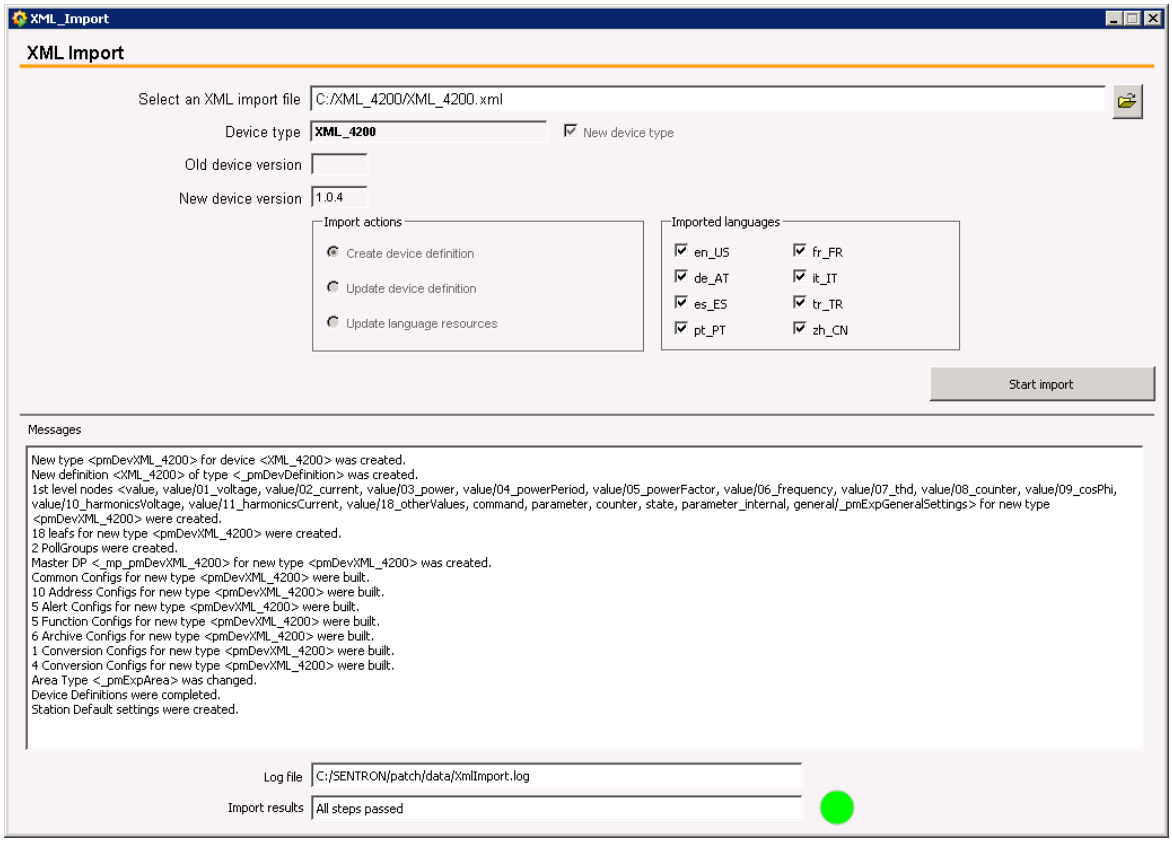
✧ Click  next to the **Select an XML import file** field.
The **Choose a file** window opens.

✧ Browse to the XML file path.

✧ Select the XML file you want to import and click **Open**.
The details of the select XML file are displayed on the **XML_Import** window.

✧ Click **Start Import**.
powermanager starts importing the XML file.

✧ After the import is complete, the Import Results field shows the following message:
All steps passed.
Additionally, a green circle is displayed next to the Import Results field.



[sc_ImportXML, 3, en_US]

✧ Close the **XML_Import** window.
After successful import of the XML, the newly created device is visible in the **Create device** context menu.

8.1.4 Measuring Period and Tariff Synchronization

8.1.4.1 Overview

powermanager enables you to synchronize the power demand values and the tariffs of multiple devices using the digital input of a single device. You can only synchronize the PAC devices (PAC2200, PAC3100, PAC3200, PAC3200T, and PAC4200).

NOTE

It is recommended that you enable synchronization when configuring the devices.

powermanager enables you to add offline device for synchronization. These devices are taken into consideration when they come online.

Prerequisites

Ensure that you meet the following prerequisites before enabling synchronization:

- Ensure that all the devices that you want to synchronize have the Synchronization via Bus setting enabled.
- Ensure that the synchronization interval for all the devices is 15 minutes.

8.1.4.2 Measuring Period Synchronization

To synchronize measuring period:

- ✧ Right-click the system node from the tree.
- ✧ Select **System settings**.
- ✧ Select the **Synchronization** tab.
  The **Measuring period** dialog opens.

The **Measuring period** tab displays the following columns:

Sync.: Select the checkbox in this column against the device for which you want to enable synchronization.

Device: Devices added for synchronization

Bus/DI/Clock/None: Synchronization type set for the device

Interval Length: Synchronization interval. This must always be set at 15 minutes.

- ✧ Select **Synchronize measuring period with this digital input**.
- ✧ Click  to add devices for synchronization.
  The **selection tree for digital inputs** window opens.
- ✧ Select the digital inputs for devices that you want to synchronize.
- ✧ Click **OK**.
  The device is added to the synchronization table.
- ✧ To enable synchronization for a particular device, select the device using the checkbox under the **Sync.** column.

NOTE

To enable synchronization for all devices, click  .

- ✧ Click  to save the changes.

8.1.4.3 Tariff Synchronization

To synchronize tariff:

- ✧ Right-click the project tree root.
- ✧ In the context menu, click **System settings > Synchronization > Tariff**.
  The **Tariff** tab opens.

The **tariff** tab displays the following columns:

Set tariff: Select the checkbox in this column against the device for which you want to enable synchronization.

Device: The devices that you added for synchronization.

- ✧ Select **Set high/low tariff with this digital input**.
- ✧ Click  to add devices for synchronization.
  The **selection tree for digital inputs** window opens.
- ✧ Select the digital inputs for devices that you want to synchronize.
- ✧ Click **OK**.
  The device is added to the synchronization table.

✧ Under **Tariff signal meaning**, select the appropriate option.
1-signal at digital input means high tariff: Select this option if you want to set the tariff to high.
1-signal at digital input means low tariff: Select this option if you want to set the tariff to low.

✧ To enable synchronization for a particular device, select the device using the checkbox under the **Sync.** column.

NOTE

To enable synchronization for all devices, click  .

✧ Click  to save the changes.

8.2 Engineering of the Power Management System

8.2.1 Device Engineering for Power Monitoring Devices, E-counters, and Circuit Breakers

8.2.1.1 Overview of Device Engineering

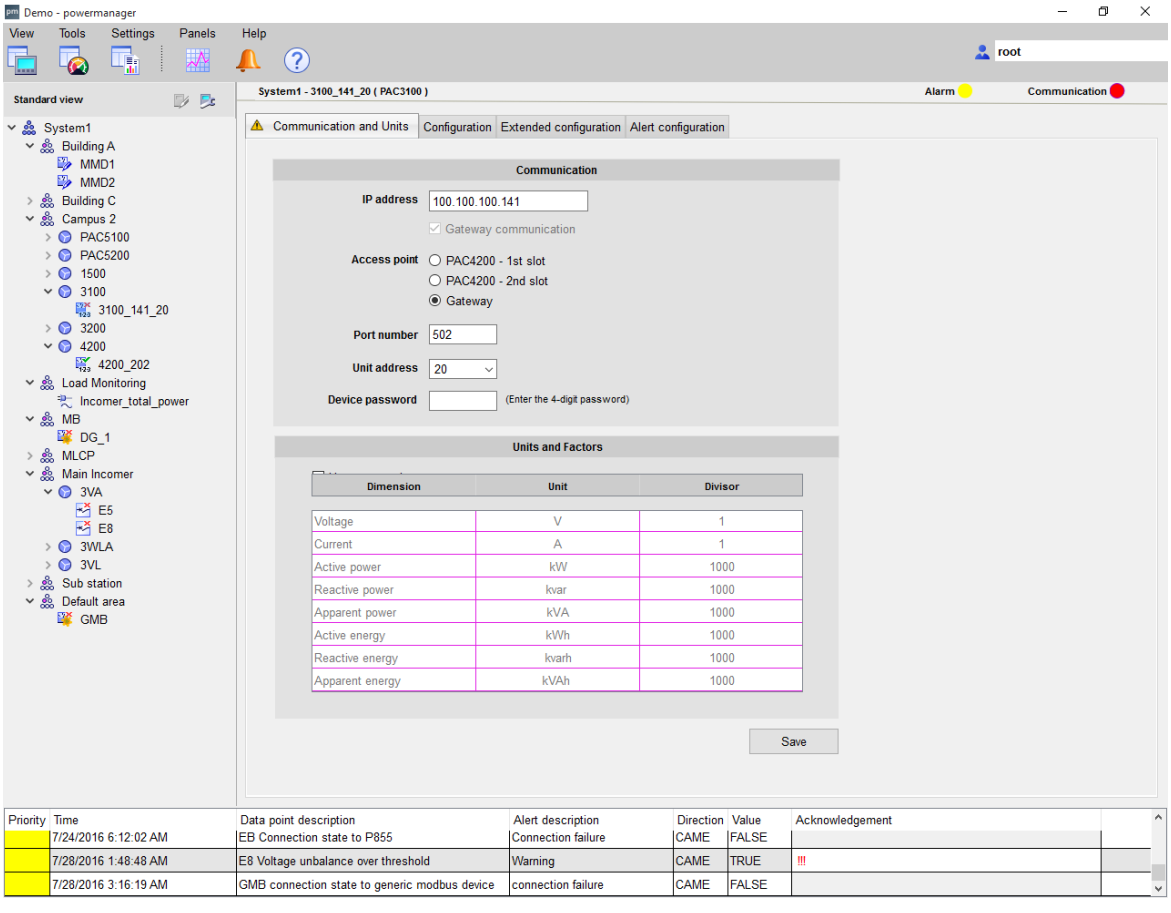
Device Support

- **Power monitoring devices and circuit breakers**: powermanager supports the power monitoring devices belonging to the PAC series and the 3VL, 3VA, and 3WL circuit breakers.
- **Generic Modbus device**: Use the generic Modbus device, to connect any Modbus-enabled data acquisition devices directly to the powermanager via Ethernet (Modbus TCP) or via a gateway (for example, PAC4200) using RS485 interface.

Opening Device Engineering

To open device engineering for a device, right-click the device in the project tree and click **Device engineering**.

8.2.1.2 Communication and Units Tab



[sc_pm_comm_units, 1, en_US]

Set the following parameters on the **Communication and Units** tab:

- **IP address of the device**: When communicating via a gateway, use the IP address of the higher level. When communicating via Modbus TCP, use the IP address of the device.

- **Gateway communication**: Activate gateway communication if the device is connected using Modbus RTU via gateway.
  - Select the **Access point**:
    - **PAC4200 - 1st slot**
    - **PAC4200 - 2nd slot**
    - **Gateway**
  - **Port number**:
    This option with the default port number **502** in the text box is displayed only on selecting the check box **Gateway communication**. You can modify the port number.
  - **Unit address**:
    Unit address (Modbus address in the Modbus RTU subnet)
- **Device password**:
  Using this option, you can enter the device password for the following devices:
  - PAC2200
  - PAC3100
  - PAC3200
  - PAC3200T
  - PAC4200

  For the password-protected devices, the synchronization of the device is possible only when you enter the correct password.

powermanager uses units and factors for setting the displayed unit. The conversion factor between the unit in the device and the displayed unit is specified.

NOTE

A unit change and a denominator refer to the display and do not change the datapoint.
When using a PAC4200 as the gateway, configure the unit address on the device.
The 3VL circuit breaker cannot be operated via COM11 over the gateway of the PAC4200.

8.2.1.3 Configuration Tab

Define the following on the **Configuration** tab:

- Elements polled by the device by software (address)
- Measured variables that are displayed under **Selected values** (display)
  You can configure the settings for individual devices.
  However, you can also inherit the settings from the entire area. For this purpose, select the **Inherit area settings** option.
- Measured variables to be archived for each device (archiving)
  If you archive large number of measured variables, it affects the system speed (performance).
  For more information, see *8.1.2 Optimizing Performance*.
- Measured variables for which an alert is triggered (alarm)
- Setting of the upper and lower limit values
  The unit in which the limit value must be entered is displayed under **Unit**.

Configuration Tab for PAC1200

The **Configuration** tab for the PAC1200 device is different from the standard **Configuration** tab available for other PAC devices. It has the following subtabs:

- **Data manager**:
  The **Data manager** tab displays the configuration options for all data points of the data-manager component of the PAC1200 device. The inheritance option is available only in the data manager **Configuration** tab.
- **Sensor**:
  The **Sensor** tab displays the configuration options for all data points of all the sensors that can be connected to the data manager (96 in total). The units for data-manager data points and sensor data points are the same.

NOTE

Communication setup is required only for data manager configuration. By default, the energy data points from data-manager configuration and the sensor configuration are archived.

8.2.1.4 Alert Configuration Tab

On the **Alert configuration** tab, define the texts to be displayed in the alert window.

For this purpose, see the message names and the standard messages saved in the software. You can modify these and assign individual texts for all the languages supported by powermanager. If you do not assign your own texts, the standard messages are used.

8.2.1.5 Extended Configuration Tab

On the **Extended configuration** tab, define the properties of the measured values of a generic Modbus device.

You can change the names of the measured variables for all the languages supported by powermanager. The element column shows the modified names.

Click **reset to default values** to reset all changes to the delivery status.

8.2.1.6 Trend Configuration Tab

The **Trend configuration** tab enables you to configure trend curves for generating trend graphs. This functionality is available for all devices.

You can add a maximum of nine trend curves for each device type.

The **Trend Configuration** tab is only visible if you access the **Device Engineering** view at the System level. The trend curves configured for a device type are applicable to all the devices of that device type. For example, if you add trend curves to PAC4200 device type, then those trend curves are visible for all the PAC4200 devices added to the project.

To add a trend curve:

✧ Right-click the tree root.

✧ On the context menu, click **Device engineering > <device type>**.
The **Device engineering** view for the selected device opens.

✧ Open the **Trend configuration** tab.
The trend configuration table displays the default trend curves for the selected device.

✧ To add new trend curves, deselect **Use default settings**.

✧ Select a row in the **Curve name** list.

✧ Click  .
The **dpSelector** window opens.

✧ In the **dpSelector** window, select the parameters for which you want to create the trend curve.

✧ Click **OK**.
The selected parameter is added to the **Curve name** list.

✧ Click , to delete the selected data point.

✧ Click , to delete all the data points.

✧ Click **Save**.

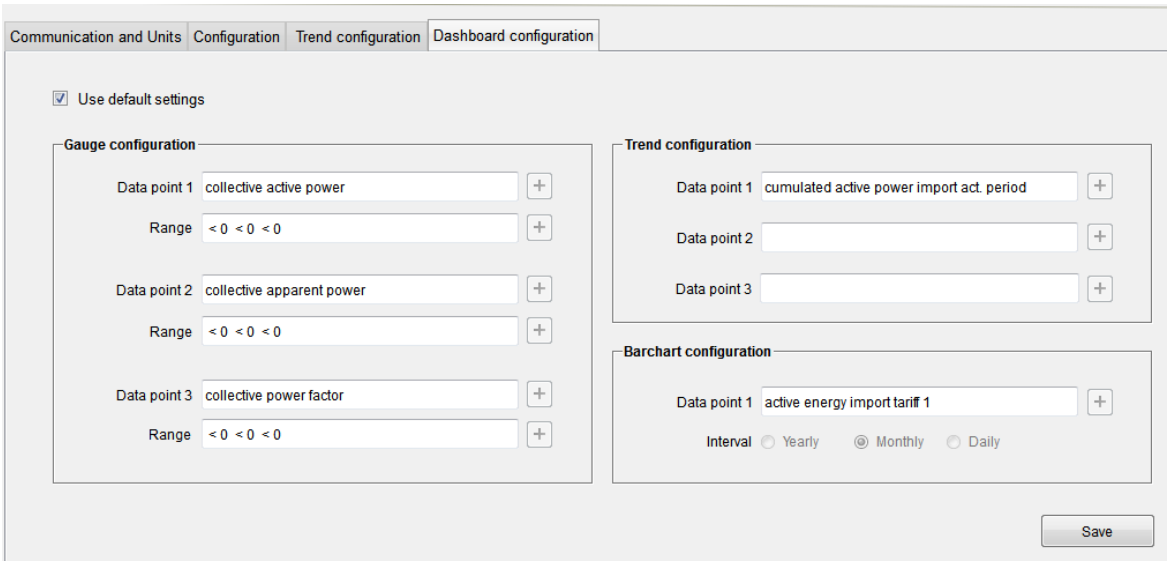
The new curve is visible under the **Trend** tab in the standard view of the device type.

8.2.1.7 Dashboard Configuration Tab

The **Dashboard configuration** tab enables you to configure gauge, trend, and bar chart configurations. This functionality is available for all devices.
The **Dashboard Configuration** tab is only visible if you access the **Device Engineering** view at the System level.

✧ Right-click the tree root.

✧ On the context menu, click **Device engineering > <device type>**.
The **Device engineering** view for the selected device opens.



[sc_Dashboard_Config, 1, en_US]

✧ Open the **Dashboard configuration** tab.
The default **Gauge configuration**, **Trend configuration**, and **Barchart configuration** is displayed.

✧ You can deselect the **Use default settings**, to change the configurations.
In the **Gauge configuration** section,

✧ Click , next to any of the **Data point** fields.
The **Data point selector** dialog opens.

✧ Select a data point and click **OK**.
The name of the selected data point will be displayed in the data point field.

✧ Click , next to the corresponding **Range** field.
The **Select range** dialog opens.

- ✧ Configure the range values and colors and click **OK**.
  The configured **Range** will be displayed.
  Configure the required data points and ranges accordingly.
  In the **Trend configuration** section,
- ✧ Click  , next to any of the **Data point** fields.
  The **Data point selector** dialog opens.
- ✧ Select a data point and click **OK**.
  The name of the selected data point will be displayed in the data point field.
  In the **Barchart configuration** section,
- ✧ Click  , next to the **Data point** field.
  The **Data point selector** dialog opens.
- ✧ Select a data point and click **OK**.
  The name of the selected data point will be displayed in the data point field.
- ✧ Select an **Interval**.
- ✧ Click **Save**, to save the configuration.

8.2.2 PAC4200

Event Memory Messages

The messages of the PAC4200 event memory are displayed if they were configured in the device as the **Warning** or **Alert** type. The message type can be configured in the device.

NOTE

Set the messages in the system settings to **back-to-normal** if you have authorization for switching (3). For example, use this setting when messages of the PAC4200 event memory are displayed but the associated messages in the device are deleted.

Load Profile Memory

The Power period group shows values of the load profile memory. In this connection, apparent energy, active energy, or reactive energy can be recorded, depending on the device configuration. The type of reactive power (VAR1, VARn, or VARtot) in the load profile memory depends on the settings in the device.

8.2.3 Inputs and Outputs

PAC3100 Digital Inputs

Use the 2 digital inputs of the PAC3100 as status inputs in powermanager. The settings on the device are made via the powermanager device configuration software.

PAC3200/PAC3200T Digital Inputs

The digital input of the PAC3200/PAC3200T can be freely assigned:

- Universal counter
- Status

The software detects the selected mode automatically.

PAC4200 Digital Inputs

Use the 2 digital inputs of the PAC4200 in the software in accordance with the configuration in the device.

If the inputs are configured as pulse inputs in the device, record the value via the two universal counters in the software. For this purpose, activate the address and, if necessary, archiving of the universal counter in the device engineering.

The device automatically detects the unit and cannot be changed in the software.

If the inputs have been configured as status inputs in the device, you can monitor them in the software. If necessary, trigger an alert. Configure the alert texts in the device software in the project tree.

In addition to the internal inputs, you can use the inputs and outputs of the DI/DO modules in accordance with the configuring in the device.

You can switch the outputs of the modules via the software. Use the **Switch digital outputs** tab for this purpose.

PAC4200 - External DI/DO Modules

powermanager detects and external modules plugged into the device. Each module offers 4 digital inputs that can be used in the software in accordance with their configuration in the device.

If you want to read the inputs via the **user counters** in accordance with the configuration of the device, activate their addresses in powermanager. Use device engineering for this purpose.

You can also use device engineering to activate data archiving. The units are read out directly from the device and cannot be changed in the software.

If you want to assign alerts to the inputs, select the measured variable for status monitoring in the device engineering. Define the alert texts on the **Alert configuration** tab in device engineering.

Outputs

General

For information on digital outputs, see *6.4.1 Overview of Reaction Plans*.

PAC3100

If you switch an output of the PAC3100, it takes up to 10 s before the switching operation is visible for the powermanager user. The switching operation takes effect immediately on the device.

N-conductor Module

N-conductor modules can be connected to PAC3200 and PAC4200 devices. Only one N-conductor module can be connected to one PAC3200/PAC4200 device. The system checks if any N-conductor module is connected to the device and displays the N-conductor details accordingly. The N-conductor details are available in the **Status and Commands** tab in the respective section. The functionality is similar to that of any DI/DO module getting plugged into the device. Also, if the N-conductor module is plugged in, in the **Overview** tab of the PAC3200/PAC4200 device, the neutral current measured is also displayed below the neutral current. The details about I5 and I6 are displayed in powermanager as they are configured in the device.

8.2.4 Generic Modbus Device

Any Modbus-Enabled Data Acquisition Devices

With the generic Modbus device, you can link any Modbus-enabled measuring devices to powermanager.

The generic Modbus device supports:

- Up to 50 measured variables
- 10 status messages
- 5 power demand values
- 5 counter values

- 10 commands (write values)
- 10 digital outputs

Power and energy values are displayed in groups.

The following specifications are mandatory for device configuration:

- Name of the measure value
- Transformation type
- Index
- Specification of the Modbus Function Code
- Specification of a factor with which the supplied measured value is multiplied
- Unit of the measure value
- Specification of a message for the status messages

Overflow Limits

You can parameterize the overflow limits of the counters on the **Counter Configuration** tab.

Support of Free Interval Lengths

The values that are parameterized as power demand values in the generic Modbus device are restamped in the system.

Setting the Endian Byte Order

You can set the endian byte order for polling the data on the **Communication & Units** tab.

Depending on whether the device transmits data in big endian order or little endian order, select the appropriate option for data polling under **Endian Byte Order** on the **Communication & Units** tab.

Configuring Digital Outputs

Each generic modbus device that you create contains provision to configure 10 command data points and 10 digital outputs.You can configure these command datapoints and digital outputs from the **Extended configuration** tab in the **Device engineering** view.

You can assign values to each command data points (write values) on the **Write values** tab in the standard view of Generic modbus device.

Additionally, you can view and change the state of the digital outputs on the **Switch digital outputs** tab in the standard view of Generic modbus device.

8.2.5 Virtual Counters

8.2.5.1 Overview

Use a virtual counter to calculate consumption values such as active energy, reactive energy, or counted units of the universal counter.

Linking Count Values

Virtual counters are used to link counter values. They are available as objects in the tree.

The following operations are possible:

- Summation/differentiation of counter values

A unit can be specified for the result.

In the display, you see the formula including the measured variables involved. You can create the virtual counters from the shortcut menu.

8.2.5.2 Device Engineering for Virtual Counter

On the **Counter configuration** tab, assign an energy counter or a universal counter to the virtual counter. Define the unit and the corresponding conversion factor.

Following components are visible on the **Counter configuration** tab of the device engineering view:

- **Unit**
  - Unit recorded by the universal counter of the connected device. For example, m3 for cubic meters.
  - Unit of the energy counter.
- **Factor**
  Define a factor to convert units. For example, conversion from watt-hours to kilowatt hours with a factor of 0.001.
- **Variable**
  Universal counter or energy counter
- **Operator**
  Operators for adding or subtracting counters

To add a universal or energy counter to the **Counter configuration** tab:

✧ Define the unit of the counter in the **Unit** field.

✧ Click  .

The **VC input panel** window opens.

✧ In the **VC input panel** window, define the factor in the **Factor** field.
Select the universal or energy counter from the **Variable** drop-down list.

✧ Click **OK**.

✧ Click **Save**, to save the changes.

NOTE

You can add up to 10 counters per virtual counter.

You can also add one virtual counter as an universal/energy counter for another virtual counter.

8.2.6 Calculation Value Device

8.2.6.1 Overview

You can create the **calculation value** device unit in the project tree.

The Calculation value object enables you to group and convert a maximum of 10 freely selected measured values using a customized formula.

Effect of Using Calculation Units

A device can be deleted only if it is not used in any calculation unit.

For more information about the device engineering of the Calculation values, see *8.2.6.2 Calculation Value Configuration Tab*.

8.2.6.2 Calculation Value Configuration Tab

Variable

Select the measured values using the selection tree. Every selected measured value is assigned a variable identifier p1, p2, and so on. Use the variables in the calculation formula.

Operators

They are also used for the following Boolean functions:

Notation 1	Notation 2	Function
OR	||	OR
AND	&&	AND
XOR	^	EXCLUSIVE OR
NOT	|	NOT

Formula in the Function Box

Create the formula in the **Function** box.

The **Function** box is case-sensitive.

If a variable identifier used in the **Function** box does not correspond to any measured value, the value of that identifier is zero.

Ensure that the formula is syntactically correct. The function is checked for validity before it is saved.

Examples

Following are some examples of syntactically correct formulas:

- p1 + p2 + p3
- (p1 + p2) / 1000
- (p1 || p2) && p3

8.2.7 Average Value Device

8.2.7.1 Overview

The average value device is a virtual device, which enables you to calculate the average value of any data point from a physical device or another average value device over a specific time period.

After configuring an average value device, you can monitor, represent, and archive the average value calculated by the device.

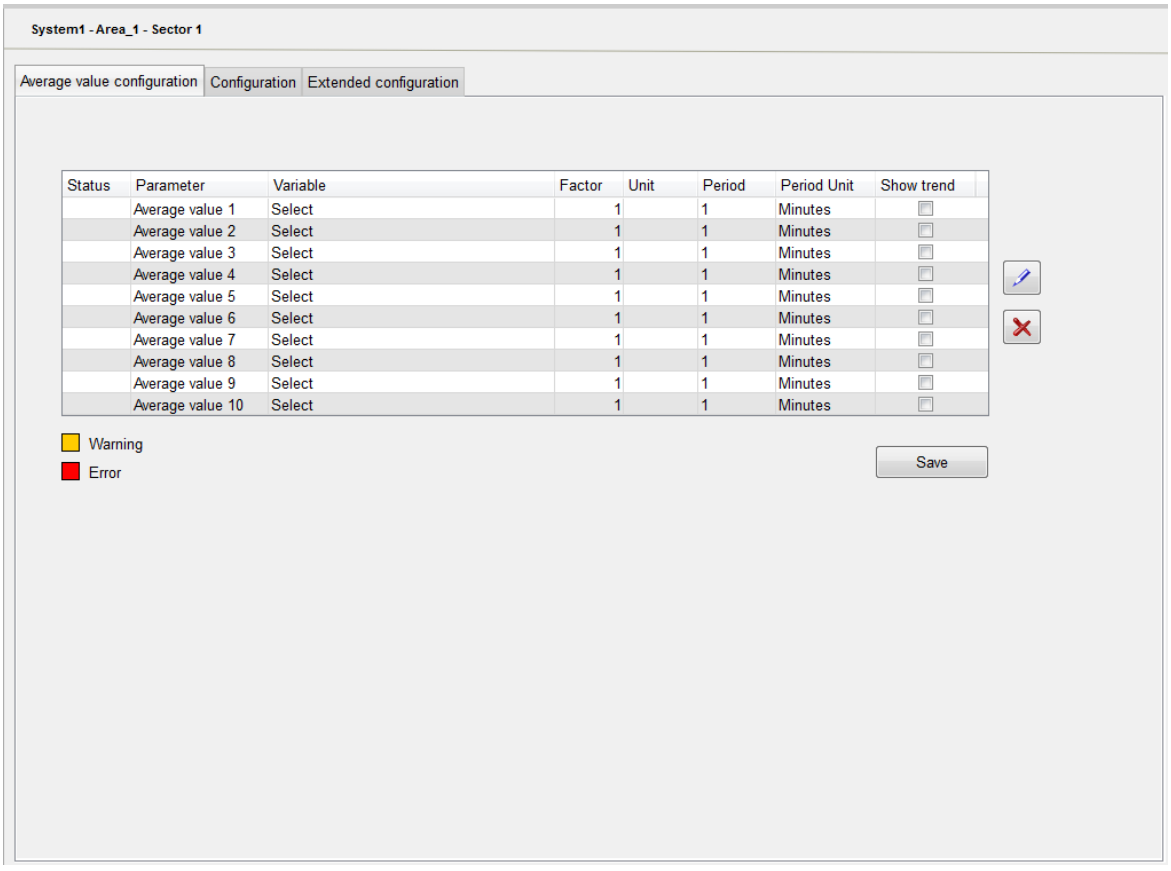
The **Device Engineering** view enables you to define average value parameters for each device on the **Average value configuration** tab. You can define up to 10 average value parameters for each device.

For more information, see *8.2.7.2 Average Value Configuration Tab*.

8.2.7.2 Average Value Configuration Tab

The **Average value configuration** tab enables you to configure the Average value device.

By default, there are 10 placeholders available to add the parameters for which you want to calculate the average value. The placeholders for average value parameters are named **Average Value 1**, **Average Value 2**, **Average Value 3**...**Average Value 10**.



[sc_AverageValue_Tab, 2, en_US]

Average Value Configuration Tab

To add an average value parameter for an average value device:

- ✧ Select a placeholder from the **Average value configuration** table.
- ✧ Click  .
  The **dpSelector** window opens.

NOTE

To delete a parameter, select the parameter and click  . The parameter is deleted and is replaced by the respective placeholder.
For example, if you delete the third parameter, then it is replaced by the placeholder **Average Value 3**.

- ✧ In the **dpSelector** window, select the device for which you want to create the average value parameters.
- ✧ Click **OK**.
- ✧ The average value parameter is added to the table.
- ✧ By default, the average value for a device is calculated for an interval of 15 minutes. However, you can set the interval between 1 min to 1440 minutes (24 hours).
- ✧ Under the **Factor** column, define a factor to calculate the average value for the defined unit.
- ✧ Under the **Unit** column, define the unit of the average value data point.
- ✧ Click **Save**, to save the configuration.

NOTE

Ensure that the average value parameter fulfills the following conditions:

- The selected data point must be available for the device.
- The selected data point must belong to a local system and not a distributed system.
- The selected data point type must be an integer, unsigned integer, or float value.
- The selected data point must not be an average value data point itself.
- Each combination of the data point and the calculation interval should be unique.

Additionally, the selected data point must also be archived for powermanager to calculate the correct average value. If the data point is not archived, powermanager will still calculate the average value for that data point. However, if you restart the project, powermanager does not calculate the correct value for the data point.

NOTE

For information on the **Configuration** and **Extended Configuration** tabs, see *8.2.1.3 Configuration Tab* and *8.2.1.5 Extended Configuration Tab*.

8.2.8 Converter Device

8.2.8.1 Overview

The converter device is a virtual device, which enables you to convert the power values to corresponding energy values and vice versa.

After configuring a converter device, you can monitor, represent, and archive the power or energy values calculated by the device.

The **Device Engineering** view enables you to select data points to convert for each device on the **Converter configuration** tab. You can define up to 10 converter data points for each device.

For more information, see *8.2.8.2 Device Engineering for Converter Device*.

8.2.8.2 Device Engineering for Converter Device

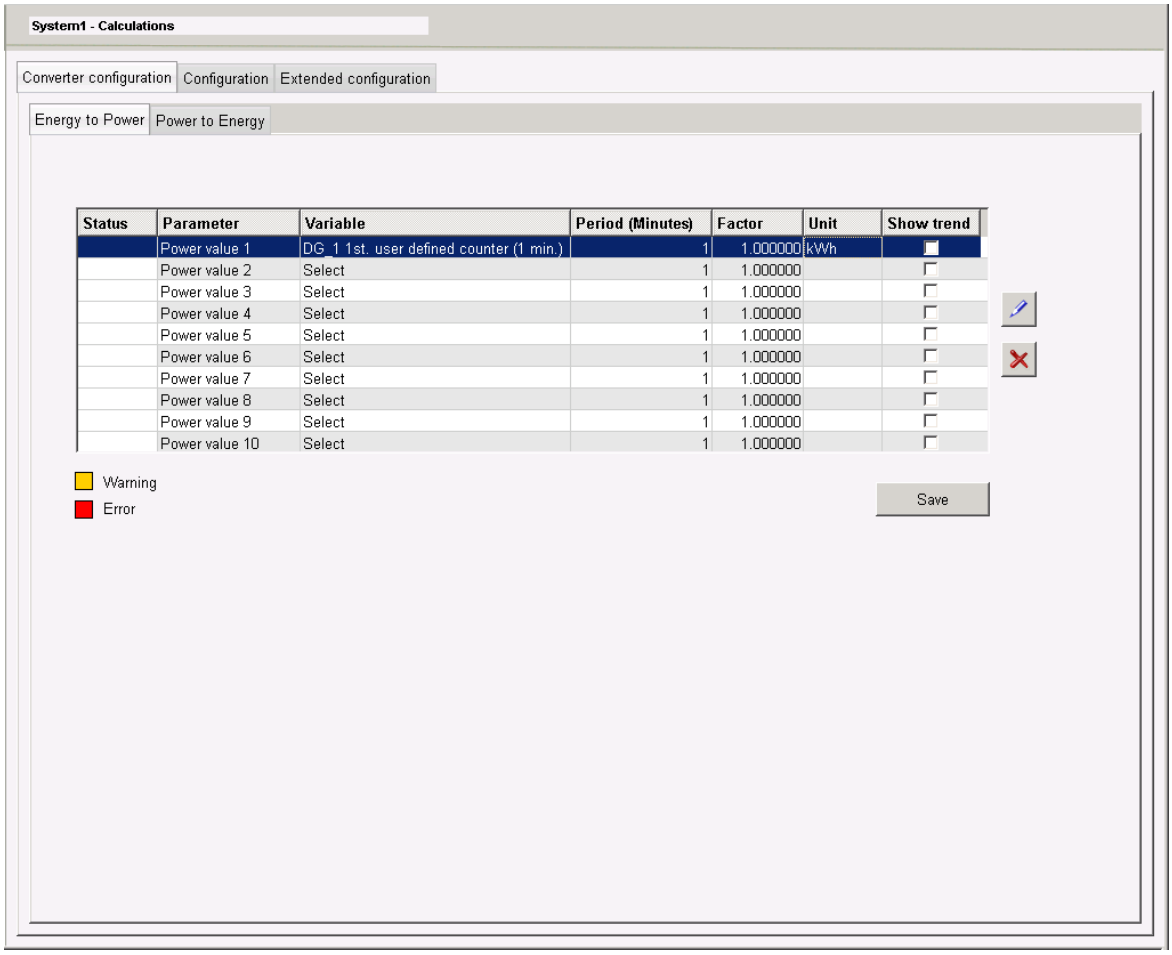
The device engineering view enables you to define power/energy parameters for each device on the **Converter configuration** tab. You can define up to 10 parameters for each device.

By default, there are 10 placeholders available in each tab to add the power or energy parameters. The placeholders for energy parameters are named **Energy Value 1**, **Energy Value 2**, **Energy Value 3**...**Energy Value 10**. The placeholders for power parameters are named **Power Value 1**, **Power Value 2**, **Power Value 3**...**Power Value 10**.

Converting Energy to Power

To add energy parameters to the **Energy to Power** tab:

✧ Select a placeholder from the **Energy to Power** table.

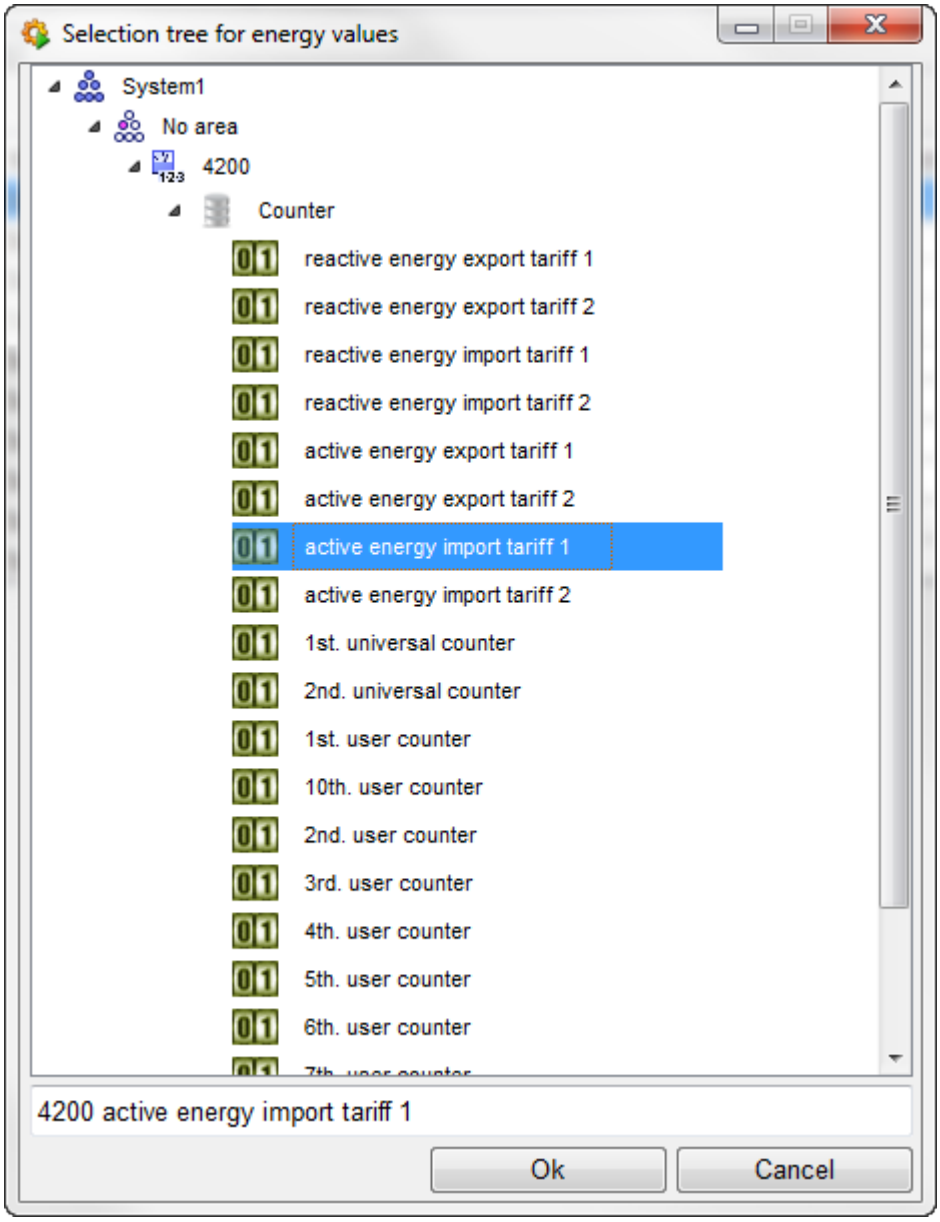


[sc_Energy2Power_Converter, 2, en_US]

Figure 8-1 Energy to Power Converter Tab

✧ Click  .

The **Selection tree for energy values** window opens. The **Selection tree for energy values** window displays only the energy data points of all the devices.



[sc_EnergyDP_Input, 1, en_US]

Figure 8-2 Selection tree for energy values

NOTE

To delete a parameter, select the parameter and click ✕. The parameter is deleted and is replaced by the respective placeholder.
For example, if you delete the third parameter, then it is replaced by the placeholder **Energy Value 3**.

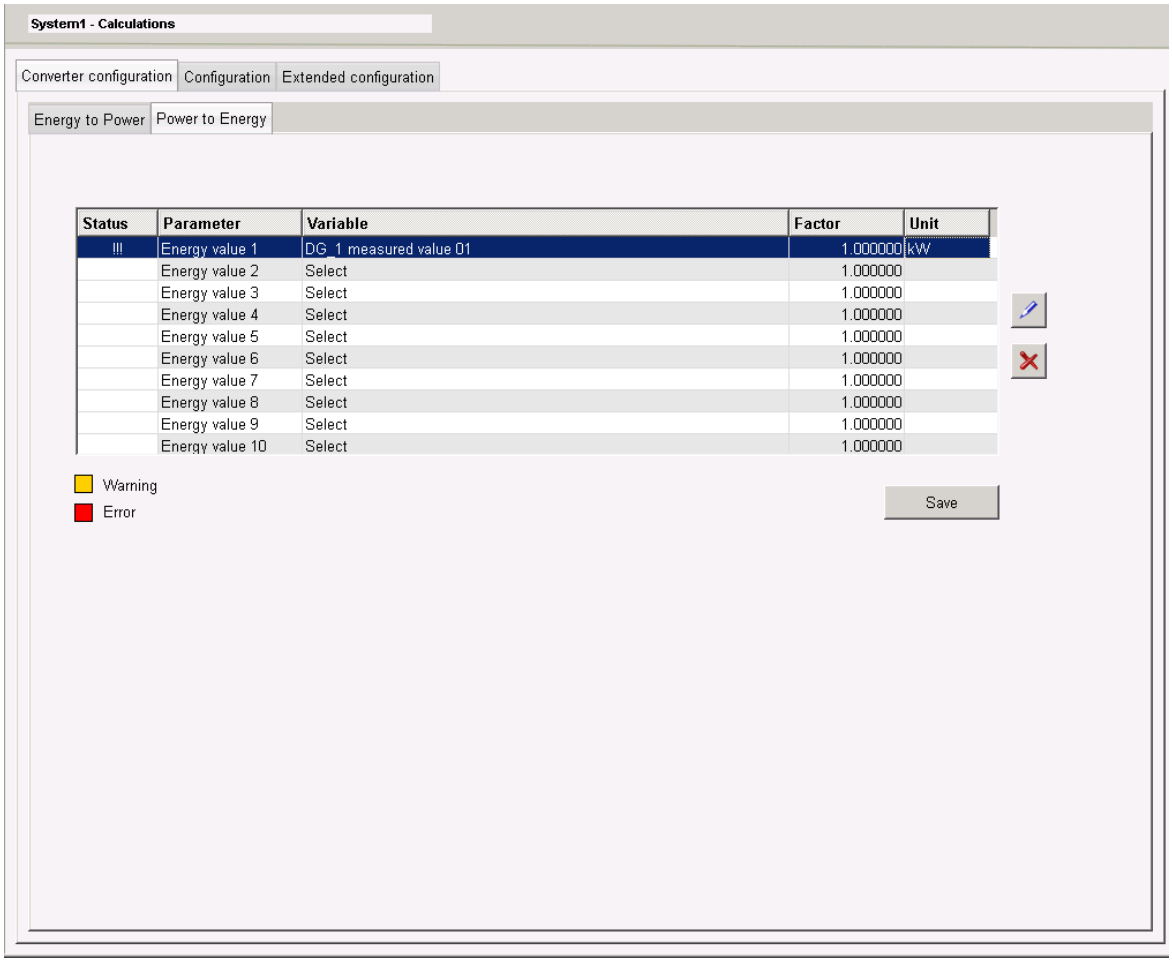
- ✧ In the **Selection tree for energy values** window, select the data points for which you want to create the average value parameters.
- ✧ Click **OK**.
  The converter parameter is added to the table.
- ✧ Under the **Period (mins)** column, select the time interval for which the energy data is collected. This data is then converted to power data.

- ✧ Under the **Factor** column, define a factor to convert units. For example, converting kW to kWh.
- ✧ Under the **Unit** column, define the unit of the converter data point.
- ✧ Select the show trend option from the **Show trend** column.
  This enables you to view the trend graph of the selected data points in the trends view.
- ✧ Click **Save**.

Converting Power to Energy

To add power data points to the **Power to Energy** tab:

- ✧ Select a placeholder from the **Power to Energy** table.

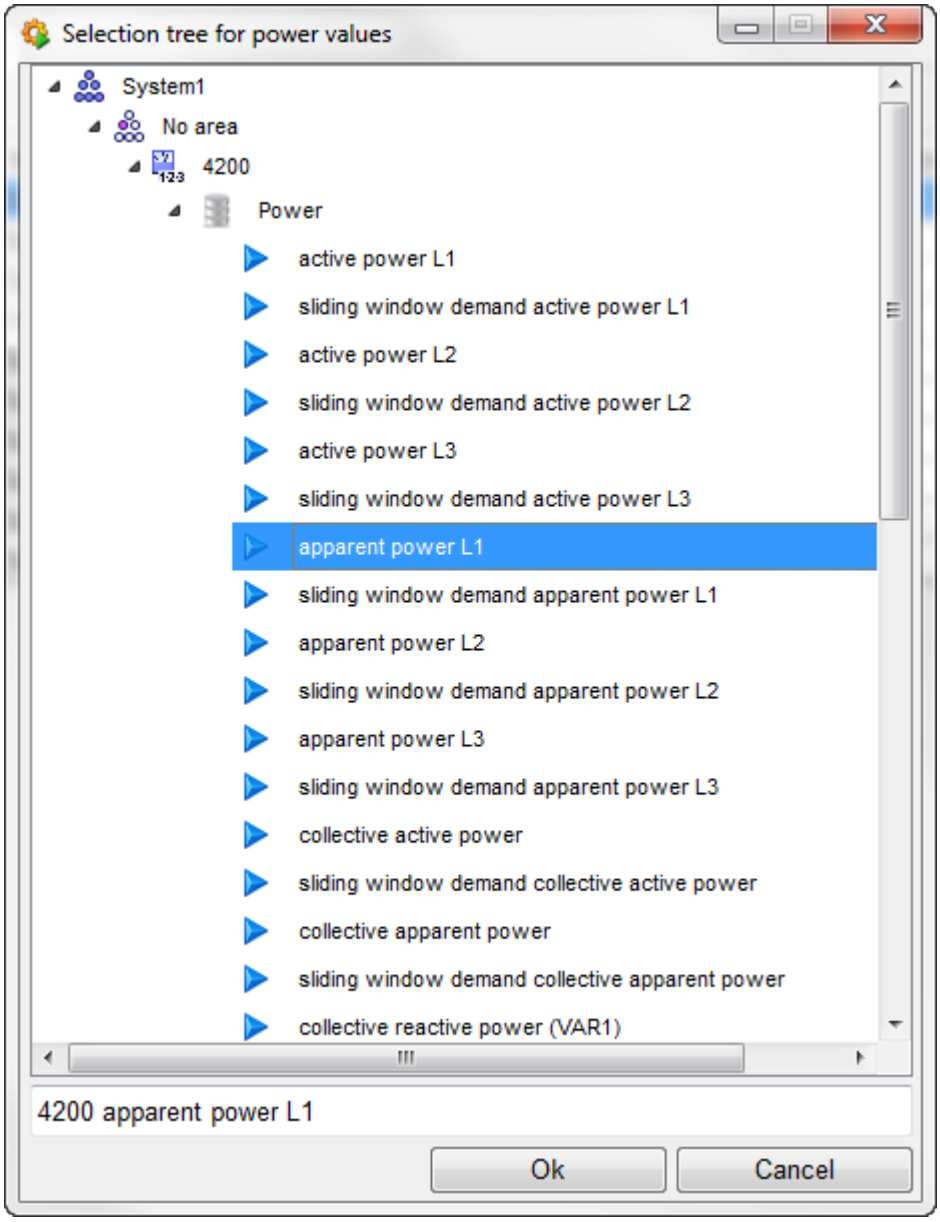


[sc_Power2Energy_Converter, 2, en_US]

Figure 8-3 Power to Energy Converter Tab

- ✧ Click  .

  The **Selection tree for power values** window opens. The **Selection tree for power values** window displays only the power data points of all the devices.



[sc_PowerDP_Input, 1, en_US]

Figure 8-4 Selection tree for power values

NOTE

To delete a parameter, select the parameter and click ✕. The parameter is deleted and is replaced by the respective placeholder.
For example, if you delete the third parameter, then it is replaced by the placeholder **Power Value 3**.

- ✧ In the **Selection tree for power values** window, select the data point for which you want to create the average value parameters.
- ✧ Click **OK**.
  The converter parameter is added to the table.
- ✧ Under the **Factor** column, define a factor to convert units. For example, converting kWh to kW.
- ✧ Under the **Unit** column, define the unit of the converter data point.

✧ Select the show trend option from the **Show trend** column.
This enables you to view the trend graph of the selected data points in the trends view.

✧ Click **Save**.

NOTE

Ensure that the converter parameter fulfills the following conditions:

- The selected data point must be available for the device.
- The selected data point must not be a converter data point itself.
- Each data point selected for conversion must be unique.

Additionally, the selected data point must also be archived for powermanager to correctly convert the data point. If the data point is not archived, powermanager will still convert that data point. However, if you restart the project, powermanager does not calculate the correct conversion value for the device.

NOTE

For information on the **Configuration** and **Extended Configuration** tabs, see: *8.2.1.3 Configuration Tab* and *8.2.1.5 Extended Configuration Tab*.

8.2.9 Filter Administration

8.2.9.1 Overview of Filter Administration

You can use filters to restrict the scope of the measured quantities, displayed in the base panel, to individual views.

Some examples of filtering are:

- Filtering current values of all devices belonging to a specific sector
- Filtering voltage values supplied by all devices of the PAC4200 type
- Filtering total active power of all devices in the system with heating as part of their names

Using Filters

User-defined filters are available at the area, sector, and project tree root level. The required filter can be selected from the **filter** list box in the base panel.

Filter Administration and Configuration

Use filter administration to define new filters or to modify existing ones. Right-click the project tree root to view the filter configuration options.

8.2.9.2 Using Filters

To apply a user-defined filter:

✧ In the tool bar, click  to open the Standard view of the base panel.

✧ In the project tree, select the level (root, area, or sector) to which you want to apply the filter.

✧ Select the required filter from the **filter** list box.

The base panel shows the filtered datapoints of the selected project tree branch.

The system remembers the assignment of the project tree branch and filter. Use **No filter** from the **filter** list box to return to the unfiltered overall view.

NOTE

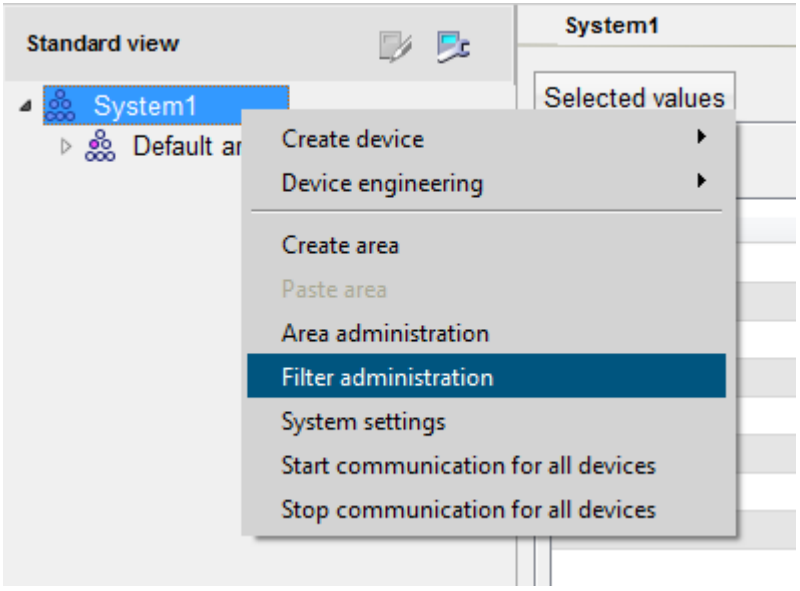
If the **filter** list box shows only the **default** and **No filter** filters, then it implies that no user-defined filters are created.

In this case, create a **filter** list.

8.2.9.3 Managing Filters

Opening Filter Administration

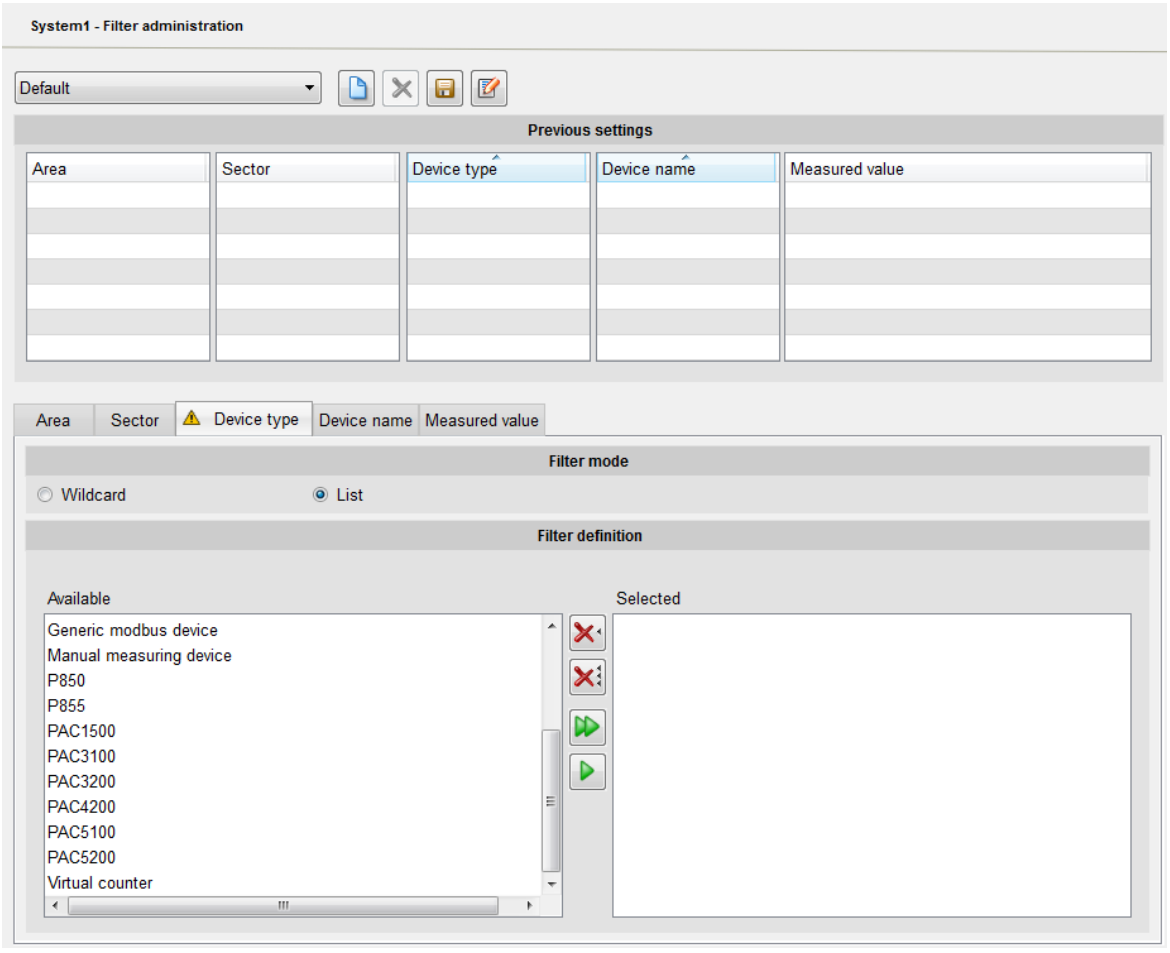
Right-click the project tree root and then click **Filter administration** to open the filter administration view.



[sc_pm_filteradmin, 1, en_US]

Figure 8-5 Selecting Filter Administration

Filter Administration View



[sc_FilterAdmin_View, 2, en_US]

Figure 8-6 Filter Administration View

Filter administration is split into the following three areas:

- **Basic Functions**
  The area at the top provides four basic functions:
  -  – Create a filter
  -  – Delete a filter
  -  – Save filter settings
  -  – Rename a filter
- **Previous Settings**
  The **previous settings** area shows the settings of the currently selected filter.
- **Configuration Elements**
  The Filter mode and Filter definition areas enable you to configure the filters.

Creating a New Filter

To create a filter:

✧ Click  .

✧ Name the filter and click **Accept**.
The filter name appears in the list box at the top of the filter administration view.

✧ Configure the filter in the **configuration elements** area.

✧ Click  to save the filter.
You can change the filter name later to adapt it to a different language.

Modifying an Existing Filter

To modify an existing filter:

✧ Select the filter you want to edit from the list box at the top of the filter administration view.

✧ Change the filter configuration in the **configuration elements** area.

✧ Click  to save the filter.

Deleting a Filter

✧ Select the filter you want to delete from the list box at the top of the filter administration view.

✧ Click  to delete the selected filter.

The selected filter is deleted.

NOTE

You cannot delete the default filter.

Renaming a Filter

To rename a filter:

✧ Select the filter you want to rename from the list box at the top of the filter administration view.

✧ Click  to rename the selected filter.

✧ Enter the new name in the dialog.
The dialog shows several languages for selection. Change the name in the required target language.

8.2.9.4 Configuring Filters

Types of Definitions

Filter administration offers two methods of configuring filter settings:

- Select selection criteria from predefined lists.
  To do this, select the **list** option.
- Definition of text sequences that conduct a full text search.
  To do this, select the **wildcard** option.

Areas

The filter conditions can be applied to:

- **Area**
  Areas that are created in the project tree.
- **Device type**
  Device types.
- **Device name**
  Devices that are created in the project tree.
- **Sectors**
  Sectors that are created in the project tree.
- **Measured value**
  All retrievable measured values.

Five tabs denote the objects to which filter conditions are applied. Each tab represents one object.
If you select the **list** option, the tabs provide area-specific lists for selection.
A text sequence of the **wildcard** filter definition type is effective in the area in which it has been created.

Language Dependence

If you use the **list** option, the filter results are identical for all languages in the project. The system saves the compiled filter based on the internal designation.
Wildcards refer to the designations in the current language. When you use wildcards, the same filter in different languages return different results.

List Filter Mode

Assigning Selection Criteria

To adopt selection criteria for a filter, move the values from the available groups and available measure points boxes to the selected box.

- **Selecting a measured variable for the filter**

  Select a measured variable from the available measure points box and click  to move it to the selected box.
- **Selecting all the measured variables for the filter**

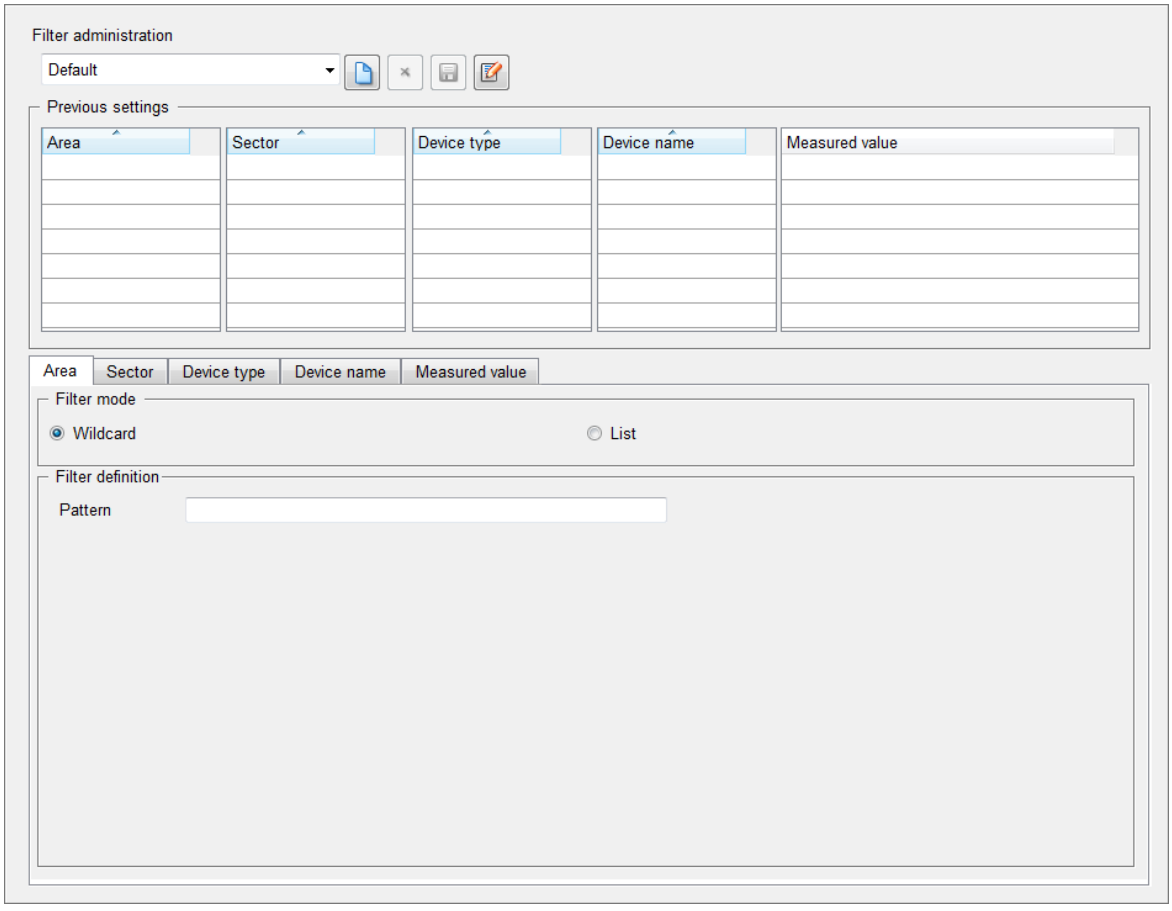
  Click  to move all the measured variables to the selected box.
- **Removing a measured variable from the filter**

  Select a measured variable from the selected box and click  to move it to the available measure points box.
- **Removing all measured variables from the filter**

  Click  to remove all measured variables from the selected box.

Wildcards Filter Mode

The wildcards mode allows you to define text sequences that filter the display as full text search criteria.
The text sequences can contain wildcards.



[sc_Filter_WildcardsMode, 1, en_US]

Figure 8-7 Power Peak: Wild Card Filter Mode

Table 8-1 Wildcards

?	Any character
*	One or several of any characters

Example:

The text sequence PAC* entered in the advance selection of the **Device** tab limits displays only the devices from the PAC series.

Empty Filter

No filter is active when the **Pattern** box is blank or contains the test sequence ***.
The configured filters are displayed immediately in the **Previous settings** area.

8.2.10 User Rights

8.2.10.1 User Rights

NOTE

Assign a password to each user with administration rights. Else, access to powermanager is unprotected.
When powermanager is delivered, the standard user **root** has no password. Assign a password to the standard user **root**.

Predefined Authorization Levels and User Groups

The powermanager standard has the following predefined groups and levels:

- 5 user groups
- 5 authorization levels
- Assignment of user groups
- Authorization levels

Table 8-2 Authorization Levels

Level	Name in the dialog	Scope of rights
1	Visualize	Allows only visualization
2	Normal operator authorization	Allows the opening of panels
3	Extended operator authorization	Allows the execution of commands, the setting of substitute values, the setting of correction values, and the modification of value range types
4	Administration	Allows the use of GEDI and PARA
5	Acknowledgement	Allows the acknowledging of alerts

Table 8-3 Rights of the User Groups in the powermanager Standard

Group/Level	Visualization	Operator Authorization		Administration	Acknowledge-ment
		Normal	Advanced		
Root	X	X	X	X	X
Para	X	X	X	X	X
Operatorall	X	X	X		X
Operator	X	X			X
Guest	X				

The group assignment confers the group rights on the user.
For more information, see User Administration, Basics.

8.2.10.2 Creating Users

NOTE

Do not delete the standard user "root".

To create a user:

✧ In the menu bar click **Settings** > **System management**.
The **System Management** window opens.

✧ Open the **Permission** tab in the **System Management** window.

✧ Click  .
The **User Administration** window opens.

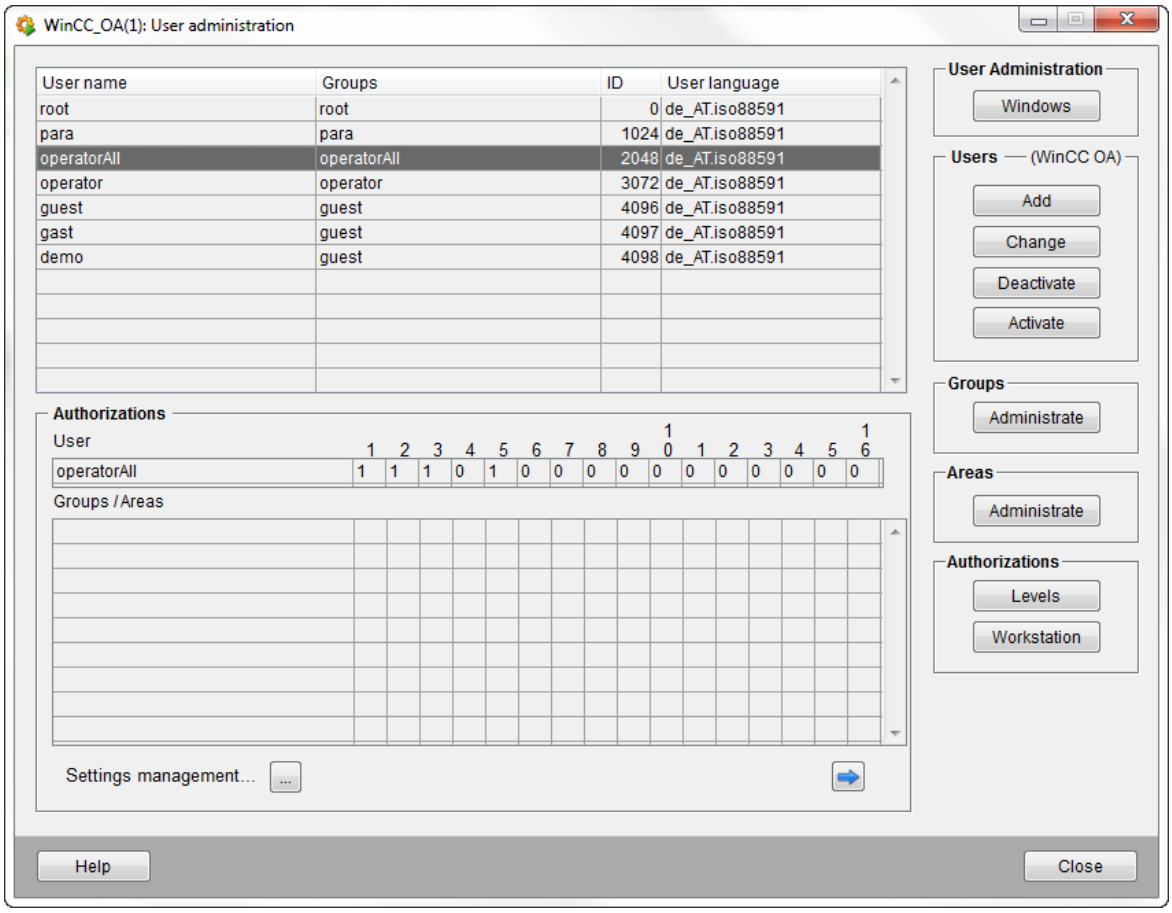
✧ On the **User Administration** window, click **Add User**.
The **User Characteristics** window opens.

✧ Enter the required information in the **User Characteristics** window.
Assign a password.

✧ Click **OK** to confirm creation of the new schedule.
The user account is created in powermanager. The account is listed in the **User administration** window. You can log on with the assigned user name and password.

✧ Click **Close** to exit the **User administration** window.

8.2.10.3 User Administration Window



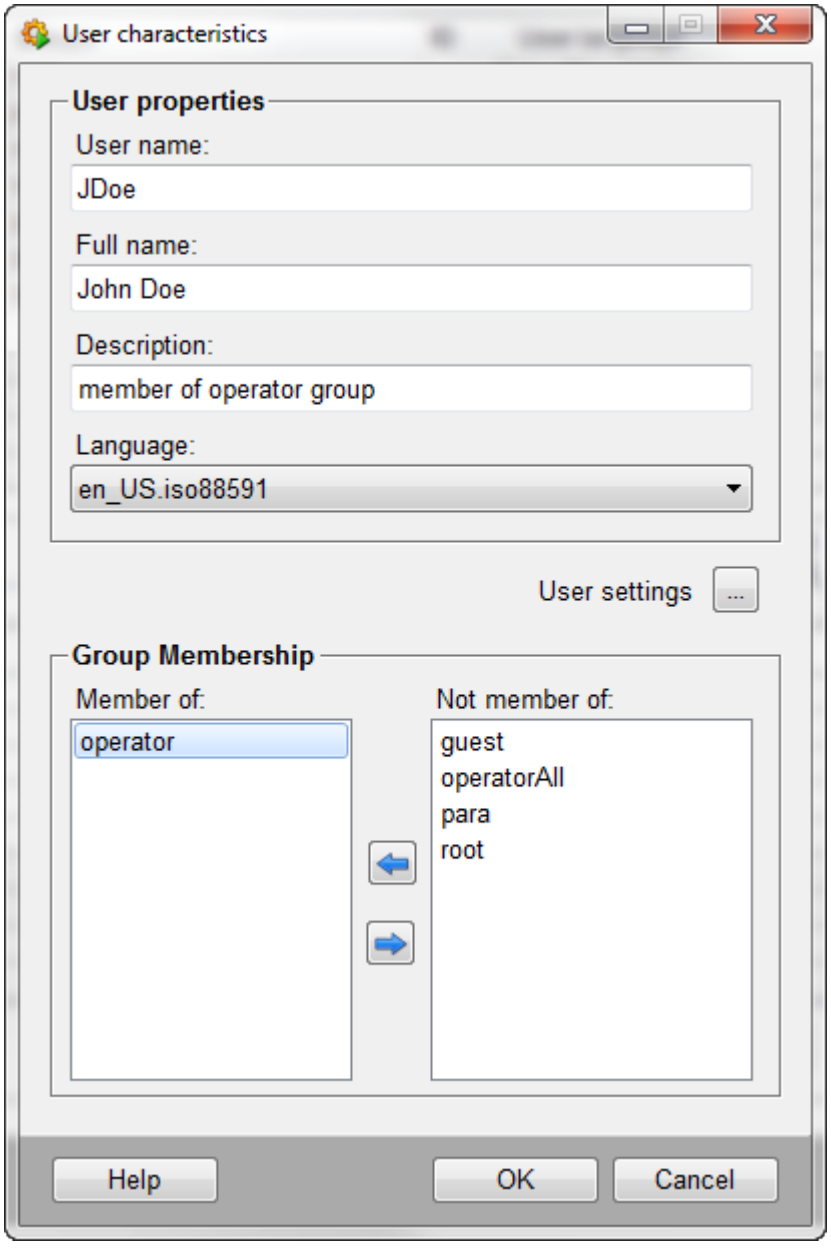
[sc_UserAdmin_Window, 1, en_US]

Figure 8-8 User Administration Window

- **User name**
  powermanager logon name
- **Groups**
  User groups to which a user is assigned
  Each user receives specific user rights through the group. Assign each user to at least one group.
- **ID**
  Internal identification number of the user account
- **User language**
  Language of the powermanager user interface
  powermanager suggests the language when you log on.

User Characteristics Window

On the **User Administration** window, click **Add User**. The **User Characteristics** window opens.



[sc_UserCharacteristics_Window, 1, en_US]

Figure 8-9 User Characteristics Window

- **User name**
  Name of the user account
  The user uses this name to log on.
- **Full Name**
  Full name of the user
- **Description**
  Short description of the user account
- **Language**
  Language of the powermanager user interface
  The language is suggested to the user at logon.

- **Group membership**
  Assign the user to at least one user group. You can also assign the user to multiple groups.
  The group assignment confers the group rights on the user. For more information on the rights assigned to the users in different groups, see Predefined Authorization Levels and User Groups.
- **Password**
  Click **Password** to open the field for assigning password.
  Ensure that you assign a password for each user having administration rights. Else, the access to powermanager is unprotected.

8.2.11 Archive Settings

8.2.11.1 Archive Settings

Alert Classes

With the default database configuration, archive records are not deleted from the hard disk until they are saved using Backup. Therefore, the hard disk capacity becomes full unless appropriate backups are made.
To prevent this, warning limits are set as default for hard disk capacity monitoring.
The default settings are:

- **Hard disk full (warning)**: powermanager displays this warning when 3 GB or less hard hard disk is free.
- **Hard disk full (alert)**: powermanager displays this alert when 1 GB or less hard hard disk is free.
- **Emergency mode**: powermanager displays this alert when 100 MB or less hard hard disk is free.

You can change these settings. For more information, see Monitoring the hard disk.
If disk capacity falls below the set emergency limit of 100 MB, powermanager switches to a safe mode to protect its own database integrity. In the safe mode, you can still operate the project, but values are no longer archived.
To exit emergency mode, correct the storage bottleneck and restart the project.

8.2.11.2 Archiving of Measured Values

General

The following measured values are archived as standard:

- Total power demand
  - Active power
  - Reactive power
  - Apparent power
- Energy values
  - Active energy (total of tariff 1 and tariff 2, tariff 1 by default)
  - Reactive energy (total of tariff 1 and tariff 2, tariff 1 by default)
  - Apparent energy

The power demand values are used to display load curves. You can optimally save the associated min/max values. The energy values are used for consumption analysis.

Online Measured Values

You can configure measured values to be archived.
Measured values are time-stamped in the software. When archiving measured values, adapt the archive size to the database since archiving of these measured variables uses up considerable space in the database.

NOTE

Adapt the archive size due to the multiple measured variables. To optimize storage capacity, the data is only written to the database when modified.

For more information, see *8.1.2 Optimizing Performance*.

Archiving Power Demand Values (PAC4200)

Power demand values from the PAC4200 device are read out of the device memory. Therefore, if the connection to the device fails, the data is read later from the device and entered in the database. This process avoids gaps in the database.

8.2.12 Further Engineering Options

Support of Free Interval Lengths for PAC Devices

powermanager supports 15 min interval lengths.

The interval length supplied with the power values is compared with the interval length available in the DPE. An error message is issued in the alert line if the values deviate from one another by more than 30 s. The alert is reset if the interval length again drops between the tolerance limits.

It is not necessary to adapt the polling cycles of measured values as they are always below 1 min (minimum interval length).

An additional DPE converts the interval length supplied by the PAC to minutes. You can select this variable for the selected values.

If an energy export is triggered and then a tariff interval is modified, this change is not detected in the export.

Period and Time Synchronization

Activate the addresses for a device in device engineering to enable period/time synchronization for the device.

The **Set Date/Time Automatically** element is available for time synchronization, and the **Automatic Load Profile Synchronization** element is available for period synchronization.

Inheritance

Inheritance means that the configuration of a device type is transferred to all devices within the area.

To activate inheritance, select the **Inherit area settings** option in Device engineering.

To set the valid area settings:

- Right-click the area.
- In the shortcut menu, under device engineering, select the device type for which you want to create the area settings.
- Configure the device type.
- Click **Save**.

Inheritance is applied to all devices in the area for which the **Inherit area settings** option is selected.

Deselect the **Inherit area settings** option if you want to remove inheritance from the device.

General Configuration

Perform general configuration of powermanager in the System Management.

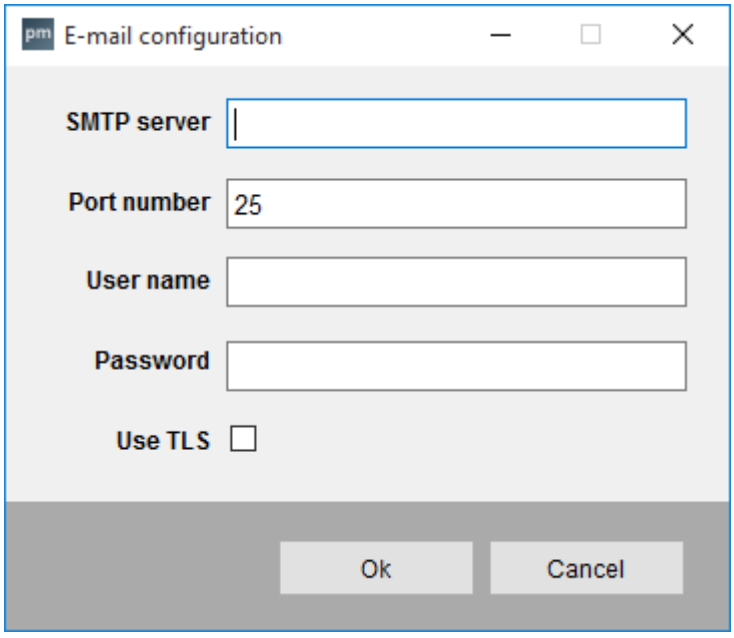
For more information, see System Management.

8.3 Configuring E-Mail Server Settings

The **E-mail configuration** dialog is used to configure the E-mail server settings.

✧ In the menu bar, select **Settings**.

✧ Click **E-mail configuration**.
The **E-mail configuration** dialog is displayed.



[sc_pm_email_configuration, 1, en_US]

✧ Enter a **SMTP server** address.

✧ Enter the corresponding **Port number**.

✧ Enter a **User name**, for the SMTP server.

✧ Enter a **Password**, for the SMTP server.

✧ Select **TLS**, to use encryption and authentication.

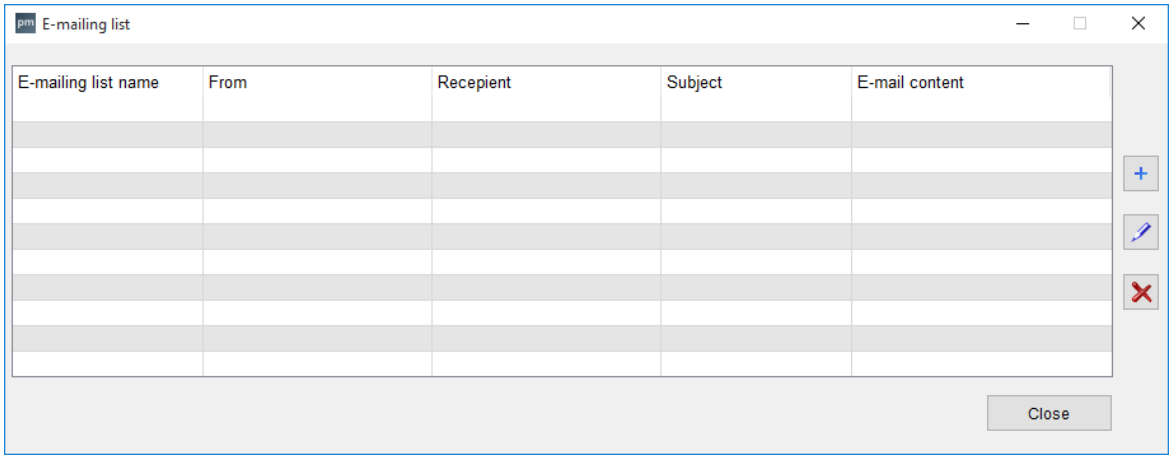
✧ Click **OK**.
The E-mail server settings are configured.

8.4 E-mailing List

The **E-mailing list** dialog is used to configure the e-mailing list details.
To configure the e-mailing list, proceed as follows:

✧ In the menu bar, select **Settings**.

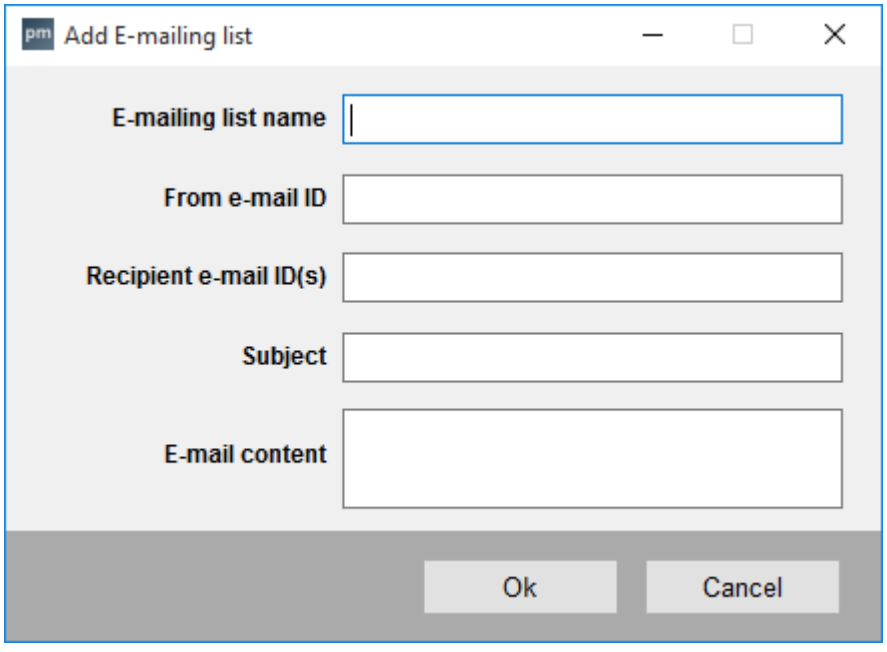
✧ Click **E-mailing list**.
The **E-mailing list** dialog is displayed.



[sc_pm_emailing_list, 1, en_US]

✧ Click + to add the mailing list details.

The **Add E-mailing list** dialog appears.



[sc_pm_addemaillist, 1, en_US]

✧ Enter the required details.

✧ Click **Ok**.
The mailing list details are configured and displayed in the **E-mailing list** dialog.

8.5 OPC Server Configuration

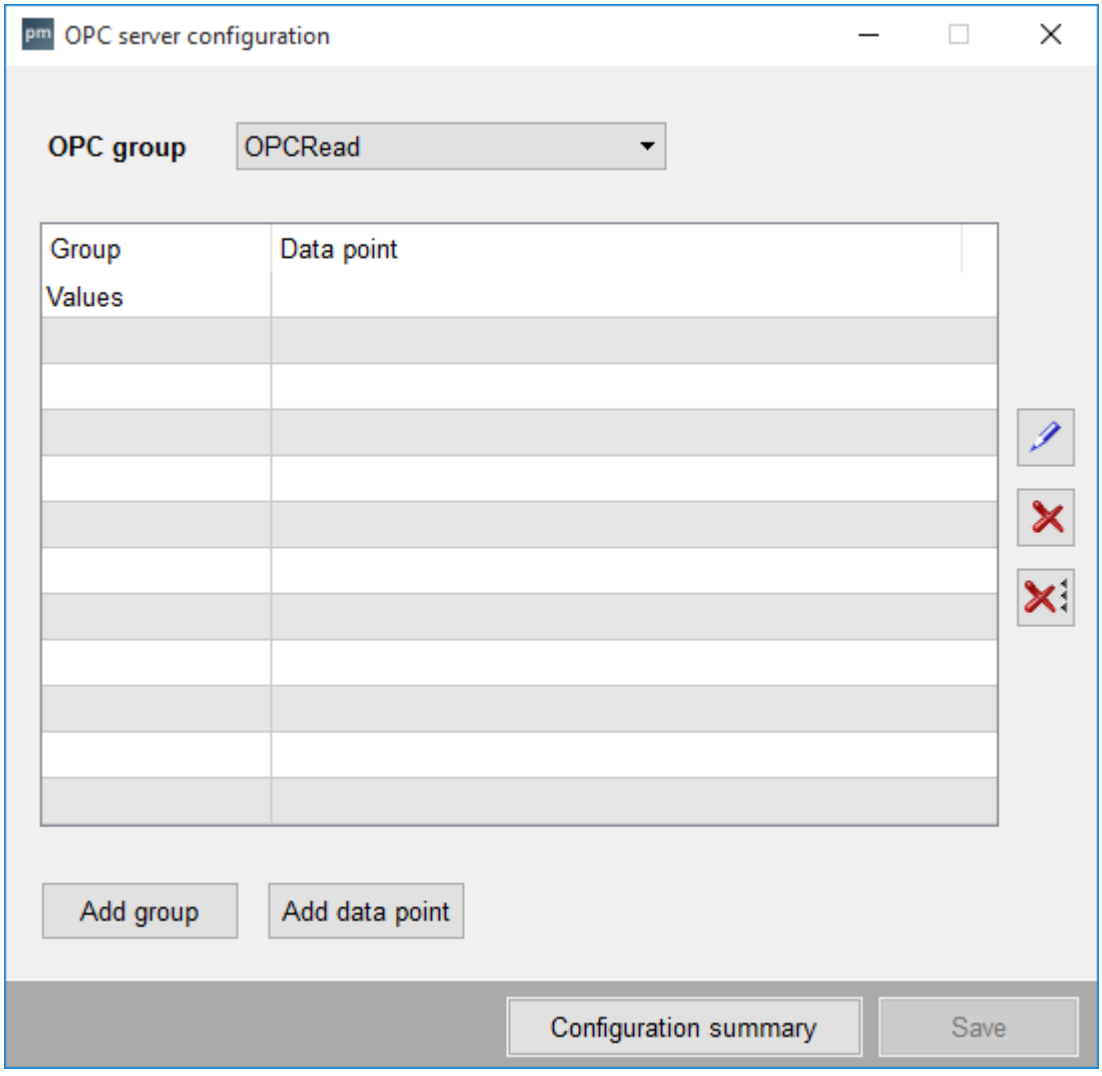
The **OPC server configuration** dialog enables you to add a data point or a group of data points to configure the OPC server.

OPC UA Server and **OPC UA Client** are supported from powermanager V3.5 onwards.

To configure the OPC server, proceed as follows:

✧ In the menu bar, select **Settings**.

✧ Click **OPC server configuration**.
The **OPC server configuration** dialog is displayed.

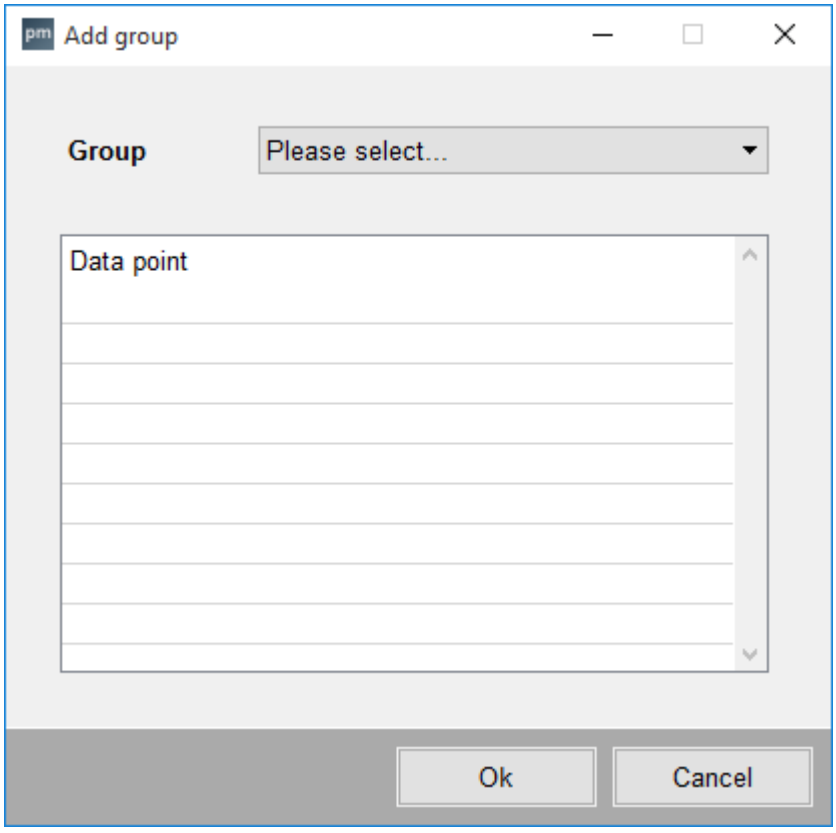


[sc_pm_opc, 1, en_US]

✧ Using the list-box option, select the desired **OPC group** value as **OPCRead**, **OPCWrite**, **OPCUARead**, or **OPCUAWrite**.

✧ Click **Add group**.

The **Add group** dialog is displayed.

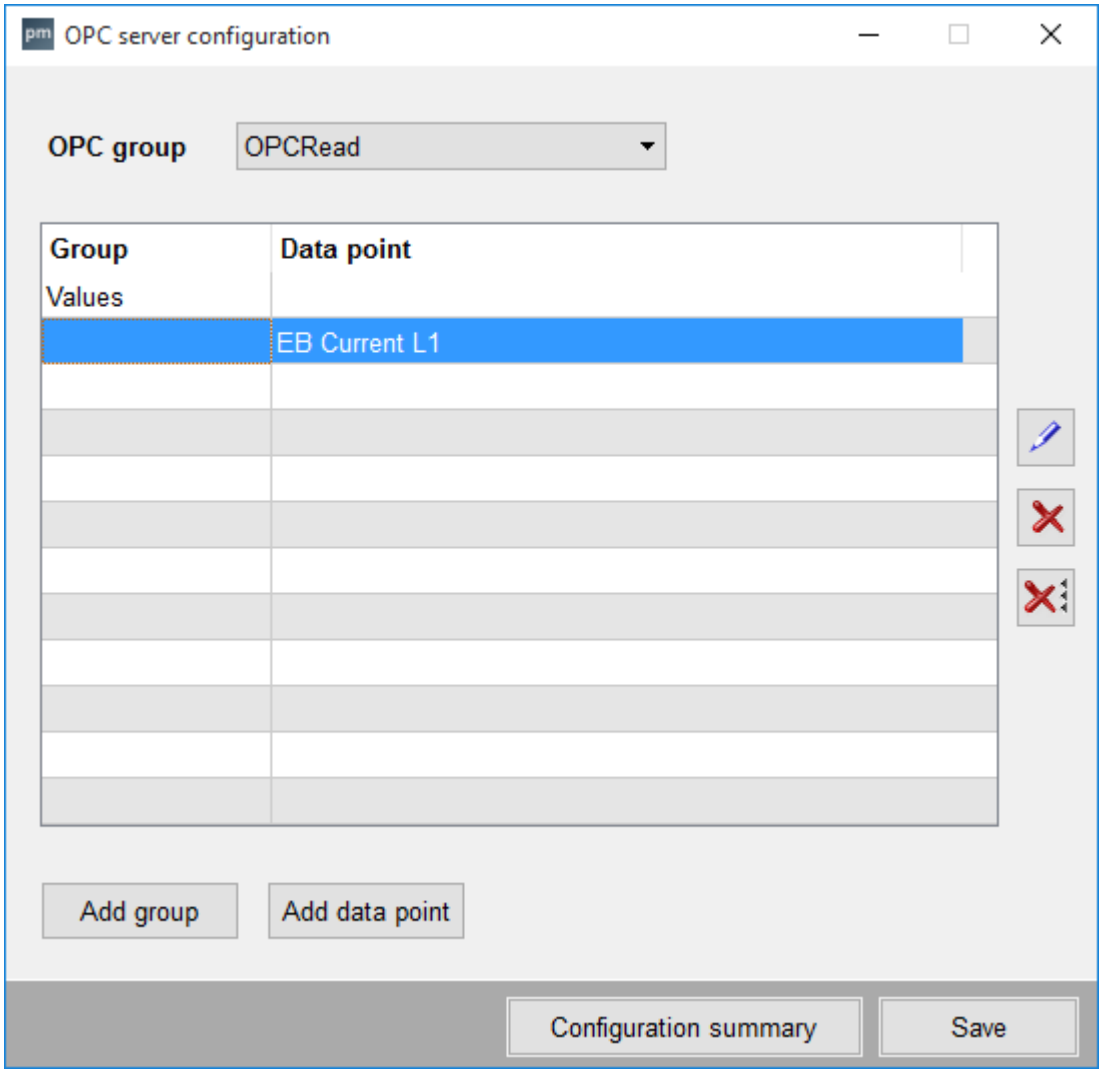


[sc_pm_addgroup, 1, en_US]

✧ Using the list-box option, select the desired **Group**.

✧ Click **OK**.

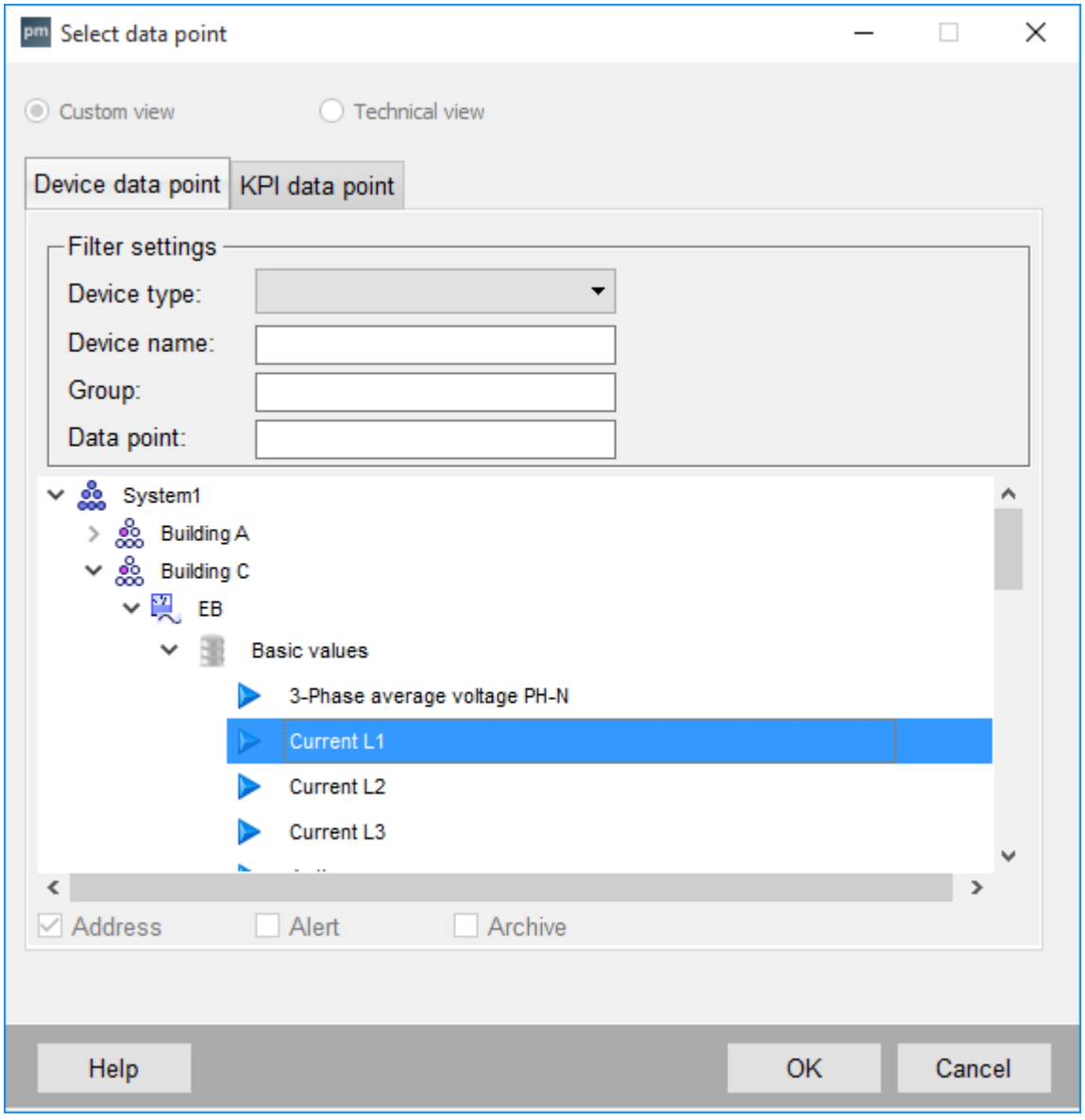
The group is added.



[sc_pm_groupadded, 1, en_US]

✧ Click **Add data point**.

The **Select data point** dialog is displayed.



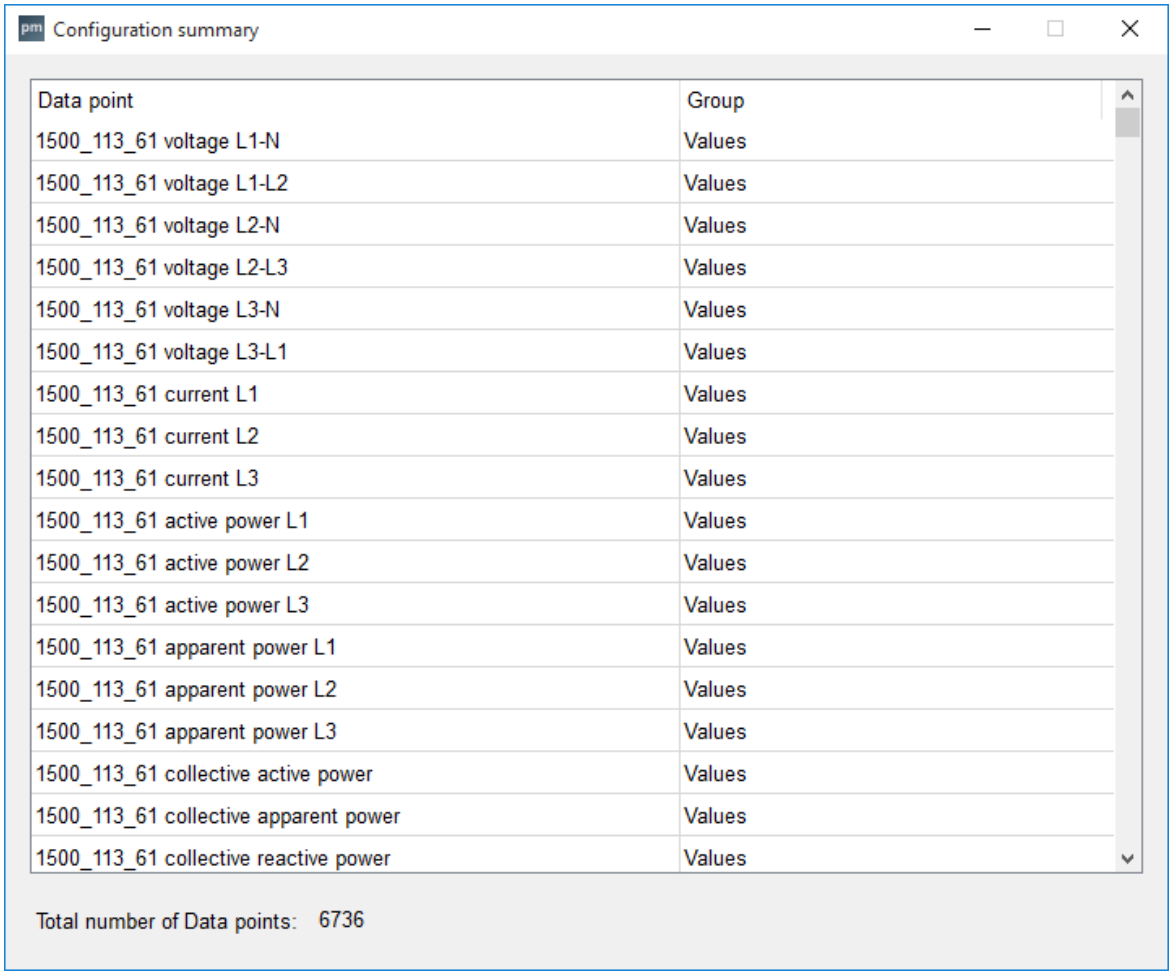
[sc_pm_selectdpexample, 1, en_US]

✧ Select the desired data point.

✧ Click **OK**.
The data point is added.

✧ Click **Configuration summary**.

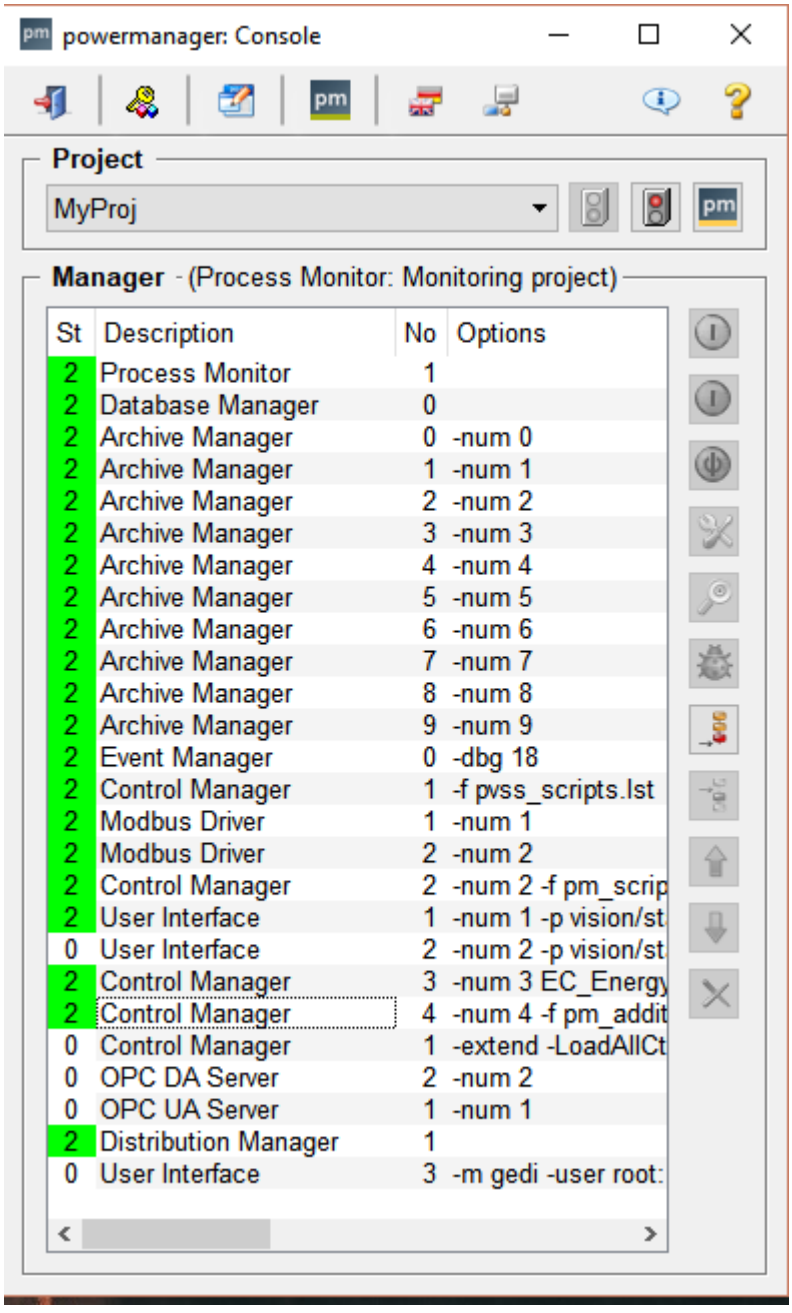
The **Configuration summary** dialog displays the list of all the configured details.



[sc_configuration_summary, 1, en_US]

OPC UA services

You must start the OPC UA Server manually to use OPC UA services. A separate license is required to enable OPC UA services. For more information on OPC UA, refer to the **Drivers** section in the extended help.



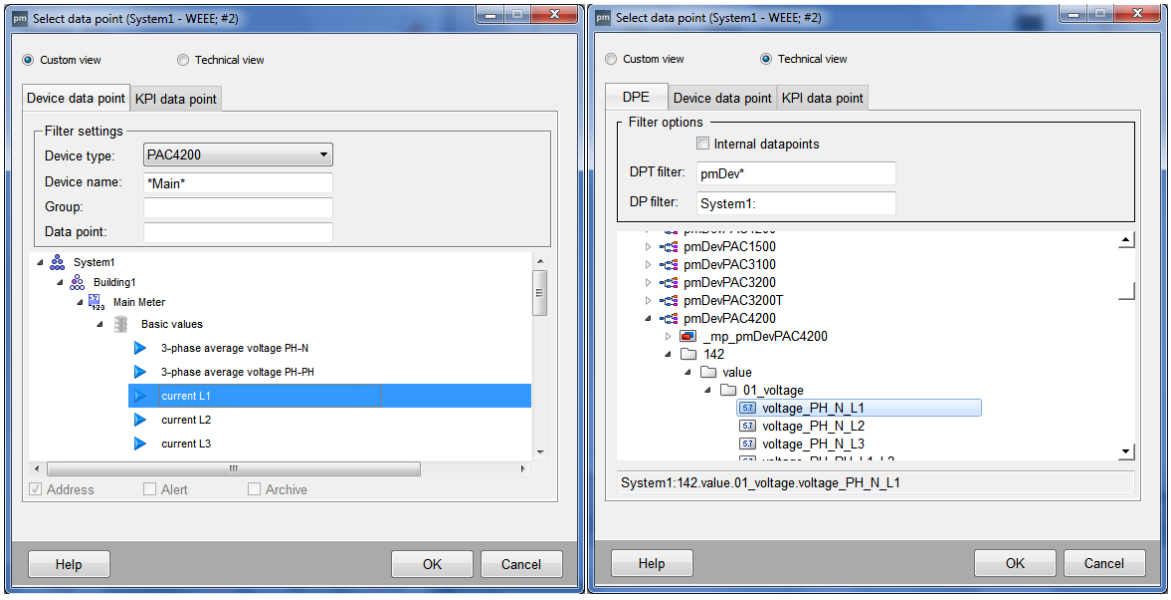
[sc_pm_opc_ua, 1, en_US]

8.6 dpSelector Window

The **dpSelector** (**Select data point**) window enables you to select the appropriate datapoints or measured values.

You can toggle between two views on the **dpSelector** window:

- The **Device data point** tab under **Custom view** displays the project tree with project-specific designations for the area, sector, and device.
- The **KPI data point** tab under **Custom view** displays the KPI tree with project-specific designations for the group and KPI.
- The **DPE** tab under the **Technical view** displays the three-stage tree of the datapoint types, datapoints, and datapoint elements.



[sc_pm_dpselectorviews, 1, en_US]

Figure 8-10 Data Point Selector Windows

NOTE

The **Technical view** is only available with powermanager expert license.

Selecting Datapoint Elements

To select datapoint element for the trend display:

✧ For **Device data point** tab, apply the filter criteria in the **Filter settings** box.

The **Filter settings** box contains the following fields:

Device type: Select the device type from this drop-down list.

Device name: Enter the device name.

Group: Enter the group name to which the device belongs.

Data point: The name of the data point.

✧ Double-click the relevant entries in the tree view to reach the datapoint element that you want to include in the trend view.

✧ Select the datapoint element and click **OK**.

- or -

✧ For **DPE** tab, apply the filter criteria in the **Filter options** box.

The **Filter options** box contains the following fields:

DPT filter: The **Datapoint Type (DPT) filter** field has a default filter value of **pmDev***. The * in the string indicates any character string.

DP Filter: Define the Datapoint (DP) filter in this field.

The final results are filtered based on the filters defined in both the fields.

8.7 Load Monitoring

8.7.1 Overview of Load Monitoring

Purpose of Load Monitoring

Electricity supply contracts contain provisions to calculate the kilowatthour rate and the demand charge.
The demand charge is calculated according to the maximum imported power.
Therefore, avoid power peaks and distribute the power demand uniformly throughout the day.
Load monitoring enables you to:

- Monitor energy use
- Respond to deviations from the planned target

Orientation Variables

Load monitoring supplies two orientation variables for estimation of consumption behavior:

- Correction power
- Forecast energy consumption

Correction Power

The correction power is the power that has to be connected or disconnected to use the energy volume available for the current tariff interval optimally. It informs you whether the energy imported in the tariff interval is within the limits of available energy and is used optimally.

Forecast Energy Consumption

Load monitoring forecasts the expected energy consumption at the end of the tariff interval. The forecast is recalculated for each calculation interval and becomes more precise after each calculation interval.

Tariff Interval / Calculation Interval

The tariff interval is subdivided into a number of calculation intervals that can be selected. The correction power and the consumption forecast are determined for each calculation interval.

Response

Load monitoring supports reactive measures with:

- Switching bits
- Alerts

Switching Bits

Load monitoring sets the following switching bits:

- **Element switchNo**: The bit is set if the correction power is within the limit curve or the first or last calculation interval is calculated.
- **Element switchOff**: powermanager sets this bit if the load needs to be deactivated.
- **Element switchOn**: powermanager sets this bit if the load needs to be activated.

The bits are triggered based on the defined limit curve.
The switching state is queried in reaction plans.
For more information on reaction plans, see *6.4.1 Overview of Reaction Plans*.

Alerts and Warnings

An alert or a warning can be optionally configured for each switching bit. Configure it when defining the limit curve.

8.7.2 Load Monitoring

To call load monitoring:

✧ Ensure that the Standard view is activated.

If Standard view is not activated, click  to activate the Standard view.

✧ In the project tree, click the load monitoring data source.

The **Overview** tab opens.

8.7.3 Configuring Load Monitoring

powermanager manages load monitoring as a device. It is attached to an area or sector in the project tree. The command to create a load monitor is in the shortcut menu of the project tree.

To create a load monitoring device:

✧ Right-click the system node.

✧ Click **Create device > Monitoring functions > Load monitoring**.

✧ Assign a name to the load monitoring device. The name must not contain any spaces, special characters, or diacritical marks.

✧ Click **Create**.

✧ Creation of the new device can take some time depending on the device and the project size.

The load monitor is visible in the project tree, but it is not configured. The **Configuration** view is launched automatically.

For more information, see *8.7.5.1 Overview of Configuration*.

8.7.4 View

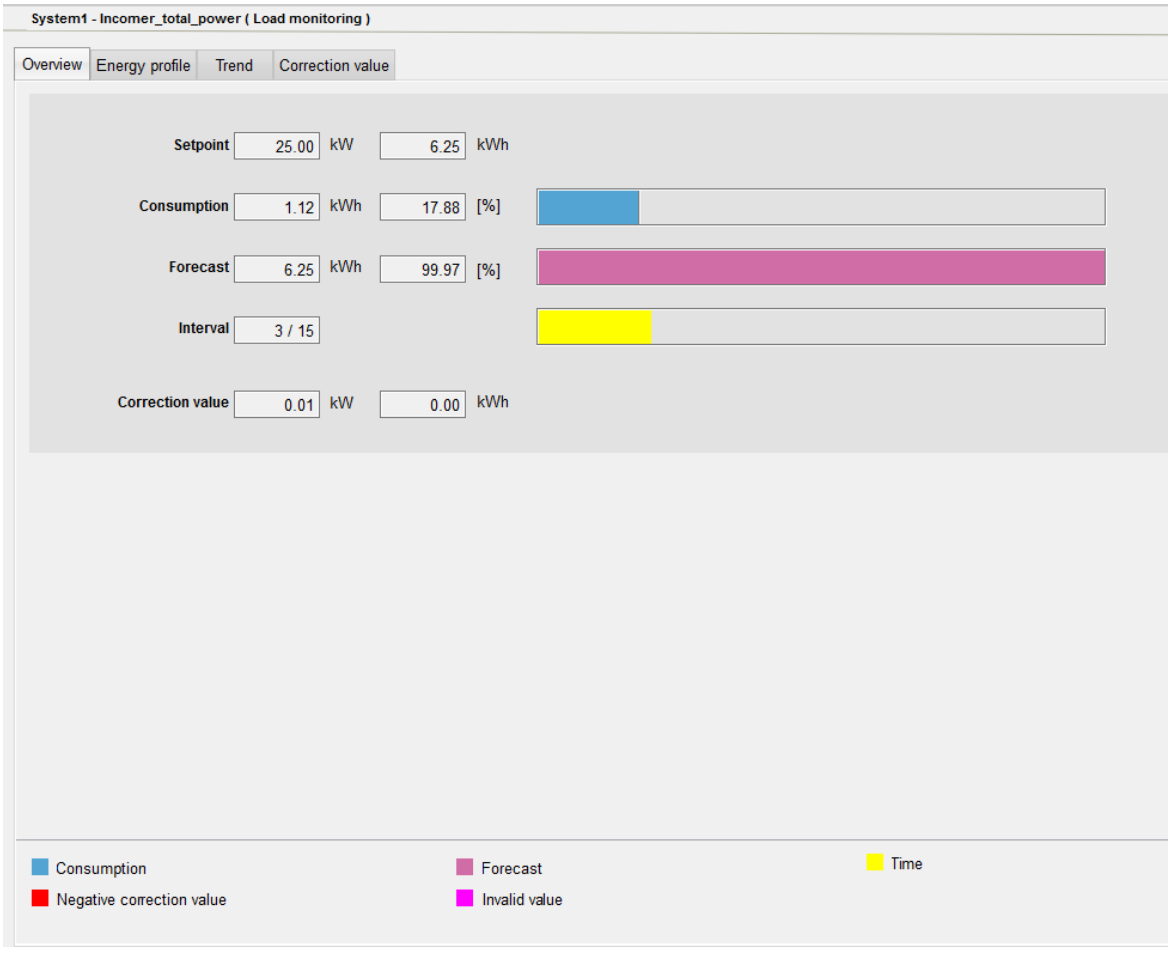
8.7.4.1 Overview Tab

The **Overview** tab shows the consumption development of the monitored datapoint in the current tariff interval:

- Actual energy consumption
- Forecast energy consumption
- Timing
- Correction value

The values are shown as:

- Percentage values in a graphical bar chart
- Absolute numerical values.



[sc_pm_overview, 1, en_US]

Figure 8-11 Overview Tab

Bar Chart

The bar chart contains the following components:

- **Consumption**: The blue **Consumption** bar shows the actual percentage energy consumption in the current tariff interval. The reference value is 100 % of the setpoint.

  The percentage value of the consumption with respect to the setpoint is displayed in the text box and indicated in the bar chart.

- **Forecast**: The **Forecast** bar shows the forecast of the consumption in the current tariff interval.

  The forecast is updated for each calculation interval.

  The percentage value of the forecast is displayed in the text box and indicated in the bar chart.

- **Interval**: The **Interval** field displays the calculation intervals.

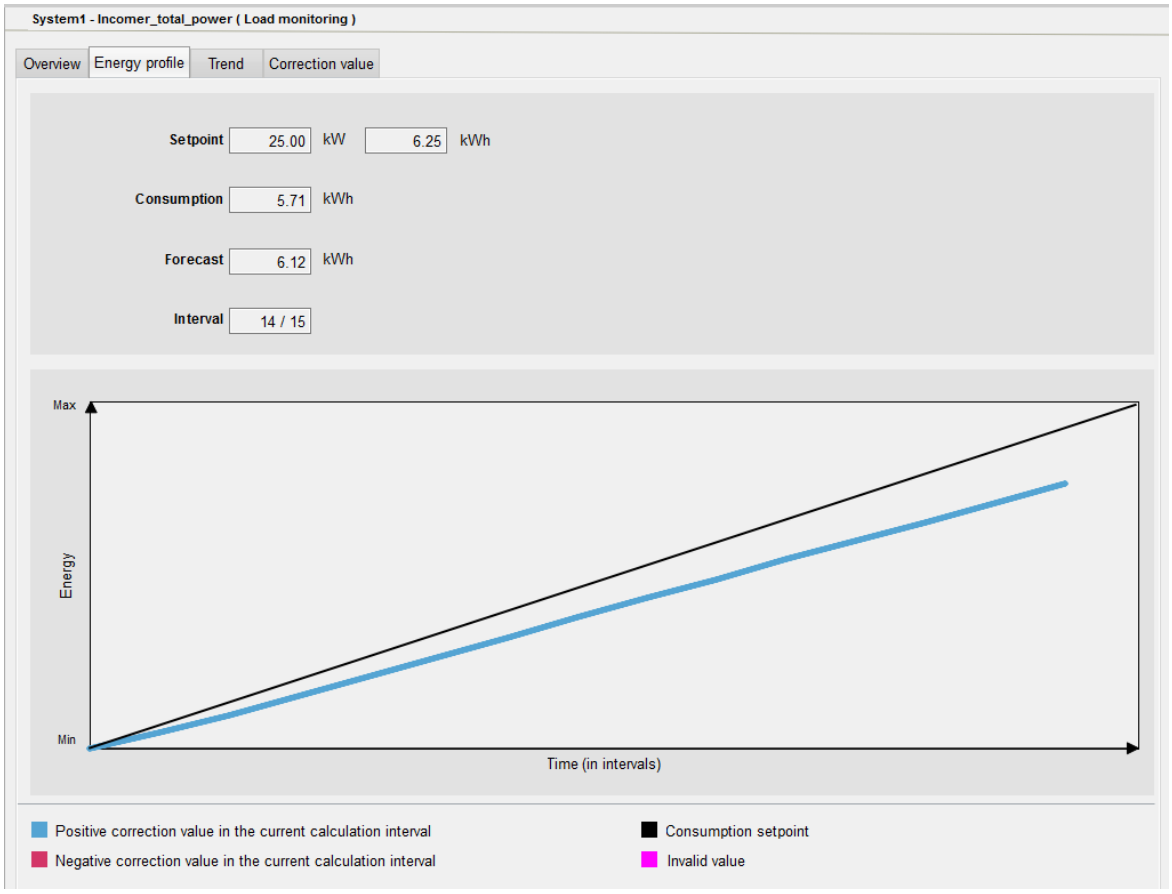
  The first value specifies the last completed calculation interval. The second value shows the number of calculation intervals into which the tariff interval is subdivided.

  The yellow time bar shows the timing in the current tariff interval. The bar ends at the 100 % when the last calculation interval is reached.

Correction value: The **Correction value** field shows the positive or negative power correction value. Use this value to adjust the actual power to its optimal value so that it corresponds to the setpoint.

8.7.4.2 Energy Profile Tab

The **Energy profile** tab displays the deviation between actual energy consumption and rated energy consumption during the current tariff interval.



[sc_pm_energyprofile, 1, en_US]

Figure 8-12 Energy Profile Tab

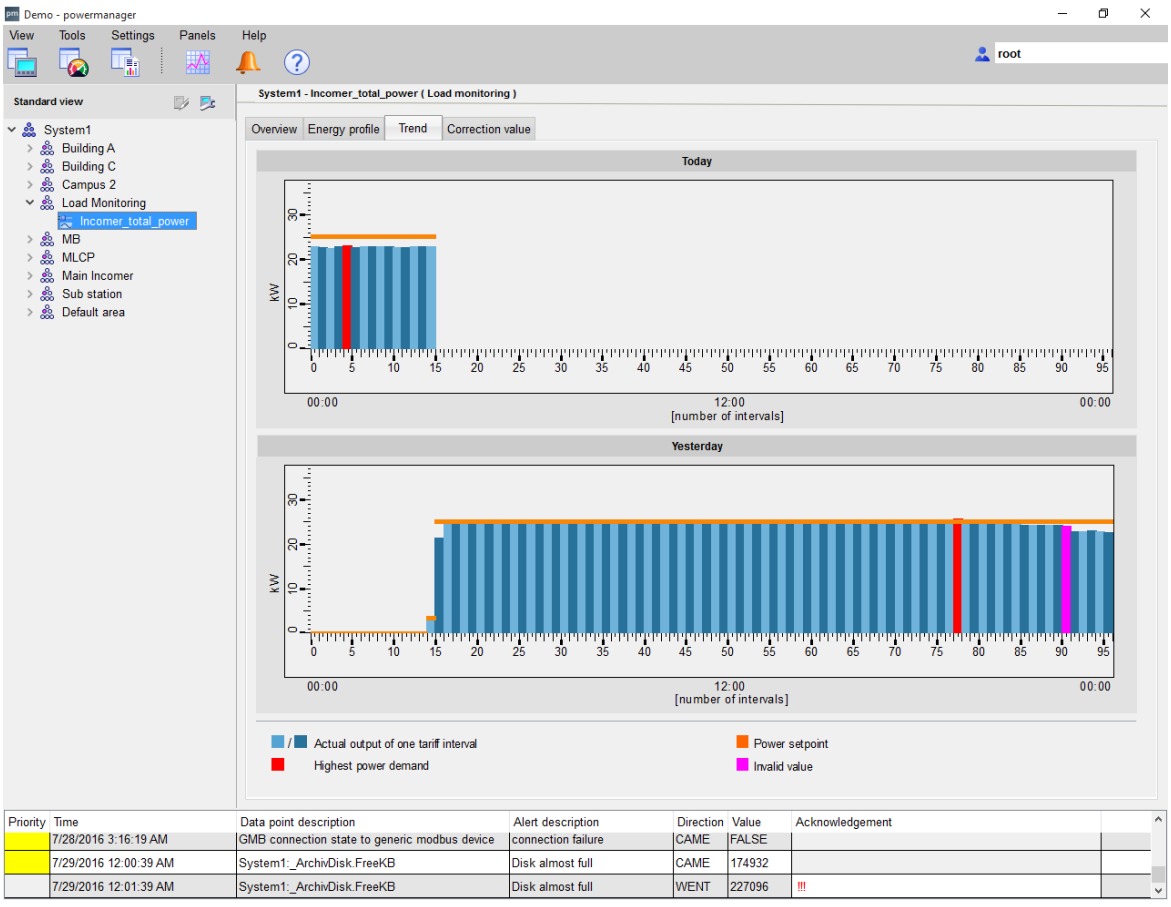
Graphic

The **Energy profile** tab contains the following information:

- The X-axis denotes the time curve of the tariff interval.
- The Y-axis denotes the imported energy.
- The black trend line denotes the consumption setpoint. It is always linear.
- The colored trend line shows the actual consumption.
  The trend line is either blue, red, or magenta.
  - If the actual consumption is below the setpoint, then the trend line is blue. This indicates a positive correction power in the current calculation interval. You can activate extra power without exceeding the setpoint.
  - If the actual consumption is above the setpoint, then the trend line is red. This indicates a negative correction power in the current calculation interval. Switch off some power to bring the consumption to the setpoint.
  - If powermanager encounters an invalid value during the calculation interval, then the trend line is magenta.

8.7.4.3 Trend

The **Trend** tab displays the power demand of the monitored load during the current day and the previous day. The trend of the previous day is not displayed if no data is available for the previous day or if the calculation interval length has changed with respect to the previous day.



[sc_pm_dailytrend, 1, en_US]

Figure 8-13 Trend Tab Display

The **Trend** tab displays the following information:

- The X-axis shows the tariff intervals for a 24 hour time range.
- The Y-axis shows the power in kW.
- The orange horizontal axis shows the power setpoint.
- The blue column shows the actual output of one tariff interval.
- The red column shows the tariff interval with the highest power demand during the day.
- The magenta column shows the tariff intervals with invalid values.

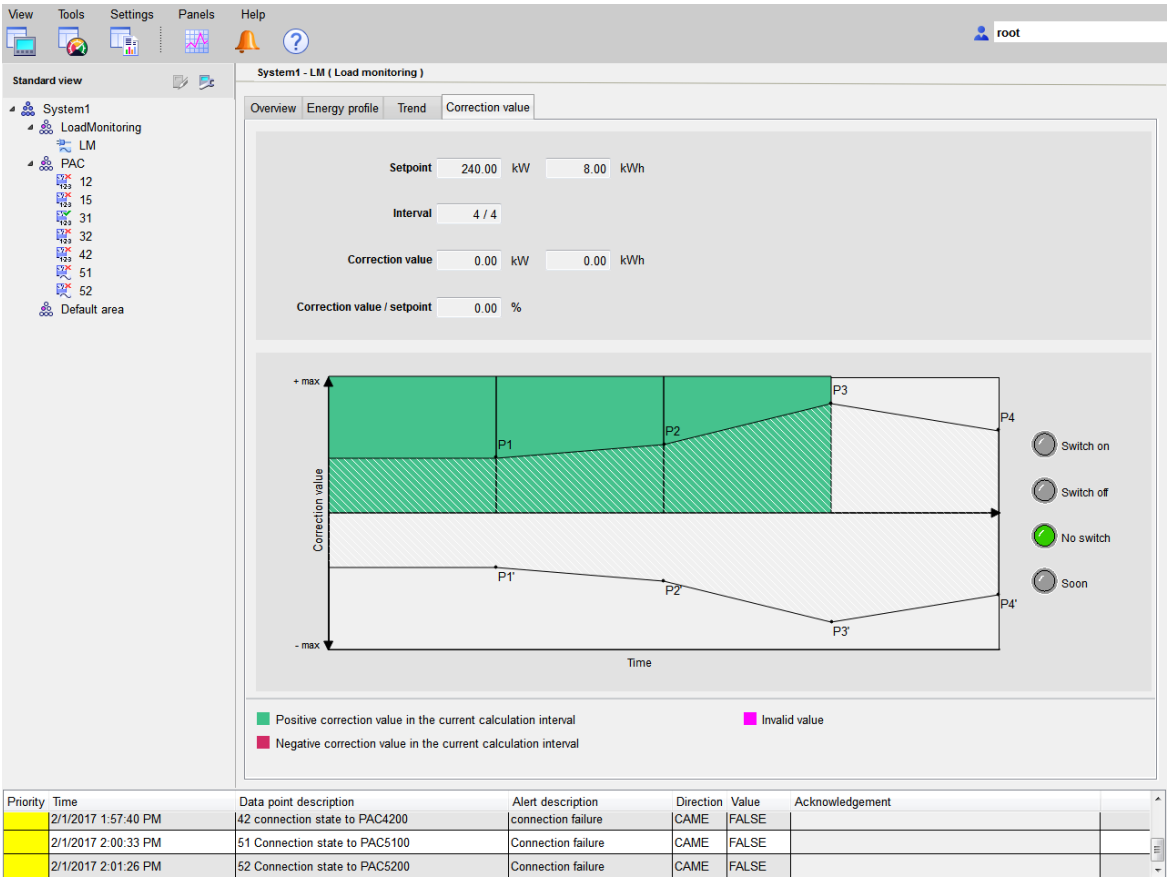
8.7.4.4 Correction Value

The **Correction value** tab shows:

- Correction power values of the calculation intervals during the current tariff interval
- Parameterized limit curve

  The limit curve defines the threshold of the correction power. Switching is only recommended if the actual power exceeds the limit curve. The purpose of limit definition is to smooth brief power spikes, thus reducing the number of switching recommendations.
- Alert notifications for **Switch on**, **Switch off**, **No switch** and **Soon** are displayed with LED controls.

Superpositioning of the 2 curves results in the calculation intervals with the switching recommendation that takes effect.



[sc_pm_correctionvalue, 1, en_US]

Figure 8-14 Correction Value Tab

Limit Curve

The limit curve shows the defined positive and negative limits within which no switching recommendation is given.

The limit curve can be configured in device engineering view, on the **Limit curve** tab.

The **Limit curve** tab displays the following information:

- The X-axis shows the time curve of the tariff interval.
- The Y-axis shows the correction power in kW.
- The colored bars show the correction power of the calculation interval.
  - The green bars above the X-axis indicate positive correlation power in the calculation interval.
  - The red bars below the X-axis indicate negative correlation power in the calculation interval.

8.7.5 Configuration

8.7.5.1 Overview of Configuration

A load monitoring unit created in the project tree monitors one data point.

Following configurations are necessary for the load monitoring unit to start monitoring:

- Selection of the data point
- Definition of the tariff interval and of the calculation interval
- Definition of the setpoint, either constant or variable, during the day

- Definition of the limit curve
- Definition of the response

To access the **Configuration** view (**Parameterization** tab and **Limit curve** tab) for a load monitoring device, right-click the device and click **device engineering**. Device engineering opens automatically when you create a configuration.

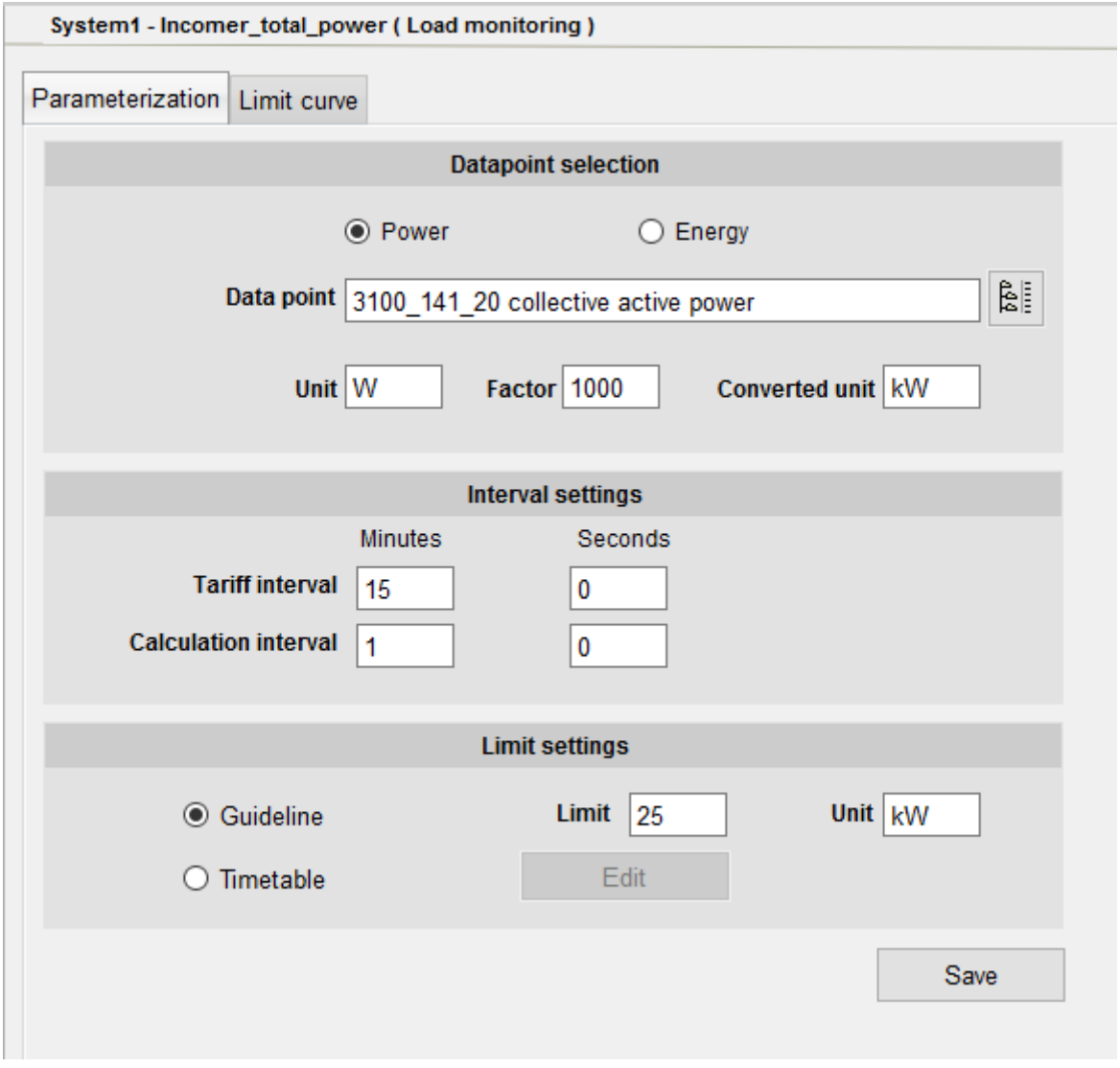
After making the configuration changes, click the **Save** button to confirm the changes.

Any tariff interval running at this time is stopped and marked as invalid.

NOTE

Ensure that you use only positive values for load monitoring. Using negative values results into display problems.

8.7.5.2 Parameterization Tab



[sc_pm_parameterization, 1, en_US]

Figure 8-15 Parameterization Tab

Monitored Datapoint

The **Datapoint selection** area enables you to select the data source for **Power** or **Energy** that you want to monitor via the radio button options.

Ensure that you provide the appropriate information in the following list boxes to select the data source that you want.

Click  to select the respective data point for **Power** or **Energy** directly from the project tree structure.

Interval Settings

Use the **Interval settings** area to define the length of the tariff and calculation intervals.

- **Tariff interval**: Define the tariff interval in minutes and seconds.
- **Calculation interval**: Define the calculation interval in minutes and seconds.

While defining the tariff and calculation intervals, ensure that:

- The tariff interval is integrally divisible by the calculation interval.
- 60 minutes are integrally divisible by the tariff interval.
- The tariff interval lasts a maximum of 60 minutes.

Limit Settings

Assign a constant or variable setpoint to the monitored data source.

Set a schedule for a variable setpoint.

- **Guideline**: Select Guideline to assign a constant setpoint to the monitored data source.
  Selecting this option activates the **Setpoint** field.
- **Setpoint**: Define the momentary power in kW in the **Setpoint** field. The smallest calculated setpoint is 1 kW.
- **Timetable**: Select **Timetable** to assign a variable setpoint to the monitored data source.
  The **Edit** button is activated after you select this option.
  Click **Edit** to prepare a schedule for a variable setpoint.
  For more information on creating schedules, see *8.7.5.3 Schedule*.

8.7.5.3 Schedule

Objective

For each tariff interval during a day, a schedule defines the rated power of the monitored datapoint. Thus, the planned rated power varies in intervals and can increase or decrease at various times in a day.

The system calculates the number of tariff intervals. The interval length in the schedule is prepared accordingly. For example, if a 15-minute tariff interval is configured, the schedule contains 96 intervals.

A schedule applies to any selected calendar period. For all days without an assigned individual schedule, the system accesses a default schedule.

The time difference between summer and winter time is not considered in the schedule. Configure the changeover days separately.

To create or edit schedules, explicitly activate an edit mode. This prevents inadvertent parameterization errors.

Path and File Name

The system subdivides consecutive calendar periods into days and creates a file in the following directory:

`<project_name>\data\EC_TimeTable`

The format of the name assigned to the file is:

`<load_monitor_name>_YYYYMMDD.csv`

The file containing the default schedule is named:

<load_monitor_name>_default.csv

Opening the Edit Schedule Window

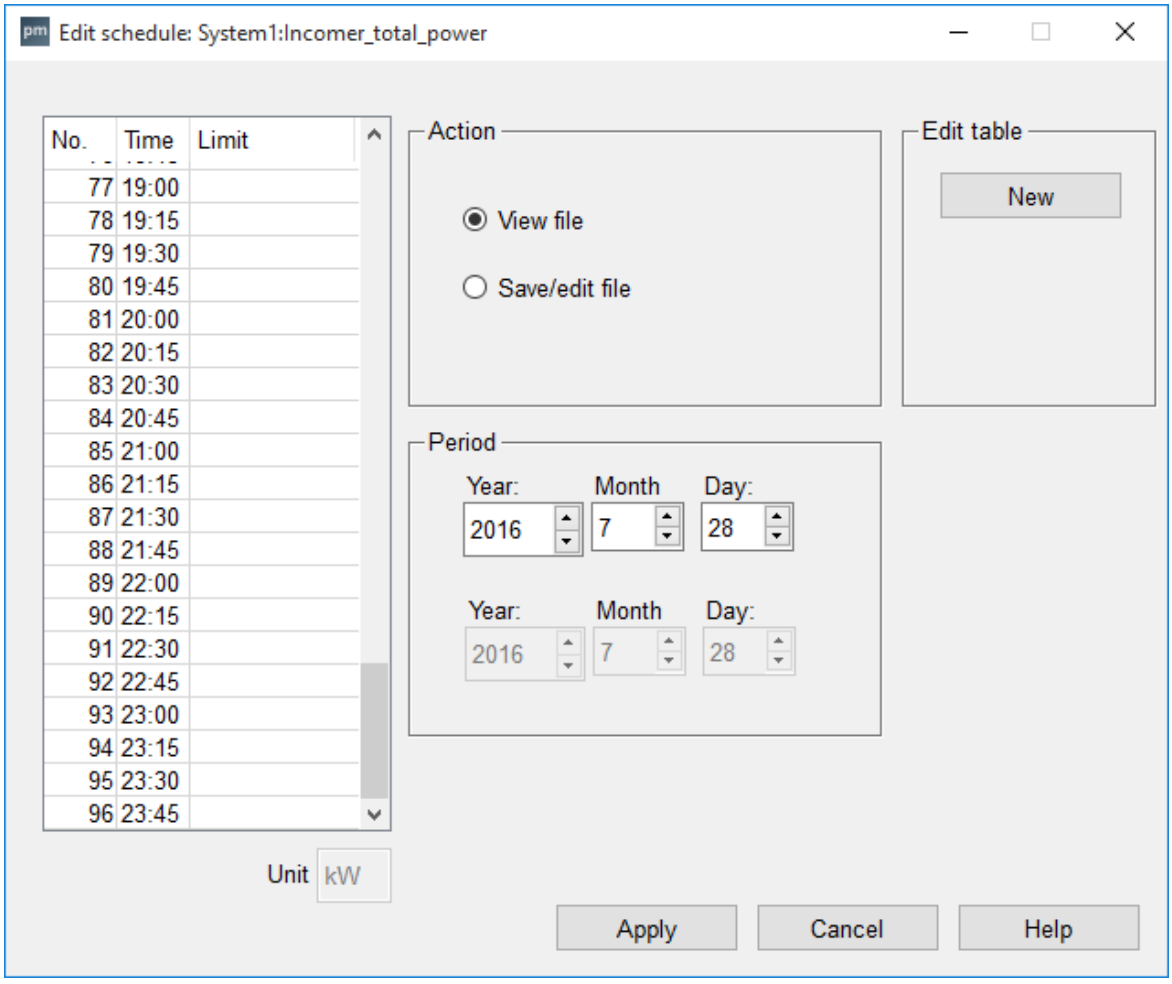
To open the **Edit Schedule** window:

- In the **Setpoint** area, select the **Timetable** option in device engineering.
- Click **Edit**.

If a schedule exists, it is used automatically and the table is filled with it. Else, a message appears.

Edit Schedule Window

The **Edit schedule** window enables you to create and edit timetables. You can define the schedules for a prolonged period and store them for each day.



[sc_pm_edit_schedule, 1, en_US]

Figure 8-16 Edit Schedule Window

The schedule table has the following columns:

- **No.**: The n^{th} tariff interval in the course of the day. The system calculates and specifies the number of tariff intervals.
- **Time**: Start time of the tariff interval.
- **setpoint**: Power setpoint on the monitored datapoint in the tariff interval.

The **Action** area has the following boxes:

- **View file**: This option is selected by default when you open the **Edit Schedule** window. It enables you to view the current schedule in the table.
  Also, only the starting point of the schedule is activated in the **Period** area when you select this option.
- **Save/edit file**: Select this option to edit the schedule.
  Selecting this option activates both the starting point and ending point of the schedule in the **Period** area.
  Additionally, you can edit the setpoint in the **Setpoint** column of the schedule table.

Period Area

In the display mode, only the top date boxes **Year**, **Month**, and **Day** are open. The visible schedule is assigned to the selected calendar date.
In the edit mode, the bottom date fields are additionally open. The top and bottom calendar dates specify the calendar period to which a schedule is assigned. The top calendar date specifies the start day and the bottom calendar date specifies the end day.

Creating a Schedule

To create a schedule:

- Check whether an individual schedule exists for the target period.
  The schedule table has the heading **Default schedule** when the default schedule is visible. The table does not have a heading when an individual schedule is assigned to the currently selected day.
- Select **Save/edit file**.
- In the **Period** area, define the time range for which the schedule is valid.
- Set up the schedule in the table. Define the power setpoint of the monitored datapoint for each tariff interval.
  Empty Setpoint cells in the table assume the value from the Setpoint cell above. If you want to apply a constant setpoint through the entire day, define the setpoint only for the first interval at the start of the day.
  If the Setpoint cell of the first tariff interval at the start of the day is not filled, the value entered on the **Parameterization** tab applies.
- Click **Apply** to confirm the changes.

Creating a Default Schedule

If no default schedule exists, powermanager shows an error message when you open the **Edit Schedule** window.
To create a default schedule:

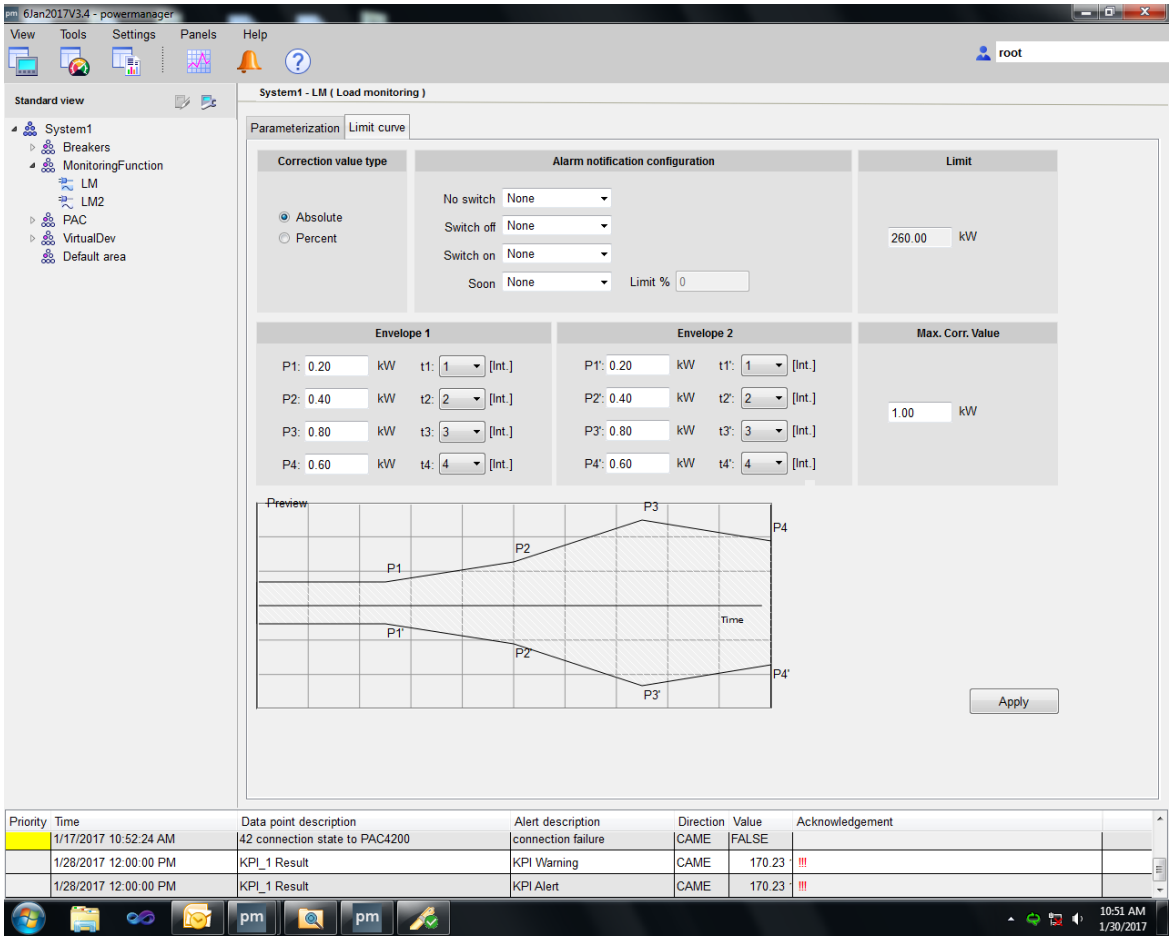
- Create a schedule in the **Edit Schedule** window.
- After you create a schedule, go to **<project_name>\data\EC_TimeTable**.
- Select the new schedule file.
  The file name format for the new file is: **<load_monitor_name>_YYYYMMDD.csv**.
  The date **YYYYMMDD** in the file name corresponds to the date value in the dialog.
- Replace the date **YYYYMMDD** with **default**.
  Therefore, the new file name has the format: **<load_monitor_name>_default.csv**.

Click the **New** button in the **Edit table** area to empty all setpoint fields of the currently selected schedule.
This action is only possible in the display mode. To fill the blank table, switch to the edit mode.

8.7.5.4 Limit Curve Tab

Objective

The limit curve defines the threshold of the correction power. Switching is only recommended if the actual power exceeds the limit curve. The purpose of limit definition is to smooth brief power spikes, thus reducing the number of switching recommendations.



[sc_pm_limitcurve, 1, en_US]

Figure 8-17 Limit Curve Tab

Positive and Negative Limit Correction Power

Define the upper and lower envelopes for the positive and the negative thresholds of the correction power on the **Limit curve** tab.

Define the following fields:

- **Alarming**

  Select whether you want the limit curve to be defined according to power (in kW) or the percentage of the setpoint.

- **Maximum correction value**

  The maximum correction value determines the range of value of the correction power displayed in the diagram.

  Ensure that the limits of the interpolation points P1 to P4 do not exceed the maximum correction value.

- **Envelope 1**

  Define the threshold for the positive correction power in the **Envelope 1** area.

- **Envelope 2**
  Define the threshold for the negative correction power in the **Envelope 2** area.
- **P1, t1 to P4, t4**
  Define the interpolation points of the limit curve in these boxes under the **Envelope 1** and **Envelope 2** areas.
  You can see the preview of the limit curve at the bottom of the **Limit curve** tab.

Alerting

Activate the alerts in the **Alerting** area of the **Limit curve** tab.
The internal switching bits of the system trigger the alerts sending. In turn, which switching bits the system sets depends on the defined limit curve.
There are four options available in the **Alerting** area:

- **No switch**
  Select this option to receive an alert/warning whenever the **switchNo** switching bit is set.
  You do not need to connect or disconnect the load.
- **Switch off**
  Select this option to receive an alert/warning whenever the **switchOff** switching bit is set.
  Disconnect the load.
- **Switch on**
  Select this option to receive an alert/warning whenever the **switchOn** switching bit is set.
  Load can be connected.
- **Soon**
  Switch off the load because the percentage threshold in the **Limit %** field is reached.
  The value in the **Limit %** field refers to the energy consumption setpoint in the tariff interval. 100 % corresponds to the setpoint.

8.8 Manual Measuring Devices

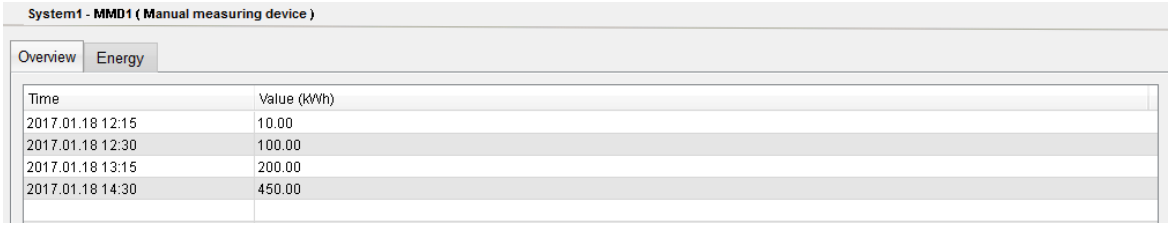
8.8.1 Overview of Manual Measuring Devices

Several electrical subsystems within non-residential buildings or small and medium industrial plants consist of measuring devices, which are either not capable of or restricted from communicating with any external systems such as powermanager. The manual measuring device feature enables you to manually add data from an external device that cannot be integrated with powermanager.

8.8.2 Runtime View

The runtime view for manual measuring devices shows the following tabs.

Overview Tab

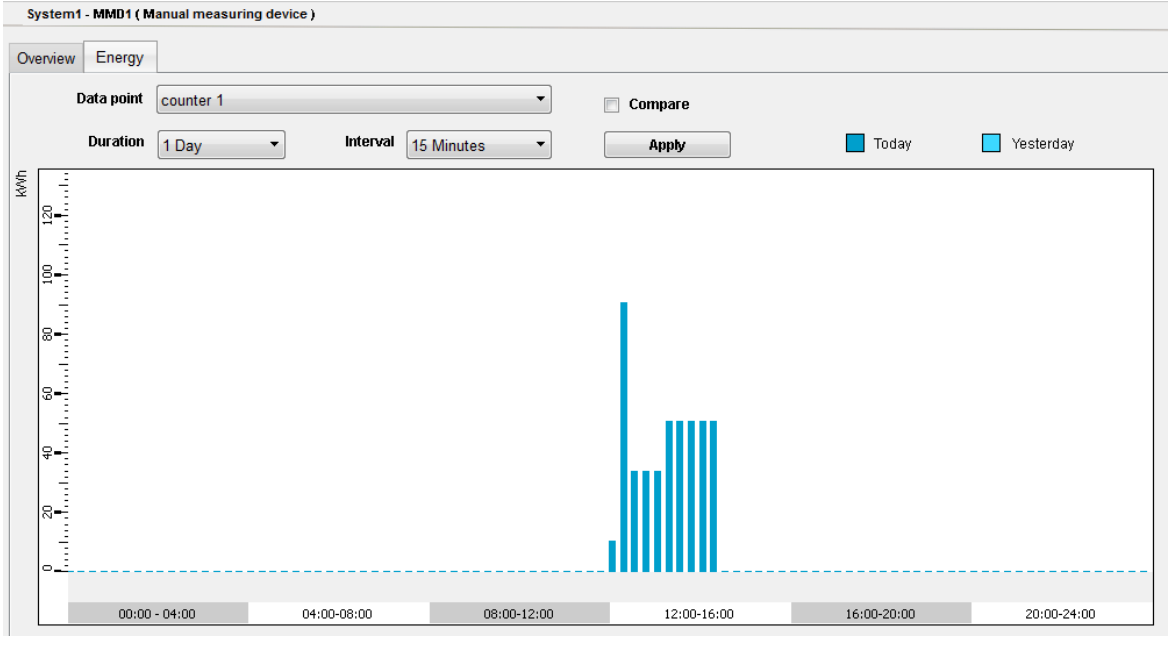


[sc_pm_overviewtab, 1, en_US]

Figure 8-18 Overview Tab

The **Overview** tab displays the measured values entered for the selected devices. This tab shows a maximum of 50 previous values. In order to add new measured values for the device, switch to Input view. For more information, see *6.3.1 Overview*.

Energy Tab



[sc_pm_energy_runtime, 1, en_US]

The **Energy** tab displays the energy consumption details. This tab enables you to compare the energy consumption between 2 different time periods.

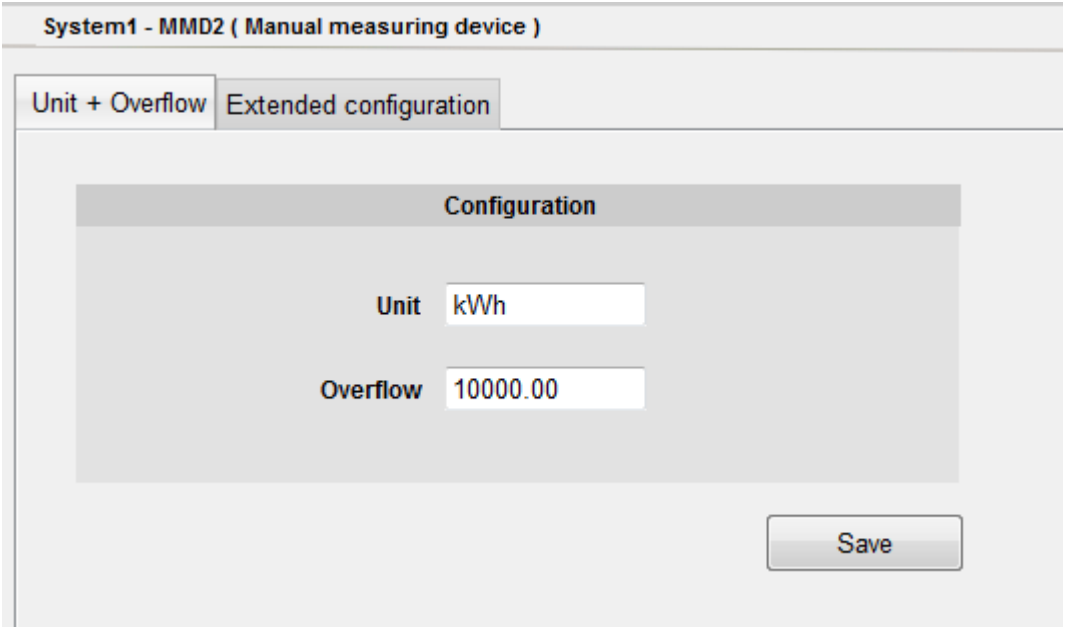
For more information, see *6.1.7 Energy*.

8.8.3 Device Engineering

After adding the device to powermanager, on the **Unit+Overflow** tab, define the following parameters:
Unit: The measurement unit for the data entered for the device. You cannot change the unit after you save the configuration.
Overflow: The maximum acceptable measured value.

NOTE

Ensure that the overflow value is greater than or equal to 0.
The overflow value cannot be negative.



[sc_pm_devengg, 1, en_US]
Figure 8-19 Unit+Overflow Tab for Manual Measuring Device

Archiving

By default, powermanager creates an archive of the measured values entered for a device. Each archive stores measured values upto 13 months. After the archive is full, it is closed and you cannot edit the archive.

Reporting

You can generate the Cost Center report and the Energy report for manual measuring devices.

8.9 Expert Option

8.9.1 Range of Functions

The Expert option offers a Graphics Editor (GEDI). Use GEDI to create and display new panels.
Expert mode also offers a script language to customize your adaptations to the product.
For more information, see Graphics Editor (GEDI).
You can display the measuring devices and their measured variables, created in the project tree, in the graphics pictures.

NOTE

A separate license is required to enable use of the Expert option. For more information, see *2.3.2 License Packages*.

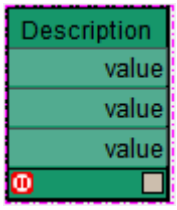
To open the graphics editor, right-click the project tree root in the device tree and then click **Tools > Graphics Editor**. This option is disabled without a valid license.

8.9.2 Device Support

In GEDI, the **pm** tab under **All Objects** contains the device types of powermanager.

Device Information

PAC 1200

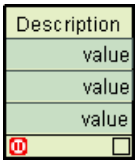


[sc_PAC1200_DeviceInfo, 1, en_US]

Display:

- Device name
- Three measured values
- Communication status
- Alert status/sum alert
- Device type (with background color)
- DP does not exist in the database (device is deleted without adapting the graphics)

PAC 1500

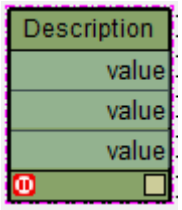


[sc_PAC1500_DeviceInfo.tif, 1, en_US]

Display:

- Device name
- Three measured values
- Communication status
- Alert status/sum alert
- Device type (with background color)
- DP does not exist in the database (device is deleted without adapting the graphics)

PAC1651

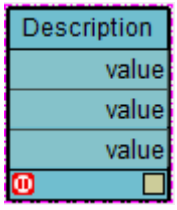


[sc_PAC1651_DeviceInfo, 1, en_US]

Display:

- Device name
- Three measured values
- Communication status
- Alert status/sum alert
- Device type (with background color)
- DP does not exist in the database (device is deleted without adapting the graphics)

PAC1661

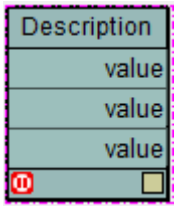


[sc_PAC1661_DeviceInfo, 1, en_US]

Display:

- Device name
- Three measured values
- Communication status
- Alert status/sum alert
- Device type (with background color)
- DP does not exist in the database (device is deleted without adapting the graphics)

PAC1665

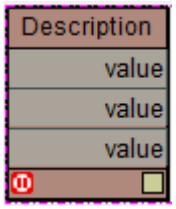


[sc_PAC1665_DeviceInfo, 1, en_US]

Display:

- Device name
- Three measured values
- Communication status
- Alert status/sum alert
- Device type (with background color)
- DP does not exist in the database (device is deleted without adapting the graphics)

PAC1682

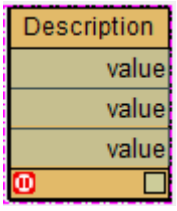


[sc_PAC1682_DeviceInfo, 1, en_US]

Display:

- Device name
- Three measured values
- Communication status
- Alert status/sum alert
- Device type (with background color)
- DP does not exist in the database (device is deleted without adapting the graphics)

PAC2200



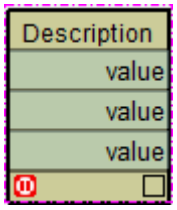
[sc_PAC2200_DeviceInfo, 1, en_US]

Display:

- Device name
- Three measured values

- Communication status
- Alert status/sum alert
- Device type (with background color)
- DP does not exist in the database (device is deleted without adapting the graphics)

PAC 3200



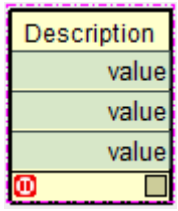
[sc_PAC3200_DeviceInfo.tif, 1, en_US]

Display:

- Device name
- Three measured values
- Communication status
- Alert status/sum alert
- Device type (with background color)
- DP does not exist in the database (device is deleted without adapting the graphics)

After you insert the object, the **Properties** panel opens. You can assign a device (DPE) to the graphics object. Right-click the graphics object to select the displayed measuring points at runtime.

PAC 3200T



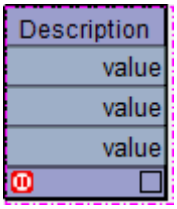
[sc_pm_3200, 1, en_US]

Display:

- Device name
- Three measured values
- Communication status
- Alert status/sum alert
- Device type (with background color)
- DP does not exist in the database (device is deleted without adapting the graphics)

After you insert the object, the **Properties** panel opens. You can assign a device (DPE) to the graphics object. Right-click the graphics object to select the displayed measuring points at runtime.

PAC 4200



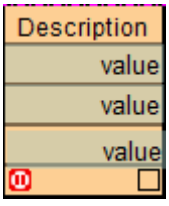
[sc_PAC4200_DeviceInfo.tif, 1, en_US]

Display:

- Device name
- Three measured values
- Communication status
- Alert status/sum alert
- Device type (with background color)
- DP does not exist in the database (device is deleted without adapting the graphics)

After you insert the object, the **Properties** panel opens.
You can assign a device (DPE) to the graphics object. Right-click the graphics object to select the displayed measuring points at runtime.

PAC5100



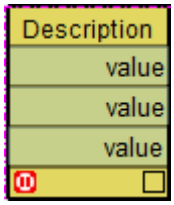
[sc_P850_DeviceInfo, 1, en_US]

Display:

- Device name
- Three measured values
- Communication status
- Alert status/sum alert
- Device type (with background color)
- DP does not exist in the database (device is deleted without adapting the graphics)

After you insert the object, the **Properties** panel opens.
You can assign a device (DPE) to the graphics object. Right-click the graphics object to select the displayed measuring points at runtime.

PAC5200



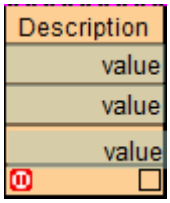
[sc_P855_DeviceInfo, 1, en_US]

Display:

- Device name
- Three measured values
- Communication status
- Alert status/sum alert
- Device type (with background color)
- DP does not exist in the database (device is deleted without adapting the graphics)

After you insert the object, the **Properties** panel opens.
You can assign a device (DPE) to the graphics object. Right-click the graphics object to select the displayed measuring points at runtime.

P850



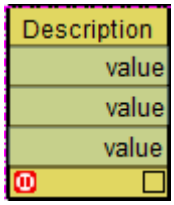
[sc_P850_DeviceInfo, 1, en_US]

Display:

- Device name
- Three measured values
- Communication status
- Alert status/sum alert
- Device type (with background color)
- DP does not exist in the database (device is deleted without adapting the graphics)

After you insert the object, the **Properties** panel opens. You can assign a device (DPE) to the graphics object. Right-click the graphics object to select the displayed measuring points at runtime.

P855



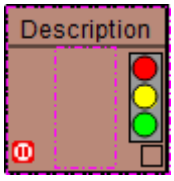
[sc_P855_DeviceInfo, 1, en_US]

Display:

- Device name
- Three measured values
- Communication status
- Alert status/sum alert
- Device type (with background color)
- DP does not exist in the database (device is deleted without adapting the graphics)

After you insert the object, the **Properties** panel opens.
You can assign a device (DPE) to the graphics object. Right-click the graphics object to select the displayed measuring points at runtime.

3WL



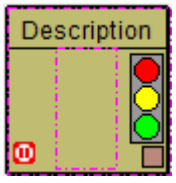
[sc_3WL_DeviceInfo.tif, 1, en_US]

Indicator:

- Device name
- Switch status (not ready/ON/OFF/TRIPPED)
- Communication status
- Sum alert
- Device type (with background color)
- DP does not exist in the database (device is deleted without adapting the graphics)

After you insert the object, the **Properties** panel opens.
You can assign a device (DPE) to the graphics object. Right-click the graphics object to select the displayed measuring points at runtime.

3WL10

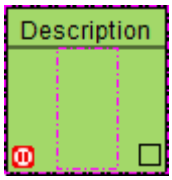


[sc_3WL10_DeviceInfo, 1, en_US]

Indicator:

- Device name
- Switch status (not ready/ON/OFF/TRIPPED)
- Communication status
- Sum alert
- Device type (with background color)
- DP does not exist in the database (device is deleted without adapting the graphics)

3VA



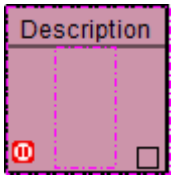
[sc_3VA_DeviceInfo, 1, en_US]

Indicator:

- Device name
- Switch status (not ready/ON/OFF/TRIPPED)
- Communication status
- Sum alert
- Device type (with background color)
- DP does not exist in the database (device is deleted without adapting the graphics)

After you insert the object, the **Properties** panel opens.
You can assign a device (DPE) to the graphics object. Right-click the graphics object to select the displayed measuring points at runtime.

3VL



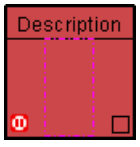
[sc_3VL_DeviceInfo.tif, 1, en_US]

Indicator:

- Device name
- Switch status (not ready/ON/OFF/TRIPPED)
- Communication status
- Sum alert
- Device type (with background color)
- DP does not exist in the database (device is deleted without adapting the graphics)

After you insert the object, the **Properties** panel opens.
You can assign a device (DPE) to the graphics object. Right-click the graphics object to select the displayed measuring points at runtime.

3VL COM21



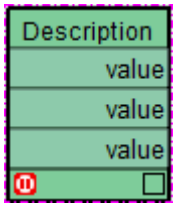
[sc_3VLC21_DeviceInfo.tif, 1, en_US]

Indicator:

- Device name
- Switch status (not ready/ON/OFF/TRIPPED)
- Communication status
- Sum alert
- Device type (with background color)
- DP does not exist in the database (device is deleted without adapting the graphics)

After you insert the object, the **Properties** panel opens.
You can assign a device (DPE) to the graphics object. Right-click the graphics object to select the displayed measuring points at runtime.

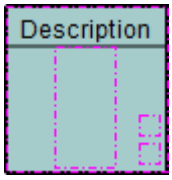
Generic Modbus Device



[sc_GMD_DeviceInfo.tif, 1, en_US]

The display visualizes the values that you select, analogously to the PAC devices.
After you insert the object, the **Properties** panel opens.
You can assign a device (DPE) to the graphics object. Right-click the graphics object to select the displayed measuring points at runtime.

General Switch

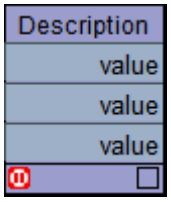
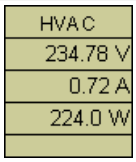


[sc_GeneralSwitch_DeviceInfo.tif, 1, en_US]

The display visualizes the statuses in graphical and textual form.
You can parameterize the following functions in the **Properties** panel of the switch:

- Switch ON
- Switch OFF
- Switch Tripped
- Switch Withdrawn
- Switch Close
- Switch Open

Configuration of the Device

	Object/device in the panel view. Define all the settings here.
	Object/device in the QuickTest view. The previously configured object shows the values read from the system in the QuickTest view. If you move the mouse over the object, a tooltip opens in which the set parameters and the device type are displayed.

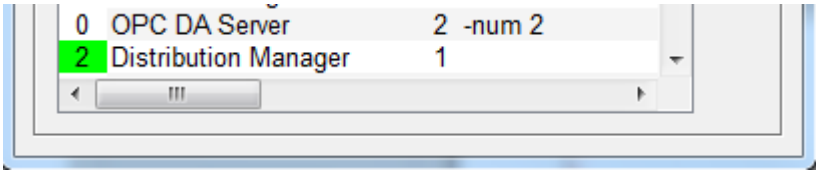
For more information on the functionality of the graphics editor, see Graphics Editor (GEDI).

8.10 Distributed Systems

8.10.1 Overview of Distributed Systems

Distributed systems enable connection of two or more autonomous powermanager systems via a common network. Each subsystem of a distributed system can be configured either as a single-station system or a multi-station system. Each system can process and display values and alerts of other systems. Access is only possible if there is a permanent network connection between the systems.

Within the powermanager, the Distribution Manager is the interface to the other systems.



[sc_DistributionManager, 1, en_US]

Figure 8-20 Distribution Manager

Parameterization of Distributed Systems

You can only operate distributed systems with a separate license. Each powermanager system that you want to operate within a distributed system must have an appropriate license.

For more information on the type of licenses, see *2.3.2 License Packages*.

Distributed systems are parameterized by specifying fewer items in the Config file of your project.

For more information, see *8.10.6 Configuration File for Distributed Systems*.

Define the interconnections between all the systems in the distributed system in the configuration files of the individual systems via the **distPeer** item.

The following entries exist in the powermanager's configuration file. The entries are examples. Adjust them accordingly.

[general]

distributed = 1

[dist]

#Establishing connection to Host1 with system number 1

#distPeer = "Host1" 1

#Establishing connection to Host2 with system number 2

#distPeer = "Host2" 2

#Establishing connection to Host3 with system number 3

#distPeer = "Host3" 3

#Establishing connection to Host4 with system number 4

#distPeer = "Host4" 4

System Names and System Numbers

Corresponding to the **distpeer** entries in the configuration file, applicable system names, and numbers are assigned to the project databases. A system name and a system number can only be used once within a system network.

The system name and number are assigned when creating a project in the project administration.

The powermanager project have a predefined system name (System1) and system number (1). If you want to connect multiple projects having the predefined system name and system number, change the system name and system number of the individual projects.

Use the following command to change the system name and number:

NOTE

Stop the project before you run the following command.

NOTE

powermanager saves the individual datapoints including the system name in the database. If the system name is changed, it is recommended to reconfigure the datapoints in **KPI**, **Reports** (**Basic** and **Advanced**), and **Custom panels**.

WCCOAtoolSyncTypes –system <system_number> <system_name> -proj <project_name>

Here, **<system_number>** is the new system number that is assigned to the project,

<system_name> is the new system name that is assigned to the project,

<project_name> is the name of the project.

If you want to run the distributed system as a single-user system again, then set the system number back to 1.

Example

If the system number is **1**, the system name is **System**, and the project name is **powermanager**, then run the following command:

WCCOAtoolSyncTypes –system 1 System -proj powermanager

Updating Archive Structure

To ensure that all the systems are able to read the updated report data, update the archive structure.

To update the archive structure:

✧ In the menu bar, click **Tools** > **Report** and open the excel **Report** window.

✧ In the excel **Report** window, click the **Add-Ins** tab.

✧ In the **Add-Ins** tab, click **Report > Configuration > Archive Structure**.

✧ Enter the valid password.
The default password is **erAdmin**.

✧ Click **OK**.

✧ Click **Yes** on all subsequent dialogs.

8.10.2 Basics of Distributed Systems

Distributed systems in powermanager enable you to connect two or more autonomous powermanager systems via a network. You can configure each subsystem of a distributed system either as single-station system or multiple-station system in each case redundant or not redundant. A subsystem is a server on which an Event manager is running (it is not necessarily a complete project). In a redundant system, both redundant running servers are considered as a single system.

The distributed systems in powermanager are intended for the following purposes:

- Connecting several standalone powermanager systems.
- Increased performance (increase of the entire performance and number of the DPEs via load sharing on several computers).
- Creating one central system and unoccupied subsystems.

Each system can process and display data (values and alerts) of other systems. You can access online values, alerts, and history of each system using distributed systems in powermanager. When you access remote DPEs the datapoints of the subsystems are not copied to the local system. Therefore, the datapoints are not multiplied and you can only access the system when a connection to this specific system exists.

The distribution manager (Dist manager) builds the interface to other systems. The Dist manager is responsible for the communication with the parameterized subsystems. Therefore, for the proper functionality of the distributed systems in powermanager, add the Dist manager to the console and start it.

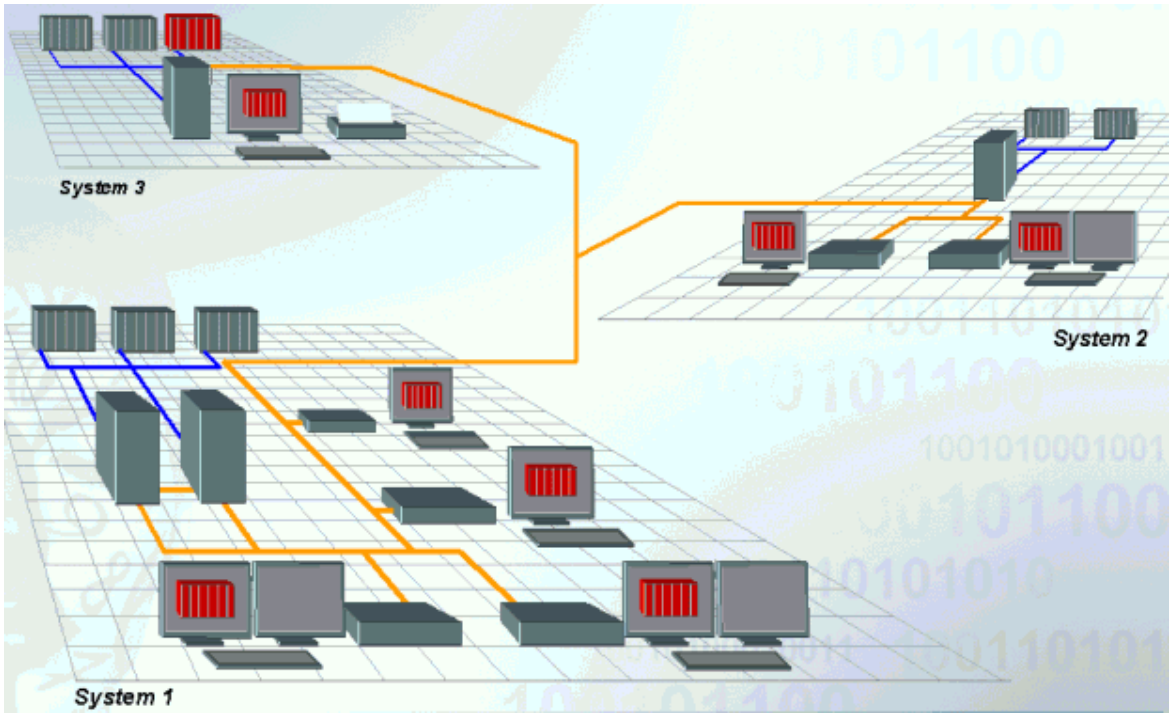
The distributed systems are parameterized easily when creating a project using a wizard or by specifying few entries in the config file of your project.

For more information, see:

Create a distributed system

8.10.6 Configuration File for Distributed Systems

The following figure shows a possible structure of several powermanager systems connected to each other.



[sc_DistributedSystems, 1, en_US]

Figure 8-21 Distributed Systems with powermanager

- The figure shows a distributed system consisting of a redundant system (System 1), a multiple-station system (System 2) and, a single station system (System 3).
- Each system has its own process connection (PLC, DDC, telecontrol head).
- All process data is mapped to datapoints local (in the own system).
- In a plant display, you can show datapoints of the local as well as of the connected systems.
- The network connection between the systems is redundant.
- You can connect 2048 systems.
- A weighting can be assigned to errors occurring in a subsystem. You must parameterize the weighting, that is, how grave the error is for the specific system. Also, a possible loss of a connection to a subsystem has an assigned error weighting (like a PLC breakdown).
  For more information on the parameterization of weighing for error cases, see System overview panel for distributed systems.

Advantage of Distributed Systems in powermanager

- Flexibility and scalability
- Increased performance: Parallel processing, load sharing
- Fault tolerance: Availability increase of the complete system
- Parameterize complete identical systems (datapoint types and datapoints) only once. For example, create the panels and reference the datapoints with **$** parameters only once.

8.10.3 Prerequisites and Installation

Prerequisites

- Complete installation of powermanager.
- An appropriate license for distributed systems.
- The configuration of the languages (it is defined when creating the project) on all systems is similar.
- The access rights are evaluated in the network of a distributed system. Create the same users with same rights on all systems.

NOTE

Use the following connect and query functions to query datapoint values: :dpConnect(), dpQuery(), dpQueryConnectAll(), dpQueryConnectSingle(), isAnswer(), and isRefresh().

For more information, see Control Functions.

Installation

Install powermanager on all the systems in a distributed system.

For more information on installing powermanager, see Installation Under Windows.

For more information on configuration of a distributed system with powermanager, see Creating a distributed system.

8.10.4 Application Planning and Hints on Distributed Systems

Planning of Distributed Systems

The first thing to consider when planning a distributed system, is the topology. Different structures are realized by connecting each system with the other. The topology of a distributed system is described in the config file (see *8.10.6 Configuration File for Distributed Systems*).

Use the following questions to formulate the requirements of the distributed system:

- How many subsystems does the complete system consist of? A subsystem is a server with an Event manager. In a redundant system, both servers of the redundant pair are counted as one system. Remote stations are not considered.
- Are commands transferred to the remote systems or is the data of these systems only displayed?
- Is there are a system which is a higher-level system than the other systems. Should the subcontrol rooms be able to communicate with each other. Which things do you want to handle from the main control room?
- Are there systems with equal rights, which control one or more systems (manned and unmanned stations)?
- Should only values of other systems be available on one system (visualization in specific panels, overview panels) or should the process images of remote systems also be displayed?
- Should parameterization be possible on all systems or only on one system?
- In which systems should the collected data be evaluated (reporting, archiving, processing)?
- Which systems are used at which time and who is using the systems?
- Should the commands between the single systems be controlled?
- Which alerts should be displayed in which systems? Who (which user in which system) must acknowledge them.

  You can parameterize the alert classes differently on each system in a distributed system.
- Which bandwidth (capacity of the network connection) is available for connecting single systems?

Hints and Restrictions When Working with Distributed Systems

Hardware

Following hardware components are recommended for distributed systems:

- Ensure that the network connections between the systems are permanent connections (leased lines).

  powermanager does not support switched lines directly. Switched lines are only possible when powermanager cannot detect that it is a switched line.

  Therefore, build the connection independently using the router when data is transferred via the line and the connection is released after the time-out. If you use switched lines Siemens AG recommends using hardware routers of Cisco.
- For the construction of computers in distributed systems consider the number of datapoints and dynamics of the local system and the part of locally used datapoints of other systems. Also, consider the additional communication overhead.
- For bigger applications (projects with > 20000 DPEs) computers with dual processors are recommended.

Archiving/Reporting

You need a network connection to access historical data of other systems.

The data is located on the particular source systems by default.

If historical values are not saved in the source system, create the datapoints in the system in which the historical values are saved. Transmit the values via a runtime script with registration on these datapoints. However, this is not recommended because problems with data and correction values arise.

Rights

If a function is used from several systems, implement the specification and switching of commands manually (which user interface to use the function on which system at a particular time). All other user interfaces/users normally do not have any rights in this case.

The access rights are also evaluated in the network of a redundant system. Therefore, it is necessary to create the same users with the same rights on all systems.

Functions

- For enhanced performance, ensure that CTRL functions avoid intensive calculating and system-wide queries. Also, large number of dpConnect() calls on the datapoints of a remote system overload the computer and the network.
- If you use dpConnect() to access datapoints, ensure that the datapoints are located on the same system.
- If you use dpGet() or dpSet() to query or set several datapoints, ensure that the datapoints are located on the same system.
- The dpGet() call works only on the local system. If you use dpGet() call to query remote systems, the log viewer shows the following error message:

  WCCOAui (1), 2007.09.26 14:11:19.266, PARAM,SEVERE, 175, this request cannot address more than one system, DP: dist_789:ExampleDP_Arg1.:_original.._value

  WCCOAui (1), 2007.09.26 14:11:19.266, CTRL, WARNING, 76, Invalid argument in function,

  WCCOActrl (2), 2007.09.26 14:24:54.887, PARAM,SEVERE, 175, this request cannot address more than one system, DP: dist_789:ExampleDP_Arg1.:_original.._value

  WCCOActrl (2), 2007.09.26 14:24:54.887, CTRL, WARNING, 76, Invalid argument in function, dpGetAll.txt Line: 14, dpGet
- All nodes of a distributed system must contain the same number of languages.

- You cannot set the following parts of the **General** config from a UI on the remote system:
  Description, format, unit, and alias
  If you want to set these parts do it via a control datapoint and an easy runtime script that runs the command local. However, the configs can be parameterized via a remote UI (VISION, PARA, GEDI) on each system via the network.
- The functions dpCreate(), dpDelete(), dpGetAlias(), dpGetAllAliases(), dpGetDescription(), dpGetAllDescriptions(), dpGetFormat() work cross the system boundaries. When you use these functions for queries on remote systems, specify the system name for the datapoint.
- You can create, change, or delete the datapoints in Module PARA only on the local system.
- The configurations (saved default settings) of event and alert panel, trend, group datapoints, and so on, are saved on the system on which the configurations were created.
  For more information, see Alert and event panel.
- Sum alerts (alerts) cannot handle alerts from 2 or more different systems simultaneously.
- The initialization of the Dist Manager and its connection establishment takes longer than the start of the first user interface or runtime script (CTRL) when starting the system. If these build connections (dpConnect() with hotlinks) to datapoint elements on remote systems the connection is not established until the Dist Manager starts. Else, the datapoints of remote systems are identified as not available.
- If you use a dpGet() call on a remote system and the Dist connection does not exist, the dpGet() call returns 0 (OK). Use getLastError() to query the error.
  GetLastError() returns the following error message: *Message could not be sent, DP: System1:ap.:_original.._value, MAN: (SYS: 1 Dist -num 1 CONN: 1), Could not send message DP_MSG_SIMPLE_REQUEST #326*.

NOTE

For more information on functions, see Control Functions.

SQL Queries

- You cannot run SQL queries on two or more systems simultaneously. Also, the alert and event panel divide such queries in the distributed systems into several queries.
- To run queries, use the appropriate SQL keyword (= REMOTE) across the system boundaries. Use the keyword REMOTE ALL to query all systems.
  For more information, see:
  - SQL keyword
  - SQL panel

Driver Parameterization

The parameterization of driver datapoints in distributed systems is only allowed on the local system.

8.10.5 Principle and Functionality

A distributed system consists of two projects on different computers with different or same operating system. The distributed powermanager systems are connected the Dist manager (WCCOAdist). The Dist manager builds the logical connection to several Dist managers of other powermanager systems. There is one Dist manager per system and it is responsible for the connection to all other systems.

The redundancy is an exception. In a redundant system, a Dist manager runs on each redundant computer. The data of other systems is accessed like the data of the local system. Datapoints of remote systems are not copied to the local system. Thus, you can only access the remote data when the connection to the specific system exists (when the connection to the subsystem is lost, queries are not possible anymore). Only active

queried information is transferred (that is, replies to queries that were executed on a subsystem via dpGet(), dpGetPeriod(), dpConnect() calls).

The Dist Manager is responsible for the following tasks in a distributed system:

- Connection establishment to other powermanager systems as well as monitoring of the connections.
- Exchange of the DP identification on all systems.
- Transmission of messages.

Each system in a distributed system must have a unique system name and a unique system number. The manager number of the Dist Manager is assigned automatically when the Data Manager starts. The manager number also represents the system number of the particular system.

The DP identification of the systems is exchanged when a subsystem and the Dist Manager start. For performance reasons, each DP of a system is accessed in powermanager internal via a number instead of the name. This number is the DP identification (= Id). The names are converted internal to IDs via tables.

The following information is used when converting the names:

- **Datapoint types**: There is an internal table per DPT. This table contains the name of datapoint types and elements.
- **Datapoints**: There is an internal table with the name per DP.
- **Datapoint elements**: There is an internal table per DPE. The table contains the description, unit, format, and alias.
- **System name**
- **Config and attribute names**: The config and attribute names are fixed. You cannot change them in the project.

In bigger projects, the DP Id is bigger, with size up to several MBs. The access to DPs (for example, with CTRL) is not possible without this Id.

For more information, see DP identification.

Datapoints/System Name

The first part of each datapoint identifier (datapoint name) in powermanager contains the system name (default is the local system name). All datapoints within the system contain the same system name. Therefore, each involved system must have a unique system name and a unique system number. Datapoints of remote systems are addressed using the system name and a colon.

Example

```
"System3:ExampleDP_Trend1.:_original.._value"
```

If you refer to a datapoint in a script (UI, CTRL) without a system name, powermanager uses the local system name. All scripts and all panels that process or display data of other systems must use complete datapoint identifiers.

Example

The following function call in a script only returns datapoints (that match the pattern) of the system where the function was called:

```
dpNames("*","ExampleDP_Bit");
```

The following call in a script returns the datapoints (that match the pattern) of all systems:

```
dpNames("*:*","ExampleDP_Bit");
```

NOTE

The system name is not used hard coded in project-specific scripts. In the datapoint lists which are imported via the ASCII manager, specify the datapoint identifiers without system name, although the datapoints are imported to other systems.

The datapoint types and datapoints must be different in the subsystems. The DP identification is exchanged when the connection to other systems is established via the Dist manager. Therefore, you can access all remote DPEs (for example, with dpGet(), dpGetPeriod(), dpConnect(), dpSet(), and so on). However, the datapoints of remote systems are not copied to the local system. Therefore, the datapoints are not multiplied and you can only access the datapoints of a subsystem when a connection to the system exists. You can use the DPEs on the remote systems like the local DPEs (the connected systems and DPTs/DPEs are visible in the PARA module).

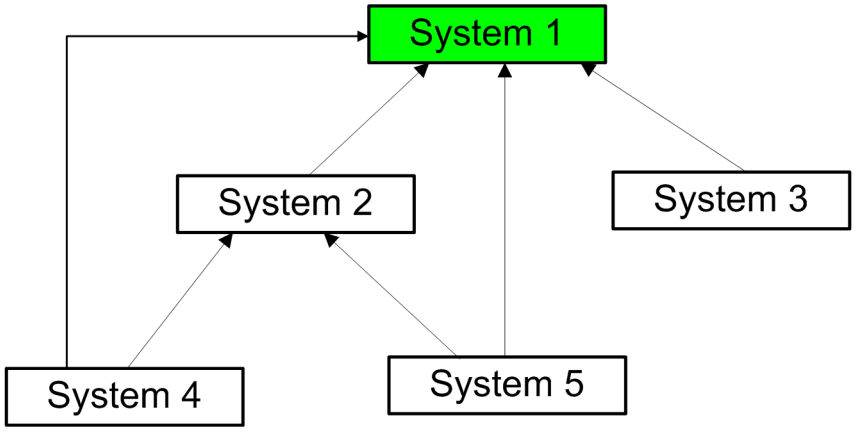
If the connection to a subsystem is lost, this is visible via the invalid bit of the original value for the attributes **_original.._invalid** and **_original.._bad** as well as via the online value for the attributes **_online.._invalid** and **_online.._bad** . For more information, see _original and _online.

Query these attributes to know the connection status. This means that all dpConnect() functions with reply (second parameter is TRUE) to a subsystem return a hotlink with a null value and the status bits are set so that the value is marked as invalid. Furthermore, the dpConnects with a reply return an error (can be queried via getLastError()) with code 144. This applies also to the functions dpQueryConnectAll() and dpQueryConnectSingle().

Topology of a Distributed System

You can structure the distributed systems in powermanager hierarchically. One system is on the top of the hierarchy, the further systems are located in the levels below. The system on the top is the server and the systems below are the clients. This structure simplifies the parameterization of distributed systems. The following figure shows a distributed powermanager system in hierarchical form.

In the figure above, the System 1 is server for all other systems and accepts connections of these systems. System 2 connects to System 1 and is the server for the systems below (system 4 and system 5).



[sc_Hierarchical_structure, 1, en_US]

The advantage of this kind of structure is the parameterization of distributed systems with this configuration. When the parameters are set, it is sufficient to specify the connection in one direction. System 1 is defined first under the **Settings of the new own project** via **Creating a distributed system with the wizard**. The second step is to create the further subsystems and parameterize their connections to other systems. This is made in the wizard via the **connected systems** part. For more information, see Example of a redundant distributed system.

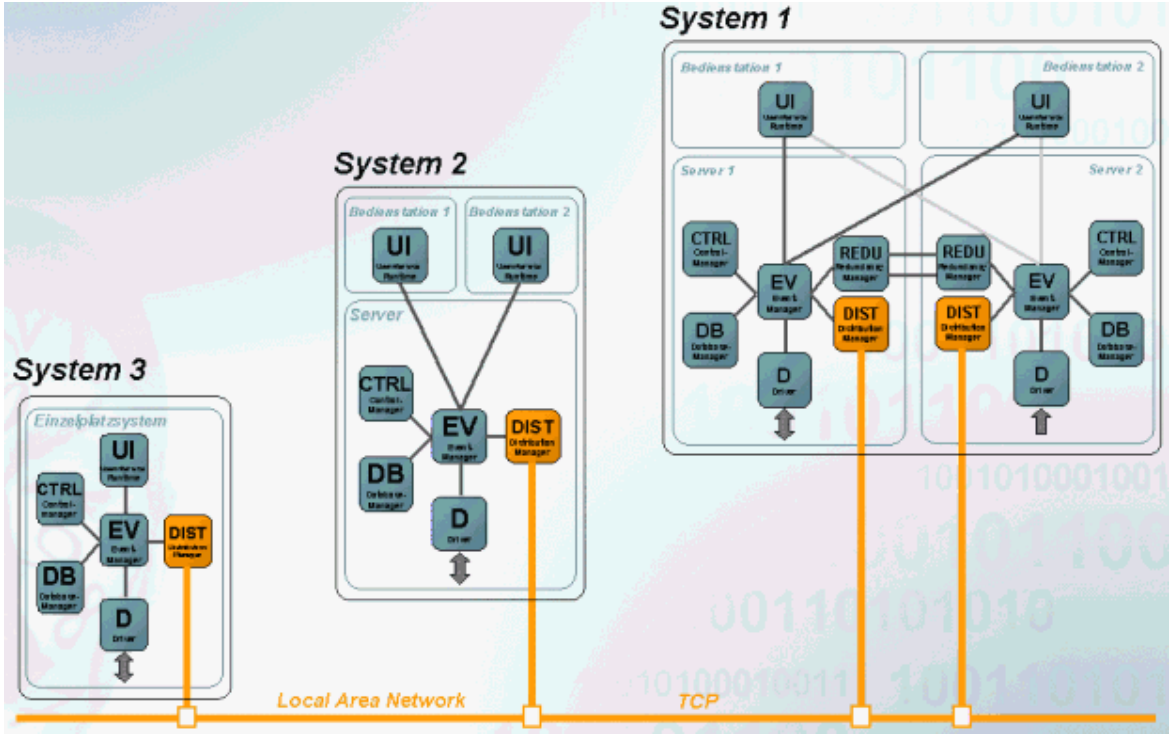
If the connection to a system is built, it is bidirectional and the systems at the ends of the connection see each other (if the connection from system 4 to system 2 is established both can communicate with each other and are visible in the system overview panel). This kind of structure ensures that new lower-level systems are included in the topology restarting the server (Dist Manager). For information on how configuration of a hierarchical structure looks like in the config file, see *8.10.6 Configuration File for Distributed Systems*.

NOTE

Connect the powermanager systems that exchange messages with each other directly. The messages are not routed (for example, as shown in the preceding figure, the system 4 cannot exchange any messages with the system 3). If the connection to a system is built once, it is bidirectional and the systems at the ends of the connection discover each other. Therefore, the parameterization of the connection in one direction is sufficient.

Forwarding of Messages

The following paragraphs describe the messages and how they are forwarded (queries on subsystems) in distributed systems. The following figure displays the principle of distributed systems.



[sc_DistributedSystems2, 1, en_US]

Figure 8-22 Distributed System in powermanager

System 3 is a single station system, system 2 a multiple-station system, and system 1 is configured redundant. All three systems are connected via the local network. The network connection to the three computers used in this distributed system can be redundant. The three systems can have their own process connection.

For more information on creating a distributed system using powermanager, see Creating a distributed system.

When using this configuration the messages are forwarded as follows (the forwarding of messages is described using system 3 and system 2):

- A CTRL script is started on system 3. The CTRL script queries values of DPEs on the system 2 (for example, via dpGet(), dpGetPeriod(), dpConnect()).
- The CTRL manager sends a message to the Event manager of the local system. The Event manager forwards the message to the local Dist manager. The Dist manager again forwards the message to the Dist manager of system 2. The Dist manager on the system 2 forwards the message to the local Event manager that evaluates the message.
- The reply to the query is sent in reverse direction. The Event Manager on the system 2 forwards the queried value to the Dist Manager. The Dist Manager on the system 2 forwards the value to the Dist Manager on the system 3 (which sent the original query). The Dist Manager on the system 3 forwards the value to its Event manager and this forwards it again to the source. The source is the CTRL manager which processes the reply to the query.

NOTE

If the connection between the Dist Managers of the two systems is lost when dpConnect() registrations exist. the registrations remain. When the connection is established again, the values of existing registrations are updated for all registered managers.

Each manager in powermanager is identified via the manager type and number, system number, and replica. Therefore, you can identify each manager in a distributed system. Via this manager identifier, forward messages to other managers in a subsystem without a direct connection between the source and target manager. Therefore, when a message is sent, all managers located between the source and target manager only forward the message and do not deal with the content. In a redundant system (for example, like in the figure System 1), the messages are forwarded via the Dist Managers of the subsystems in the distributed system. The Dist Manager of the active computer sends the message to the active Event Manager in case of redundancy. The split mode in a redundant system is an exception. Since both Event Managers of the redundant system are active in the split mode, determine the active Dist Manager in the system overview panel.

8.10.6 Configuration File for Distributed Systems

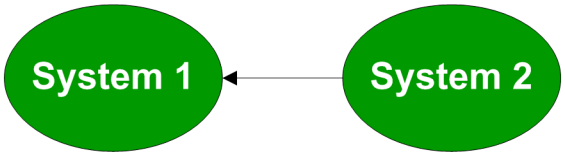
This chapter describes the necessary entries that are generated automatically when creating a distributed project. The entries are set in the config file located in `proj_path/config/`.

Following entries required for a distributed system:

Entry	Possible values	Description
[general] **distributed**	1 or 0	Mandatory entry. This entry defines a distributed system. A distributed system requires the ***`distributed = 1`*** entry in the **`[general]`** section. This value can also be overwritten for individual Managers. [ctrl_1] distributed = 0 In this case, the Control Manager with the number 1 cannot access the DPs of other systems (DP identification is not communicated to this Manager).
[dist] **distPort**	Port number. The default value is 4777.	Defines the port numbers used by the Dist Manager to accept connections from other systems. The default value is 4777. Do not define port numbers if your projects run on different computers. However, if your projects run on the same computer, define the port numbers.

Entry	Possible values	Description
[dist] **distPeer**	-	distPeer = "host1[:port1][$host2[:port2]]" system number Defines the hosts and the system number to which the Dist Manager establishes the connection as the "client" (the other system is the "server"). If the other system is redundant, powermanager separates both host names using **$**.

Example 1



[sc_2DistributedSystems, 1, en_US]

Figure 8-23 Distributed System Consisting of Two Systems

To create a distributed system containing two different systems connected with each other (System 1 and System 2) following entries are necessary on the two systems:

System 1 (Host name Host1):

[general]

distributed = 1

#The System 1 does not need any distPeer entry since it is a server for

#the System 2

System 2 (Host name Host2):

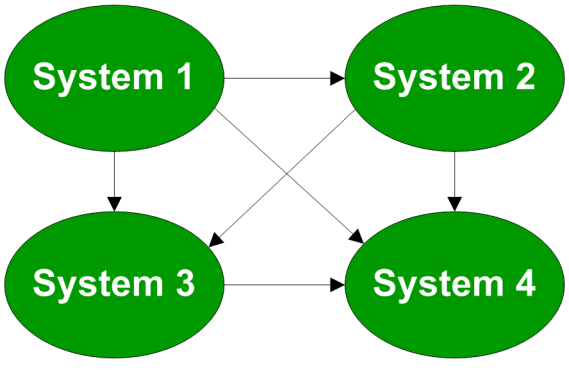
[general]

distributed = 1

[dist]

distPeer = "Host1" 1 #Connect to Host1 (of System 1), system number 1

Example 2



[sc_4DistributedSystems, 1, en_US]

Figure 8-24 Distributed System Consisting of Four Systems

To create a distributed system containing four different systems (System 1, System 2, System 3, and System 4), the following entries are necessary:

NOTE

In this example, System 4 is server for all other systems, System 3 is client to System 4 and server for System 1 and System 2, System 2 is client to System 3 and System 4, and server for System 1. System 1 is client to all other systems.

System1 (Host name Host1):

[general]

distributed = 1

[dist]

distPeer = "Host2" 2 #Connect to Host2 (of System 2), system number 2

distPeer = "Host3" 3 #Connect to Host3 (of System 3), system number 3

distPeer = "Host4" 4 #Connect to Host4 (of System 4), system number 4

System2 (Host name Host2):

[general]

distributed = 1

[dist]

distPeer = "Host3" 3 #Connect to Host3 (of System 3), system number 3

distPeer = "Host4" 4 #Connect to Host4 (of System 4), system number 4

System3 (Host name Host3):

[general]

distributed = 1

[dist]

distPeer = "Host3" 3 #Connect to Host3 (of System 3), system number 3

System4 (Host name Host4):

[general]

distributed = 1

Alternatively (all four systems as server and client)

Alternatively, you can configure all four systems as server and client.
The advantage of this configuration is that the dist section of the
config file is the same on all systems. In this configuration all dists
try to establish the connection to the partner. This does not have any

effects in practice
In this case the config file of all 4 systems could look like the
following:

[general]

distributed = 1

[dist]

distPeer = "Host1" 1 #Connect to Host1 (of System 1), system number 1

distPeer = "Host2" 2 #Connect to Host2 (of System 2), system number 2

distPeer = "Host3" 3 #Connect to Host3 (of System 3), system number 3

distPeer = "Host4" 4 #Connect to Host4 (of System 4), system number 4

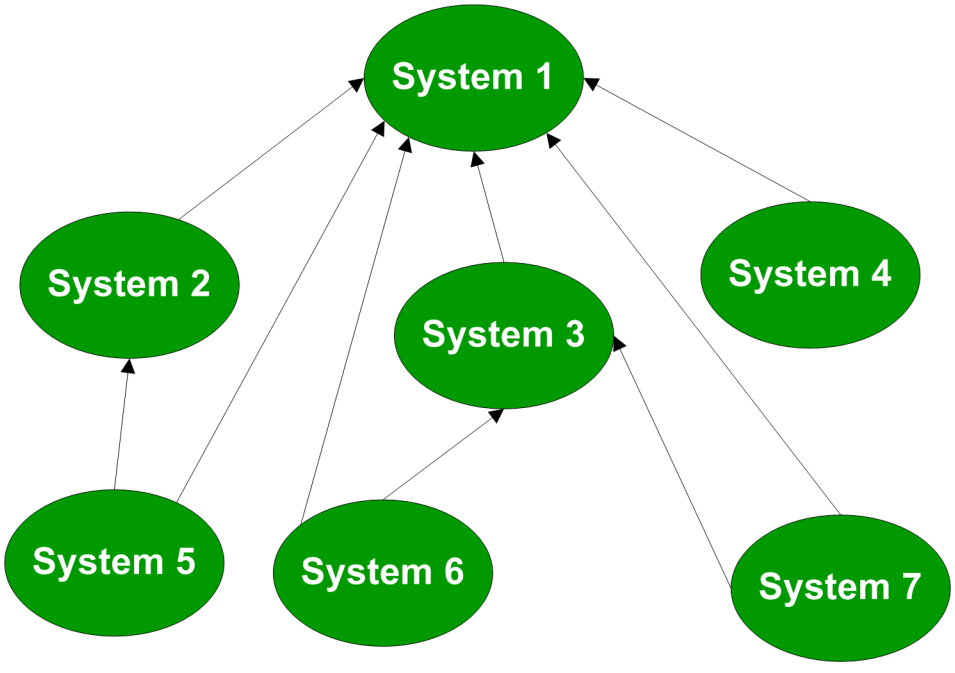
#The entry specifying that a dist tries to connect itself (for example, **distPeer = "Host1" 1 on #the computer 1**) is ignored.

Example 3

Consider a distributed system containing 7 different systems arranged in a hierarchical structure.

All systems are connected to System 1, System 5 is connected to System 2, and Systems 6 and 7 are connected to System 3.

In a hierarchical structure, the best solution is that the top-level system is server for all other systems, the bottom-level systems are clients to all other systems and the medium-level systems are servers for all systems below and clients to all system above. This has two advantages: you need less config entries, and if you add lower-level systems, you do not have to change the config file of the higher-level systems (and therefore, you do not have to restart the higher-level systems).



[sc_7DistributedSystems, 1, en_US]

Figure 8-25 Distributed System Consisting of Seven Systems

System 1 (Host name Host1):

[general]

distributed = 1

System 1 does not need any distPeer entry since it is a server.

System 2 (Host name Host2):

[general]

distributed = 1

[dist]

distPeer = "Host1" 1 #Connect to Host1 (of System 1), system number 1

System 3 (Host name Host3):

[general]

distributed = 1

[dist]

distPeer = "Host1" 1 #Connect to Host1 (of System 1), system number 1

System 4 (Host name Host4):

[general]

distributed = 1

[dist]

distPeer = "Host1" 1 #Connect to Host1 (of System 1), system number 1

System 5 (Host name Host5):

[general]

distributed = 1

[dist]

distPeer = "Host1" 1 #Connect to Host1 (of System 1), system number 1

distPeer = "Host2" 2 #Connect to Host2 (of System 2), system number 2

System6 (Host name Host6):

[general]

distributed = 1

[dist]

distPeer = "Host1" 1 #Connect to Host1 (of System 1), system number 1

distPeer = "Host3" 3 #Connect to Host3 (of System 3), system number 3

System7 (Host name Host7):

[general]

distributed = 1

[dist]

distPeer = "Host1" 1 #Connect to Host1 (of System 1), system number 1

distPeer = "Host3" 3 #Connect to Host3 (of System 3), system number 3

NOTE

Use WCCOAtoolSyncTypes to change the system number and name.
Use the following command to start and stop the project using PVSStoolSyncTypes:

WCCOAtoolSyncTypes -system 3 newSysName -proj "Demo_3.5"

As shown above, specify first the system number and then the system name.
In CONTROL, use the functions getSystemName() and getSystemId() to query the system number and name:

```
main()

{

int sysId;

string sysNam;

sysNam = getSystemName();

DebugN("NAME IS:",sysNam);

sysId=getSystemId(sysId);

DebugN("ID IS:",sysId);

}
```

8.10.7 Summary

Distributed systems in powermanager enable you to connect two or more autonomous powermanager systems via a network. You can configure each subsystem of a distributed system as single-station system or multiple-station system, in each case redundant or non-redundant. A subsystem is a server on which an Event manager is running (not necessarily a complete project). In a redundant system, both redundant running servers are considered as one system.

Each system can process and display data (values and alerts) of other systems. You can also access online values, alerts, and history of each system using distributed systems in powermanager. When you access remote DPEs, the datapoints of the subsystems are not copied to the local system. Therefore, the datapoints are not multiplied and you can only access the system when a connection to this specific system exists.

8.11 Archive Settings

The archive configuration is modified in powermanager V3.5.

Configurations for New Projects and Projects Updated from Previous Versions

The following tables show the recommended configurations for each archive manager for the projects updated from the previous versions of powermanager and new projects considering the number of devices in the system.

Table 8-4 Recommended Archive Configurations for 100 Devices

Archive	Name	100 Devices (Default)						
		DP Elements	DP Number	Frequency	Change	Free Entries	Deletion	Compression Time Offset
1	Instantaneous Values 1	3800	5000	24x	daily	10	2400	720
2	Instantaneous Values 2	4600	5000	24x	daily	10	2400	300
3	Power Demand Consumption Values	5000	4000	1x	weekly	720	260	300
4	Commands	2600	500	1x	monthly	10	12	300
5	Binary Status	500	500	1x	monthly	10	12	300
6	Energy Consumption Values	22 000	800	1x	monthly	10	60	3600
7	Instantaneous Values 3	4500	5000	24x	daily	10	2400	1800
8	Instantaneous Values 4	5000	5000	24x	daily	10	2400	300
9	Manual Measuring Values	500	3000	1x	monthly	10	60	3600
	Polling rate for Instantaneous values	1 s						
	Polling rate for Energy values	10 s						
	Driver Smoothing	Disabled						

Table 8-5 Recommended Archive Configurations for 200 Devices

Archive	Name	200 Devices						
		DP Elements	DP Number	Frequency	Change	Free Entries	Deletion	Compression Time Offset
1	Instantaneous Values 1	7600	2500	24x	daily	10	2400	720
2	Instantaneous Values 2	9200	2500	24x	daily	10	2400	300
3	Power Demand Consumption Values	10 000	4000	1x	daily	120	2000	300
4	Commands	5200	500	1x	monthly	10	12	300
5	Binary Status	1000	500	1x	monthly	10	12	300

Archive	Name	200 Devices						
		DP Elements	DP Number	Frequency	Change	Free Entries	Deletion	Compression Time Offset
6	Energy Consumption Values	42 000	800	1x	monthly	10	60	3600
7	Instantaneous Values 3	9000	2500	24x	daily	10	2400	1800
8	Instantaneous Values 4	10 000	2500	24x	daily	10	2400	300
9	Manual Measuring Values	1000	3000	1x	monthly	10	60	3600
	Polling rate for Instantaneous values	2 s						
	Polling rate for Energy values	10 s						
	Driver Smoothing	Disabled						

Table 8-6 Recommended Archive Configurations for 500 Devices

Archive	Name	500 Devices						
		DP Elements	DP Number	Frequency	Change	Free Entries	Deletion	Compression Time Offset
1	Instantaneous Values 1	19 000	1000	24x	daily	10	2400	720
2	Instantaneous Values 2	23 000	1000	24x	daily	10	2400	300
3	Power Demand Consumption Values	22 000	2000	1x	daily	120	2000	300
4	Commands	13 000	500	1x	monthly	10	12	300
5	Binary Status	2500	500	1x	monthly	10	12	300
6	Energy Consumption Values	35 000	800	1x	monthly	10	60	3600
7	Instantaneous Values 3	22 500	1000	24x	daily	10	2400	1800
8	Instantaneous Values 4	25 000	1000	24x	daily	10	2400	300

Archive	Name	500 Devices						
		DP Elements	DP Number	Frequency	Change	Free Entries	Deletion	Compression Time Offset
9	Manual Measuring Values	2500	3000	1x	monthly	10	60	3600
	Polling rate for Instantaneous values	5 s						
	Polling rate for Energy values	20 s						
	Driver Smoothing	Enabled	1 %					

Table 8-7 Recommended Archive Configurations for 1000 Devices

Archive	Name	1000 Devices						
		DP Elements	DP Number	Frequency	Change	Free Entries	Deletion	Compression Time Offset
1	Instantaneous Values 1	38 000	500	24x	daily	10	2400	720
2	Instantaneous Values 2	46 000	500	24x	daily	10	2400	300
3	Power Demand Consumption Values	45 000	950	1x	daily	120	2000	300
4	Commands	26 000	500	1x	monthly	10	12	300
5	Binary Status	5000	500	1x	monthly	10	12	300
6	Energy Consumption Values	45 000	800	1x	monthly	10	60	3600
7	Instantaneous Values 3	45 000	500	24x	daily	10	2400	1800
8	Instantaneous Values 4	50 000	500	24x	daily	10	2400	300
9	Manual Measuring Values	5000	3000	1x	monthly	10	60	3600

Archive	Name	1000 Devices						
		DP Elements	DP Number	Frequency	Change	Free Entries	Deletion	Compression Time Offset
	Polling rate for Instantaneous values	10 s						
	Polling rate for Energy values	20 s						
	Driver Smoothing	Enabled	1 %					

Additionally, the following conditions apply to projects that are updated from previous versions:

- If the number of devices in the project ≤ 200
  - The archive configurations of the existing devices are unchanged.
  - A predefined set of datapoints for each device is archived for new devices.
- If the number of devices in the project > 200
  A predefined set of datapoints for each device is archived for existing and new devices.

The following table contains the list of the predefined datapoints that are archived:

Table 8-8 Predefined Datapoints

Main Group	Subgroup	Element Name
PAC1200 - Controller	Energy Values	Active energy import tariff1
PAC1200 - Sensors	Energy Values	Active energy import
PAC1500	Energy Values	Collective active energy import tariff1
PAC2200	Power Interval	cumulated_active_power_import_EM
	Energy Values	active_energy_import_tariff_1
PAC3100	Power Interval	cumulated_active_power_import_EM
	Energy Values	active_energy_import_tariff_1
PAC3200	Power Interval	cumulated active power import
	Energy Values	active energy import tariff 1
PAC3200T	Power Interval	cumulated_active_power_import_EM
	Energy Values	active_energy_import_tariff_1
PAC4200	Energy	active_energy_import_tariff_1
	Power Interval	cumulated active power import
	Power Interval	information_flag_bytes_act_period
	Power Interval	real_load_profile_period_length_act_period
	Power Interval	real_load_profile_subinterval_length_act_period
	Power Interval	OID_act_period_unique_period_entry_identification_index
PAC5200; PAC 5100; P850; P855	Power Interval	avg_collective_active_power_EM
	Energy Values	active_energy_import_tariff_1
SEM3 - Controller	Energy Values	Total system active energy
SEM3 - Sensors	Energy Values	Active energy import tariff1
	Energy Values	Total active power demand
3VA27; 3WL10	Energy Values	active_energy_import_tariff_1
3VAETU8	Power Interval	cumulated_active_power_import_act_period
	Energy Values	active_energy_import_tariff_1

Main Group	Subgroup	Element Name
3WL	Energy Values	active_energy_import
7KT1651	Energy Values	active_energy_import_tot
7KT1661	Energy Values	active_energy_import_tot
7KT1665	Energy Values	active_energy_import_tot
7KT1682	Energy Values	active_energy_import_tot
GMB	Power Interval	cumulated_active_power_import_EM
	Energy Values	active_energy_import_tariff_1

NOTE

The Energy and the Power Interval values are archived for each existing device. Siemens recommends reviewing the archive configuration after the upgrade to V3.5.

8.12 SENTRON MindApp

The device values recorded in powermanager can be transferred to SENTRON MindApp. For this, the SENTRON MindApp component of powermanager has a JSON import/export functionality. Initially, a request file containing the following is created from powermanager:

- Details of all the devices in the system
- Device types
- Topology information

The request JSON file is generated using the export JSON option.

The request JSON file exported can be viewed in the SENTRON MindApp. You can select the devices and the data to be transferred to SENTRON MindApp during the onboarding process. A response JSON file is then generated from SENTRON MindApp and this JSON file can then be imported back to powermanager.

Once the response JSON file is imported, the selected devices in the response JSON file are onboarded to the SENTRON MindApp and the data transmission from powermanager to SENTRON MindApp is initiated. The data transmission occurs based on the intervals specified in the response JSON file.

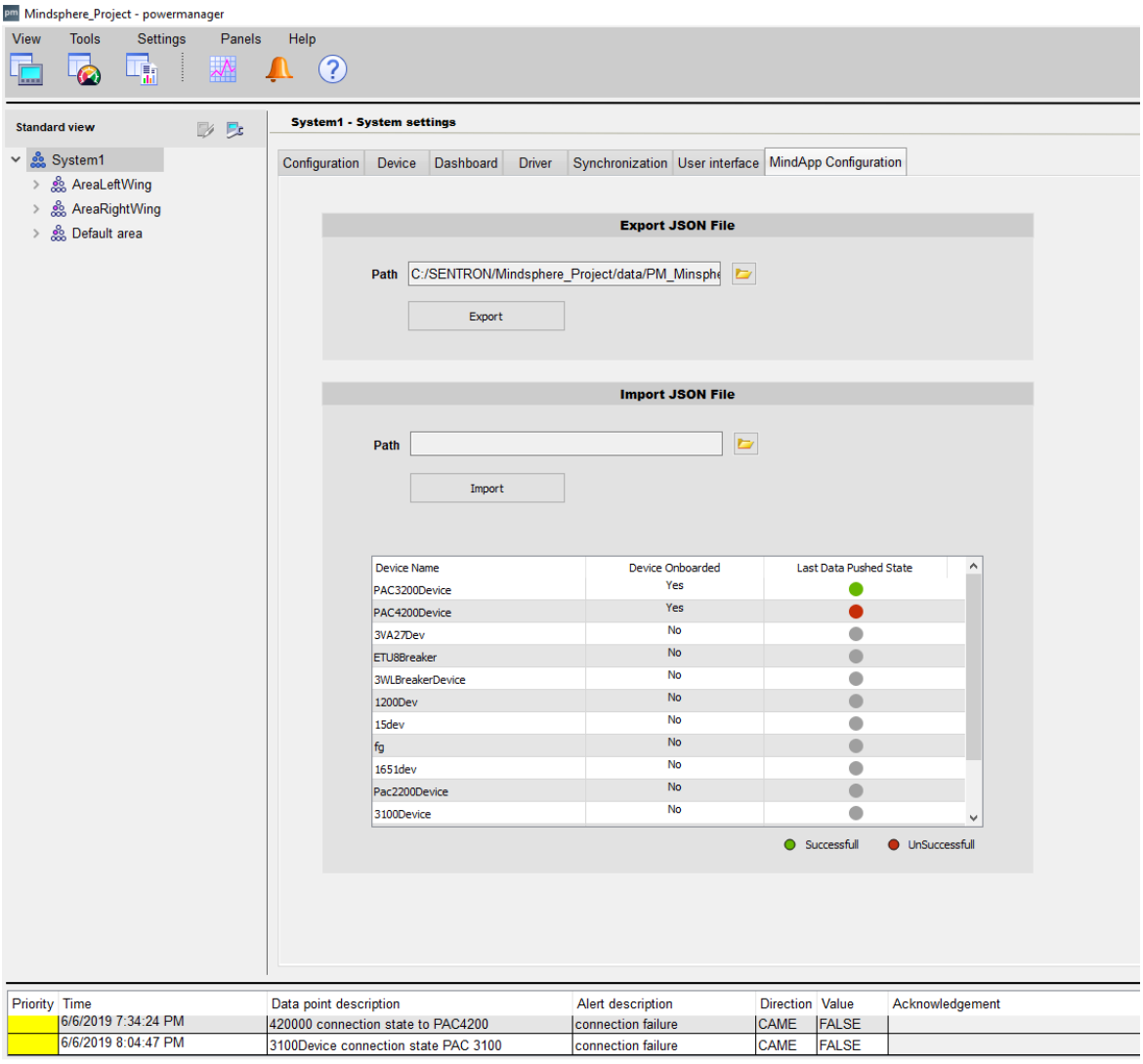
Configuring the SENTRON MindApp Functionality

To transfer the values to SENTRON MindApp, you must first export the request JSON file. To do this, proceed as follows:

✧ In the project tree view, right-click the project tree root.

✧ In the context menu, click **System settings**.
The **System settings** page opens.

✧ Click the **MindApp Configuration** tab.



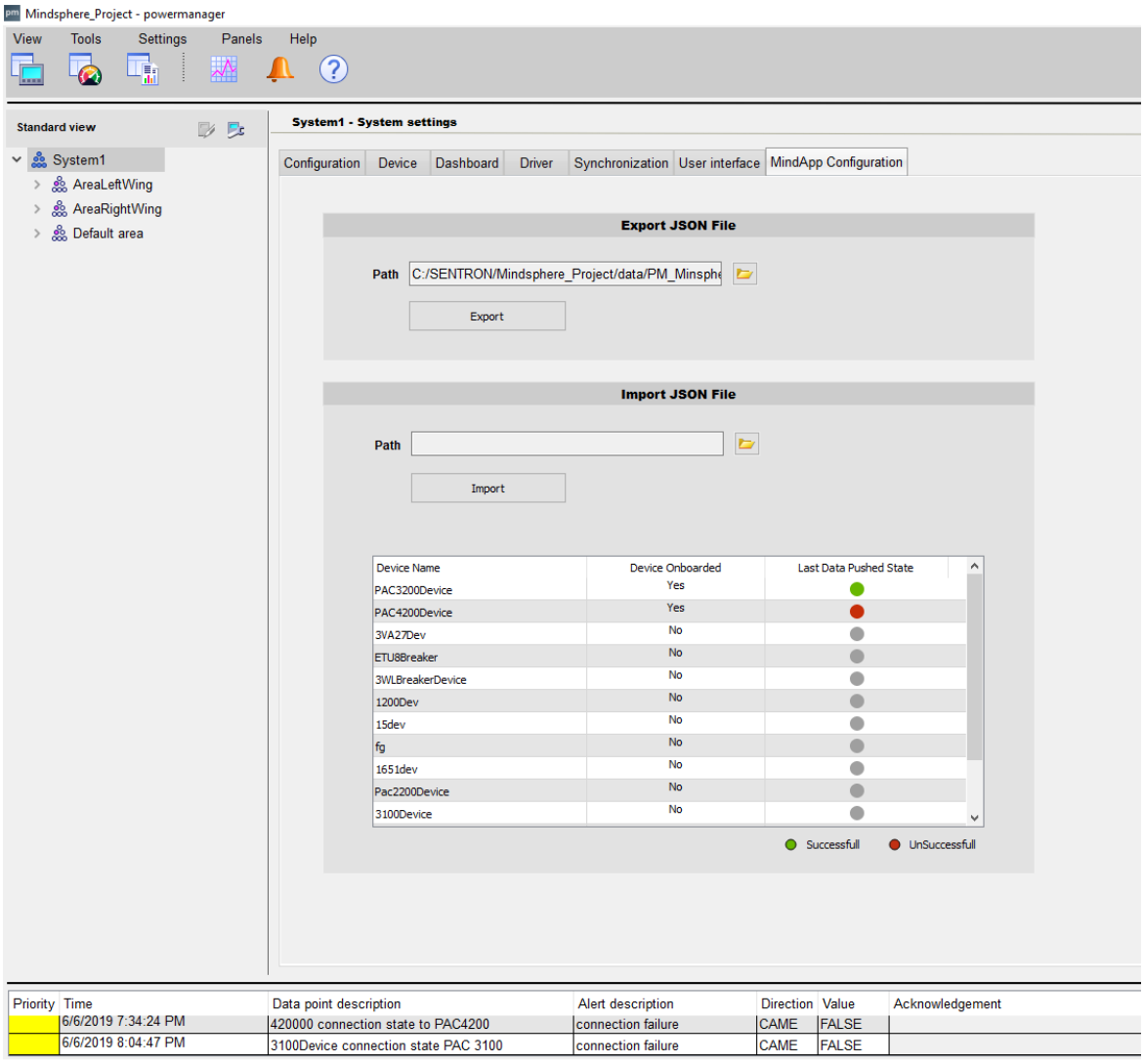
[sc_mindsphere, 1, en_US]

- ✧ Under **Export JSON File**, click **Export**.
- ✧ Click **OK** in the **Information** pop-up window.

The request JSON file is created.

Import the Response JSON file to Complete the Process

- ✧ In the project tree view, right-click the project tree root.
- ✧ In the context menu, click **System settings**.
  The **System settings** page opens.
- ✧ Click the **MindApp Configuration** tab.



[sc_mindsphere, 1, en_US]

✧ Under **Import JSON File**, select the file to be imported and click **Import**.

✧ In the **Information** pop-up window, click **OK**.

The devices and their onboarding status and last transferred status are displayed in a table.

NOTE

If you try to import a JSON file after a successful import, the system displays a warning message. If you select to continue, the existing configuration will be lost.

9 Extended Help

9.1 Extended Help

For additional information on powermanager components such as Administration panel, Console panel, System management, click  in the Administration panel or the Console panel.