

merbon

SCADA

User guide - simple

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1 Introduction

This user guide is a brief overview of Merbon SCADA functions. In several steps it describes the basic functionality for new users who intend to operate the system. Therefore this document is focused mainly on orientation in the environment and on basic user settings. The authors believe that the manual will be a useful guide for the first steps in the Merbon SCADA software.

1.1 Merbon SCADA

Merbon SCADA is used as a networked supervisory software using data communication networks as well as local communication buses. The system uses state-of-the-art technologies and communication standards, but also incorporates many proven standard technologies. The system modularity makes possible to create supervisory systems in different scales, from the simplest process visualisations to large integrated systems. The impact is put on high reliability, fast engineering and simple setup even for inexperienced users.

1.1.1 What is Merbon SCADA designed for

The SCADA software provides visualisation and easy control of data from different technologies (room sensors, heating controllers, operation and status indicators, etc.).

Merbon SCADA displays these data as technology schemas, where real-time values of all peripherals and important variables can be monitored, and records the data in a history database. The history data provide trend displays of values such as temperatures, which helps to diagnose problems and optimize the system (fine tuning). This is done by setting of critical parameters, which maximizes sensitivity to alarms while maintaining comfort conditions. It is also possible to control aggregates and plants from the graphics, change setpoints, set time schedules etc., according to the user-defined graphic pages and populating the pages with technology values and parameters. A very important function is also alarm messaging, optionally using alarm pop-up windows and voice messages over the sound card of the PC.

2 Login and logout

Merbon SCADA is accessed using a web browser. Enter the URL of Merbon SCADA server into the browser address bar. This page displays the login screen:

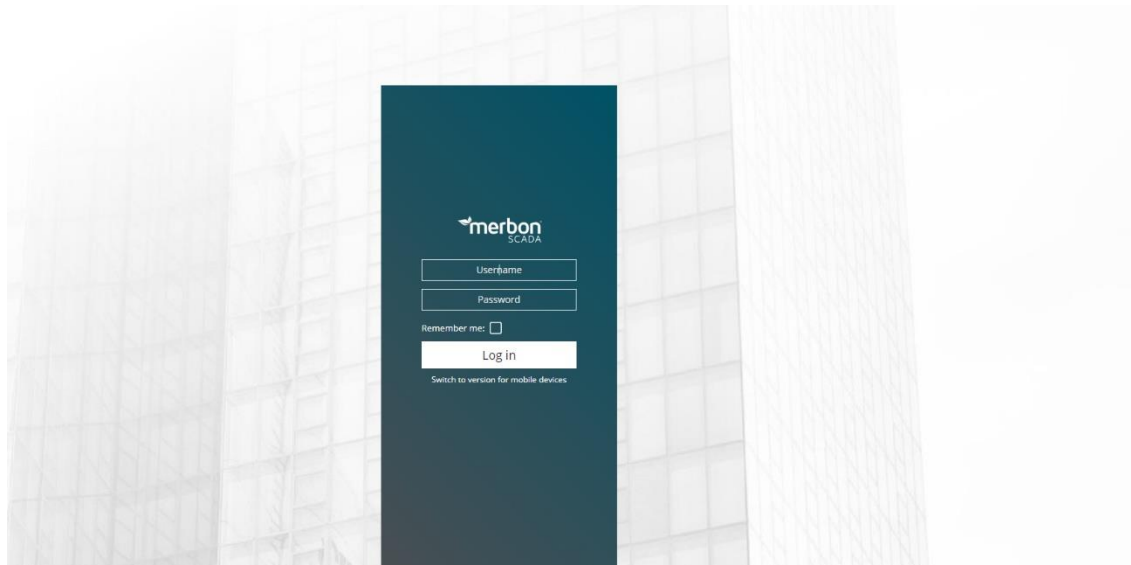


Fig.: Merbon SCADA Login


Enter the user name and password and click the *Login* button. User name and password are defined by system administrators, who are mostly engineers of the supplier. The functionality described below may be limited for particular user based on their user rights.

„*Permanent login*“ saves the login data for the current browser instance (which is the opened tab or window).

After successful login, the main screen is displayed:



Fig.: Main screen

To log out, click the logout icon in the upper right corner .

3 Projects


After the first login, select a project. Open the list of available projects by clicking the list icon  in the upper left corner. If there are more projects in the list, filter can be applied.



Fig. Filter

The filter searches according to project names. Another click opens the selected project. The project opens as a new tab in the upper bar. If there are more opened projects at the same time, they can be switched between using tabs. Close a project by clicking the cross icon next to the project name.

3.1 Selection of display

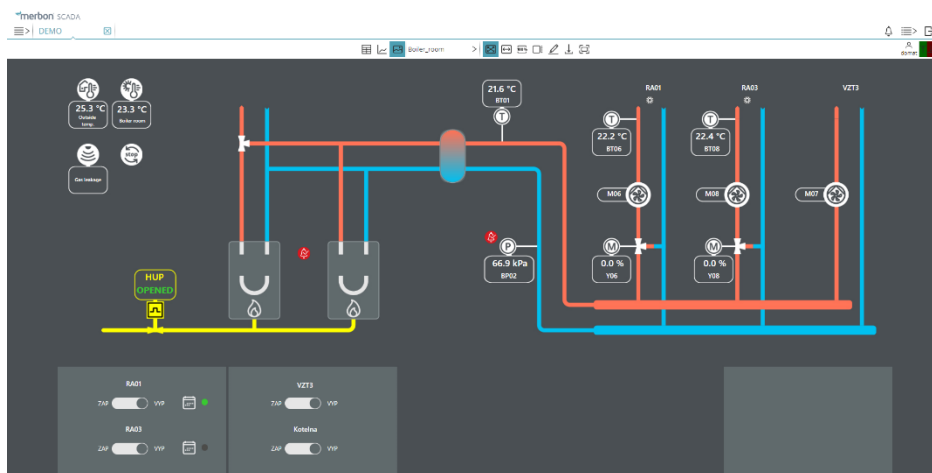





Fig. Selection of display

According to the user rights, it may be possible to display Table view, , Charts  or Schemas  for a project. The active display has a light blue background.

3.2 Schemas

A project contains one or more technology schemas. Select a schema from the list of schemas of a project:

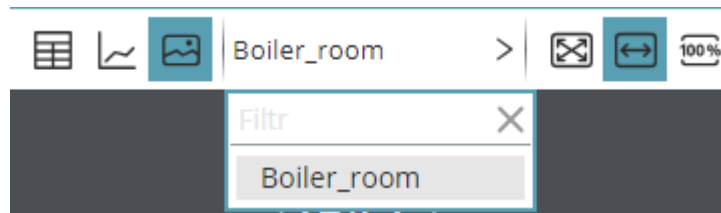





Fig. List of schemas

Based on how the schemas have been engineered, it may be possible to jump between schemas directly using reference buttons.

Schemas may be displayed in three modes: Schema size is adapted to the browser window size , Schema fits to window width , or Schema displays in its original size . The active option is undercoloured.

The value display fields may be tagged by holding the CTRL key and clicking the fields, or just by clicking a field and ticking the checkbox. The tagged fields are marked by a black dashed line, see below.

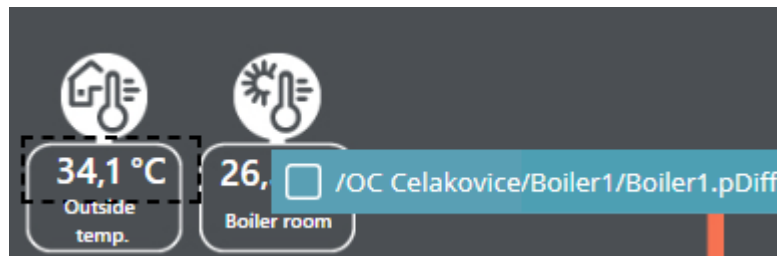





Fig. Selected data point

To unselect all fields, click the  button in the upper tab bar. Individual fields can also be unmarked in the same way as they were marked.

By clicking the  symbol in the upper bar, a text note in a schema can be entered. The note is then displayed as  and it can be unfolded by clicking. It can be moved to another place in the schema by dragging and dropping.

3.3 Charts

After values are selected in the schemas (see previous part), they can be displayed in a time-based chart. The recorded values are retrieved from trend files or

from a database. Click the  button to display the trend chart:

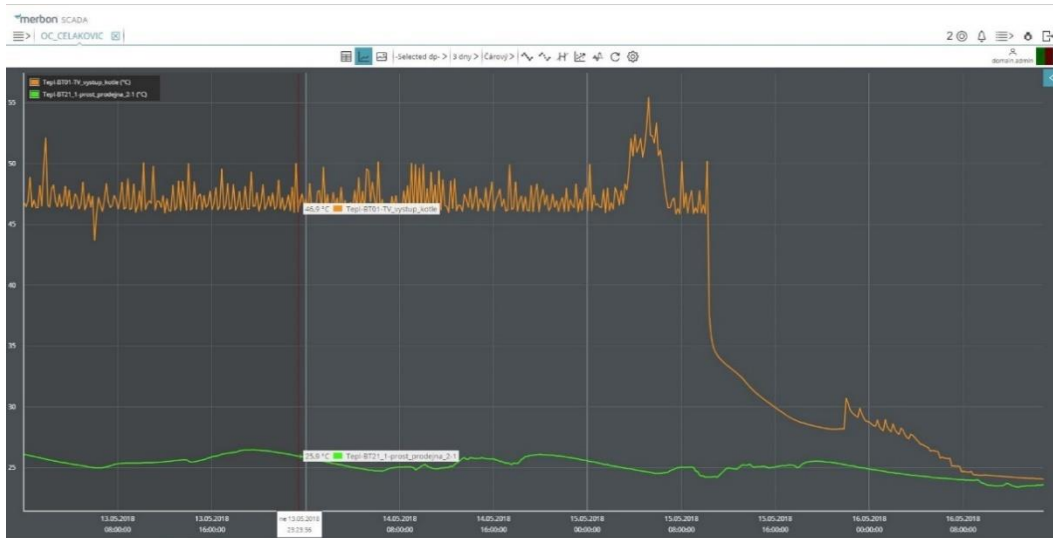


Fig. 1: Chart

The **-Selected dp- >** symbol indicates that the tagged data points are displayed in the trend. Apart from this, a predefined template can be selected from the list of templates. The templates must be edited at project engineering. The time span to display is selected by clicking the **1 minuta >** button. Select the required chart type by clicking the “Line” button.

Chart types

- **Line chart** – Classical chart with value plot over a certain time interval.
- **Carpet plot** – The X axis displays date, the Y axis displays time of day. The variable value is represented by the color of the field (see the scale below the chart). Note that a carpet plot can display a single variable only.
- **Modulo chart** – Draws the data point values repeatedly according to the selected time period. Select the time period by clicking the “Day” button. The values from all periods of the selected time range are displayed over a common X axis.
- **Differential line chart** – This type is basically just a graphical function that can be used to compare multiple datapoint series. It draws the

datapoints connected with lines and fills the space between with the color of the series that has higher value in the specific moment of time. E.g.: Fig. 17.

In the picture you can see area highlighted with red square. In that specific time interval the temperature of the series that is represented with the orange colour is higher. Graph function fills the space between series with orange colour so the user can see the comparison between datapoints selected by single glance.

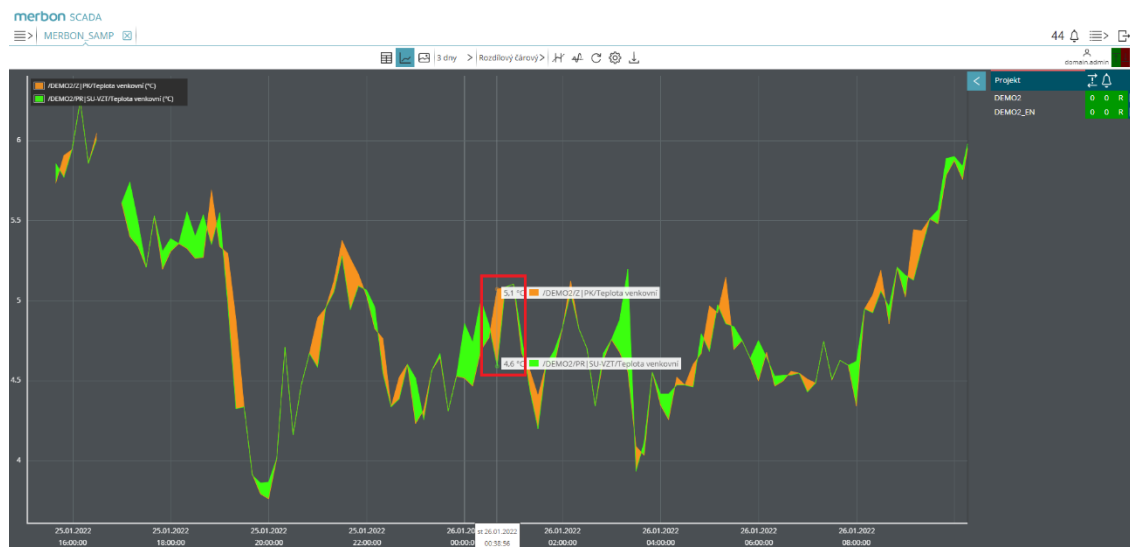






Fig. 2: Differential line chart




- **Bar graph** – The values are represented using columns of different height. Select the time period by clicking the “Day” button and the calculation mode by clicking the **Minimum** > button.

Calculation type:

- **Sum** – shows sum of the values in the selected time period
- **Average** – shows arithmetic mean of the values in the selected time period
- **Minimum** – shows the lowest value from the selected time period
- **Maximum** – shows the highest value from the selected time period
- **Difference** – shows the difference between values of the selected time interval. E.g.: If you select “Day”, graph will show you how much the value changed compared to the day before.

- **Difference increasing** - similar function as “Difference”
 - it calculates the difference between values in the chronological order. When the value of the difference is positive it sums all these differences and shows the result in the graph. Negative differences are ignored. It has its greatest use when we expect specific value **to grow only** (decrease of the value is considered as an error or invalid value).
 - **E.g.:** If the measured value is a meter registration and the electricity meter is replaced, standard difference would return negative value for electric consumption. However, from the point of view of measuring monthly consumption, this is an undesirable phenomenon. The Difference increasing function solves this problem in the described case so that the result will not be a negative value but a real increase in consumption measured by both the original and the new electricity meter.

If the measured values must be displayed rather than the connecting lines only, click the  symbol. To cut the loaded data from the server to the current view only, click . If there are data with different ranges displayed in the same chart, it may be useful to set the optimized display , which recalculates the measured values and correlations among the variables can be found better. If the trend view shall be updated in real time, click the  symbol and the trend will be displayed as an oscilloscope view. The symbols shown above are active when displayed as under-colored.

A one-time update of trend values can be invoked by the  button. Use the  button for extended trend plot settings. Use the symbol  to display the export dialog, in which you can export data or export the graph to PNG.

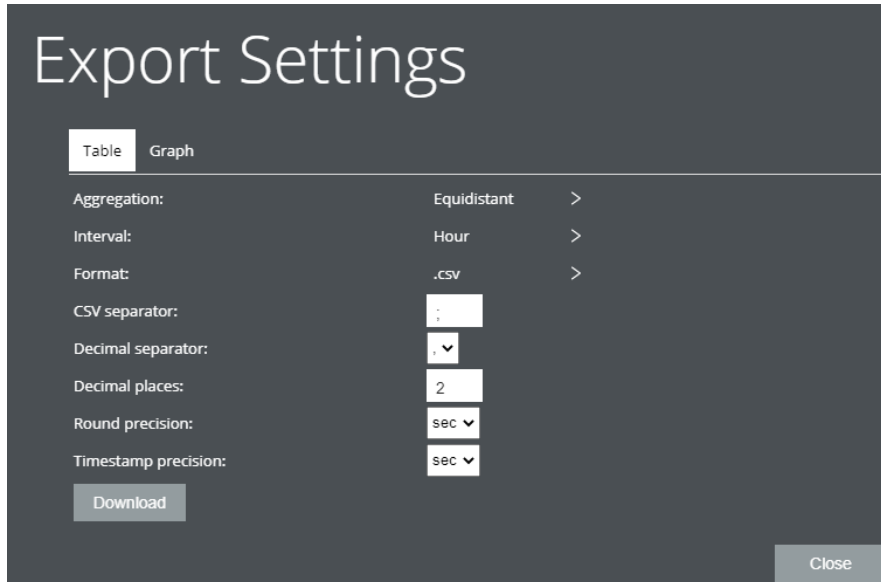


Fig. 3: Export dialog

Two export types can be selected in the export settings:

- Equidistant - Here the user can select the data sampling interval and the export will have an assigned value for each interval given.
- Accurate – With this option selected the export file will consists of values and timestamps in raw form. Just like they were saved in the file or database.

Two file format types can be selected in the export settings:

- .csv - Here the user chooses any column separator (e.g. semicolon) and a decimal separator (comma or dot). This setting is important for the subsequent display of data in MS Excel.
- .xlsx - Data will be exported to a standard MS Excel file.

In a plotted trend view, all data points can be hidden and enabled. Click the data point description to hide / display its trend line.

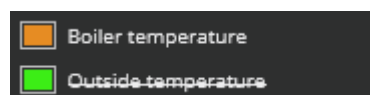











Fig. 4: Data point descriptions

Click the  symbol in the upper right corner of the trend to display the extended functions menu.

Set different data descriptions by clicking the buttons     - *No legend, Short legend, Complete legend and Hide description*. The active setting is under-colored.




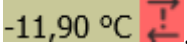
To zoom or un-zoom the view, use buttons  and . The required area also can be zoomed by dragging the mouse cursor over the area of interest. Click the   buttons to move the X (time) axis.

4 System


System informations are displayed in the upper right corner of the SCADA window.





Fig. System information

The logged-in user name is displayed below the person icon:  domain.admin. The communication indicator  shows data communicated to/from the Merbon SCADA server. The values should be up-to-date, otherwise the symbol  goes active. A communication error between a particular device and process station (PLC data are of bad quality, but are communicated to SCADA) is indicated by orange arrows with exclamation mark in the schema: .

If the communication dropout lasts for longer than about 10 minutes, check the connectivity to PLC with your network administrator.

The  icon gives number of tagged data points across all schemas. Click it to list all tagged datapoints.

The alarm symbol  gives number of active unacknowledged alarms. Click it to list all active unacknowledged alarms.

The basic user settings can be changed in the Settings menu: 

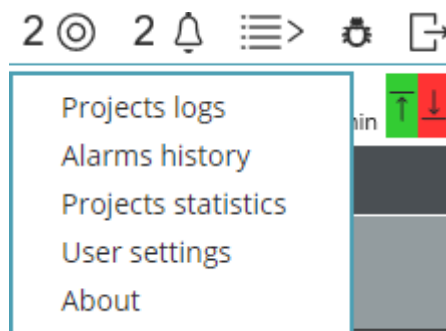


Fig.: Menu

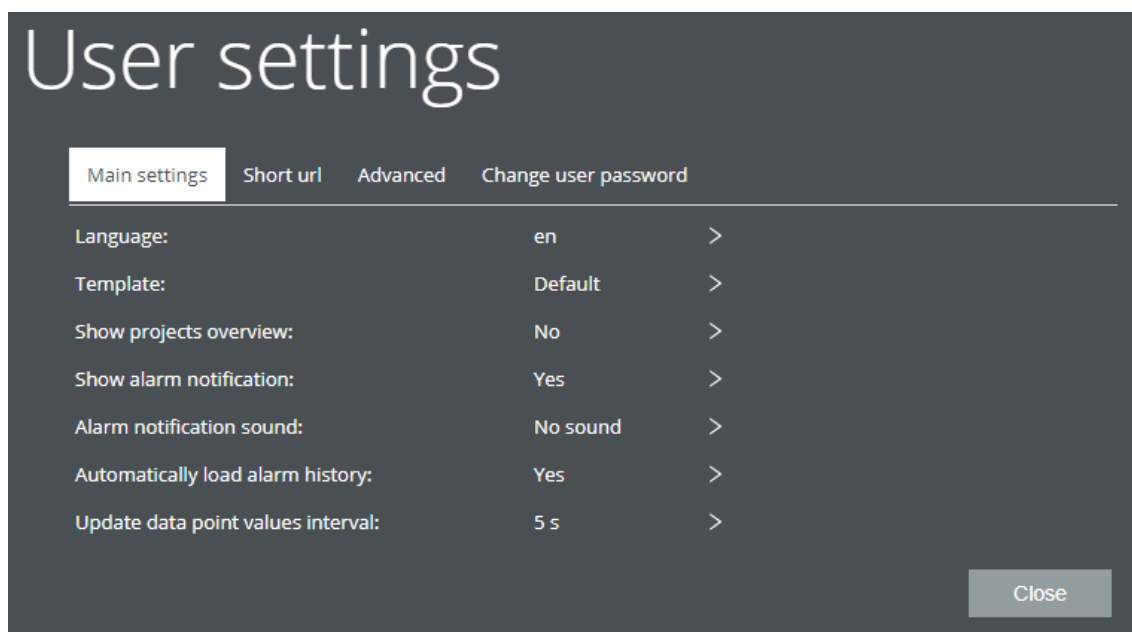


Fig. User settings

It is not necessary to change any settings in default settings here. These function are optional and users are fully responsible for changes they make here.