

SCADA

Software - User manual

no. documentation: 212 04-100-02

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Document version:

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Date of creation:

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1. Introduction

1.1. General information

1.2. Principle of system operation

2. SW for monitoring of physical quantities

2.1. Installation of client application

- 1) Start the *cis-client-v##-setup.exe* installer
- 2) Follow the installer instructions

2.2. Start-up and configuration of client

- 1) After initial start, it is necessary to set the client address and server port to be connected to. (Fig. 1).



Figure 1: Configuration of the client after initial start

- 2) The client will try to establish connection with the server entered (Fig. 2). If searching for the server takes a long time (more than 1-2 minutes), it is either unavailable or running under a different IP address or port (*standard port is 11321*). To change the settings, you can press **Cancel** and check or change the client settings.
- 3) After successful finding of the server, the client downloads the necessary files and opens the login window.



Figure 2: After starting, the client is trying to find the server

2.3. Login

After launching the software, the Login screen is opened to login and start the software. User name and password options are used to login. For more comfortable login, you can use "Remember username" or possibly "Login automatically" options. The first option fills in the user name, the second one executes automatic login. We recommend to use this option only in the case that there is no risk of unauthorised intervention in the system by an incompetent user.

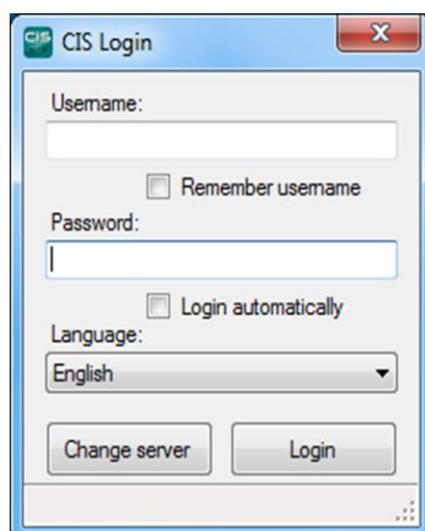


Figure 3: Login

Use the "Change server" button to manually set the connection to the server (Fig. Chyba: zdroj odkazu nenalezen).

2.4. Program main window

The main window is displayed after logging in. Main program functions are contained in the main menu. Some of the items in the menu are only shown if the user has authorisation to them

2.4.1. File menu

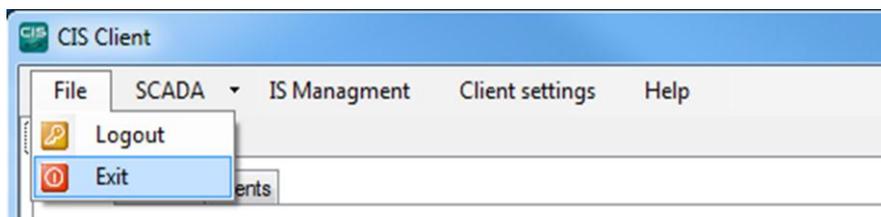


Figure 4: Main menu - File

- Ⓢ **Logout** – the client application is logged out and a dialogue for subsequent login is shown
- Ⓢ **Exit** – the application is terminated.

2.4.2. IS management menu

- Ⓢ **IS Users management** – enables the management of user groups, individual users and their rights in the system.
- Ⓢ **Server log** – the current server log is displayed in a new window.
- Ⓢ **Server Management** – contains server characteristics settings.

2.4.3. Client settings menu

- Ⓢ **CSV export** – sets basic characteristics of CSV export.
- Ⓢ **Client ends with window close** – the client operation is terminated with window closing. If this option is deactivated, the client is minimized to system tray with the window close.
- Ⓢ **Show balloons in system tray** – enables/disables the representation of messages in system tray.

2.5. Grid component module

The application contains a universal grid component by which means the majority of reports provided by the system. This component also contains the functions to export and print these reports.

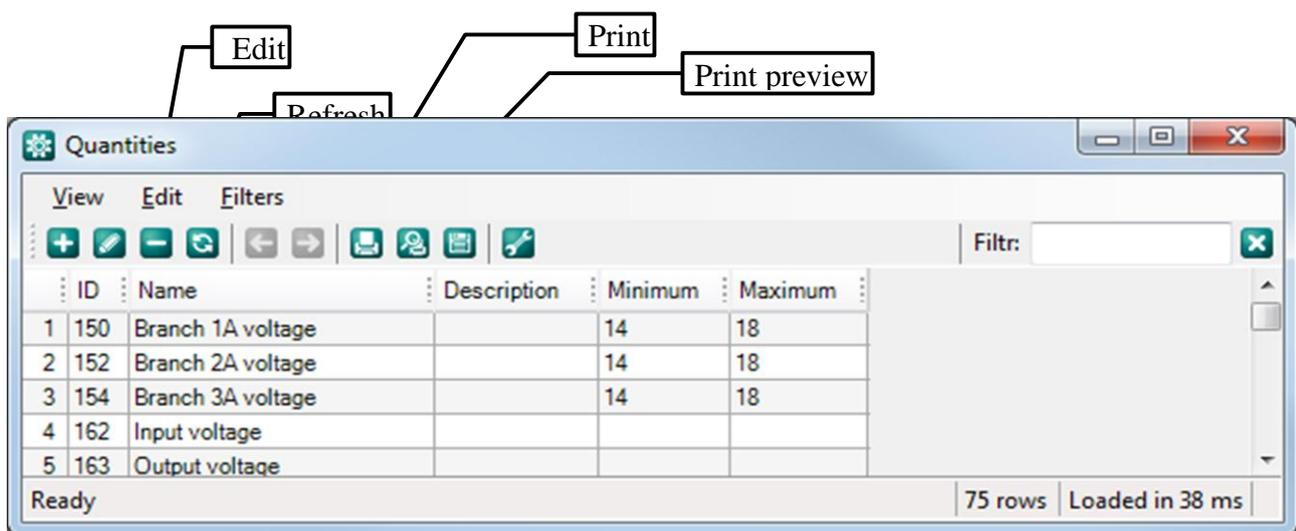


Figure 5: Basic grid component - description of controls

2.5.1. Grid arrangement according to columns

Besides the functions of the buttons in the control panel, it is possible to use the option for arrangement according to individual columns. Carry out the re-arrangement by double left click on column header according to which the grid should be re-arranged. By another double click onto the same column, you change the direction of arrangement according to this column.

2.5.2. Filtering

In the top right corner of the grid component there is a field for filter activation. When entering a text in this field, all items containing the entered text are automatically filtered out and the grid shows only these items.

2.6. Desktop – tab system

The desktop is made up of the "tab" (or panels) system, which makes it possible to switch between individual functional blocks.

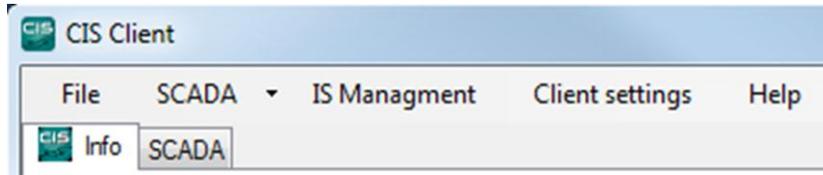


Figure 6: Desktop - panels

2.6.1. Info

This tab contains all basic information about the system such as software version, volume of transferred data between the client application and the server and also the list of all devices currently connected to the system. The devices in this list are displayed without any linkage to the system configuration.

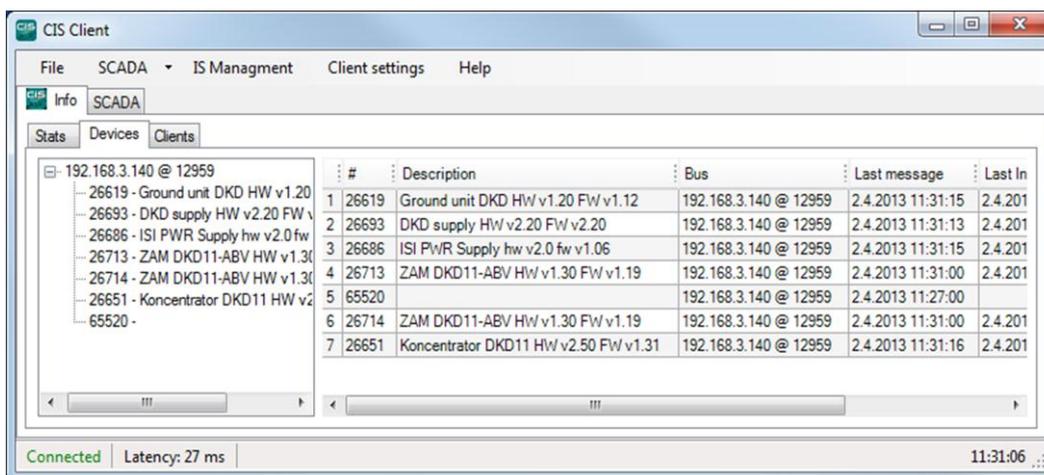


Figure 7: Info

tab

3. Scada module

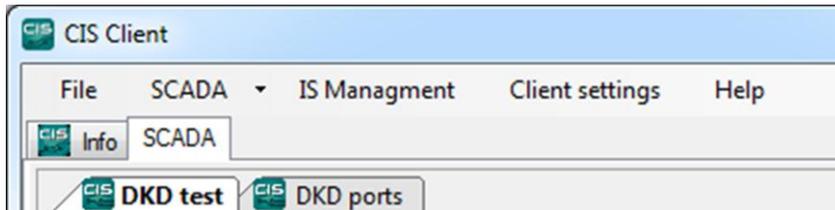


Figure 8: Desktop – Scada tab

3.1. Description of items in SCADA menu

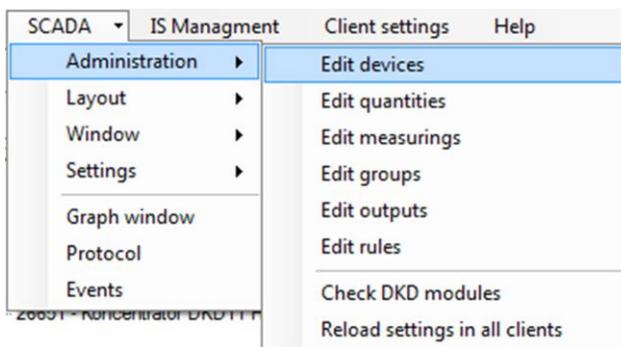


Figure 9: SCADA menu - Administration

- ⊗ **Administration** – contains items for administration of the entire system
 - ↘ **Edit devices** – administers physical devices in the system (DKD11 and ABV)
 - ↘ **Edit quantities** – administers physical quantities in the system (concentration, temperatures)
 - ↘ **Edit measurings** – administers measured quantities appearing in the system (real temperature measured on given device)
 - ↘ **Edit groups** – administers measurement groups
 - ↘ **Edit outputs** – administers types of outputs for individual devices
 - ↘ **Edit rules** – administers the settings for rules to switch outputs pursuant to values of given quantities
 - ↘ **Check DKD modules** – enables to record rules and limits in the DKD device
 - ↘ **Reload settings in all clients** – forces to load new settings in all clients.
- ⊗ **Layout** – contains items for creation of layout (grids, graphs, graphical window, etc.)
 - ↘ **Add Grid**– adds a window with a grid in the report



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- ↘Add Graph – adds a window with a graph in the report
- ↘Add Events – adds a list of recent events in the report
- ↘Add Outputs – adds a window with a grid containing outputs
- ↘**Add Plan** – adds a window for graphical preview in the report
- ↘**Save selected layout** – saves the existing layout for the selected group
- ↘**Save all** – saves the existing layout of reports in all groups

⑩ **Window**

- ↘**Restore Windows** – returns the report to the state saved last time

⑩ **Settings**

- ↘**Sound** – enables/disables audio notification of exceeding limits
- ↘**Hide Event notification** – hides the tool for representation of exceeded limits

⑩ **Graph window** – displays a graph window for viewing behaviours of measured values

⑩ **Protocol** – displays a window for printing a value measurement protocol

⑩ **Events** – displays a window for browsing induced events

3.2. Edit devices menu

Using the Edit devices menu item, you will get to the window with a summary of defined measuring devices, including set parameters.



	Name	Tag	Active	Comment	Parent name
1	7973	7973	Yes	Thermometer	
2	7991	7991	Yes	Thermometer	
3	DKD-Battery	26556	Yes		DKD-test
4	DKD-PowerSupply	26561	Yes		DKD-test
5	DKD-test	26632	Yes		

Ready | 5 rows | Loaded in 5 ms

Figure 10:

Summary of devices

3.2.1. Add device

To add a device, it is necessary fill in a name, you can select a tag, device type, parent device, validity flag or a comment.

New device

General:

Name: DKD-test

Tag: 26632

Device type: DKD11

Active: Yes

Parent name:

Comment:

Buttons: OK and next, OK, Cancel

Figure 11: Dialogue for

adding a device

Description of items

- **Name** – device name
- **Tag** – device serial number
- **Device type** – type of device to be added
- **Active** – validity record flag



- **Parent name** – selection of the device to which the element is connected
- **Description** – detailed description

3.2.2. Edit device

After clicking on the edit device icon, the Edit device dialogue is displayed. For description of items, refer to Add device.

After confirming by the OK button, new values are saved and the dialogue is closed.

3.2.3. Delete device

After clicking on the delete device icon, the system will display the confirmation dialogue and after its confirmation, the selected devices will be deleted.

3.3. Edit quantities menu

In order to display a measured value, it is necessary to define the measured value at first. The defined quantities window displays a list of defined quantities saved in the

Name	Description	ID	Minimum	Maximum
2 Input voltage		162		
3 Output voltage		163		
4 Branch 1A voltage		150		
5 Branch 1B voltage		151		
6 Branch 2A voltage		152		
7 Branch 2B voltage		153		
8 Branch 3A voltage		154		
9 Branch 3B voltage		155		
10 Branch 4A voltage		156		
11 Branch 5B voltage		157		

Ready | 47 rows | Loaded in 7 ms

Figure 12: Summary of quantities system.



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3.3.1. Add quantity definition

After clicking on the Add new definition icon, the following dialogue is displayed:



New quantity

General: ID: 0 Name: _____

Description: _____

Abbreviation: _____ Unit: _____ Data type: int 16

Data length: 0 Data multiplier: 0.000 Byte mask: _____

Cumulative: No Cumulative interval: _____

Minimum: _____ Maximum: _____

Critical maximum: _____ Enabled: No Color: ■

Warning maximum: _____ Enabled: No Color: ■

Warning minimum: _____ Enabled: No Color: ■

Critical minimum: _____ Enabled: No Color: ■

Save: Save interval: _____ Save threshold: _____ Data timeout: _____

Conversion: Coefficient A: _____ Coefficient B: _____ Formula: = A * n + B

Show: Format: _____ Name: _____ Unit: _____

Preview: 1.23

OK and next OK Cancel

Figure

13: Definition of quantity



Description of items

- ⑩ **ID** – internal quantity identifier (it is set up by the hardware manufacturer)
- ⑩ **Name** – quantity name
- ⑩ **Comment** – user's comment
- ⑩ **Abbreviation** – short name of the quantity
- ⑩ **Unit** – quantity unit
- ⑩ **Data type** – data type (set up by hardware manufacturer)
- ⑩ **Data length** – data length in bytes (set up by hardware manufacturer)
- ⑩ **Coefficient** – (set up by hardware manufacturer)
- ⑩ **Byte mask** – (state quantity mask) (set up by hardware manufacturer)
- ⑩ **Cumulative** – specifies whether the quantity is cumulative – i.e. the values are displayed as a sum of incoming partial values in a defined time interval
- ⑩ **Cumulative interval** – interval in which the cumulative quantity is summarized
- ⑩ **Minimum** – minimum value which the quantity may reach
- ⑩ **Maximum** – maximum value which the quantity may reach
- ⑩ **Enabled** – flag for validity of the appropriate limit value and colour
- ⑩ **Critical maximum** – maximum tolerated value, an alarm is immediately started when exceeded
- ⑩ **Warning maximum** – maximum value permissible for ordinary operation of the measuring device
- ⑩ **Warning minimum** – minimum value permissible for ordinary operation of the measuring device
- ⑩ **Critical minimum** – minimum tolerated value, an alarm is immediately started when exceeded
- ⑩ **Save interval** – specifies an interval after which the samples are saved in database
- ⑩ **Save threshold** – specifies a minimum value by which the measured value must differentiate so as to be saved
- ⑩ **Data timeout** – specifies an interval after which measuring sensor failure is announced
- ⑩ **Coefficient A** – constant by which the value must be multiplied before displaying
- ⑩ **Coefficient B** – constant which must be added to the value before displaying



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- ⑩ **Format** – way how the value is displayed
- ⑩ **Name** – name of the quantity displayed before the measured value
- ⑩ **Unit** – unit of the quantity displayed before the measured value
- ⑩ **Preview** – preview of set limits and display parameters

3.3.2. Edit quantity definition

After clicking on the edit quantity icon, the Edit quantity dialogue is displayed. For description of items, refer to Add quantity.

After confirming by the OK button, new values are saved and the dialogue is closed.

3.3.3. Delete quantity definition

After clicking on the delete quantity icon, the system will display the confirmation dialogue and after its confirmation, the selected definition will be deleted.

3.4. Edit measurings menu

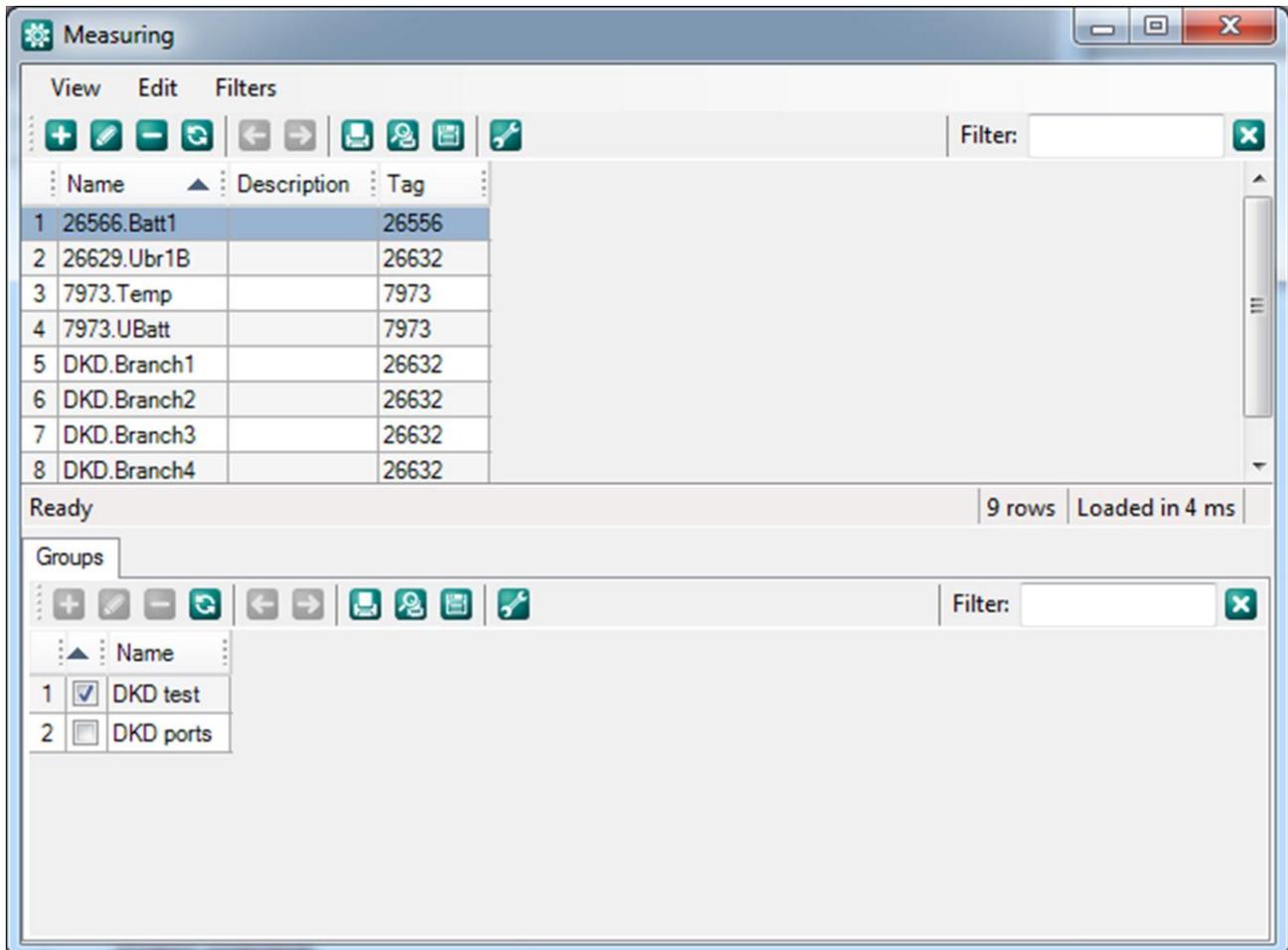


Figure 14: Summary of measuring places

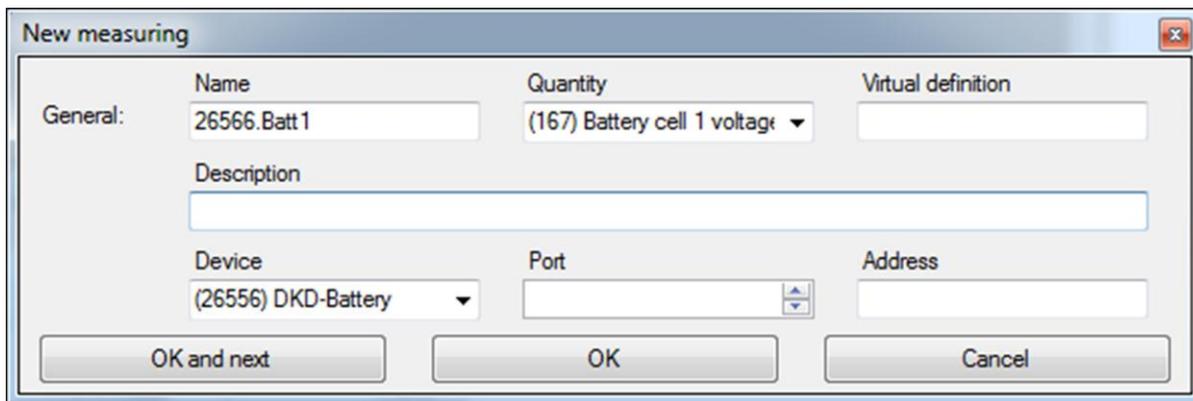
3.4.1. Add measuring place

After clicking on the add measuring place icon, the dialogue containing the following items will be displayed:

Description of items

- ⑩ **Name** – measuring place designation
- ⑩ **Quantity** – selection of a monitored quantity
- ⑩ **Description** – user's comment
- ⑩ **Device** – device transmitting measured values
- ⑩ **Port** – port to which the device is connected

- ⑩ **Address** – device IP address



Figure

15: Dialogue for adding a measuring place

After confirming by the OK button, new values are saved and the dialogue is closed.

3.4.2. Edit measuring place

After clicking on the edit measuring place icon, the dialogue containing the following items will be displayed: Contrary to the dialogue displayed while creating a new measuring place, it shows also the items inherited from the selected measured quantity whereas they can be re-defined after unchecking the appropriate check box.

Description of items

- ⑩ **Critical maximum** – maximum tolerated value, an alarm is immediately started when exceeded
- ⑩ **Warning maximum** – maximum value permissible for ordinary operation of the measuring device
- ⑩ **Warning minimum** – minimum value permissible for ordinary operation of the measuring device
- ⑩ **Critical minimum** – minimum tolerated value, an alarm is immediately started when exceeded
- ⑩ **Save interval** – specifies an interval after which the samples are saved in database
- ⑩ **Save threshold** – specifies a minimum value by which the measured value must differentiate so as to be saved
- ⑩ **Data timeout** – specifies an interval after which measuring sensor failure is announced
- ⑩ **Coefficient A** – constant by which the value must be multiplied before

displaying

- ⑩ **Coefficient B** – constant which must be added to the value before displaying
- ⑩ **Format** – way how the value is displayed
- ⑩ **Name** – name of the quantity displayed before the measured value
- ⑩ **Unit** – unit of the quantity displayed before the measured value
- ⑩ **Preview** – preview of set limits and display parameters

After confirming by the OK button, new values are saved and the dialogue is closed.

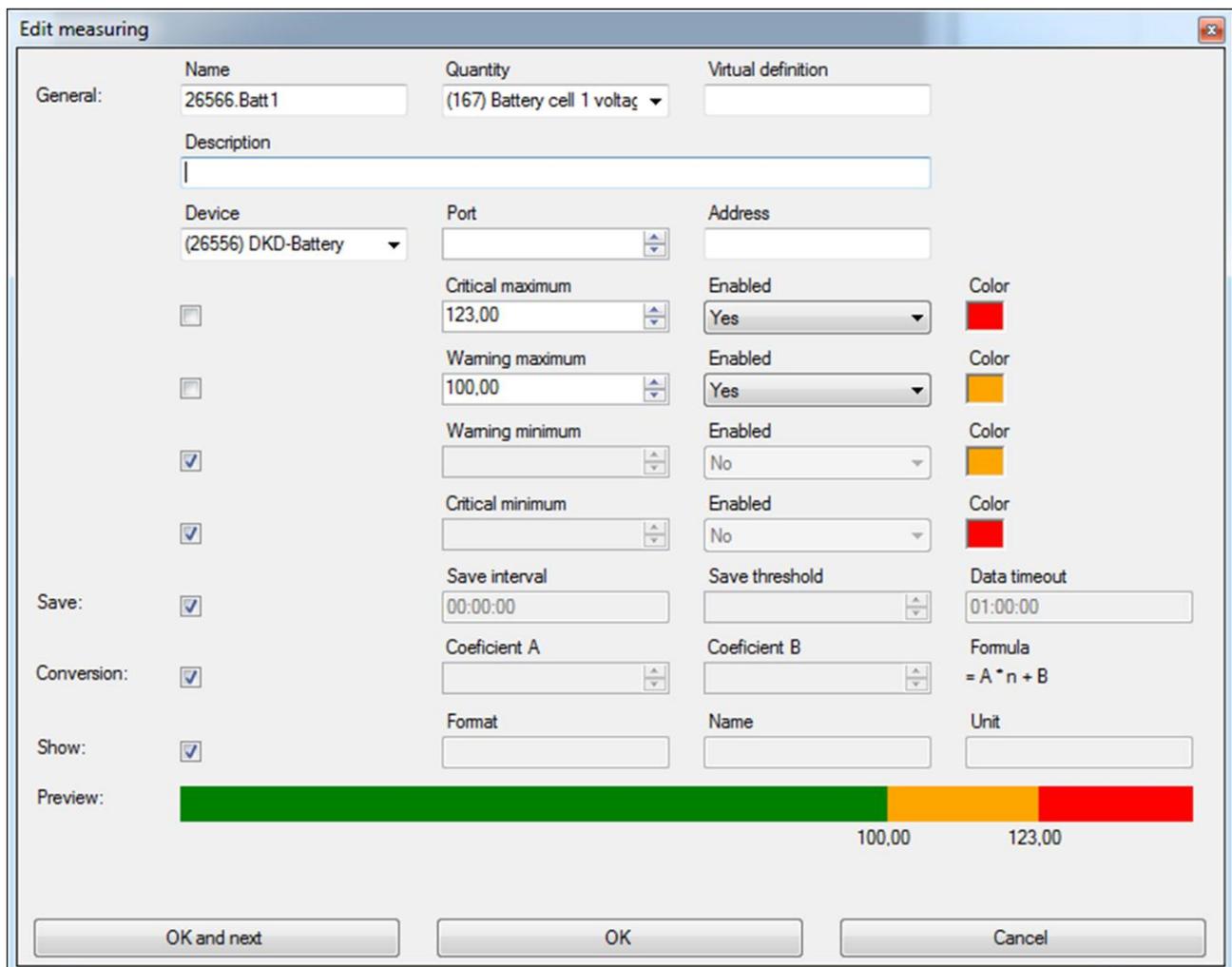


Figure 16: Dialogue for measuring place editing

3.4.3. Delete measuring place

After clicking on the delete icon, the system will display the confirmation dialogue and after its confirmation, the selected place will be deleted.

3.5. Edit groups menu

The measuring places can be joined together in groups that are displayed as tabs in the main window of the module.

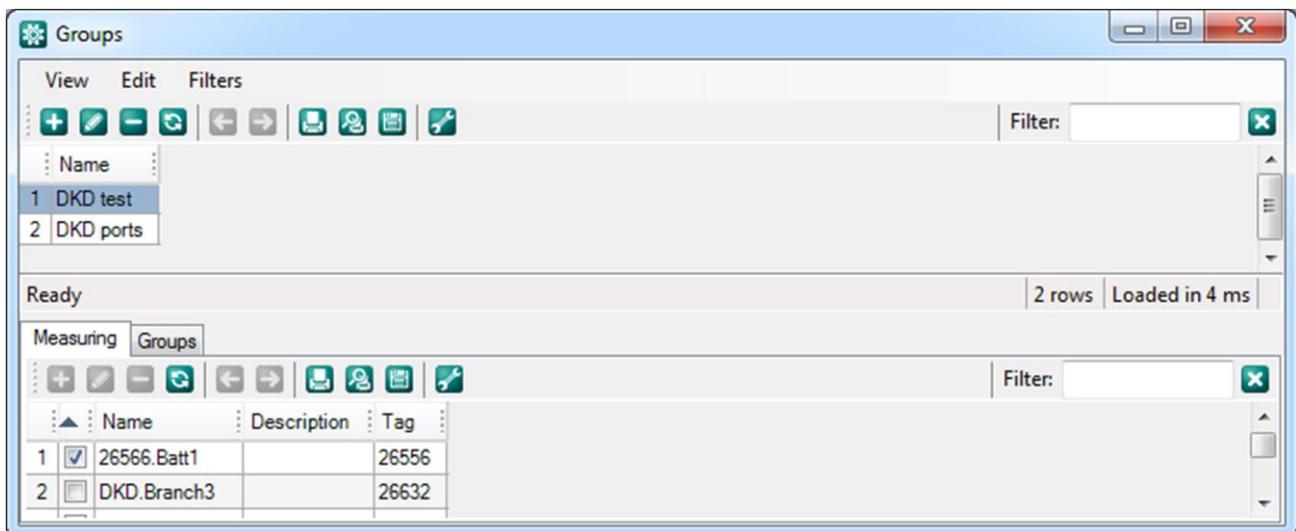


Figure 17: Summary of measurement groups

The window is divided into 2 parts; the upper part includes a list of measurement groups saved in the system, the lower part includes measuring places and by clicking on the check box next to the measuring place you can add or remove the given measuring place into the measurement group checked in the upper part of the form. The other tab contains a list of user groups by which means you can define which user groups will be allowed to view individual measurement groups.

3.5.1. Add measurement group

After clicking on the add measurement group icon, the Measurement group detail dialogue is displayed.

Description of items

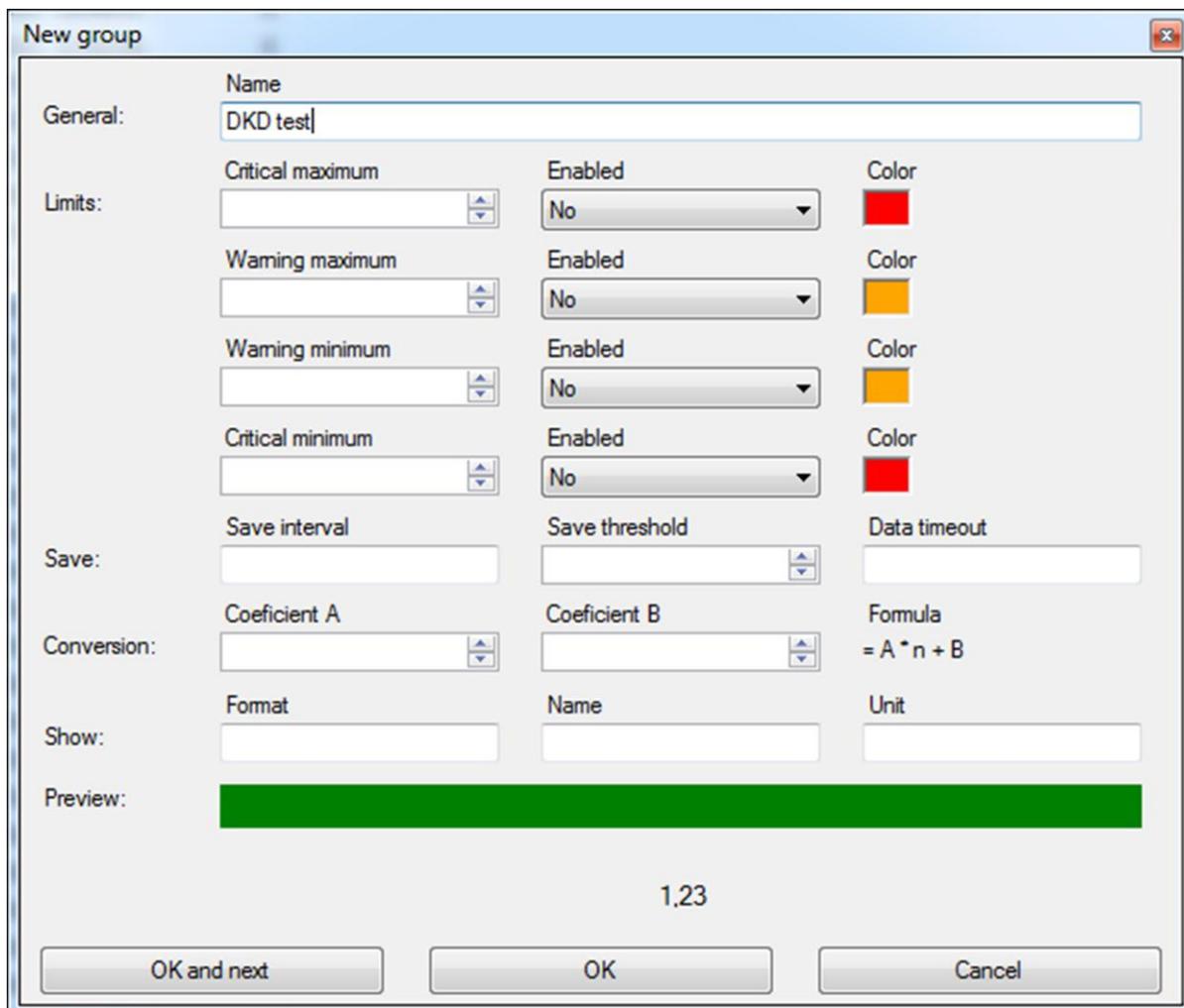
- Ⓜ **Name** – designation of group
- Ⓜ **Enabled** – flag for validity of the appropriate limit value and colour



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- ⑩ **Critical maximum** – maximum tolerated value, an alarm is immediately started when exceeded
- ⑩ **Warning maximum** – maximum value permissible for ordinary operation of the measuring device
- ⑩ **Warning minimum** – minimum value permissible for ordinary operation of the measuring device
- ⑩ **Critical minimum** – minimum tolerated value, an alarm is immediately started when exceeded
- ⑩ **Save interval** – specifies an interval after which the samples are saved in database
- ⑩ **Save threshold** – specifies a minimum value by which the measured value must differentiate so as to be saved
- ⑩ **Data timeout** – specifies an interval after which measuring sensor failure is announced
- ⑩ **Coefficient A** – constant by which the value must be multiplied before displaying
- ⑩ **Coefficient B** – constant which must be added to the value before displaying
- ⑩ **Format** – way how the value is displayed
- ⑩ **Name** – name of the quantity displayed before the measured value
- ⑩ **Unit** – unit of the quantity displayed before the measured value
- ⑩ **Preview** – preview of set limits and display parameters



Figure

18: Dialogue for adding a group

After confirming by the OK button, new values are saved and the dialogue is closed.

3.5.2. Edit measurement group

After clicking on the edit measurement group icon, the Edit group dialogue is displayed. For description of items, refer to Add measurement group

After confirming by the OK button, new values are saved and the dialogue is closed.

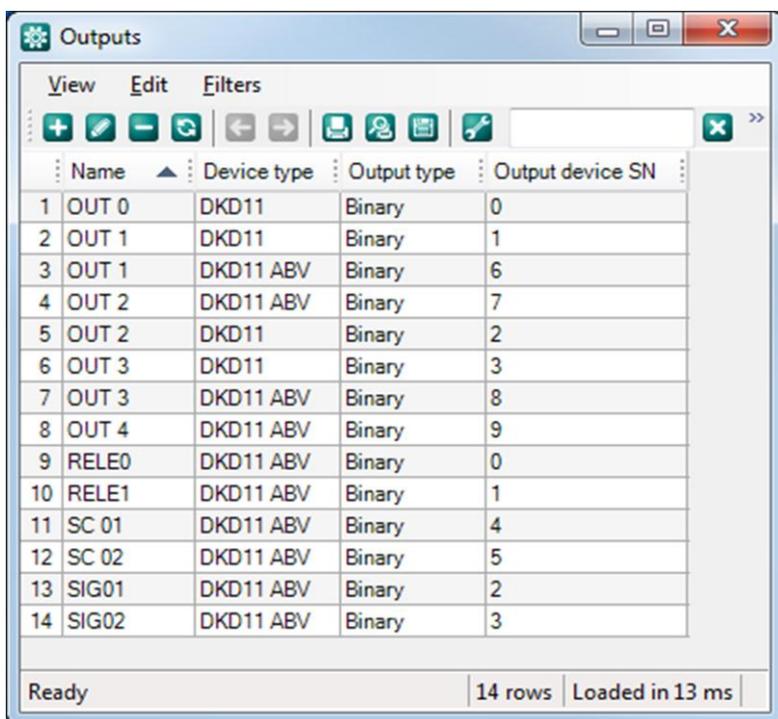
3.5.3. Deleting measurement group

After clicking on the delete icon, the system will display the confirmation dialogue and after its confirmation, the selected group (or more groups) will be deleted.

3.6. Outputs menu

Some of the devices in the system have outputs that can be switched by means of rules. This menu contains only a list of outputs that belong to the existing devices.

This list is generated at the first installation and incompetent intervention may result in malfunction of the system.



	Name	Device type	Output type	Output device SN
1	OUT 0	DKD11	Binary	0
2	OUT 1	DKD11	Binary	1
3	OUT 1	DKD11 ABV	Binary	6
4	OUT 2	DKD11 ABV	Binary	7
5	OUT 2	DKD11	Binary	2
6	OUT 3	DKD11	Binary	3
7	OUT 3	DKD11 ABV	Binary	8
8	OUT 4	DKD11 ABV	Binary	9
9	RELE0	DKD11 ABV	Binary	0
10	RELE1	DKD11 ABV	Binary	1
11	SC 01	DKD11 ABV	Binary	4
12	SC 02	DKD11 ABV	Binary	5
13	SIG01	DKD11 ABV	Binary	2
14	SIG02	DKD11 ABV	Binary	3

Figure 19: Summary of outputs in

the system

3.6.1. Add output

After clicking on the add output icon, the New output dialogue is displayed.

Description of items

- Ⓜ **Name** – designation of output
- Ⓜ **Device type** – type of device containing the given output
- Ⓜ **Output type** – type of output

⑩ **Output device SN** – internal identifier of output within the framework of device

3.6.2. Edit measurement group

After clicking on the edit output icon, the Edit output dialogue is displayed. For description of items, refer to Add output

After confirming by the OK button, new values are saved and the dialogue is closed.

3.6.3. Delete output

After clicking on the delete icon, the system will display the confirmation dialogue and after its confirmation, the selected output (or more outputs) will be deleted.

3.7. Rules menu

You can set rules for measured quantities to define inputs which should make/break in case of exceeding the warning or critical limits.

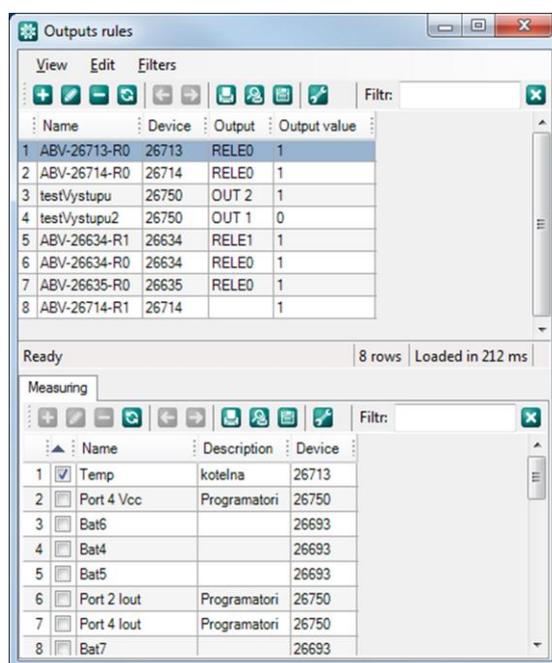


Figure 20: Summary of rules

The upper part of the window contains a list of rules and the lower part contains a list of measured values associated with these rules.



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3.7.1. Add rule

After clicking on the add icon, the New rule dialogue is displayed.

Description of items

- ⑩ **Name** – rule name
- ⑩ **Device** – the device, the output of which should make/break.
- ⑩ **Output** – the output which should make/break
- ⑩ **Critical** – to activate/deactivate the rule when critical limits are exceeded
- ⑩ **Warning** – to activate/deactivate the rule when warning limits are exceeded
- ⑩ **Output value** – the value to which the output should be set in case the limits are exceeded. (1 for make in case the limit is exceeded, 0 for break in case the limit is exceeded)

3.7.2. Edit rule

After clicking on the edit rule icon, the Edit rule dialogue is displayed. For description of items, refer to Add rule.

After confirming by the OK button, new values are saved and the dialogue is closed.

3.7.3. Delete rule

After clicking on the delete rule icon, the system will display the confirmation dialogue and after its confirmation, the selected rule will be deleted.

3.7.4. Assigning a measurement rule

To assign a rule for measurement, select the rule in the upper and lower parts of the screen.

3.8. Check DKD rules menu

The changes in rules or limits must be transferred also to the DKD11 device for independent evaluation of alarms states. This recording of rules is enabled by Check DKD rules menu.



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Id	State	Name	Serial n.	Port	Address	Quantity
1		Modbus-CH4	26651	0	1	230
2	OK	CH4-1-ABV	26714	1	0	230
3	OK	CH4-2-ABV	26714	1	1	230
4	OK	Temp	26713	2	0	101
5	OK	Anemometr	26713	2	1	234
6	OK	Modbus-CH4 2	26651	0	2	230

Figure 21: Summary of rules for DKD

Select the DKD11 unit from drop-down menu into which you want to record current limit values and rules for outputs.

Load the data for the selected DKD11 unit using the Load data for DKD rules button. After doing so, the current limit data and rules for units connected to the selected DKD11 unit are loaded.

Use the Upload rules to DKD button to start recording limits and rules into the DKD11 unit. The rows, which will not be recorded, are shown in yellow. After successful recording and checking the row in the unit, this row will be shown in green.

When recording, there may be a situation when a row is not recorded into the device successfully. In such a case, the row will be shown in red. After completion of recording, it is possible to re-record the unsuccessful limits by pressing down the Upload rules to DKD button again.



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4. Layout

It is possible to set up the layout of the data from measurement for each group. The layout may contain a summary of data in tables, graphs or graphical layout. All of these components can be added to the group in the form of tabs which can be rearranged by pulling the tab within the scope of window.

All changes in layout or settings of individual components are copied to the server after saving and they are distributed from there to other client workstations when update is requested. Therefore, it is necessary to save any layout after every greater modification using (SCADA → Layout → Save current / Save all) menu.

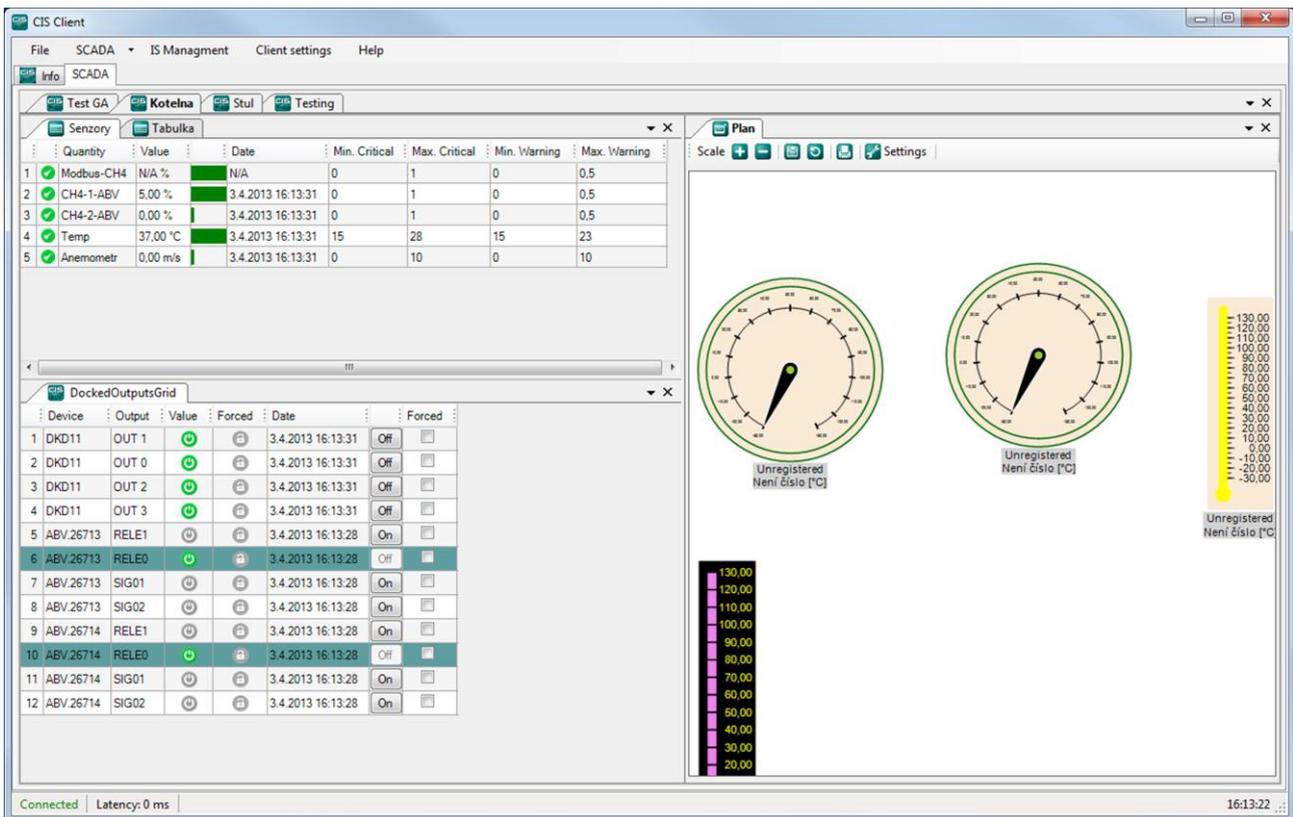


Figure 22: Example of layout of displayed elements

The resulting layout may look like in the figure:

4.1. Add Grid menu

You can add windows to the current tab according to group for overview of the system state. The first window is the one with a table

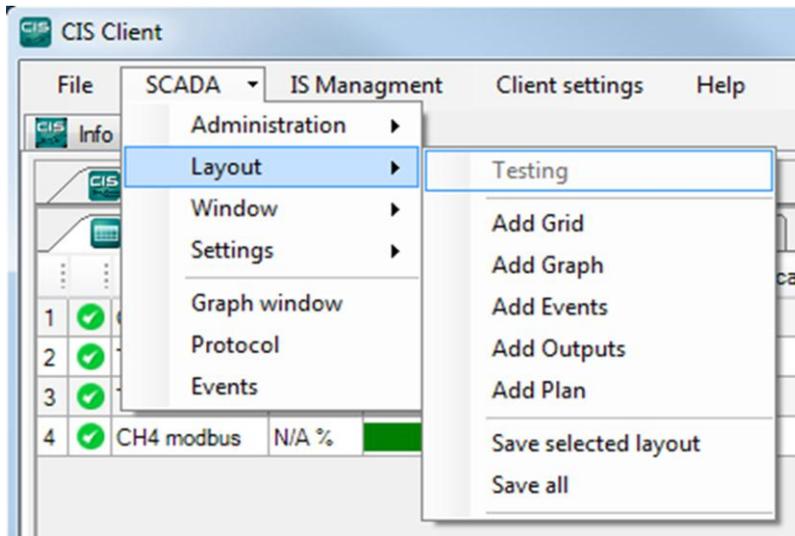


Figure 23: Add Grid menu

Now the tab named "DockedGridView" is added in the window and by a right click on this tab, a context menu is produced:

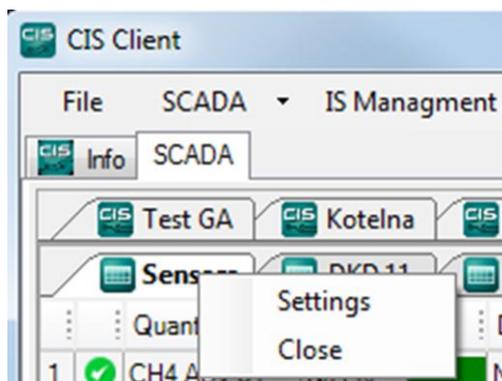


Figure 24: Grid settings context menu

Select *Close* to close the added tab. Select *Settings* to produce the window with settings.

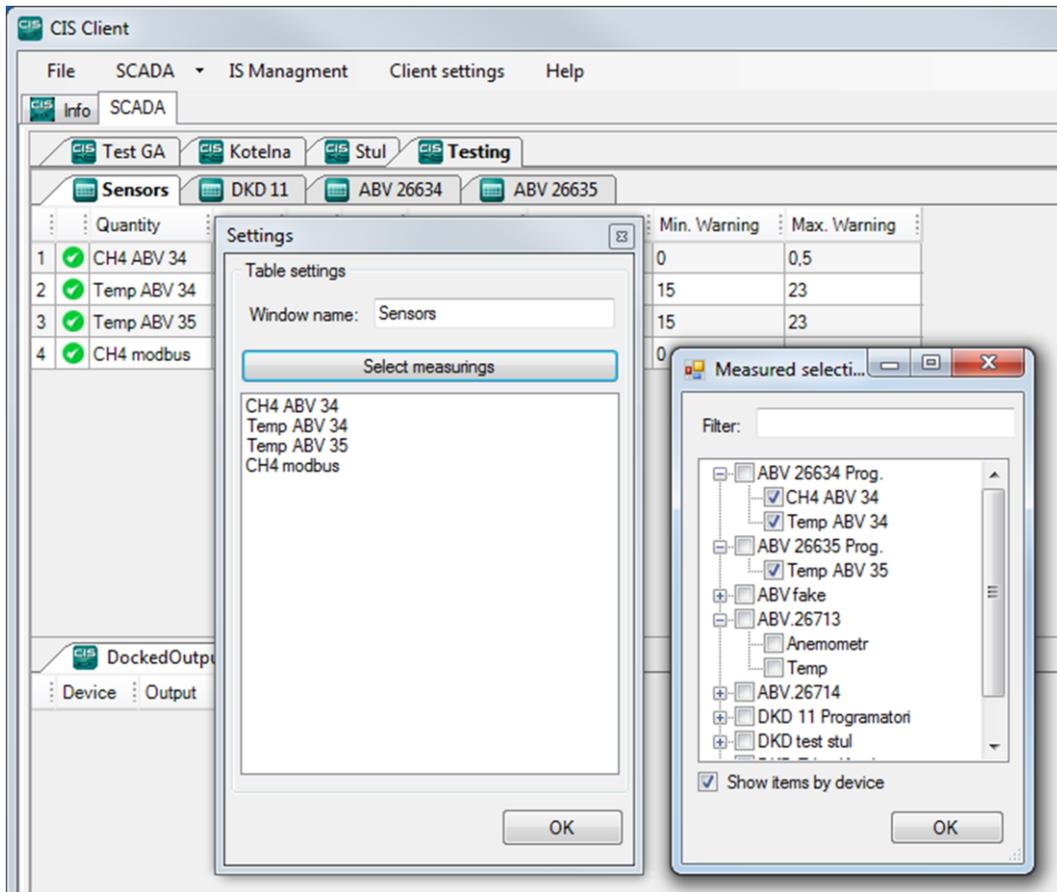


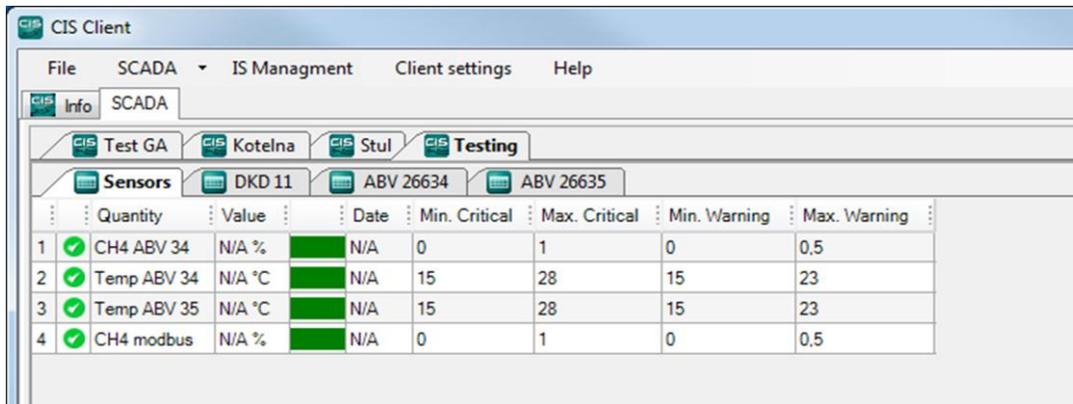
Figure 25: Grid

settings window

Measured quantities are added to the grid by clicking on the *Select measurings* button for opening another window where you can choose the given quantities from the tree menu and press OK. The tab can be arbitrarily renamed in the settings window.

The selected quantities will now be displayed in the settings window. You can rearrange them by selecting and pulling or delete them from the list by pressing the *Delete* key.

The quantities will be added in the grid by confirming OK:



The screenshot shows the CIS Client interface with a grid window displaying sensor data. The window title is 'CIS Client' and the menu bar includes 'File', 'SCADA', 'IS Management', 'Client settings', and 'Help'. The 'Info' tab is active, showing a 'SCADA' section with sub-tabs for 'Test GA', 'Kotelna', 'Stul', and 'Testing'. Under 'Sensors', there are sub-tabs for 'DKD 11', 'ABV 26634', and 'ABV 26635'. The main grid contains the following data:

Quantity	Value	Date	Min. Critical	Max. Critical	Min. Warning	Max. Warning
1	CH4 ABV 34	N/A %	N/A	0	1	0,5
2	Temp ABV 34	N/A °C	N/A	15	28	15, 23
3	Temp ABV 35	N/A °C	N/A	15	28	15, 23
4	CH4 modbus	N/A %	N/A	0	1	0,5

Figure 26: Add

Grid window

4.2. Add Graph menu

It is possible to add a graph in the current tab. Add it in Layout → Add Graph menu. The item named "Graph" is added by a right click on this tab to show the context menu as previously done by selecting Settings to open the settings window:

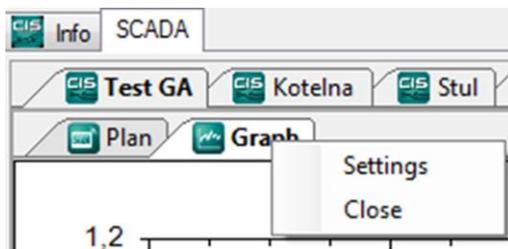


Figure 27: Grid settings context menu

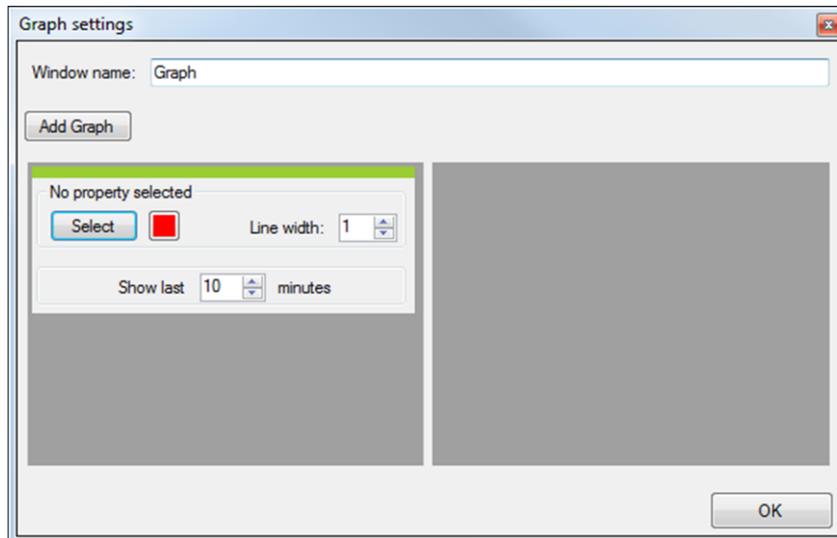


Figure 28: Graph settings window

Figure 28: Graph settings window

The tab can be arbitrarily renamed in the settings window.

The graph is added by clicking on the *Add Graph* button. If more of them are required, you can rearrange them as necessary by pulling them by the green header.

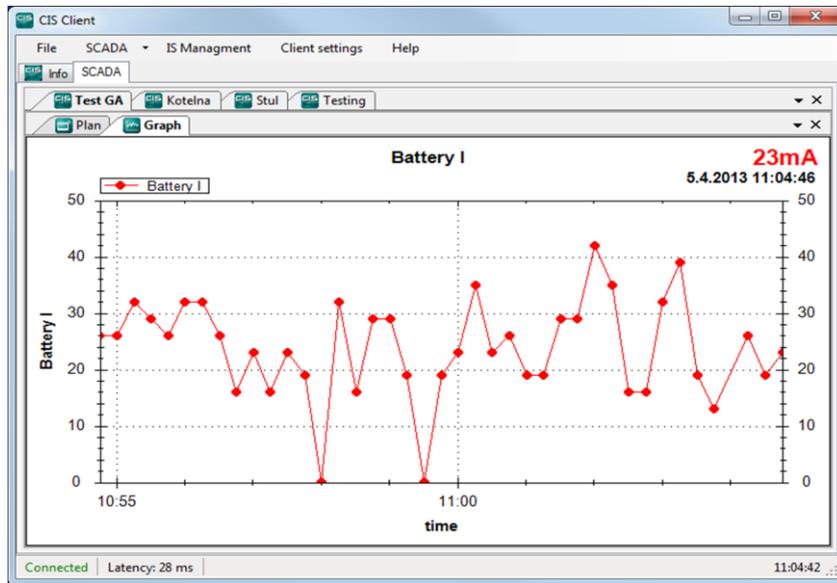
Click on the *Select* button to select the particular quantity or quantities you want to display in the graph. After confirming with OK, the resulting graph will appear as follows:



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graph

Figure 29: Window with set

4.3. Add Events

It is possible to add events in the current tab. This grid displays several recent events in the system. It has no special setting.

4.4. Add Outputs

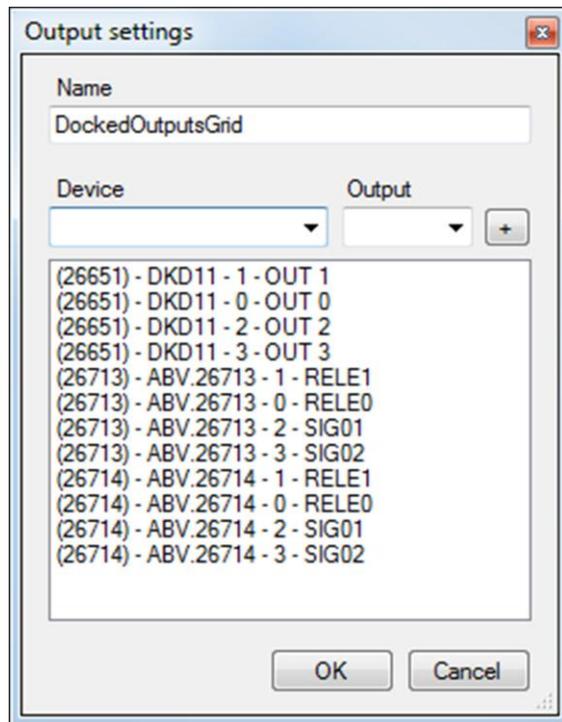


Figure 31: Output settings

4.4.2. Output settings

You can select which outputs will be displayed in the selected grid in the output settings. Select a device in *Device* pull-down menu and select an output from *Output* menu which you want to add. After pressing down the *Add (+)* button, add a new output in the list below.

You can change the position of the output in such a way that you use mouse to select the row with the output which you want to move and drag it to the desired position.

The output is deleted in such a way that you select the appropriate output in the list of outputs and press down the *Delete* key.

4.5. Add Plan menu

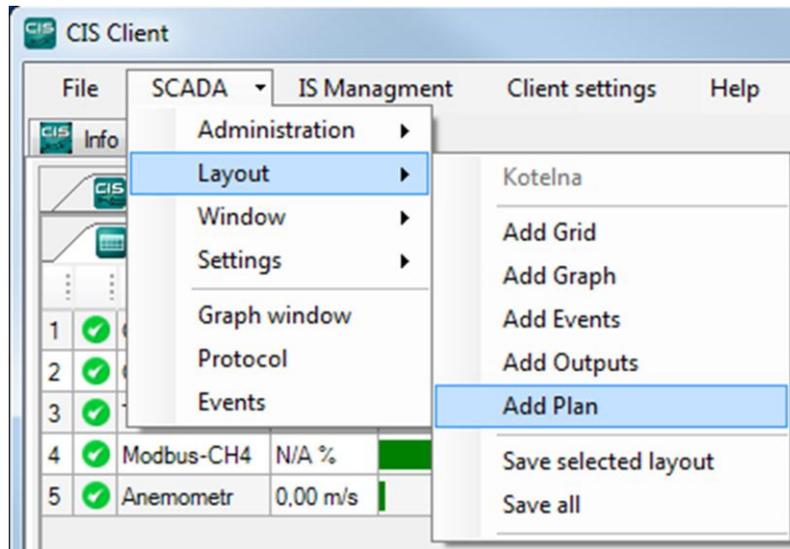


Figure 32: Add Plan menu

Now the tab named "DockedGA" is added in the window:

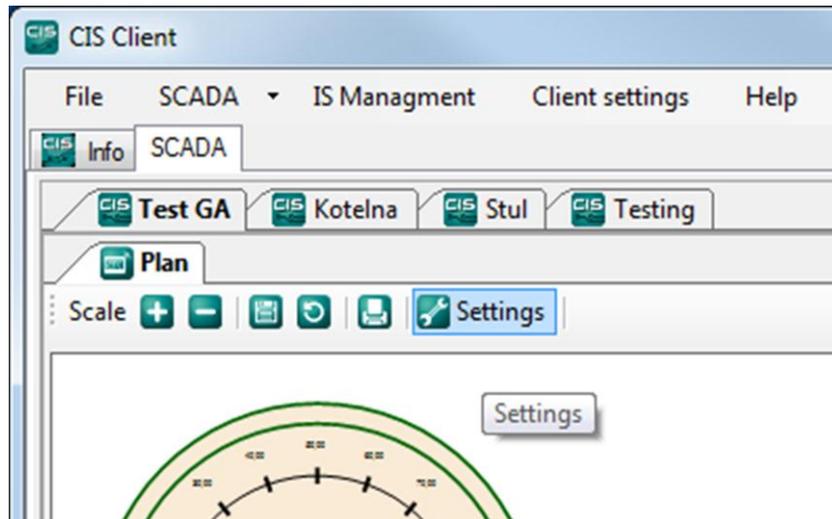


Figure 33: Add Plan menu

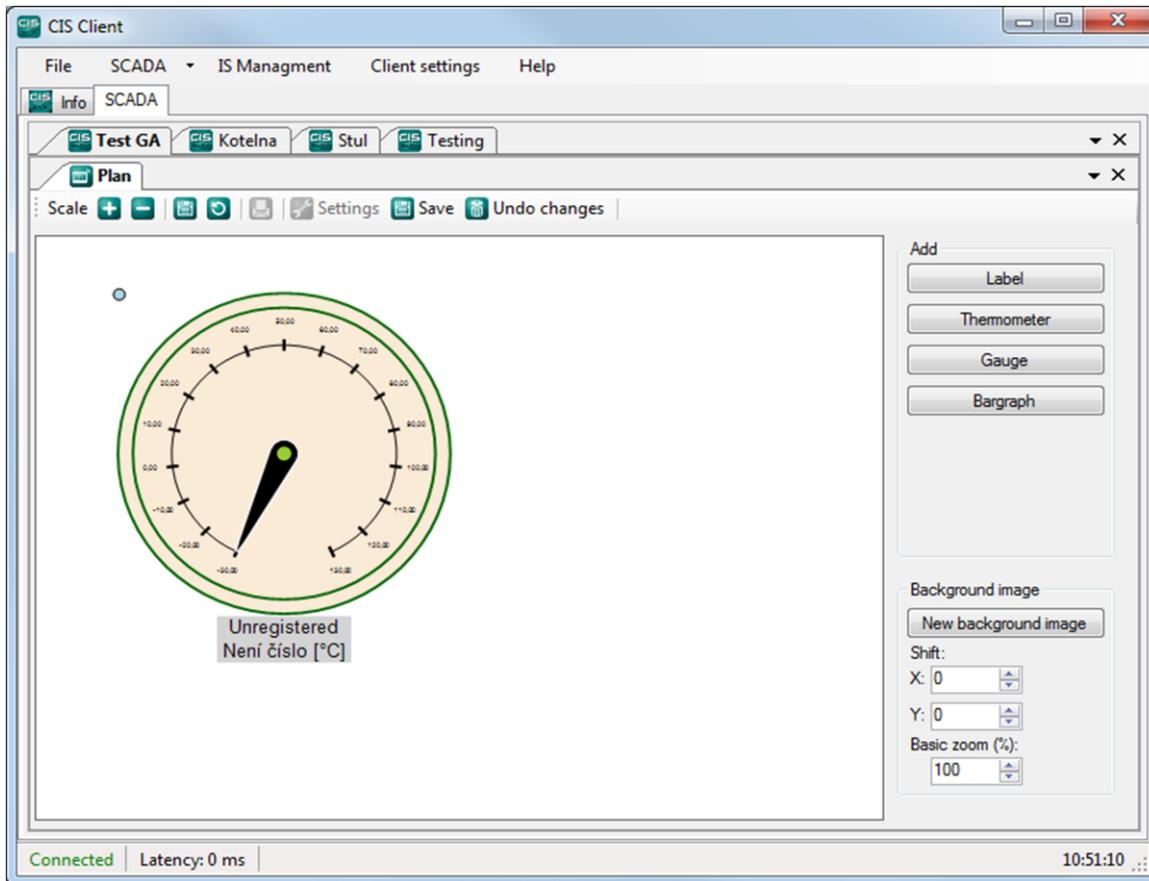
Click on *Settings* to pull down the edit menu in the right part of the tab and the tab will be in edit mode until the user confirms saving or undoing the changes by pressing down the *Save* or *Undo changes* buttons.



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Figure

34: Graphical plan in edit mode

By means of the *Background image* control group you can set up the background of the tab using any picture file. The background provides elementary handling operations such as displacement and scaling.

The *Add* control group contains buttons for adding the user elements. The context menu is produced when the right mouse button is pressed down over any user element. This control can be deleted or set in this way.

Every user element can be moved using the grip in the left top corner of the component.

User elements are:

- ⑩ *Label*: adds a simple text label to which colour and font can be assigned.
- ⑩ *Thermometer*: adds a thermometer to which a particular measured quantity is

assigned.

- Ⓢ *Gauge*: adds a gauge to which a particular measured quantity is assigned.
 - Ⓢ *Bargraph*: adds a bargraph to which a particular measured quantity is assigned.
- Setting is briefly illustrated in the following figure.

4.5.1. Label

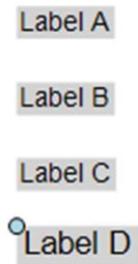


Figure 35: Label

Labels make it possible to add any text on the area of the plan. They serve primarily for designation of background data.

4.5.2. Thermometer and Bargraph



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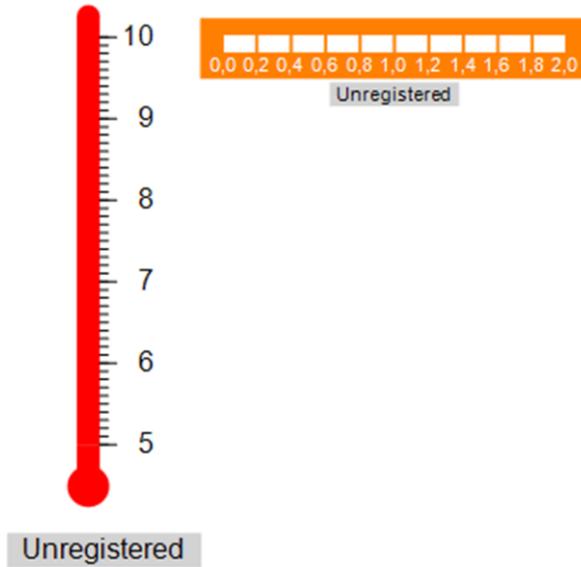


Figure 36: Thermometer and Bargraph

The thermometer and the bargraph are two elements that are different only in the style of display. But they have the same settings so they will be described together.

Using these elements, it is possible to display the state of a quantity on the simple scale in the form of a thermometer or just one column / row.

4.5.2.1. **Thermometer / Bargraph settings**

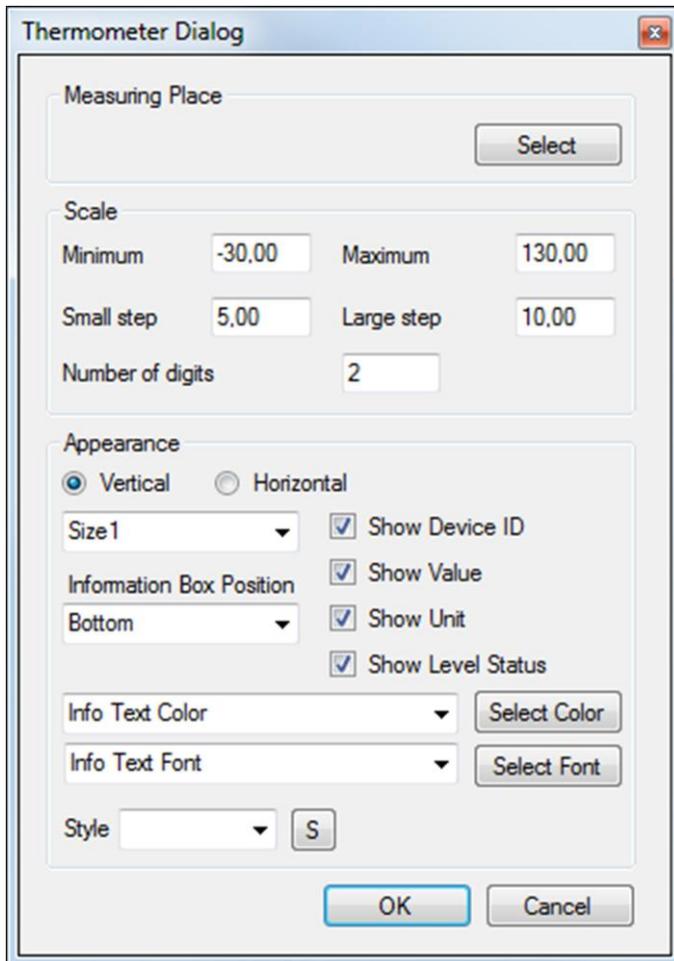


Figure 37: Thermometer / Bargraph

settings

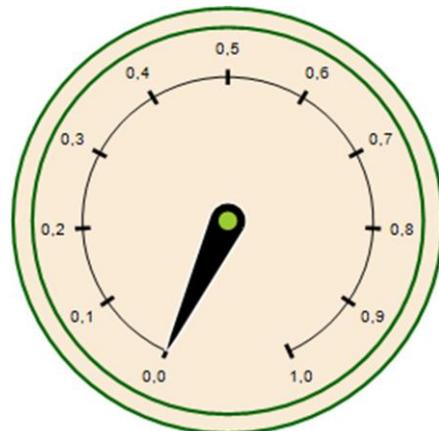
In Fig 37., you can see a dialogue window for setting the appearance of Thermometer and Bargraph elements.

In the Measuring place group, you can select a quantity you wish to display using the Select button.

In the Scale group, you can set minimum and maximum of the scale and a large step displayed on the scale.

In the Appearance group, you can set the appearance of the element and displayed information.

4.5.3. Gauge



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Figure 38: Gauge

The Gauge makes it possible to display the measured value in the style of analogue pointer instruments. The options are shown in the figure 39.

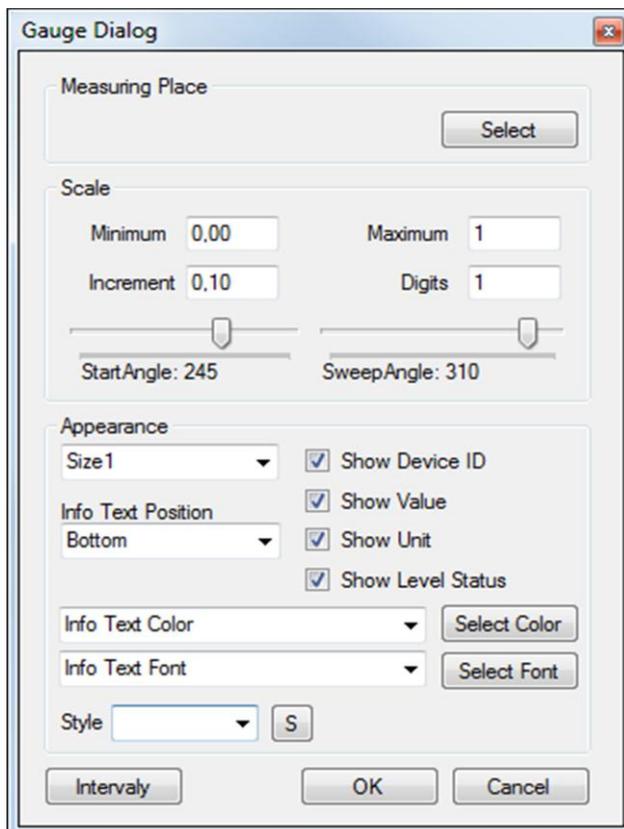


Figure 39: Gauge settings

Much like in other elements, it is possible to select the measured quantity in the



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Measuring Place group at first.

The Scale group contains again setting the scale and divisions on it. There are two scroll bars newly. *StartAngle* makes it possible to turn the origin of the scale. *SweepAngle* sets the size of sector which is used for drafting the scale.

In the *Appearance* group, you can set the appearance of the control again.



5. Data viewing

The system provides access to the measured data in several different ways that will be described in this Chapter later.

5.1. Viewing of measured quantity development

By means of the Graph tool, you can display the development of any quantity in a separate window.

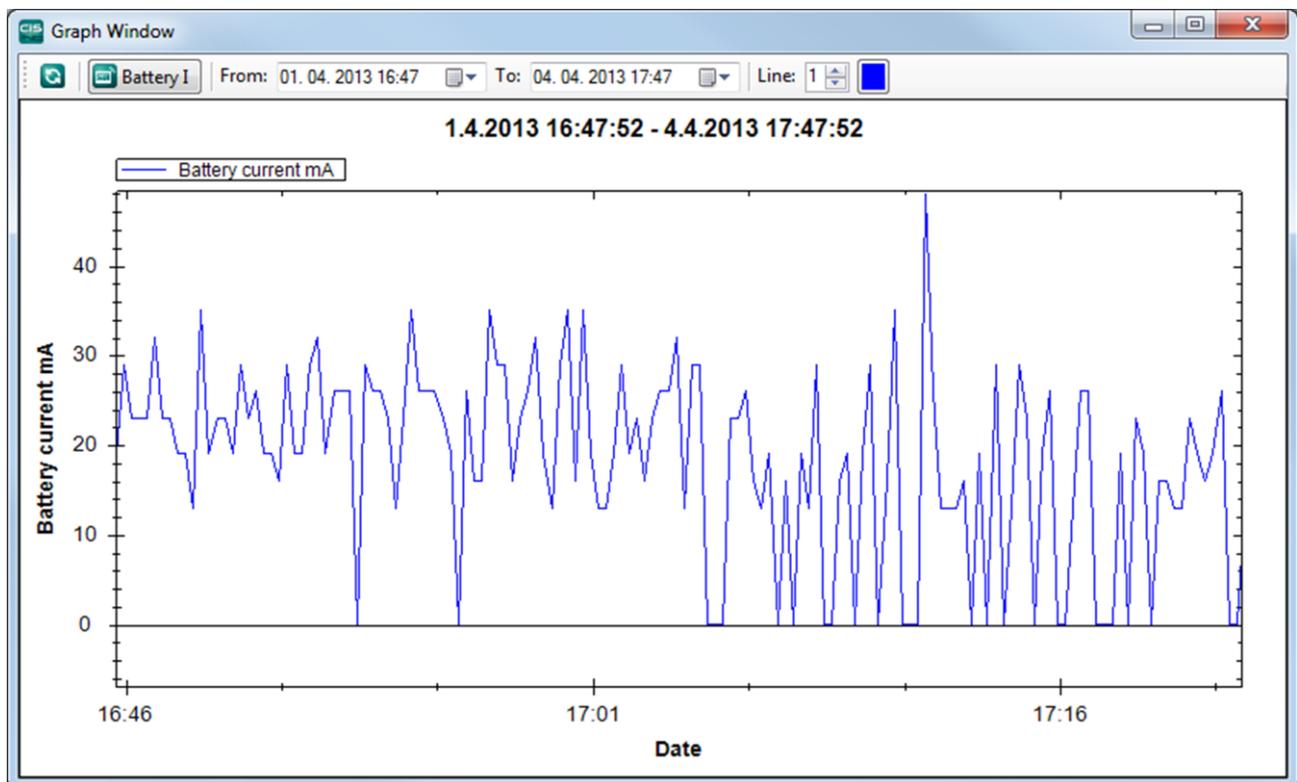


Figure 40: Quantity graph development window

The controls are apparent from the figure 40. Left to right:

- ④ Update button – loads the development from the database according to current settings
- ④ Select button – selects the desired quantity for representation
- ④ Selection of time frame From – To – selects the data within the desired data range
- ④ Thickness and colour of line – development display settings



5.1.1. Graph handling

- Ⓜ Graph displacement - by holding the central mouse button.
- Ⓜ Selection of area for enlargement – by holding left mouse button and dragging
- Ⓜ Context menu display– by right click
- Ⓜ Zoom – scrolling with mouse wheel

5.2. Generating protocols

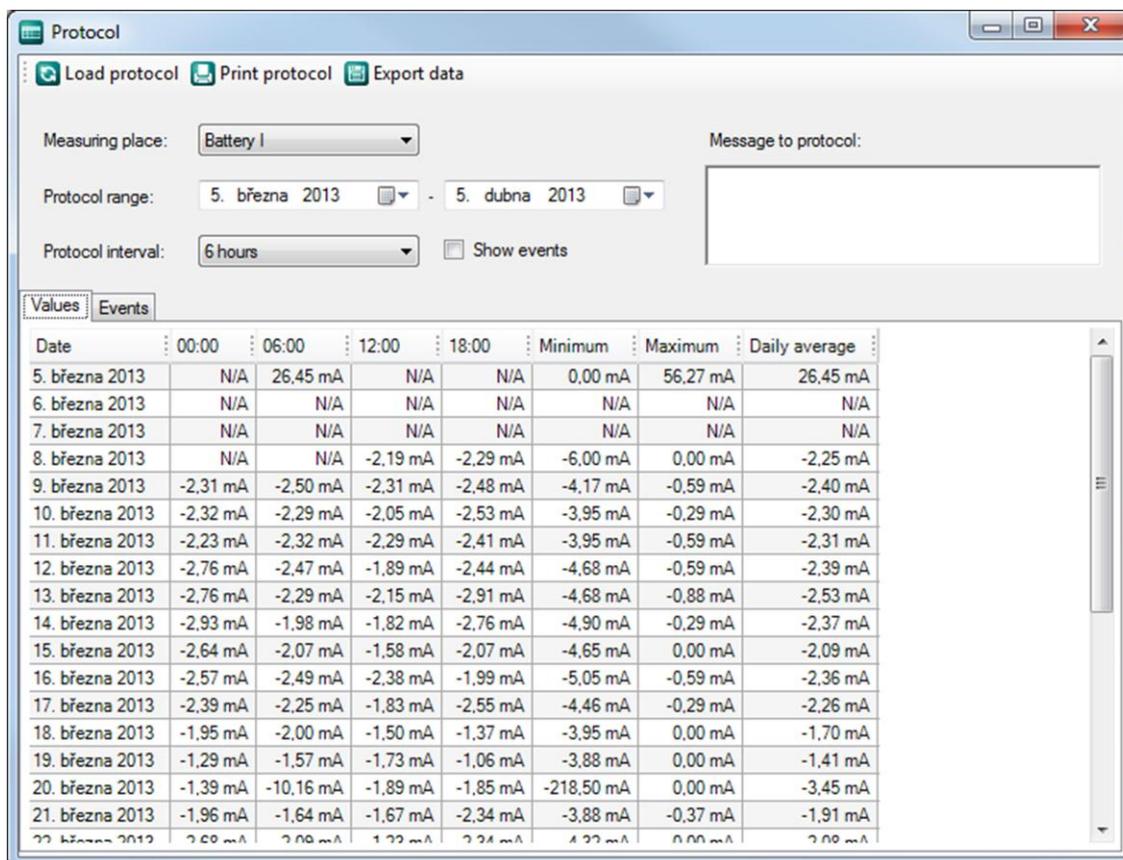


Figure 41:

Protocol window

The system makes it possible to generate protocols that show tables with values of measured quantities. It can be found in SCADA → Protocol menu. In the figure, you can see a protocol window for *Battery I* quantity for one-month period.

This protocol can be printed or exported to CVS a subsequently opened, e.g. in MS Excel application.



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5.3. Browsing the recent events

Ts	Type	Device	Measuring place	Value	Limit value
6.3.2013 13:41:40	DeviceNotResponding		Modbus-CH4 2	6.3.2013 12:41:39 %	
6.3.2013 15:11:07	DeviceNotResponding		Modbus-CH4	6.3.2013 14:11:06 %	
6.3.2013 15:12:13	DeviceNotResponding		CH4-1-ABV	6.3.2013 14:12:10 %	
6.3.2013 15:12:13	DeviceNotResponding		CH4-2-ABV	6.3.2013 14:12:10 %	
7.3.2013 15:29:24	DeviceNotResponding		Modbus CH4 stul	7.3.2013 14:29:23 %	
7.3.2013 15:29:24	DeviceNotResponding		Anenometr fake	7.3.2013 14:29:23 m/s	
8.3.2013 9:59:07	DeviceRespondingAgain		CH4-1-ABV	8.3.2013 9:59:05 %	
8.3.2013 9:59:07	DeviceRespondingAgain		CH4-2-ABV	8.3.2013 9:59:05 %	
8.3.2013 16:37:45	DeviceNotResponding		Modbus-CH4	8.3.2013 15:37:42 %	
8.3.2013 16:42:07	DeviceNotResponding		Port 4 lout	8.3.2013 15:42:04 mA	
8.3.2013 16:42:07	DeviceNotResponding		Port 3 lout	8.3.2013 15:42:04 mA	
8.3.2013 16:42:07	DeviceNotResponding		Port 2 lout	8.3.2013 15:42:04 mA	
8.3.2013 16:42:07	DeviceNotResponding		Port 1 lout	8.3.2013 15:42:04 mA	
8.3.2013 16:42:07	DeviceNotResponding		Port 4 Vcc	8.3.2013 15:42:04 V	
8.3.2013 16:42:07	DeviceNotResponding		Port 3 Vcc	8.3.2013 15:42:04 V	
8.3.2013 16:42:07	DeviceNotResponding		Port 2 Vcc	8.3.2013 15:42:04 V	

Figure 42:

Events window

The Events window serves for browsing the events arisen in the system within the set time frame. Open it using SCADA → Events menu.