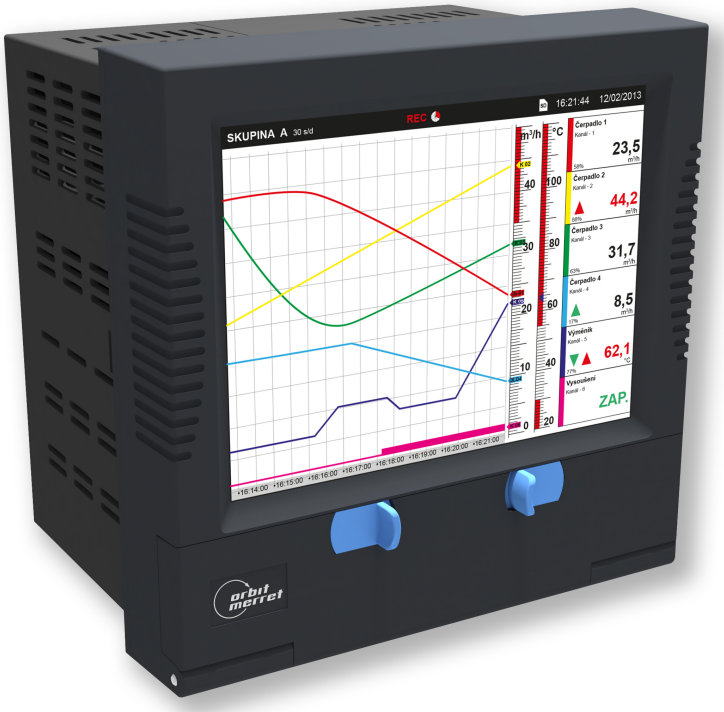


Paperless recorder OMR 700

User guide

Version: 1.0.13
July 2016

1 Introduction

1 Introduction

Basic building blocks of the OMR700

Functionality of the paperless recorder OMR700 is based on the following parts:
a) Inputs and outputs
b) Nodes
c) Screens
d) Records
e) Timers
f) Constants

Inputs and outputs – they come from the IC cards (fixed B1 or expanding A1 - A4, B2 - B5). They themselves contain conversions.

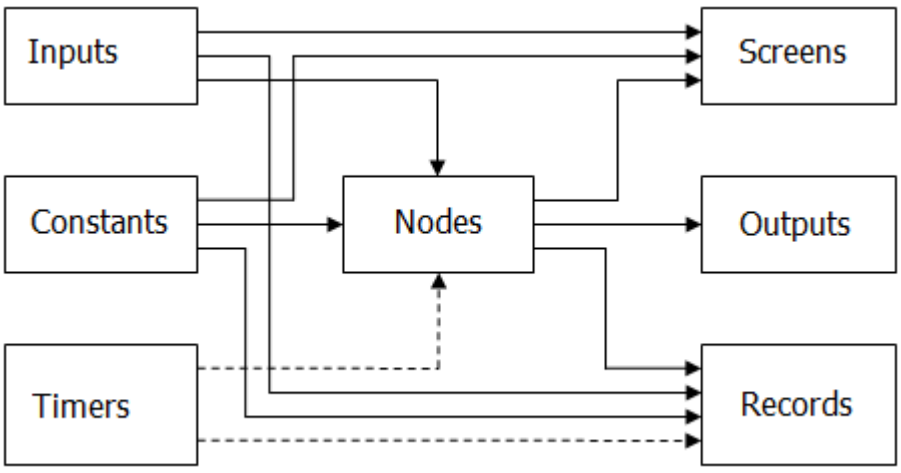
Nodes – mathematical or other calculations with the goal of providing requested adjustments of the measured signals or preparation of the output values.

Screens – graphical representation of the measured or calculated values on the recorder display.

Records – what, where, how often, in what format, and other parameters of measured or calculated data for recording.

Timers – provide periodic execution of linked blocks with a given period.

Constants – spontaneously unchangeable named values for further use.



Block chart of the recorder

From the block chart it is apparent that the central point of the recorder is created by the **nodes**. They process the measured inputs, constants, other nodes, and using the preset calculations they calculate a new value. The calculation is kept in time by the timer. The calculated values of the nodes can be displayed on the screen and recorded on the media. The outputs can also be equipped by them.
An important feature of the nodes is the fact that they can have a history (they

remember previous values). This is an optional configuration offering the advantage of displaying the value of the node with its history (running chart).

Timers have an optional setting period. The client can set the period within the range of 1ms up to 40 days (by 1ms, while the dialog limits the settings to the order of ms, s, minutes, hours, and days). There are N timers in the recorder (8 at the moment) so that it is necessary to choose a proper setting for each timer to cover the needs of the entire recorder. The timers control calculations of the nodes and recording on the media, while the internal mechanism guarantees that the nodes are calculated first and only then the new values are recorded on the media.

Inputs and Outputs provide rate, which is different for each type of the card and even for each register on the card. The IC cards are in fact designed as intelligent ones = they conduct their operations in order to relieve the main processor. They are organized into a set of registers. Some of the registers are configurable (e.g. those of input range), some are designated for measured values under different phases of processing. A typical input card provides several values for each input – direct input value of the converter (converter bits), value converted into electrical value (e.g. mA), and the resulting converted value (e.g. in case of weight, the strain gauge input card recalculates the voltage of the strain gauge into weight by a preset formula - range, tare). Similarly, it is possible to control also the outputs. For example: You set the requested turns of a ventilator and the card will itself, according to the preset parameters, recalculate the measured value into voltage and set it on its output.

Constants are designated for easy and well-arranged changes of the settings, e.g. of the required values, filtration parameters... On one place the value can be changed, used for calculations, displayed and recorded.

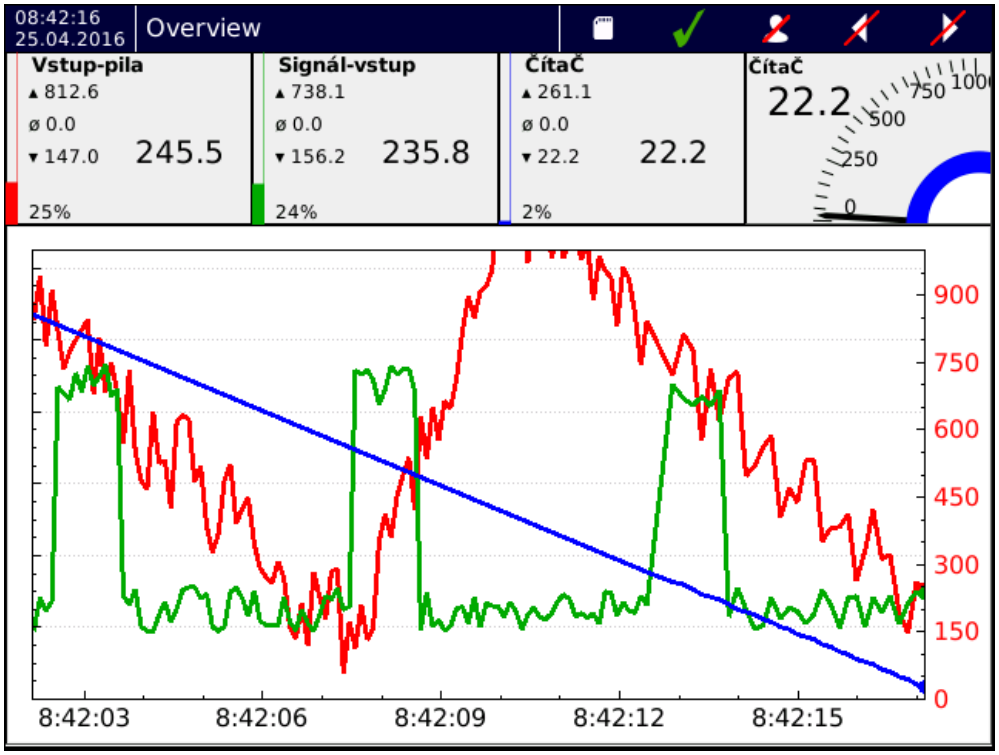
Screens are used for displaying the measured values. There are N screens (16 at the moment) and each of them can occupy up to M (25 at the moment) different elements like running chart, bar chart, normal text value, finger measuring indicator... You set the element type, size, location, number of displayed values, color, range... So you can build very diverse screens. The redraw period is set in such a manner that it enables a smooth and fast enough drawing, which, at the same time, relieves the main processor. Some elements (as e.g. the running chart) display, besides the current values, also their previous ones. By these elements it is therefore advantageous if the displayed node has a history that is used for filling up the chart when switching over to the screen.

Records serve for recording values on the media. There are N of them (16 at the moment). To each record you can assign a name, frequency, file format, number of records in the file, where you want to record, and, of course, what you want to record (max. 16 values at the moment). All records can be viewed in the record browser. They can also be downloaded to a PC and displayed there.

2 Control Bar

2 Control Bar

In the upper part of the display there is a dark blue Control Bar. It shows the main control elements.



Main screen after switching on the recorder

Bar without a logged user

The appearance of the bar without a logged-in user. Control buttons are disabled and therefore you can not change the screen, enter the menu or view errors, logs and capacity utilization of the memory media.

Control bar without a logged user

Bar with a logged user - level "User"

User with access rights "User" has the right of switching over screens, viewing errors, logs and memory media.

Control bar with a logged user

Bar with a logged user - level "Advanced user" and beyond

User with access rights "Advanced user" and beyond has, in addition, access to the menu.

Control bar with a logged user

Time and date

Indication of the current time and date.

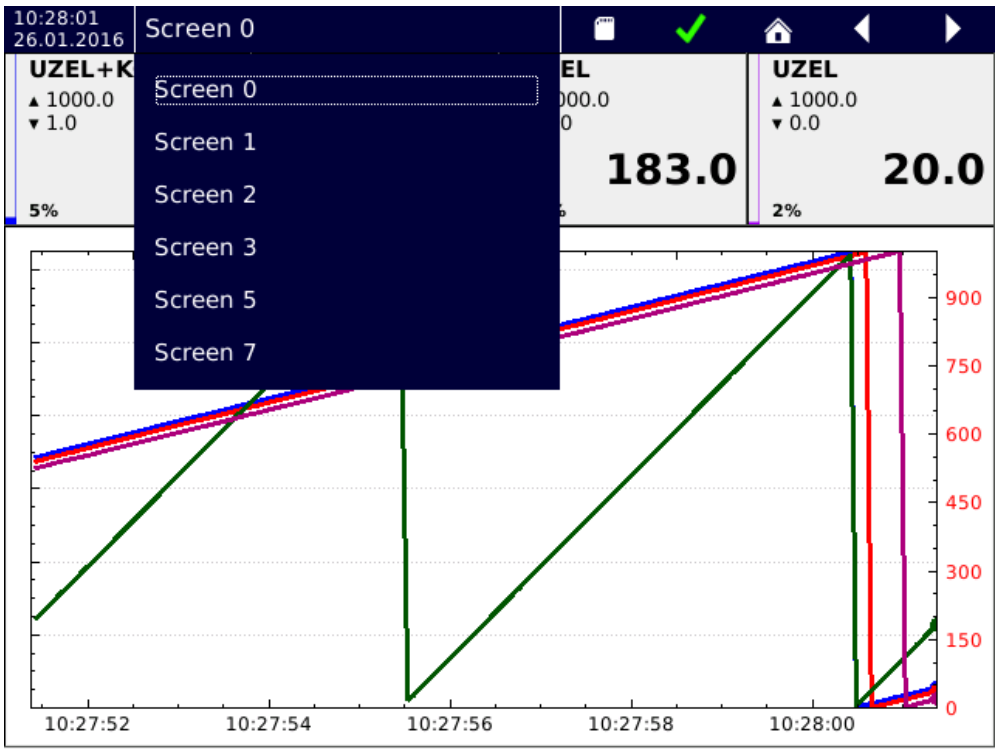
Time and date

Name of the currently displayed screen

Space in the control bar, which shows the name of the currently displayed screen.

Name of the currently displayed screen

Click into this space opens the offer with an overview of all defined screens for a fast screen selection.



Fast screen selection

Overwiev of the memory media

State of the recorder

Recorder always operates in one of its four states.

State "OK" - device has not detected any function problem

State "Warning" - device outside the specified values, but without consequences on its functioning. This state can be caused for instance by an undervoltage greater than 10%, by filling the memory in excess of 80%, and by many other causes. If the device returns within the specified values, "Warning" state will disappear and the log record will be carried out.

State "Error" - device outside the specified values, but with possible consequences on its functioning. This state can be caused for instance by an undervoltage greater than 20%, by filling the memory in excess of 90%, and by many other causes. At the "Error" state an error window is displayed, through which you can view the errors. If the device returns within the specified values, "Error" state will disappear and the log record will be carried out.

Error window of the "Error" state

State "Critical error" - device outside the specified values with consequences on its functioning. This state can be caused for instance by an undervoltage greater than 50% or by filling the memory up to 100 % so that it is not possible to make records. At the "Critical error" state an error window is displayed, through which you can view the errors. If the device returns within the specified values, both "Critical error" and the error window remain displayed until a confirmation (acknowledgment) of the "Critical error" is done. After confirmation the log record will be carried out.

Error window of the "Critical error" state

More details about the states of the recorder can be found in the chapter Errors and Warnings.

User login or entry into the menu

Anonymous - no one is logged and the function keys are disabled. The icon is used to open the log-in dialog.

Logged on the level "User" - the icon is used for the user log-out.

Logged on the level "Advanced user" and beyond - the icon is used to enter the menu.

Switching the previous or the next screen

Switching over to another screen. If you have defined only one screen, the screen remains unchanged.

Switching over to the previous screen. If you have defined only one screen, the screen remains unchanged.

3 Login

3 Login

Principle

In the recorder factory setting the device can be logged with the name UNIVERSAL, under which you can create another user name and set the device incl. its functions. Access password is sent together with the delivery note.

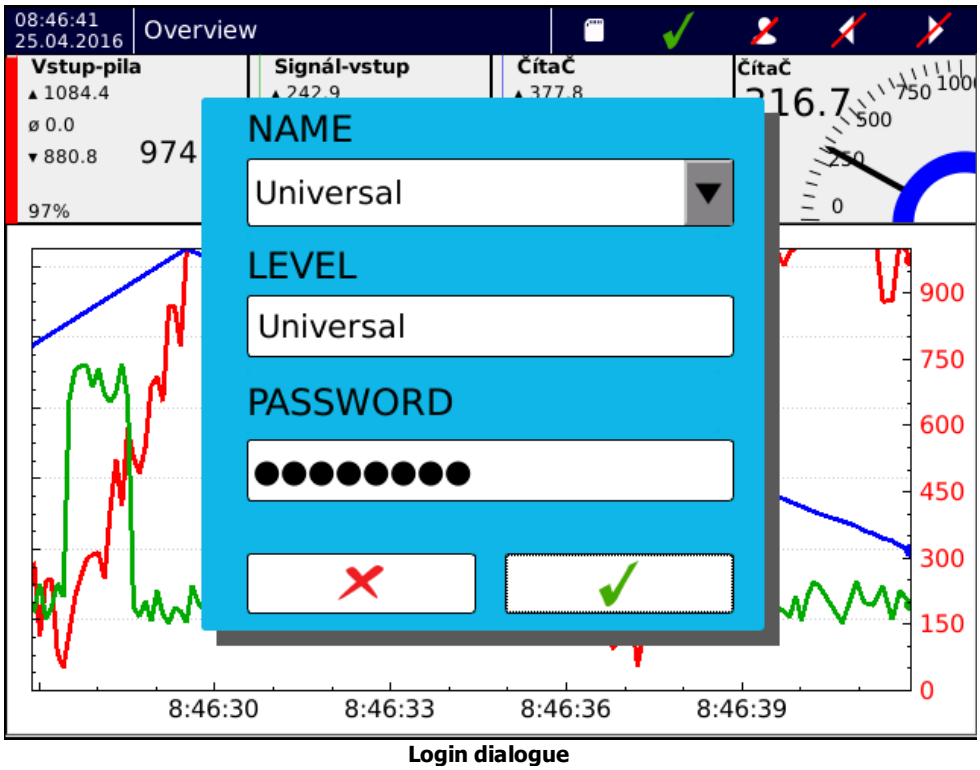
Login dialogue

The dialogue consists of three lines and two buttons.

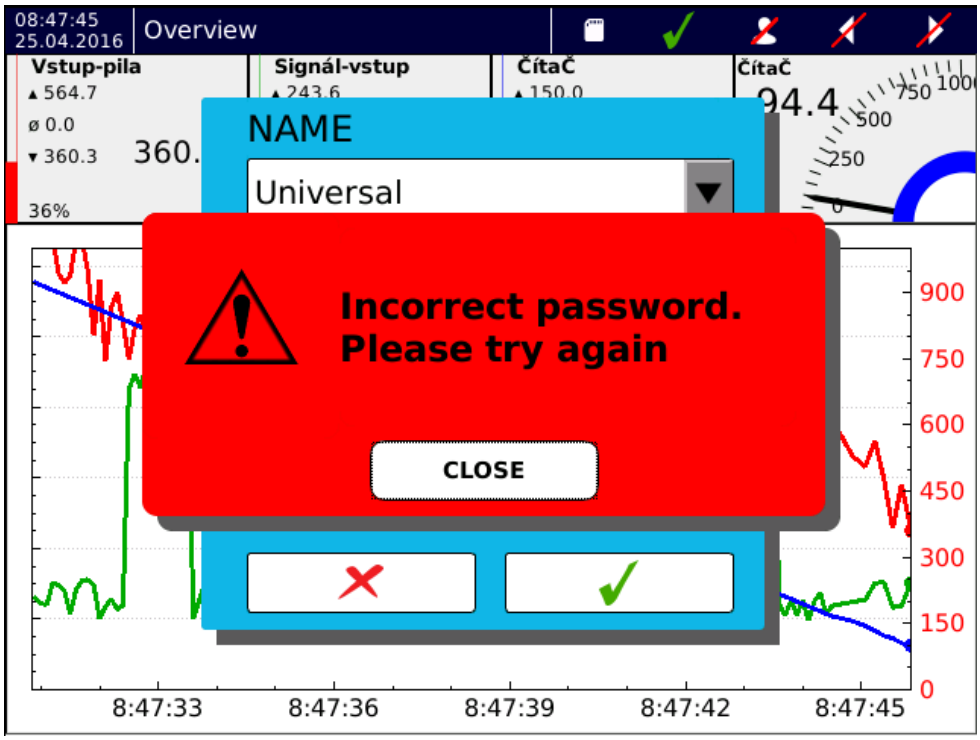
1. **Name** - from the list of created user names kindly select the one, under which you want to log-in.
2. **Level** - level of access rights of the selected user.
3. **Password** - after a click on the line a keyboard appears. Then enter a password to log-in.

4.  - button "Confirm" - it confirms the login. If the password is OK, the dialogue disappears and the icon in the control bar will change. If the password is incorrect, an error window will appear. You can close it and start the login dialogue again.

5.  - button "Cancel" - it will close the login dialogue.



Login dialogue



Warning window of a failed login

4 Menu

4 Menu

Menu of the recorder is divided into three basic groups:
-->

1. **Device settings** - basic settings of the OMR 700 from time and date setting via language setting, connection, users, sounds and display, up to copying all settings and updating the device.
2. **Setting functions -** setting the computing part of the OMR700. Here you will find settings for the input and output cards, timers, named constants, nodes, groups, records, and graphics.
3. **Viewing** - instruments for viewing measured data, errors and warnings, recorded logs, and for diagnostics of the recorder.

Device settings:


Setting current date and time.


Time zone setting.


Language setting.


Setting network connection, connectivity via WiFi and USB.


Device update. It opens a dialogue for firmware updates and device software.


Device update. It opens a dialog for firmware and software updates.


User setting. Dialog for creating and managing users.


Screen saver setting.


Configuration management. Dialog for copying or saving configurations from a portable media.


Setting the volume of sound effects.


Setting programmable buttons.

Basic information about the device.

Setting alarms (Under preparation)

Report setting (Under preparation)

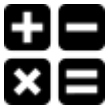
Custom card calibration (Under preparation)

Setting functions:

I/O setting. Window for input and output cards settings.

Timer settings. Creating and managing timers for further use with the device settings.

Named constants setting. Creation and management of named constants.



Nodes setting. Creation and management of the nodes.

Groups setting. Creation and management of the groups of any functional elements, e.g. nodes and input or output channels.

Records setting. Creation and management of the records for recording and backup of the measured data.

Screens setting. Creation and management of the screens for graphical display of the measurement data.

Viewing:

Viewing the stored values of the entries recorded in the internal memory.

Functionality diagnostics. Diagnostics of the secondary core running, and functions of the plug-in cards.

Viewing errors and their acknowledgment, and viewing warnings for running of the OMR 700.

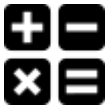
Viewing logs of the OMR700.

Upper bar:

Switches to the menu setting.

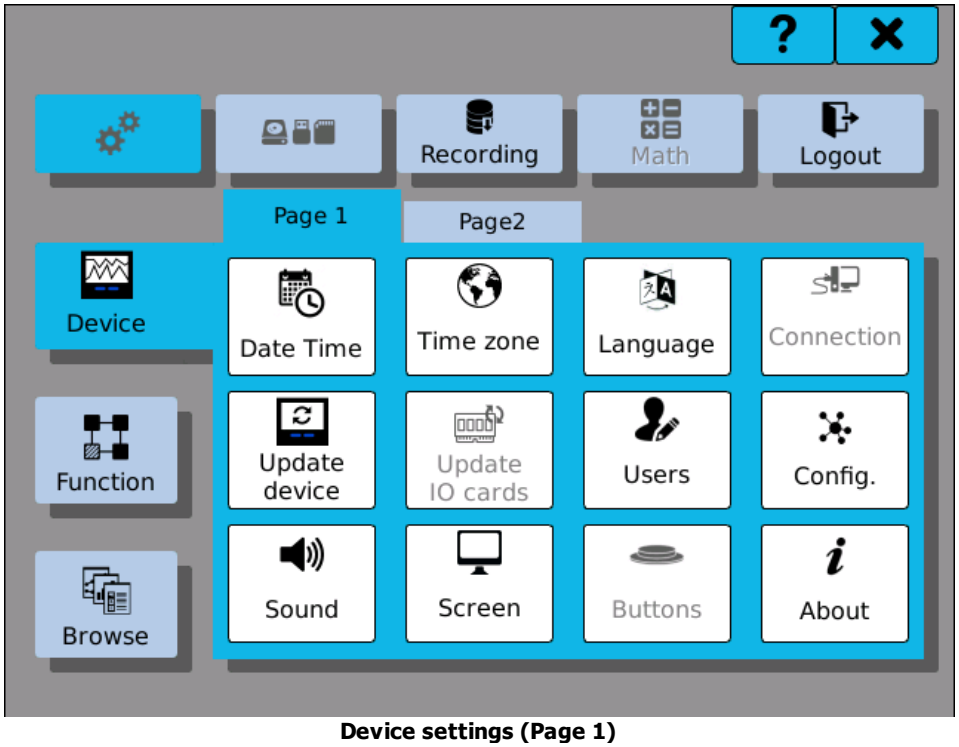
Switches to the media filling.

Storing records - turn on/off. If saving is active, the button is tinged green.

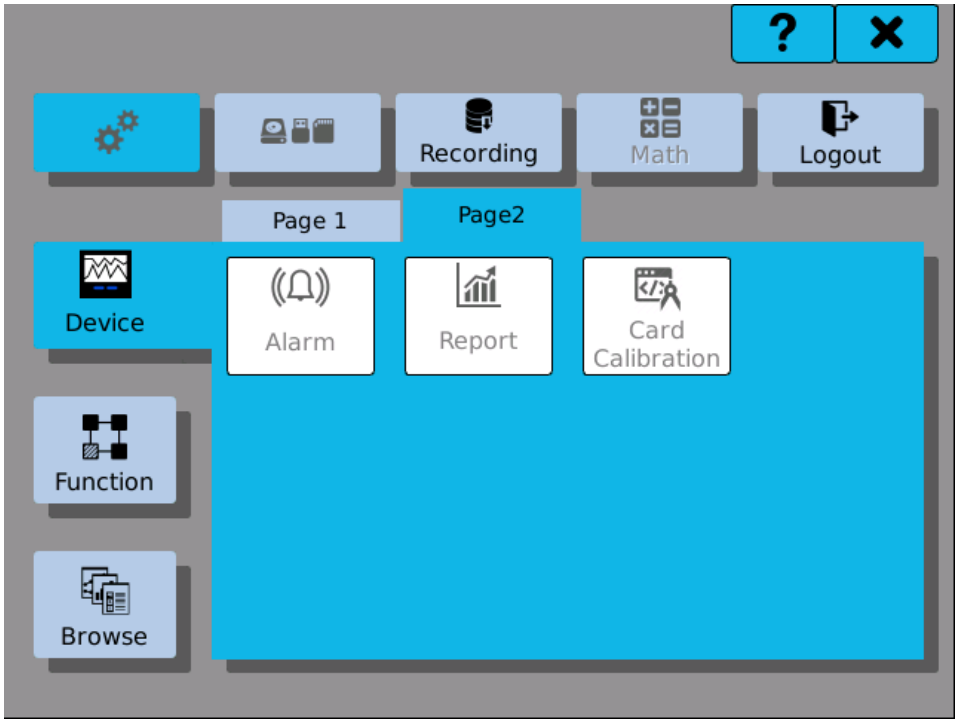


Mathematical functions - turn on/off. If counting is active, the button is tinged green.

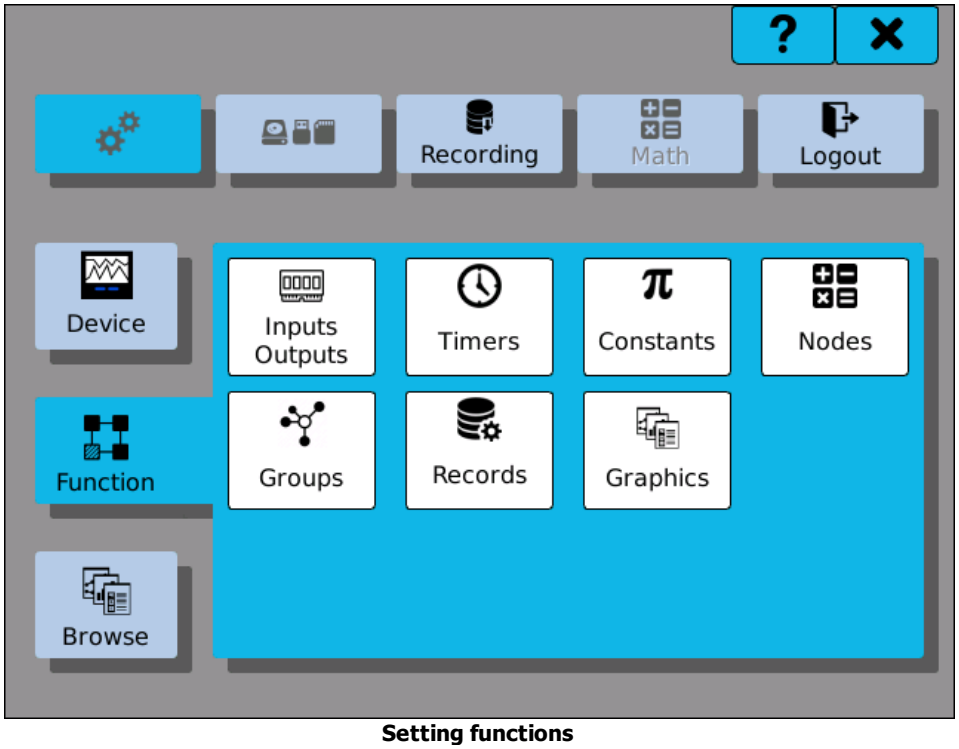
User logout.



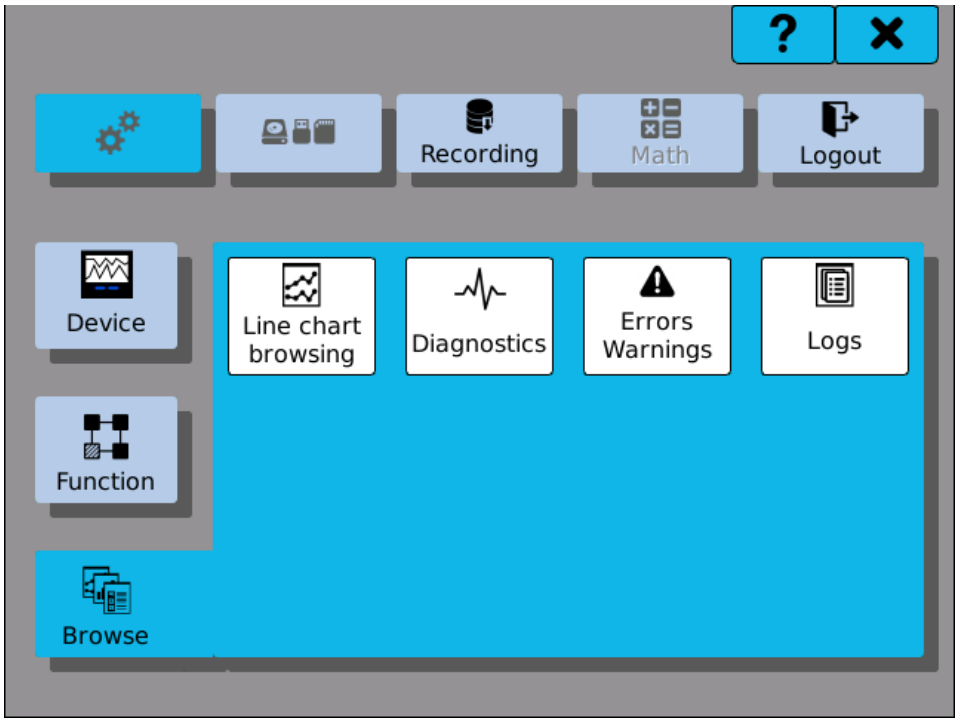
Device settings (Page 1)



Device settings (Page 2)



Setting functions



Viewing

5 Setting the input part

5 Setting the input part

There are four groups in the "Setting the input part" window.


Setting channels. Here you will find all settings from the I/O cards.


Setting timers. Here you will find all timer settings.


Setting named constants. Here you will find all settings of the named cards.


Setting nodes. Here you will find all nodes settings.

5.1 Input and output cards

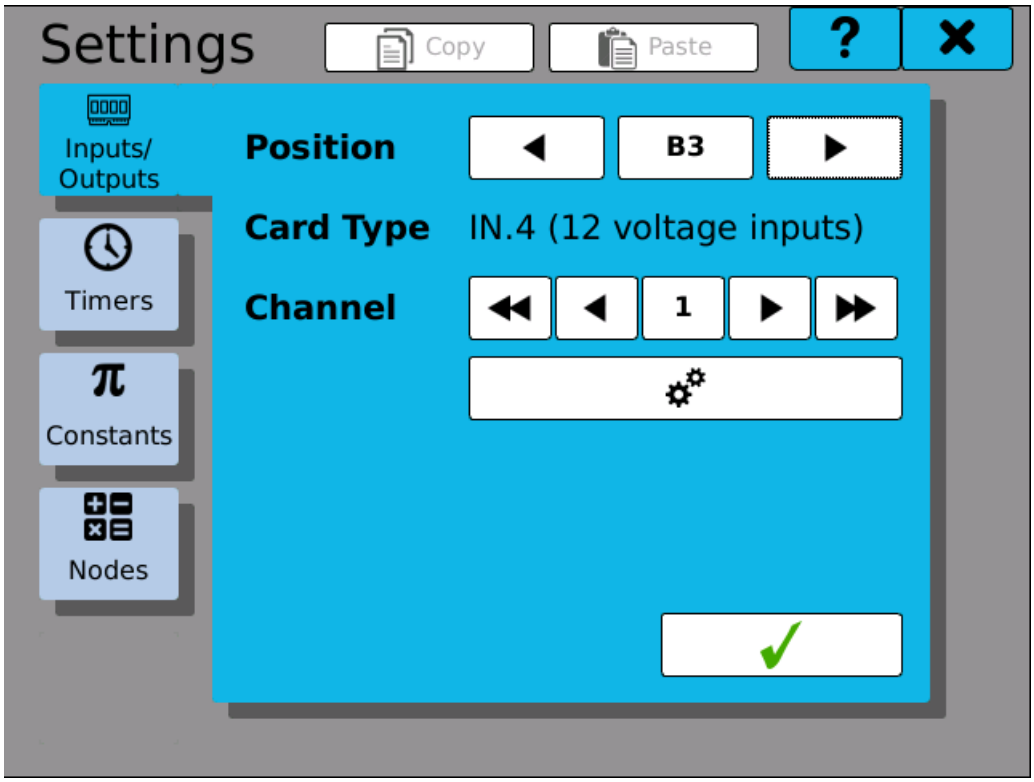
Each of the I/O cards has at least one channel, which itself performs some recalculations.
The following parameters can be edited in the settings:

Position — Position of the card that we want to set. Buttons ◀ ▶ serve for rolling among the plugged-in cards (e.g. if there is no plugged-in card on position 3, the setting will not offer it).

Type — Type of the card that is logged-in on a specified position. Type of the card cannot be changed. This is just an informative text.

Channel number — Number of the channel that we want to set. Buttons ◀◀ ◀ ▶ ▶▶ serve for rolling among the channels. Number of possible adjustable channels is determined by the card, which we set.

The button  is used to navigate to the settings of the selected channel.

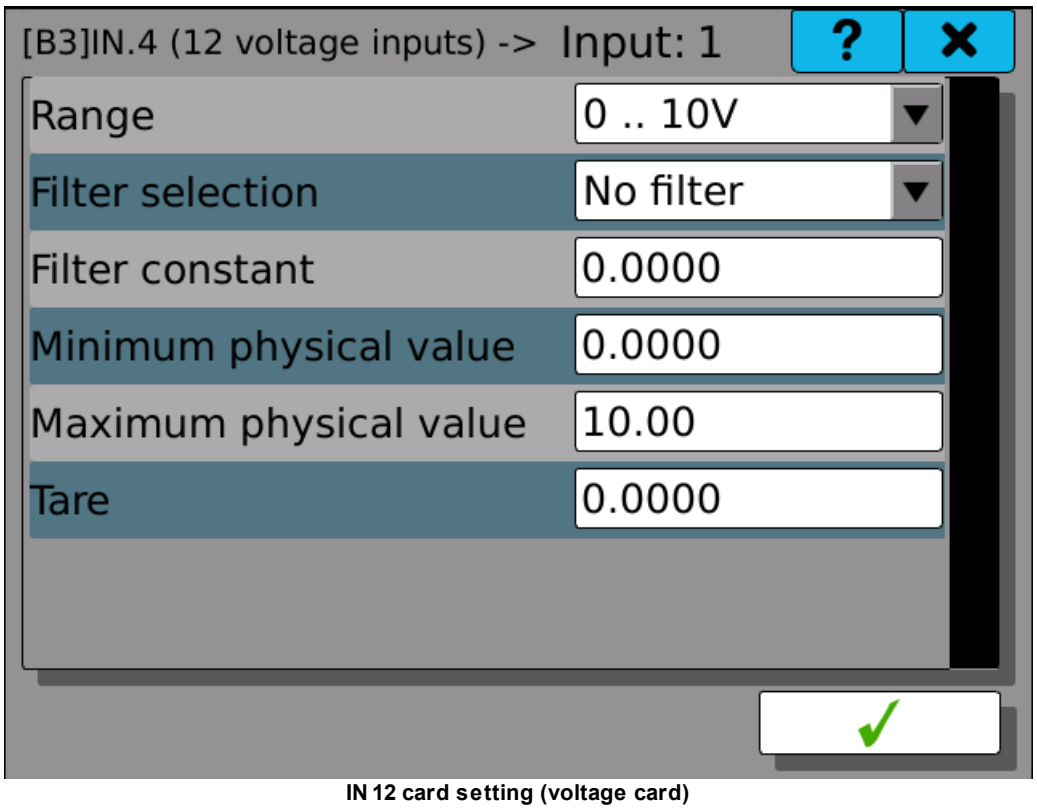


Channel setting

5.1.1 Channel settings

In the input and output settings you will find a summary of all setting parameters, which may be performed on the respective card and on the respective input or output. These are e.g. the range, filter and filter constants settings, measurement rate, minimum and maximum limit value, tare and many others.

Setting of individual cards is described in the next chapters.



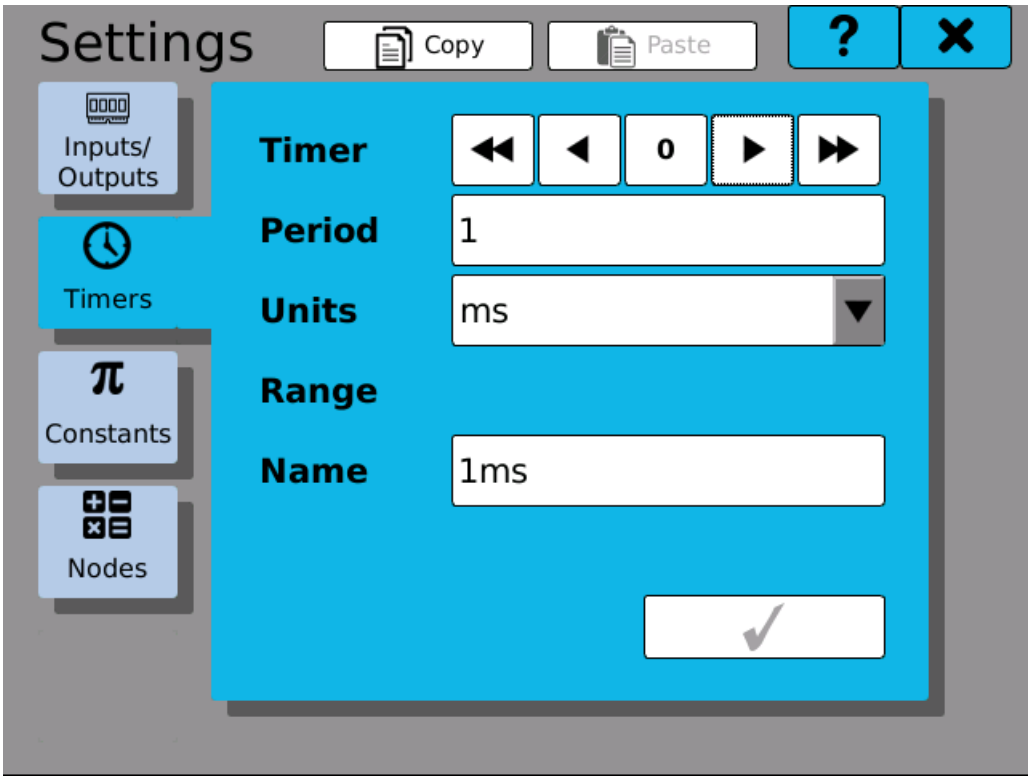
IN 12 card setting (voltage card)

5.2 Timer

Timers provide a periodic execution of various tasks of the recorder.
The following parameters are edited in the settings:

Timer	Number of the currently viewed or edited timer. It obtains values from 0 to 7. Buttons ◀◀ ◀ ▶ ▶▶ serve for rolling among the nodes.
Name	Name of the timer. Under this name you will see the timer in the next settings of the device. The name can consist of up to 32 characters.
Unit	Unit value reported in the Period.
Range	Range of permitted values that can be entered into the Period.
Period	Time, after which the timer related operations repeat.

Using buttons  **Copy** and  **Enter** you can copy complete settings among the channels.



Timer setting

5.3 Constant

Constants are spontaneously unchangeable named values for further use.
The following parameters are edited in the settings:

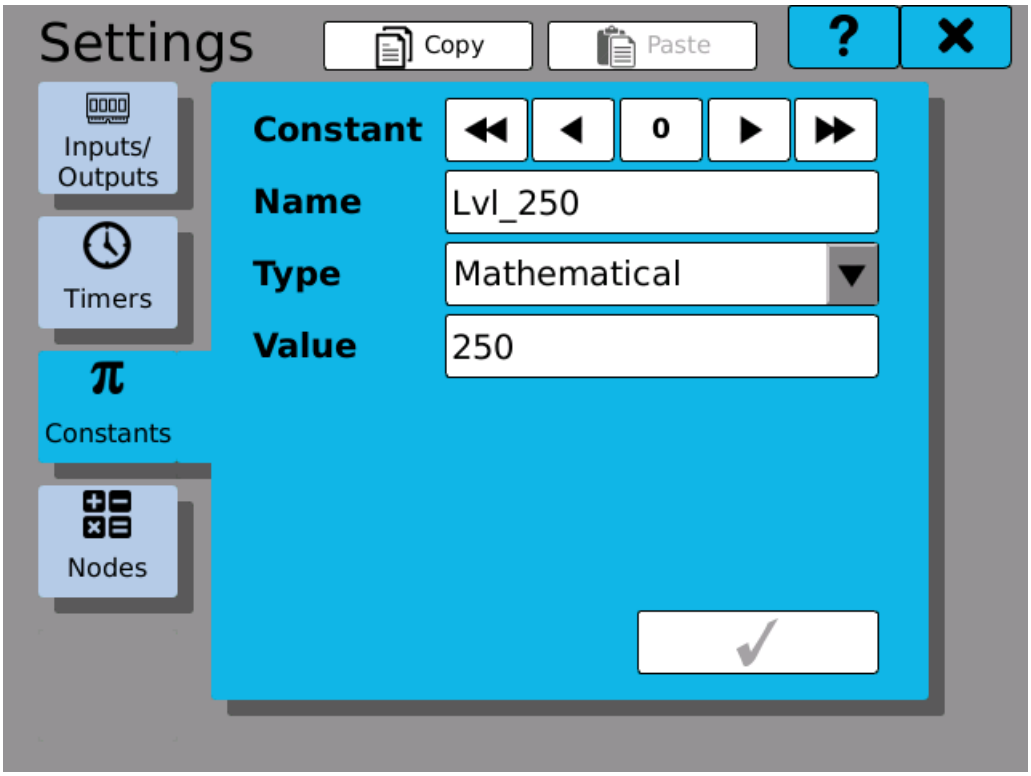
Constant Number of the currently viewed or edited constant. It obtains values from 0 to 63. Buttons ◀◀ ◀ ▶ ▶▶ serve for rolling among the constants.

Name Name of the constant. Under this name you will see the constant in the next settings of the device. The name can consist of up to 32 characters.

Type Type of the constant. Mathematical type indicates the number with a decimal point. Logical type indicates state 0 (untruth) or 1 (truth).

Value Value of the constant. In case of the mathematical type, it relates to a numerical value, in case of the logical one, you can enter 0 (untruth) or 1 (truth).

Using buttons **Copy** and **Enter** you can copy complete settings among the constants.



Setting named constants

5.4 Nodes

Mathematical or other calculations, the aim of which is to make the requested adjustments of the measured signals or to prepare values for the outputs.
The following parameters are edited in the settings:

Node Number of the currently edited node. It obtains values from 0 to 255. Buttons ◀◀ ◀ ▶ ▶▶ serve for rolling among the nodes.

Name Name of the node. Under this name you will see the node in the next settings of the device. The name can consist of up to 32 characters.

Timer Selection of all defined timers. The timers determine with what period values will be prepared, calculations made or value storage filled in.

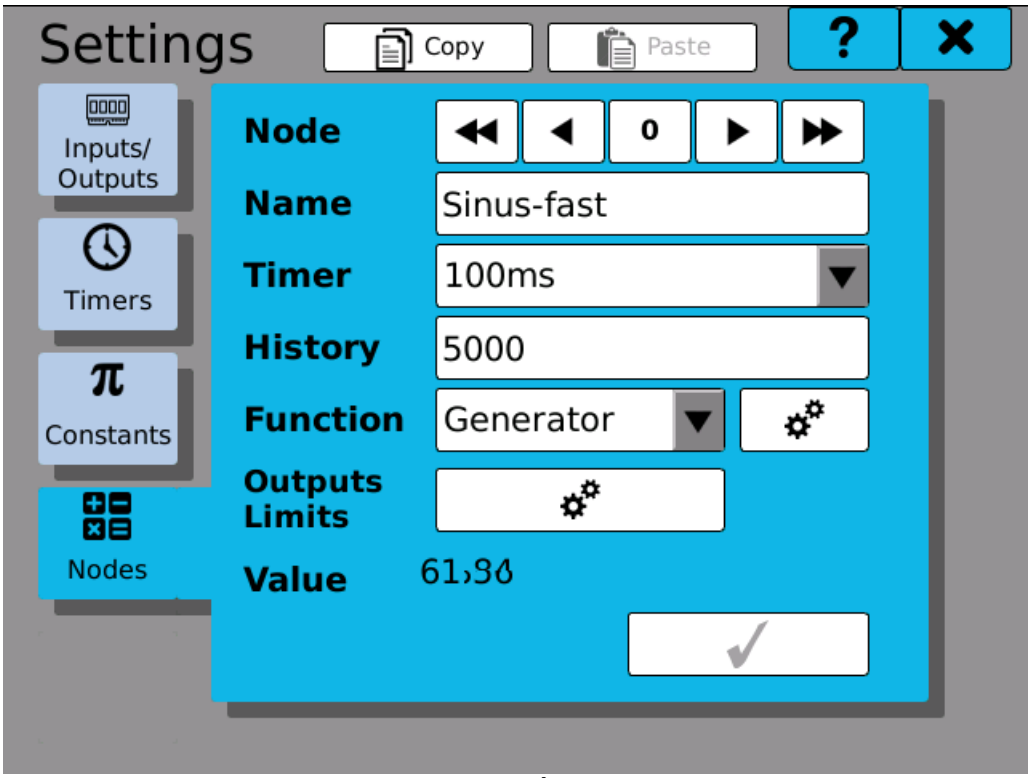
History Number of values that are recorded in the node and that can be pictured later as a chart or similar. These values get lost when power is turned off. When a preset number is reached, values are overwritten.

Function Specifies the function that the node will perform.
Functions are:
Not used - The node does not count and is taken for invalid.
Mathematics - The node counts from preset mathematical formulas.
IO storage - The node stores the measured values in memory.
Comparator - The node compares two values.
Generator - The node generates values.
Further function setups and specifications of input and output values can be managed when using the button ⚙ next to the selection.

Output Limits A click on the setting button ⚙ takes you to the dialog for setting limits and outputs of the current node.

Value Calculated value of the node with the specified settings.

Using buttons **Copy** and **Enter** you can copy complete settings among the nodes.



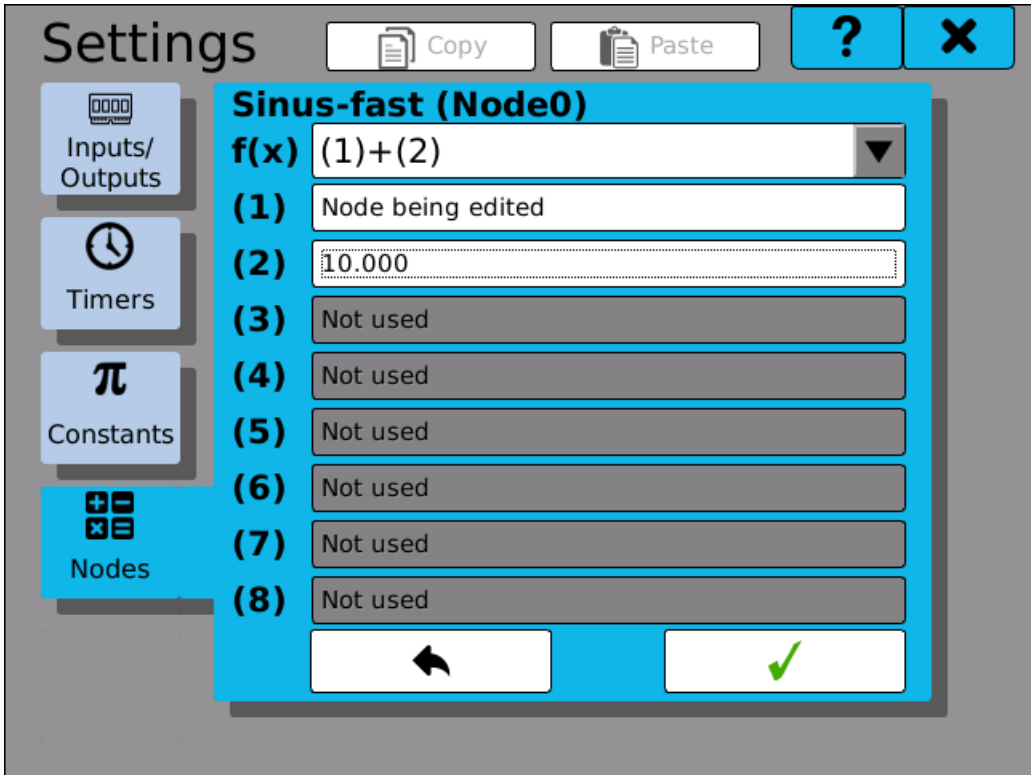
Nastavení uzlu

5.4.1 Mathematical functions

They make calculations of basic mathematical operations like adding, subtracting, multiplying and dividing between two to eight parameters.
The following parameters are edited in the settings:

f(x)	Function used for calculations. The name matches the order of calculation and parameters. For example: Entering (1) + (2) means that parameter 2 should be added to parameter 1.
(1),(2)... (7),(8)	Parameters of the functions.

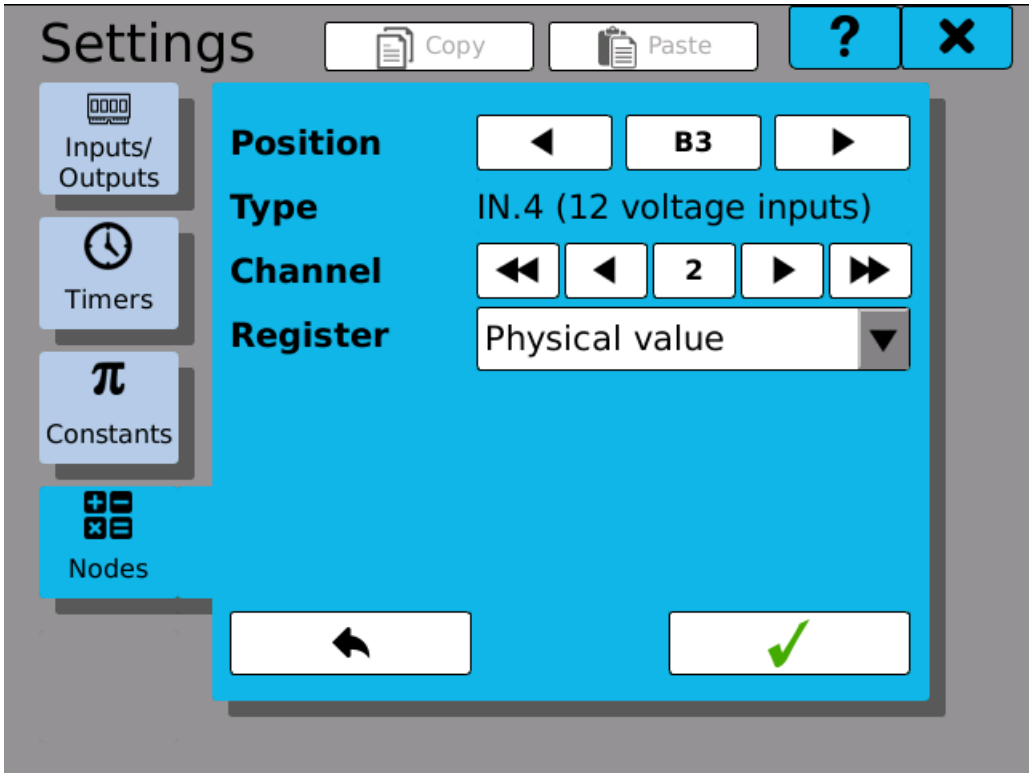
On the line of the function parameter there is the name of the node used, of the input, output, named constant or numeric value. If no value is assigned to the parameter, inscription **"Not used"** appears on its line.
Clicking on the parameter line opens a window for parameter selection (see chapter **"Parameter selection window"**), where you can add, change or remove the parameter value.



Setting mathematical functions

5.4.2 IO buffer

It is used mainly for displaying the measured values on the screen. It stores the input or output data into memory and when a running chart is displayed, we can also see their throughout history. The storage capacity is determined by the entry in the setup of the **History** node. Storage data do not serve as a record and therefore no backup is available. If the recorder is switched-off or switched-on, the storage data will be lost.
The following parameters are edited in the IO storage settings:



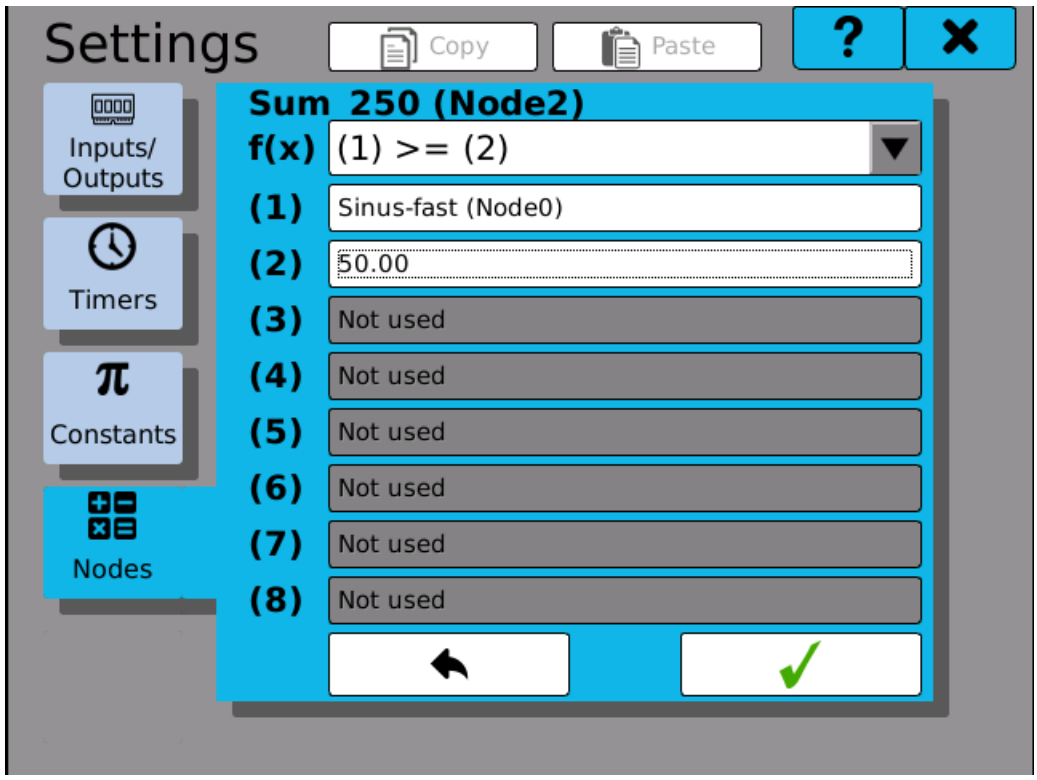
IO buffer setting

5.4.3 Comparator

Compares two or more parameters among themselves and on the basis of the comparison result it sets the value of the node on 1 (truth) or 0 (untruth).
The following parameters are edited in the comparator settings:

f(x)	Function used for comparison. The name matches the order of calculation and parameters. For example: Entering (1) >= (2) means that we compare whether parameter 1 is bigger than or equals parameter 2.
(1),(2) ... (7),(8)	Parameters of the comparator.

On the line of the comparator parameter there is the name of the node used, of the input, output, named constant or numeric value. If no value is assigned to the parameter, inscription **"Not used"** appears on its line.
Clicking on the parameter line opens a window for parameter selection (see chapter **"Parameter selection window"**), where you can add, change or remove the parameter value.



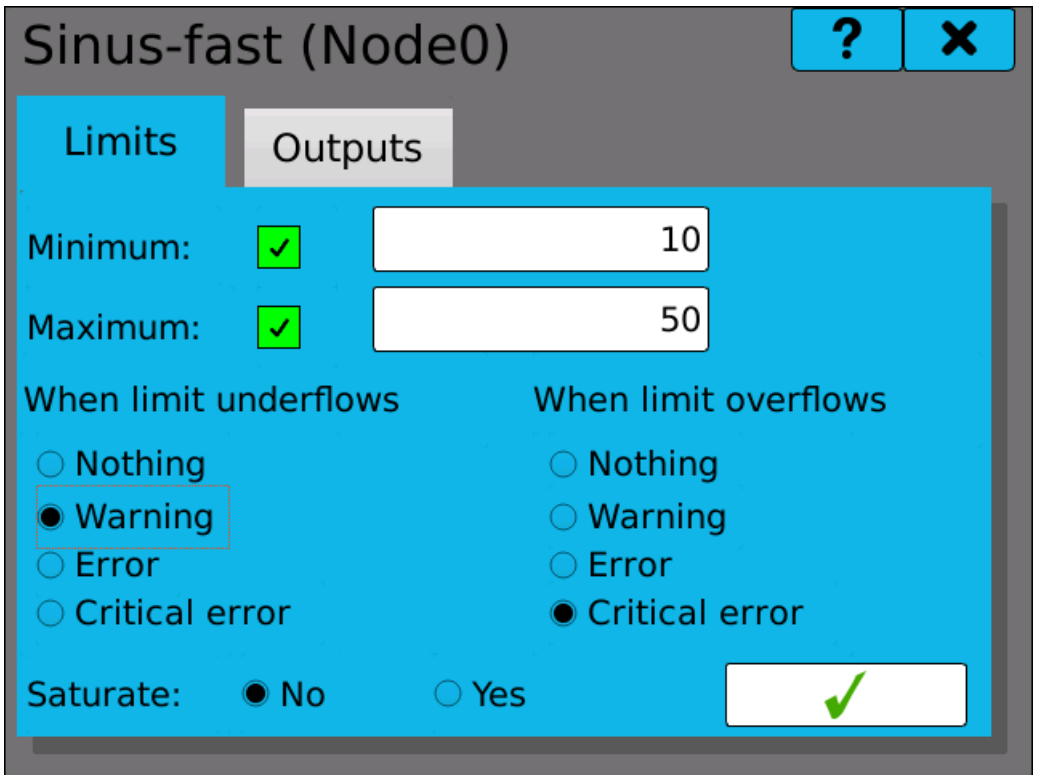
Comparator settings

5.4.4 Setting outputs and limits

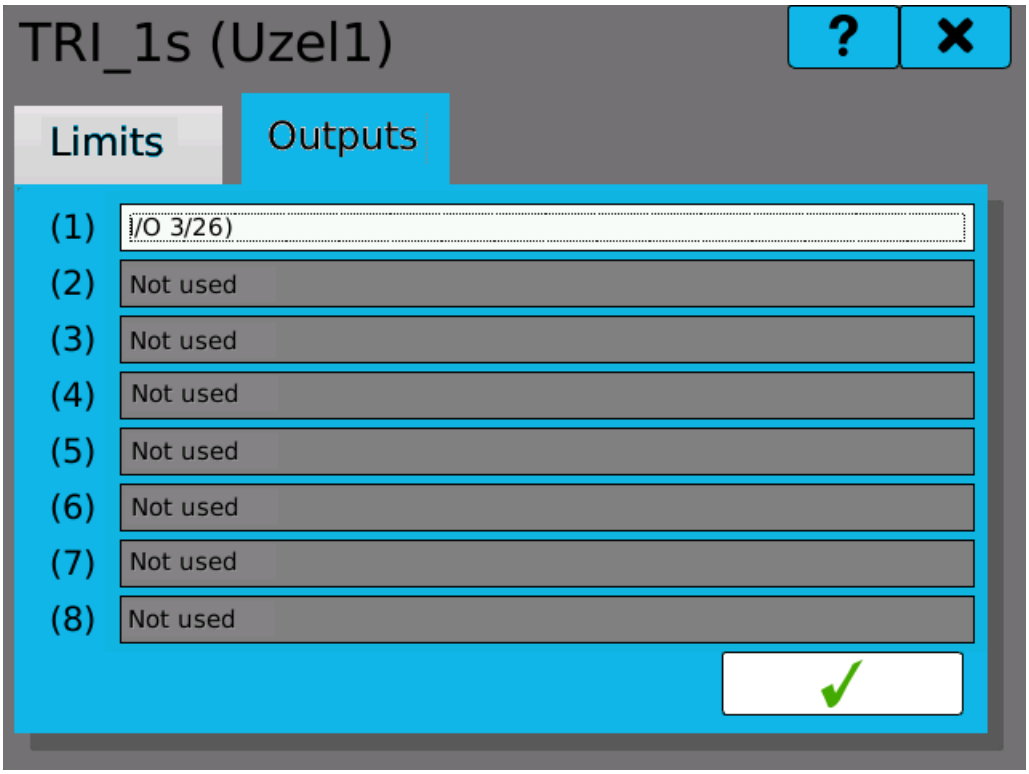
By clicking on the tab you can switch between setting limits and setting outputs.
The following parameters are set in the limits settings:

Minimum	Clicking and ticking the square authorizes the lower limit. Limits of the lower limit can be set by clicking on the value line.
Maximum	Clicking and ticking the square authorizes the upper limit. Limits of the upper limit can be set by clicking on the value line.
Saturate	If at least one of the limits is permitted, we can authorize or prohibit saturation (cutting down to minimum or maximum).
Underflow limits	We select in the table what should happen in case of underflow of the lower limit. The options are: Nothing, Warning, Error or Critical error.
Overflow limits	We select in the table what should happen in case of overflow of the upper limit. The options are: Nothing, Warning, Error or Critical error.

In the output settings we connect e.g. relay outputs on the cards, analogue outputs or logical outputs. Clicking on the authorized line opens the parameter selection window, in which we find and connect the desired output to the edited node.



Limits



Outputs

5.4.5 Generator

It is is used to generate signals sinus, saw, triangle, rectangle, or a random course.
The following parameters are edited in the generator settings:

Type Clicking on the button displays a choice of six types. The types are rising saw, declining saw, triangular waveform, rectangular waveform, sinus function graph and random data.

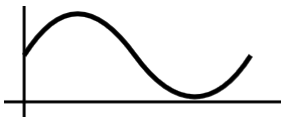
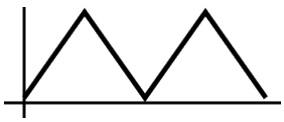
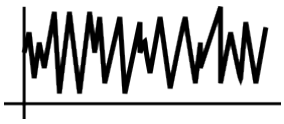
Minimum Minimum function range.

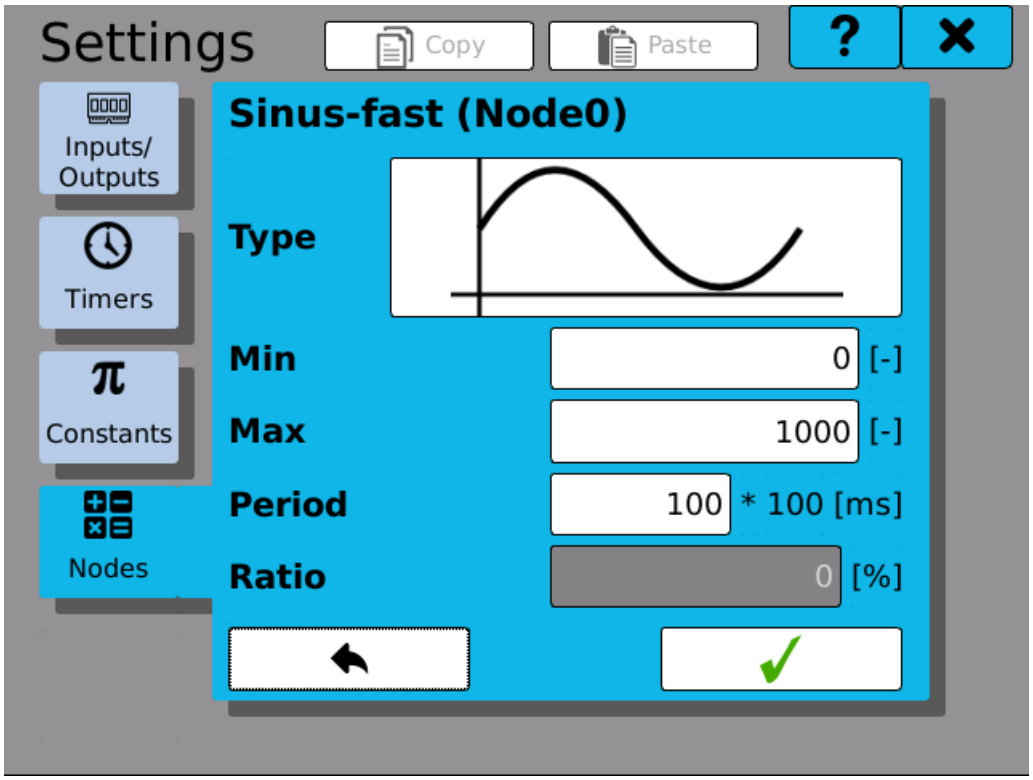
Maximum Maximum function range.

Period Time to replay the function. Period can be set only for the functions that require it.

Duty cycle The percentage signal ratio between the length of the front and rear edges, or if the signal is in its maximum or minimum. The specified percentage always indicates the length of each front edge or the length of the maximum value (e.g. if we have 20% - 20% of the period is in maximum and 80% of the period is in minimum). Duty cycle can be set only for the functions that require it.

List of types:

	Declining saw. Setting minimum, maximum and period.
	Rising saw. Setting minimum, maximum and period.
	Function sinus. Setting minimum, maximum and period.
	Rectangle. Setting minimum, maximum, period and duty cycle.
	Triangle. Setting minimum, maximum, period and duty cycle.
	Random signal. Setting minimum and maximum.



Signal generator

6 Overview of input and output cards

6 Overview of input and output cards

Basic information and settings for the IO plug-in cards.

6.1 IN.6

IN.6 is a 12-entry card for the measurement of current loops.

7 Setting output and graphic parts

7 Setting output and graphic parts

You can set three groups in the setting window of the output part.


Setting groups.


Setting screens.


Setting records.

7.1 Screens

Setting graphic display of the measured values.
The following parameters can be edited in the settings:

Screen Number of the currently edited screen. It obtains values 0 to 15. Buttons ◀◀ ◀ ▶ ▶▶ serve for rolling among the screens.

Name Giving name to the screen. Under this name you will see the screen in the next device settings. The name can consist of up to 32 characters.

Group Selection of one of the preset parameter groups. If there is one preset element on the screen (from or without the group), the selection cannot be changed. To be able to change it, you have to erase settings of all the graphic elements of the screen.

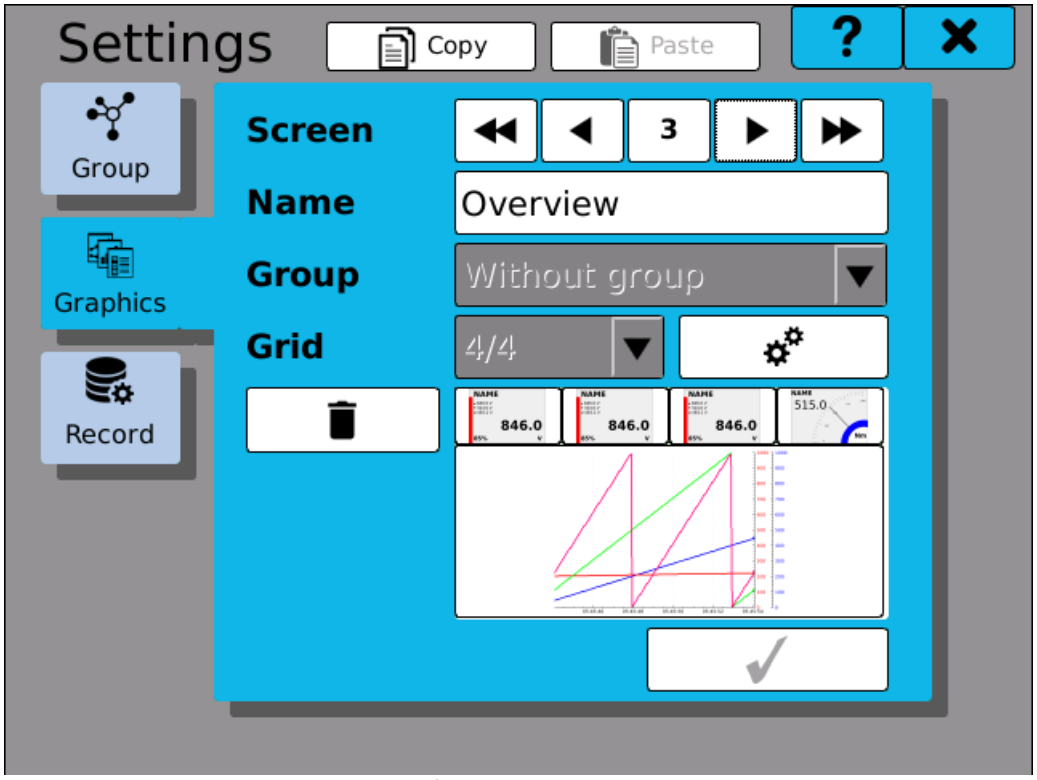
Arrangement Selection of a grid for the arrangement of graphic elements. Standard arrangement is 4x4. Another options are 5x5, 3x4 a 4x3.

Using button  you get to settings and arrangement of graphic elements on the screen.

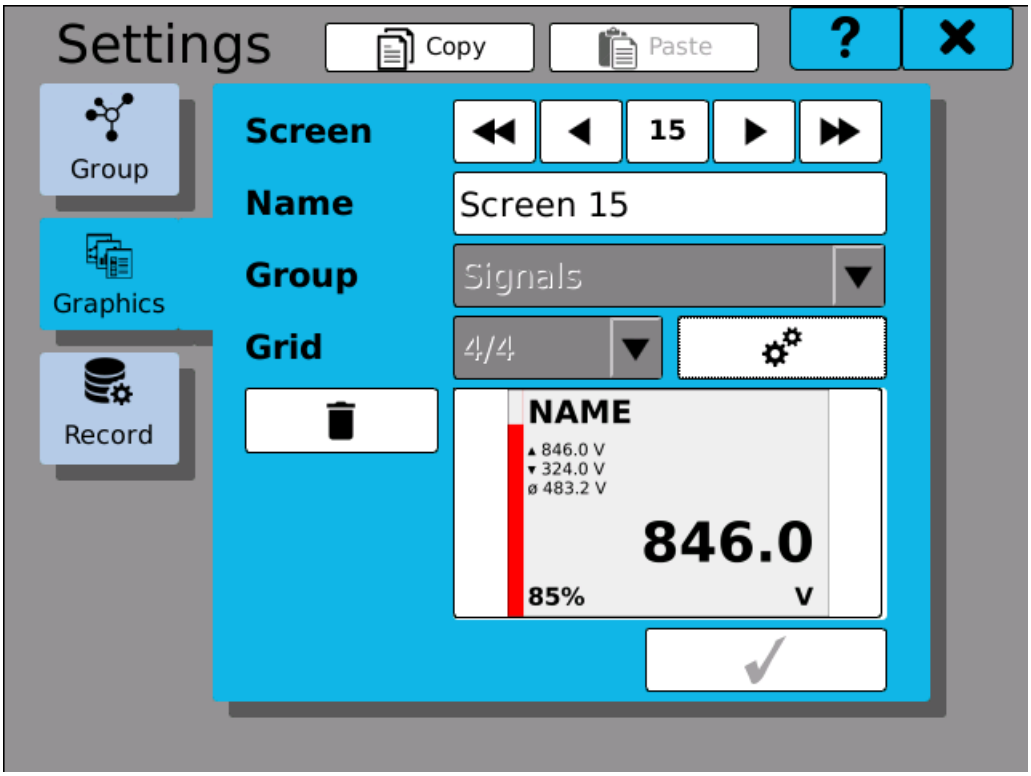
Under the grid there is a graphical preview of the screen and of the elements arranged in the screen. If there is any vacant part in the graphical preview of the screen, it is filled in by the symbol  .

Using buttons  **Copy** and  **Enter** you can copy complete settings among the screens.

Button  **Erase** serves for erasure of all graphic elements of the screen.



Screen settings



Defined overview screen

7.1.1 Graphics configuration

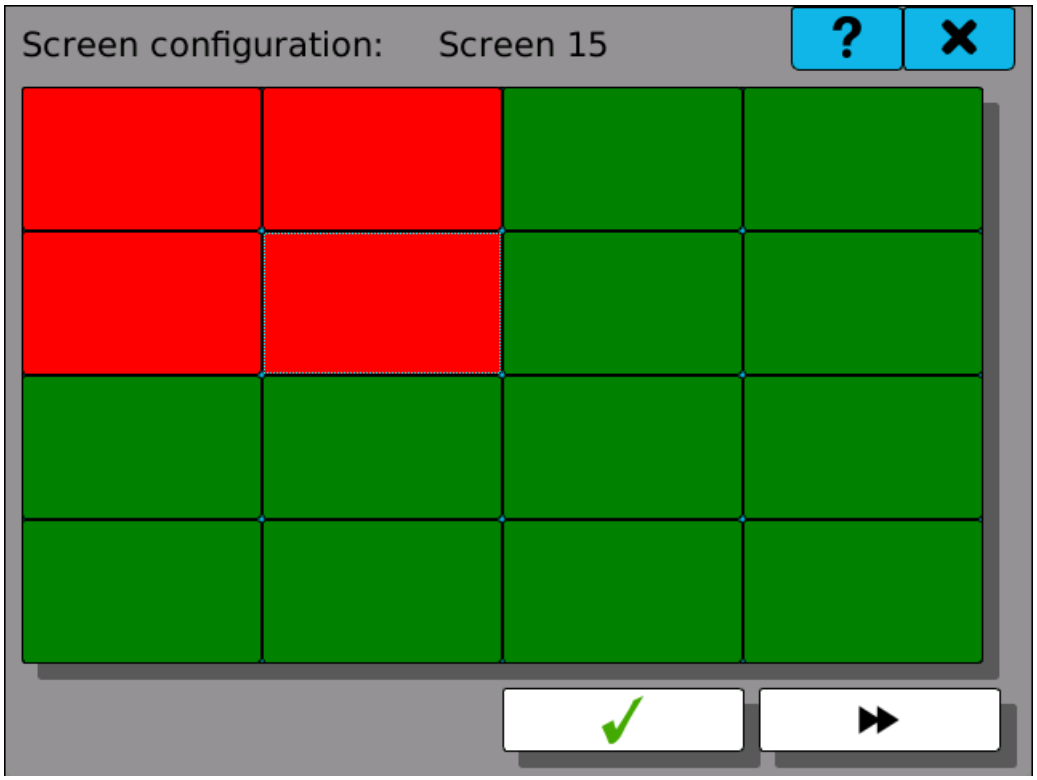
It is used for a practical configuration of the various visual elements on the screen.

In this configuration we see a grid of green rectangles. Into each of the rectangles you can insert one element. You can choose more than one rectangle at a time and the display element takes the size of the marked field. You can select the rectangle by clicking on one of them (upper left corner of the element) and it will turn red. Any other click on each rectangle **under** or **to the right** from the selected one (lower right corner of the element) will select the area of the display element with red color.

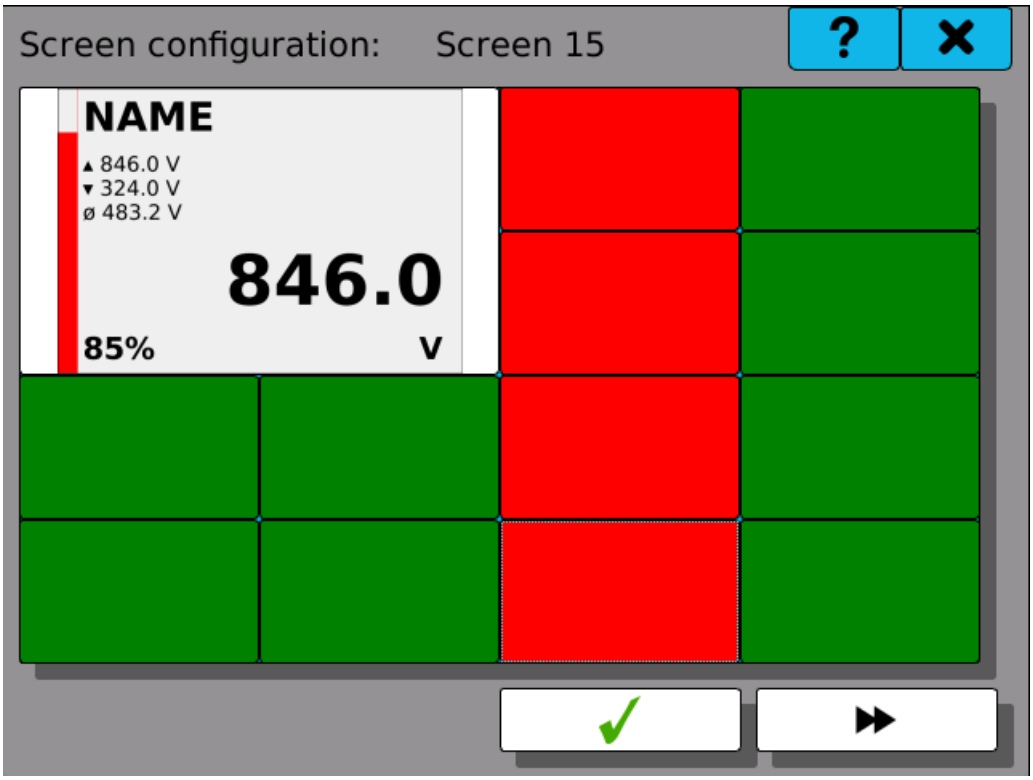
After selection of the desired area, clicking the button takes you to the screen for setting the display element, its style and parameters.

Upon completion of setting styles and parameters of the display element, the selected area will change into the image of this element. By clicking on the icon you can edit or erase the respective element. If there is space on the screen, you can add another element by selecting again the rectangle area and by clicking the button.

Setting of the graphic elements on the screen is saved by the button .



Area selection for the display element



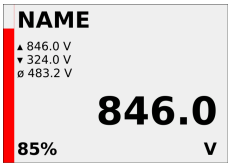
Adding 1 element and selection of the area for another element

7.1.2 Setting style and parameters

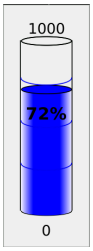
It is used for setting the appearance of the graphic item and the quantity, which it displays.
The following parameters can be edited in the style and parameter settings:

Type	Clicking on the button displays a choice of six types of display elements. The button  takes you to the advanced options that are specific for each display element.
Value Range	The range of values visible on the display element.
Para-meters	One to four parameters displayed on the display element. Clicking on the line takes you to the parameter selection window (see chapter **"Parameter selection window" and "Selecting items from the group"**). By clicking on the colored rectangle next to the parameter line you can choose the color of the parameter.

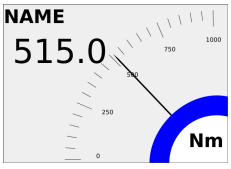
Types of display elements:



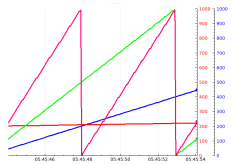
Numeric display with bargraph. Percentage figure indicates the input value in proportion to the given range. There is a possibility of displaying minimum, maximum and average of the measured values.



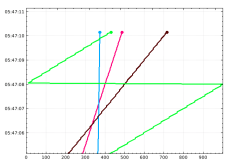
Bar chart indicating minimum and maximum value range and the percentage displayed in the element.



Pointer measuring instrument with numeric values.



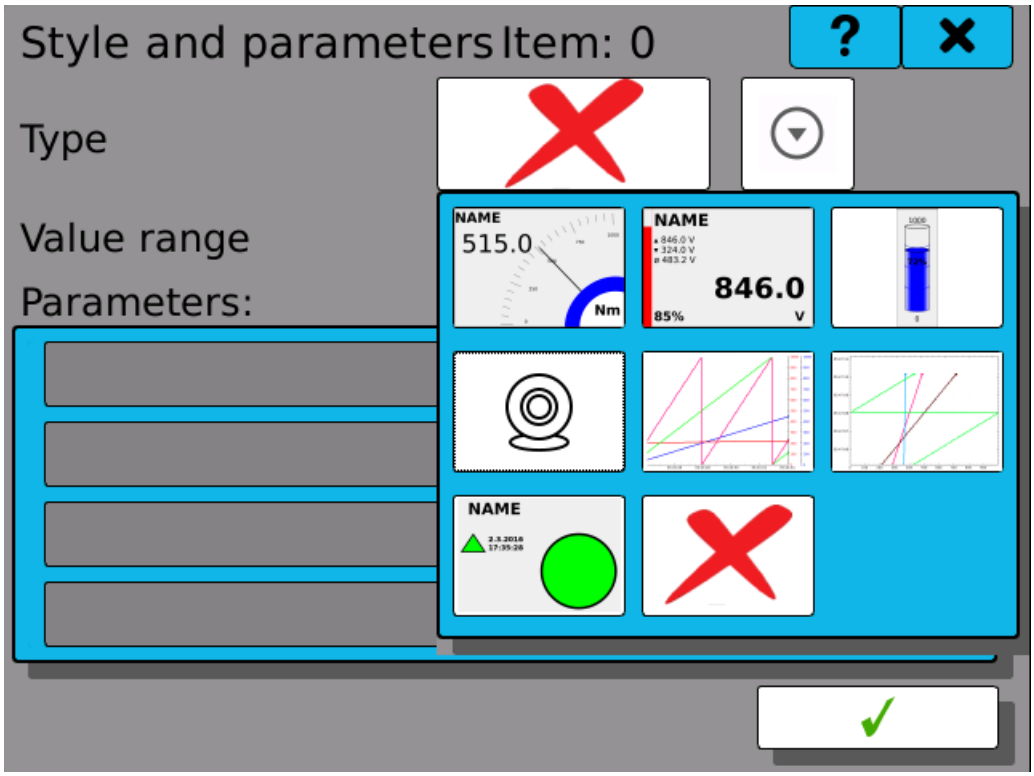
Running chart with the X axis as a time axis (horizontal). Up to four parameters simultaneously.



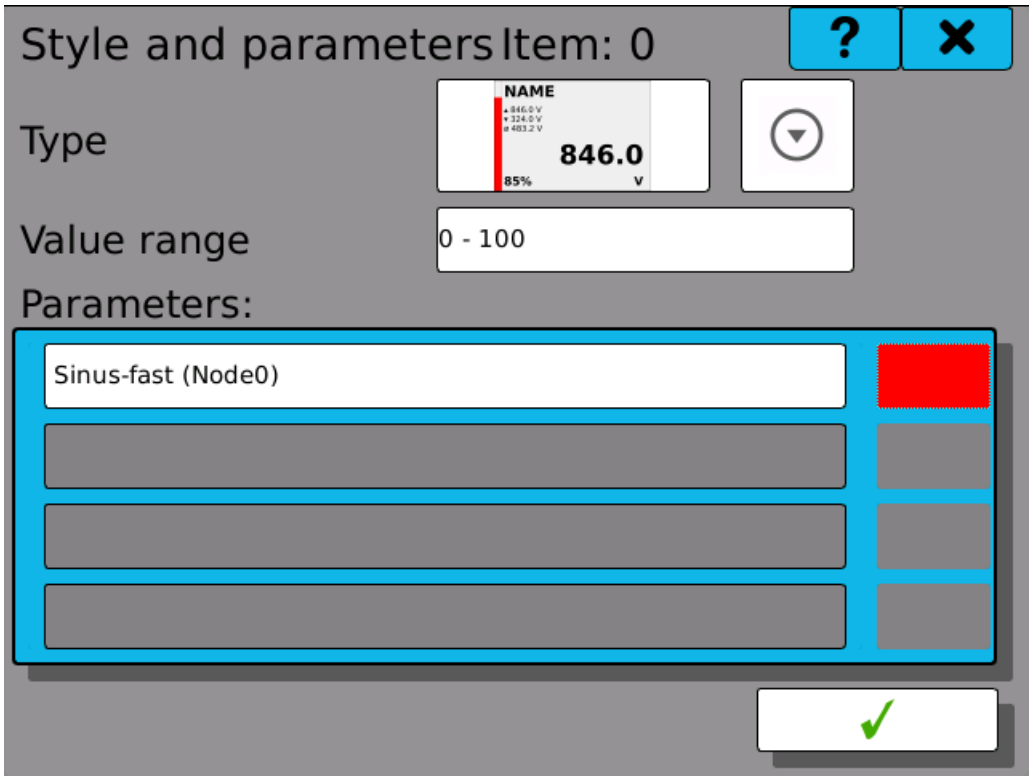
Running chart with the Y axis as a time axis (vertical). Up to four parameters simultaneously.

IP camera.

No style selected.



Style selection



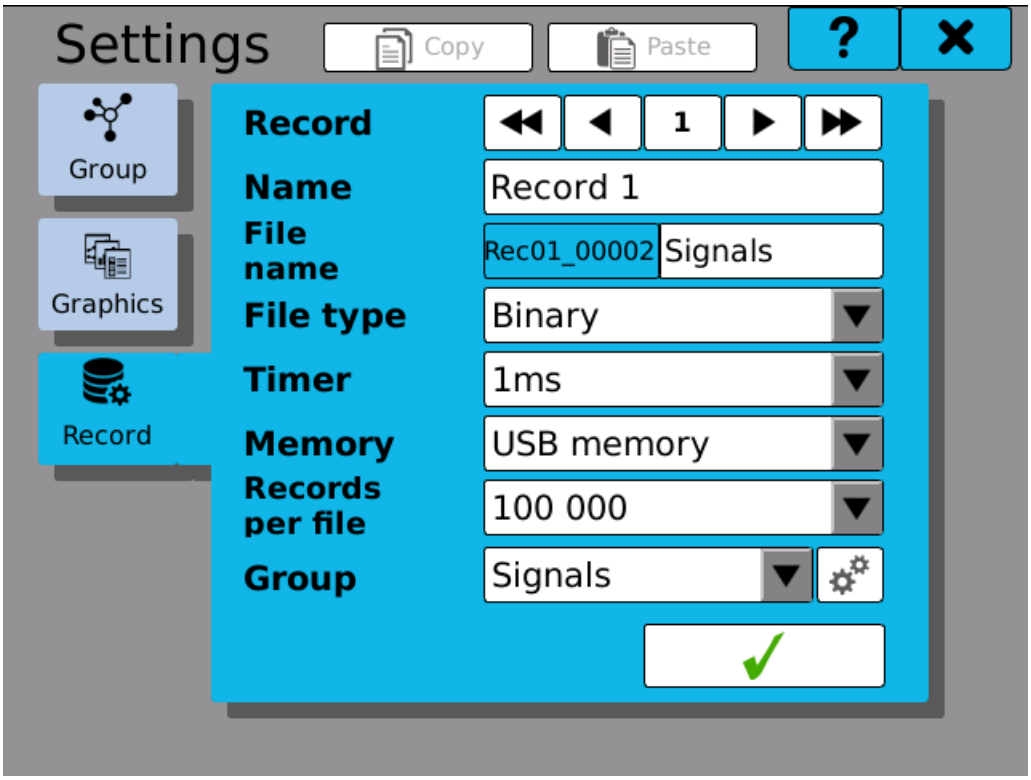
Adding parameter and color

7.2 Records

They determine what, when, how and where should be recorded. There is a possibility of setting recorded value from measured or calculated values, of determining period of recording in compliance with the timers, selecting format of the output file and a memory media to be recorded in.
The following parameters are edited in the records settings:

Record	Number of the currently viewed or edited record. It obtains values from 0 to 16. Buttons ◀◀ ◀ ▶ ▶▶ serve for rolling among the nodes.
Name	Name of the record. Under this name you will see the record in the next settings of the device. The name can consist of up to 32 characters.
File name	Name of the file, which has a fixed beginning in the form of RECXX_YYYYY, where XX is the number of the record. Thus from 00 to 15 and YYYYY makes the serial number of the file. Sequential file number increases by one each time when the number of records in one file reaches the value specified in the "Entries in the file", or if you interrupt recording and start it again.
File type	Supported types of stored files are: Binary files or CSV.
Timer	Selection from all defined timers. It determines with what period the values will be recorded.
Memory	Memory medium, on which the logs will be recorded. USB, SD card or internal memory of the recorder.
Records in the file	Maximum number of values recorded into one file. Exceeding this value will create a new file.
Group	Selection of the set group of measured or calculated values that will be recorded. If the group is selected, the record should be pre-filled by all items in the group. The button  opens administration of the items stored under the given record.

Using buttons  **Copy** and  **Enter** you can copy complete settings among the records.

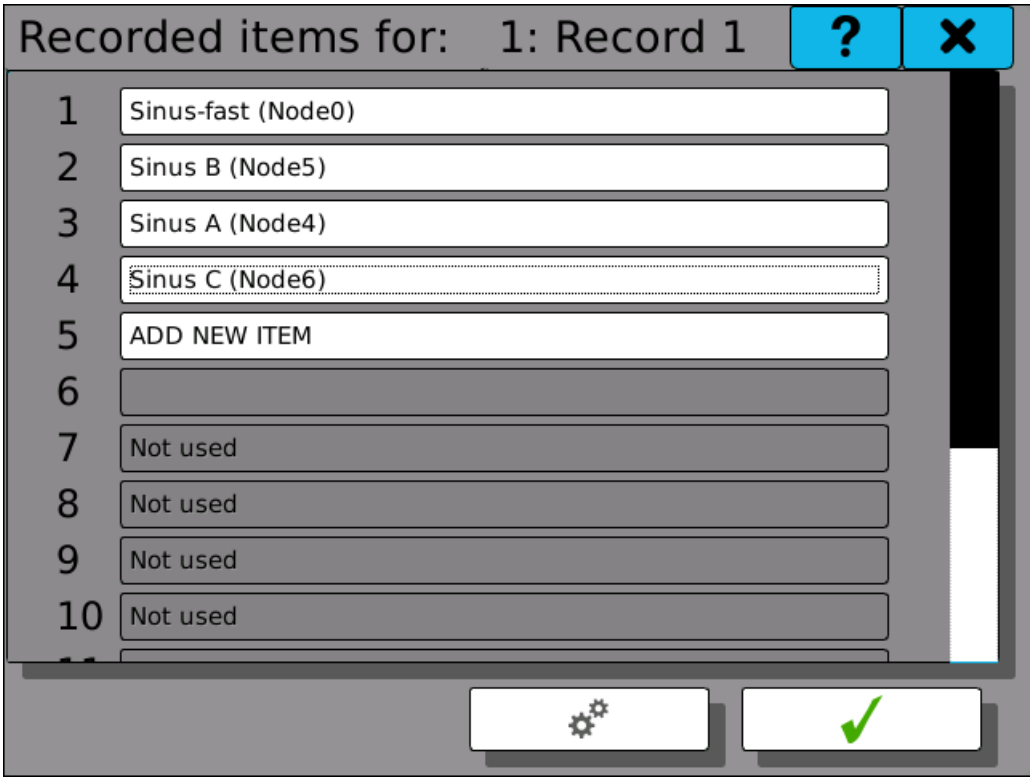


Setting records

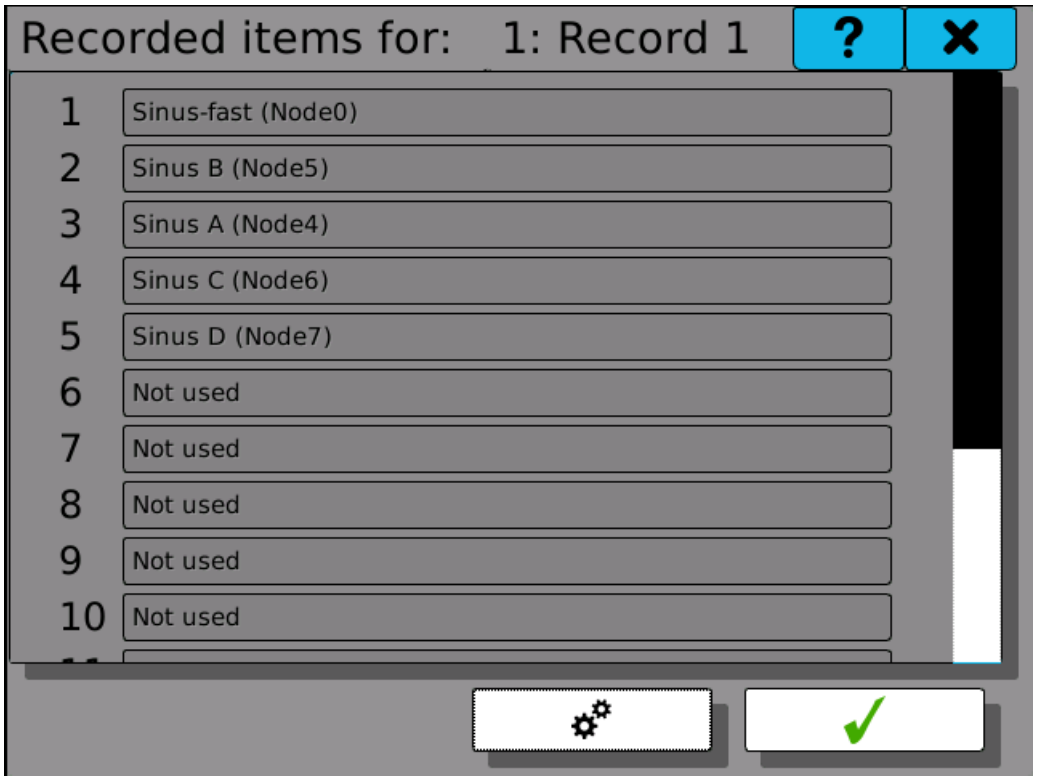
7.2.1 Adding parameters

There is a list of 16 buttons in the adding parameters window. The logic of adding and deleting parameters is as follows:
Adding parameters: From top to bottom by clicking the button **"Add new parameter"** (parameter is added and the next button is released).
Deleting parameters: From bottom to top by clicking the last button with a parameter, and by selecting the option **"Not used"** in the parameter selection window (see chapter **"Parameter selection window"**).

If a group is used, by ticking the button  we can move to the group item selection.



Selecting items outside the group



Selecting items from the group

7.3 Groups

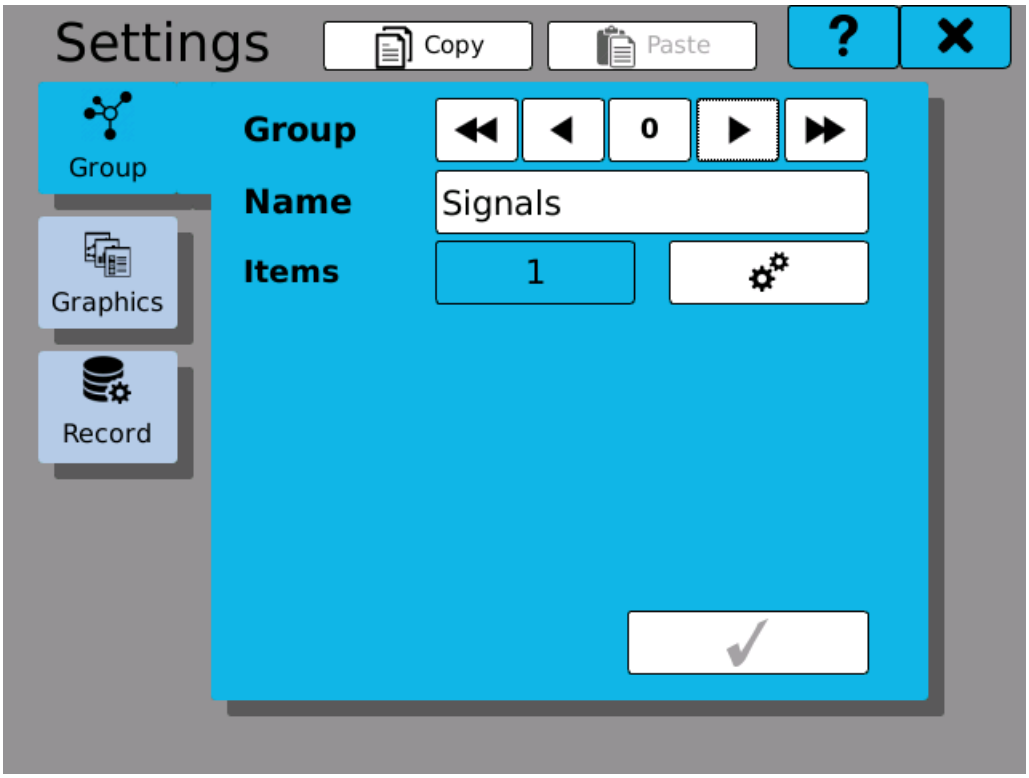
It serves to simplify the settings by grouping signals from the card channels, nodes or outputs (both relay and analogue), and it also simplifies their subsequent preset, which can be further used to create screens or records.

Group Number of the currently viewed or edited group. It obtains values 0 to 16. Buttons ◀◀ ◀ ▶ ▶▶ serve for rolling among the groups.

Name Name of the group. Under this name you will see the group in the next settings of the device. The name can consist of up to 32 characters.

Items Number of assigned values in the group. The button opens management of the items in the group, where you can edit, add or delete them.

Using buttons **Copy** and **Enter** you can copy complete settings among the groups.

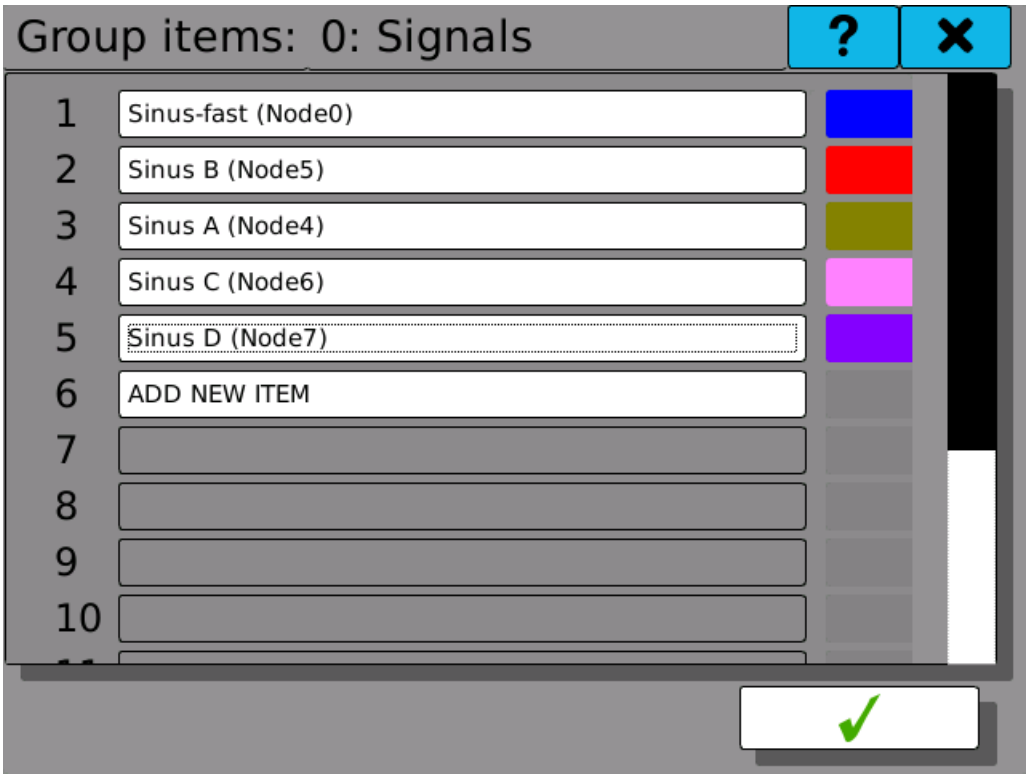


Setting groups

7.3.1 Adding items into group

There is a list of 16 buttons in the window for adding parameters and for their management. The logic of adding and deleting parameters is as follows:
Adding parameters: From top to bottom by clicking the button **"Add new parameter"** (parameter is added and the next button is released).
Deleting parameters: From bottom to top by clicking the last button with a parameter, and by selecting the option **"Not used"** in the parameter selection window (see chapter **"Parameter selection window"**).

Clicking the button **"Add new parameter" or a line with an item** opens the window with a selection of colors and with settings of the range.



Selecting items

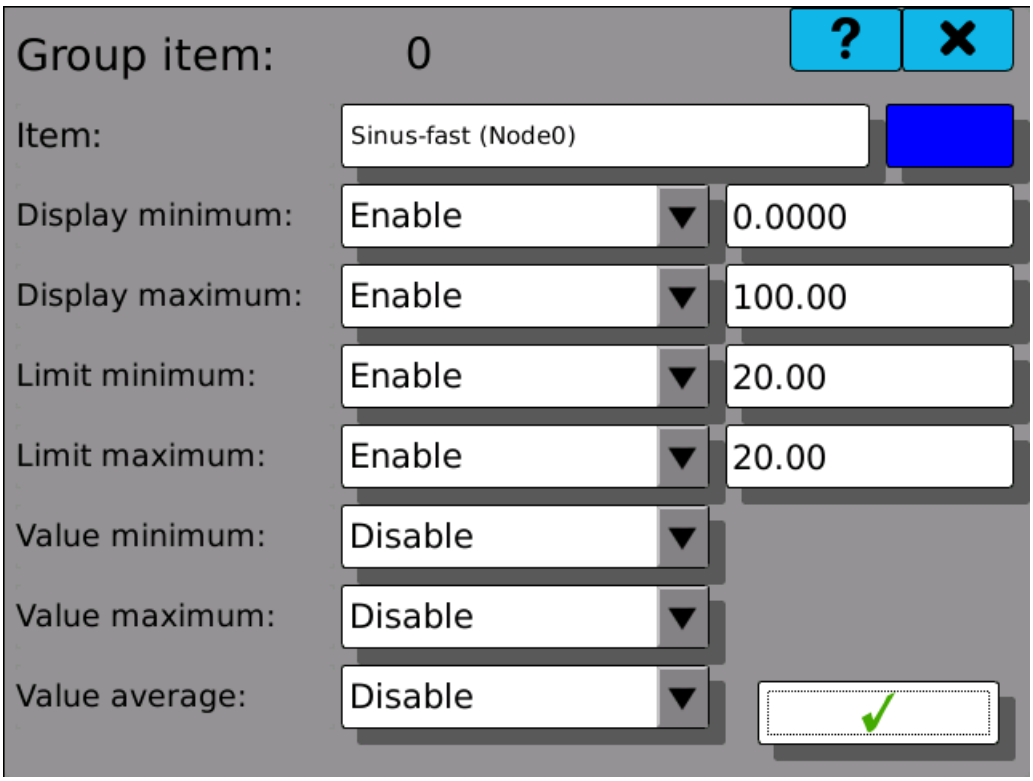
7.3.2 Item Editing

Selection of the item is done in the window for editing and parameter selection. Click on the white line opens item selection dialogue ,where we select the item. The color is chosen by clicking on the colored box with a selection of colors from a color palette.
There are 3 options for the selection of display and of a limit minimum and maximum: **"Disable"** means that it is not possible to use the display range from the group. **"Enable"** means that values entered in the lines can be used in other settings from the group. **"Inherited"** means that values entered in the item can be used in other settings from the group.
For the minimum, maximum and average values we specify, whether the values should be displayed on a graphical element or not.

Explanation:
Disable means that there is no preset parameter in the group and that the setup of this item from the group cannot be used for further settings of the graphic elements.
Enable means that there is a preset parameter in the group and that the setup of this item from the group can be used for further settings of the graphic elements.
Inherited means that parameter gets its value from the previous setup of the node, input and constant. This is selected in the line "Item".

Display minimum and maximum specify display limits that may be used in setting the graphic elements as a display range of the element.
Limit minimum and maximum specify limits of the limit that may be used in setting the graphic elements. It will be displayed as a part of the color-coded graphical element. Limit minimum must be bigger than the display minimum and limit maximum must be smaller than the display maximum.

Minimum, maximum and average value specify the symptom of a graphic element that determines whether the reached minimum, maximum and average value should be displayed.



Item editing

8 Parameter selection window

8 Parameter selection window

There are five groups in the parameter selection window, from which the parameters can be selected.


Not used. Parameter will be erased.


I/O cards. It will select one of the card channels.

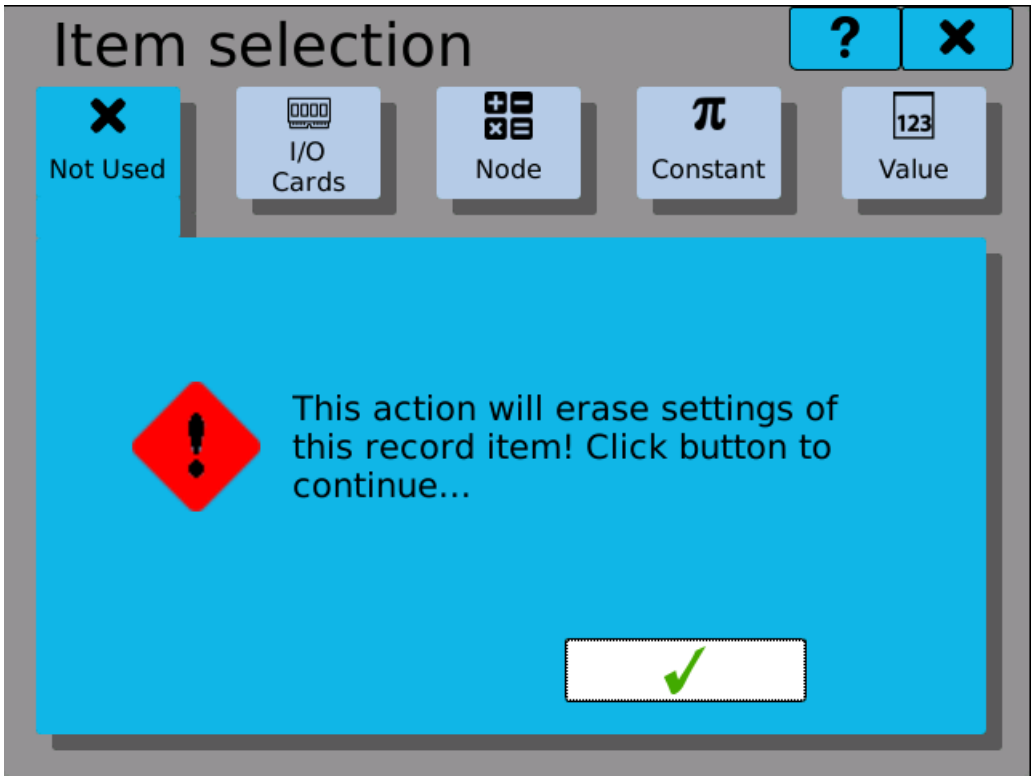

Node. It will select one of the nodes.


Constant. It will select one of the named constants.

Value. It will directly record the unchanging value.

8.1 Parameter "Not used"

Selecting this option you will erase the symptom used while setting records, screens, mathematical functions, and similar.



Selection "Not used"

8.2 Parameters from the I/O cards

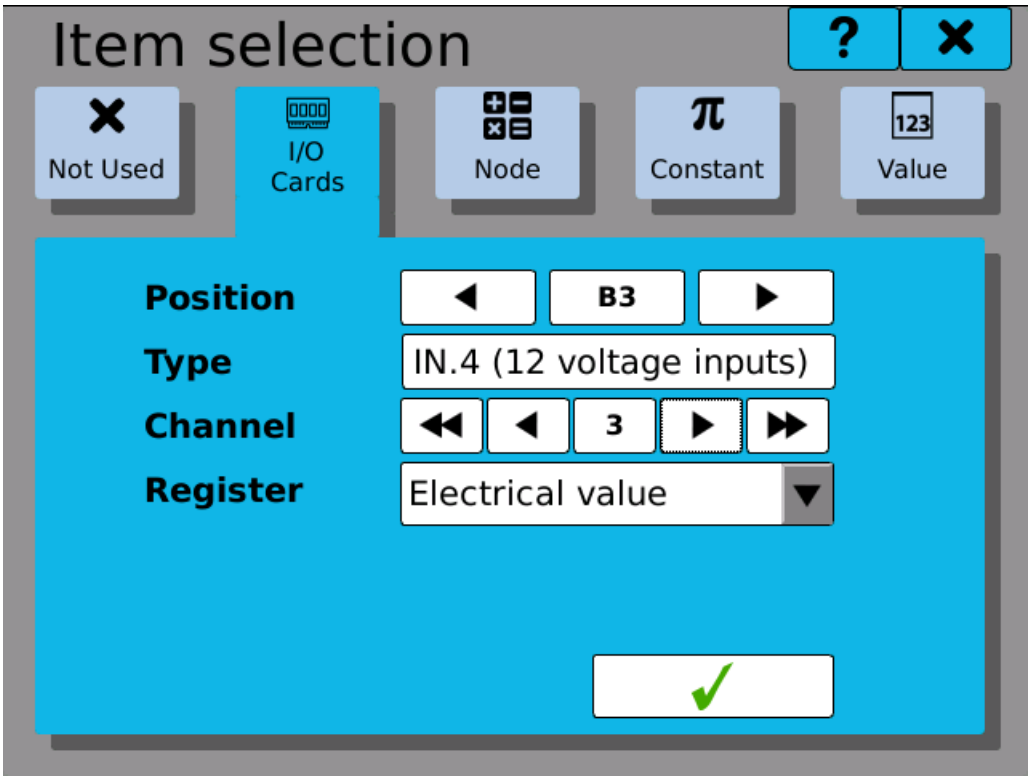
Parameter selection from the I/O cards consists of selecting the needed card position, the channel, and the actual parameter.

Position — Position of the card we are going to set. Buttons ◀ ▶ serve for rolling among the plugged-in cards. (Example: If there is no card on position A3, the setting will not offer it).

Type — Type of the card plugged-in on the specified position. Type of the card cannot be changed. Informative text.

Channel number — Channel number, from which we want to select the register. Buttons ◀◀ ◀ ▶ ▶▶ serve for rolling among the channels. The number of possible channels is determined by the card, from which we select the parameter.

Register — Specific value of the channel, which is used as a parameter for settings of the nodes, screens, records and the like.

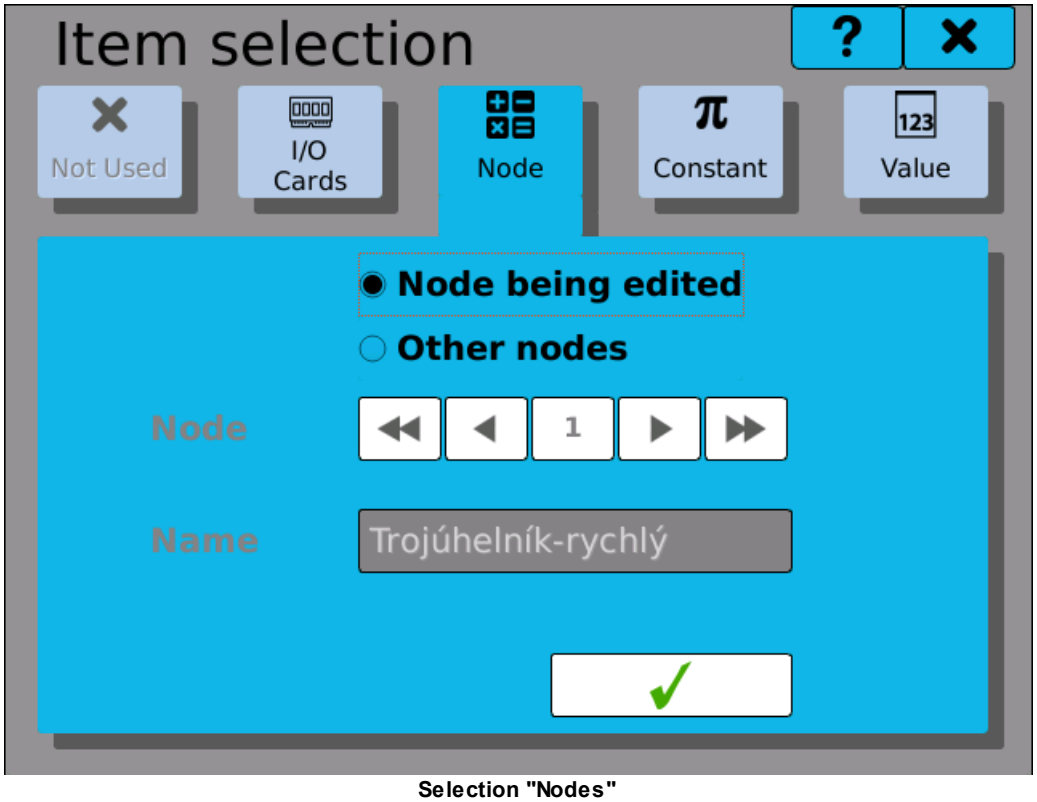


"IO" selection

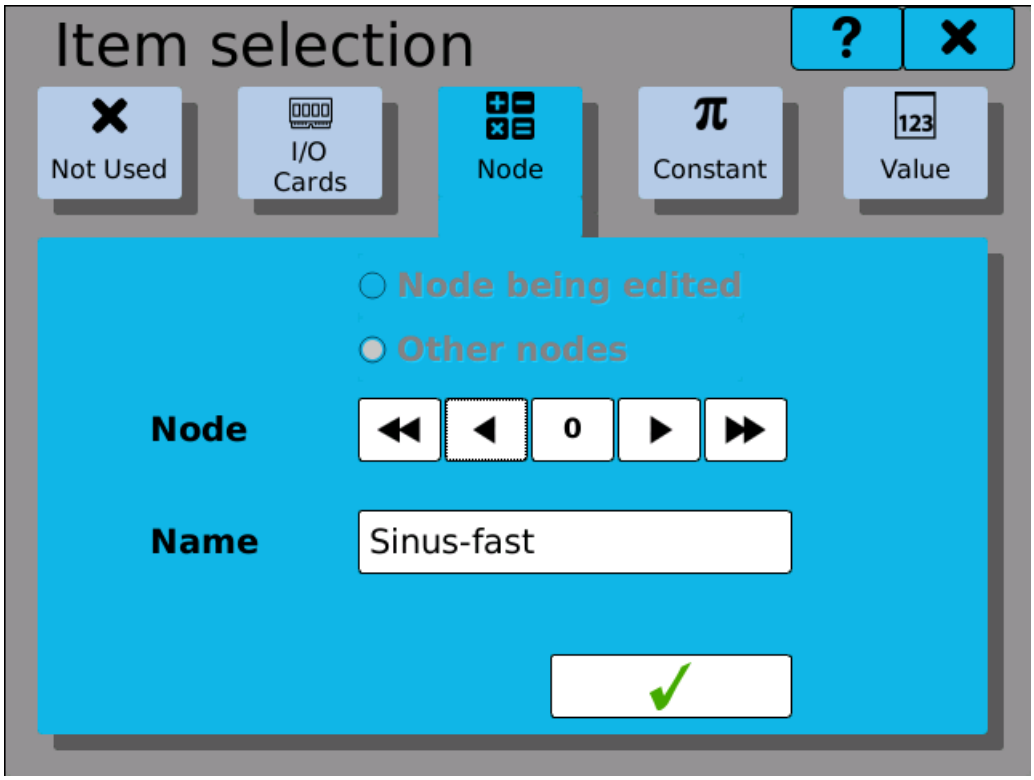
8.3 Parameters from the nodes

Parameter selection from the nodes consists of selecting one of the defined nodes. If we add a parameter into the node, we can select the option **"Currently edited node"**, which will use the currently edited node and by copying the settings among the nodes it will change according to the current node (so e.g. for node 0 there is the parameter node 0, for node 10 there is the parameter node 10).

Currently edited node	If you add a parameter into any of the nodes, you can select this option. Otherwise, the option is disabled.
Other nodes	Standard option. Enables selection from all defined nodes.
Node	Node number we want to select. Buttons ◀◀ ◀ ▶ ▶▶ serve for rolling among the nodes. Altogether up to 256 nodes.



Selection "Nodes"



Other nodes

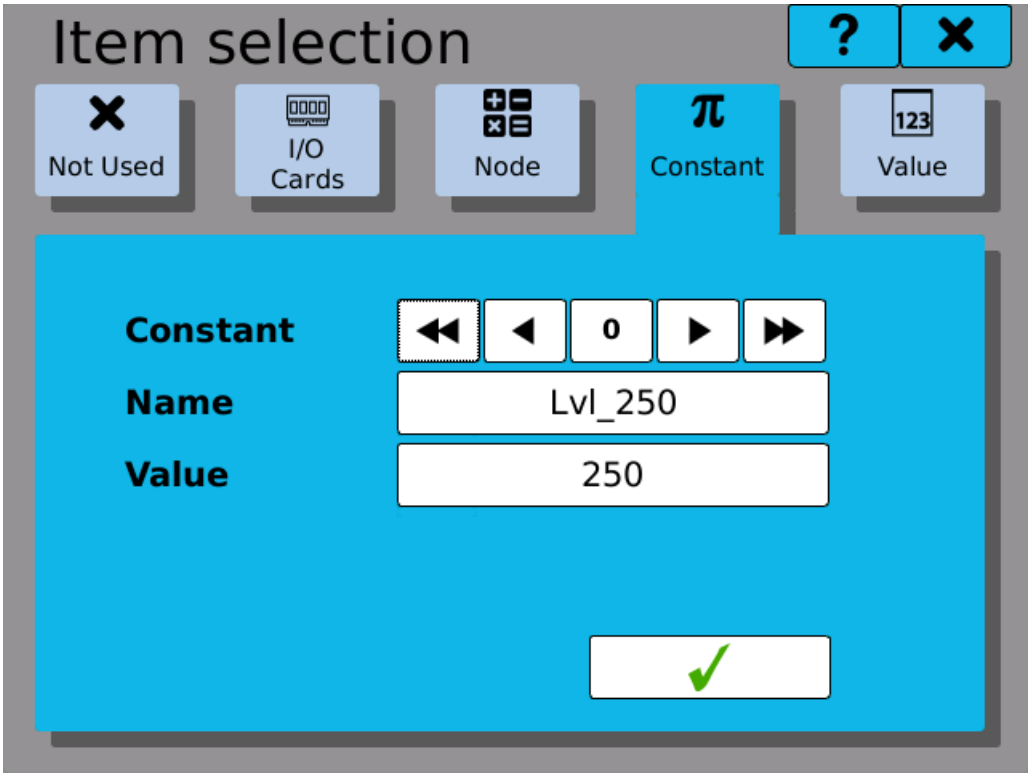
8.4 Parameters from the constants

Parameter selection from the constants consists of selecting a defined, named constant.

Constant Number of the constant we want to select. Buttons ◀◀ ◀ ▶ ▶▶ serve for rolling among the constants. Altogether up to 62 constants.

Name Number of the constant we chose in the previous settings.

Value Value of the constant we chose in the previous settings.

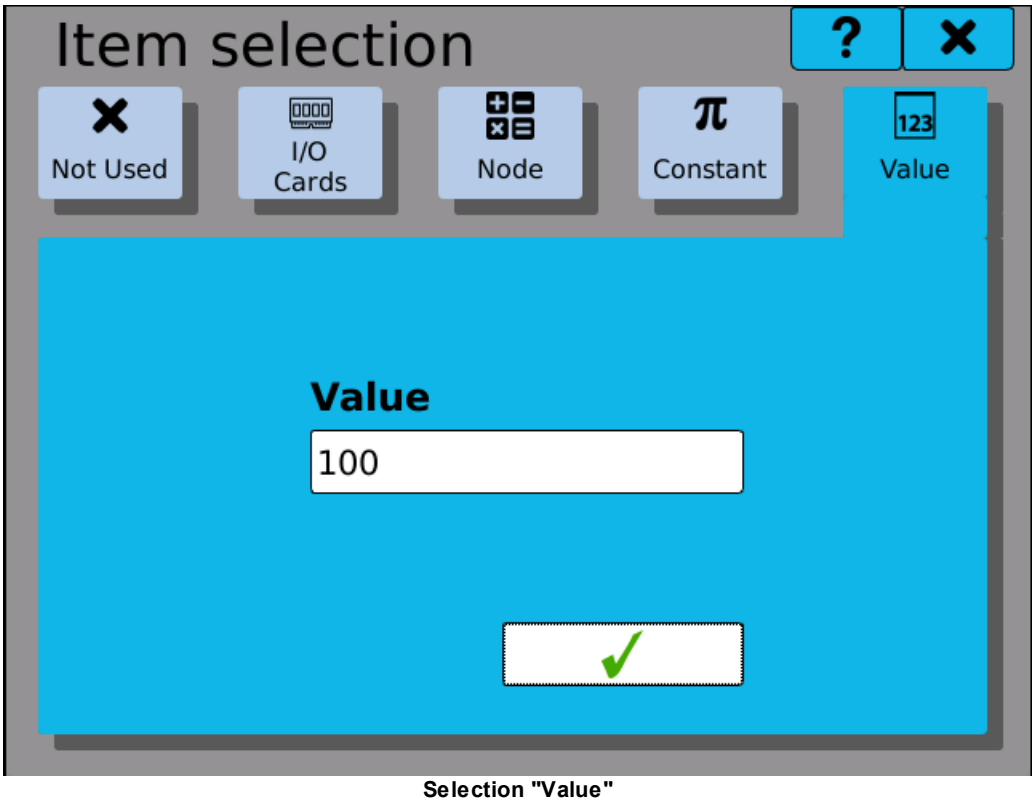


Selection "Named constant"

8.5 Parameter value

Setting a fixed value consists of writing just a number into the box.

Value The box for setting fixed value.

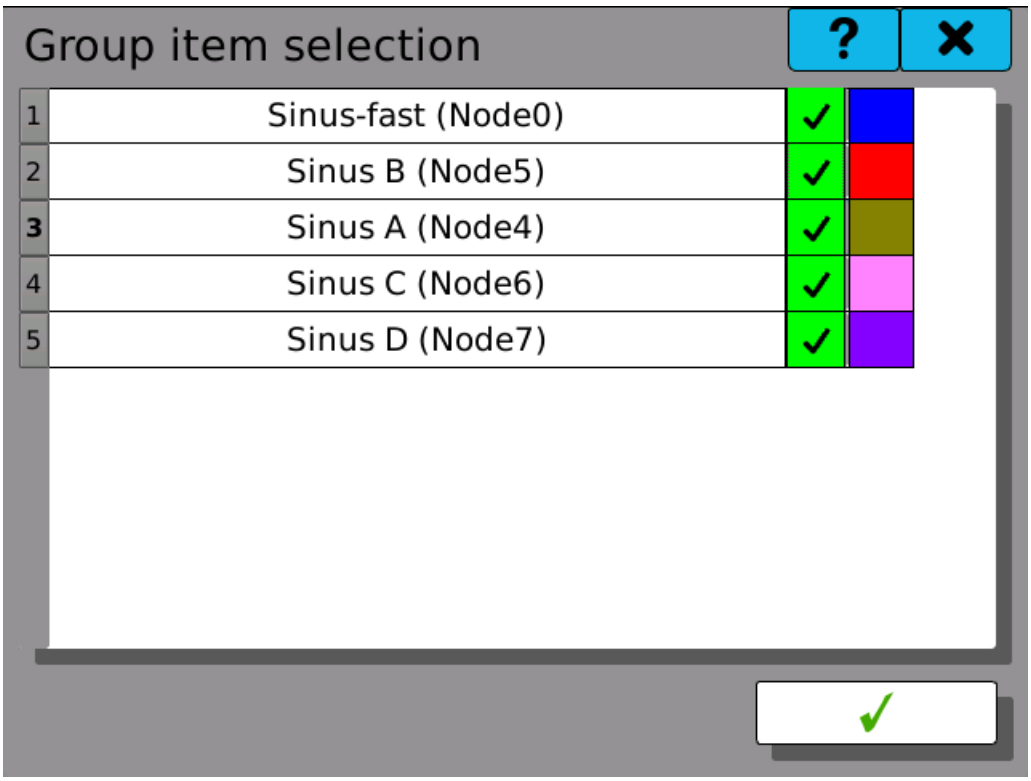


Selection "Value"

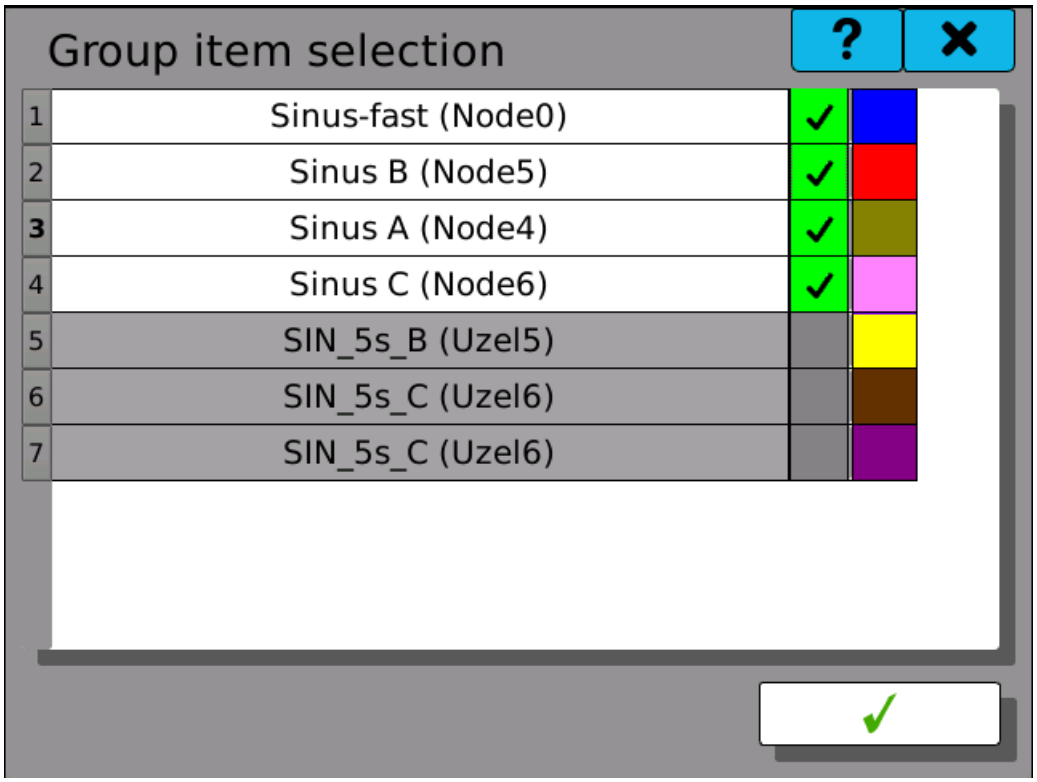
9 Selecting item from the group

9 Selecting item from the group

In the window for selecting items from the group you can see a chart overview of all items in the group as well as the colors of each group. The selection is always limited to a certain number of items that you can select together.
For example, for the **records** it is up to 16 items.
For the **running chart** it is up to 4 items.
For other **graphic elements** it is only 1 item.
As soon as the maximum number of selected items is reached, the other ones are disabled and they can not be selected.



Selecting item from the group



Selecting item from the group with a maximum number of selected parameters

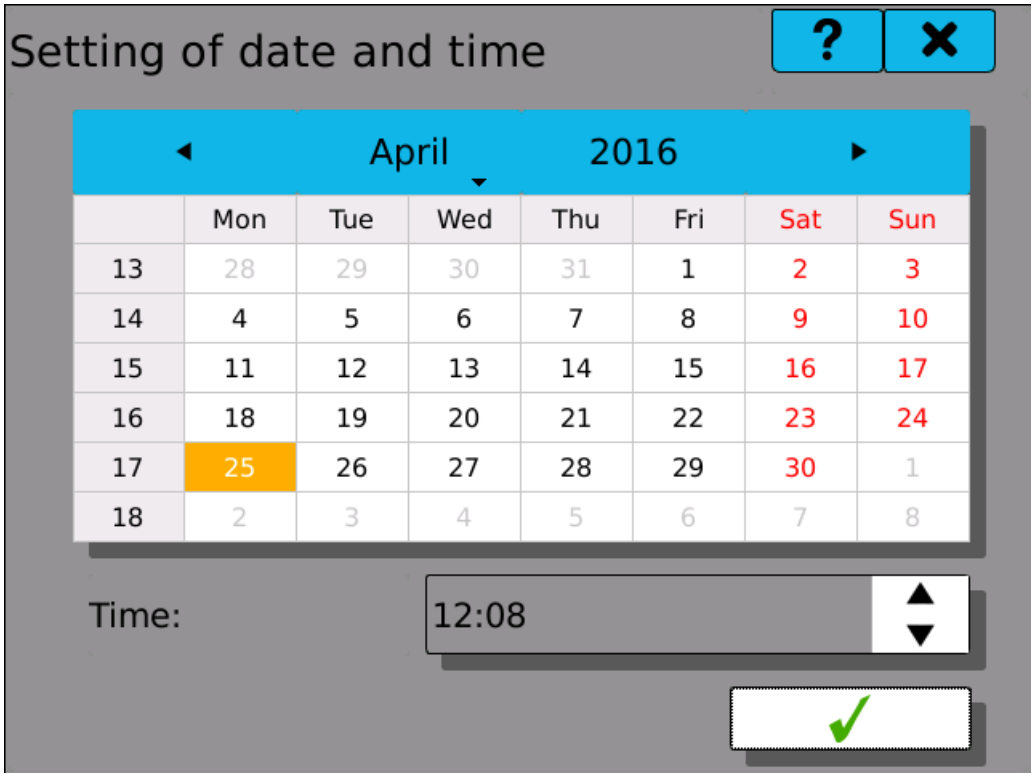
10 Setting date and time

10 Setting date and time

Using buttons ◀ ▶ you move among the months. A click on the current month unrolls the month selection. A click on the year will display up and down arrows ▲ ▼ for the change of the year. For time settings click on the hour or minute box. By the up and down arrows ▲ ▼ you set the value of the marked field (hours and minutes).

Selection of a calendar field marks the current day, and a click on the button ✓ confirms the selection and resets the date and time.

All records must disabled while setting date and time!



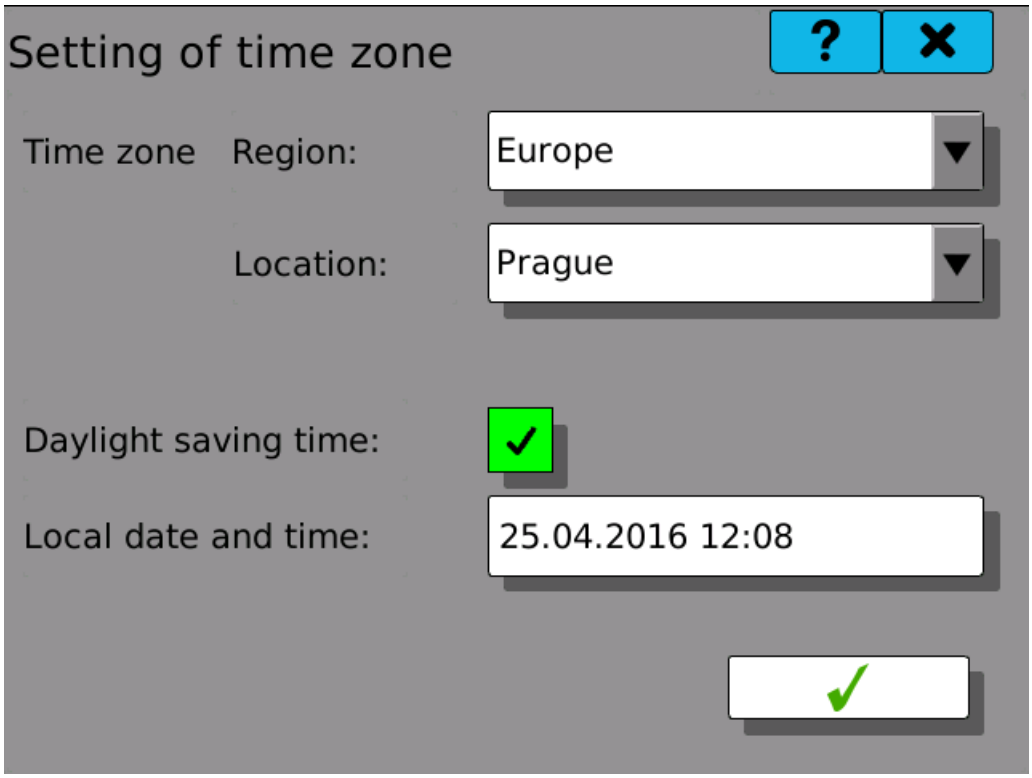
Setting date and time

11 Time zone setting

11 Time zone setting

The time zone can be selected by entering the name of the region and the town where you currently are. There are two selection elements: Region and Location.
To secure an automatic switching over between the Summer and Winter times you have to tick the box **"Daylight saving time"** and use the symbol ✓.
The time in the box **"Local date and time"** changes in accordance with the time regulations of the respective region and town.

Setting of the time zone should be confirmed by clicking the button ✓.
All records must be disabled while setting the time zone!

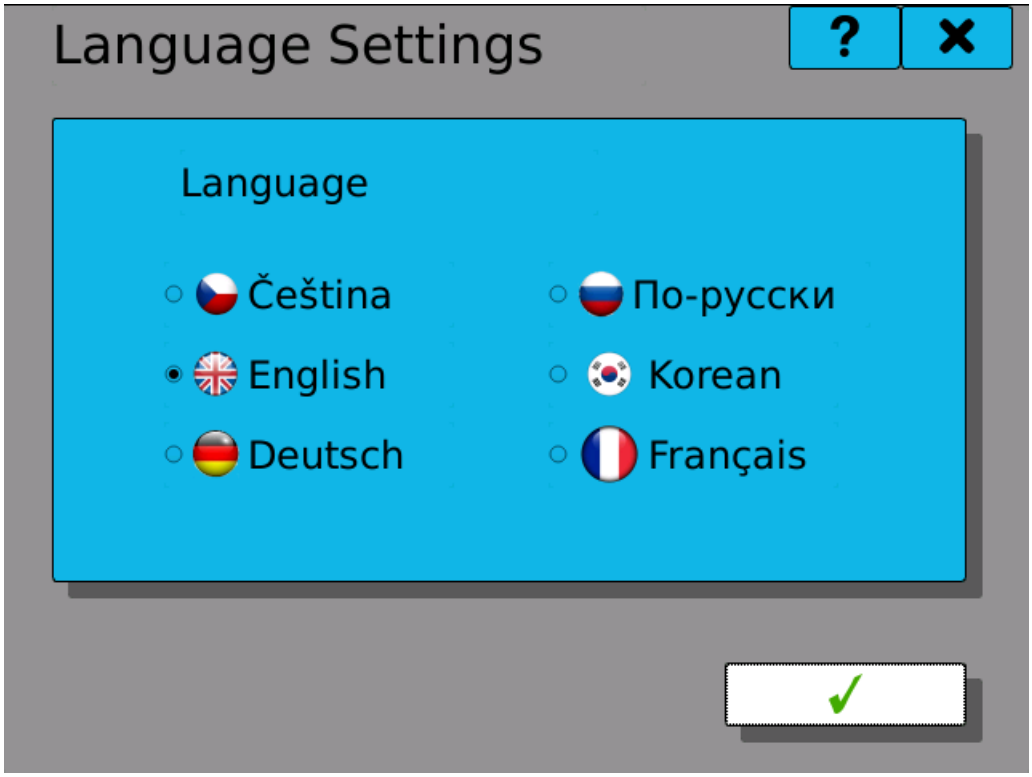


Time zone setting

12 Language settings

12 Language settings

Language of the menu and settings of the recorder OMR700. There are the following options: Czech, English, German, Russian, Korean, and French.



Language settings

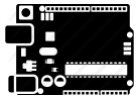
13 Diagnostics

13 Diagnostics

It serves to check the functions of the OMR700. We can diagnose function of the I/O cards, run of the secondary core, information on the motherboard, status of connection, and an overview of memory occupation of both the fix and portable storage media.

I/O cards. It moves you to the card overview and to the selection of one card for diagnostics.

Secondary core. It displays information on firmware and status of the secondary core.



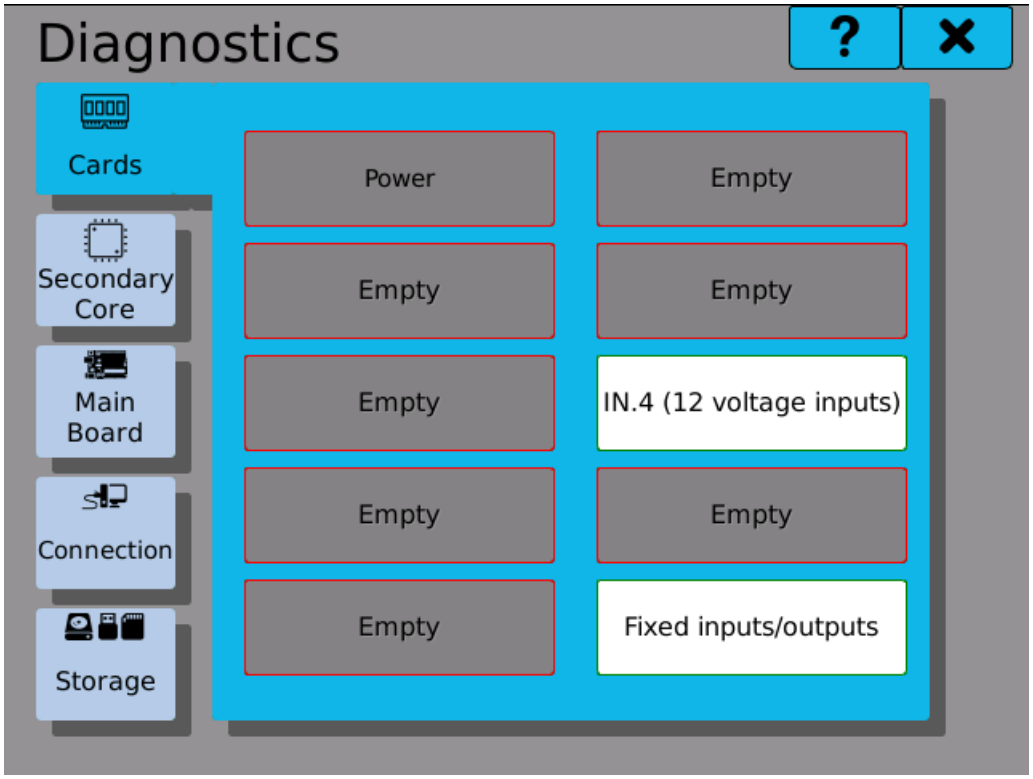
Motherboard. Information on temperature, light exposure, and power supply of the motherboard.

Connection. Information on connection via Ethernet, USB and/or WiFi.

Storage. Overview of memory occupation of both the fix and portable storage media.

13.1 I/O Cards

Overview window of the plugged-in cards. A click on the card field gets you to the card status report.



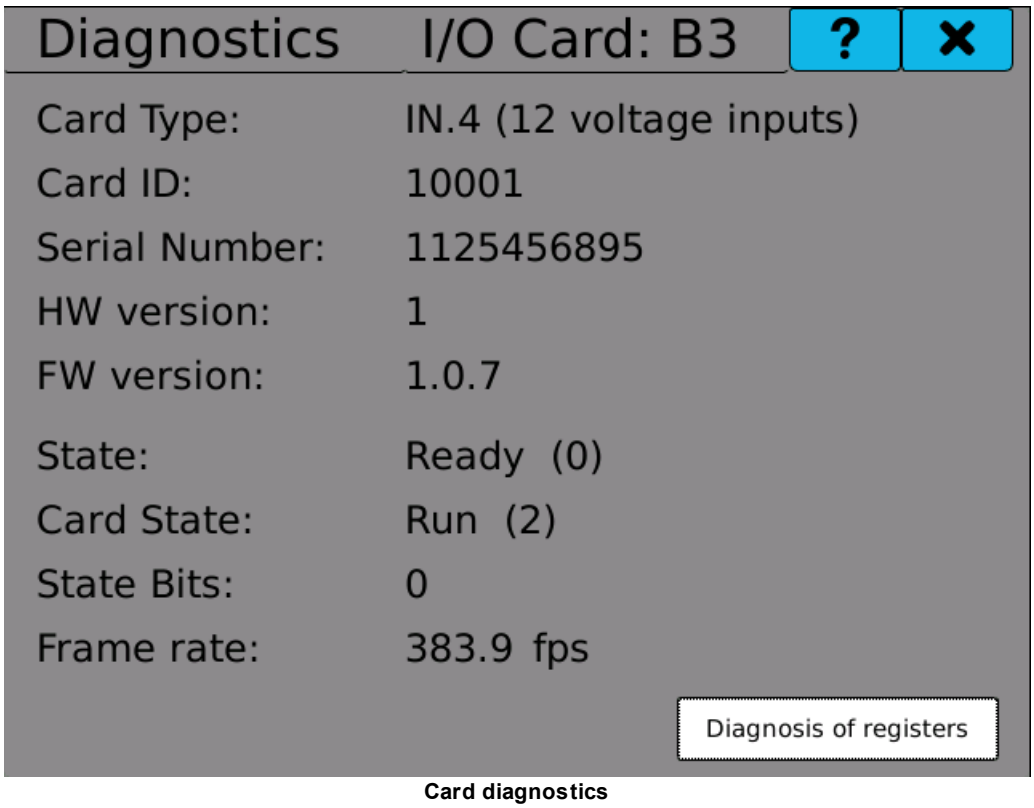
Cards overview

13.1.1 Card diagnostics

State and summary information for the card in question.

Card type	Type of the diagnosed card.
Card ID	Identification of the diagnosed card.
Serial Number	Serial number of the diagnosed card.
HW version	Hardware version of the diagnosed card.
FW version	Firmware version of the diagnosed card.
State	Ready, Enumeration.
Card State	The options are Reset, Initialization, Run, and Stopped.
State Bits	State bits of the diagnosed card.
Frame rate	The speed of data transfer between the card and the core (frame per second **FPS**).

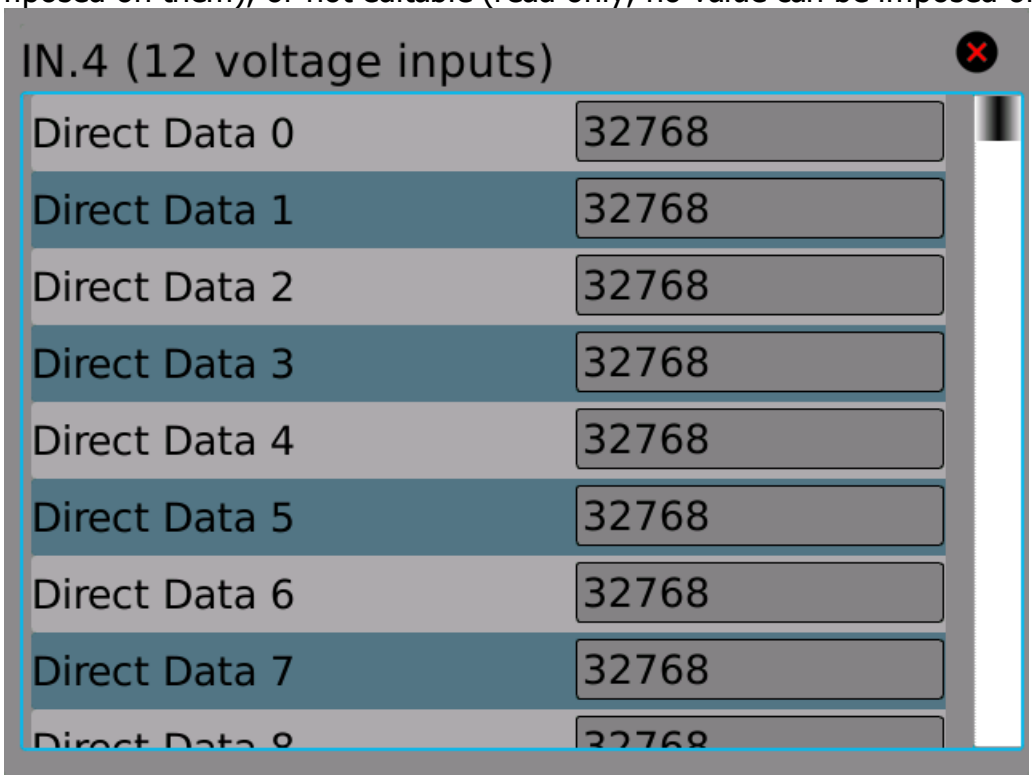
A click on the button "Diagnostics of registers" takes you to the diagnostics of the individual values on the card in question.



Card diagnostics

13.1.2 Diagnostics of the card registers

Values in the card registers. Values can be either editable (from the diagnostics a value can be imposed on them), or not editable (read only, no value can be imposed on them).

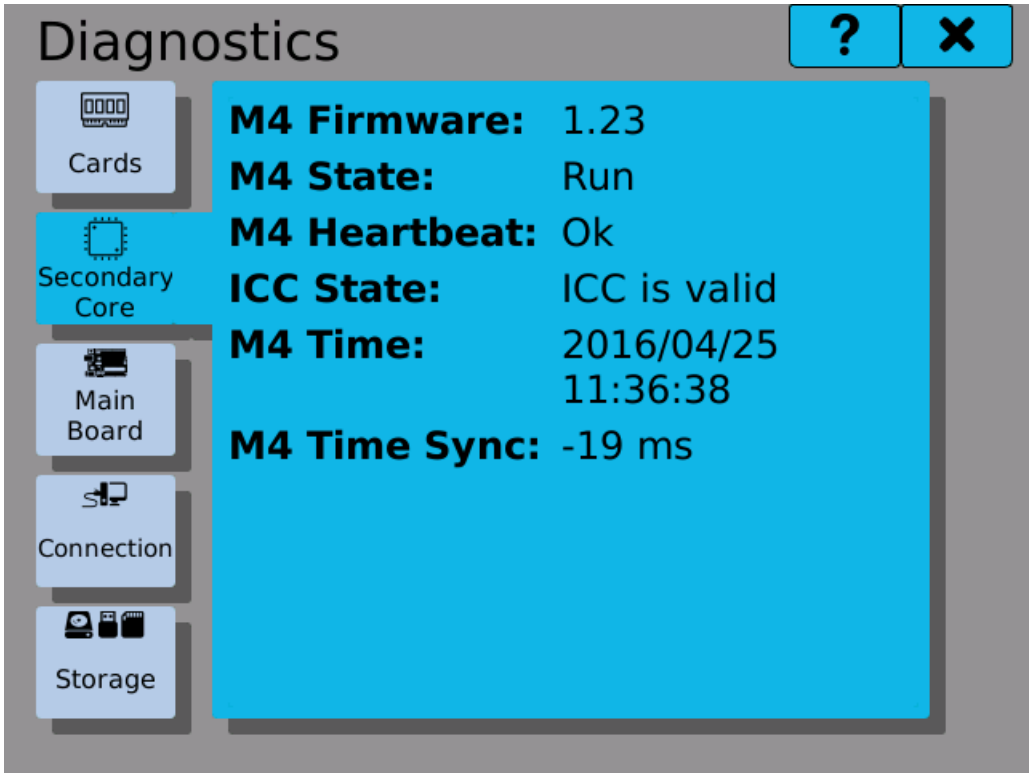


Register diagnostics

13.2 Secondary Core

State and information about the secondary core of the OMR 700.

Firmware	Firmware version running on the secondary core.
State	State of the secondary core. There are two options: Run or Stopped.
ICC State	ICC state. It checks if the ICC is valid.



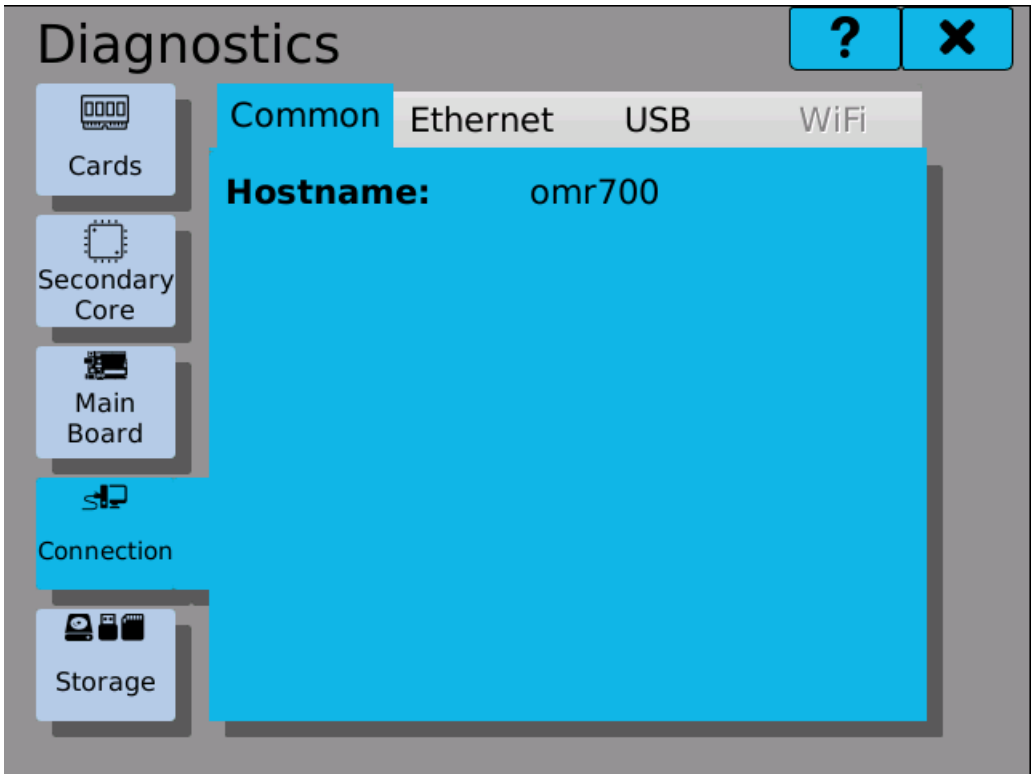
Secondary core

13.3 Connection

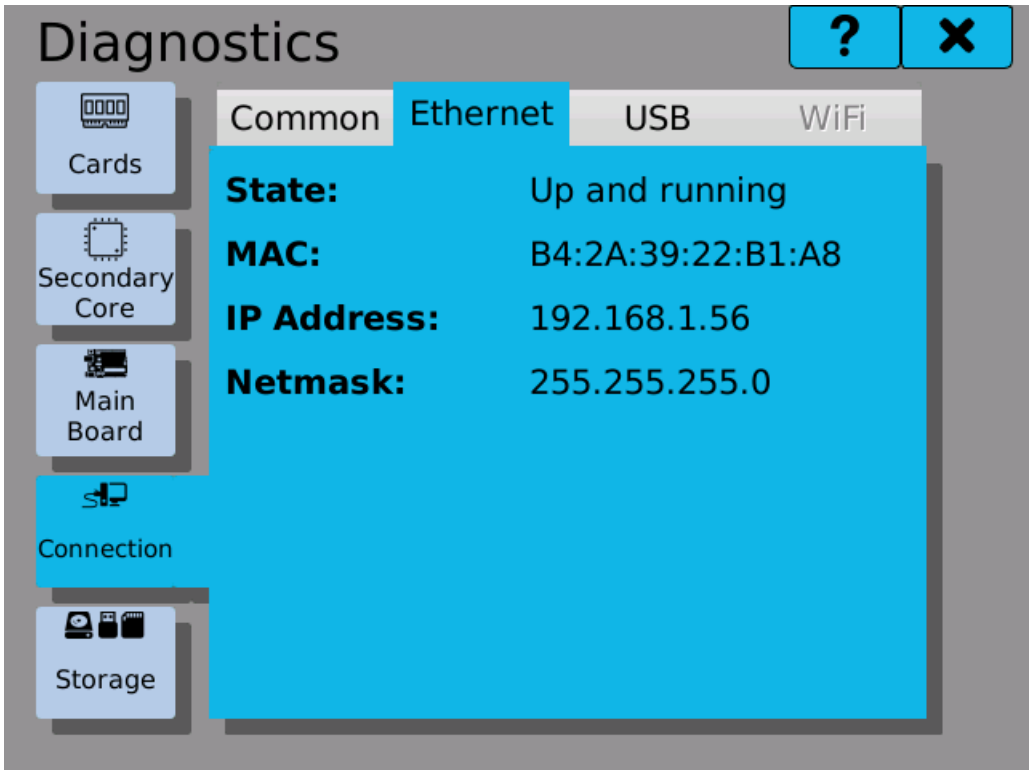
Status and information about the network connection of the recorder OMR700. The diagnostics can be switched over among the tabs "Common", "Ethernet", "USB" and "WiFi".

Common	Information common for all types of connection. E.g. the name of the recorder network.
Ethernet	Information about the Ethernet connection. There you will find connection status, MAC address, IP address and subnet mask.
USB	Information about Ethernet connection via USB. There you will find connection status, MAC address, IP address and subnet mask.
WiFi	Information about wireless connection to the network. There you will find connection status, MAC address, IP address and subnet mask.

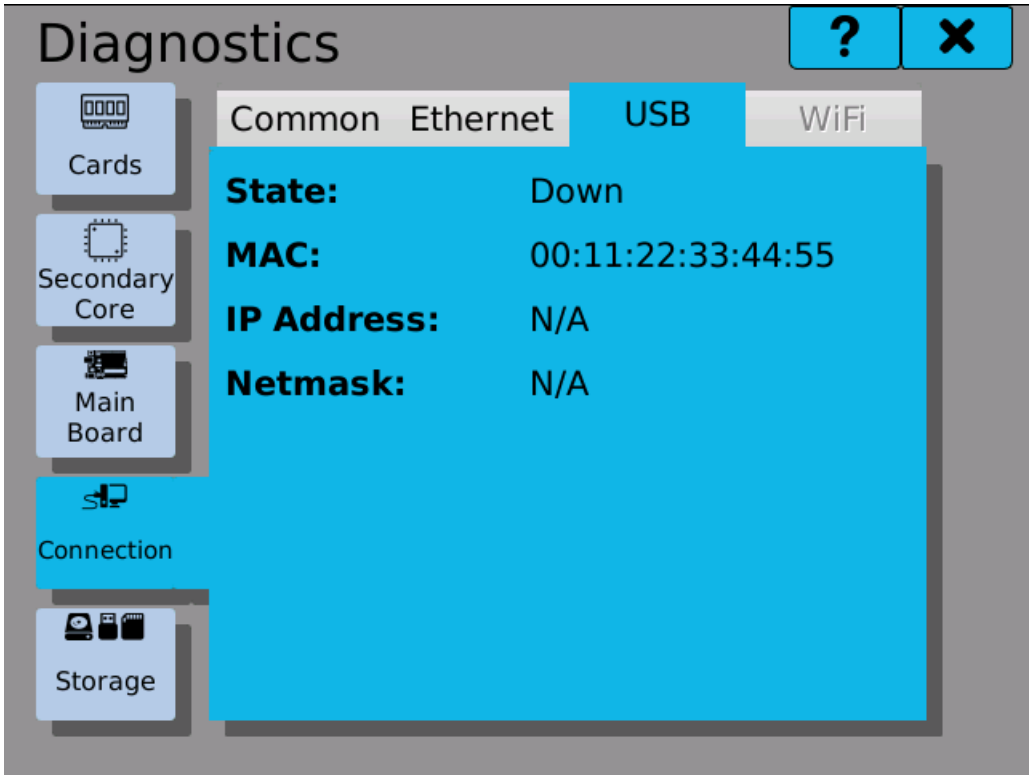
Connection status:
Down - the interface is disabled.
Up - the interface is enabled but not active.
Up and running - the interface is enabled and active.



Common



Ethernet



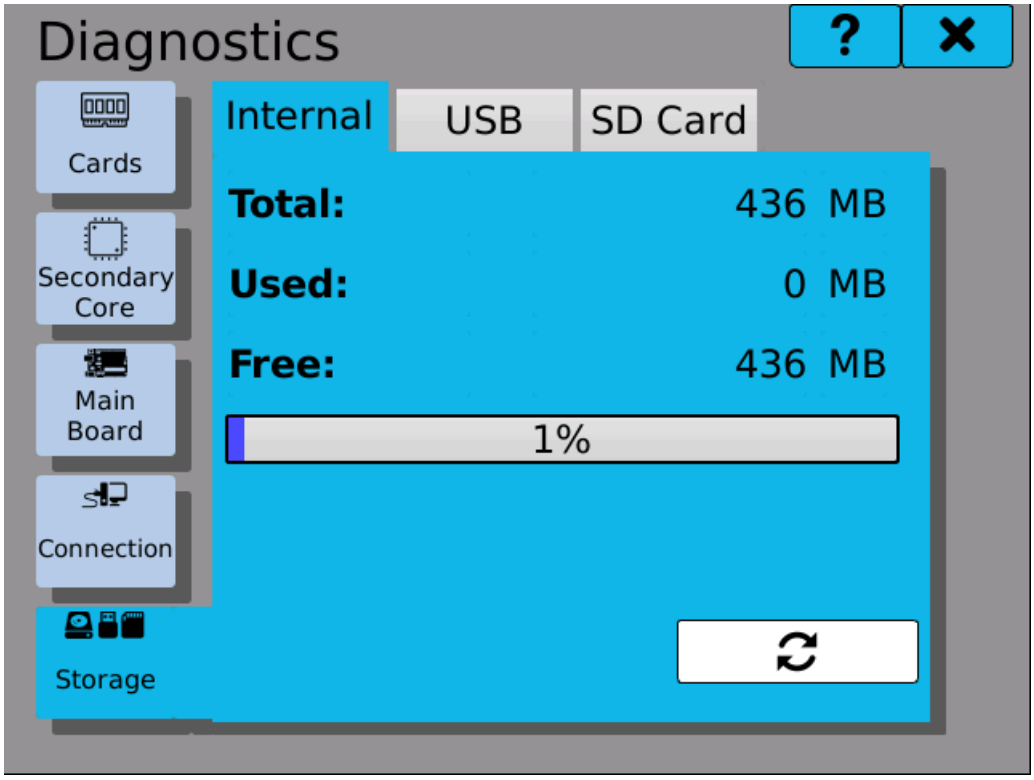
USB down

13.4 Storage

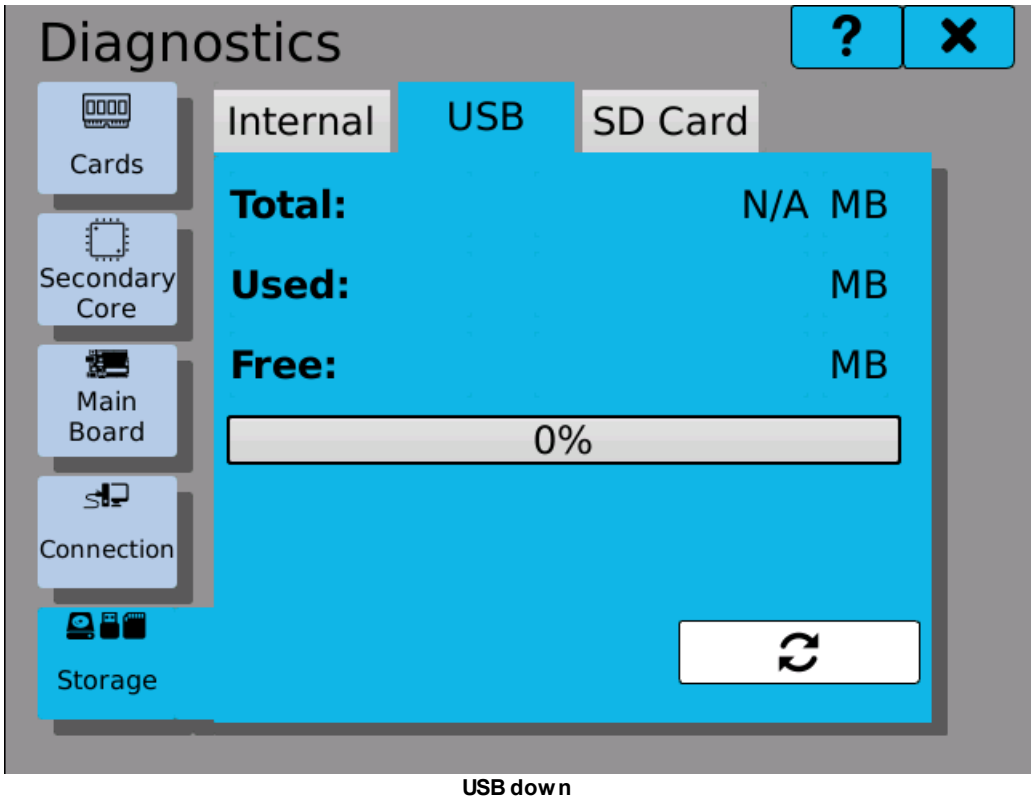
Status and information on how full is the capacity of the internal storage and of the removable storage media. The diagnostics can be switched over among the tabs "Internal", "USB" or "SD Card".

Internal	Information about free space in the internal storage.
USB	Information about free space on USB Flash Drive.
SD Card	Information about free space on SD card.

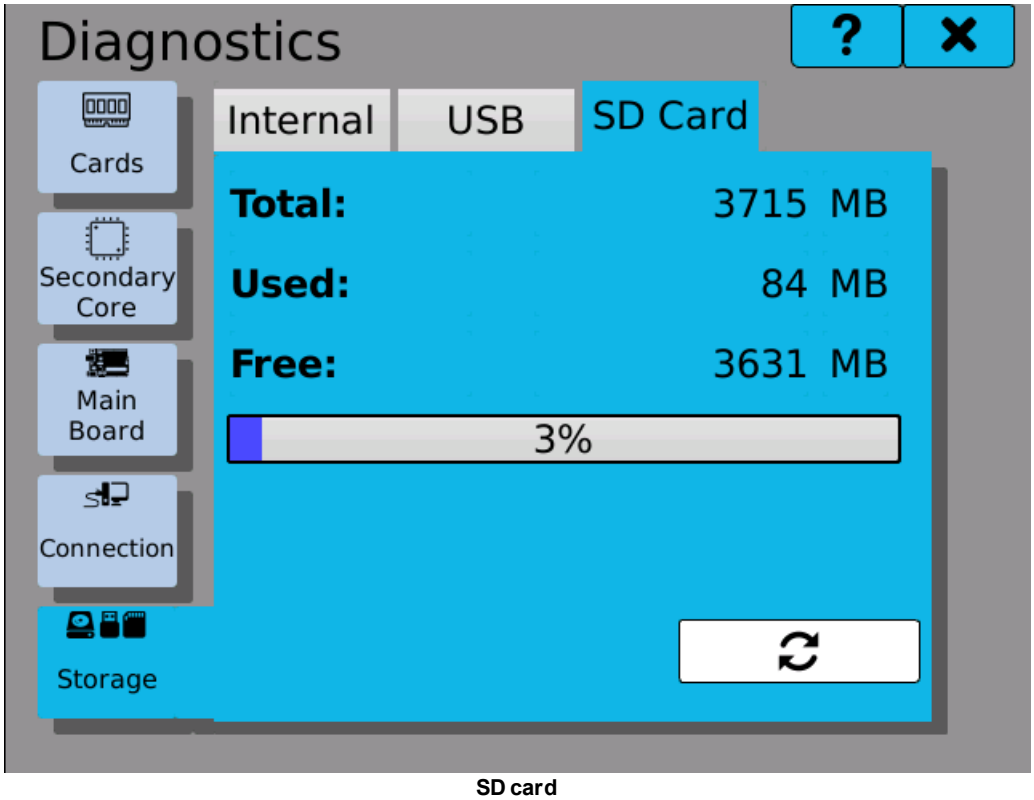
Button ⟳ updates capacity of the media.
If removable medium is not up,"**N/A**" is displayed.



Internal storage



USB down



SD card

14 OMR 700 update

14 OMR 700 update

Update procedure:

1) The update window opens by an enabled selection between USB flash drive and SD card. Kindly plug-in one of these two storage media, make the same selection on the screen and press the button "**Load packages**".
   We recommend that you create a folder "**omr700-upgrade**" on the storage media .

2) Pressing the button "**Load packages**" opens two boxes: Selection of the found firmware and selection of the found system. Empty boxes mean that no installation packages were found. Please check location and names of the installation packages. Your click on the box or on the down arrow unrolls the menu of found firmware or system installation packages. Select the requested firmware and system and continue by clicking the button "**Update**". Firmware (or software) runs under the Linux Operating System and the update can be performed either for firmware itself or for system + firmware together. Updating just the system is not possible. If you can not find the desired firmware version, the selection box turns red and it can not be edited. The error will be cleared by changing the firmware to a version that finds the required version on the storage media or by adding the correct version of the system to the storage media. Select the latest versions. Those are the ones with the highest version numbers.

3) Pressing the button "**Update**" starts firmware and system updates. The progress of updating is displayed on two indicators. The upper indicator shows the progress of the entire update process and the lower one shows the progress of the currently executed update step. The steps are: Update preparation, system update, firmware update, update end. There is a text description of the current process under the indicators .

4) The process of updating can be stopped by the button "**Stop**". It is not recommended to interrupt the updating process, because it may damage the backup files. Use it only in an extreme situation. If the button "**Stop**" turns gray (you can not press it) the updating process is in progress and it can not be interrupted. Please wait for completion of this step.
   If the process is stopped by the button "**Stop**", the error window "**Interrupted with error**" pops up.

5) After a correct completion of the update a message pops up, which warns that changes will not take effect until the device has been restarted. You can either confirm or cancel this option. If it is canceled, switching to the backup version is possible in two ways: Either at the next start of the device or by pressing the button "**Switch to backup**".

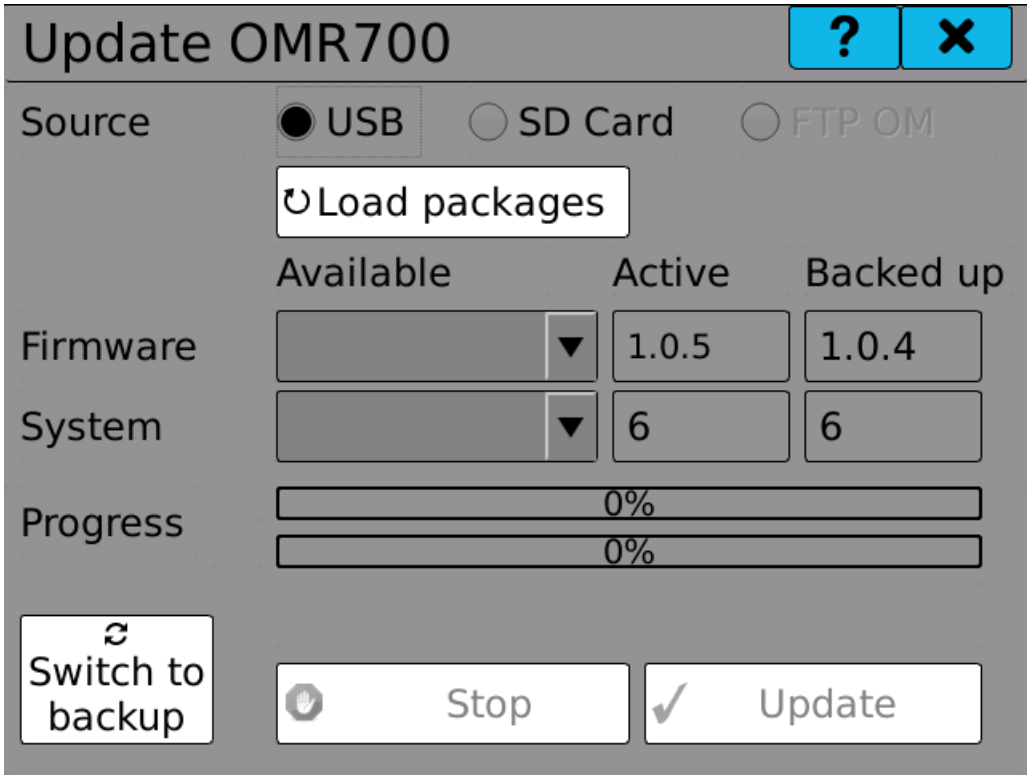
6) If for some reason the update is unsuccessful, an error window "**Interrupted with error**" pops up and the error is described in a text form.

7) Fast troubleshooting:

Message	Solution

No connection with the server	Check connection to Internet
Loading failed	Check connection to Internet
Update package not found	Check if the packages are on the storage media or if they have been properly named
Check sum error	Package error. Download and save it on the storage media again
The update is already running	Stop the running update or restart the recorder

In case of any other error kindly contact the manufacturer!



Update

15 Cards update

15 Cards update

Update procedure:

1) Card selection from the card menu. Only the plugged-in cards will be offered. Fill in the current version of the firmware (recorded on the selected card) into the box "**Current Firmware**".

2) Selection between USB flash drive or SD card. Kindly plug-in one of these two storage media, make the same selection on the screen and press the button "**Load packages**".
We recommend that you create a folder "**omr700-upgrade**" on the storage media .

3) After pressing the button "**Load Packages**" the menu of available packages for the selected card will be filled in, and it will also offer the latest found firmware of the card. Subsequently the button "**Update**" will be enabled.

4) Pressing the button "**Update**" starts the update of the card firmware. Its progress is displayed. There is a text description of the current progress under the indicator. The update lasts less than one minute.

5) The process of updating can be stopped by the button "**Stop**". If the button "**Stop**" is disabled (you can not press it), the updating process is in progress and it can not be interrupted. Please wait for completion of this step. If the process is stopped by the button "**Stop**", the error window "**Interrupted with error**" pops up.

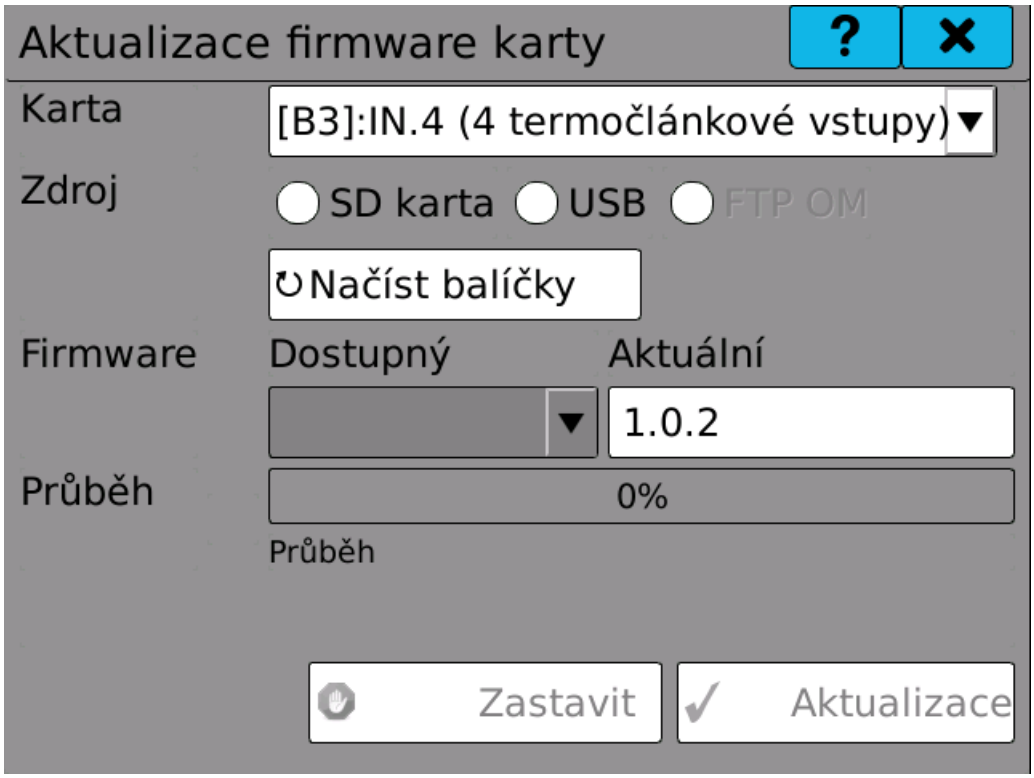
6) After completion of the update you will need to wait a short while before the cards are put into operation and start measuring again.

7) If for some reason the update is unsuccessful, an error window "**Interrupted with error**" pops up and the error is described in a text form.

8) Fast troubleshooting:

Message	Solution
No connection with the server	Check connection to Internet
Loading failed	Check connection to Internet
Update package not found	Check if the packages are on the storage media or if they have been properly named
Check sum error	Package error. Download and save it on the storage media again

In case of any other error kindly contact the manufacturer!



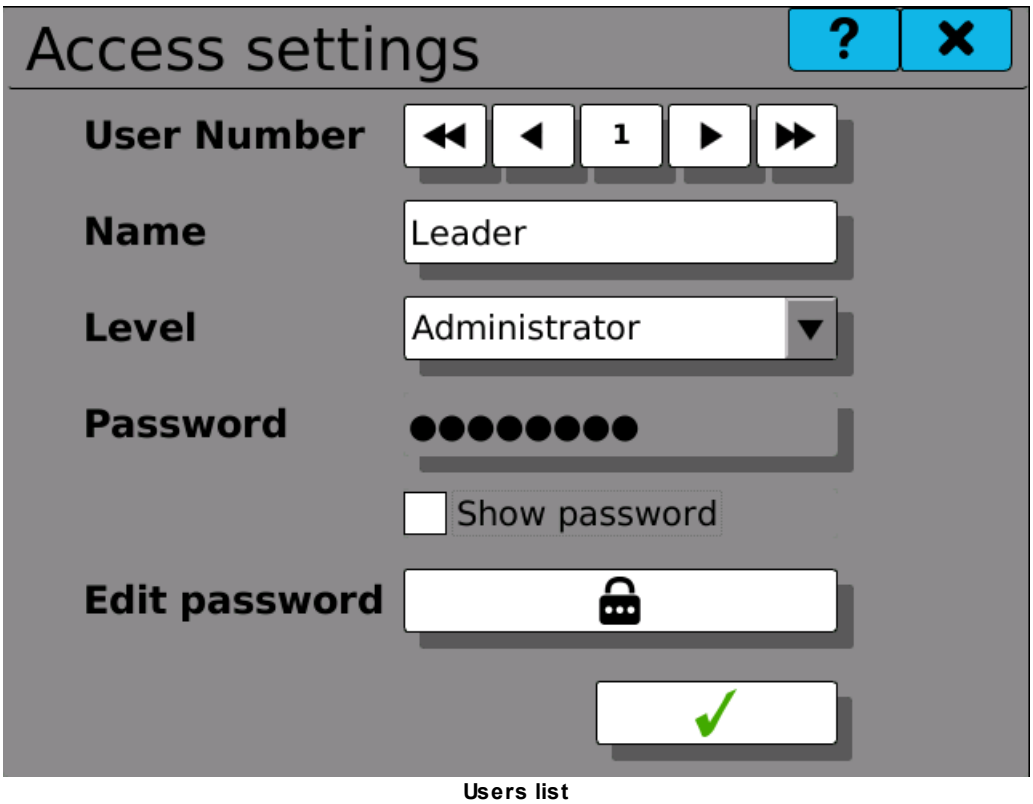
Update

16 User administration

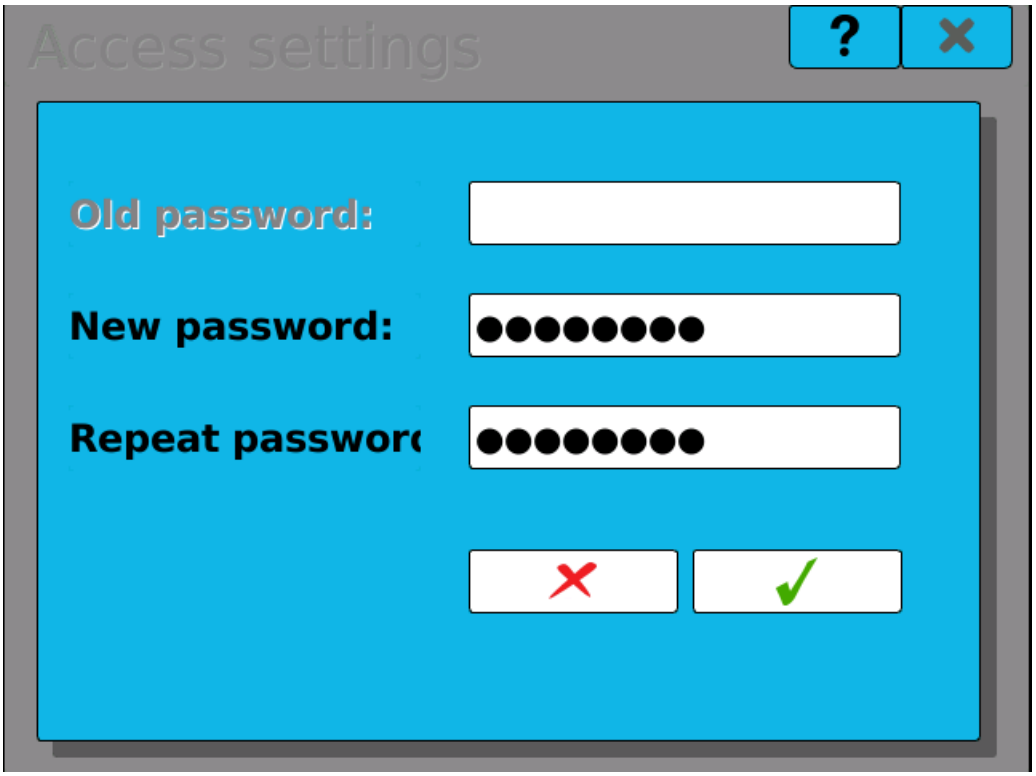
16 User administration

User administration serves for creation and subsequent modification of users, their access rights and passwords.
The following can be edited in the user administration:

User number	Number of the currently viewed or edited user. It obtains values 0 to 31. Buttons ◀◀ ◀ ▶ ▶▶ serve for rolling among the users.
Name	Name of the user. Under this name you log in. The name can consist of up to 32 characters.
Level	Level of user access rights. There are five levels: "User", "Advanced user", "Master", "Administrator", "Service".
Password	It must consist of min. four and max. eight characters. It can be composed of letters, numerals, hyphens and underscores. The password is hidden by default but you can view it.
Change password	To change the password, kindly click the button , which will open boxes "Old password", "New password" and "Repeat password". If you want to change the password, you have to fill in all the three boxes. If you are authorized to change the password of a lower level user, fill in just the boxes "New password" and "Repeat password".



Users list



New password

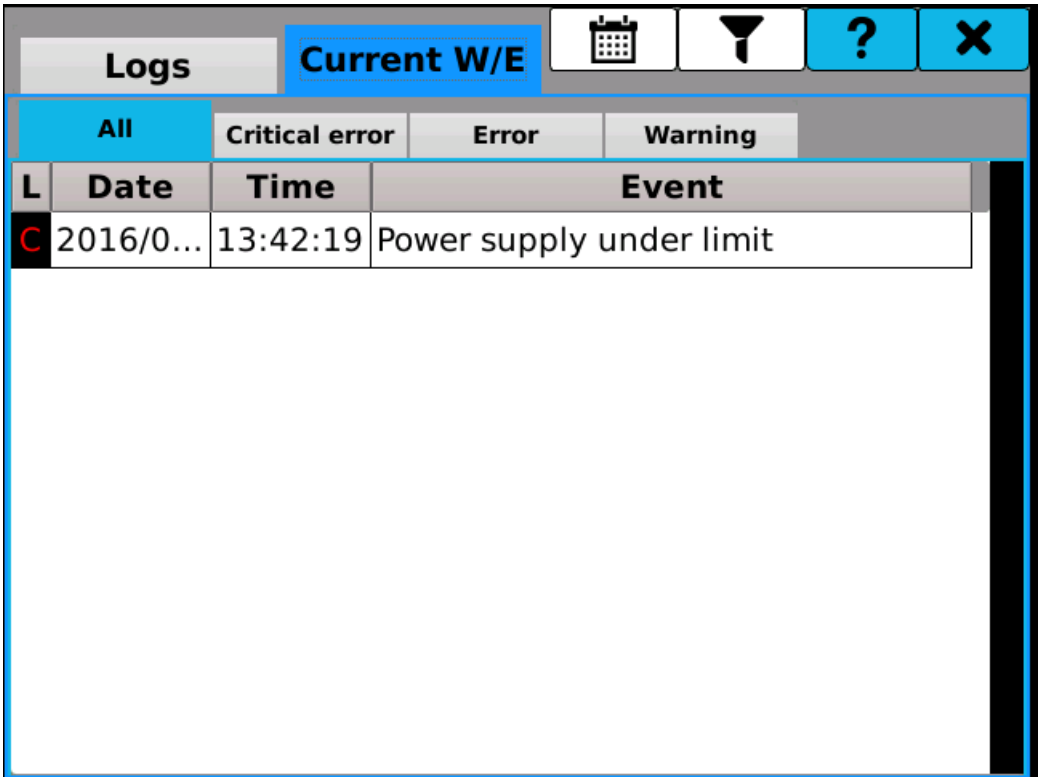
17 Warning, error and critical error

17 Warning, error and critical error

Tool for viewing the current warnings, errors, critical errors, and logs. If there is a critical error in the device, it must be confirmed (acknowledged).
In the window you can also switch over to the logs overview.
In the tab Current W/E you can switch over the levels of severity among warnings, errors, critical errors, or you can view all.
The overview of warnings and errors is presented in a spreadsheet-style divided into columns.

L	Level column (color differences)
Date	Date of the warning or error
Time	Time of the warning or error
Event	Text description of the warning or error

A click on the warning or error tab reveals details of the event. If the error is critical, it is to be confirmed (acknowledged) here



Critical error

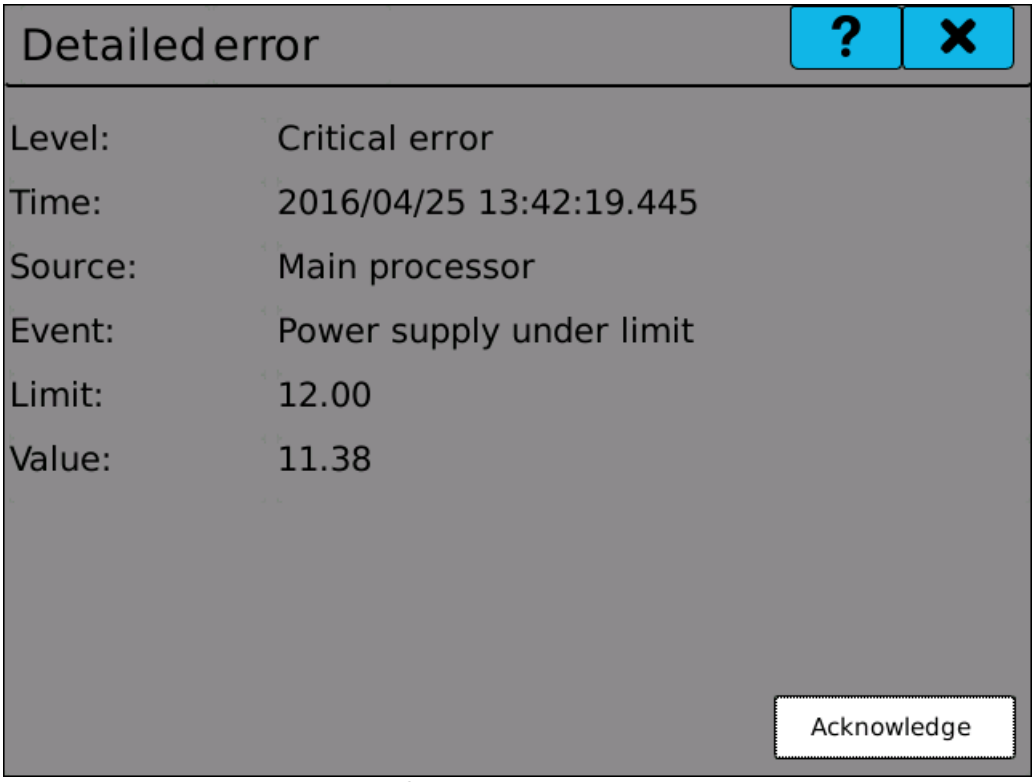
17.1 Warning or error details

In a detailed description can be found:

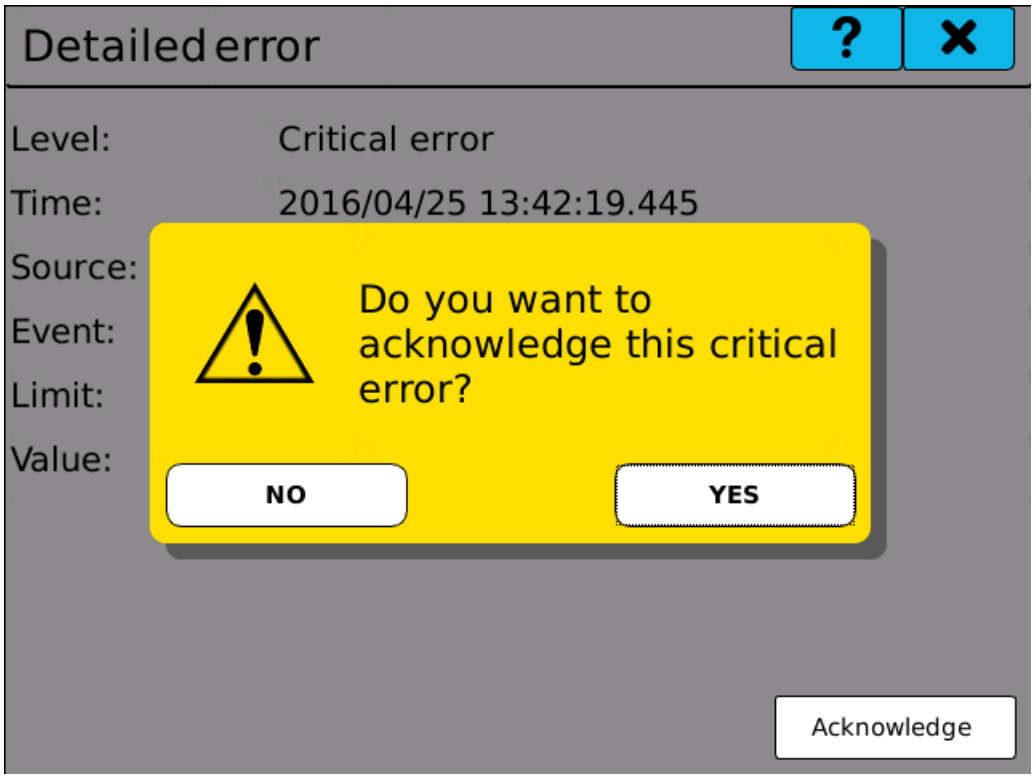
Level	Warning, error or critical error.

Time stamp	Date and time of the warning or error inception.
Source	Cause of the warning or error. It can be either the main processor, secondary processor or the plugged-in cards.
Event	Text description of the warning or error.
Value	Values associated with the warning or error. There can be up to 4 values.

If it is necessary to confirm (acknowledge) the error, click the button "Acknowledge". If you really want to acknowledge the error, a warning window pops up. Provided that the recorder is once again among the specified limits, the error disappears after its acknowledgment.



Critical error in detail



Error acknowledgment

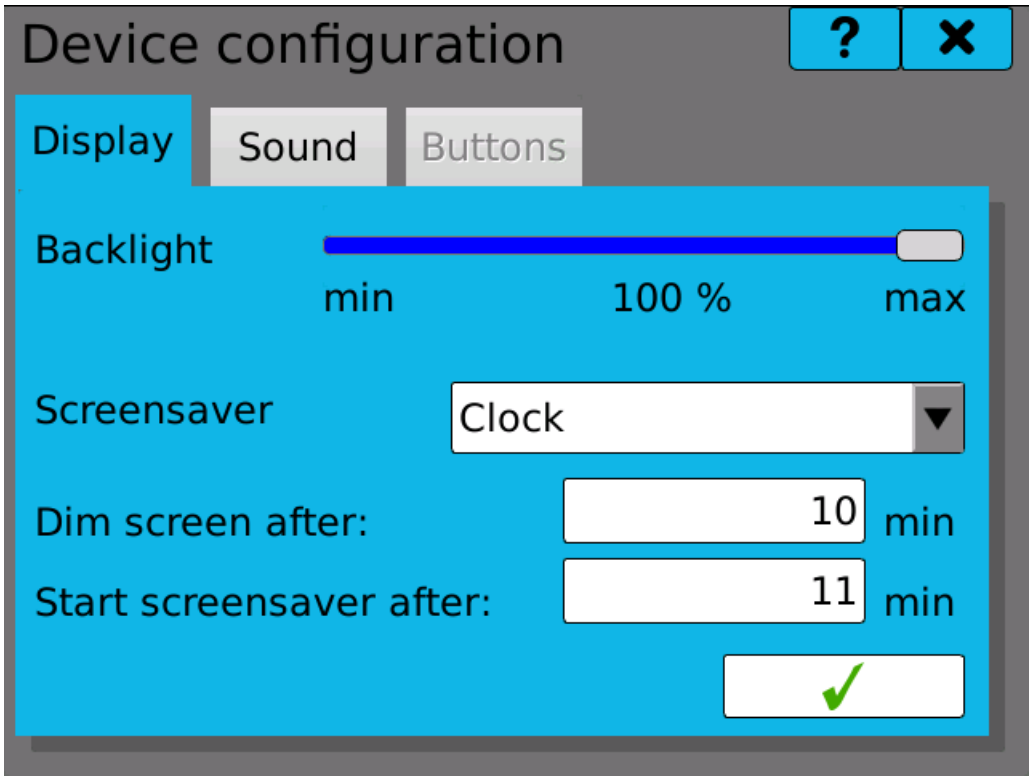
18 Display settings

18 Display settings

Here you can adjust brightness (backlight) of the display or set the screensaver.

Backlight	Moving the slider to the left or right changes the intensity of the back light.
Screensaver	A click on the box unrolls the selection menu. There you can select the type of the screen saver.
Dim screen after:	The time after which the screen turns dim.
St. screensaver after:	The time after which the screensaver is put into operation.

There is an option of switching over from display settings to sound settings and to programmable buttons. Just click the tabs "Sound" or "Buttons".



Display settings

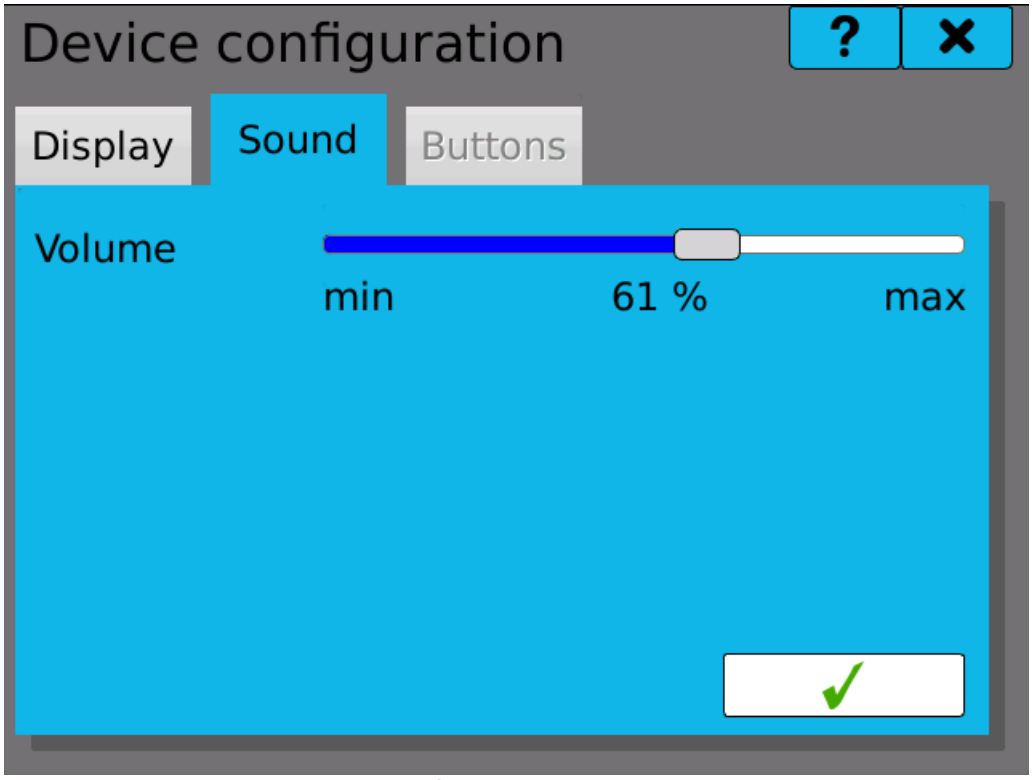
19 Sound settings

19 Sound settings

Here you can set volume of sounds used in the device.

Volume	Moving the slider to the left or right changes the sound volume.

There is an option of switching over from sound settings to display settings and to programmable buttons. Just click the tabs "Display" or "Buttons".



Setting volume

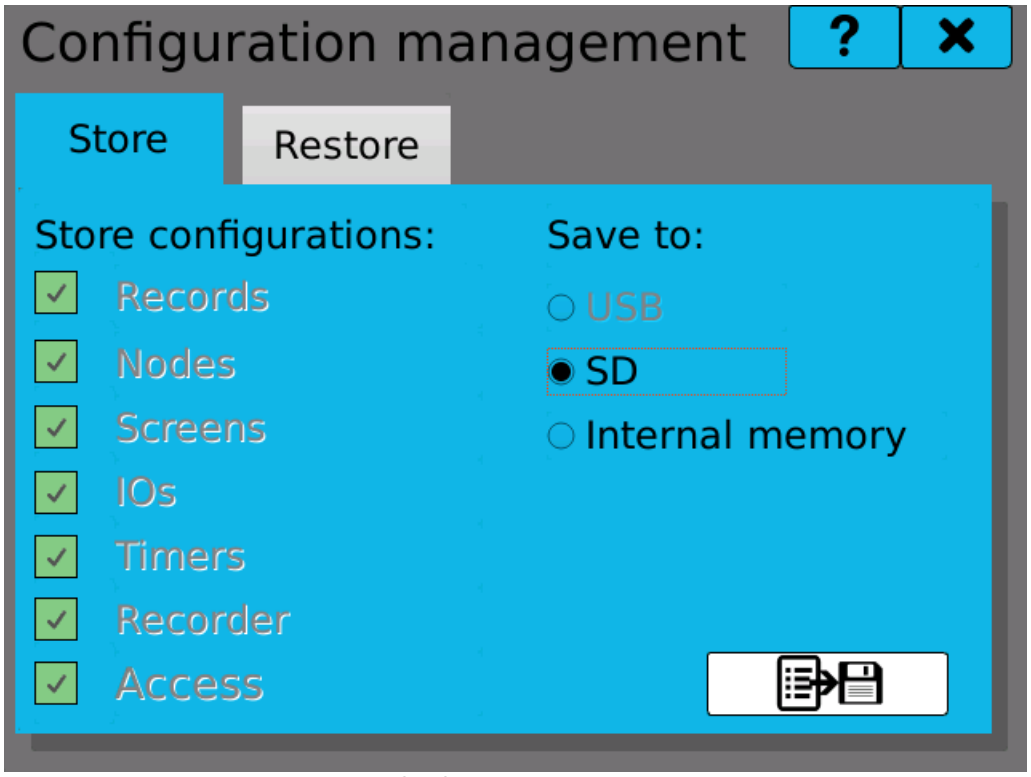
20 Configuration management

20 Configuration management

There are two tabs in the configuration management "Store" and "Restore".

Backup
In the tab "Store" we select the storage media, where a backup package with configurations will be created. The options are USB flash drive, SD card or internal memory of the device. A click on the button  will create a package on the selected medium. The name of the package will be e.g. **OMR700-Cfg-1.0.1-2-1234567890-20160208-075603.tar.gz**, where OMR700-Cfg is unchangeable, 1.0.1-2- are firmware and system versions, 1234567890- is the serial number, which always has 10 characters, and 20160208-075908 gives information about the date and time of the package creation. In this case it is on 08.02.2016 at 7:59:08.

Restoration
In the tab "Restore" we choose a storage medium, from which the restoration will be carried out and where we will look for the configuration package. The options are USB flash drive, SD card or internal memory of the device. Select one of these media and click on the button  . If there are some valid configuration packages on the storage medium, the selection "Select file:" will be filled in. We again see the packages under the name
OMR700-Cfg-1.0.1-2-1234567890-20160208-075603.tar.gz and we can select one of the offered packages. Using the box  we decide which one of the configurations should be restored. A click on the button  restores the configurations. To be able to load and use the new configuration, the device must be restarted. Therefore a warning window "Device will be restarted" will pop up.



Configuration backup

Configuration backup completed

Configuration backup failed

21 Viewing the stored values

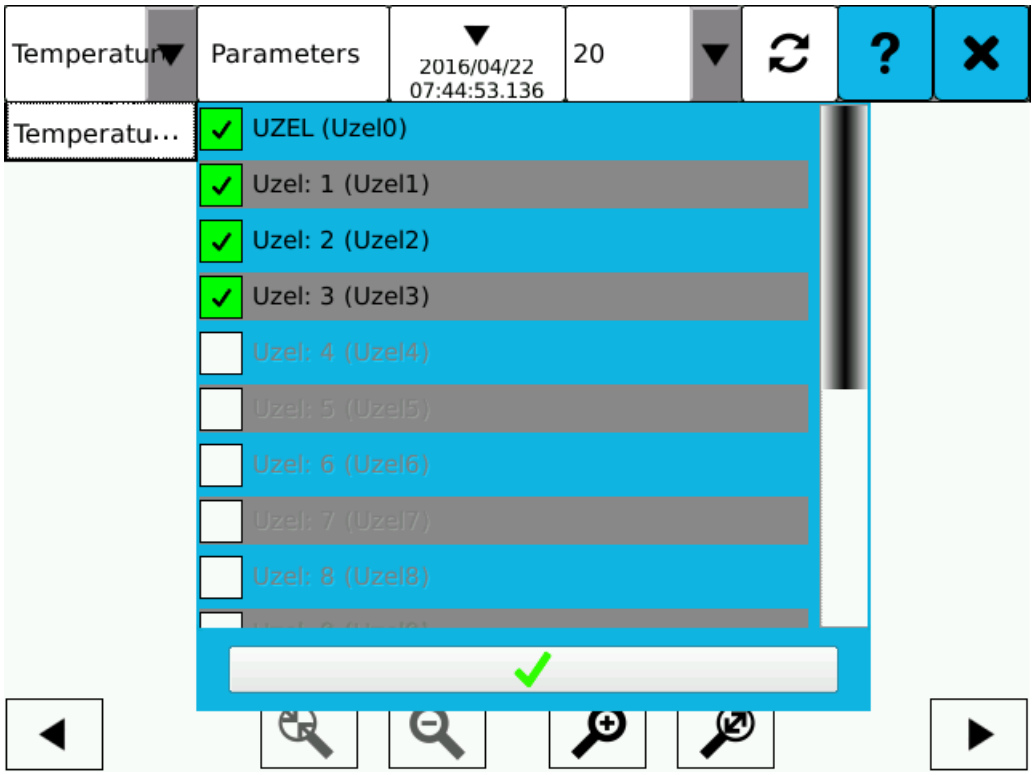
21 Viewing the stored values

A tool for viewing the measured data. The viewing is to be set gradually from selection of the record to selection of up to four parameters from the records, setting date and time for the beginning of plotting, and selection of the time span for displaying data in a chart.

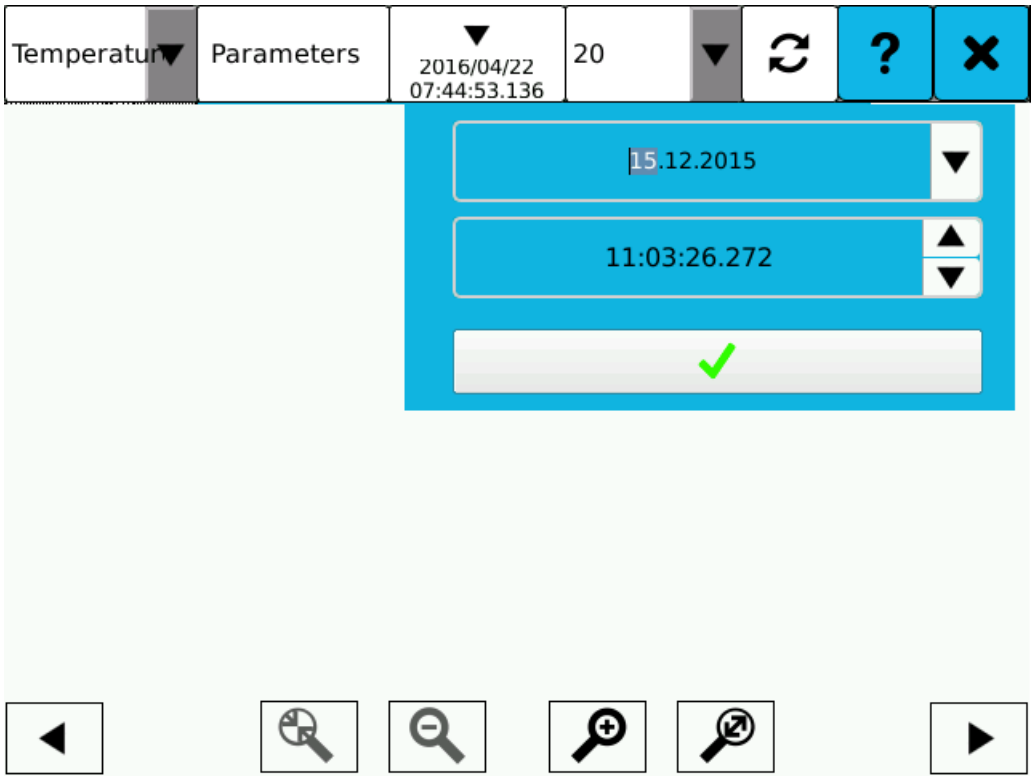
Record selection	Offer of all records with valid data.
Parameter selection	Offer of all parameters stored in a selected record. You can select up to four parameters to be displayed on one screen.
Setting date and time	Date and time since which the measured data have been loaded and displayed.
Setting time span	The time span displayed in a maximum zoom out of the chart.
	Button to confirm the setting for viewing and plotting a chart.

The chart is always plotted in a maximum zoom out. Using the buttons  and  we are stepwise getting closer (2x enlargement) or we can get the maximum zoom in of the displayed chart. Using the buttons  and  we are stepwise getting further (2x reduction) or we can get the maximum zoom out.

If the chart is in its maximum zoom out, the buttons  serve for shifting the chart to the left or right by the preset time span. However, if the chart is zoomed in, it shifts to the right or left within the time span always by 75% of the timeline.



Setting the viewing



Setting date and time

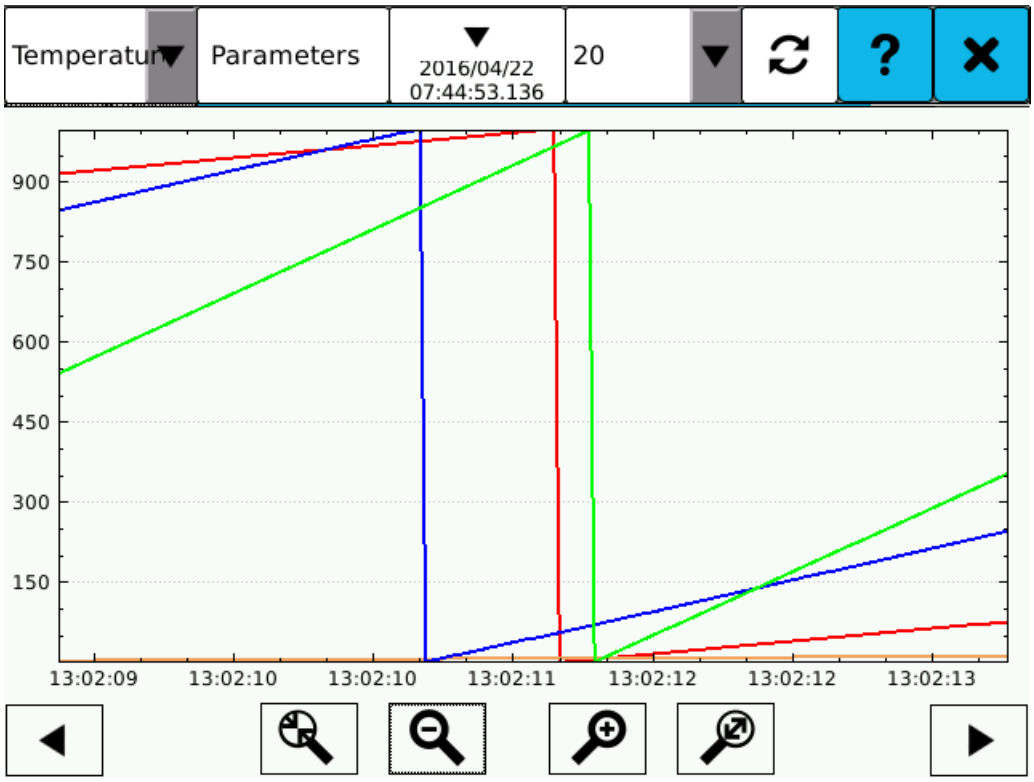


Chart display

22 Storage management

22 Storage management

A tool for copying, moving, and deleting stored logs and measured records in the internal memory.

 The button to start copying logs or records. The files are copied and they stay in the internal memory.

 The button to start moving logs or records. The files are copied and deleted from the internal memory. **The operation can not be undone!**

 The button to start deleting logs or records. The files are deleted from the internal memory. **The operation can not be undone!**

To work with the stored logs:
By selecting a start and end date in the selection calendar (the calendar is opened by clicking on ▼) all existing logs in the specified time span are searched, and the resulting number and size is displayed on the screen.

A click on one of the buttons USB flash or SD card selects the memory medium, on which the logs will be copied/moved.

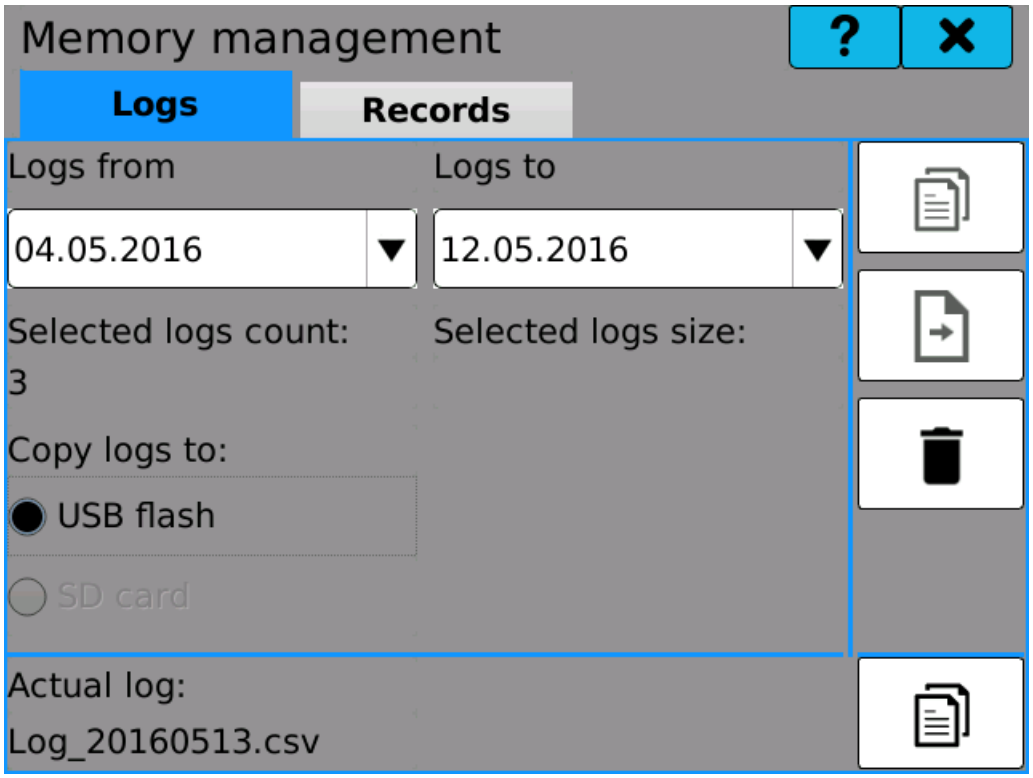
Clicking one of the buttons will start the file operations.
The log of the current day is displayed on the line **"Current log".** This log can be copied only. Use the button  at the end of the line.

To work with the stored records:

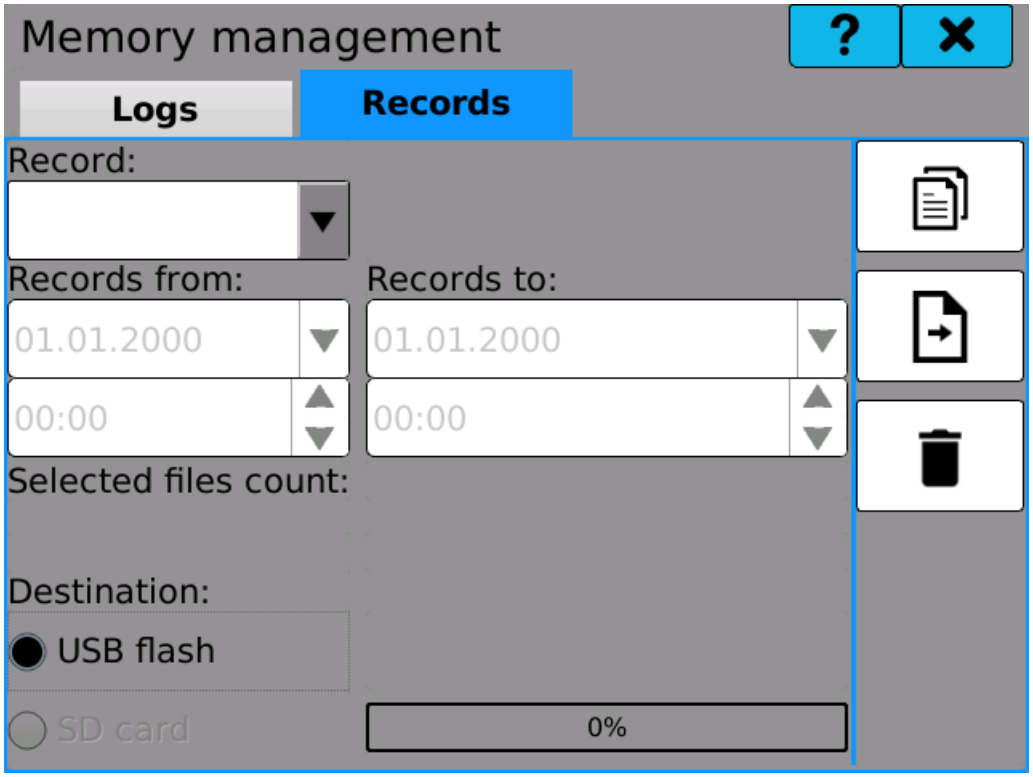
In the tab **"Records"** you can select one of the stored records in the internal memory. This record will fill in the date and time of the first and the last stored record.

A click on one of the buttons USB flash or SD card selects the memory medium, on which the records will be copied/moved.

Clicking one of the buttons will start the file operations. Copying progress is displayed in the progress indicator.



Logs management



Records management